AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS I & II

MISOPHRIIDÆ, LONGIPEDIIDÆ, CERVINIIDÆ, ECTINOSOMIDÆ
(PART)

WITH 16 AUTOGRAPHIC PLATES



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INTRODUCTION.

Of all the groups of the Copepoda, that of the *Harpacticoida* is undoubtedly the most extensive, and at the same time the most difficult to examine, on account of the generally very small size of the forms comprised within it, some of them being indeed almost undistinguishable to the naked eye. The most prominent character whereby the present group is distinguished from that of the *Calanoida* is, as clearly shown by Dr. Giesbrecht, the very movable articulation of the last segment of the metasome with the preceding segment, and its firm connection with the 1st segment of the urosome, giving it the appearance of more properly belonging to that section of the body. Thus far this group perfectly agrees with that of the *Cyclopoida*, and indeed Dr. Giesbrecht comprised both in his division *Podoplea*. I find it, however, more appropriate to keep these 2 groups apart, as in other respects they differ from each other rather materially. By most authors, the group here in question is regarded only as a family, *Harpacticidæ;* and the numerous genera comprised within it have of course been arranged under a series of subfamilies. In accordance with the arrangement adopted by the present author, as regards the *Calanoida*, these subfamilies are here recorded as true families, and their number has been considerably augmented. Moreover an attempt has been done to group these families under a few sections, as will be shown farther on.

The type of the present group is the genus from which its name is derived, viz., *Harpacticus* Milne-Edwards; and indeed this genus seems to combine some of the most characteristic features of the group, and in all probability constitutes a very primitive form. The difference, both as regards the external appearance and the structural details, between this genus and those of the *Calanoid* and *Cyclopoid* groups is very conspicuous; yet we find many deviations from this type, tending partly towards that of the *Calanoida*, partly towards that of the *Cyclopoida*, and in most cases a very gradual change in one or other direction may be easily demonstrated.

As regards the general shape of the body, in the greater number of the forms it is very slender and more or less cylindrical, with no very pronounced demarcation between the anterior and posterior divisions. In some cases, however, the posterior division, including the last segment of the metasome, appears abruptly much narrower than the anterior, which may be more or less expanded, as in the *Cyclopoida*, for instance, in the genera *Misophria*, *Pseudotachidius*, *Idya*, etc. In some forms both the anterior and posterior divisions appear greatly expanded, whereby the body acquires a pronouncedly depressed, even leaf-like form, as in the genera *Zaus*, *Peltidium*, *Porcellidium*. In other cases, quite contrary to this, the body is found to be highly compressed, for instance in the genus *Amymone*.

The cephalosome is generally coalesced with the 1st segment of the metasome, though in some few forms a well-marked demarcation between them may be found to exist. The lateral parts of this section are more or less expanded, being so deep in some forms, e. g. the genus *Longipedia*, that they wholly include between them the oral appendages. It projects in front in a more or less distinct, generally lamellar rostrum, which in most cases is movably connected with the cephalic shield. The 3 succeeding segments of the metasome are always well defined, and are provided with more or less distinct epimeral plates. The last segment of the metasome, as stated above, has always a very movable articulation with the preceding segment, whereas it is firmly connected with the 1st segment of the urosome. Its epimeral plates are generally obsolete, or at any rate much smaller than on the preceding segments. The urosome is composed of 5 segments, the first 2 of which, however, in the female are more or less completely coalesced, though in some forms a distinct suture between them is seen dorsally. In the male these 2 segments are always distinctly separated, and the 1st of them projects at the end, on each side of the ventral face, to a small setiferous process. The caudal rami are in most cases short, and firmly connected with the last caudal segment. Of the apical setæ, as a rule, only the 2 middle ones are well developed, the others being more or less rudimentary. A single eye is generally present, though in some forms, especially in those from deep water, no trace of such an organ is to be found.

The anterior antennæ are, as a rule, of inferior size and composed of a limited number of articulations, rarely (as in the genus *Misophria*) exceeding 8 in all. One of the articulations, generally the 3rd or 4th, exhibits at the end anteriorly a projecting knob, to which a slender sensory appendage is attached, and the succeeding portion of the antenna is generally abruptly narrowed, forming a well-defined terminal part. In the male both these antennæ are prehensile, and often greatly swollen in their outer part. The

posterior antennæ are on the whole more strongly built than in the *Calanoida*, and are generally tipped with coarse denticulated spines. They always carry a secondary appendage (outer ramus); but in most cases this appendage is of rather inferior size as compared with the chief stem (the inner ramus). The mandibles carry outside a more or less developed palp, and this is also generally the case with the maxillæ. The anterior maxillipeds are short and stout, with several digitiform processes, the number of which may however be considerably reduced. The posterior maxillipeds in the majority of forms are pronouncedly prehensile, terminating in a powerful clawed hand. There are, however, a number of forms in which these appendages are of a very different structure, and not prehensile at all. The 1st pair of legs are in some instances of a structure similar to that of the succeeding pairs; but in the majority of cases they differ rather conspicuously, being more or less transformed into grasping organs. The 3 succeeding pairs are always natatory and generally have both rami 3-articulate, though the inner one may sometimes be much reduced in size. The last pair of legs are very unlike the others, and are never natatory. They are generally lamellar in structure, biarticulate, and edged with strong setæ or spines.

The ova are in most cases carried within a single ovisac attached to the ventral face of the 1st caudal segment. More rarely 2 ovisacs are present, which likewise are appended to the ventral face, never, as in the *Cyclopoida*, laterally or subdorsally.

With regard to the inner organisation, it may be noted that, unlike what is the case in the *Calanoida*, no heart is present (except in the genus *Misophria*), and that the male genital apparatus is always perfectly symmetrical.

By far the greater majority of forms belonging to the present group are marine, only a very limited number of genera being represented in fresh water. Some species seem, however, to prefer brackish water, and so far cannot properly be said to be either true marine or true fresh-water forms. Contrary to what is generally the case with the *Calanoida*, the *Harpacticoida* are, as a rule, true bottom forms, to be sought for among algæ near the shores, in tidal pools, or in mud brought up from various depths. But in this respect also there are some exceptions. Thus the species of the genera *Setella, Euterpe, Clytemnestra, Miracia*, lead a true pelagic life. Some few forms are known to be commensal with other Crustacea *(Sunaristes)*, or even with Vertebrates *(Balænophilus)*; but no true parasites are as yet known among the *Harpacticoida*.

The several families comprised within the present group may be arranged under 2 chief sections. In the one, *Achirota*, the posterior maxillipeds are of weak consistency and not prehensile; in the 2nd, *Chirognatha*, these appendages

are pronouncedly prehensile, terminating in a more or less powerful, clawed hand. The latter section may again be conveniently divided into 2 subsections, according to the structure of the 1st pair of legs. In the one subsection, *Chirognatha pleopoda*, these legs are of a structure similar to that of the succeeding pairs and, like them, natatory; in the other sub-section, *Chirognatha dactylopoda*, they are rather unlike the succeeding pairs, and more or less distinctly transformed into grasping organs.

Section I. Achirota.

Remarks.—This section is far less extensive than the next. It comprises, however, as yet, 4 different families, each of which, except the 1st, contains several well-defined genera. The chief characters common to all of them is the non-prehensile structure of both the posterior maxillipeds and the 1st pair of legs. In the latter character they agree with those belonging to the 1st subdivision of the next section.

The greater number of species are true deep-water forms, and it is very probable therefore, that on a future closer examination of deep-water deposits, several additional forms will be detected, requiring perhaps the establishment of both new genera and new families.

Fam. 1. Misophriidæ.

Characters.—Body *cyclopoid* in shape, the posterior division (including the last segment of metasome) being abruptly much narrower than the anterior. Anterior antennæ unusually prolonged, and consisting of numerous articulations; both antennæ in male, as usual, prehensile. Posterior antennæ and oral parts of a structure rather similar to that in the *Calanoida*. Natatory legs more *cyclopoid* in shape, and rather powerful, with both rami triarticulate. Last pair of legs 3-articulate, and of same appearance in both sexes. Ovisac single, ventral. A heart present, as in the *Calanoida*. Male genital apparatus symmetrical, like that in the other *Harpacticoida*.

Remarks.—This family, established by Prof. Brady, has generally been placed between the *Calanoida* and *Cyclopoida*, being regarded by some authors as more nearly related to the former group, by others as nearer to the latter. In my opinion, it ought more properly to be included in the *Harpacticoid* group,

though in some respects it certainly exhibits an apparent resemblance both to the *Calanoida* and to the *Cyclopoida*. That at any rate the typical genus *Misophria* cannot be referred to the former group, has been clearly shown by Dr. Giesbrecht; and he also finds it impossible to class it among the *Cyclopoida*, because the posterior antennæ have a well-developed outer ramus, wholly absent in all known forms of that group. So far I fully agree with that author; but, on the other hand, I cannot concur in his opinion that the difficulties in referring this form to the *Harpacticoida* are equally great. True, the anterior antennæ look rather different from their comparatively greater length and more numerous articulations; but this character is evidently of far less importance than those referred to as distinguishing the genus from the *Calanoida* and *Cyclopoida*. There is another character, to which Dr. Giesbrecht has called attention, and which, indeed, seems to be of much greater importance, viz., the presence in *Misophria* of a distinct, though rather small and imperfectly developed heart. Such an organ, as is well known, is wholly absent in both the *Cyclopoida* and the *Harpacticoida*, whereas in the *Calanoida* it is always present. As, however, several other important features (for instance, the mode of articulation of the last segment of the metasome, and the symmetrical structure of the male genital apparatus) make it quite unreasonable to place the genus in that group, we must set aside this peculiarity, and otherwise decide to which of the 2 groups, *Cyclopoida* or *Harpacticoida*, it should rightly be referred. For my own part, I consider a character, not found out by Dr. Giesbrecht, to be quite conclusive, viz. the presence in *Misophria* of only a single ventral ovisac.

In addition to the typical genus, Prof. Brady refers 2 other genera to the family *Misophriidæ*, viz., *Pseudocyclops* and *Cervinia*, and to the same family Mr. Th. Scott subsequently referred another genus, *Paramisophria*. All these 3 genera must, however, be discarded from the present family, 2 of them, *Pseudocyclops* and *Paramisophria* being, as shown by Dr. Giesbrecht, true *Calanoids*, whereas the 3rd belongs to a very different family of the *Harpacticoida*, viz., *Cerviniidæ*, to be treated of below. Of course the present family as yet comprises only a single genus.

Gen. 1. **Misophria**, Boeck, 1864.

Generic Characters.—Body comparatively robust, sub-depressed, with the anterior division considerably expanded. Cephalosome wholly confluent with the

1st segment of the metasome, and produced in front to an immobile rostrum. Last segment of metasome abruptly much narrower than the preceding ones, and without any distinct epimeral plates. Urosome rather narrow, and subcylindric in form; genital segment in female with a well-defined transversal suture dorsally in the middle. Caudal rami short, with the innermost apical seta well developed, though considerably shorter than the 2 middle ones. Eye wholly absent. Anterior antennæ slender, attenuated, many-jointed, those in male distinctly geniculate, with all 3 sections well defined. Posterior antennæ with the inner ramus distinctly 3-articulate, and carrying on the tip slender curved setæ, outer ramus well developed, though smaller than the inner, and 6-articulate. Mandibles with the masticatory part lamellarly expanded, and divided into several denticulated teeth, palp large, biramous, with both rami biarticulate and carrying slender setæ. Maxillæ very fully developed, and exhibiting all the parts found in those of the *Calanoida*, inner ramus of palp greatly elongated, biarticulate. Anterior maxillipeds robust, with the normal number of digitiform lobes, the outermost being produced to a strong claw. Posterior maxillipeds more slender, and resembling in structure those in the *Calanoida*, terminal part 5-articulate. Natatory legs with comparatively broad, flattened rami, those of 1st pair of about equal size, those of the 3 succeeding pairs somewhat unequal, the outer one being the larger. Last pair of legs consisting each of 3 flattened joints carrying scattered setæ.

Remarks.—This genus, established by Boeck, was placed by that author, with some hesitation, among the *Cyclopoida*, and indeed its external appearance is pronouncedly cyclopoid. There is also in this respect a perplexing similarity between this genus and some calanoid genera, viz., *Pseudocyclops* and *Paramisophria*. On a closer comparison, it may, however, at once be distinguished from these genera by the very different mode of articulation of the last segment of the metasome, and from the *Cyclopoida* by the single ventral ovisac. The genus as yet comprises only a single species, to be described below.

1. Misophria pallida, Boeck.

(Pl. I & II).

Misophria pallida, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. 1864, p. 248.

Specific Characters.—Female. Anterior division of body rounded oval in form, with the dorsal face evenly vaulted. Cephalosome (including the 1st segment of metasome) occupying about $^2/_3$ of that division, rostral projection very strong, acute at the tip, and pointing straight downwards. Penultimate segment of meta-

some deeply emarginated behind, and almost wholly encompassing laterally the small last segment. Urosome not attaining half the length of the anterior division, genital segment slightly dilated in its anterior part, and exceeding in length the remaining segments combined. Caudal rami broader than they are long, and transversely truncated at the tip, apical setæ rather elongated and densely plumous, the innermost but one fully half as long as the whole body. Anterior antennæ about the length of the cephalic segment, and consisting of 16 articulations, the 3 proximal of which are considerably dilated and densely clothed with partly ciliated setæ. Last pair of legs with the 1st joint conically produced at the end inside, and carrying on both edges a ciliated seta, that of the inner corner rather elongated and deflexed; 2nd joint somewhat smaller, and obliquely produced outside, with a long seta at the outer corner; last joint oval in form and carrying on the tip a lanceolate, denticulated spine and a slender seta, outer corner produced to a small dentiform projection. Ovisac small, rounded, and containing a very limited number of large globular ova.

Male considerably smaller than female, with the anterior division of the body less expanded. Genital segment considerably dilated, and generally containing on each side a large, oval spermatophore. Anterior antennæ composed of only 13 articulations, basal section considerably dilated and 5-articulate, with several well-developed sensory appendages in front; middle section very sharply defined from the basal one, narrow fusiform, and consisting of 6 articulations; terminal section biarticulate. Last pair of legs scarcely different from those in female.

Colour whitish, with a pale reddish tinge.

Length of female 0.70 mm., of male 0.55 mm.

Remarks.—This peculiar Copepod may be easily recognized from any of the other *Harpacticoida*, its external appearance deviating, indeed, considerably from the ordinary type, and more resembling that in forms belonging to quite different divisions of the Copepoda. It is unquestionably the most anomalous form of the whole group.

Occurrence and Habits.—I have found this interesting form occasionally in several places off the west coast of Norway, in depths varying from 20 to 50 fathoms, sandy bottom. Last summer, a single female specimen was captured in the Trondhjem Fjord, near Agdenæs, in about 50 fathoms. The solitary specimen examined by Boeck, was taken at Skudesnæs, west coast of Norway.

The animal moves in a manner very similar to that observed in some of the deep-sea Calanoids, for instance *Stephos* and *Pseudocyclops*, now proceeding quite slowly in a somewhat rotatory manner produced by rapid vibrations of the

posterior antennæ and oral parts, now with quick leaps effected by powerful strokes of the natatory legs and the urosome. It keeps constantly close to the bottom.

Distribution.—English and Scottish coasts (Brady, Scott), Gulf of Naples (Giesbrecht).

Fam. 2. Longipediidæ.

Characters.—Body of normal appearance, more or less cylindrical in form, with no sharp demarcation between the anterior and posterior divisions. Cephalosome in some cases distinctly defined from the 1st pedigerous segment; rostrum lamellar and movably articulated to the cephalic shield. Eye well developed. Anterior antennæ short and stout, consisting of a very limited number of articulations densely clothed with partly spiniform setæ. Posterior antennæ with the outer ramus very fully developed, cylindrical, 6- or 7-articulate. Mandibles and maxillæ with well-developed and abundantly setiferous palps. Anterior maxillipeds calanoid in structure; posterior ones very delicate, lamellar, and fringed with densely plumous setæ. Natatory legs with both rami 3-articulate and rather narrow, being armed outside with strong spines, inside and at the tip with long, partly spiniform setæ; 1st pair not differing greatly from the others. Last pair of legs with the inner expansion of the proximal joint very small, distal joint well-developed or rudimentary. Ovisac single or double.

Remarks.—In this family I propose to comprise the 3 genera *Longipedia* Claus, *Sunaristes* Hesse and *Canuella* Scott, which are undoubtedly closely allied, and together form a natural group of the *Achirota*. It does not answer to the subfamily *Longipediinæ* of Brady, to which a much wider range is given, also comprising, as it does, the genera *Zosime*, *Ectinosoma* and *Bradya*, which in my opinion ought to be referred to other families. The most characteristic features of the present family are the unusually full development of the outer ramus of the posterior antennæ, the likewise largely-developed palps on the mandibles and maxillæ, and, finally, the peculiar, delicate structure of the posterior maxillipeds. In all these characters there is a great similarity between the 3 above-named genera, whereas in other respects well-marked differences between them are found to exist.

Gen. 2. **Longipedia**, Claus, 1863.

Generic Characters.—Body more or less slender, with the anterior division conspicuously compressed. Cephalic segment comparatively large and confluent with the 1st segment of metasome, its lateral parts very deep, forming broad vertical lamellæ, finely ciliated below, and wholly including between them the oral parts; rostrum well developed, narrow linguiform. Epimeral plates of the 3 succeeding segments large, vertical, angularly produced behind, and including between them the bases of the natatory legs. Last segment of metasome not much narrower than the preceding one, but without distinct epimeral plates. Urosome gradually attenuated behind, genital segment in female with a very distinct transversal suture in the middle dorsally, and exhibiting at the end of the suture, on each side, a strong recurved dentiform projection; last 2 caudal segments comparatively short. Anal opercle produced at the tip to a spiniform process and generally having a number of smaller denticles on each side. Caudal rami short, with the apical setæ more or less spreading. Anterior antennæ rather robust and much curved, consisting of 5 imperfectly-defined articulations thickly beset with strong setæ, some of which are plumose, others spiniform and strongly pectinate; those in male terminating in a clawed hand. Posterior antennæ with the outer ramus fully as long as the inner and very flexible, 6-articulate. First pair of natatory legs considerably smaller than the succeeding ones, with the spine outside the 2nd joint of the outer ramus remarkably slender and upturned; 2nd pair with the inner ramus greatly elongated, baculiform, the last joint being much produced and armed with 3 thick apical spines and 3 marginal ones. Last pair of legs with the distal joint well developed, lamellar, proximal joint carrying outside a long digitiform process, tipped by a delicate seta, its inner expansion very narrow and terminating in a slender curved seta. A single ovisac present in female.

Remarks.—This genus, established by Claus, is easily distinguished from any of the other *Harpacticoida* by the peculiar transformation of the inner ramus of the 2nd pair of legs to a kind of leaping-pole, a character, indeed, which has given rise to the generic name proposed by Claus. It moreover differs materially from the 2 other genera included in the present family in the presence of only a single ovisac. Off the Norwegian coast occur 4 different, though very nearly allied species, to be described below.

2. Longipedia coronata, Claus.

(Pl. III & IV).

Longipedia coronata, Claus, Die freilebenden Copepoden, p. 111, Pl. XIV, figs 14—24.

Specific Characters.—Female. Body moderately slender, with the anterior division, seen dorsally, of nearly uniform width throughout, the posterior one gradually attenuated. Caudal segments with the posterior edge perfectly smooth, without the slightest trace of denticles. Anal opercle with 2 subequal denticles on each side, terminal spine rather elongate. Caudal rami a little longer than they are broad, and somewhat divergent, apical setæ apparently quite smooth and considerably spreading, the innermost but one slightly exceeding half the length of the body. Inner ramus of 2nd pair of legs with the terminal joint almost 3 times as long as the first 2 combined, proximal spine of inner edge placed in front of that of the outer, the latter occurring at about the middle of the joint. Last pair of legs with the distal joint oblong quadrangular in form, being scarcely at all expanded distally, inner expansion of proximal joint with a slender denticulated spinule inside the base of the terminal seta.

Male not differing much in external appearance from female, but of considerably smaller size, and easily recognizable by the strongly-hooked anterior antennæ and the distinctly 5-articulate urosome. Genital segment exhibiting at the end on each side a small 3-setose lappet. Last pair of legs slightly differing from those in female.

Colour yellowish gray, with a slight greenish tinge, caudal setæ dark brown.

Length of adult female 1.30 mm., of male 1.08 mm.

Remarks.—It seems to me beyond doubt that the above-described form is that originally examined by Claus, and named as above. On the other hand, scarcely any of the forms recorded by other authors under that name are identical with Claus's species, but belong to one or other of the 2 nearly-allied species described below as *L. Scotti* and *L. minor*. The present species may be easily distinguished from these 2 forms by the total absence of any denticles on the posterior edge of the caudal segments. In the structure of the inner ramus of the 2nd pair of legs, it agrees with *L. minor;* but the last pair of legs are rather unlike in the 2 forms, as also the size of the animal.

Occurrence and Habits.—This form is very common in the upper part of the Christiania Fjord in depths varying from 6 to 30 fathoms, muddy bottom. I have also taken it abundantly in the Trondhjem Fjord, and more rarely off the west coast of Norway. It may be easily obtained by placing the muddy deposits taken up by the aid of the dredge in a shallow vessel with a small amount of

water. The specimens will then at once make their appearance, owing to a peculiarity which they have in common with some other Copepoda, namely, that on touching the surface, they remain floating upon it. The swimming movements of the animal are rather rapid, and constitute an even progress through the water. When keeping to the bottom, it may, however, propel itself in a more abrupt, jerky manner, by employing the long inner rami of the 2nd pair of legs like a pair of leaping-poles.

Distribution.—Heligoland, Gulf of Naples (Claus).

3. Longipedia Scotti, G. O. Sars, n. sp.

(Pl. V, fig. 1).

Syn: *Longipedia coronata*, Brady, Scott (not Claus).

Specific Characters.—Female. Very like the preceding species, but of somewhat larger size, and perhaps more robust form of body. Posterior edge of caudal segments fringed throughout with delicate denticles. Anal opercle with one large and 4 smaller denticles on each side, terminal spine very strong. Caudal rami about as in *L. coronata*, the apical setæ being very strong and dark-coloured, though perhaps somewhat shorter than in that species. Inner ramus of 2nd pair of legs with the inner proximal spine of the terminal joint placed behind the spine of the outer edge. the latter occurring in front of the middle; distal inner spine generally turned outwards. Last pair of legs with the distal joint sub-spatulate in form, gradually widening towards the tip, inner expansion of proximal joint with a very small hair-like spinule inside the base of the terminal seta.

Colour yellowish gray.

Length of adult female reaching 1.50 mm.

Remarks.—This is the form recorded by Brady [1]) and Scott as *L. coronata* Claus. In one of his numerous papers, Th. Scott has called attention to a character in which the present form differs conspicuously from another smaller form, at first only regarded by him as a variety (var. minor) of Claus's species. This character consists in the different position of the inner proximal spine on the terminal joint of the inner ramus of the 2nd pair of legs. The author seems, however, to have been unaware of the fact that in Claus's species this spine has

[1]) As first pointed out, however, by Th. Scott, Brady has under this name confounded 2 very different Copepods, not even belonging to the same genus, only that regarded by him as the male being referable to the present species.

a very different position from that in the present form. Another character by which the present species may be easily distinguished from *L. coronata* Claus, is the dense fringe of delicate denticles, with which the posterior edges of the caudal segment are ornamented. Moreover the last pair of legs exhibit some well-marked differences.

Occurrence.—I have found this form occasionally at Aalesund, west coast of Norway, as also in the Trondhjem Fjord just beneath steep cliffs, in depths ranging from 6 to 10 fathoms. In habits it exactly agrees with the preceding species.

Distribution. English and Scottish coasts (Brady, Scott).

4 Longipedia minor, Scott.

(Pl. V, fig. 2).

Longipedia coronata, var. *minor*, Th. Scott, Additions to the Fauna of the Firth of Forth. 11th Report of the Fishery Board for Scotland, p. 200, Pl. 11, figs. 14—20.

Syn: *Longipedia coronata*, Boeck, Giesbrecht (not Claus).

Specific Characters.—Female. Body of the usual form, the anterior division being considerably compressed, the posterior slightly attenuated. Posterior edges of last segment of metasome and those of urosome fringed throughout with delicate denticles. Anal opercle about as in *L. Scotti*. Caudal rami short, scarcely longer than they are broad, apical setæ strong and very much elongated, the innermost but one almost attaining the length of the whole body. Inner ramus of 2nd pair of legs much elongated, inner proximal spine of terminal joint placed in front of that of the outer edge, the latter occurring behind the middle. Last pair of legs with the distal joint much narrower and more elongated than in any of the other species, inner expansion of proximal joint with a slender smooth spinule inside the base of the terminal seta.

Colour light yellow, mottled with brown.

Length of adult female scarcely exceeding 0.80 mm.

Remarks.—This form was at first regarded by Th. Scott as merely a variety of *L. coronata* Claus; but subsequently it has been recorded by that author as a distinct species under the above name. It is unquestionably identical with the form described in detail by Dr. Giesbrecht as *L. coronata* Claus; and the form observed by Boeck also seems to belong to the same species, to judge from the drawings he has left behind. Indeed, the present form is closely allied to Claus's species, though at once distinguishable from it by the finely denticulated

posterior edges of the caudal segments, and the slender form of the distal joint of the last pair of legs. It is moreover of much inferior size.

Occurrence.—This form is found rather abundantly along the whole south and west coast of Norway, from the Christiania Fjord at least as far as the Trondhjem Fjord. It generally occurs in a few fathoms' depth among algæ, and thus seems to be a more sub-littoral form than the other species of the genus.

Distribution.—Kieler Föhrde (Giesbrecht), Scottish coast (Scott), ? coast of France (Canu).

5. Longipedia rosea, G. O. Sars, n. sp.

(Pl. V, fig. 3).

Specific Characters.—Female. Body less compressed than in the other species and more abruptly attenuated behind; integuments unusually thin and pellucid. Rostral plate comparatively broader and more obtuse at the tip. Genital segment with the lateral denticles rather small; posterior edge of this and the succeeding segments with only very slight traces of spinules. Anal opercle with 3 very small denticles on each side near the base, terminal spine comparatively shorter than in the other species. Caudal rami short and thick, rounded at the tip, each with an oblique series of small denticles dorsally; apical setæ of moderate length, and very conspicuously ciliated, especially the 2 middle ones. Inner ramus of 2nd pair of legs comparatively shorter than in the other species, inner proximal spine of last joint at about the same level as the outer spine. Last pair of legs with the distal joint of about the same appearance as in *L. coronata*, proximal joint with the outer digitiform process comparatively short and thick, inner expansion with a very small spinule inside the base of the terminal seta.

Body semipellucid, of a whitish colour, and variegated with irregular patches of a bright rosy hue.

Length of adult female 1.20 mm.

Remarks.—In the living state, this form is at once recognized from any of the other species by its peculiar and beautiful colouring; but, as usual, this character is lost in preserved specimens, which very soon assume a uniformly whitish colour. On a closer examination, however, the present species may be easily distinguished by the more slender form of the body, and especially by the very distinct ciliation of the caudal setæ, which, moreover, are not dark-coloured as in the other species.

Occurrence.—Only a very limited number of specimens of this remarkable form have hitherto come under my notice. They were taken at different times, some off the west coast of Norway (Aalesund), some in the Trondhjem Fjord, from rather considerable depths, down to 100 fathoms. Some apparently immature specimens were also picked out of a plankton-sample taken from deep water, a fact that seems to prove that this form is not so absolutely confined to the bottom, as is the case with the other species of this genus.

Gen. 3. **Sunaristes**, Hesse, 1867.

Syn: *Longipedina*, W. Müller.

Generic Characters. Body very slender in form, with the anterior division scarcely at all compressed, posterior cylindrical in shape. Cephalosome confluent with the 1st pedigerous segment, lateral parts not completely obtecting the oral parts at the sides. Epimeral plates of the succeeding segments small, rounded. Genital segment in female without any trace of a transversal subdivision, and without lateral denticles. Anal opercle smooth. Caudal rami somewhat produced and slightly divergent, apical setæ about as in *Longipedia*. Anterior antennæ less robust and less arcuate than in that genus, 6-articulate, and clothed with very slender, partly ciliated setæ; those in male terminating in a very strong clawed hand. Posterior antennæ and oral parts very similar in structure to those in *Longipedia*. Natatory legs, however, somewhat different. 1st pair of nearly the same size and structure as the 2nd, inner ramus of the latter quite normal in female, slightly transformed in male, the 2 posterior pairs of somewhat simpler structure than the 2 anterior, and provided with unusually long and slender setæ. Last pair of legs in both sexes quite rudimentary. Ovisac double.

Remarks.—This genus was established in the year 1867 by the French naturalist, Hesse, to include a peculiar Copepod found by him as a commensal in the same shell with a kind of hermit crab. The genus *Longipedina* of W. Müller is unquestionably identical with that of Hesse. As indicated by the name proposed by the former author, this genus is, indeed, nearly allied to *Longipedia*, exhibiting, as it does, a very similar structure of both the antennæ and the oral parts. In other respects, however, it differs rather materially, as for instance in the altogether normal appearance of the inner ramus of the 2nd pair of legs, the rudimentary condition of the last pair of legs, and the presence in the female of

2 ovisacs. Moreover the genital segment in the female does not exhibit any trace of a subdivision, no transversal suture existing dorsally. The genus as yet only comprises a single species, to be described below[1]).

6. Sunaristes paguri, Hesse,

(Pl. VI & VII).

Sunaristes paguri, Hesse, Ann. d. Sc. Nat., Ser. V, Vol. VII, p. 205.

Syn: *Longipedina paguri*, W. Müller.

Specific Characters.—Female. Body extremely slender and elongated, with very thin and flexible integuments. Anterior division slightly widening in front, cephalic segment rather large, exceeding in length the 3 succeeding segments combined, rostral plate broad and obtusely truncated at the tip. Last segment of metasome of about the same width as the preceding one. Urosome occupying more than half the length of the whole body, genital segment very large, about equalling in length the 2 succeeding segments combined, and scarcely at all dilated in front; genital region with 2 unequal setiform appendages on each side. Last segment much shorter than the preceding ones. Caudal rami about twice the length of that segment, rather narrow and somewhat attenuated distally, apical setæ slender and indistinctly ciliated, one of them attached to the outer edge at some distance from the tip. Anterior antennæ of moderate length and somewhat attenuated, with the apical filaments very slender. Posterior antennæ with the outer ramus somewhat shorter than the inner. The 2 anterior pairs of natatory legs with both rami of about equal size, the 2 posterior pairs with the inner ramus shorter than the outer, and carrying on the tip 2 setæ and a short spine. Legs of last pair consisting each of only a very small lamella edged with 4 setæ, the outermost one very slender. Ovisacs (according to Hesse) narrow fusiform and greatly diverging.

Body semipellucid, of a whitish colour with a yellowish tinge.

Length of adult female reaching 3 mm.

Remarks.—As above stated, this form was first described by Hesse under the above name. Subsequently the same form was observed by W. Müller, who, being unaware of the earlier description of Hesse, regarded it as new, and recorded it under the name of *Longipedina paguri*. It is an easily recognizable form, and perhaps the largest of all known *Harpacticoida*.

Occurrence.—Only a solitary female specimen of this interesting form has hitherto come under my notice. It was taken up in the dredge, together with

[1]) In a just received paper Mr. A. Scott describes 3 additional species from the Indian Ocean.

some gravelly sand, at Hvalör, outside the Christiania Fjord, from a few fathoms' depth. According to the statements of both M. Hesse and W. Müller, this form is generally found in shells occupied by the common hermit-crab, *Eupagurus bernhardus*. I have myself, however, failed to detect any specimens under such circumstances, nor has this been done by Th. Scott.

Distribution.—French coast (Hesse), Scottish coast (Scott).

Gen. 4. **Canuella**, Scott, 1893.

Generic Characters.—Body nearly cylindrical in form, with very thin and flexible integuments. Cephalosome distinctly defined from the 1st segment of the metasome, its lateral parts not very deep, rostrum well developed, narrow linguiform. Epimeral plates of the pedigerous segments small, rounded. Genital segment in female exhibiting in the middle dorsally a well-marked transversal suture, lateral denticles wanting; that in male conspicuously dilated, and produced at the end below to 2 acute projections comprising between them a somewhat hollowed area. Anal opercle simple, rounded. Caudal rami more or less elongated and greatly divergent, apical setæ of moderate length, outer edge with a small seta about in the middle. Anterior antennæ resembling in structure those in *Sunaristes*, though somewhat more robust; those in male less dilated at the end. Posterior antennæ with the outer 2 joints of the inner ramus imperfectly defined, outer ramus very powerful, 7-articulate. Oral parts on the whole built upon the same type as in the 2 preceding genera. Natatory legs rather strongly built, with the outer corner of the joints more or less produced; inner ramus of 2nd pair of normal appearance in both sexes. Last pair of legs, as in *Sunaristes*, rudimentary. Ovisac double.

Remarks.—As observed by Th. Scott, this genus is closely related to *Sunaristes*, though exhibiting some differences, which make it advisable to keep it apart. One of these differences, not referred to by that author, though indicated in the figure of the animal given, consists in the complete separation of the 1st pedigerous segment from the cephalosome, a character very rarely found in the group in question. Among other differences may be named the distinct transversal suture occurring in the middle of the dorsal face of the genital segment in the female, and the somewhat different structure of the posterior antennæ, natatory legs and caudal rami. Two nearly-allied species of this genus occur off the Norwegian coast.

7. Canuella perplexa, Scott.

(Pl. VIII & IX).

Canuella perplexa, Th. Scott, Notes on Copepoda from the Firth of Forth. Ann. of Scottish Nat. Hist. 1893, p. 92, Pl. II, figs. 1—3.

Syn: *Longipedia coronata* ♀ Brady (not Claus).

Specific Characters.—Female. Body of almost uniform width throughout, or very slightly attenuated behind, with rather deep and conspicuous instrictions between the segments. Cephalic segment comparatively small, somewhat vaulted above, and with the lateral parts but slightly expanded; rostral plate narrowly rounded at the tip. 1st segment of metasome well defined, though much shorter than the others; last segment scarcely narrower than the preceding one. Urosome much shorter than the anterior division of the body, genital segment but slightly dilated in its anterior part; the 3 posterior segments gradually diminishing in size. Caudal rami scarcely twice as long as the last segment, greatly divergent, and gradually tapering distally; apical setæ minutely ciliated, the middle one about twice as long as the outer, and equalling in length the urosome. Anterior antennæ rather robust, and consisting of 5 articulations, some of the setæ very strong and coarsely pectinate. Posterior antennæ with the outer ramus fully as long as the inner, some of the setæ very strong, almost spiniform. 1st pair of natatory legs considerably shorter than the succeeding ones, spines of outer ramus rather elongated; 2nd pair with the first 2 joints of the inner ramus considerably produced at the inner corner. Last pair of legs extremely minute, each forming a thin plate edged with 4 setæ, the innermost but one the longest and distinctly plumous. Ovisacs large, rounded oval in form.

Body semipellucid, of whitish colour, with a faint yellowish tinge.

Length of adult female 1.30 mm., of male 1.25 mm.

Remarks.—Mr. Th. Scott first called attention to the fact that Prof. Brady, in his Monograph of the British Copepoda, has, under the name of *Longipedia coronata* Claus, confounded 2 entirely different Copepoda, the one, regarded by him as the male sex, being in reality a female *Longipedia* (= *L. Scotti* G. O. Sars), whereas that recorded as the female of *Longipedia coronata* is the form here under discussion. This form was then described by Th. Scott as the type of a new genus under the above name, and its differences from *Longipedia* were pointed out. The most conspicuous of these differences is unquestionably the presence of 2 diverging ovisacs, a feature, indeed, very seldom met with in the *Harpacticoid* group; and it is apparently this anomalous character which has given rise to the specific name *perplexa* proposed by that author.

Occurrence.—The only place on the Norwegian coast where I have met with this form, is at Fredriksvärn, outside the Christiania Fjord. It there occurred not unfrequently in a few fathoms depth, on a sandy bottom partly overgrown by algæ.

Distribution.—English coast (Brady), Scottish coast (Scott).

8. Canuella furcigera, G. O. Sars, n. sp.

(Pl. X).

Specific Characters.—Female. Very like the preceding species, but with less deep instrictions between the segments and with the urosome more abruptly, attenuated. Genital segment with 2 small juxtaposed lanceolate lappets below. Caudal rami much larger than in *C. perplexa*, equalling in length the 3 posterior caudal segments combined, and generally greatly divergent, each with a well-marked carina along the dorsal face, middle apical seta more than twice as long as the outer one, both very indistinctly ciliated. Structure of the several appendages almost exactly as in *C. perplexa*.

Male resembling that of the typical species, though having the genital segment comparatively more expanded, and the caudal rami much larger.

Colour yellowish gray, with a few interrupted transversal bands of a deep ochraceous hue.

Length of female 1.40 mm., of male 1.25 mm.

Remarks.—Though very closely allied to the typical species, this form may at once be recognized by the much fuller development of the caudal rami, which to some extent seem to be mobile, as in some specimens they are found to be greatly divergent, in others pointing more backwards. Moreover the instrictions between the segments are less conspicuous than in *C. perplexa*, and the urosome, at any rate in the male, is more abruptly attenuated.

Occurrence.—I have not infrequently found this form in the upper part of the Christiania Fjord, not far from the town, in depths ranging from 2 to 7 fathoms, muddy bottom.

Fam. 3. Cerviniidæ.

Characters.—Body more or less slender, with the anterior and posterior divisions generally well marked off from each other. Cephalosome in some cases distinctly defined from the 1st segment of the metasome, rostral plate quite immobile, forming the immediate continuation of the cephalic shield. Caudal rami, as a rule, much elongated, though scarcely divergent. Eye wholly absent. Anterior antennæ comparatively short and robust, 6—7-articulate, and more or less densely clothed with partly ciliated setæ. Posterior antennæ with the outer 2 joints of the inner ramus confluent, outer ramus less fully developed than in the *Longipediidæ*. Mandibles very strong, with the palp generally large, biramous. Maxillæ with the outer appendages (exopodite and vibratory plate) more or less rudimentary. Anterior maxillipeds short and compact; posterior ones of less delicate structure than in the *Longipediidæ*, and scarcely at all lamellar. Natatory legs of somewhat varying structure in the different genera. Last pair of legs small, biarticulate. Ovisac simple.

Remarks.—The type of this family is the remarkable genus *Cervinia* of Norman, the systematic position of which has been much disputed by carcinologists. Closely allied to it is a new genus, *Cerviniopsis*, to be treated of below, as also the genus *Eucanuella* of Scott. Finally, I am of opinion that the genus *Zosime* of Boeck, though in some points differing conspicuously from the 3 above-mentioned genera, ought more properly to be included in the present family. All the species belonging to this family, are true deep-water forms, and in accordance therewith are quite devoid of visual organs. They moreover differ materially from those of the *Longipediidæ* in the fact that the rostral plate is quite immobile and continuous with the cephalic shield, as also in the very different structure of the posterior maxillipeds.

Gen. 5. **Cervinia,** Norman, 1878.

Generic Characters.—Body slender, attenuated, with very thin and flexible integuments. Cephalosome distinctly defined from the 1st segment of metasome, lateral parts but slightly expanded, wholly exposing the oral appendages. Epimeral plates of the pedigerous segments small, rounded; last segment rather narrow. Urosome comparatively large, genital segment in female without any

transversal suture dorsally. Caudal rami long and narrow, discontiguous, each with a small seta in the middle of the outer edge, the 2 middle apical setæ of a peculiar soft consistency. Anterior antennæ consisting of 7 well-defined articulations, none of which are particularly expanded; those of male imperfectly prehensile (?). Posterior antennæ with the inner ramus very strong, outer comparatively small, 4-articulate. Mandibles with the masticatory part very massive, palp comparatively large, with both rami somewhat lamellar, and carrying thick plumose setæ. Maxillæ without any trace of either exopodite or vibratory plate. Anterior maxillipeds with the 1st basal joint gibbously expanded behind; posterior ones 4-articulate, last 2 joints (constituting the terminal part) comparatively small and armed with spiniform setæ. 1st pair of natatory legs with both rami 3-articulate and of normal appearance, the 3 succeeding pairs with the inner ramus more or less transformed. Last pair of legs very small, with no inner expansion of the proximal joint.

Remarks.—This genus was established by Canon A. M. Norman, to include a peculiar deep-water Copepod found by him off the English coast. The specimens were sent to Prof. Brady for examination, and in the well-known Monograph of the latter author, the genus is recorded as a member of the family *Misophriidæ*. This arrangement is unquestionably incorrect, as the genus does not exhibit any very close affinity to *Misophria;* and Dr. Giesbrecht has also subsequently called attention to the unreasonableness of Brady's classification as regards this genus. We do not know at present with certainty more than a single species belonging to this genus.

9. Cervinia Bradyi, Norman.

(Pl. XI).

Cervinia Bradyi Norman, in Brady's Monograph of the British Copepoda, Vol. I, p. 86, Pl. XXIV A, figs. 3—13.

Specific Characters.—Female. Body slender and elongated, with the anterior division somewhat depressed and gradually widening in front. Cephalosome comparatively short and broad, almost truncated in front, with the rostral plate very small, triangular. Last segment of metasome much narrower than the preceding segment. Urosome (comprising the caudal rami) fully as long as the anterior division of the body, genital segment very large, equalling in length the 3 remaining segments combined, and slightly dilated in its anterior part, but without any lateral projections; the succeeding segments finely hairy on the ventral and lateral faces, last segment longer than the preceding one and tapering dis-

tally; anal opercle somewhat projecting, but perfectly smooth. Caudal rami narrow linear, about equalling in length the last 2 segments combined, and everywhere minutely hairy, the 2 middle apical setæ slightly unequal and much stronger than the others, having the outer part minutely annulated and thickly covered with delicate cilia. Anterior antennæ almost attaining the length of the cephalosome, and slightly attenuated, carrying strong curved setæ along the anterior edge and on the tip, the outer 4 articulations somewhat narrower than the 3 proximal ones. Posterior antennæ with remarkably strong and densely ciliated spines at the tip, outer ramus not even attaining $^1/_3$ of the length of the inner, and much narrower. Inner ramus of the 3 posterior pairs of natatory legs (in the adult animal) consisting of only 2 joints, the proximal of which, especially in the 2nd pair, is greatly expanded, and produced at the inner corner to a strong deflexed spiniform process, in front of which a similarly strong curved spine is attached; distal joint in this pair produced at the tip, between the 2 innermost spines, to a similar, but smaller process. Last pair of legs extremely small, with the distal joint scarcely longer than the proximal one, and provided with one apical seta and 2 small lateral spines.

Body semipellucid, with a pale yellowish tinge.

Length of adult female 1.45 mm.

Remarks.—I have been in some doubt about the correctness of my identification of the above-described form with Norman's species, because the inner ramus of the 3 posterior pairs of natatory legs in that species is described by Brady as 3-articulate, whereas in the Norwegian form it consists of only 2 joints; but in all other respects it so closely agrees with Brady's description, that I have not felt justified in establishing a new species on account of this apparent difference, which may perhaps be due to the circumstance that the specimen dissected by Brady had not attained its full development. On the other hand, I am of opinion that the solitary male specimen described by Dr. Giesbrecht from the Gulf of Naples may more properly be referable to a distinct species, differing, as it does, very conspicuously in the large size of the rostral plate.

Occurrence.—Only a very limited number of specimens of this form, all of the female sex, have hitherto come under my notice. They were taken at different times, some off the west coast of Norway, some off the Lofoten Islands, from considerable depths amounting to 100 fathoms.

Distribution.—English and Scottish coasts (Brady, Scott).

Gen. 6. Cerviniopsis, G. O. Sars, n.

Generic Characters.—General form of body about as in *Cervinia*. Cephalosome, however, comparatively larger and imperfectly defined from the 1st pedigerous segment, its lateral parts rather deep, partly including between them the oral appendages; rostral plate large and broad at the base. Epimeral plates of the 3 succeeding segments slightly angular. Genital segment in female with a well-marked transversal suture in the middle dorsally, and produced on each side of the suture to a recurved spiniform projection. Caudal rami very narrow, linear, and contiguous along their whole length, apical setæ of normal appearance. Anterior antennæ very robust, clavate, 6-articulate, and clothed with strong, partly spiniform setæ, one of them, issuing from the end of the 4th joint, being transformed in to a large, almost fusiform appendage curving backwards and clothed along one of the edges with long cilia, this joint and the 2 outer ones very short and less distinctly defined. Posterior antennæ less robust than in *Cervinia*, outer ramus of larger size, 4-articulate. Oral parts on the whole resembling in structure those in *Cervinia*. Natatory legs with both rami 3-articulate and of about equal size. Last pair of legs with the distal joint slender, linear, proximal joint quite short and without any inner expansion. Male unknown.

Remarks.—This new genus is somewhat intermediate in character between *Cervinia* and *Eucanuella*, agreeing in some points more closely with the former, in others with the latter. From both of them it differs conspicuously in the structure of the anterior antennæ, and the peculiar appearance of the caudal rami, which are so closely squeezed together, that they look like a single appendage. Off the Norwegian coast occur 2 closely allied species, to be described below.

10. Cerviniopsis clavicornis, G. O. Sars, n. sp.

(Pl. XII & XIII, fig. 1).

Specific Characters.—Female. Body moderately slender, with the anterior division somewhat depressed behind and widening in front. Cephalic segment rather large and deep, exceeding in length the 4 succeeding segments combined; rostral plate broadly triangular and slightly deflexed. Last segment of metasome with a distinct dentiform projection on each side. Urosome (including the caudal rami) not quite as long as the anterior division; genital segment with the lateral spiniform projections very strong and prominent. Last caudal segment abruptly contracted towards the end, anal opercle semilunar. Caudal rami slightly exceeding

in length the last 2 segments combined, each carrying in front of the middle outside a very small, hair-like bristle and another stronger one at some distance from the tip, the 2 middle apical setæ very unequal, the inner one more than twice the length of the outer, both very minutely denticulate. Anterior antennæ pronouncedly claviform in shape, the 3rd joint being considerably expanded, and arching over the short recurved terminal part. Posterior antennæ with the outer ramus about the length of the 2 outer confluent joints of the inner. Natatory legs with both rami of normal structure. Last pair of legs with the distal joint about 4 times as long as the proximal one, narrow linear in form, and carrying on the tip 2 unequal spines and between them a slender seta. Ovisac of moderate size, oval in form, and containing a rather limited number of large globular ova.

Colour whitish gray.

Length of adult female 1.60 mm.

Remarks.—In its general appearance, this form bears an unmistakable resemblance to *Eucanuella spinifera* Scott, to be described farther on, and indeed, I was at first inclined to refer it to that genus. On a closer examination, however, it is found to differ in some points rather materially, the most conspicuous difference being the peculiar structure of the caudal rami, also shown in the succeeding nearly-allied species.

Occurrence.—Several specimens of this peculiar form, all of the female sex, were found many years ago in the Østnæs Fjord, Lofoten Islands. The specimens were obtained by examining the loose muddy deposits taken up by the aid of a light dredge from a depth of about 100 fathoms.

11. Cerviniopsis longicaudata, G. O. Sars, n. sp.

(Pl. XIII, fig. 2).

Specific Characters.—Female. Very like the preceding species, but of somewhat smaller size and more slender form of body. Anterior division, seen dorsally, of almost uniform width throughout, rostral plate less broad. Last segment of metasome without any lateral projections. Urosome (including the caudal rami) fully as long as the anterior division, lateral projections of genital segment much smaller than in *C. clavicornis*. Caudal rami exceedingly slender and elongated, exceeding in length the 3 last segments combined, hair-like bristle of the outer edge occurring behind the middle. Antennæ and oral parts of much the same structure as in the preceding species. Natatory legs, however, slightly

differing, 1st joint of inner ramus in the 2nd and 3rd pairs exhibiting an appearance similar to that in *Cervinia*, the inner corner being greatly produced, and the natatory seta transformed in to a strong spine. Last pair of legs with the distal joint comparatively less slender than in *C. clavicornis*, middle apical seta quite short.

Colour whitish gray.

Length of adult female 1.30 mm.

Remarks.—Though very closely allied to the preceding species, this form is unquestionably specifically distinct, differing not only in the greater length of the caudal rami, but also in the smaller size of the lateral projections of the genital segment, and partly also in the structure of the legs.

Occurrence.– Only 2 female specimens of this form have hitherto come under my notice. They were taken from great depths off the west coast of Norway, the exact locality not being stated.

Gen. 7. **Eucanuella**, Scott, 1901.

Generic Characters.—General form of body about as in *Cerviniopsis*. Cephalosome imperfectly defined from the 1st segment of metasome, and projecting in front to a conically-pointed rostrum. Epimeral plates of the 3 succeeding segments well developed, acutely pointed behind. Genital segment in female with a well-marked transversal suture in the middle dorsally, and produced on each side to a strong spiniform projection. Caudal rami somewhat lamellar, non contiguous, tapering distally. Anterior antennæ distinctly 7-articulate, and edged with ciliated setæ, one of them, issuing from the 4th joint, being much larger than the others, the 3 outer joints abruptly much narrower than the preceding ones. Posterior antennæ comparatively feebler in structure than in the 2 preceding genera, outer ramus well developed, 4-articulate. Oral parts on the whole resembling those in *Cervinia* and *Cerviniopsis*. Natatory legs comparatively slender, with both rami 3-articulate, outer ramus of 1st pair unusually strong and much longer than the inner. Last pair of legs about as in *Cerviniopsis*. Male unknown.

Remarks.—This genus, established by Th. Scott, ought undoubtedly to be referred to the family *Cervinidæ*, as here defined. In several respects it exhibits, indeed, a close resemblance to the genus *Cerviniopsis*, but differs in some other points so materially, that it ought more properly to be kept apart. The chief

differences from that genus refer to the structure of the anterior antennæ and the caudal rami, partly also to that of the natatory legs. We do not know at present of more than a single species, to be described below.

12. Eucanuella spinifera, Scott.

(Pl. XIV).

Eucanuella spinifera, Th. Scott in 19th Report of the Fishery Board for Scotland, Part III, Scientific Investigations, p. 245, Pl. XVIII, figs. 1—10.

Specific Characters.—Female. Body moderately slender and conspicuously attenuated behind. Cephalic segment comparatively large, exceeding in length the 4 succeeding segments combined, and evenly vaulted above, lateral parts rather deep, partly including between them the oral appendages, rostrum projecting considerably. Epimeral plates of the 3 succeeding segments projecting behind in a somewhat spiniform corner. Last segment of metasome slightly produced on each side, but without any distinct dentiform projection. Urosome (including the caudal rami) shorter than the anterior division, genital segment rather broad, with the lateral projections very prominent. Last caudal segment longer than the preceding one, and gradually tapering distally; anal opercle somewhat prominent, semilunar. Caudal rami conspicuously asymmetrical, the right one projecting considerably beyond the left, and nearly as long as the last 2 segments combined, both gradually tapering distally, and exhibiting outside, at some distance from the base, a small spinule; dorsal face with 3 delicate bristles, 2 of which occur near the tip, the 3rd in front of the middle; tip with only 2 setæ, the inner of which is more than twice as long as the outer. Anterior antennæ with the 4 proximal joints considerably expanded, 2nd joint armed with a strong spiniform projection issuing from the upper face and pointing backwards. Outer ramus of 1st pair of legs scarcely inferior in size to that of the succeeding pairs, and fully twice as long as the inner. Last pair of legs with the outer digitiform process of the proximal joint rather thick, distal joint narrow linear, with one apical and 2 lateral setæ. Ovisac comparatively small, rounded.

Colour whitish gray.

Length of adult female 1.30 mm.

Remarks.—The above-described form is unquestionably identical with that recorded by Th. Scott under the above name. It may at once be recognized from any of the other *Cervinidæ* by the characteristic structure of the caudal rami, as also by the conically-produced rostral plate.

Occurrence.—Some few specimens of this form, all of the female sex, have been taken at different times, from depths of 50—60 fathoms. One of the specimens was found at Hankö, lower part of the Christiania Fjord, the others off the west coast of Norway.

Distribution.—Scottish coast (Scott).

Gen. 8. **Zosime,** Boeck, 1872.

Generic Characters.—Body of comparatively robust form, with the anterior and posterior divisions, at any rate in female, well marked off from each other. Cephalosome confluent with the 1st pedigerous segment, and produced in front to a short and broad rostral plate. Epimeral plates of the 3 succeeding segments well developed, sub-angular. Last segment of metasome abruptly narrower than the preceding one. Urosome in female somewhat flattened, with the segments more or less expanded laterally, in male more cylindrical in form. Genital segment in female with a very distinct transversal suture in the middle dorsally. Caudal rami of moderate length, discontiguous, the 2 middle apical setæ of a soft consistency similar to those in *Cervinia*. Anterior antennæ short and stout, densely setiferous, 6-articulate. Posterior antennæ with the outer 2 joints confluent, outer ramus 3-articulate. Oral parts differing somewhat in structure from those in the other *Cerviniidæ*. Mandibles with the palp tri-lobate, inner lobe confluent with the basal part, the other 2 constituting the 2 rami. Maxillæ with 2 small knob-like projections outside the palp. Anterior maxillipeds short and compact, with 4 digitiform lobes; posterior ones of comparatively simple structure, 3-articulate. First pair of natatory legs much smaller than the others, with the inner ramus bi-articulate; the 3 succeeding pairs with both rami slender, 3-articulate. Last pair of legs somewhat resembling those in the *Ectinosomidæ*, proximal joint exhibiting inside a well-marked setiferous expansion, distal joint imperfectly defined.

Remarks.—This genus, established by Boeck, was considered by that author, as also by Prof. Brady, to be most nearly related to the genus *Ectinosoma*, which in the present Account is regarded as the type of a distinct family, *Ectinosomidæ*. On a closer examination, however, I find that it should more properly be referred to the family *Cerviniidæ*, as here defined. True, the last pair of legs, as also the posterior maxillipeds, exhibit some resemblance to those in the genus

Ectinosoma; but in all other respects this genus is very different, and apparently more nearly related to the 3 preceding genera. We do not know at present with certainty more than a single species belonging to this genus.

13. Zosime typica, Boeck.

(Pl. XV).

Zosime typica, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. 1872, p. 46.

Specific Characters.—Female. Body rather short and stout, somewhat depressed, with a very conspicuous constriction in the middle. All segments having the posterior edge distinctly denticulate dorsally, the denticles of the penultimate caudal segment being in particular very coarse and partly bifid at the tip. Cephalic segment rather large, considerably exceeding in length the 3 succeeding segments combined, rostral plate short and broad, blunt at the tip, and carrying 2 small apical bristles; the 3 succeeding segments with the epimeral plates somewhat exstant laterally. Last segment of metasome abruptly much narrower than the preceding ones, and produced on each side to a slight dentiform corner. Urosome (including the caudal rami) about the length of the anterior division, its 3 anterior segments forming on each side well-marked lamellar expansions each terminating in an acute recurved corner; last segment very small. Caudal rami about 3 times as long as they are broad, slightly constricted at the base, and transversely truncated at the end, outer edge finely denticulate and carrying, at some distance from the tip, a small bristle; the 2 middle apical setæ rather coarse and very unequal, the inner one twice as long as the outer, and exhibiting near the base a peculiar angular bend. Anterior antennæ with the 2nd joint much the largest, and equal in length to the succeeding 4 joints combined. Posterior antennæ with the outer ramus somewhat shorter than the inner. Last pair of legs with the inner expansion triangular and carrying 3 slender setæ, distal joint not distinctly defined from the proximal one, truncated at the tip and provided with 3 apical and one lateral seta.

Colour whitish gray.

Length of adult female 0.55 mm.

Remarks.—It seems to me somewhat questionable, whether the form described under this name by British authors (Brady, Scott) is in reality identical with Boeck's species. Prof. Brady, for instance, indicates the length of the animal to be 0.80 mm., whereas the largest of my Norwegian specimens only measures

0.55 mm. in length; and further the figures of the animal given by that author and by Th. Scott do not fully agree with the form examined by me. Finally, on comparing my drawings with those given by the above-named authors, I also find some differences in the structural details.

Occurrence.—I have found this form occasionally in the upper part of the Christiania Fjord in depths of about 16 fathoms, muddy bottom. The specimen examined by Boeck was likewise from that locality.

Distribution.—? British Isles (Brady, Scott).

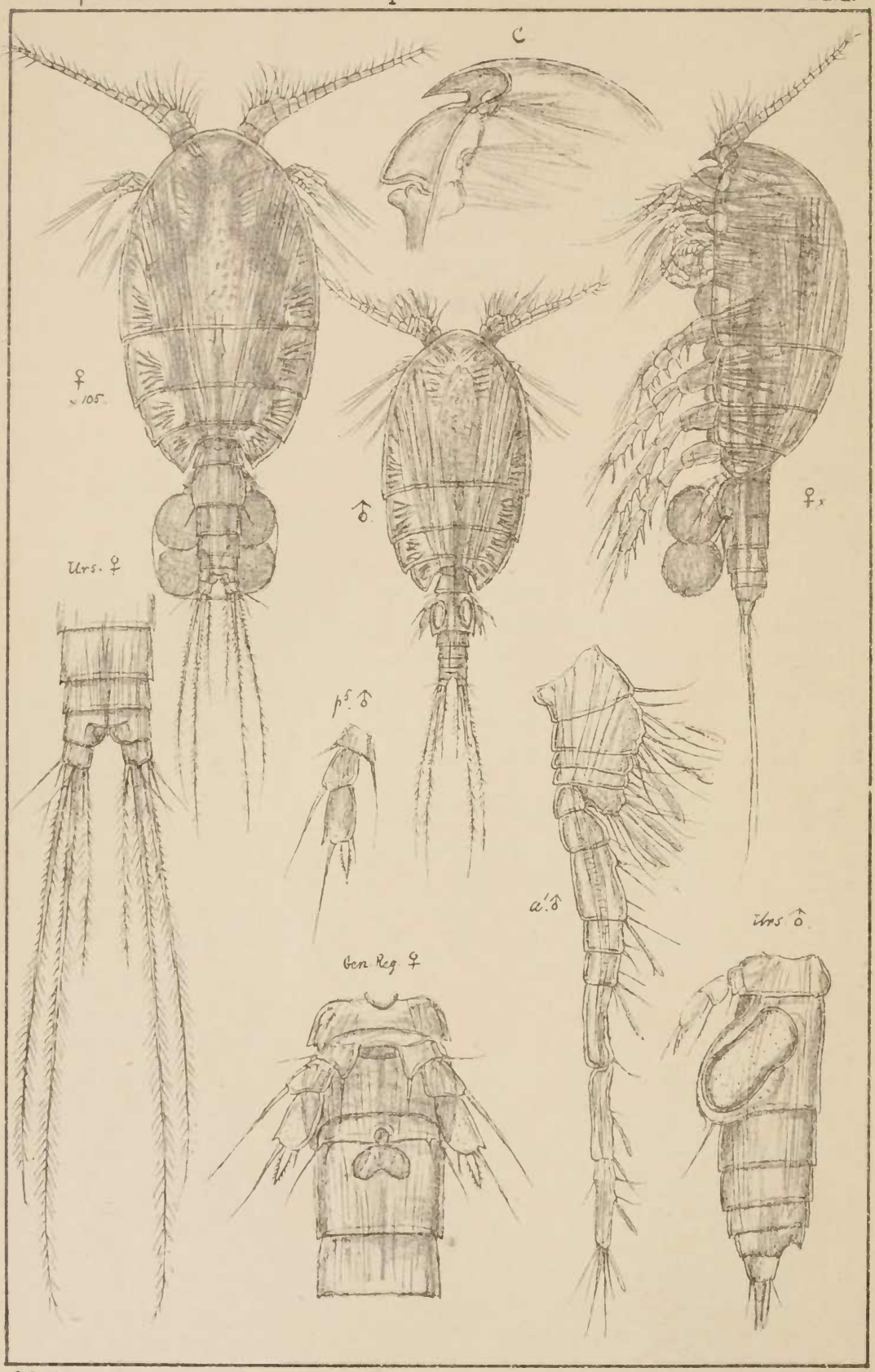
Fam. 4. Ectinosomidæ.

Characters.—Body of a peculiarly smooth appearance, and more or less fusiform in shape, with no very conspicuous demarcation between the anterior and posterior divisions. Cephalosome wholly confluent with the 1st pedigerous segment, and produced in front to a more or less prominent rostral plate continuous with the cephalic shield. Epimeral plates of the 3 succeeding segments well developed. Last segment of metasome without such plates. Urosome consisting in female of 4, in male of 5 segments, the last one generally small and more or less cleft at the end. Caudal rami discontiguous, divergent, with the 2 middle apical setæ more or less elongated. No true eye present. Anterior antennæ comparatively small, and composed of a limited number of articulations. Posterior antennæ with strong denticulated spines at the tip, outer ramus slender, 2- or 3-articulate. Oral parts differing rather greatly in their structure from those in the preceding families. Natatory legs powerfully developed, with both rami 3-articulate and densely spinous. Last pair of legs lamellar and edged with strong spiniform setæ. Ovisac single.

Remarks.—This family, the type of which is the genus *Ectinosoma* of Boeck, exhibits several well-marked differences from the preceding ones, both as regards the external appearance and the structural details; and as there are several genera which so far closely agree with each other, the establishment of this new family may be fully justified. It comprises as yet 4 genera, all of which are represented in the fauna of Norway.

Copepoda

Harpacticoida

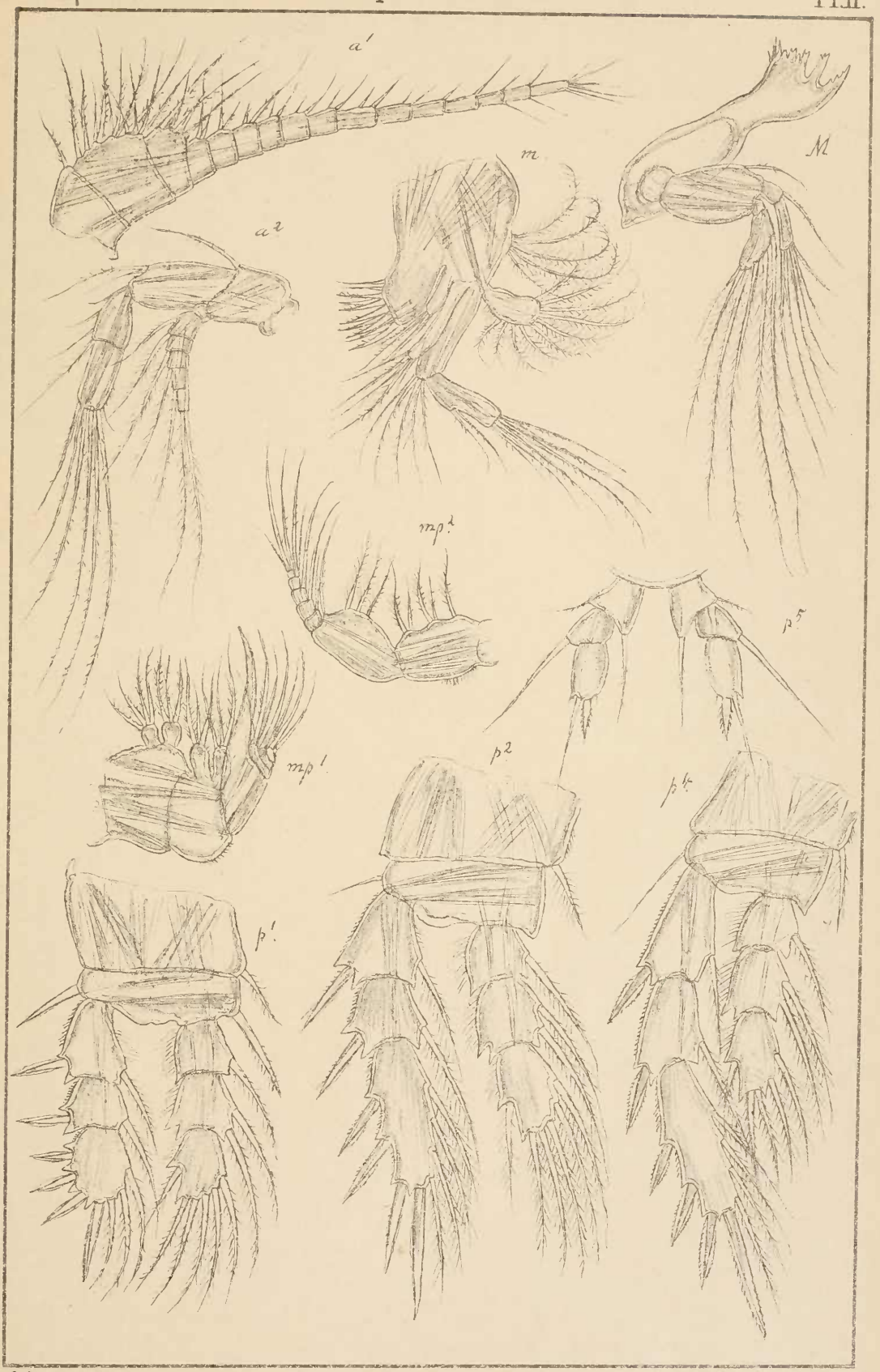


G.O. Sars autogr.

Trykt i den private Opmaaling Chra

Misophria pallida, Boeck

Copepoda
Harpacticoida



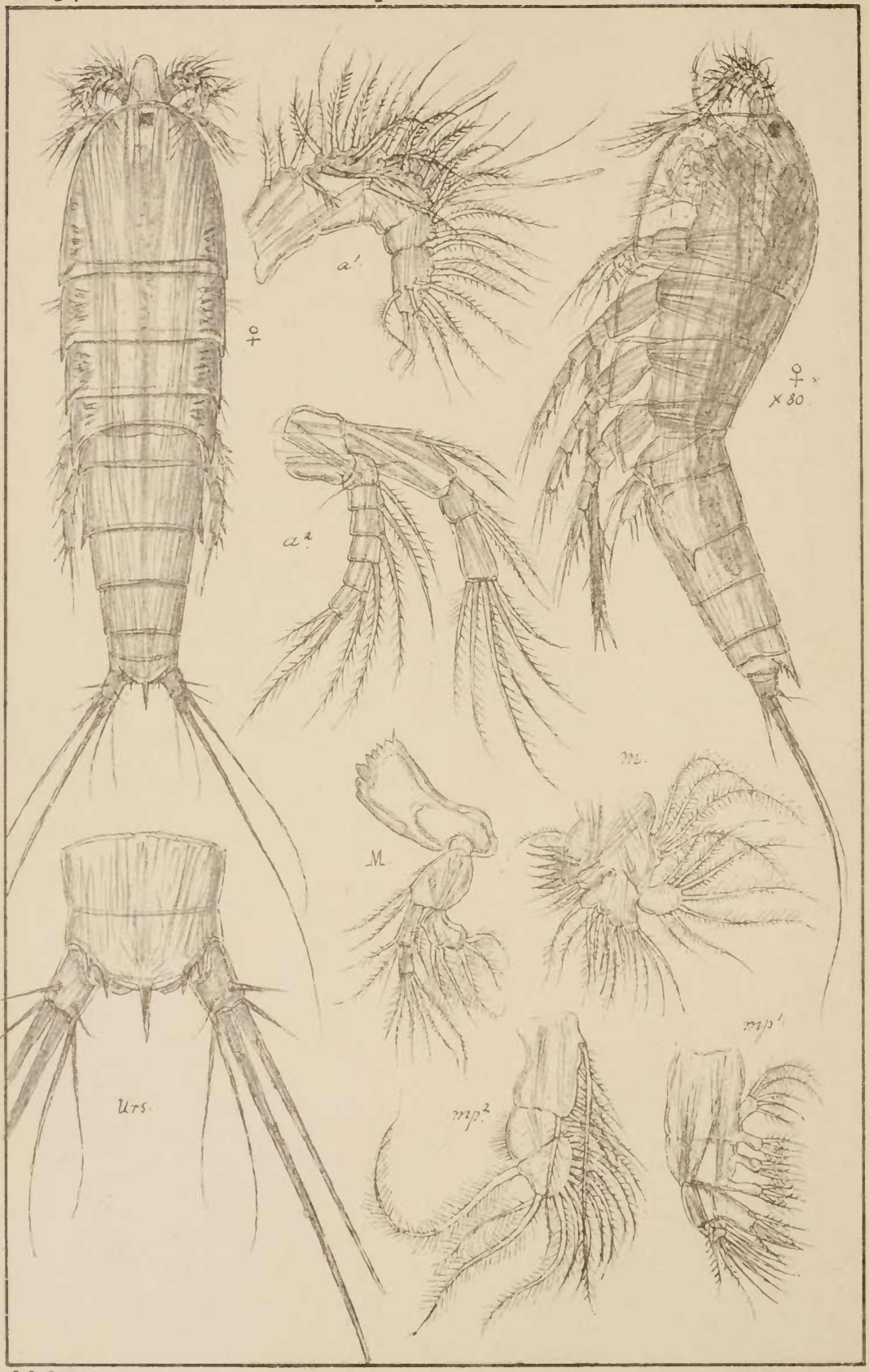
G.O. Sars autogr.

Trykt i den private Opmaaling Chra

Misophria pallida, Boeck
(continued)

Copepoda

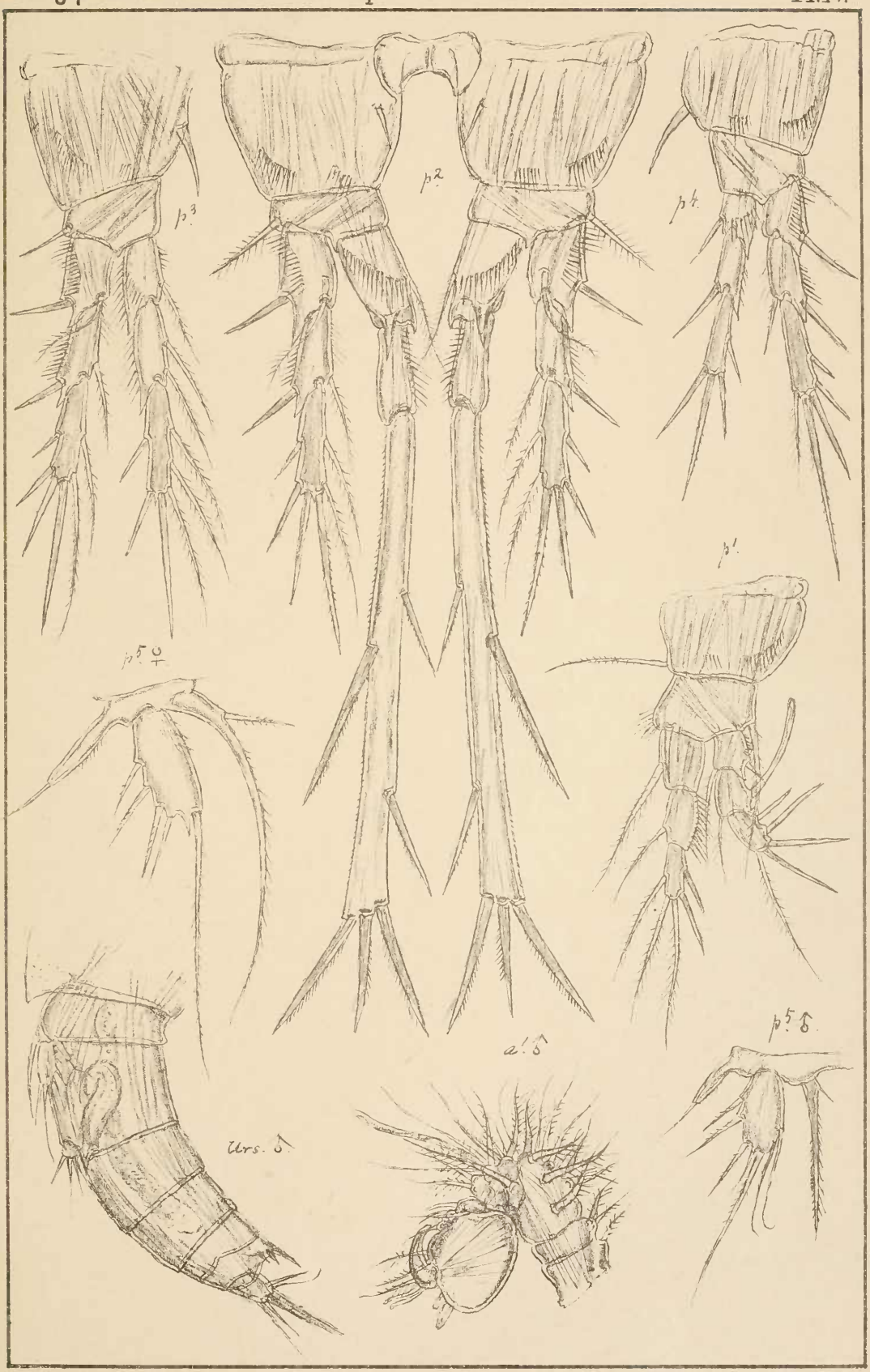
Longipediidæ — Harpacticoida — Pl. III.



G.O. Sars autogr.

Trykt i den private Opmaaling. Chra

Longipedia coronata, Claus



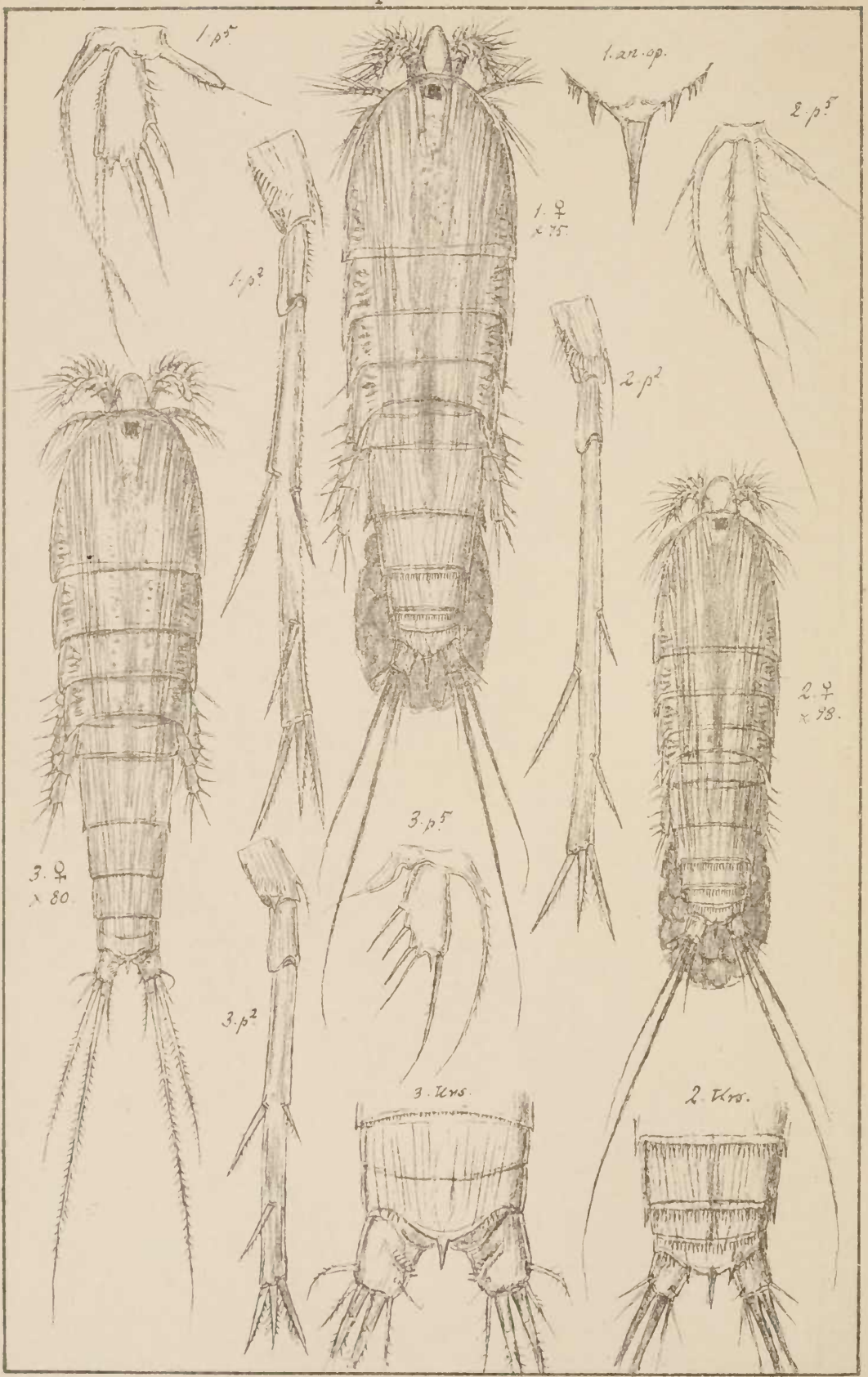
G.O. Sars autogr.

Longipedia coronata, Claus
(continued)

Trykt i den private Opmaaling. Chra

Copepoda

Harpacticoida

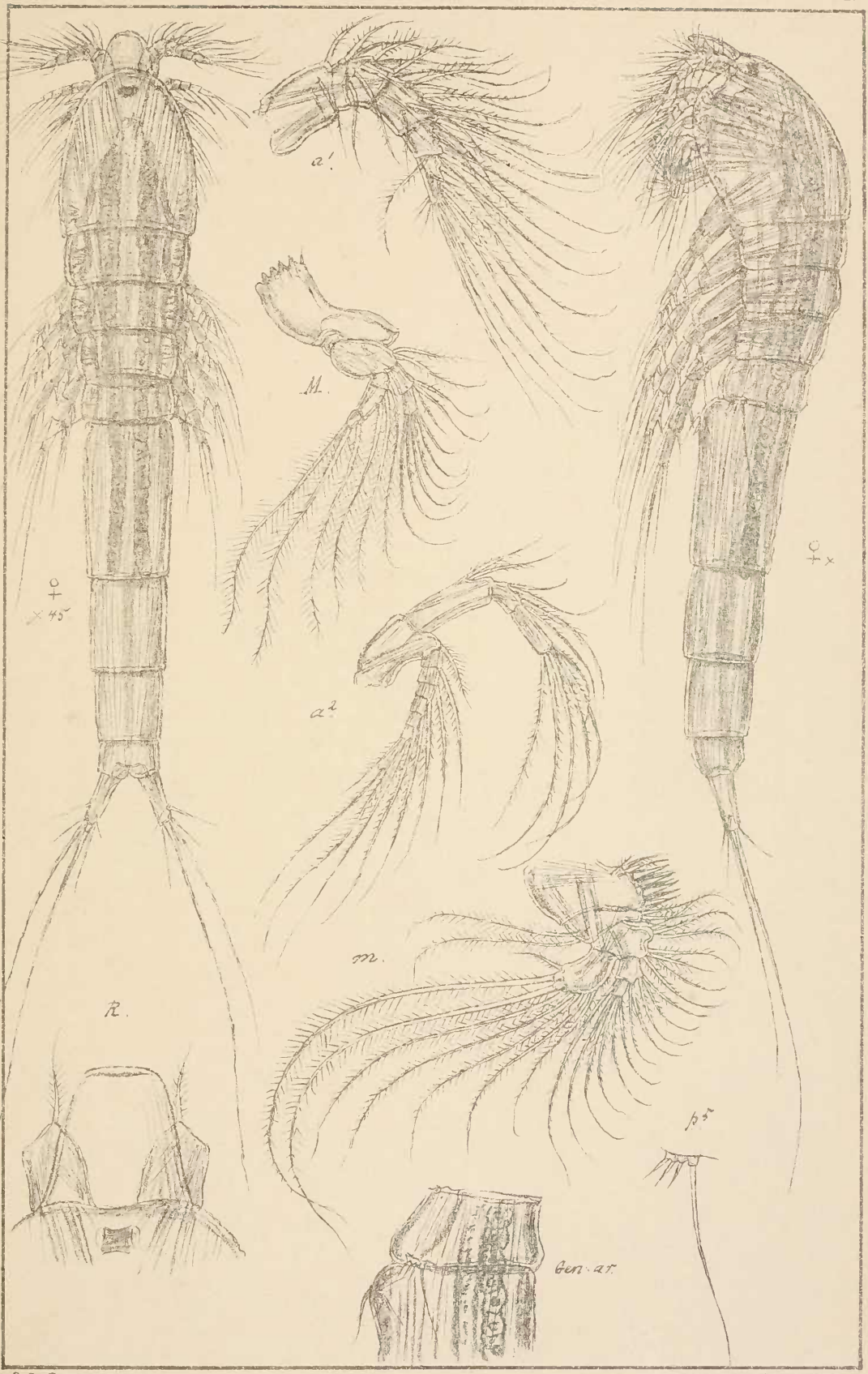


G.O. Sars autogr.

Trykt i den private Opmaaling Chra

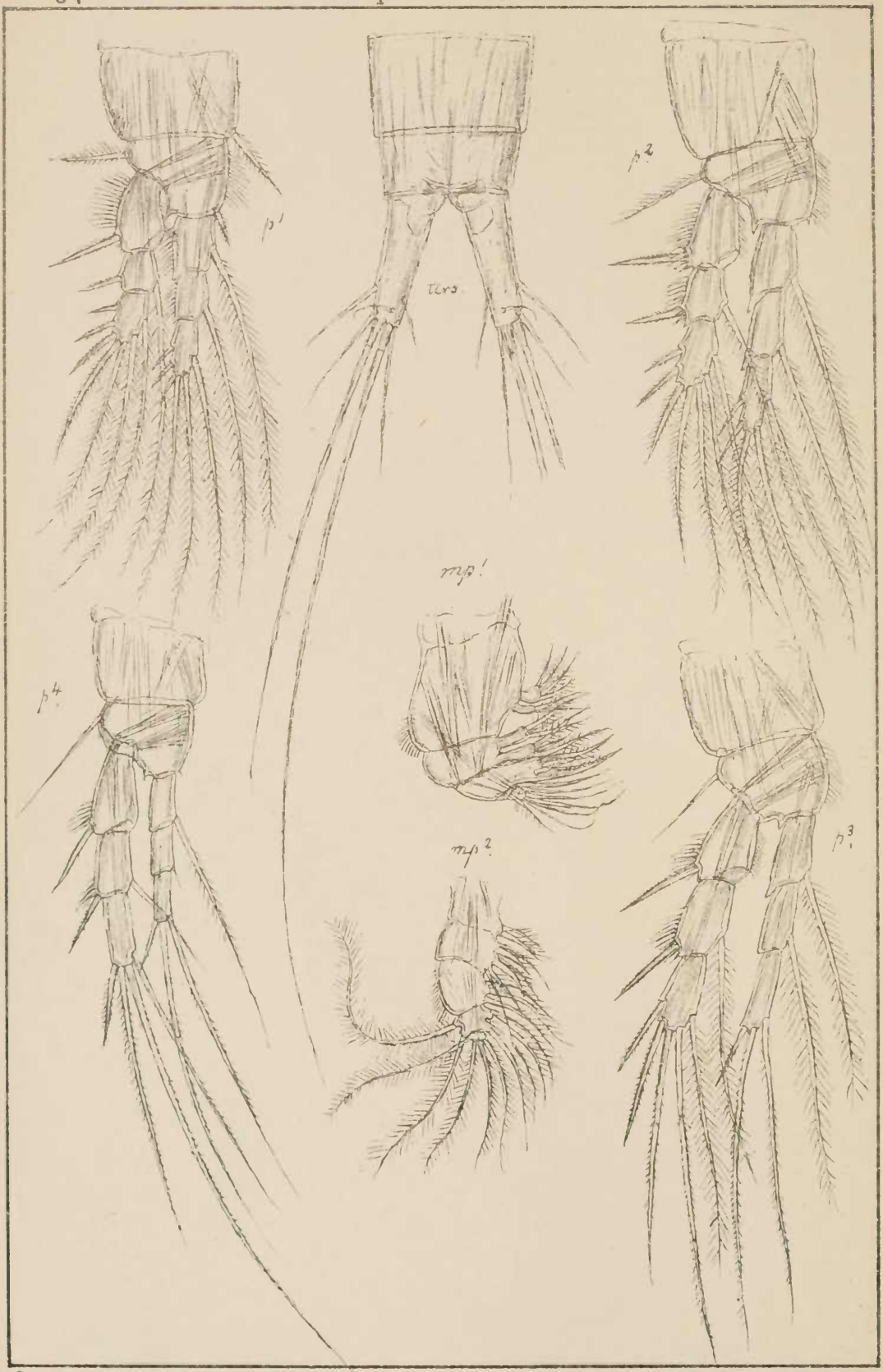
1 Longipedia Scotti G.O.Sars

2 Longipedia minor, Scott



G O Sars autogr. Trykt i den private Opmaaling. Chra

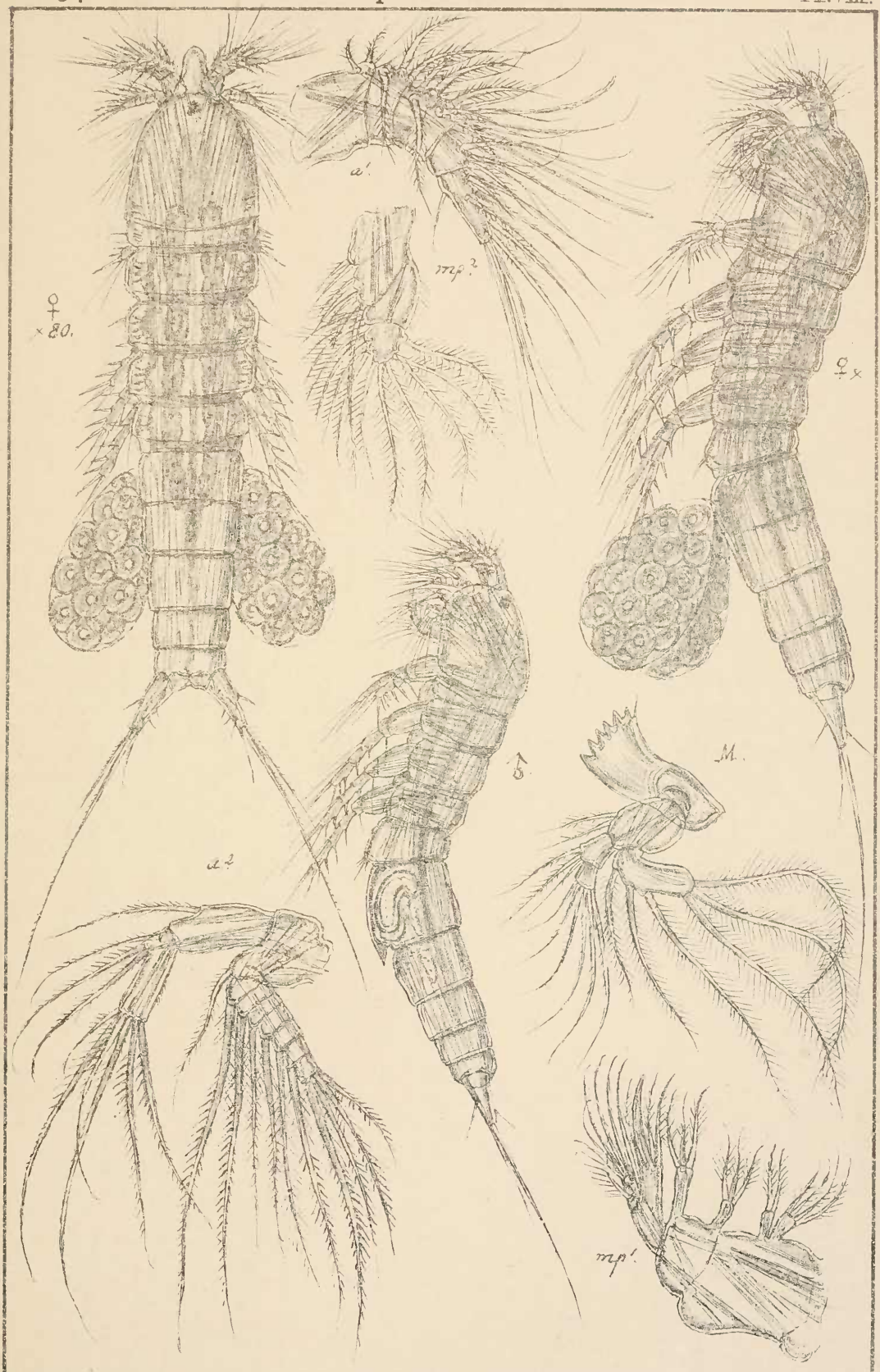
Sunaristes paguri, Hesse



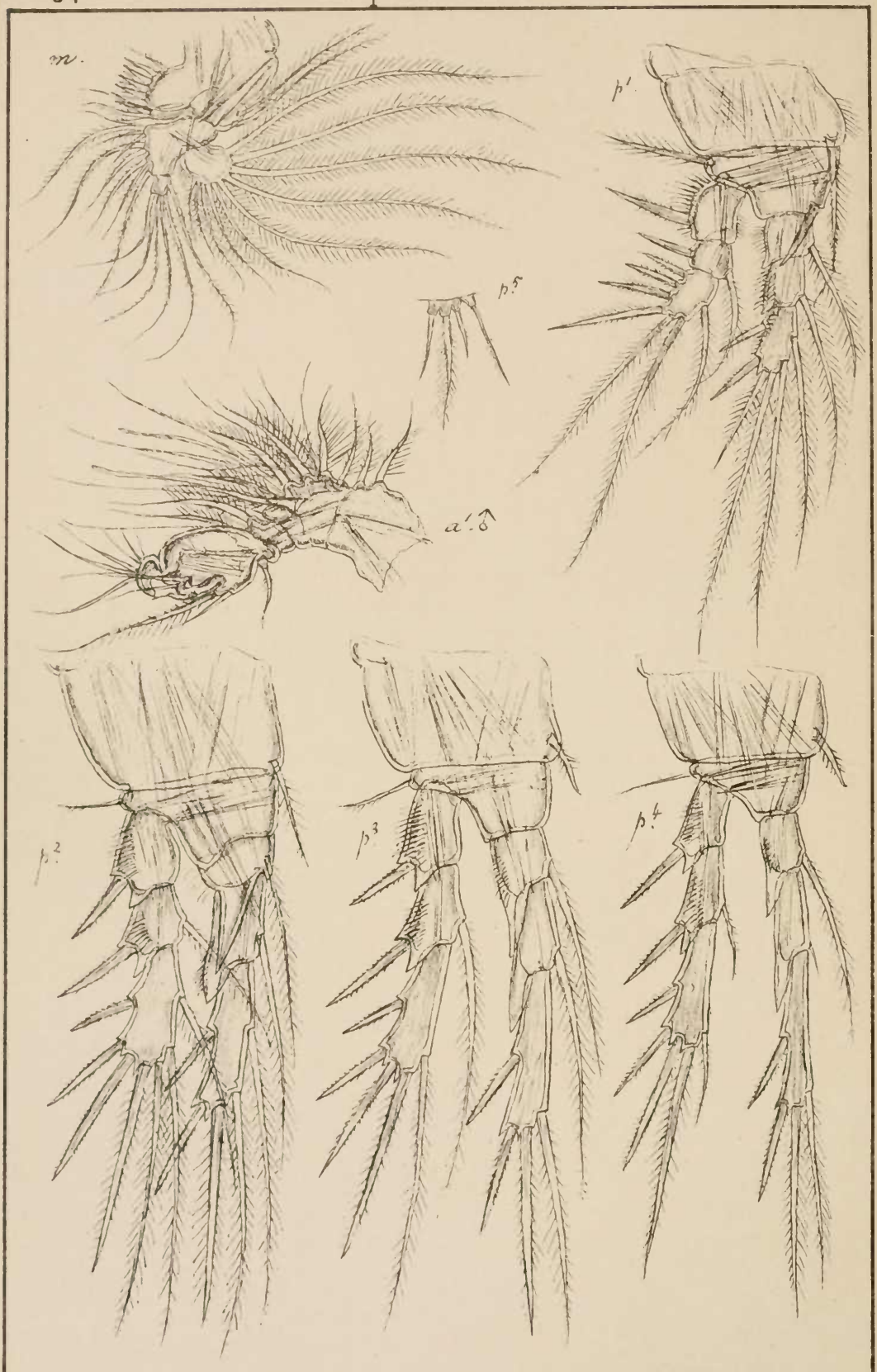
G O Sars autogr

Trykt i den private Opmealing. Chra

Sunaristes paguri, Hesse
(continued)

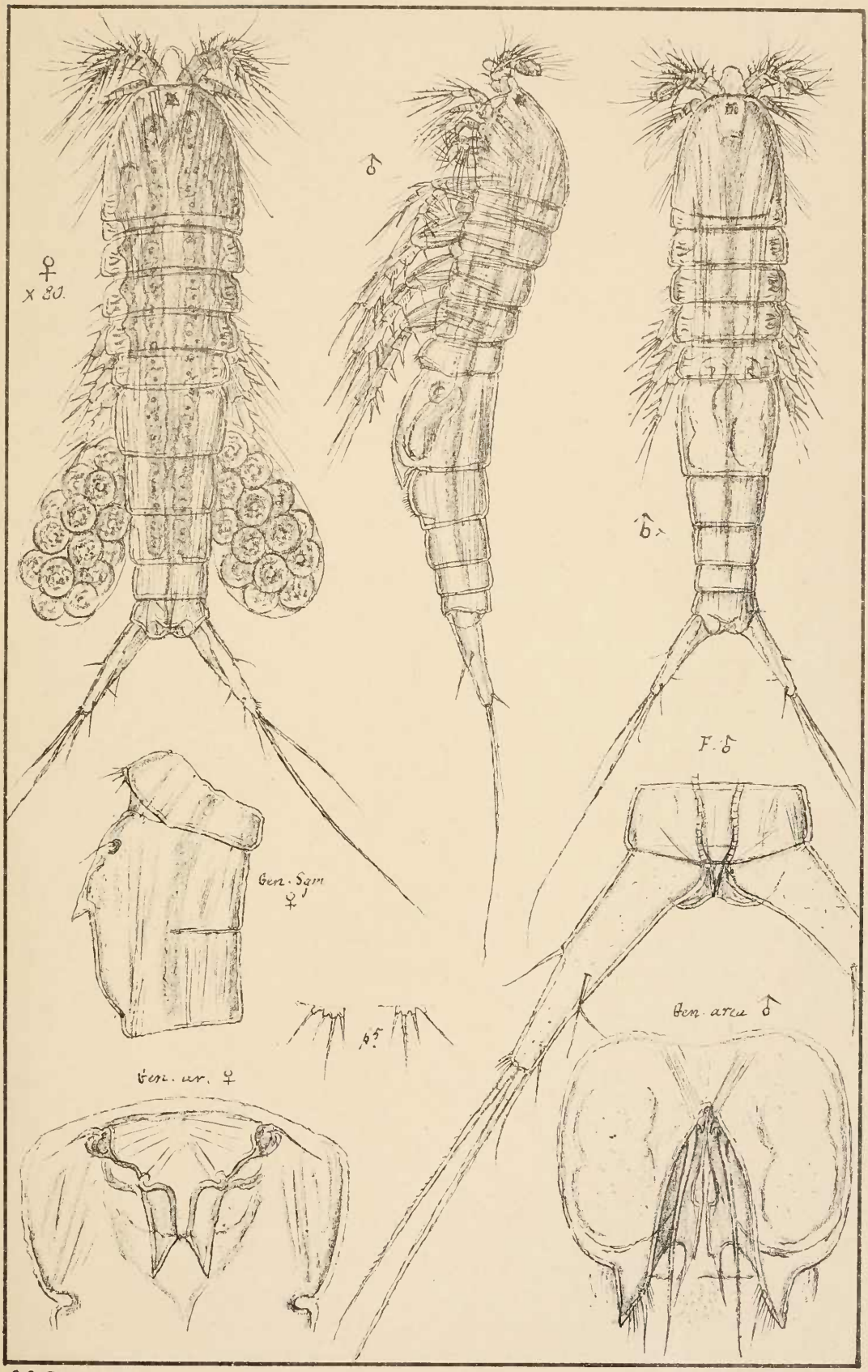


G.O. Sars autogr. Canuella perplexa, Scott. Trykt i den private Opmaaling. Chra



G.O. Sars autogr. Trykt i den private Opmaaling, Chra.

Canuella perplexa, Scott.
(continued)



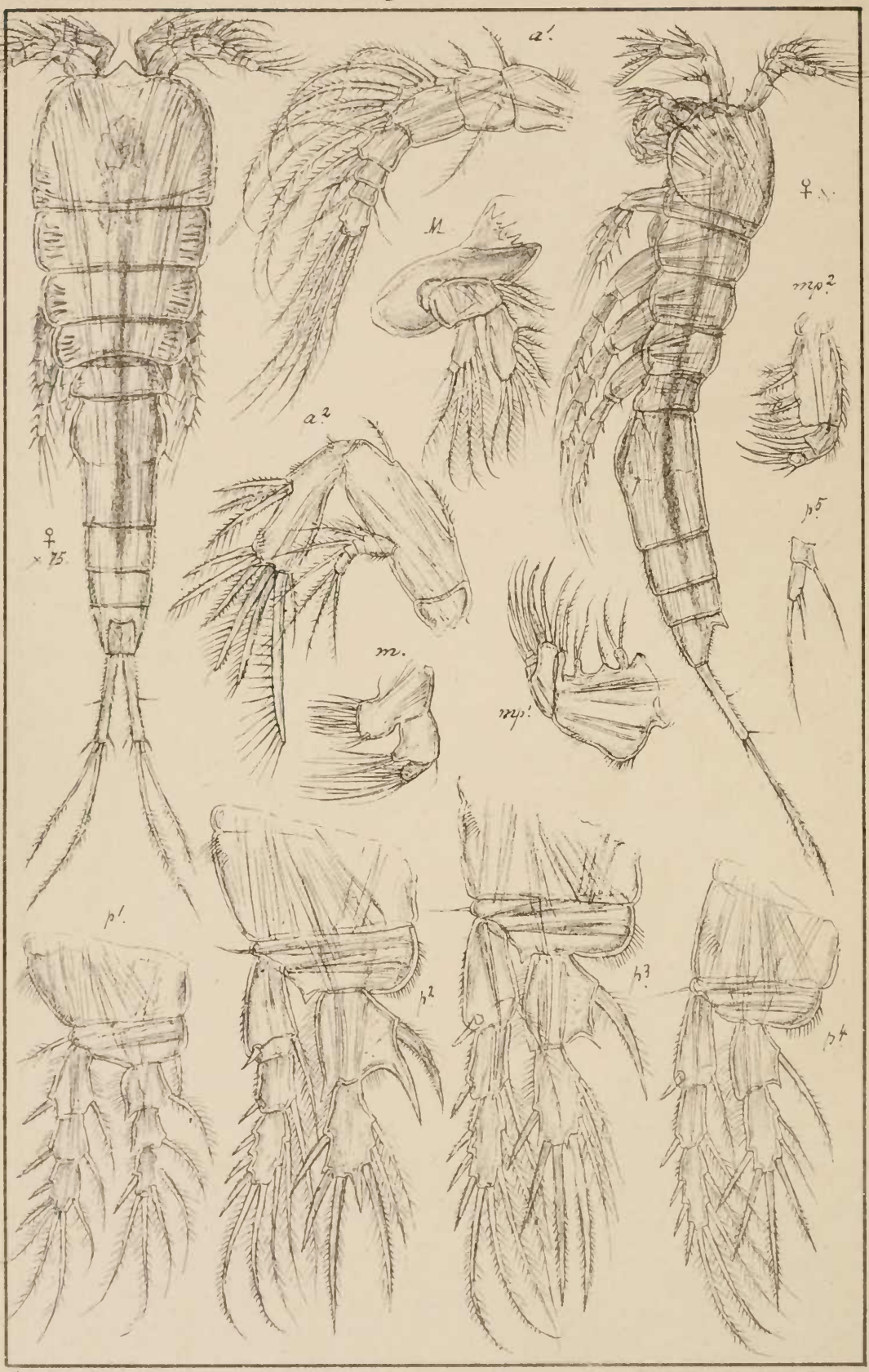
G.O. Sars autogr.

Trykt i den private Opmaaling, Chra

Canuella furcigera, G.O.Sars

Copepoda

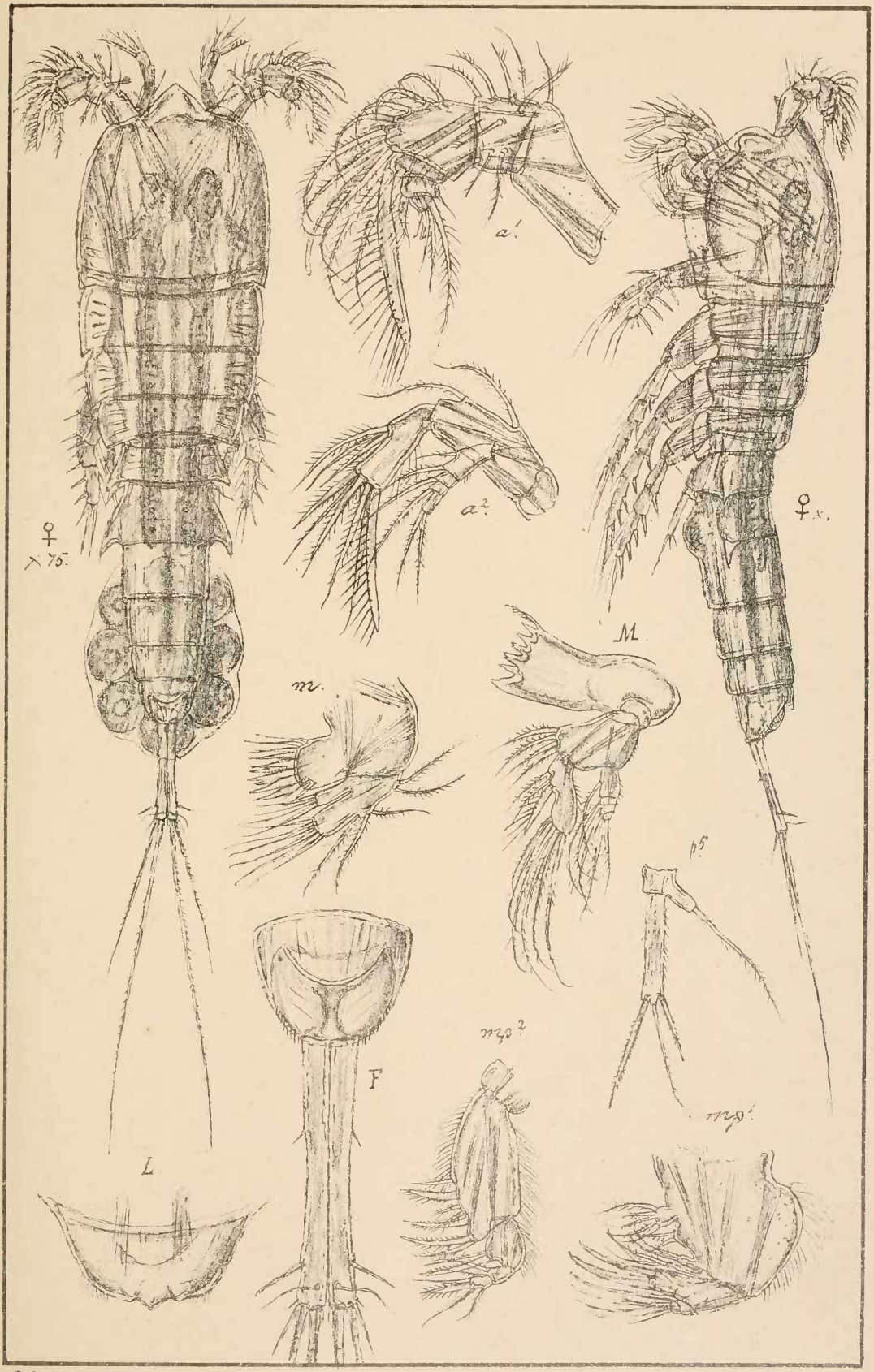
Harpacticoida



G.O. Sars autogr.

Trykt i den private Opmaaling, Chra

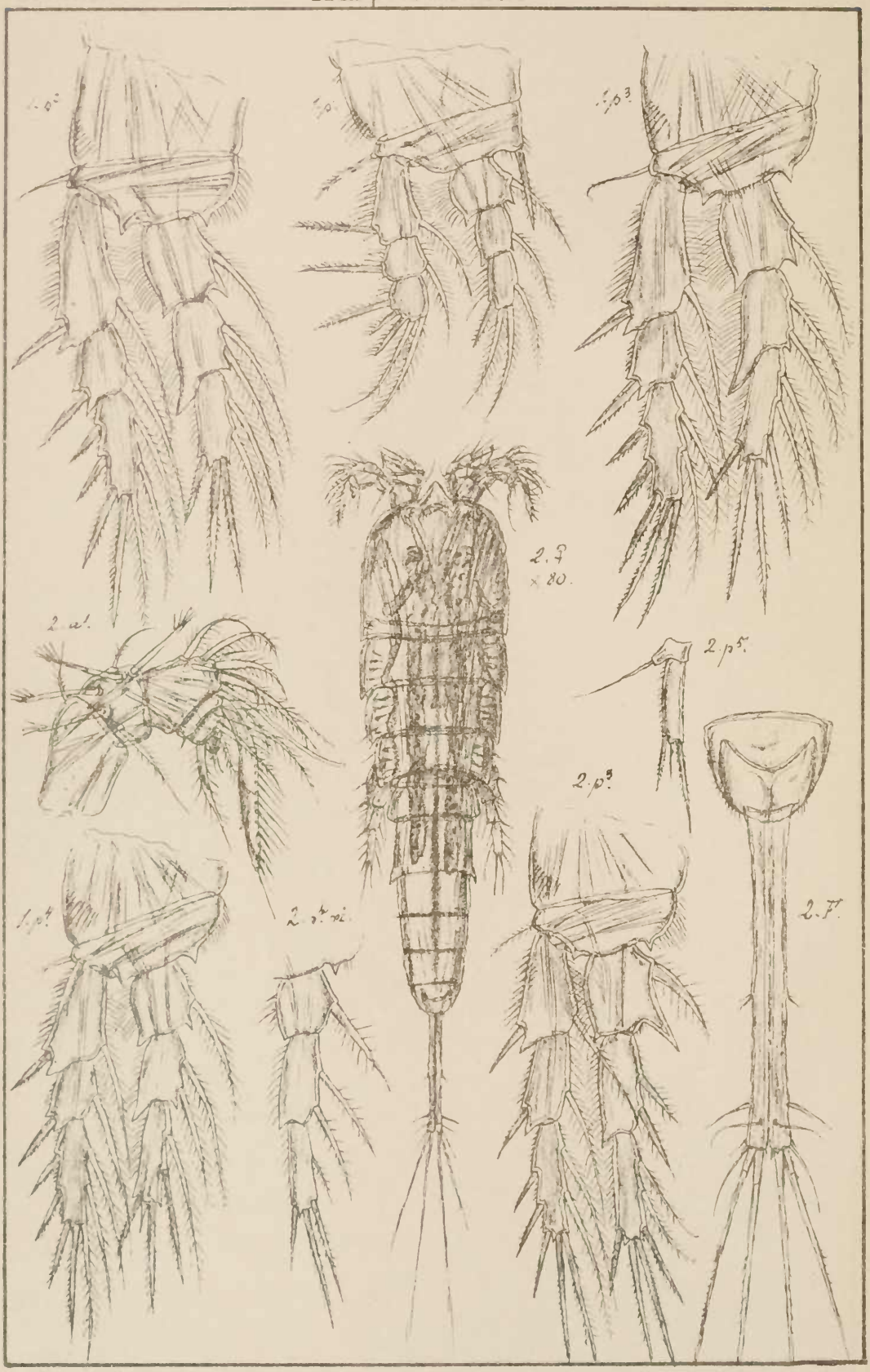
Cervinia Bradyi, Norman



G.O. Sars autogr.

Trykt i den private Opmaaling, Chra

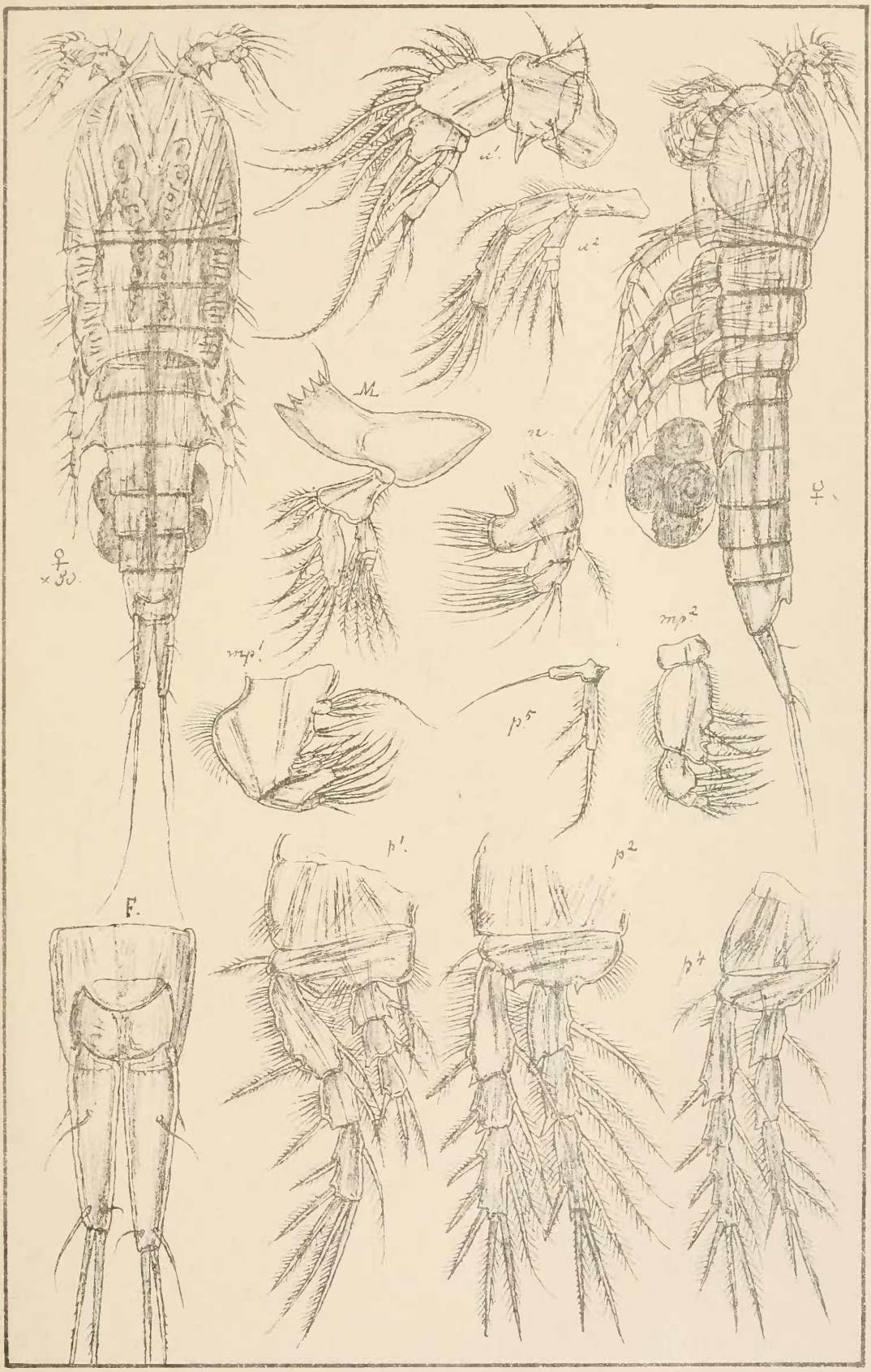
Cerviniopsis clavicornis, G.O. Sars



G.O. Sars autogr. Trykt i den private Opmaaling, Chra

1 Cerviniopsis clavicornis, G.O Sars
(continued)

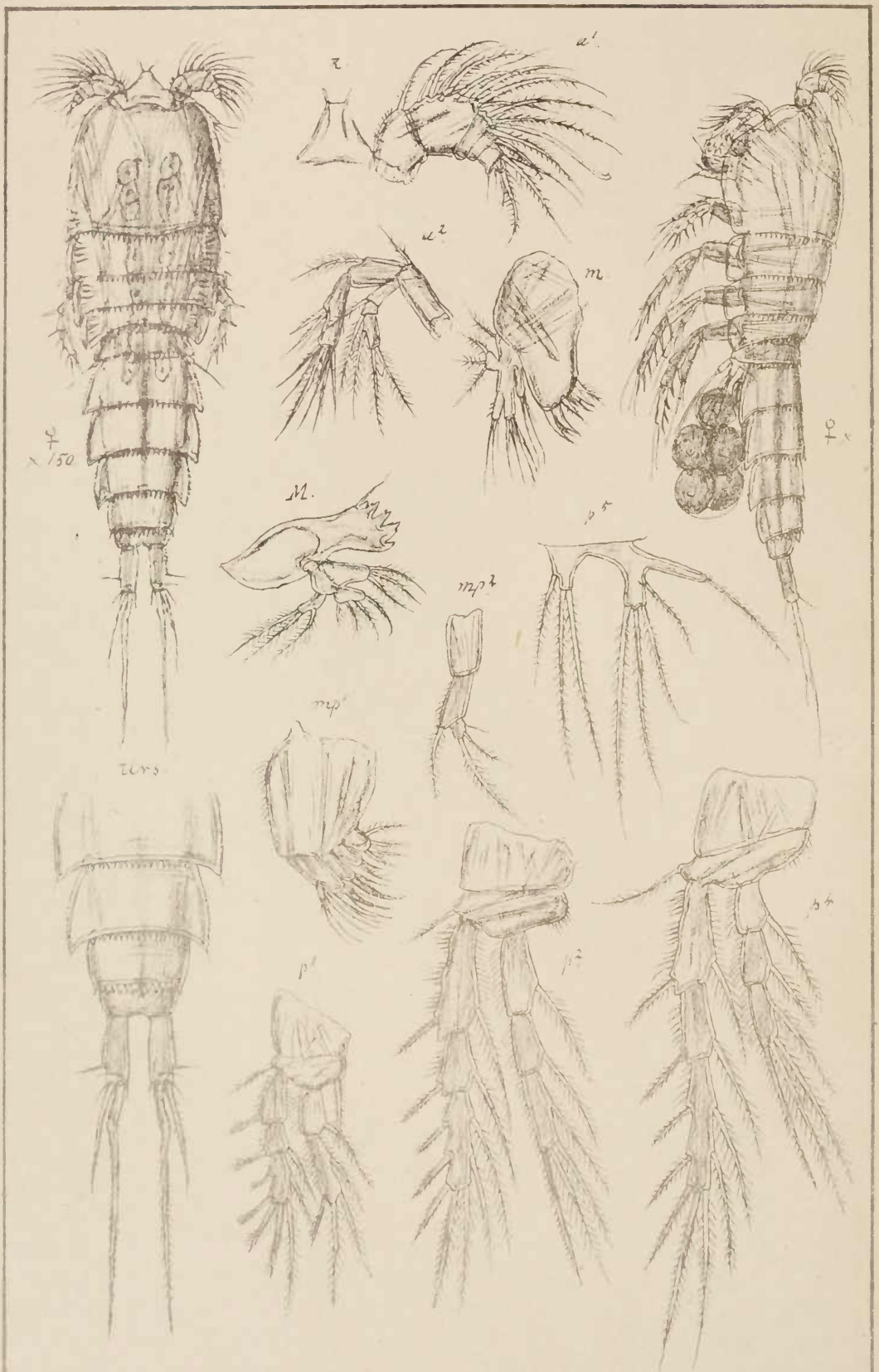
Copepoda
Harpacticoida



G.O. Sars autogr.

Trykt i den private Opmaaling, Chra

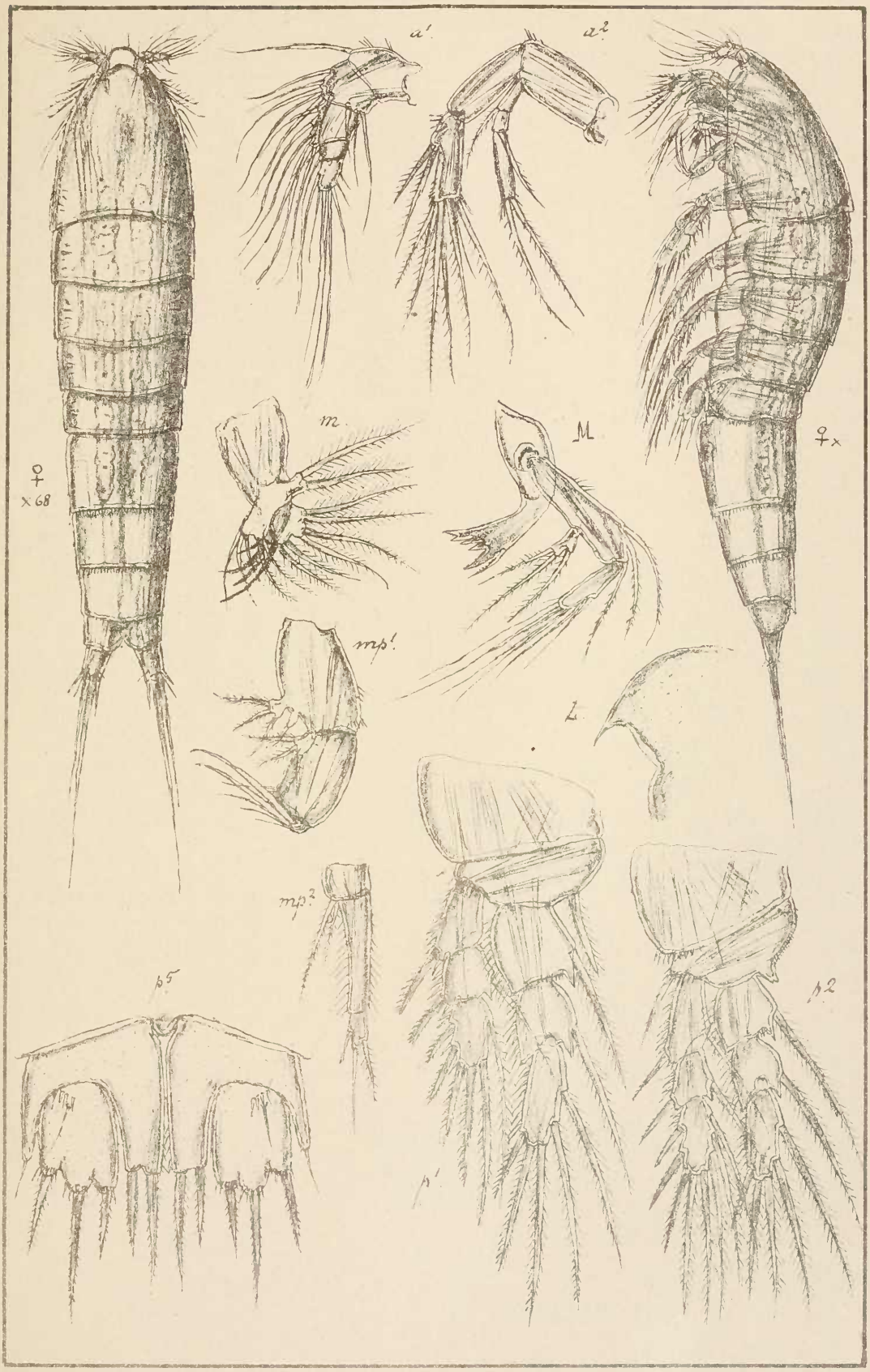
Eucanuella spinifera, Scott.



G. O. Sars autogr.
Trykt i den private Opmaaling, Chra

Zosime Typica Boeck

Copepoda
Harpacticoida



G.O. Sars autogr.

Trykt i den private Opmaaling Chra

Ectinosoma Sarsi, Boeck

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA

HARPACTICOIDA

PARTS III & IV

ECTINOSOMIDÆ, HARPACTICIDÆ

(PART)

WITH 16 AUTOGRAPHIC PLATES

BERGEN

PUBLISHED BY THE BERGEN MUSEUM

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1904

Gen. 9. **Ectinosoma,** Boeck, 1864.

Generic Characters.—Body more or less slender, pronouncedly fusiform in shape, with the anterior division scarcely broader than the posterior. Cephalic segment gradually attenuated in front, and produced to a tongue-shaped hyaline rostral plate, arching over the bases of the anterior antennæ; lateral parts not very deep, almost wholly exposing the oral appendages. Epimeral plates of the 3 succeeding segments acute-angular behind. Last segment of metasome scarcely narrower than the preceding segment. Urosome gradually attenuated behind, genital segment without any trace of a transversal suture in the middle, last segment rather small and more or less deeply cleft. Caudal rami comparatively short, diverging, the 2 middle apical setæ closely juxtaposed and considerably thickened at the base. Anterior antennæ rather small, 5—7-articulate, and clothed with slender setæ. Posterior antennæ with the outer 2 joints confluent, outer ramus much more slender than the inner, and distinctly 3-articulate. Anterior lip compressed and more generally projecting in front to an acute recurved point. Mandibles sharply curved, with the masticatory part deeply cleft and armed with a limited number of simple teeth, outside which is attached a thickish seta; palp comparatively large, with the basal part much elongated, both rami uniarticulate, the inner one abruptly recurved and tipped with long setæ, outer ramus comparatively small. Maxillæ with the masticatory part armed with 3 or 4 strong, claw-like spines, palp divided into several setiferous lobes. Anterior maxillipeds consisting of 2 thickish basal joints, very movably articulated the one to the other, terminal part rudimentary, carrying 2 slender, claw-like spines curved anteriorly. Posterior maxillipeds issuing inside the anterior, slender, straight, 3-articulate, middle joint narrow and elongated, terminal joint small, tri-setose. First pair of natatory legs scarcely smaller than the others, with the inner ramus longer than the outer. Last pair of legs closely approximate, and each consisting of 2 well-defined joints, the proximal one forming inside a large lamellar expansion carrying 2 spiniform setæ, distal joint trilobate, each lobe tipped with a similar seta.

Remarks.—This genus was established in the year 1864 by Boeck, to include 3 Norwegian species, one of which, *E. melaniceps*, is perhaps identical with the form recorded by Baird as *Canthocamptus minuticornis* (Müller). Subsequently several new species have been added, chiefly by Prof. Brady and Th. Scott. The latter author, in his interesting Revision of the British Species of the Genera *Bradya* and *Ectinosoma*, records no less than 13 different species belonging to the present genus, and nearly the same number have been observed by myself off

the Norwegian coast. The species are rather difficult to distinguish from one another, on account of their rather uniform external appearance, and the generally small size and inconspicuous colour of the animal. Two of the best distingishing characters are undoubtedly the structure of the last pair of legs and the relative length of the setæ with which they are fringed. In these characters there are scarcely two species which fully agree with each other. All the species have in common the peculiarity that the specimens remain floating on the surface of the water, when they come in contact with it, a circumstance which essentially facilitates the collecting of them from any mud brought up by the aid of the dredge.

14. Ectinosoma Sarsi, Boeck.

(Pl. XVI).

Ectinosoma Sarsii, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. 1872, p. 45.

Syn: *Ectinosoma spinipes*, Brady.

Specific Characters.—Female. Body somewhat robust, fusiform, greatest width exceding $^1/_5$ of the length, and occurring somewhat in front of the middle. Cephalic segment about equalling in length the 3 succeeding segments combined, rostral plate evenly rounded at the tip. Urosome only slightly exceeding in length the exposed part of metasome, posterior edge of the segments densely fringed with delicate spinules. Caudal rami comparatively short, scarcely longer than the last segment, apical setæ not much elongated, the innermost but one about equal in length to the urosome exclusive of the caudal rami. Anterior antennæ short and thick, 5-articulate. Posterior antennæ with the outer ramus almost as long as the inner, middle joint very small. Anterior lip with an acute recurved process in front. Natatory legs with the rami rather broad, all the spines coarsely denticulate, setæ very strong. Last pair of legs sub-quadrangular in outline, inner expansion of the proximal joint rather narrow and extending almost as far as the distal joint, the latter somewhat longer than it is broad, and exhibiting on the lower side, near the base, a transverse row of 4 small denticles, immediately below which a slender bristle is attached; marginal spines of both joints unusually short, not extending beyond the middle of the genital segment.

Body of an uniform pale yellowish hue, or straw-coloured.

Length of adult female reaching to 1.50 mm.

Remarks.—This is the largest of all the known species, and may moreover in the living state be recognized by its pale yellow colour. The structure of the last pair of legs is also characteristic from the unusual shortness of the

marginal spines. The *E. spinipes* of Brady is unquestionably identical with Boeck's species.

Occurrence.—I have found this form not unfrequently in the upper part of the Christiania Fjord, as also in the Trondhjem Fjord, in depths ranging from 10 to 20 fathoms. Mr. Scott records it also from Finmark.

Distribution.—British Isles (Brady, Scott), coast of France (Canu), Novaya Zemlia, Spitsberg (Scott).

15. Ectinosoma neglectum, G. O. Sars, n. sp.

(Pl. XVII, fig. 1).

Specific Characters.—Female. Very like the preceding species, but of somewhat smaller size and less robust form of body. Cephalic segment about the length of the 4 succeeding segments combined, and gradually narrowed in front, rostral plate evenly rounded at the tip. Urosome considerably longer than the exposed part of the metasome, posterior edges of the segments very finely spinulose. Caudal rami somewhat divergent, nearly twice as long as they are broad, apical setæ not much elongated. Anterior antennæ resembling in structure those in *E. Sarsi*, being rather robust and 5-articulate. Anterior lip with an acute recurved projection in front. Last pair of legs somewhat resembling those in *E. Sarsi*, but with the distal joint more unequally trilobate, the outermost lobe occurring considerably farther forward than the innermost, marginal setæ both of this joint and the inner expansion of the basal one much more elongated, partly extending beyond the genital segment.

Male considerably smaller than female, and easily recognizable by the prehensile character of the anterior antennæ, and by the subdivision of the genital segment.

Colour light brown or corneous, with dark reddish shadows in front.

Length of adult female 1.30 mm., of male 0.70 mm.

Remarks.—This form is closely allied to *E. Sarsi*, and has most probably been confounded with it by other authors. On a closer comparison, it is however found to differ rather markedly in the structure of the last pair of legs, the marginal setæ of which are much more elongated. In the living state it is moreover at once distinguished from that species by its different colour.

Occurrence.—I have met with this form rather abundantly in several places of the Norwegian coast, from the Christiania Fjord to Vadsö. It is generally found in depths ranging from 10 to 20 fathoms, muddy bottom. No doubt it will also be found to occur out of Norway.

16. Ectinosoma propinqvum, Scott.

(Pl. XVII, fig. 2).

Ectinosoma propinqvum, Th. & A. Scott, Revision of the British Copepoda belonging to the genera Bradya and Ectinosoma; Transact. Linn. Soc. London, Vol. VI, Part 5, p. 428, Pl. 36, figs. 19, 27, 46; Pl. 37, figs. 2, 15, 32, 55; Pl. 38, figs. 9, 23, 34, 54.

Specific Characters.—Female. General form of body resembling that of the 2 preceding species. Cephalic segment, however, seen dorsally, more abruptly contracted in front, with the rostral plate more horizontal and narrowly spoon-shaped. Urosome comparatively shorter and less attenuated behind. Caudal rami very short, scarcely as long as they are broad, and considerably divergent. Anterior antennæ, as in the 2 preceding species, 5-articulate and rather stout. Anterior lip with a very acute recurved projection in front. Last pair of legs comparatively small, with the marginal spines unusually short, not extending beyond the middle of the genital segment.

Colour dark corneous.

Length of adult female 0.86 mm.

Remarks.—I think I am right in identifying the above-described form with Scott's *E. propinqvum*, with which it seems to agree fairly well in most of the anatomical details, though being somewhat inferior in size. It is closely allied to *E. neglectum*, and may easily be confounded with that species. On a closer examination, however, it is found to differ, not only in its much inferior size, but also in the narrowly exserted and spoon-shaped rostral plate, the much shorter caudal rami, and the structure of the last pair of legs, which, in the shortness of the marginal spines, more resembles that in *E. Sarsi*.

Occurrence.—I have found this form in 2 widely distant localities, viz., at Hvalör, lower part of the Christiania Fjord, and in the Trondhjem Fjord at Agdenæs and Bejan, the depth ranging from 3 to 20 fathoms. Mr. Scott also records it from Finmark, and it thus seems to occur along the whole Norwegian coast.

Distribution.—Firth of Forth (Scott), Ceylon (A. Scott).

17. Ectinosoma elongatum, G. O. Sars, n. sp.

(Pl. XVIII, fig. 1).

Syn? *Ectinosoma finmarchicum*, Scott.

Specific Characters.—Female. Body extremely slender and elongated, with the cephalic segment, seen dorsally, abruptly contracted in front, rostral

plate narrowly spoon-shaped and nearly horizontal. Caudal rami of moderate size, about equalling in length the last segment, and tapering somewhat distally, apical setæ not very divergent. Anterior antennæ more slender than in the 3 preceding species, and composed of 6 well-defined articulations. Anterior lip obtusely rounded in front, without any trace of a recurved projection. Natatory legs comparatively more slender than in the 3 preceding species. Last pair of legs of moderate size, with the distal joint rather broad and somewhat oblique, apical spines slender, setiform, and rather unequal, the innermost being much shorter than the other 2, inner expansion of proximal joint with a transverse row of delicate spinules at the base, outer seta much shorter than the outermost one of the distal joint.

Colour pale yellowish.

Length of adult female 0.88 mm.

Remarks.—This is a very slender species, and in so far resembles a form briefly recorded by Th. Scott from Finmark under the name of *E. finmarchicum*. It is, however, of somewhat smaller size, and moreover, to judge from the figures given, seems to exhibit some difference in the structure of the last pair of legs and in the interrelative length of their marginal spines.

Occurrence. The only locality where I have hitherto met with this form, is at Selven, near Agdenæs, Trondhjem Fjord. It here occurred not unfrequently in a depth of 3—6 fathoms, muddy sand.

18. Ectinosoma Herdmani, Scott.

(Pl. XVIII, fig. 2).

Ectinosoma Herdmani, Th. & A. Scott, Revision, &c. p. 432, Pl. 36, figs. 16, 44; Pl. 37, figs. 3, 16, 29, 54; Pl. 38, figs. 7, 25, 33, 47.

Specific Characters.—Female. Body slender, sublinear in form, with the cephalic segment, seen dorsally, considerably attenuated in front, rostral plate narrowly exserted, spoon-shaped. Caudal rami very short, not nearly as long as they are broad, apical setæ somewhat divergent. Anterior antennæ slender, 6-articulate. Anterior lip obtusely produced in front. Last pair of legs comparatively small, with the marginal spines short and thick, all of about the same size.

Colour whitish, semipellucid.

Length of adult female scarcely exceeding 0.60 mm.

Remarks.—This form, first described by Th. & A. Scott, somewhat resembles *E. elongatum* in the general form of the body, but is rather inferior in

size, and moreover is easily distinguished by the much shorter caudal rami and by the characteristic structure of the last pair of legs.

Occurrence.—Found occasionally, together with *E. elongatum*, at Selven, Trondhjem Fjord, and also at Tananger, south coast of Norway.

Distribution.—Firth of Forth, Isle of Man (Scott).

19. Ectinosoma melaniceps, Boeck.

(Pl. XIX, fig. 1).

Ectinosoma melaniceps, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 30.

Syn? *Canthocamptus minuticornis*, Baird (not Müller).

Specific Characters.—Female. Body moderately slender, subfusiform in shape, with the cephalic segment, seen dorsally, gradually contracted in front, rostral plate obtusely rounded at the tip. Caudal rami about as long as they are broad, innermost apical seta more elongated than in most other species. Anterior antennæ rather slender and attenuated, composed of 7 well-defined articulations. Anterior lip with an angular projection in front. Last pair of legs of moderate size, distal joint comparatively broad and somewhat oblique, with the apical spines slender, setiform and rather unequal, appendicular bristle issuing from the margin between the 2 outermost spines; inner expansion of proximal joint comparatively small, with the inner apical spine quite short and remarkably broad, lanceolate in form, and coarsely serrate on the edges.

Colour grayish white, with a very conspicuous dark shade occupying the greater part of the cephalic segment.

Length of adult female 0.65 mm.

Remarks.—It seems to me very probable that the form recorded by Baird as *Canthocamptus minuticornis* is the present species. As, however, the identification of this form with *Cyclops minuticornis* of O. Fr. Müller cannot properly be accepted, the species must bear the name proposed for it by Boeck. It is easily recognizable from any of the other species by the dark-coloured cephalic segment, a character which indeed has given rise to the specific name assigned to it by Boeck. The last pair of legs also exhibit several peculiarities in their structure.

Occurrence.—This form is very common along the whole south and west coasts of Norway in comparatively shallow water among algæ, and may be easily detected, in spite of its small size, by the dark-coloured anterior part of the body. As with the other species of the present genus, on touching the surface of the

water, it remains floating upon it, and may thus easily be picked up from any freshly-taken sample.

Distribution.—British Isles (Brady, Scott), Spitsbergen (Scott).

20. Ectinosoma Normani, Scott.

(Pl. XIX, fig. 2).

Ectinosoma Normani, Th. & Scott, Revision, &c., p. 435, Pl. 36, figs. 21, 29, 39; Pl. 37, figs. 12, 26, 34, 51; Pl. 38, figs. 5, 18, 42, 45.

Specific Characters.—Female. Body somewhat more robust than in *E. melaniceps*, with the cephalic segment, seen dorsally, evenly contracted in front, rostral plate short and obtuse at the tip. A bright red pigmentary patch present on each side of the cephalic segment, just within the lateral edge and between the insertions of the anterior and posterior antennæ. Caudal rami of about the same appearance as in *E. melaniceps*, but with the innermost apical seta considerably shorter. Anterior antennæ likewise very similar in structure, though perhaps a little shorter. Anterior lip with an acute recurved projection in front. Last pair of legs not unlike those in *E. melaniceps*, distal joint, however, comparatively narrower, with the innermost apical spine longer, extending about as far as the outermost, appendicular bristle, as in *E. melaniceps*, issuing from the margin between the 2 outermost spines; inner expansion of proximal joint with the outer spine more slender and only very slightly lanceolate.

Colour uniformly whitish grey.

Length of adult female 0.55 mm.

Remarks.—The above-described form is unquestionably that recorded by Messrs. Th. & A. Scott under the name of *E. Normani*. At first I believed it to be *E. erythrops* of Brady, on account of the very conspicuous red pigmentary patches occurring within the lateral edges of the cephalic segment in front. But Messrs. Th. & A. Scott describe as Brady's species a very different form, unknown to me, though apparently referable to the Fauna of Norway, having been recorded by one of these authors from Finmark. The species here under discussion is nearly allied to *E. melaniceps*, though at once distinguished by its uniform colour and the very conspicuous red ocular patches in front. It is also rather inferior in size.

Occurrence.—Only 2 specimens of this form have hitherto come under my notice. They were both taken in the upper part of the Christiania Fjord

from a depth of about 6 fathoms, muddy bottom. Th. Scott records this form also from Vadsö, Finmark.

Distribution.—Firth of Forth, Barrow Strait (Th. Scott), Ceylon (A. Scott).

21. Ectinosoma curticorne, Boeck.

(Pl. XX, fig. 1).

Ectinosoma curticorne, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 45.

Specific Characters.—Female. Body moderately slender, fusiform in shape, greatest width in front of the middle. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate comparatively short and bluntly rounded at the tip. Caudal rami nearly twice as long as they are broad and slightly divergent. Anterior antennæ very short, though composed of 6 well-defined articulations, the 1st of which exhibits inside a very conspicuous dark pigmentary patch. Anterior lip with a blunt prominence in front, clothed at the hind edge with long cilia. Last pair of legs well developed, clothed on the lower face with several transverse rows of delicate spinules, distal joint somewhat unequally trilobate, apical spines very slender and elongated, setiform, the innermost one longer than the outermost; inner expansion of proximal joint extending about to the middle of the distal joint.

Colour dark brown or corneous.

Length of adult female 0.70 mm.

Remarks.—This form, first recorded by Boeck, may be easily distinguished from any of the preceding species by the unusually short anterior antennæ and the very conspicuous dusky pigment-patch inside the 1st joint of the latter. The form of the anterior lip and the structure of the last pair of legs are also rather characteristic. In the opinion of Th. Scott, the *Bradya Edwardsii* of Ricard is identical with this species.

Occurrence.—Only very few specimens of this form have hitherto come under my notice. They were all of them taken in the upper part of the Christiania Fjord in a depth of 6—20 fathoms, muddy bottom. The specimen observed by Boeck was also from the Christiania Fjord. Th. Scott, however, records this form from 2 localities of the Finmark coast, viz., Bugö Fjord and Vadsö.

Distribution.—Scottish coast (Scott), Spitsbergen (Scott).

22. Ectinosoma gothiceps, Giesbrecht.

(Pl. XX, fig. 2).

Ectinosoma gothiceps, Giesbrecht, Die freilebenden Copepoden der Kieler Föhrde, p. 106, Pl. I, figs. 3, 12; Pl. IV, figs. 17, 35; Pl. V, fig. 3; Pl. VII, fig. 8; Pl. VIII, figs. 10, 11; Pl. IX, fig. 17; Pl. X, figs. 10, 21; Pl. XI, fig. 13; Pl. XII, figs. 6, 10.

Syn? *Ectinosoma pygmæum*, Scott.

Specific Characters.—Female. Very like the preceding species, but of much smaller size and somewhat less slender. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate of moderate size and obtusely acuminate at the tip. Caudal rami very short, not nearly so long as they are broad. Anterior antennæ short, 6-articulate, resembling those in *E. curticorne*, but without any pigmentary patch inside the 1st joint. Anterior lip with a short acute projection in front. Last pair of legs comparatively smaller than in *E. curticorne*, but with the marginal spines very long and considerably thickened at the base; distal joint shorter and less unequally trilobate than in the above species, outermost apical spine considerably longer than the innermost; inner expansion of proximal joint very short.

Colour whitish gray.

Length of adult female 0.45 mm.

Remarks.—The above-described form is unquestionably that recorded by Dr. Giesbrecht as *E. gothiceps*, and I am also of opinion that the *E. pygmæum* of Scott is referable to the same species. It is closely allied to *E. curticorne*, but of much inferior size, and is moreover distinguished by the short caudal rami, the absence of the pigmentary patch on the anterior antennæ, and also by the somewhat different structure of the anterior lip and the last pair of legs.

Occurrence.—I have met with this small species occasionally in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths.

Distribution.—Kiel Bay (Giesbrecht), Firth of Forth, Isle of Man (Scott).

23. Ectinosoma mixtum, G. O. Sars, n. sp.

(Pl. XXI, fig. 1).

Specific Characters.—Female. Body moderately slender, with the cephalic segment, seen dorsally, gradually contracted in front, rostral plate well developed and somewhat deflexed, narrowly rounded at the tip. Caudal rami about as long

as they are broad, apical setæ rather slender. Anterior antennæ comparatively short, though longer than in the 2 preceding species, and composed of 6 articulations. Anterior lip with a small recurved projection in front. Last pair of legs of moderate size, with the marginal spines very unequal, distal joint much longer than the proximal one and subquadrangular in form, innermost apical spine very short, appendicular bristle, as in most other species, remote from the margin; inner expansion of proximal joint extending almost to the tip of the distal joint, outer spine remarkably thickened, somewhat resembling that in *E. melaniceps*, though considerably more elongated.

Colour grayish white.

Length of adult female 0.58 mm.

Remarks.—I cannot identify this form with any of the species described by Messrs. Th. & A. Scott. The specific name here proposed refers to the somewhat mixed characters, some of which resemble those of *E. curticorne*, and some those of *E. melaniceps*.

Occurrence.—Only some few specimens of this form have hitherto come under my notice. They were taken in the upper part of the Christiania Fjord, near the town, in a depth of about 3 fathoms, muddy bottom.

24. Ectinosoma brevirostre, G. O. Sars, n. sp.

(Pl. XXI, fig. 2).

Specific Characters.—Female. Body comparatively slender and somewhat compressed, with the cephalic segment, seen dorsally, but slightly contracted in front, rostral plate remarkably short and blunt at the tip. Caudal rami longer than they are broad, and somewhat obliquely truncated at the tip, apical setæ of moderate length. Anterior antennæ more slender and attenuated than in *E. mixtum*, but, as in that species, 6-articulate. Anterior lip with a similar acute recurved projection in front. Last pair of legs with the proximal joint rather large and broad, distal joint considerably shorter, being scarcely longer than it is broad, innermost apical spine exceeding half the length of the outermost one, appendicular bristle issuing near the margin; inner expansion of proximal joint scarcely extending beyond the middle of the distal joint, and exhibiting at the base an oblique transverse row of delicate spinules, outer apical spine of quite normal appearance.

Colour yellowish gray.

Length of adult female 0.55 mm.

Remarks.—This new species is chiefly characterised by the unusually short rostral plate, a character which has given rise to the specific name here proposed. In its general appearance it somewhat resembles *E. gracile*, Scott, the body being, as in that form, considerably compressed. It differs, however, very markedly in the structure of the anterior maxillipeds, which is quite normal, as also in that of the last pair of legs.

Occurrence.—Only a single, but well-preserved ovigerous specimen of this form was found last summer at Bejan, outer part of the Trondhjem Fjord, in a depth of 20—30 fathoms.

25. Ectinosoma gracile, Scott.

(Pl. XXII, fig. 1).

Ectinosoma gracile, Th. & A. Scott, Revision, p. 429, Pl. 36, figs. 18, 37; Pl. 37, figs. 13, 28, 45; Pl. 38, figs. 3, 27, 30.

Specific Characters.—Female. Body exceedingly slender and much compressed, seen dorsally, almost linear in form. Cephalic segment evenly contracted in front, rostral plate somewhat deflexed and blunt at the tip. Caudal rami about as long as they are broad, apical setæ rather slender. Anterior antennæ comparatively slender and attenuated, though composed of only 6 articulations, the penultimate one being very narrow and elongated. Anterior lip with the usual recurved projection in front. Anterior maxillipeds unusually powerful, with the 2nd basal joint more than twice as long as the 1st, and considerably dilated at the base, apical claws very slender and minutely denticulate. Last pair of legs comparatively small, but with the marginal spines rather elongated, distal joint regularly trilobate, with the innermost apical spine longer than the outermost; appendicular bristle some distance from the margin; inner expansion of proximal joint unusually short.

Colour whitish gray.

Length of adult female 0.55 mm.

Remarks.—This is a rather anomalous form, differing, among other things, from the other known species of this genus very markedly in the structure of the anterior maxillipeds. I have been enabled to prove the identity of this form with that described by Mr. Scott, by comparing it with some specimens kindly sent to me by that author.

Occurrence.—Some few specimens of this form were found last summer in the Trondhjem Fjord, at Agdenæs. They occurred in a depth of about 50 athoms, on a bottom consisting of coarse sand.

Distribution.—Firth of Forth, Isle of Man (Scott).

Gen. 10. **Pseudobradya**, G. O. Sars, n.

Syn: *Bradya*, Scott (part).

Generic Characters.—General form of body resembling that of *Ectinosoma*, being more or less pronouncedly fusiform. Caudal rami often much elongated. Anterior antennæ comparatively short, with the proximal joints more or less expanded. Posterior antennæ with the outer ramus poorly developed and in some cases consisting of only 2 joints. Anterior lip not forming any projection in front. Mandibles and maxillæ resembling in structure those in *Ectinosoma*. Anterior maxillipeds generally very small, with the 2 basal joints bent at almost a right angle, terminal part consisting of 3 well-defined, though very short joints carrying comparatively short setæ, 2 of which are generally spiniform. Posterior maxillipeds less slender than in *Ectinosoma*. Last pair of legs generally very large, lamellar, though somewhat varying in shape in the different species, distal joint always well developed, appendicular bristle in some cases very strong and issuing from the lower face of the proximal joint.

Remarks.—This new genus is established to include a number of species referred by Mr. Scott to the genus *Bradya* of Boeck, chiefly on account of some similarity in the structure of the posterior maxillipeds. These appendages are, however, in reality not nearly so powerfully developed as in *Bradya*, and on a closer comparison, several other differences in the anatomical details are found to exist, which would seem to warrant the establishment of a separate genus, somewhat intermediate in character between *Ectinosoma* and *Bradya*. Among these differences may be mentioned the poor development of the outer ramus of the posterior antennæ, the somewhat different shape of the posterior maxillipeds and the very highly developed last pair of legs. The caudal rami, moreover, in most of the species, are unusually prolonged, and the general form of the body is rather unlike that in *Bradya*, and much more resembling that in *Ectinosoma*. Of the 5 species described by Mr. Scott and referable to the present genus, I have succeeded in finding 2 off the Norwegian coast, and also a 3rd species which I regard as new to science.

26. Pseudobradya minor (Scott).

(Pl. XXII, fig. 2).

Bradya minor, Th. & A. Scott, Revision, p. 425, Pl. 35, figs. 5, 9, 13, 21, 24, 31, 35, 42; Pl. 36, figs. 5, 9.

Specific Characters.—Female. Body unusually short and stout, pronouncedly fusiform, with the greatest width in the middle. Cephalic segment, seen dorsally, gradually tapering in front, rostral plate prominent, nearly horizontal, and obtusely acuminate at the tip. Caudal rami of moderate size, scarcely longer than they are broad, apical setæ not much elongated. Anterior antennæ somewhat less abbreviated than in the other species, and composed of 6 well-defined articulations, the 1st of which exhibits inside a very conspicuous dark pigmentary patch. Outer ramus of posterior antennæ about the length of the 1st joint of the inner, and very narrow, 3-articulate. Anterior lip quite evenly rounded in front. Anterior maxillipeds with the 2nd basal joint somewhat longer than the 1st. Natatory legs rather strongly built. Last pair of legs of moderate size and clothed on the lower face with several rows of delicate spinules, marginal spines not much elongated and but slightly unequal; appendicular bristle normal, issuing from the lower face of the distal joint; the latter oval in form, with the outermost lobe occurring far in front of the innermost; inner expansion of proximal joint comparatively short, scarcely extending to the middle of the distal joint.

Colour yellowish brown.

Length of adult female 0.54 mm.

Remarks.—The above-described form is unquestionably identical with that recorded by Mr. Scott as *Bradya minor*. It may easily be recognized from any of the other species by the unusually short and robust form of the body, and by the very conspicuous black pigmentary patches inside the 1st joint of the anterior antennæ.

Occurrence.—Some specimens of this form were found last summer in the Trondhjem Fjord, at Selven, near Agdenæs, in a depth of 3—6 fathoms, muddy sand.

Distribution. —Firth of Forth, Liverpool Bay (Scott).

27. Pseudobradya acuta, G. O. Sars, n. sp.

(Pl. XXIII, fig. 1).

Specific Characters.—Female. Body rather slender, subfusiform in shape, with very thin and soft integuments. Cephalic segment, seen dorsally, considerably

contracted in front, with the rostral plate nearly horizontal and terminating in a very acute point. Urosome rather massive and but slightly attenuated behind. Caudal rami comparatively large and broad, about twice as long as the last segment, apical setæ slender and elongated. Anterior antennæ very short, 6-articulate, with the proximal joints considerably expanded. Posterior antennæ with the outer ramus very narrow, 3-articulate, the first 2 joints quite short. Anterior maxillipeds extremely small, with the 2nd basal joint scarcely larger than the 1st. Natatory legs comparatively more slender than in the preceding species. Last pair of legs very largely developed and quite smooth below, marginal spines much elongated, setiform, some of them extending as far as the tip of the caudal rami; distal joint oblong oval in form, and regularly trilobate at the end, appendicular bristle unusually prolonged and issuing from the lower face of the proximal joint; inner expansion of the latter extending about to the middle of the distal joint, outer apical spine rather elongated, though somewhat shorter than the inner.

Colour whitish gray.

Length of adult female 0.70 mm.

Remarks.—This form, which I cannot identify with any of the species described by Mr. Scott, is easily recognizable by the acutely produced rostral plate, and the large size of the last pair of legs, the marginal spines of which are more elongated than in any other form known to me.

Occurrence.—Only 2 specimens of this form, both adult females, were found, together with the preceding species at Selven, Trondhjem Fjord.

28. Pseudobradya similis (Scott).

(Pl. XXIII, fig. 2).

Bradya similis, Th. & A. Scott, Revision, p. 424, Pl. 35, figs. 3, 7, 16, 27, 33, 41, 48, Pl. 36, figs. 3, 10.

Specific Characters.—Female. Body moderately slender, with highly chitinized integuments. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate somewhat deflexed and obtuse at the tip. Urosome less massive than in *P. acuta*, slightly tapering distally. Caudal rami remarkably large and elongated, equalling in length the last 2 segments combined; apical setæ comparatively short. Anterior antennæ resembling in structure those in *P. acuta*. Last pair of legs comparatively large, though somewhat less broad than in *P. acuta*, and clothed on the lower face with several transverse rows of delicate spinules, marginal spines of moderate length and somewhat unequal; distal joint oblong

oval in form, unequally trilobate at the end, the outermost lobe occurring far in front of the innermost one; appendicular bristle very strong, spiniform, and, as in *P. acuta*, issuing from the lower face of the proximal joint; inner expansion of the latter rather narrow, and extending somewhat beyond the middle of the distal joint, outer apical spine very small.

Colour yellowish brown.

Length of adult female 0.59 mm.

Remarks.—This form, the identity of which with *Bradya similis* of Scott I cannot doubt, may be easily distinguished from any of the 2 preceding species by the remarkably prolonged caudal rami, in which respect it agrees with 2 other species described by Mr. Scott, viz., *P. elegans* and *P. hirsuta*. It is, however, of much smaller size than either of these species.

Occurrence.—Only 2 specimens of this form were found last summer, together with the 2 preceding species at Selven, Trondhjem Fjord.

Distribution.—Firth of Forth (Scott).

Gen. 11. **Microsetella,** Brady & Robertson, 1873.

Generic Characters.—Body very slender, with the anterior division scarcely broader than the posterior. Cephalic segment projecting in front in a short, deflexed rostrum. Epimeral plates of this and the 3 succeeding segments well developed, partly including between them the oral appendages and the basal parts of the natatory legs. Caudal rami short, with the 2 middle apical setæ greatly elongated. Anterior antennæ slender and elongated, with only scattered bristles; those in male distinctly geniculate, terminal part rather prolonged. Posterior antennæ with the outer ramus much shorter and narrower than the inner, 3-articulate. Anterior lip not produced in front. Mandibles with the palp very large, distal joint spatulate in form and about the size of the proximal one, carrying at the lower edge a remarkably strong spiniform seta, clothed along one of the edges with long cilia; outer ramus very small. Maxillæ of more simple structure than in *Ectinosoma*, the palp apparently consisting of only 2 setiferous lobes. Anterior maxillipeds comparatively small, resembling in structure those in *Ectinosoma*. Posterior maxillipeds, however, more strongly built, with the middle joint rather expanded. Natatory legs with the rami slender and narrow. Last pair of legs built, on the whole, upon the same type as in *Ectinosoma*.

Remarks.—This genus was established in the year 1873 by Messrs. Brady & Robertson to comprise a small Harpacticoid, *M. atlantica* B. & R., taken by them in the open sea by the aid of the surface-net. The genus was subsequently withdrawn by Prof. Brady, who in his Monograph described it as *Ectinosoma atlanticum*, believing that the anatomical differences were not sufficient to remove it from that genus. Dr. Giesbrecht has, however, again restored the original genus, adding another nearly-related form, *M. rosea* (Dana). I am also myself of opinion that the genus *Microsetella* ought to be maintained, differing, as it does, from *Ectinosoma*, not only in the peculiar habits of the species, but also in some anatomical details mentioned in the above diagnosis. Of the 2 hitherto known species, only one belongs to the fauna of Norway.

29. Microsetella norvegica (Boeck).

(Pl. XXIV).

Setella norvegica, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 281.

Syn: *Ectinosoma atlanticum*, Brady.

Specific Characters—Female. Body extremely slender, nearly linear in form, the greatest width scarcely exceeding $^1/_6$ of the length. Cephalic segment only very slightly vaulted above, seen dorsally, gradually contracted in front, rostrum short and abruptly deflexed. Urosome about half the length of the anterior division of the body, segments clothed with several circlets of delicate spinules. Caudal rami scarcely longer than they are broad, apical setæ more or less divergent, the innermost but one about twice the length of the urosome. Anterior antennæ exceeding half the length of the cephalic segment, and composed of 6 articulations, terminal part fully as long as the proximal one. Last pair of legs with the distal joint scarcely as long as the proximal one, and rounded in form, innermost apical spine very small, the other 2 considerably elongated, setiform, appendicular bristle normal; inner expansion of proximal joint large, extending as far as the distal joint, inner apical spine much shorter than the outer.

Male somewhat smaller than female, and easily recognizable by the geniculate anterior antennæ and the bipartite genital segment.

Body pellucid, white, with a faint yellowish tinge.

Length of adult female 0.46 mm., of male 0.38 mm.

Remarks.—There cannot, in my opinion, be any doubt that the form briefly recorded by Boeck as *Setella norvegica* is this species, and therefore, according

to the rules of priority, the specific name proposed by Boeck ought to be preferred to that subsequently given to this form by Messrs. Brady and Robertson. It differs from the 2nd species, *M. rosea*, in its much inferior size, and in the less elongated caudal setæ.

Occurrence.—Unlike what is generally the case with the Harpacticoida, this form is a true pelagic animal, scarcely ever to be found at the bottom. I have observed it in several places off the Norwegian coast, and always near the surface of the sea and generally at a considerable distance from the shore. In some plankton-samples examined by me, it occurred in great abundance.

Distribution.—British Isles, Atlantic Ocean, widely distributed, Arctic Ocean, Mediterranean, Pacific, Red Sea, Indian Ocean.

Gen. 12. **Bradya**, Boeck, 1872.

Generic Characters.—General form of body not unlike that of *Ectinosoma*, anterior division, however, somewhat broader and slightly depressed. Rostral plate comparatively short and blunt at the tip. Urosome conspicuously narrower than the anterior division of the body; caudal rami not much elongated, and wide apart. Anterior antennæ short and stout, densely setiferous, and composed of 6 or 7 articulations. Posterior antennæ with the outer ramus more fully developed than in the other genera of this family, being scarcely shorter than the inner, subfusiform, and distinctly 3-articulate. Anterior lip not produced in front. Mandibles with the cutting edge divided into numerous teeth, palp rather large, with the outer ramus more fully developed than in the other genera. Maxillæ normally developed, the palp having outside 2 setiferous lamellæ. Anterior maxillipeds rather powerful, with the 2 basal joints bent at nearly a right angle, terminal part short, but distinctly 3-articulate, and clothed with several short setæ, one of which is much stronger than the others and claw-shaped. Posterior maxillipeds likewise rather fully developed, 1st joint carrying at the end inside a strong deflexed seta, and another smaller one at the outer corner, middle joint lamellarly expanded and provided with an oblique row of delicate spinules, last joint imperfectly defined at the base, and carrying 4 ciliated setæ. Natatory legs with the rami comparatively broad. Last pair of legs poorly developed, with the distal joint rather small or wholly absent.

Remarks.—In the restriction here adopted, this genus is chiefly characterised by the somewhat dilated and depressed anterior division of the body, the rather full development of the outer ramus of the posterior antennæ, and partly also, by the structure of the 2 pairs of maxillipeds and the last pair of legs. Two well-defined species of this genus occur off the Norwegian coast.

30. Bradya typica, Boeck.

(Pl. XXV).

Bradya typica, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 47.

Specific Characters.—Female. Anterior division of body moderately dilated, greatest width scarcely attaining half the length; rostral plate slightly deflexed and narrowly rounded at the tip. Epimeral plates projecting behind in an acute corner. Urosome exceeding half the length of the anterior division, last segment deeply cleft. Caudal rami a little longer than they are broad, and considerably divergent, apical setæ of moderate length. Anterior antennæ short and thick, consisting of 7 well-defined articulations, the penultimate one with a remarkably strong seta in front, last joint very small, nodiform. Anterior maxillipeds with the 2nd basal joint smaller than the 1st, unguiform spine not very strong. Last pair of legs rather distant the one from the other, marginal spines very unequal, some of them rather slender, setiform; distal joint well defined, though comparatively small, subquadrangular, with the outermost apical spine much smaller than the other 2, appendicular bristle slender and elongated; inner expansion of proximal joint with 2 unequal spines at the tip.

Colour whitish gray.

Length of adult female 0.90 mm.

Remarks.—This form was first recorded by Boeck, and subsequently described and figured by Prof. Brady in his well-known Monograph. It is easily recognizable from any of the other species referred by Mr. Scott to this genus, both by the outer habitus and by some of the anatomical details.

Occurrence.—I have met with this form in several places on the Norwegian coast from the Christiania Fjord to Trondhjem Fjord. Mr. Th. Scott records it also from Finmark. It occurs in depths ranging from 10 to 30 fathoms, muddy bottom.

Distribution.—British Isles (Brady, Scott).

31. Bradya dilatata, G. O. Sars, n. sp.
(Pl. XXVI).

Specific Characters.—Female. Anterior division of body considerably dilated, seen dorsally, broadly oval in form, with the greatest width exceeding half the length. Rostral plate well developed, narrowly rounded at the tip. Urosome scarcely more than half as long as the anterior division of the body, and much narrower. Caudal rami about as in *B. typica.* Anterior antennæ composed of only 6 articulations, the last 2 being confluent. Posterior antennæ, mandibles, maxillæ, and posterior maxillipeds, of much the same structure as in *B. typica.* Anterior maxillipeds, however, considerably more powerful, with the 2nd basal joint fully as large as the 1st, and the apical claw remarkably strong. Natatory legs rather short, with unusually broad, flattened rami. Last pair of legs very small and imperfectly developed, each forming a simple setiferous lamella, without any trace of subdivision.

Colour whitish gray.

Length of adult female 1.20 mm.

Remarks.—This form, though closely agreeing with *B. typica* in most of the structural details, may be at once distinguished by the much broader form of the anterior division of the body, the very powerfully developed anterior maxillipeds, and the peculiar rudimentary condition of the last pair of legs. It also grows to a considerably larger size.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were taken many years ago in the upper part of the Christiania Fjord, in a depth of about 30 fathoms.

Section II. Chirognatha.

Remarks.—As stated above, the forms belonging to this section are chiefly characterised by the structure of the posterior maxillipeds, which, unlike those in the preceding section, constitute more or less powerful prehensile organs, terminating in a clawed hand. Of the 2 subsections into which it is divided, that of the *Dactylopoda* is by far the most extensive, and I propose to treat of this subsection in the first place.

Subsection 1. Dactylopoda.

Chief Character. First pair of legs unlike the others, and more or less distinctly prehensile.

Fam. 5. Harpacticidæ.

Characters.—Body of various form, in some cases slender and compressed or sub-depressed, in other cases much abbreviated and flattened. Rostrum well defined at the base, and to some extent mobile. Eye present. Anterior antennæ comparatively slender, with the proximal part consisting of 4 well-defined joints, terminal part of 4 or 5 much smaller articulations; those in male strongly prehensile, terminating in a clawed hand. Posterior antennæ rather powerful, biarticulate, distal joint more or less spatulate, and armed at the tip with 3 strong, claw-like spines, and behind them with 4 geniculated setæ, outer ramus comparatively small, and issuing from the middle of the proximal joint. Mandibles highly incrustated, with short and blunt cutting teeth, palp of moderate size, with 2 slender recurved rami. Maxillæ normal. Anterior maxillipeds short and stout, with several digitiform lobes in front, the outermost one carrying an unguiform spine. Posterior maxillipeds more or less powerfully developed, subcheliform. First pair of legs with both rami distinctly prehensile and very unequal, the outer one being much the longer, and armed at the tip with a number of curved claws, the inner one with a single such claw. Natatory legs with both rami 3-articulate, the outer one being the larger. Last pair of legs lamellar, biarticulate, proximal joint in female more or less expanded inside. Ovisac single.

Remarks.—In the restriction here adopted, this family is chiefly characterised by the structure of the 1st pair of legs, the rami of which are very unequal in length and both prehensile. It comprises at present 3 genera, all of which are represented in the fauna of Norway.

Gen. 13. **Harpacticus**, M.-Edwards, 1838.

Syn: *Arpacticus*, Baird.

Generic Characters.—Body slender, compressed, or slightly depressed, tapering behind. Urosome normal, with none of the segments expanded laterally, and considerably narrower in male than in female. Caudal rami short, more or less divergent, one of the apical setæ considerably elongated. Rostrum conically produced, and more or less curved downwards. Anterior antennæ in female 8- or 9-articulate; those in male very strong, with the 1st joint divided into 2 articulations, last joint of the proximal part globularly expanded, terminal part very movable, claw-shaped. Posterior antennæ with the apical spines simple, outer ramus composed of only 2 joints. Posterior maxillipeds generally very powerful, with the hand considerably expanded. First pair of legs with the outer ramus biarticulate, and nearly twice as long as the inner, apical claws but slightly curved. Inner ramus of 2nd pair of legs in male with the middle joint produced at the end outside to a long deflexed mucroniform projection; 3rd pair of same with the outer ramus exceedingly strong, curving more or less inwards, and having the spines very coarse, whereas the natatory setæ are rudimentary. Last pair of legs of moderate size, with the marginal spines, as a rule, not much prolonged, distal joint oval, inner expansion of proximal joint in female comparatively broad, in male rudimentary.

Remarks.—This genus was established as early as the year 1838 by M.-Edwards, to include the *Cyclops chelifer* of O. Fr. Müller. Several additional species have subsequently been described by different authors; but some of these species are now generally referred to other genera, or even to quite different families. One of the most characteristic features by which the present genus is distinguished from the 2 other genera of this family, is the peculiar transformation in the male of the outer ramus of the 3rd pair of legs, which constitutes a most powerful prehensile organ, by the aid of which, apparently, the female is grasped during copulation. To the fauna of Norway belong 4 distinct species, to be described below.

32. Harpacticus chelifer (Müller).

(Pl. XXVII & XXVIII).

Cyclops chelifer, O. Fr. Müller, Entomostraca, p. 114, Pl. XIX, figs. 1—3.

Specific Characters.—Female. Body pronouncedly compressed, especially in its anterior part, seen dorsally, very narrow, with the greatest width quite in

front, and gradually tapering behind. Cephalic segment rather large and deep, with the rostrum very prominent. Epimeral plates of the 3 succeeding segments rounded at the lateral corners. Last pedigerous segment comparatively small. Urosome not attaining half the length of the anterior division, posterior edges of the segment finely spinulose. Caudal rami about as long as they are broad, and somewhat divergent, apical setæ rather slender, the innermost but one about twice the length of the urosome. Anterior antennæ comparatively slender 8-articulate, terminal part not attaining $^1/_3$ of the length of the antenna. Posterior antennæ very greatly developed, outer ramus, however, small, with 6 setæ. Posterior maxillipeds exceedingly large and powerful, hand nearly globose in form, with the palm somewhat hollowed, its upper angle coarsely denticulate, dactylus very strong and curved. First pair of legs rather strongly built, joints of the outer ramus of about equal length, the distal one armed at the tip with 3 finely denticulated claws; inner ramus 3-articulate, the outer 2 joints very small and imperfectly defined, apical claw of same appearance as those of the outer ramus. Natatory legs with the outer ramus much stronger than the inner, 1st joint the largest, terminal joint rather narrow, with 4 coarse spines outside gradually increasing in length distally. Last pair of legs with the inner expansion of the proximal joint moderately broad, and provided with only 3 marginal spines. Ovisac generally not very large, oval in form.

Male somewhat larger than female, with the urosome narrower. Anterior antennæ very powerful, hand strongly dilated, dactylus simple. Outer ramus of 3rd pair of legs exceedingly large and robust, with the 1st joint fully as long as the other 2 combined, last joint spatulate, armed with 3 very thick spines. Last pair of legs much smaller than in female, distal joint oblong quadrangular in form, proximal one not at all expanded inside.

Colour light yellow.

Length of adult female 0.90 mm., of male about 1 mm.

Remarks.—The above-described form is unquestionably that originally recorded by O. Fr. Müller as *Cyclops chelifer*. In some cases, however, quite different forms have been identified with Müller's species. Prof. Brady has apparently confounded this species with *H. gracilis* of Claus, and some of the figures given in his Monograph seem indeed to be more properly referable to that form. On a closer examination, the present species may be easily recognized by the pronouncedly compressed form of the body, and by the unusually large posterior maxillipeds. Moreover, both in the structure of the antennæ and of the legs, well-marked differences from the other species are found to exist.

Occurrence.—This is one of the commonest of our Harpacticoids, being

found rather abundantly along the whole Norwegian coast, from the Christiania Fjord to Vadsö. It is a true littoral form, occurring in quite shallow water close to the shore, among algæ, and not infrequently left in tidal pools together with other littoral species. It moves in a somewhat jerky manner; but it is more frequently found clinging to the algæ or other submarine objects. The two sexes are often found tied together in copula, the male having a firm hold of the female by the aid of his powerful clawed anterior antennæ, which are inserted within the hind edge of the cephalic segment of the female.

Distribution. British Isles (Brady), Heligoland (Claus), coast of Bohuslän (Coll. Cleve), coast of France (Canu), Arctic Ocean (Scott), coast of North America, Ceylon (A. Scott).

33. Harpacticus uniremis, Kröyer.

(Pl. XXIX).

Harpacticus uniremis, Kröyer, in Gaimard's Voyage en Scandinavie, Pl. 43, fig. 1, a—p.

Syn: *Harpacticus nordlandicus,* Boeck.

„ — *chelifer, var. arctica,* Poppe.

Specific Characters.—Female. Body moderately slender, subdepressed, with the greatest width equalling about $^1/_3$ of the length, and occurring a little in front of the middle. Cephalic segment rather large, but less deep than in *H. chelifer,* rostrum broader and more obtuse at the tip. Epimeral plates of the 3 succeeding segments somewhat expanded laterally, and acutely produced at the lateral corners. Last segment of metasome rather broad. Urosome gradually somewhat coarctated behind, with the hind edges of the segments coarsely spinulose ventrally. Caudal rami very short, scarcely as long as they are broad, apical setæ slender, the innermost but one more than twice as long as the urosome. Anterior antennæ moderately slender, 9-articulate, terminal part considerably exceeding half the length of the proximal one. Posterior antennæ about as in *H. chelifer.* Posterior maxillipeds rather strongly built, though not nearly so powerful as in that species, hand rounded oval in form. First pair of legs resembling in structure those in *H. chelifer,* but with a greater number of claws at the tip of the outer ramus. Last pair of legs with the inner expansion of the proximal joint very large and broad, carrying 4 marginal spines, distal joint comparatively smaller.

Male, as usual, somewhat larger than female, with the urosome narrower and distinctly 5-articulate. Anterior antennæ with the dactylus securiform in shape, projecting outside in a strong spiniform process. Outer ramus of 3rd pair of legs somewhat less powerfully developed than in *H. chelifer,* 1st joint shorter

than the other 2 combined, last joint armed with 4 spines, the innermost rather slender. Last pair of legs very small.

Colour gray, with a slight yellowish green tinge.

Length of adult female 1.23 mm., of male 1.33 mm.

Remarks.—This form was figured, but not described, by Kröyer in the Atlas to *Gaimard's* well-known work "Voyage en Scandinavie". It is much the largest of our Harpactici, and is moreover easily recognizable by its comparatively broad, sub-depressed body. The *Harpacticus nordlandicus* of Boeck is unquestionably identical with this species; and the form recorded by Mr. S. A. Poppe as *Harpacticus chelifer*, var. *arctica*, is also referable to the same species.

Occurrence.—I have met with this form rather frequently along the whole Norwegian coast, from the Christiania Fjord to Vadsö. It is not, however, like the preceding species, a littoral form, but is only found in depths ranging from 20 to 100 fathoms, muddy bottom.

Distribution.—Behring Sea (Poppe), Bear Islands, Spitsbergen (Scott).

34. Harpacticus gracilis, Claus.

(Pl. XXX, fig. 1).

Harpacticus gracilis, Claus, Die freilebenden Copepoden, p. 135, Pl. XIX, fig. 20.

Syn: *Harpacticus elongatus*, Boeck.
„ — *chelifer*, Giesbrecht (not Müller).

Specific Characters.—Female. Body rather slender, with the anterior division slightly depressed, the posterior considerably narrower. Rostrum rather prominent. Caudal rami very short, not nearly as long as they are broad, apical setæ slender and divergent. Anterior antennæ rather elongated, attaining the length of the cephalic segment, 9-articulate, terminal part scarcely exceeding in length $^1/_3$ of the proximal part. Posterior antennæ with the outer ramus normal. Posterior maxillipeds resembling in shape those in *H. uniremis*. First pair of legs comparatively more slender than in the 2 preceding species, with the distal joint of the outer ramus shorter than the proximal one; inner ramus with the outer 2 joints confluent. Last pair of legs with the distal joint oblong in form; inner expansion of proximal joint well developed, though less broad than in *H. uniremis*, marginal spines of both joints rather slender, setiform.

Male exhibiting the usual differences from the female. Outer ramus of 3rd pair of legs considerably incurved, last joint with 3 thickish spines and a long ciliated seta at the inner corner. Last pair of legs very small, with the distal joint somewhat club-shaped, the 2 outermost setæ spiniform.

Colour whitish, with a slight yellowish tinge, and generally banded dorsally with dark brown.

Length of adult female 0.66 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Claus as *H. gracilis*. The *H. elongatus* of Boeck is the same species, and this is unquestionably also the case with the form described by Dr. Giesbrecht as *H. chelifer*, Müller. Prof. Brady seems to have been acquainted with both these forms; but he only regarded *H. gracilis* as a variety of *H. chelifer*, though in reality it is very distinct both in the external form and in the structure of some of the appendages.

Occurrence.—I have found this form occasionally in several places of the Norwegian coast, as far as to the Trondhjem Fjord. It is, like *H. chelifer*, a littoral form, occurring in comparatively shallow water among algæ.

Distribution.—British Isles (Brady), Kiel Bay (Giesbrecht), Mediterranean at Messina (Claus).

35. Harpacticus flexus, Brady.

(Pl. XXX, fig. 2).

Harpacticus flexus, Brady & Robertson, Ann. Mag. Nat. Hist. ser. 4, Vol. XII, p. 134, Pl. IX, figs. 17—21.

Specific Characters.—Female. Form of body resembling that in *H. gracilis*, though perhaps still more slender. Rostrum less prominent. Caudal rami broader than they are long. Anterior antennæ unusually short, being scarcely half as long as the cephalic segment, 9-articulate, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus very narrow and provided with only 3 setæ. Posterior maxillipeds rather unlike those in the 3 preceding species, the hand being narrow fusiform and the dactylus very slender. First pair of legs of much the same structure as in *H. gracilis*. Last pair of legs likewise rather similar, but with the distal joint comparatively smaller, and the marginal spines shorter, scarcely setiform.

Colour rather peculiar, the greater part of the anterior division being tinged with deep crimson, cephalic segment and urosome white.

Length of adult female 0.70 mm.

Remarks.—This form, first described by Messrs. Brady & Robertson, may be easily distinguished from the other species of the present genus by the shortness of the anterior antennæ and the rather different shape of the posterior maxillipeds. In the living state it is moreover readily recognized by its peculiar and beautiful colouring.

Occurrence.—Only some few specimens of this form have hitherto come under my notice. They were taken, some in the upper part of the Christiania Fjord, and some off the west coast of Norway in comparatively shallow water among algæ.

Distribution.—British Isles (Brady).

Gen. 14. Tigriopus, Norman, 1868.

Generic Characters.—General form of body resembling that in *Harpacticus*, though comparatively more attenuated behind. Anterior antennæ more robust, in male very strong, subchelate. Posterior antennæ with the outer ramus composed of 4 distinctly-defined articulations. Oral parts on the whole resembling in structure those in *Harpacticus*. First pair of legs, however, with the outer ramus distinctly 3-articulate, last joint small but well defined, and armed at the tip with a number of sharply curved claws. Inner ramus of 2nd pair of legs in male with the middle joint produced at the end both outside and inside in a deflexed spine; outer ramus of 3rd pair of exactly the same appearance in the 2 sexes. Last pair of legs of a structure similar to that in *Harpacticus*, but with the marginal spines very slender, setiform.

Remarks.—This genus, proposed in the year 1868 by Norman, is closely related to *Harpacticus*, and was not, indeed, accepted by Prof. Brady in his Monograph. Yet it seems to me that the genus ought to be maintained, on account of some well-marked differences to be found in the structural details in both sexes. The genus contains as yet only a single species, to be described below.

36. Tigriopus fulvus (Fischer).

(Pl. XXXI & XXXII).

Harpacticus fulvus, Seb. Fischer, Beiträge zur Kenntniss der Entomostraken. Abh. d. König. Bayer. Akad., Vol. VIII, p. 656, Pl. I, figs. 30—33; Pl. II, figs. 34—39.

Syn: *Harpacticus chelifer*, Lilljeborg (not Müller).
" — *curticornis*, Boeck.
" — *crassicornis*, Brady & Robertson.
" *Tigriopus Lilljeborgii*, Norman.

Specific Characters.—Female. Anterior division of body much broader than the posterior and, seen dorsally, oblong oval in form. Rostrum comparatively

short and blunt at the tip. Urosome rather narrow, almost linear in form, with the segments finely spinulose at the hind edges. Caudal rami somewhat longer than they are broad, apical setæ rather slender, the innermost but one more than twice as long as the urosome. Anterior antennæ somewhat exceeding half the length of the cephalic segment, 9-articulate, the proximal joints comparatively thick and robust, terminal part rather slender. Outer ramus of posterior antennæ with the 1st joint longer than the other 3 combined. Anterior maxillipeds comparatively broad; posterior ones with the hand oblong quadrangular in form, palm not defined, dactylus strong and curved. First pair of legs rather strongly built, outer ramus with the 1st joint about the length of the other 2 combined; last joint armed with 5 very sharp and smooth claws and 2 setæ; inner ramus with the outer 2 joints imperfectly defined, and carrying on the tip a strong claw-like spine. Last pair of legs with the inner expansion of the proximal joint very large, extending somewhat beyond the distal joint, and armed with 5 slender spines, one of which is very long; distal joint oval in form, with 5 similar spines. Ovisac very large.

Male about the same size as the female, but having the posterior division of the body considerably narrower. Anterior antennæ very strong, hand nearly globose, dactylus simple, claw-shaped. Inner ramus of 2nd pair of legs with the middle joint considerably expanded, outer projection smooth, inner somewhat longer, and densely hairy in its outer part. Last pair of legs very small, proximal joint but very slightly expanded inside, and provided with a solitary seta, distal joint oval, with 4 spiniform setæ.

Colour dark yellow or orange.

Length of adult female 1.20 mm.

Remarks.—This form was first described by Prof. Lilljeborg, who, however, erroneously identified it with *Cyclops chelifer* of O. Fr. Müller. It was some years afterwards recorded by Seb. Fischer as *Harpacticus fulvus*, and the specific name proposed by that author ought accordingly to be retained and preferred to those given to the species by Boeck and Norman, which are of later date.

Occurrence.—This form is found along the whole Norwegian coast, and often in great abundance, in small rock-pools at, or more generally somewhat above, high-water-mark. The water in these pools is more or less brackish and often exhibits a very high temperature by long exposure to the sun. I have also occasionally found this form in perfectly fresh water, but in no cases at any great distance from the shore, and it is reasonable, therefore, to assume that at times

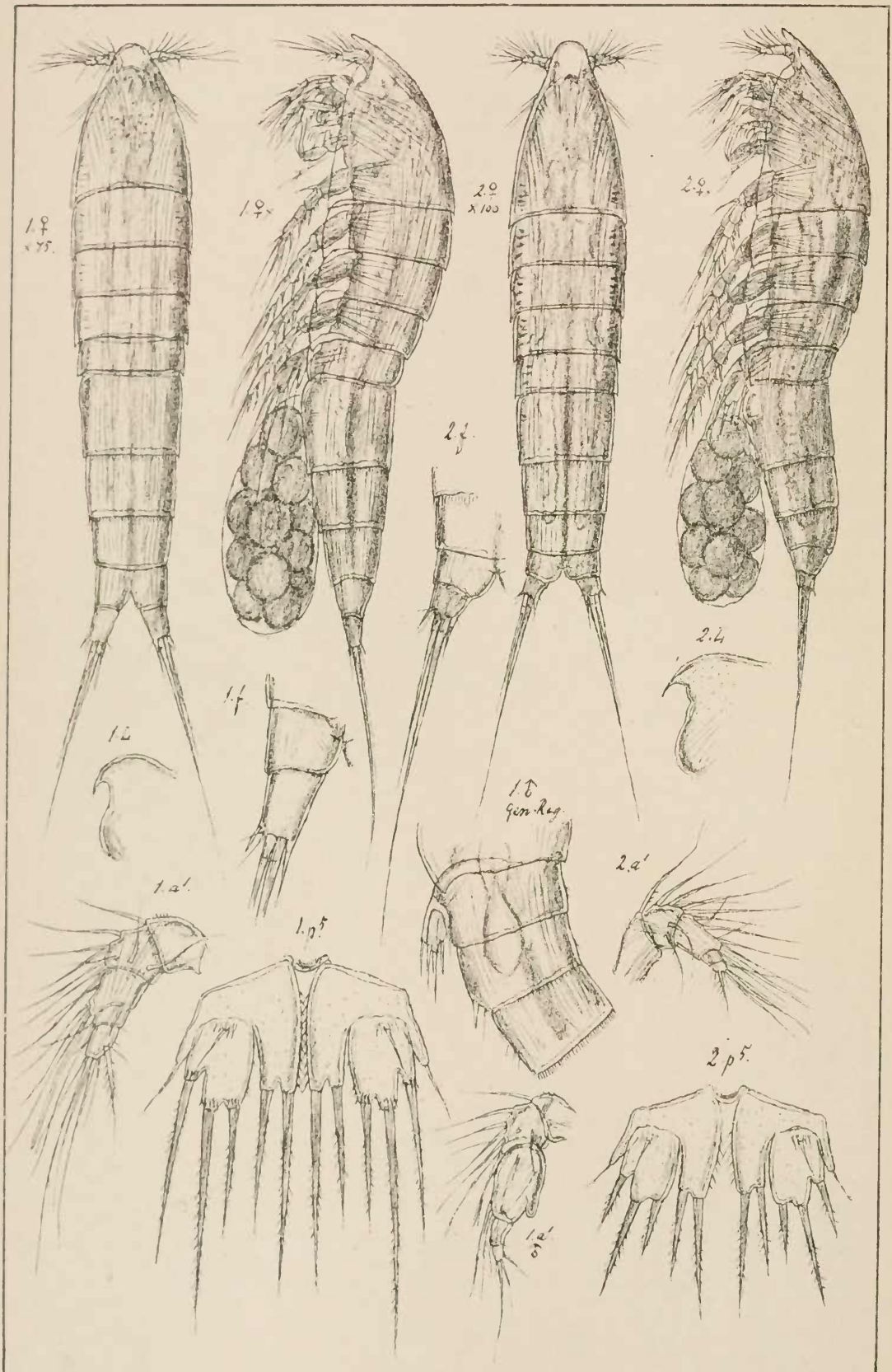
such places, by heavy storms or excessively high tides, are exposed to some admixture of salt water.

Distribution.—British Isles (Brady), coasts of Sweden (Lilljeborg), France (Canu), Madeira (Fischer), Kerguelen Islands (Brady).

Gen. 15. **Zaus,** Goodsir, 1845.

Generic Characters.—Body short and broad, flattened, with the segments of the anterior division lamellarly expanded laterally. Rostral plate broad, subtruncate at the tip. Last pedigerous segment very small, without any distinct epimeral plates. Urosome narrower than the anterior division, though having the anterior segments somewhat expanded laterally; genital segment in female with distinct traces of a subdivision. Caudal rami short, with the normal number of setæ. Anterior antennæ in female 9-articulate, terminal part comparatively short; those in male strongly prehensile. Posterior antennæ well developed, with the spines of the terminal joint in most cases densely fringed with cilia on the one edge; outer ramus comparatively small, biarticulate. Oral parts on the whole resembling in structure those in *Harpacticus;* posterior maxillipeds, however, comparatively smaller. First pair of legs, as in *Harpacticus,* with both rami distinctly prehensile and of very unequal length, the outer one being much the longer and biarticulate, tipped by a number of strong claws. The 3 succeeding pairs rather slender, and of exactly same structure in the two sexes. Last pair of legs more or less extended laterally, distal joint comparatively large, inner expansion of proximal joint in female very broad, though not much prominent, in male rudimentary. Ovisac broad, flattened.

Remarks.—This genus, established as early as the year 1845 by Goodsir, has by most authors been referred to the family *Peltidiidæ,* on account of the broad flattened body. The several appendages, however, are built upon the very same type as in the genus *Harpacticus,* and the present genus ought therefore more properly to be included in the family *Harpacticidæ* as here defined. It may be noted here, that one of the characters assigned to this genus by Prof. Brady, viz., "head distinct from cephalothorax" does not hold stand. The head is in reality, as in most other Harpacticoids, wholly united with the 1st pedigerous segment; nor is the outer ramus of the 1st pair of legs, as indicated by that author, 3-articulate, but like that in *Harpacticus,* only composed of 2 joints.

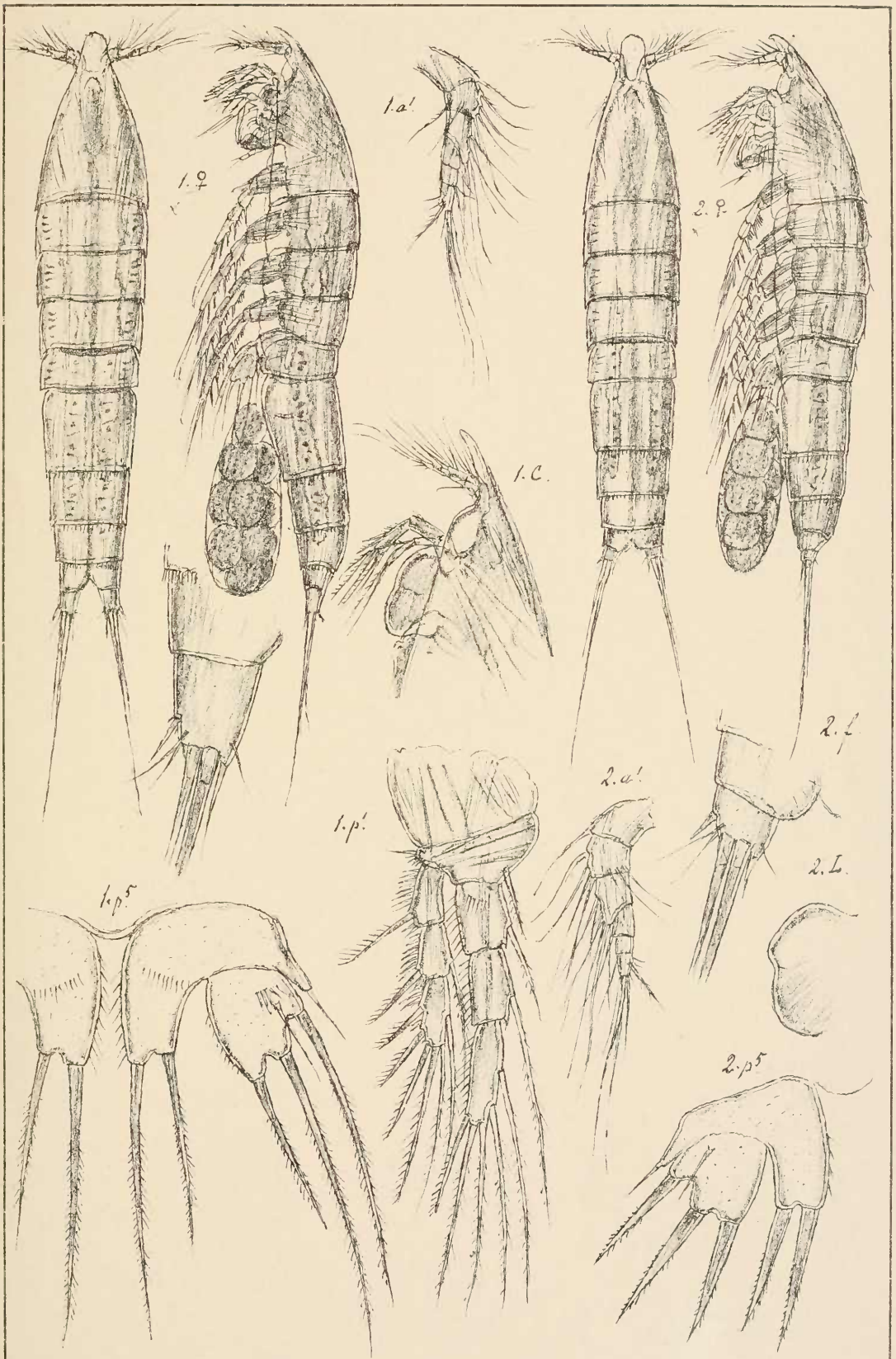


G.O. Sars autogr.

1 Ectinosoma neglectum, G.O. Sars
2 " propinqvum, Scott.

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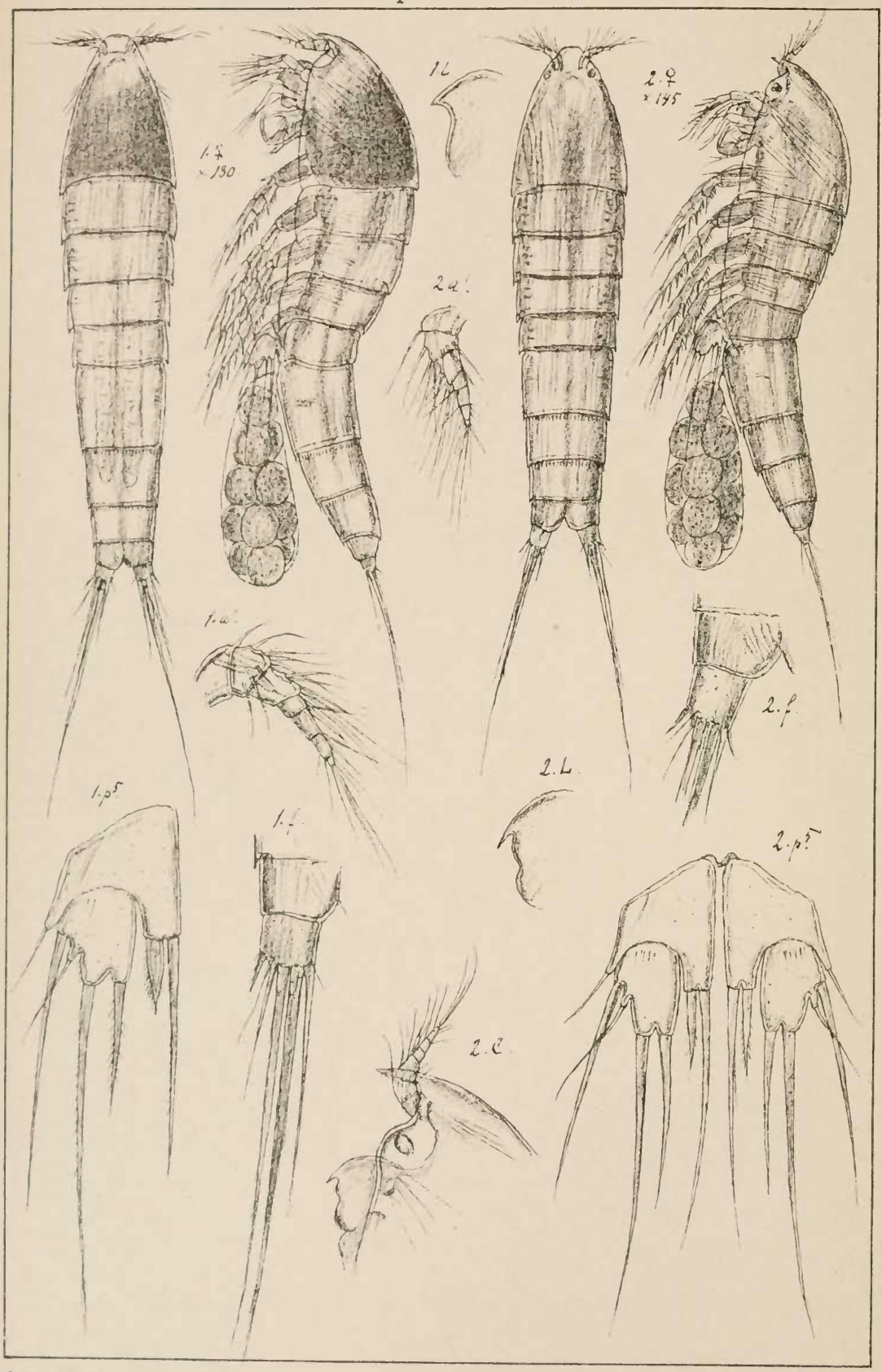
Copepoda



G.O Sars autogr.

1 Ectinosoma elongatum, G. O. Sars
2 " Herdmani, Scott

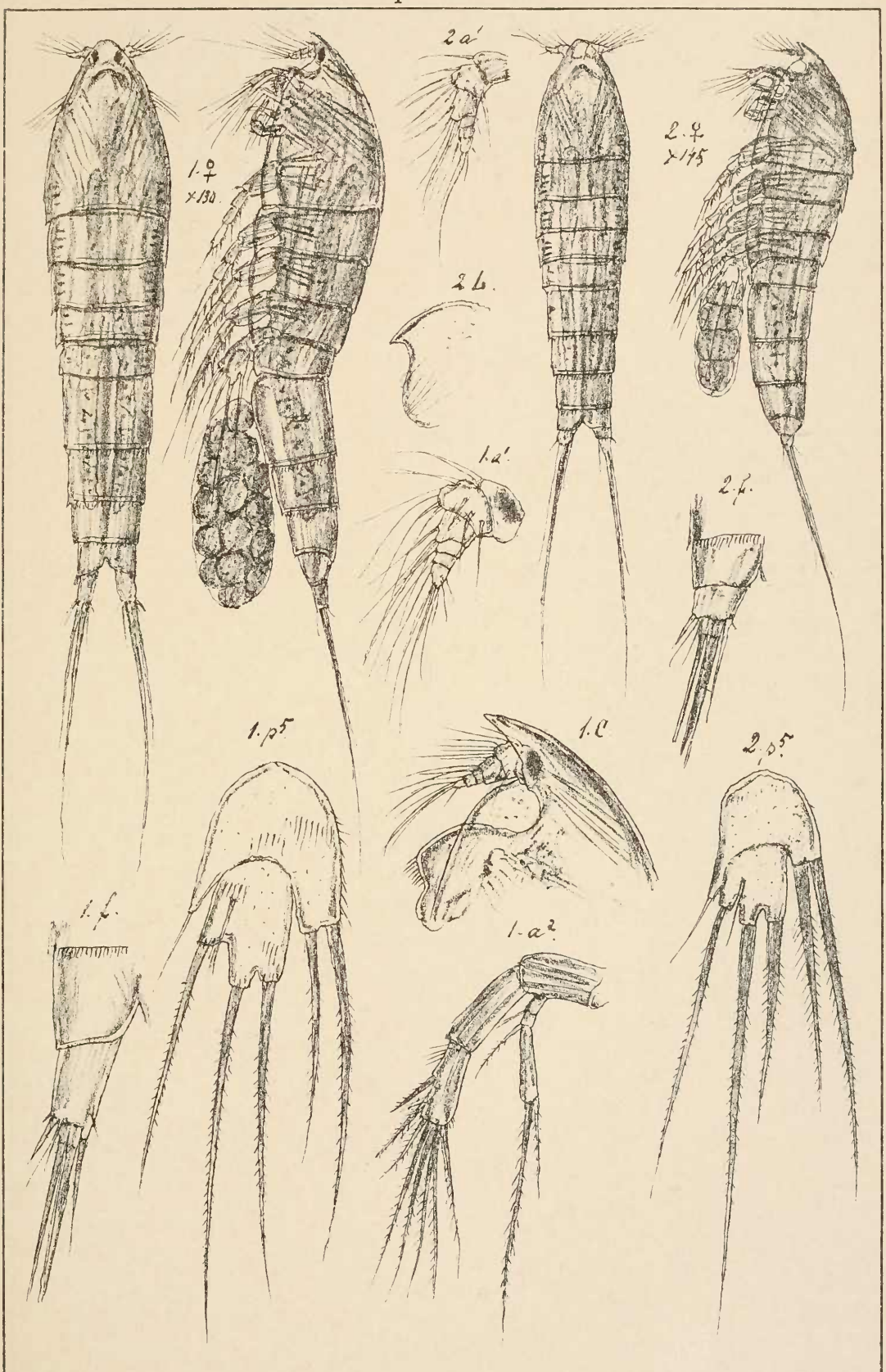
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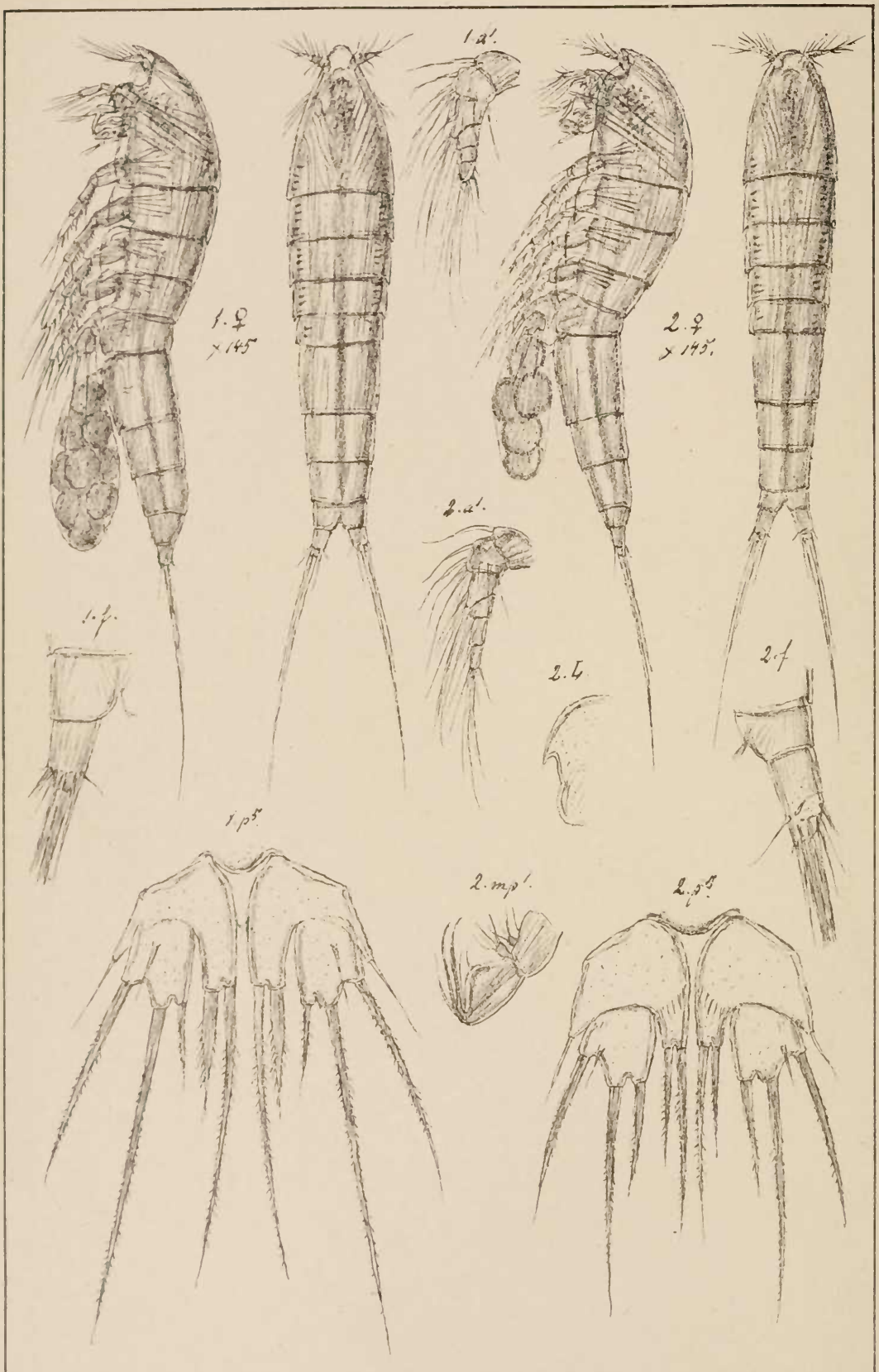
1 Ectinosoma melaniceps, Boeck
2 " Normani, Scott.

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G.O. Sars autogr. 1 Ectinosoma curticorne, Boeck
2 " gothiceps, Giesbrecht

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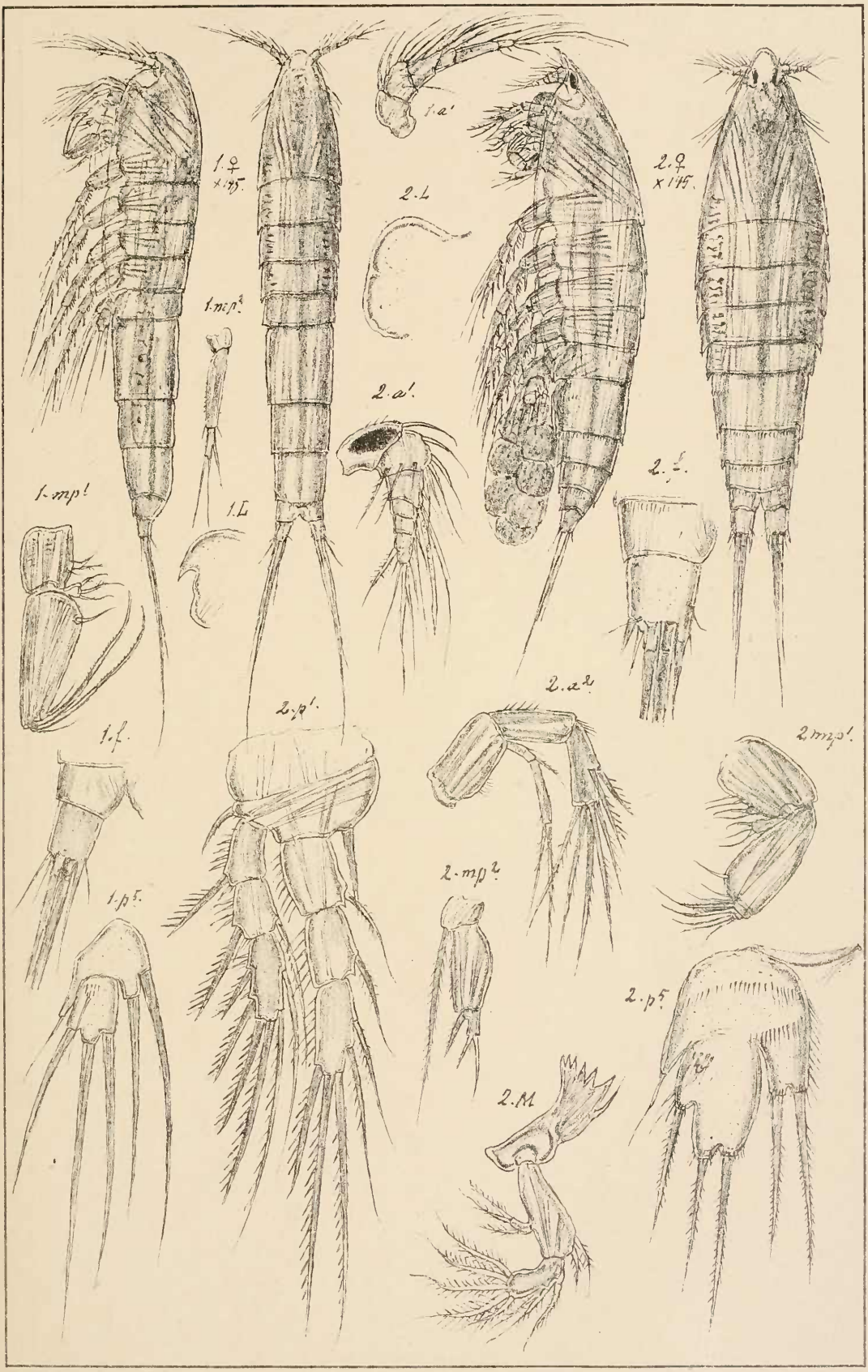


G.O. Sars autogr.

1 Ectinosoma mixtum, G.O. Sars

2 " brevirostre, G.O. Sars

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1 Ectinosoma gracile, Scott.

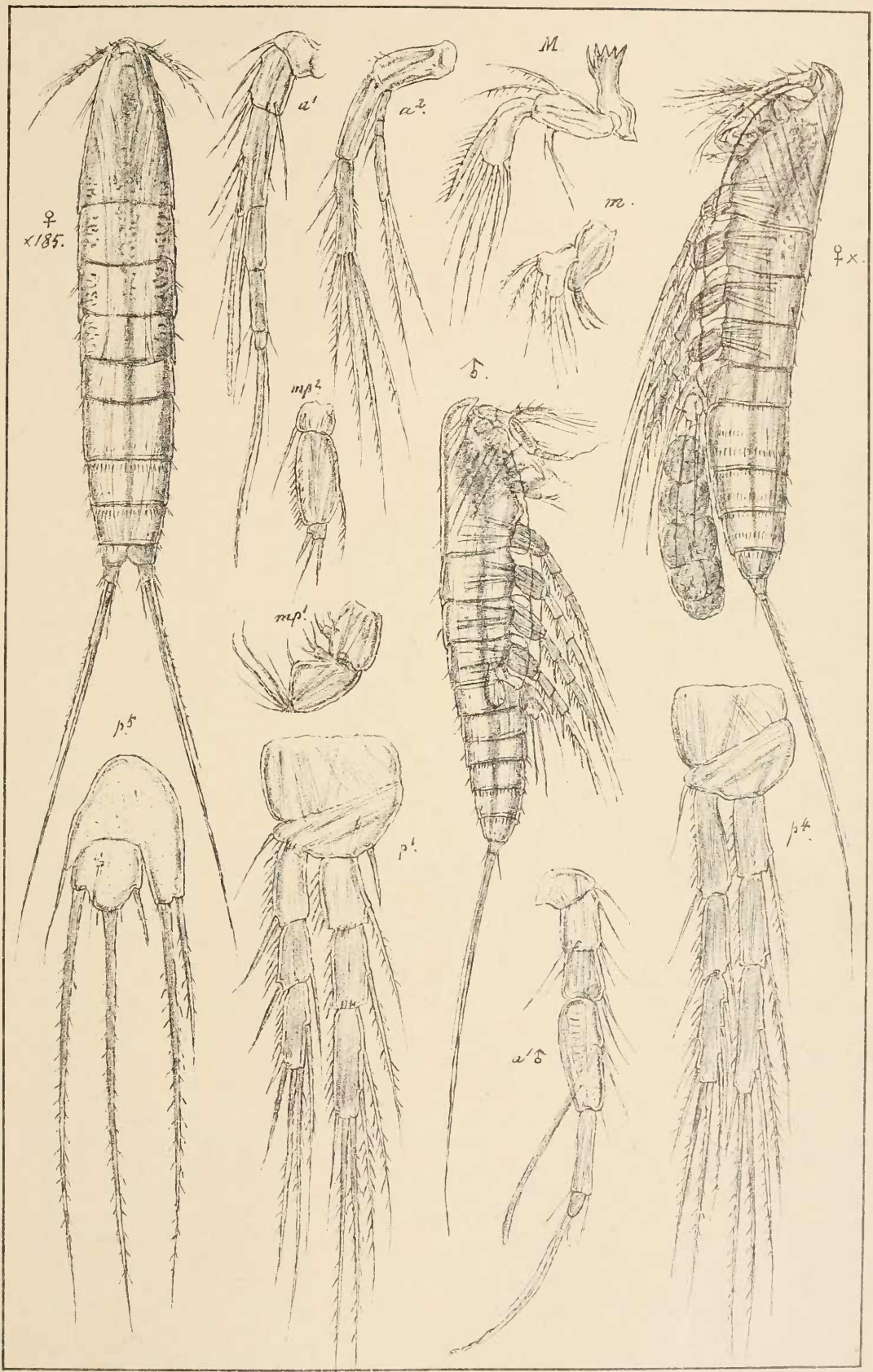
2 Pseudobradya minor (Scott.)

Copepoda
Harpacticoida



G. O. Sars autogr. 1 Pseudobradya acuta, G. O. Sars
" similis (Scott.)

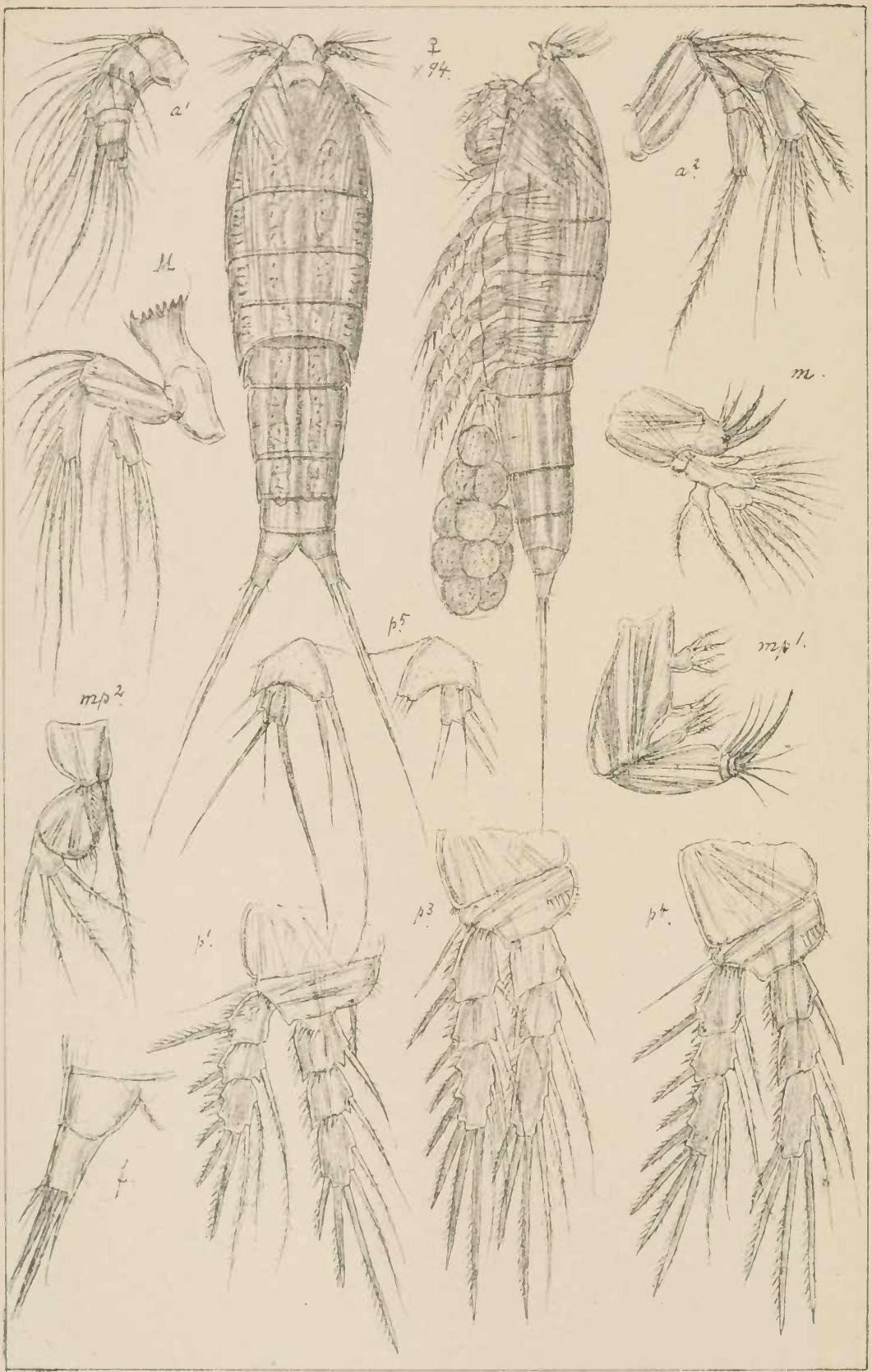
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G.O. Sars autogr.

Microsetella atlantica, Brady

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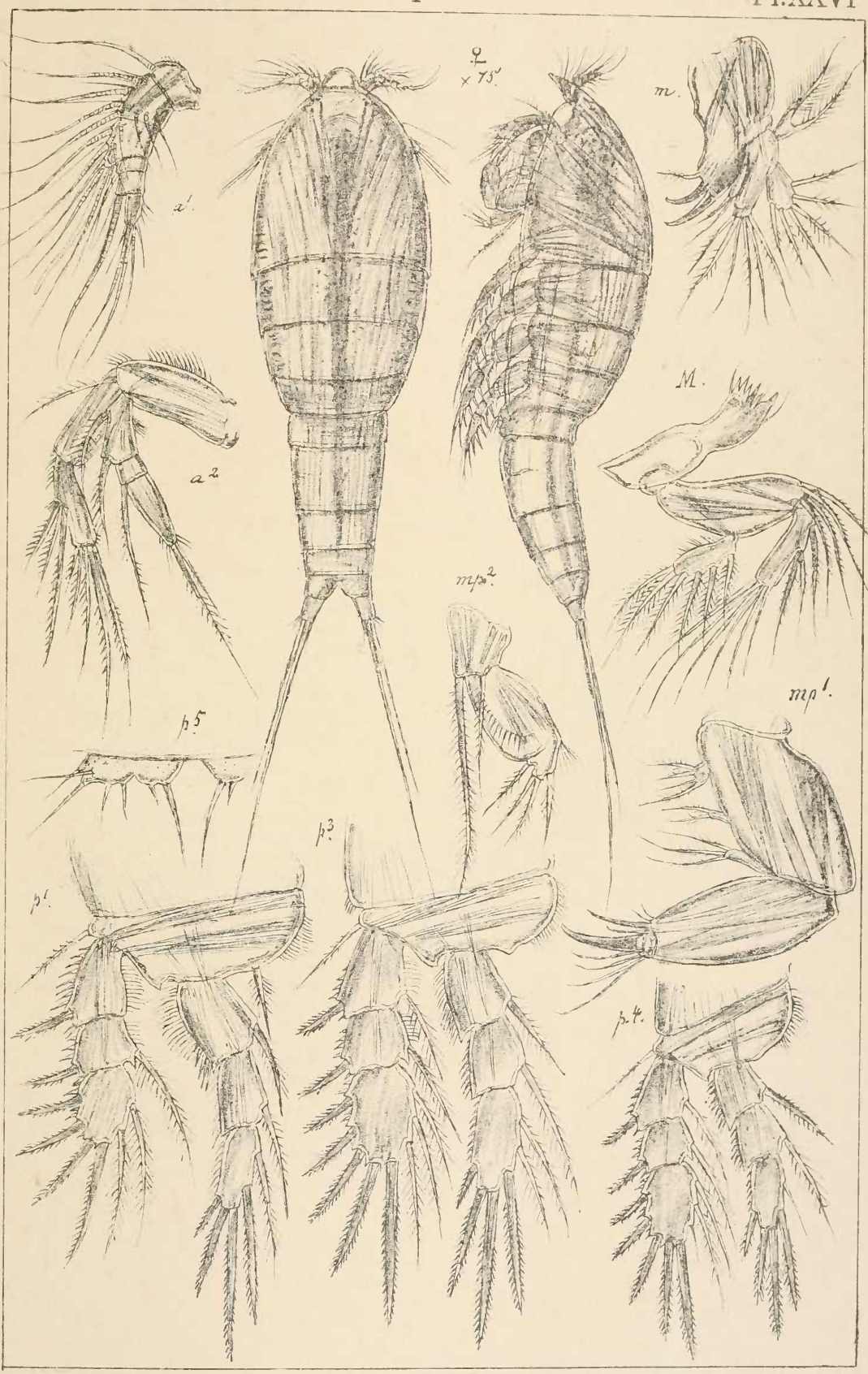


G.O Sars autogr. Norsk lith. Officin. Kr.ª

Bradya typica, Boeck.

Copepoda

Ectinosomidæ — Harpacticoida — Pl.XXVI

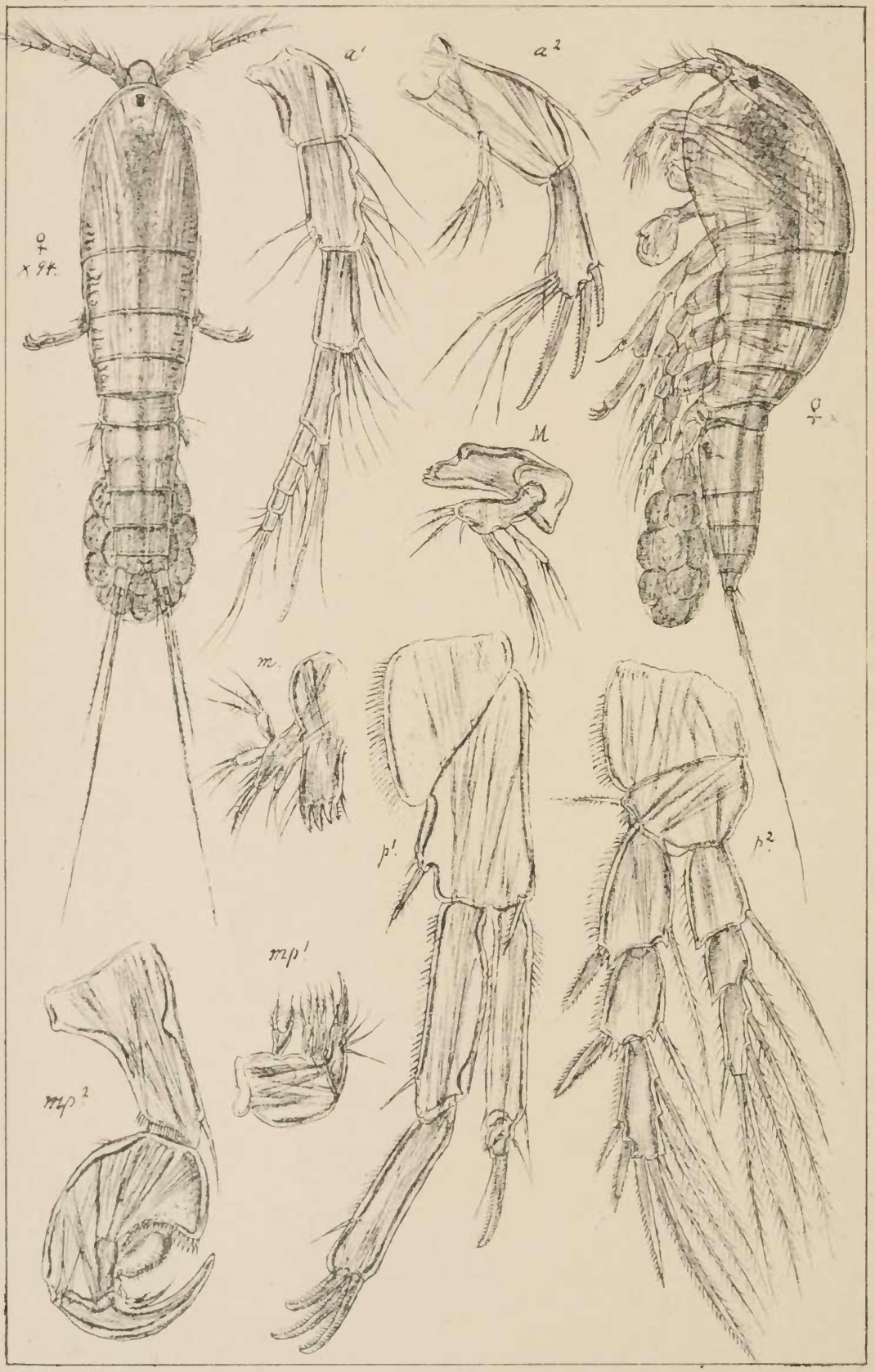


G.O Sars autogr.

Norsk lith. Officin. Kr.ª

Bradya dilatata, G.O.Sars.

Copepoda



G.O Sars autogr. Norsk lith. Officin. Kr.ª

Harpacticus chelifer, (Müller).

Copepoda



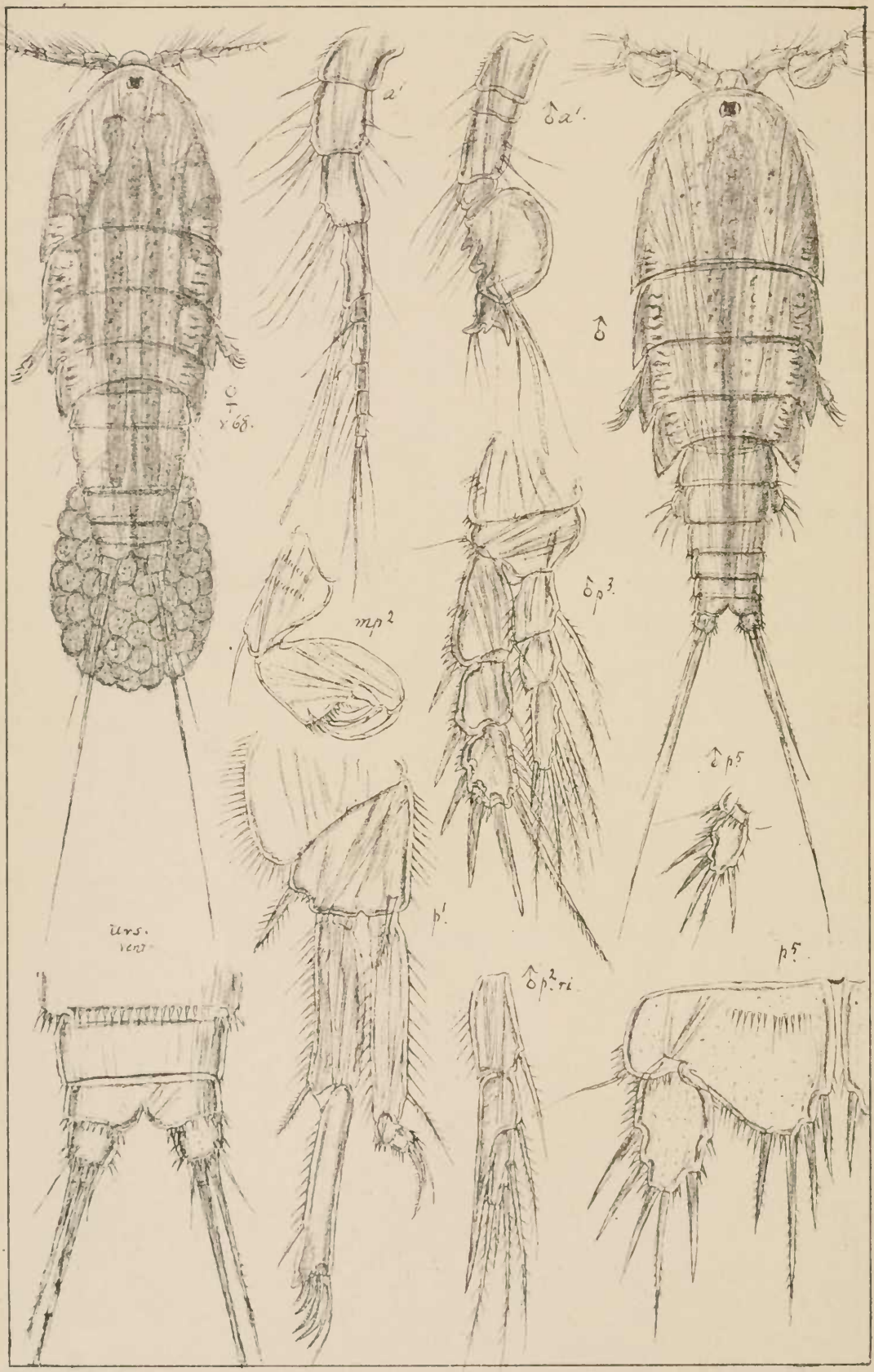
G.O Sars autogr.

Norsk lith Otficin Kr.ª

Harpacticus chelifer, (Müller).

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Copepoda

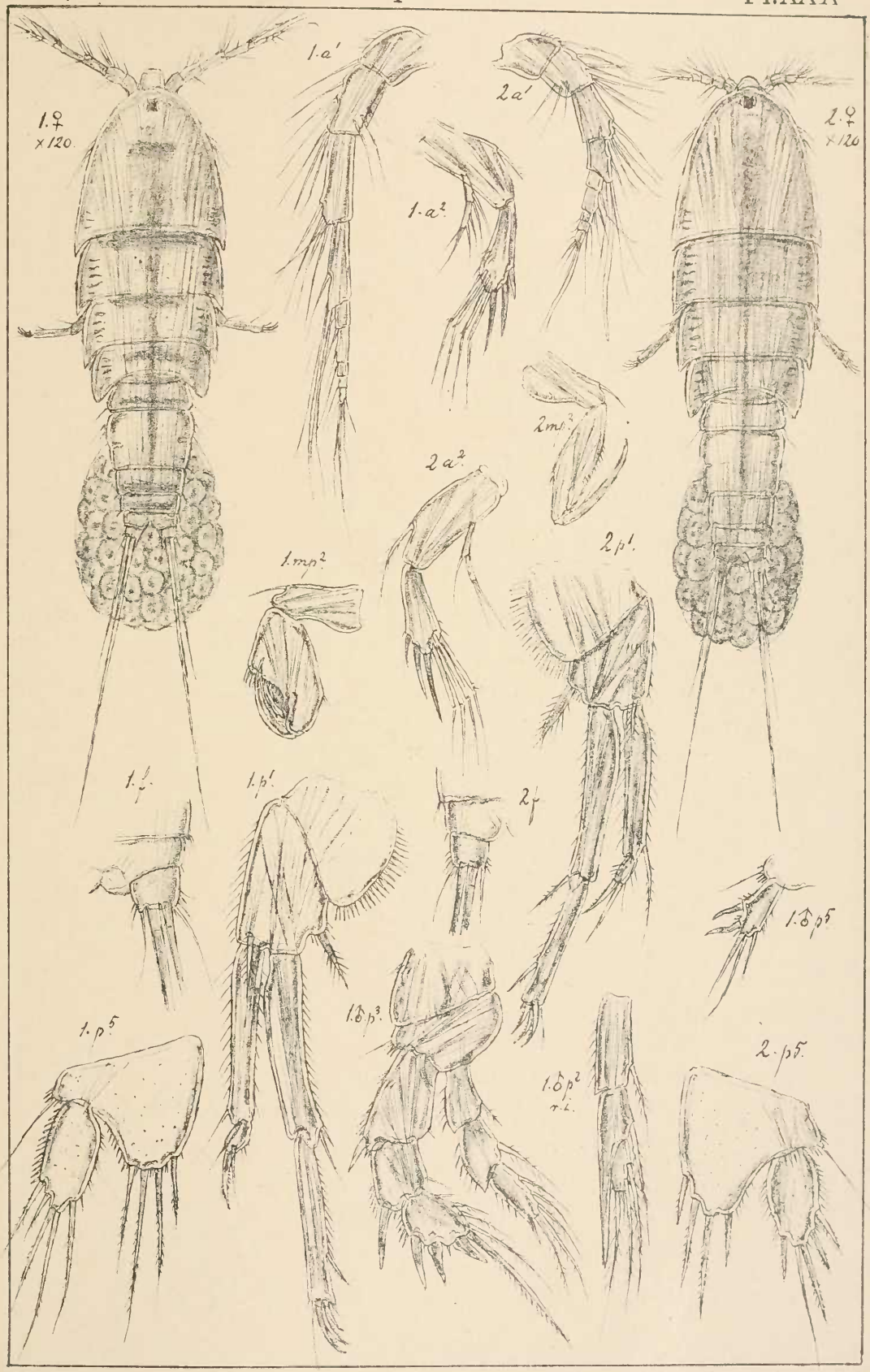


G.O Sars autogr. Norsk lith. Officin Kr.ª

Harpacticus uniremis, Kröyer.

Copepoda

Harpacticidæ — Harpacticoida — Pl. XXX

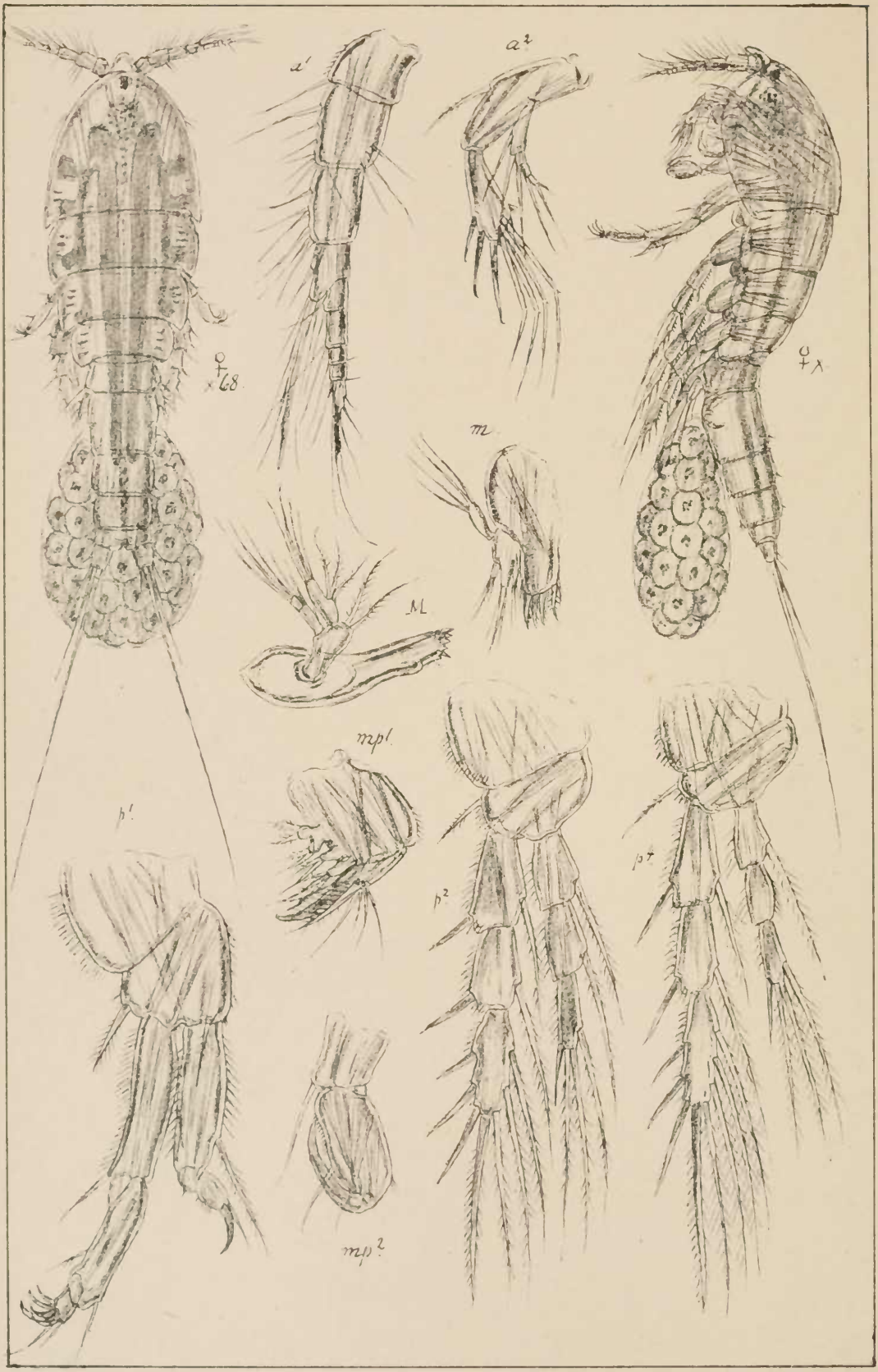


G.O. Sars autogr.

1 Harpacticus gracilis, Claus.
2 „ flexus, Brady.

Norsk lith. Officin. Kr.ª

Copepoda

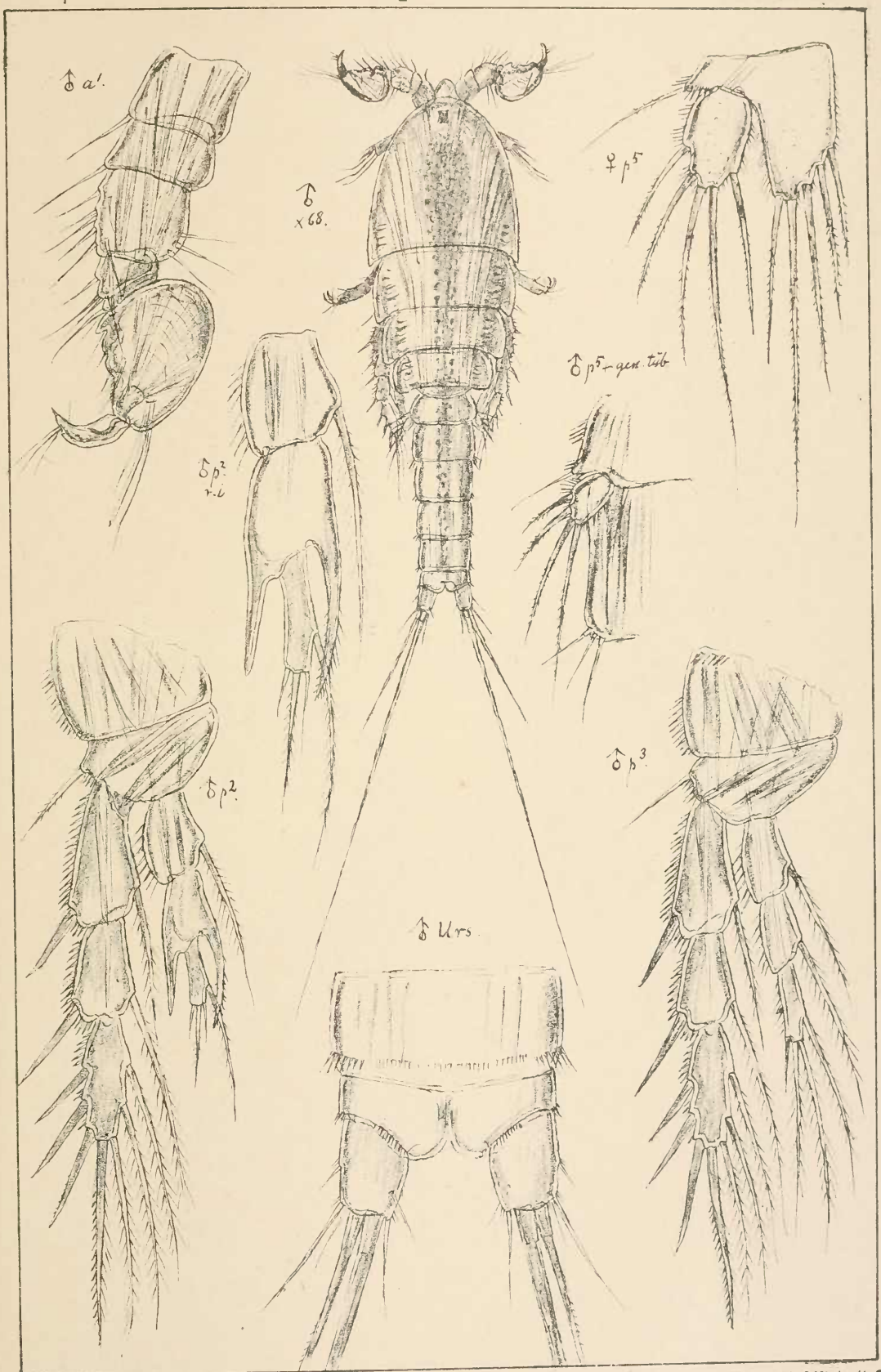


G.O Sars autogr.

Tigriopus fulvus, Fischer.

Norsk lith. Officin. Kr.ª

Copepoda



G.O Sars autogr.

Norsk lith Officin Kr.ª

Tigriopus fulvus, Fischer.
(continued)

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA

HARPACTICOIDA

PARTS V & VI

HARPACTICIDÆ (concluded), PELTIDIIDÆ, TEGASTIDÆ, PORCELLIDIIDÆ, IDYIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

BERGEN

PUBLISHED BY THE BERGEN MUSEUM

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ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA

1904

Three distinct species of this genus belong to the fauna of Norway. Mr. Poppe has moreover described a 4th species from the Behring Sea as *Z. Aurelii*, and another species is recorded by Prof. Brady from the Kerguelen Islands, but it is erroneously identified by him with one of the northern species *(Z. spinatus)*.

35. Zaus spinatus, Goodsir.

(Pl. XXXI).

Zaus spinatus, Goodsir, On several new Species of Crustaceans allied to Saphirina. Ann. Mag. Nat. Hist. Vol. XVI, pag. 326, Pl. XI, figs. 1—8.

Syn: *Zaus spinosus*, Claus.

Specific Characters.—Female. Anterior division of body, seen dorsally, oval in outline, though scarcely attenuated behind. Cephalic segment narrowly rounded in front, rostrum slightly prominent, obtuse at the tip. Last pedigerous segment very small and becoming suddenly much narrower than the others. Urosome about half the length of the anterior division, genital segment rather broad, with the lateral parts expanded, and finely setiferous at the edges; the 3 succeeding segments rapidly diminishing in size. Caudal rami about as long as they are broad, and obtusely truncated at the tip, the innermost but one of the apical setæ rather elongated, exceeding half the length of the body. Anterior antennæ moderately slender, almost attaining the length of the cephalic segment, terminal part longer than the preceding joint. Posterior antennæ with the terminal joint about the length of the basal one, its 3 spines clothed outside with a dense brush of cilia. Posterior maxillipeds with the hand quadrate in form, dactylus comparatively short, with a secondary spine at the base inside. First pair of legs with the distal joint of the outer ramus shorter than the proximal one, and widening considerably towards the end, apical claws bordered on one side with a dense comb-like series of cilia; inner ramus exceeding half the length of the outer and only biarticulate, last joint very small, with a single apical claw of the same appearance as those on the outer ramus. Natatory legs with the spines outside the last 2 joints of the outer ramus bordered on one side with a comb-like series of cilia. Last pair of legs of moderate size, distal joint much smaller than the proximal one, and broadly oval in form; inner expansion of the latter rather broad, with the edge evenly convex and densely ciliated between the setæ.

Male considerably smaller than female, with the urosome narrower and distinctly 5-articulate. Anterior antennæ very strongly built, 6-articulate, 2nd joint quite short, 3rd large, gradually widening distally, penultimate considerably

tumefied, last small, claw-like and very mobile. Last pair of legs with the distal joint of exactly the same appearance as in the female, proximal one, however, much smaller and not at all expanded.

Colour pale yellow, sometimes with a faint rosy tinge.

Length of adult female 0.56 mm., of male 0.44 mm.

Remarks.—This form was briefly described by Goodsir as early as the year 1845, and has subsequently been observed by several other authors. The Arctic form, *Z. Aurelii* of Poppe, is very nearly related to this species, scarcely differing except in the form of the distal joint of the last pair of legs, which is comparatively narrower and more produced at the tip.

Occurrence.—I have met with this form not unfrequently along the greater part of the Norwegian coast, and I am disposed to believe that the form recorded by Th. Scott from Finmark as *Z. Aurelii* Poppe, may more properly be referable to the present species. It is a strictly littoral form, living near the shore among algæ, and is occasionally left in tidal pools together with other littoral species. The flattened form of its body makes it very easy for it to run along the fronds of the algæ or other smooth objects. Male and female are often found tied together in copula, as figured by Claus.

Distribution.—British Isles (Goodsir), Heligoland (Claus), coast of France (Canu), Arctic Ocean, at Novaja Zemlia and Franz Josef's Land (Scott).

36. Zaus abbreviatus, G. O. Sars, n. sp.

(Pl. XXXII).

Specific Characters.—Female. Body very flat, shield-like, rounded oval in outline, with the segments of the anterior division lamellarly expanded laterally. Cephalic segment broadly rounded in front, rostrum broad, lamellar, obtusely truncated at the tip. Last pedigerous segment very small. Urosome comparatively short and broad, not nearly attaining half the length of the anterior division; genital segment considerably expanded and densely ciliated at the edges, posterolateral corners of this and the succeeding segment conically produced. Caudal rami about as in *Z. spinatus*. Anterior antennæ with the terminal part very short, scarcely longer than the preceding joint. Posterior antennæ and oral parts resembling in structure those parts in the preceding species. First pair of legs likewise rather similar, though with the distal joint of the outer ramus comparatively longer and less dilated towards the end; inner ramus armed at the tip with 2 spines, one of which is digitiform and quite smooth. Natatory legs comparatively

more slender than in *Z. spinatus*, spines outside the last 2 joints of the outer ramus provided, as in that species, with a dense brush of cilia on one of the edges. Last pair of legs differing conspicuously in form from those in the other known species, distal joint rather large and somewhat lozenge-shaped, outer margin convex, inner straight, apex narrowly produced, both edges densely ciliated; proximal joint constricted in the middle, with the posterior edge deeply concaved and quite smooth between the marginal setæ, 2 of which, attached close to the extremity, are considerably elongated.

Body of a light yellow colour, with a dark orange transverse band across the back, occupying the dorsal parts of the 2 anterior free segments of metasome; urosome more or less deeply tinged with the same colour.

Length of adult female 0.62 mm.

Remarks.—This form may be easily distinguished both from *Z. spinatus* and *Z. Aurelii* by its short, broad, shield-like body, and by the characteristic form of the last pair of legs. It is very strange that this distinct species, which most probably also occurs off the Scottish coast, has quite escaped the attention of that diligent observer, Th. Scott. It has perhaps been confounded by him with *Z. spinatus*.

Occurrence. The present species is by no means rare off the west coast of Norway. It is however never found close to the shore, like *Z. spinatus*, but seems to be restricted to the region of the red algæ, where it often occurs in considerable numbers.

Distribution. Polar islands north of Grinnell Land (2nd Fram Expediton).

37. Zaus Goodsiri, Brady.

(Pl. XXXV).

Zaus Goodsiri, Brady, Monograph of British Copepoda, Vol. II, p. 156, Pl. LXVI, figs. 10—13.

Syn: *Zaus ovalis*, Claus (not Goodsir).

Specific Characters.—Female. Body oblong in form and much depressed, with the integuments very much incrusted. Cephalic segment large and broadly rounded in front, rostrum broad, lamellar. Epimeral plates of the 3 succeeding segments tongue-shaped, with a nodiform projection at the base anteriorly. Last segment of metasome comparatively larger than in the 2 preceding species, though much narrower than the other segments. Urosome equal in length to about $^2/_3$ of the anterior division, genital segment rather large and, like the succeeding segment, produced at the postero-lateral corners to conical projections finely cili-

ated outside; last segment very small and deeply cleft. Caudal rami nearly twice as long as they are broad, and each produced at the tip outside to a dentiform projection; apical setæ unusually short, the innermost but one scarcely exceeding half the length of the urosome. Anterior antennæ comparatively shorter and stouter than in the 2 preceding species. Posterior antenna with the terminal joint comparatively short and much dilated distally, spines of outer edge provided with short cilia on the one side. Mandibles, maxillæ and anterior maxillipeds about as in the other species. Posterior maxillipeds, however, considerably stronger, with the hand oval in form, and the dactylus very coarse. First pair of legs rather slender, distal joint of outer ramus scarcely widening at all towards the end, apical claws with short cilia; inner ramus distinctly 3-articulate, last 2 joints small, but well defined, apical claws very strong. Natatory legs resembling in structure those in the 2 preceding species, but with the inner ramus comparatively shorter. Last pair of legs very large, distal joint oblong oval in form and densely hirsute; inner expansion of proximal joint lamellar, transversely truncated at the tip, which is finely denticulate at the edge, and provided with 4 very unequal setæ, the outermost rather small, the next much elongated, the 2 innermost very coarse and spiniform.

Body of a dark yellow colour, with a broad reddish brown transverse band across the back, occupying the dorsal parts of the 3 first free segments of metasome.

Length of adult female 1.40 mm.

Remarks.—I fully agree with Prof. Brady in saying that the identification by Claus of this form with *Sterope ovalis* Goodsir, cannot properly be sanctioned; and the name proposed by Brady is now also generally accepted by other authors. It is an easily recognizable species, being much larger than any of the others, and also differs conspicuously in the more elongated form of body.

Occurrence.—Only a few specimens of this form, all of them females, have hitherto come under my notice. They were found off the west coast of Norway, in depths varying from 20 to 50 fathoms.

Distribution.—British Isles (Brady), Heligoland (Claus), Arctic Ocean west of Spitsbergen (Scott), Polar islands north of Grinnell Land (2nd Fram Expedition).

Fam. 6. Peltidiidæ.

Characters.—Body short, depressed, with greatly incrusted integuments. Cephalic segment large, more or less flattened, rostrum immobile, not defined at the base. Epimeral plates of the 3 succeeding segments, in some cases also of the last, lamellarly expanded. Urosome short and broad, generally bent downwards. Eye present. Anterior antennæ 6—9 articulate, in male slightly transformed. Posterior antennæ distinctly 3-articulate, outer ramus comparatively small, biarticulate. Mandibles not very strong, palp slender, bi- or uniramous. Maxillæ comparatively small. Anterior maxillipeds with 3 slender setiferous lappets inside, terminal joint incurved and generally armed at the tip with a slender claw. Posterior maxillipeds terminating in a strongly clawed hand. First pair of legs with the inner ramus natatory, the outer distinctly prehensile. Natatory legs with both rami slender, 3-articulate. Last pair of legs of the same appearance in the two sexes, biarticulate, more or less falciform, proximal joint scarcely expanded. Ovisac single, rounded, extending in front between the bases of the natatory legs.

Remarks.—In the restriction here adopted, this family is chiefly characterised by the short depressed form of body, the short more or less incurved urosome, the immobile rostrum, and the structure of the 1st and last pais of legs. In the structure of the posterior antennæ and the oral parts, well-marked differences from the *Harpacticidæ* are also to be found. The family comprises as yet 3 genera, 2 of which are represented in the fauna of Norway.

Gen. 16. **Alteutha,** Baird, 1845.

Syn: *Carillus & Sterope,* Goodsir.
„ *Peltidium,* Brady (not Philippi).

Generic Characters.—Body more or less oval in outline, with the lateral parts of the cephalic segments inflexed ventrally. Epimeral plates of last segment of metasome much smaller and more rounded than those of the 3 preceding segments. Genital segment large and expanded, the succeeding segments of urosome short and tapering rapidly. Caudal rami short and broad, lamellar, each with a strong spine on the lower face, apical setæ comparatively short, 3 of them placed close together at the inner corner. Anterior antennæ of moderate length, 8- or

9-articulate. Mandibular palp distinctly biramous. Maxillæ with the palp normally developed, endopodal part somewhat produced. Anterior maxillipeds with the terminal joint of moderate length, and tipped with a slender claw. Posterior maxillipeds with the basal part uni- or biarticulate. First pair of legs with both rami 3-articulate, terminal joint of outer ramus armed with several hook-like claws of unequal size. Last pair of legs very strongly built, and extending along the sides of the urosome, distal joint large, sword-shaped, and armed with strong spines at the tip.

Remarks.—This genus was established in the year 1845 by Baird, to include one of the 2 species described below. The 2 genera, *Sterope* and *Carillus*, recorded by Goodsir, are both apparently synonymous with Baird's genus. Prof. Brady erroneously referred the species of this genus to *Peltidium* Philippi, from which the present genus is clearly distinguished both by the general aspect of the body, and the structure of the several appendages. We know at present of 3 distinct species of this genus, 2 of which belong to the fauna of Norway.

38. Alteutha interrupta (Goodsir).

(Pl. XXXVI & XXXVII).

Sterope interrupta, Goodsir, Ann. & Mag. Nat. Hist. Vol. XVI, p. 326, Pl. XI, fig. 10.

Syn: *Alteutha bopyroides*, Claus.
„ — *norvegica*, Boeck.
„ *Peltidium interruptum*, Brady.
„ — *conophorum*, Poppe.

Specific Characters.—Female. Body rather compact, somewhat vaulted above, and capable of rolling itself into a ball; seen dorsally, oval pyriform in outline, with the greatest width in front of the middle, and gradually tapering behind. Cephalic segment occupying about half the length of the anterior division, postero-lateral corners rounded, rostral projection short, deflexed, obtuse at the tip. Epimeral plates of the 3 succeeding segments only slightly produced at the posterior corners; those of last segment well defined, though less prominent than the preceding ones, and evenly rounded at the tip. Urosome short and flattened, with the genital segment broad and expanded in front, clypeiform; postero-lateral corners of this and the 2 succeeding segments conically produced. Caudal rami only slightly longer than they are broad, subquadrangular in form, and obliquely truncated at the tip, the innermost but one of the apical setæ much dilated in its proximal part. Eye large, placed near the frontal margin. Anterior antennæ rather slender, 8-articulate, 2nd joint much the largest. Posterior maxillipeds

with the basal part uniarticulate, hand narrow oblong in form. First pair of legs very slender, with the first 2 joints of the outer ramus subequal in size, last joint very small and armed with 5 claws gradually increasing in length inwards; inner ramus much shorter than the outer, all 3 joints setiferous. Last pair of legs with the proximal joint very short, distal joint oblong, flattened, with 3 strong spines at the tip, and 2 smaller ones on the outer edge, surface transversely rugulose.

Male differing but little from female in external appearance, though easily recognizable by the more strongly built and prehensile anterior antennæ. Urosome distinctly 5-articulate, 1st segment much the largest and provided on each side, at the postero-lateral corners, with a small appendage tipped with a strong spine.

Colour dark chocolate brown, anterior part of cephalic segment lighter.

Length of adult female 1.20 mm.

Remarks.—I think Prof. Brady is quite right in considering the *Sterope interrupta* of Goodsir to be the present species, and as the specific name *bopyroides,* proposed by Claus and accepted by most other authors, is of much later date, it ought to give place to that given to the species by Goodsir. The *Alteutha norvegica* of Boeck is the same species, as is also most certainly the *Peltidium conophorum* of Poppe. I have often met with specimens in which the middle of the 3 setæ issuing from the inner corners of the caudal rami has been broken off near the base, giving it exactly the appearance figured by Poppe from his solitary specimen.

Occurrence.—This is one of our commonest Copepoda, occurring rather abundantly along the whole south and west coast of Norway, at least up to the Trondhjem Fjord. It is generally found in depths varying from 2 to 20 fathoms among Laminariæ and other algæ, and is easily observable even to the naked eye, on account of its dark-coloured body. It is rather an active little creature, swimming about with considerable speed and a somewhat rolling motion, now and then affixing itself to the fronds of the algæ or the walls of the vessel in which it is observed. When disturbed, it rolls itself almost into a ball, and remains in this attitude quite immovable for some time.

Distribution.—British Isles (Brady), Heligoland (Claus), Baltic (Poppe), coast of France (Canu), Mediterranean (Canu).

39. Alteutha depressa, Baird.

(Pl. XXXVIII).

Alteutha depressa, Baird, Brit. Entomostraca, p. 216, Pl. XXX, figs. 1, 2.

Syn: *Carillus oblongus*, Goodsir.
„ *Peltidium purpureum*, White (not Philippi).
„ *Alteutha purpurocincta*, Norman.
„ *Peltidium depressum*, Brady.
„ *Eupelte purpurocincta*, Canu.

Specific Characters.—Female. Body much depressed, seen dorsally, oblong oval in form, with the greatest width about the middle. Cephalic segment very large, considerably exceeding in length the 4 succeeding segments combined, postero-lateral corners acutangular, rostrum large and prominent, truncated at the tip. Epimeral plates of the first 3 free segments of metasome acutely produced behind, especially those of 3rd segment. Last segment with the epimeral plates evenly rounded and far less prominent. Urosome short and broad, of a structure similar to that in the preceding species. Caudal rami of exactly the same appearance as in that species, apical setæ, however, shorter, and none of them conspicuously thickened at the base. Eye placed rather far back. Anterior antennæ comparatively shorter and stouter than in *A. interrupta*, and distinctly 9-articulate. Posterior antennæ, mandibles, maxillæ and anterior maxillipeds of a structure very similar to that in the preceding species. Posterior maxillipeds, however, somewhat different, the basal part being distinctly biarticulate, and the hand shorter and broader, oval fusiform in shape. First pair of legs comparatively more robust, with the inner ramus almost as long as the outer, and without the seta inside the middle joint. Natatory legs resembling those in *A. interrupta*, except that in the inner ramus of 4th pair some of the setæ are spiniform. Last pair of legs very large and robust, falciform, proximal joint rather large, distal one conically tapered, and armed at the tip with 3 very coarse spines.

Body of a yellowish olive colour, with a dark purplish blue transverse band across the middle, occupying the whole of the first 3 free segments of metasome.

Length of adult female 1.30 mm.

Remarks.—Allthough the figures and description of this form given by Baird are rather poor, I must agree with Prof. Brady in thinking that they in all probability refer to the present species. It is also, as opined by the same author, very likely that the *Carillus oblongus* of Goodsir is the same species. Mr. Norman, who considered the species as new, described it under the name of *Alteutha purpurocincta*, a name which has been accepted by several other authors.

The species has been referred by Canu and also by Th. Scott to the genus *Eupelte* of Claus; but in this view I cannot by any means agree, since Claus expressly states that in this genus the inner ramus of the 1st pair of legs consists of only 2 joints. It is true that the present species differs somewhat from *A. interrupta* in the structure of the anterior antennæ and posterior maxillipeds; but in all other respects it exhibits so great a resemblance to that species, that it can hardly be separated generically.

Occurrence.—This form is not nearly so common as *A. interrupta*. I have, however, taken it occasionally in several places off the west coast of Norway, as also in the Trondhjem Fjord. It occurs in depths varying from 6 to 20 fathoms, on a sandy or gravelly bottom.

Distribution.—British Isles (Brady), coast of France (Canu).

Gen. 17. **Peltidium**, Philippi, 1839.

Syn: *Oniscidium*, Claus.
„ *Reticulina*, Cleve.

Generic Characters.—Body short, flattened, strengthened with very conspicuous anastomosing chitinous stripes. Cephalic segment very large and expanded, lateral parts not inflexed ventrally; rostrum more or less prominent. Epimeral plates of all the segments of metasome, including those of the last, lamellarly produced, tongue-shaped, recurved. Urosome very short, with the genital segment expanded on each side like those of metasome; distal part very small and soft-skinned. Caudal rami narrow, with one of the apical setæ considerably elongated. Eye apparently consisting of 3 separate parts, one median and 2 lateral. Anterior antennæ comparatively short, 6—8-articulate. Posterior antennæ of about the same structure as in *Alteutha*. Mandibular palp uniramous. Maxillæ with the palp imperfectly developed, wanting the exopodal appendage. Anterior maxillipeds with the outermost of the lateral lappets very slender, terminal joint likewise exceedingly elongated and narrow, produced at the tip to a short digitiform process. Posterior maxillipeds with the basal part uniarticulate; hand very large. First pair of legs with the outer ramus resembling that in *Alteutha*, inner comparatively broad, lamellar, biarticulate. Natatory legs slender, of normal structure. Last pair of legs wholly obtected by the epimeral parts of the body, biarticulate, falciformly curved, distal joint armed at the tip and outer edge with strong spines.

Remarks.—This genus was established as early as the year 1839 by Philippi, to include the species described below. The genus *Oniscidium* of Claus is unquestionably identical with Philippi's genus, as is also the genus *Reticulina*, recently established by Prof. Cleve. The genus is especially characterised by the very conspicuous net-work of chitinous stripes strengthening the body, as also by the unusual development of the epimeral plates of the last segment of the metasome and the 1st of the urosome. Of the several appendages, the anterior maxillipeds and the 1st and last pair of legs in particular are of a characteristic structure. In addition to the typical species, 5 new species have recently been recorded by Mr. A. Scott from Ceylon. The form described by Prof. Cleve as *Reticulina aurivilli* from the Malay Archipelago is in all probability identical with one of these species.

40. Peltidium purpureum, Philippi.

(Pl. XXXIX & XL).

Peltidium purpureum, Philippi, Wiegmann's Archiv f. Naturgeschichte 1839, p. 131, Pl. IV, figs. 12, 13.

Syn: *Oniscidium armatum*, Claus.

Specific Characters.—Female. Body, seen dorsally, oval quadrangular in outline, greatest width in front of the middle and exceeding half the length. Cephalic segment very large, occupying nearly half the body, postero-lateral corners acutely produced, frontal margin angular on each side, rostrum large and prominent, transversely truncated at the tip. Free segments of metasome each produced dorsally in the middle to a triangular, posteriorly-pointing projection; genital segment with 2 similar dorsal projections. Epimeral plates all of uniform appearance, tongue-shaped and curving posteriorly; those of genital segment extending beyond the extremity of the urosome, and having a much smaller acute lappet behind. Caudal rami far apart, sublinear in form, the innermost but one of the apical setæ much coarser than the others, and exceeding the urosome in length. Anterior antennæ not attaining half the length of the cephalic segment, 7-articulate and densely setiferous. 1st pair of legs with the 2nd joint of the outer ramus somewhat longer than the 1st, last joint small and armed with 3 strong claws and a curved seta; inner ramus of about the same length as the outer, distal joint fully as long as the proximal one and provided at the tip with 2 equal-sized setæ, and at the inner edge with a much coarser ciliated spine. Last pair of legs with the distal joint evenly curved, and armed with 6 strong ciliated spines, 3 of which issue from the outer edge.

Male somewhat smaller than female, but otherwise of a very similar external appearance. Anterior antennæ, as usual, prehensile. Appendicular lappet of genital segment replaced by a small trisetose piece.

Body in both sexes tinged all over with a rich carmine.

Length of adult female 1.05 mm.

Remarks.—This is an easily recognizable form, being distinguished from all our other Copepoda both by its general appearance and the beautiful colour of the body. The *Oniscidium armatum* of Claus seems to be identical with the present species.

Occurrence.—I have met with this form in several places on the west coast of Norway, as also in the Trondhjem Fjord, in depths varying from 6 to 20 fathoms, sandy bottom. It is at once observable, even with the naked eye, owing to its unusual colour.

Distribution.—Scottish coast (Scott), Mediterranean (Philippi).

Fam. 7. Tegastidæ.

Characters.—Body short and compact, highly compressed, with very hard integuments. Cephalic segment large, in some cases with a chitinous stripe across the back, indicating the posterior limit of the head; lateral parts very deep and terminating behind in a triangular promontory; rostrum short, deflexed, not defined at the base. Epimeral parts of the 3 succeeding segments rudimentary. Last segment of metasome more or less completely coalesced with the genital segment, which more generally forms a large and highly chitinized dilatation below, armed with variously formed projections. Distal part of urosome, as a rule, very small and thin-skinned. Caudal rami short, with the normal number of setæ. Eye well-developed, trilobate. Anterior antennæ slender, 6—8-articulate, and but sparsely setiferous; those in male transformed in the usual manner. Posterior antennæ 3-articulate, with a very small outer ramus; terminal joint wanting the usual geniculate setæ. Oral parts, except the posterior maxillipeds very small; the latter well developed, terminating in a strongly clawed hand. First pair of legs imperfectly prehensile, both rami short, uniarticulate. Natatory legs with the rami extremely slender, the inner one being the longer. Last pair of legs of different shape in the two sexes, proximal joint in female greatly expanded, in male simple.

Remarks.—The forms belonging to this family exhibit several apparently very anomalous characters, especially as regards the general form of the body, the structure of the 1st pair of legs, and the composition of the genital apparatus. Yet in the structure of the greater number of the appendages, they seem to come nearest to the *Peltidiidæ*, in spite of the very dissimilar external appearance of the body. Two nearly-related genera of this family are represented in the Norwegian fauna; and I regard the form recorded by Claus under the name of *Amymone harpactoides* as the type of a 3rd genus.

Gen. 18. Tegastes, Norman, 1903.

Syn: *Amymone*, Claus (not Müller).

Generic Characters. Body, seen laterally, almost circular in outline, with the back much curved, and the genital segment greatly produced below. Outer segments of urosome generally very short and retractile. Anterior antennæ 8-articulate, with the first 2 joints considerably larger than the others. Posterior antennæ rather slender, with the terminal joint not dilated distally, one of the apical spines very strong and prolonged; outer ramus biarticulate, with the last joint extremely minute. Mandibular palp uniramous, biarticulate. Maxiliæ with the palp elongated, biarticulate, exopodal and epipodal appendages wanting. Anterior maxillipeds with the outermost lateral lobe considerably dilated at the end and carrying 3 thickish setæ, terminal joint scarcely produced at the tip. Posterior maxillipeds with the basal part uniarticulate, hand of different form in the different species. First pair of legs with the rami scarcely longer than the 2nd basal joint, the outer one considerably narrower than the inner. Natatory legs with both rami distinctly 3-articulate. Last pair of legs of moderate size, inner expansion of proximal joint in female triangular, distal joint very narrow and not extending beyond the proximal, with 2 slender setæ at the tip. No true ovisac present in female, only a single ovum being received between the lamellæ of the last pair of legs. The ovoid spermatophore in male contained in a large cornet-shaped reservoir issuing from the genital segment in front, and terminating in a two-lipped, beak-like extremity.

Remarks.—This genus was established in the year 1863 by Claus, to include some very peculiar Copepoda, some of which he found off Heligoland, and others in the Mediterranean. As however the generic name *Amymone* proposed by him

had been used by O. Fr. Müller in quite a different sense, viz., to designate some common larval forms (Nauplii), it cannot properly be accepted, and the Canon Norman has therefore recently proposed to substitute for this name that of *Tegastes*, the type being considered by him to be *T. satyrus* of Claus, which species certainly belongs to the present genus in the restriction here adopted. No less than 5 different species referable to this genus have been observed by the present author off the Norwegian coast.

41. Tegastes falcatus (Norman).

(Pl. XLI).

Amymone falcata, Norman, Brit. Assoc. Report, 1868, p. 296.

Syn: *Amymone sphærica*, Brady (not Claus).
„ — *rubra*, Boeck (1872).

Specific Characters.—Female. Cephalic segment very deep, with the postero-lateral corners greatly produced, acuminate; no chitinous stripe across the back. Genital segment produced below into 2 strong, posteriorly-curving hook-like projections. Distal part of urosome only very slightly projecting. The innermost but one of the caudal setæ peculiarly transformed, lancet-shaped. Posterior maxillipeds rather powerful, with the hand oblong oval in form, and densely ciliated along the palmar edge. Last pair of legs with the distal joint extending to the tip of the inner expansion of the proximal one, the latter with 3 short setæ along the curved anterior edge, and 2 unequal ones at the tip.

Male a little smaller than female, and easily recognizable by the prehensile character of the anterior antennæ, and by the large, acutely-beaked spermatophore-reservoir. None of the caudal setæ transformed. Last pair of legs very narrow, with the proximal joint small and simple.

Body of a golden yellow colour, variegated with a dark reddish brown pigment, especially along the ventral face and the posterior edges of the segments.

Length of adult female 0.46 mm.

Remarks.—This form was first briefly described by Norman from the Shetland Isles as *Amymone falcata*. It was subsequently erroneously identified by Prof. Brady with *A. sphærica* of Claus, which is a very different species, and does not even belong to the same genus. The form recorded by Boeck as *A. rubra* is identical with Norman's species. It is the largest of the Norwegian species, and is moreover easily recognizable by the dark red colour of the body, and by the 2 very hooked projections of the genital segment.

Occurrence.—I have found this form not unfrequently in several places off the west coast of Norway, as also in the Trondhjem Fjord; and Mr. Scott also records it from Finmark (as *A. spærica).* It generally occurs in depths varying from 3 to 20 fathoms, on a sandy bottom, and is easily observable, even with the naked eye, owing to its dark red colour and peculiar tremulous movements.

Distribution.—British Isles (Brady), Shetland Isles (Norman), Arctic Ocean: off Franz Josef's Land and Novaja Zemlia (Scott), Ceylon (A. Scott).

42. Tegastes flavidus, G. O. Sars, n. sp.

(Pl. LXII, fig. 1).

Specific Characters.—Female. Cephalic segment about as in the preceding species, with no trace of a chitinous stripe across the back. Genital segment with 2 projections below, the anterior one obtuse at the tip and not recurved, the posterior one broadly claw-shaped. Distal part of urosome much more prominent than in any of the other species; caudal setæ normal. Posterior maxillipeds somewhat less strong than in the preceding species, with the hand narrow oblong in form. Last pair of legs with the distal joint not extending to the tip of the inner expansion of the proximal one, the latter only provided with 2 setæ in front. Spermatophore-reservoir in *male* bluntly beaked at the tip.

Colour light yellowish gray.

Length of adult female 0.40 mm.

Remarks.—Though nearly allied to *T. falcatus*, this form may be easily distinguished by the blunt anterior projection of the genital segment, the feebler posterior maxillipeds, and the unusually prominent distal part of the urosome. The last pair of legs and the male spermatophore-reservoir are moreover somewhat different in form. Finally, the colour of the body is rather different in the two species.

Occurrence.—I have only met with this form in 2 localities of the west coast of Norway, viz., at Kalvaag and Eggesbönæs. In both places it occurred rather sparsely at a depth of about 3 fathoms, muddy sand.

43. Tegastes longimanus (Claus).

(Pl. XLII, fig. 2).

? *Amymone longimana*, Claus, Die freilebenden Copepoden, p. 115, Pl. XX, figs. 13, 14.

Specific Characters.—Female. Cephalic segment with a distinct chitinous stripe across the back indicating the posterior limit of the head, postero-lateral

corners less acutely produced than in the 2 preceding species. Ventral protuberance of genital segment narrowly produced, with the tip slightly bilobed and the posterior edge projecting in a blunt tooth. Distal part of urosome only slightly projecting, caudal setæ normal. Posterior maxillipeds rather strong, with the hand oval triangular in form, palmar edge angularly curved above the middle. Last pair of legs resembling those in *T. flavidus;* inner expansion of proximal joint, however, with 3 setæ along the anterior edge.

Body of a pale yellow colour, and minutely speckled with reddish brown.

Length of adult female 0.33 mm.

Remarks.—It is with considerable hesitation that I refer this form to Claus's species. Both the description of this species and the 2 figures given by that author are rather poor, and scarcely suffice for an exact determination; yet the form of the posterior maxillipeds, as represented by Claus in fig. 14, exhibit at any rate some resemblance to that in the present species. The characteristic form of the ventral protuberance of the genital segment at once distinguishes this species from any of the others here described; but unfortunately this part has been wholly omitted in Claus's figure of the animal (fig. 13).

Occurrence.—Some few specimens of this form were taken, together with *T. flavidus,* at Eggesbönæs, west coast of Norway.

Distribution.—Heligoland (Claus), British Isles (Brady).

44. Tegastes grandimanus, G. O. Sars, n. sp.

(Pl. XLII, fig. 3).

Specific Characters.—Female. Cephalic segment, as in *T. longimanus,* provided with a distinct chitinous stripe across the back, postero-lateral corners obtusely acuminate. Ventral protuberance of genital segment terminating in 2 unequal projections, the anterior obtuse, the posterior tooth-like and extending behind. Distal part of urosome scarcely projecting. Posterior maxillipeds exceedingly powerfully developed, hand very broad, with the palmar edge much curved in the middle, and deeply concave below, dactylus strong and curved. Last pair of legs with the distal joint rather short, extending little beyond the middle of the inner expansion of the proximal one.

Colour not yet stated.

Length of adult female 0.42 mm.

Remarks.—This forms seems to be most nearly related to *T. longimanus* Claus, but is of considerably larger size, and has the posterior maxillipeds much

more powerfully developed. In the form of the ventral protuberance of the genital segment, it somewhat resembles *T. flavidus;* but the anterior projection is more obtuse, and the posterior scarcely unguiform at all.

Occurrence.—Only a single female specimen of this form has hitherto come under my notice. It was taken in the same place in which *T. longimanus* occurred.

45. Tegastes nanus, G. O. Sars, n. sp.

(Pl. XLII, fig. 4).

Specific Characters.—Female. Cephalic segment, as in the 2 preceding species, with a distinct chitinous stripe across the back, postero-lateral corners much produced, acuminate. Ventral protuberance of genital segment terminating in 2 blunt projections, the posterior one recurved. Distal part of urosome only slightly prominent. Posterior maxillipeds of moderate size, hand narrow oblong in form, with the palm not defined. Last pair of legs resembling in structure those in *T. grandimanus.* Spermatophore-reservoir of *male* rather thick, with the beak short, recurved.

Colour yellow, variegated with chestnut-brown.

Length of adult female 0.31 mm.

Remarks.—This is the smallest of the Norwegian species, and moreover easily recognizable, when alive, by the light brown colour of the body.

Occurrence.—In addition to the 2 above-mentioned localities of the west coast of Norway, I have found this form occasionally at Aalesund and Christiansund in moderate depths.

Gen. 19. Parategastes, G. O. Sars, n.

Syn: *Amymone*, Claus (part).

Generic Characters.—General form of body resembling that in *Tegastes*, the genital segment being expanded below in a similar manner, and the distal part of the urosome much shortened. Anterior antennæ composed of only 6 or 7 articulations. Posterior antennæ with the outer ramus uniarticulate. Anterior maxillipeds with the 2 proximal lateral lobes replaced by simple setæ, outermost lobe less broad than in *Tegastes*, and provided with only 2 setæ at the tip, ter-

minal joint produced at the tip to a long digitiform process. 2nd and 3rd pairs of legs with the outer ramus very short, biarticulate. Last pair of legs in female very large, with the inner expansion of the proximal joint broad and vaulted, distal joint somewhat dilated towards the end, with a single short apical seta. No true ovisac present in female. Male spermatophore-reservoir very prominent.

Remarks.—The type of this new genus is *Amymone sphærica* of Claus, which, though resembling the species of *Tegastes,* as regards external appearance, exhibits some well-marked differences in anatomical details, which entitle it to be separated generically. The 4 new species of *Tegastes* recently described by Mr. A. Scott from Ceylon, also seem, according to the structure of the anterior antennæ and the natatory legs, to be more properly referable to the present genus.

46. Parategastes sphæricus (Claus).

(Pl. XLIII).

Amymone sphærica, Claus, Die freilebenden Copepoden, p. 114, Pl. XX, figs. 1—9.

Syn: *Amymone nigrans*, Scott.

Specific Characters.—Female. Cephalic segment with a well-marked chitinous stripe across the back, postero-lateral corners moderately produced, obtusely acuminate, rostrum slightly prominent at the tip. Genital segment produced below to a rather massive, nearly quadrangular prominence, with the anterior corner somewhat exserted and tongue-shaped, the posterior unguiform and recurved, and exhibiting in the middle, between the two, a smaller recurved dentiform projection on each side. Distal part of urosome only slightly prominent. Anterior antennæ rather slender, 7-articulate. Posterior antennæ with the outer ramus extremely small, bisetose. Posterior maxillipeds of moderate size, hand oblong fusiform in shape. 4th pair of legs with the inner ramus extremely slender, terminal joint linear, without any lateral setæ, apex armed with 2 unequal spines. Last pair of legs with the distal joint extending somewhat beyond the tip of the inner expansion of the proximal joint, the outermost of the lateral setæ much elongated.

Male resembling the female in external appearance, but having the postero-lateral corners of the cephalic segment transversely truncated at the tip. Anterior antennæ, as usual, prehensile, with the 4th joint rather large, the last claw-shaped. Last pair of legs very narrow, with the proximal joint not expanded, distal joint linear, with 2 slender setæ at the extremity. Spermatophore-reservoir very large, terminating in 2 acute lappets.

Body of a dark cinereous colour, variegated with a sooty brown, or almost black pigment.

Length of adult female 0.35 mm.

Remarks.—There cannot in my opinion be any doubt that this is the true *Amymone sphærica* of Claus, and the form recorded by Boeck under this name is also unquestionably the same species. Mr. Scott, who on the authority of Prof. Brady believed the *Amymone falcata* of Norman to be the Clausian species, described the present form as a new species under the name of *A. nigrans*. It is easily recognized from any of the species of *Tegastes* by the form and armature of the ventral prominence of the genital segment, as also by the very dark colour of the body.

Occurrence.—This form is rather common in the upper part of the Christiania Fjord, near the shore among algæ, and also occurs occasionally off the west coast of Norway. In spite of its small size, it is easily observable on account of the very dark colour of the body, the animals, when alive, looking like rapidly moving, black granules.

Distribution.—Scottish coast (Scott), Heligoland (Claus), coast of France (Canu), Mediterranean (Claus), Ceylon (A. Scott).

Fam. 8. Porcellidiidæ.

Characters.—Body much depressed, shield-like, with some of the segments imperfectly defined, and with the urosome short and flattened, biarticulate. Anterior antennæ short, and composed only of a limited number of articulations. Posterior antennæ 3-articulate, with a well-developed outer ramus. Oral parts on the whole of rather peculiar structure, mandibular palp very largely developed; posterior maxillipeds imperfectly subcheliform. First pair of legs with both rami flattened and very dissimilar, the inner one distinctly prehensile. Natatory legs normal. Last pair of legs very different in the two sexes. Sexual difference on the whole very much pronounced. A single flattened ovisac present in female.

Remarks.—This family is as yet only represented by a single genus, viz., *Porcellidium* Claus, which in several respects deviates considerably from the typical Harpacticoida. In the short depressed form of the body, it somewhat recalls the

Peltidiidæ, to which family it was indeed referred by Claus; but the structure of the several appendages is very different, and more approaches that in the following family, the *Idyidæ*.

Gen. 20. **Porcellidium**, Claus, 1860.

Syn: *Thyone*, Philippi (not Oken).

Generic Characters.—Body short and flattened, with the cephalic segment very large and expanded; rostrum broad, lamellar, not defined at the base. Epimeral plates of the first 2 free segments of metasome tongue-shaped, those of 3rd segment in female rudimentary, in male well developed. Last segment in both sexes without any trace of epimeral plates, and in female imperfectly defined behind. Urosome short and flattened, in both sexes composed of only 2 segments, the anterior one large and lamellar, the posterior small, subquadrate. Caudal rami more or less lamelliform, with very short apical setæ. Eye present, of usual structure. Anterior antennæ short, 6-articulate, in male strongly prehensile. Posterior antennæ with the outer ramus uniarticulate. Mandibles very strong, with the palp excessively large, lamellar, indistinctly 3-lobed, and provided outside with numerous thick plumose setæ. Maxillæ with the palp normally developed. Anterior maxillipeds comparatively short and stout, with 2 unequal setiferous lobes inside, terminal joint rather broad, incurved, with several strong spiniform setæ on the tip. Posterior maxillipeds rather small, 3-articulate, 1st joint provided in front with an oval ciliated lamella, 2nd joint tapered distally, with a short deflexed lobe inside, last joint very small, with 2 short incurved claws at the tip. First pair of legs with the outer ramus 3-articulate and very delicate, being edged outside with soft plumose setæ, inner ramus biarticulate, 1st joint large and triangular in form, last small and armed with 2 subequal claws, densely fimbriate on one side. Natatory legs with both rami 3-articulate, inner ramus in 1st pair much larger than in the 2 succeeding pairs. Last pair of legs in female distinctly biarticulate, distal joint large, lanceolate; those in male much smaller, uniarticulate, sub-quadrate, terminal edge aculeate.

Remarks.—This genus was established as early as the year 1839 by Philippi, to include a Mediterranean species, *T. viridis;* but as the name *Thyone* proposed by him had been previously appropriated by Oken for a genus of Holothuroida, it was changed by Claus to *Porcellidium*. The latter author records 3

species of this genus from the Mediterranean, one of which may be the *Thyone viridis* of Philippi, and Mr. A. Scott has recently added 3 new species from Ceylon. To the Norwegian fauna belongs only a single species, to be described below.

47. Porcellidium fimbriatum, Claus.

(Pl. XLIV & XLV).

Porcellidium fimbriatum, Claus, Die freilebenden Copepoden, p. 140, Pl. XXII, fig. 1.

Syn: *Porcellidium fasciatum*, Boeck.
„ — *viride*, Brady (male).
„ — *subrotundum*, Norman (young).

Specific Characters.—Female. Body oval quadrangular in outline, width somewhat exceding $^2/_3$ of the length. Cephalic segment very broad and flattened, obtusely truncated in front, with the lateral corners rounded; rostrum slightly prominent, broad, lamellar, truncated at the tip. Epimeral plates of the 2 succeeding segments large and closely contiguous, being, like the cephalic segment, surrounded by a narrow hyaline rim; those of 4th segment very small and easily overlooked. Last segment imperfectly defined. Urosome almost semicircular in outline, genital segment expanded on each side to a thin lamella finely ciliated at the edge and encompassing laterally the small quadrate terminal segment together with the caudal rami. The latter spatulate in form, about twice as long as broad, and slightly widening distally, tip transversely truncated and provided with 5 very small setæ, one of which issues from the inner corner, the others nearer to the outer one; moreover 2 similar setæ issue from the dorsal face of each ramus. Anterior antennæ scarcely extending beyond the antero-lateral corners of the cephalic segment, angularly bent at the base, and consisting of 6 articulations rapidly diminishing in size distally. Posterior antennæ with the 1st joint much larger than the others, outer ramus about the length of the middle joint, and carrying 6 plumose setæ. First pair of legs with the outer ramus gradually tapering distally, 1st joint much larger than the others, setæ of outer edge bulbously dilated at the base, terminal joint with 4 such setæ, and moreover with a slender apical spine and a strong plumose seta inside. Last pair of legs with the distal joint very large, lanceolate, extending between the epimera of the 2nd free segment of metasome and the lateral expansions of the genital segment, so as to look like a pair of epimeral plates.[1]) Ovisac almost wholly covered by the urosome.

[1]) They have also been regarded as such by Prof. Brady, who erroneously describes the lateral expansion of the genital segment as the last pair of legs.

Male considerably smaller than female and of a rather different external appearance. Cephalic segment transversely truncated in front, with the lateral corners sub-angular; rostrum almost obsolete. 3rd free segment of metasome with well-developed epimeral plates of the same appearance as those of the 2 preceding segments. Genital segment but slightly expanded, and not encompassing laterally the distal part of the urosome. Caudal rami much shorter than in female, being considerably broader than they are long. Anterior antennæ very strongly built and angularly bent at the base, 4-articulate, 3rd joint considerably dilated, last joint unguiform and very mobile. Last pair of legs spatulate, intercalated between the epimeral plates of the 3rd free segment of metasome and the urosome, tip obliquely truncated and armed with a row of 6 short spines.

Body in both sexes of a clear yellowish green colour, and generally provided dorsally with a dark violet transverse band across the posterior part of the cephalic segment, urosome in female tinged at the base with a similar colour.

Length of adult female 0.90 mm., of male 0.60 mm.

Remarks.—The remarkable sexual difference occurring in this form has led Prof. Brady, and perhaps also Claus, to describe the two sexes as 2 different species. There cannot, in my opinion, be any doubt that the form recorded by Prof. Brady as *P. viride*, and regarded as identical with *P. dentatum* of Claus, is nothing but the male of the present species. True, a figure is also given of the supposed female of *P. viride;* but the specimen drawn is certainly not adult, and appears to be a young male, in which the anterior antennæ have not yet been fully transformed. Nor can I doubt that the *P. subrotundum* of Norman is founded upon immature specimens of the present species (compare the figure of such a specimen given on the accompanying plate). The *Porcellidium fasciatum* of Boeck is not, as opined by Prof. Brady, identical with *Aspidiscus fasciatus* Norman, but is most certainly the present species. Whether Philippi's species is the male of this species or a distinct form, it is very difficult to decide. The female of the present species, at any rate, is easily recognizable by the greatly expanded genital segment and by the characteristic form of the caudal rami.

Occurrence.—I have met with this form rather frequently in several places on the west coast of Norway, as also in the Trondhjem Fjord. It lives, as a rule, on the fronds of Laminariæ, to which it applies its flattened body so closely, that it is only with great difficulty that it can be loosened from its hold, when alive. On employing its natatory legs, the animal runs about rather quickly along the fronds or other smooth objects, with an even, gliding motion.

Distribution.—British Isles (Brady), Mediterranean (Claus), Ceylon (A. Scott).

Fam. 9. Idyidæ.

Characters.—Body more or less depressed, with the posterior division becoming abruptly much narrower than the anterior, both with the normal number of segments. Eye distinct or wanting. Anterior antennæ more or less slender, 8- or 9-articulate, distinctly prehensile in male. Posterior antennæ 3-articulate, with the outer ramus well developed. Oral parts differing somewhat in structure in the different genera. First pair of legs, as a rule, with both rami 3-articulate, but of rather different structure, the inner one generally the longer and always prehensile. Natatory legs normal. Last pair of legs more or less extended laterally, proximal joint but slightly expanded, distal joint more or less elongated. A single ovisac present in female.

Remarks.—The forms belonging to this family are chiefly characterised by the sharp demarcation between the anterior and posterior divisions of the body, the former being more or less expanded and depressed, the latter abruptly much narrower. In the structure of the several appendages, some approach may be found, partly to that in the *Porcellidiidæ*, partly to that in the *Thalestridæ*. The shape of the last pair of legs is, however, rather different from that in either of those 2 families, and agrees more with that found in the *Peltidiidæ*. We know as yet of 6 different genera belonging to this family, all of which are represented in the fauna of Norway.

Gen. 21. Aspidiscus, Norman, 1868.

Syn: *Scutellidium*, Brady (not Claus).

Generic Characters.—Anterior division of body much expanded and depressed, clypeiform, with the dorsal face slightly vaulted and very smooth. Cephalic segment large and evenly curved in front, and, like the epimeral plates, bordered by a narrow hyaline rim; rostrum lamellar, distinctly defined at the base. Epimeral plates of the first 3 free segments of metasome well developed, imbricate, recurved; 3rd segment fornicate behind, arching over the very small last segment, as also over the anterior part of the urosome. The latter abruptly much narrower than the anterior division and gradually tapering distally, genital segment scarcely expanded. Caudal rami very small, but with the apical setæ much elongated and extending straight backwards. Eye distinct, of usual

structure. Anterior antennæ of moderate length, not dilated in the middle, 9-articulate. Posterior antennæ with the apical setæ comparatively short, outer ramus fully as long as the inner and 3-articulate, with one of the apical setæ much elongated. Mandibular palp rather large and complex, produced in front to a digitiform, finely ciliated process. Maxillæ with the epipodal plate very large and tipped with 2 exceedingly strong plumose setæ. Maxillipeds comparatively small and simple in structure, the anterior ones without any lateral lobes, terminal joint small and tipped with 2 ciliated spines; the posterior ones with a single comparatively short claw at the tip. First pair of legs rather large and of a very delicate structure, with both rami flattened and somewhat resembling those in the genus *Porcellidium;* inner ramus, however, distinctly 3-articulate, with the 1st joint large and dilated in the middle, the outer 2 comparatively short, last joint carrying 2 digitiform claws densely fimbriate on one side. Natatory legs with both rami of nearly equal length, middle joint of inner ramus in 1st pair with 2 setæ inside, in the 2 succeeding pairs with only one. Last pair of legs differing somewhat in shape in the two sexes, those in female rather coarse, with the proximal joint elongated and scarcely at all expanded, distal joint more or less lamelliform.

Remarks.—This genus was established by Norman in the year 1868, to include a form found by him off the Shetland Isles and named *A. fasciatus.* The genus was not, however, accepted by Prof. Brady, who in his Monograph referred Norman's species to the genus *Scutellidium* Claus (= Psamathe Philippi), to which genus it certainly exhibits a close relationship. I think, however, that Norman's genus ought to be maintained, since 2 nearly-related species exist showing the very same characteristic differences from Claus's genus, which likewise comprises 2 or 3 closely-related species. The most characteristic feature of the present genus consists in the peculiar fornicate condition of the 3rd free segment of the metasome, a character not found in any other Copepoda with which I am acquainted. Moreover, on a closer comparison, several well-marked differences are found to exist in the structure of some of the appendages. The genus comprises, as above stated, 2 well defined species, to be described below.

48. Aspidiscus littoralis, G. O. Sars, n. sp.

(Pl. XLVI & XLVII).

Syn: *Scutellidium fasciatum*, Brady (not Norman).

Specific Characters.—Female. Anterior division of body very broad, scarcely narrowed behind. Cephalic segment large, occupying more than half

the length of the anterior division, edges evenly curved throughout, postero-lateral corners acutely produced and applying closely against the 1st pair of epimeral plates; rostrum but slightly projecting, broad, lamellar, with the terminal edge evenly curved. Epimeral plates of the first 2 free segments of metasome much produced and closely imbricate; those of 2nd segment extending as far back as the tip of the succeeding pair. 3rd segment highly fornicate behind, wholly obtecting the last segment and the anterior half of the genital segment, posterior edge slightly arched and bordered with a broad hyaline rim. Urosome scarcely $^1/_3$ as long as the anterior division, and having the segments very sharply defined. Caudal rami extremely small, the innermost but one of the apical setæ almost 3 times as long as the urosome. Anterior antennæ scarcely more than half as long as the cephalic segment and rather narrow, terminal part slightly exceeding in length the 2 preceding articulations combined. Posterior antennæ with the spines outside the terminal joint coarsely denticulated on the one side. Last pair of legs rather elongated and curving evenly behind, proximal joint only very slightly widened towards the end, distal joint about the same length as the proximal one, and narrow oblong in form, with 4 delicate setæ at the end, outer face and edges densely hairy. Ovisac large, rounded oval, and somewhat flattened.

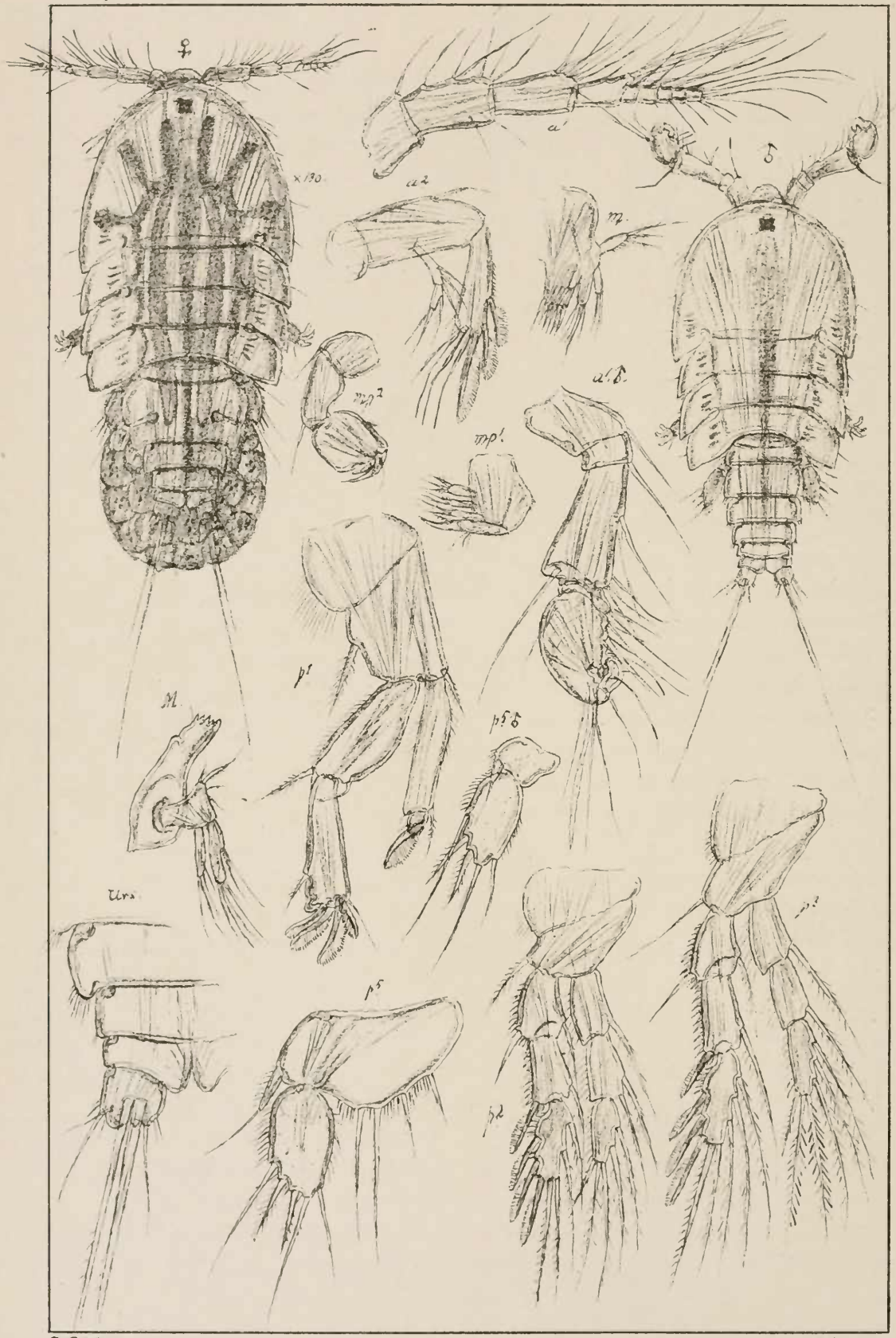
Male considerably smaller than female, and having the anterior division of the body less expanded, and oval in outline. Epimeral plates less produced, those of the 2nd free segment of metasome not extending to the tip of the succeeding pair. Urosome narrower and distinctly 5-articulate. Anterior antennæ more strongly developed than in female, and hinged between the 5th and 6th articulation. Last pair of legs considerably smaller than in female, with the proximal joint much shorter than the distal one.

Body in both sexes generally of a uniform golden yellow colour, occasionally exhibiting on the back 2 irregular patches of a dark red hue, the one occupying the centre of the cephalic segment, the other the dorsal part of the 3rd free segment of metasome.

Length of adult female about 1 mm., of male 0.70 mm.

Remarks.—This form has been described and figured by Prof. Brady in his well-known Monograph, as *Scutellidium fasciatum*, as it was believed to be identical both with the form recorded by Boeck as *Porcellidium fasciatum*, and with that described by Norman as *Aspidiscus fasciatus*. It has been stated above that Boeck's species is undoubtedly quite a different form, viz., *Porcellidium fimbriatum* Claus, and I also regard it as beyond doubt that Norman's rather full description of his *Aspidiscus fasciatus* does not refer to the present, but to the next species, for which reason it has been necessary to give a new specific name

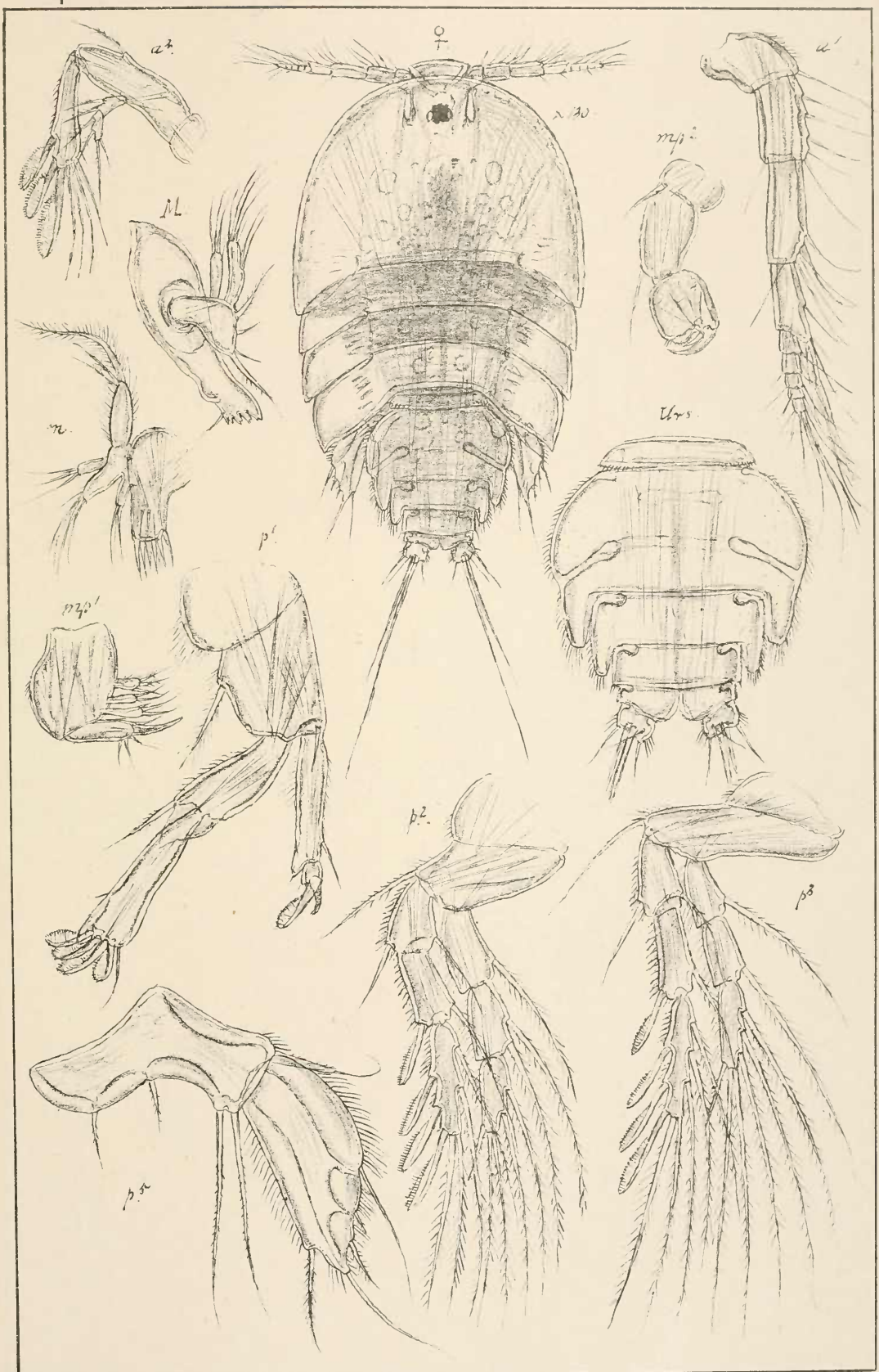
Copepoda



G.O. Sars autogr.

Zaus spinatus, (Goodsir.)

Norsk Lithgr. Officin.



G.O. Sars autogr. Norsk Lithgr. Officin.

Zaus abbreviatus, G.O. Sars.

Copepoda

Harpacticidæ. Harpacticoida. Pl. XXXV.

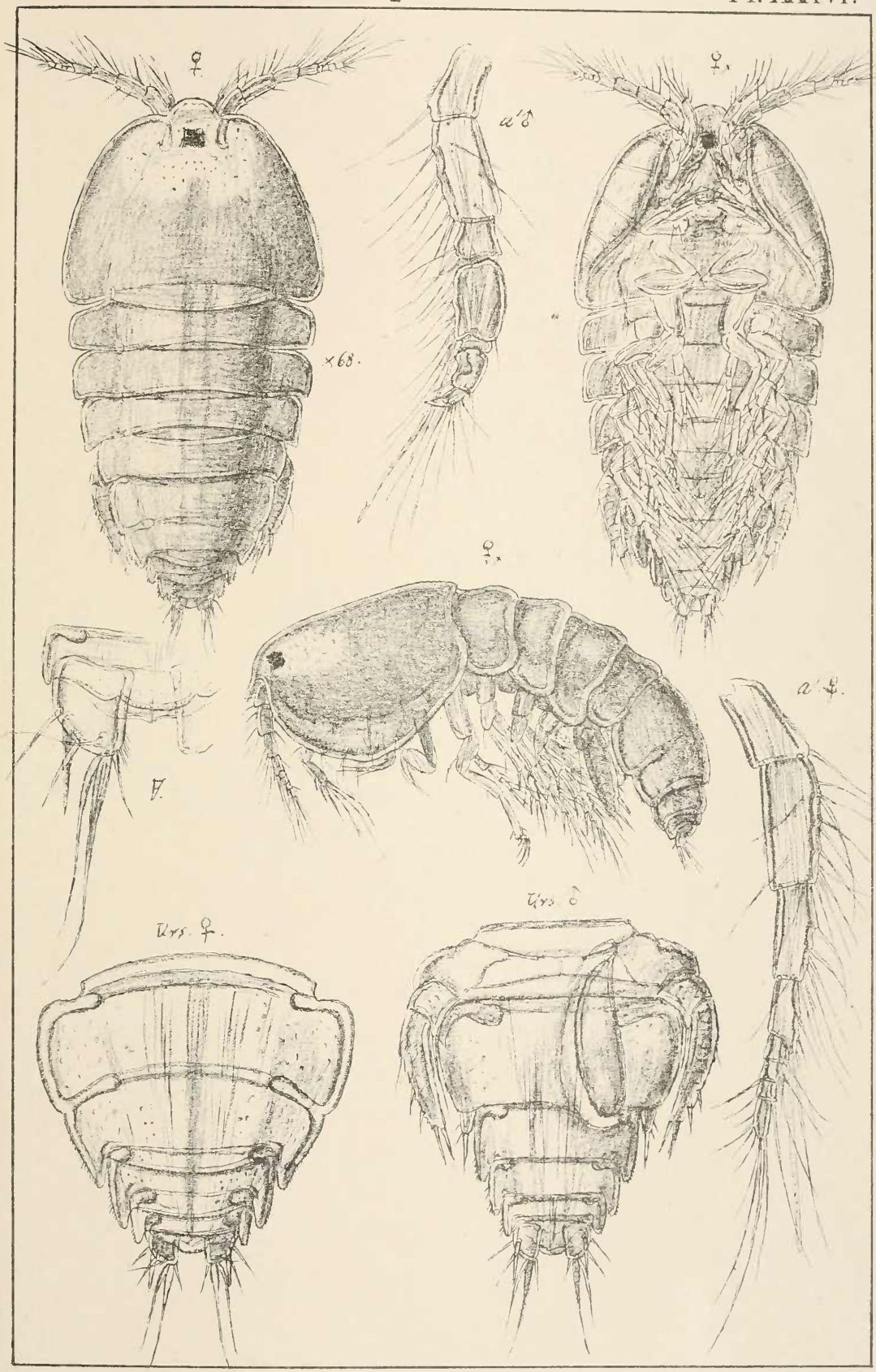


G.O. Sars autogr. Norsk Lithgr. Officin.

Zaus Goodsiri, Brady

Copepoda

Peltidiidæ. Harpacticoida. Pl. XXXVI.

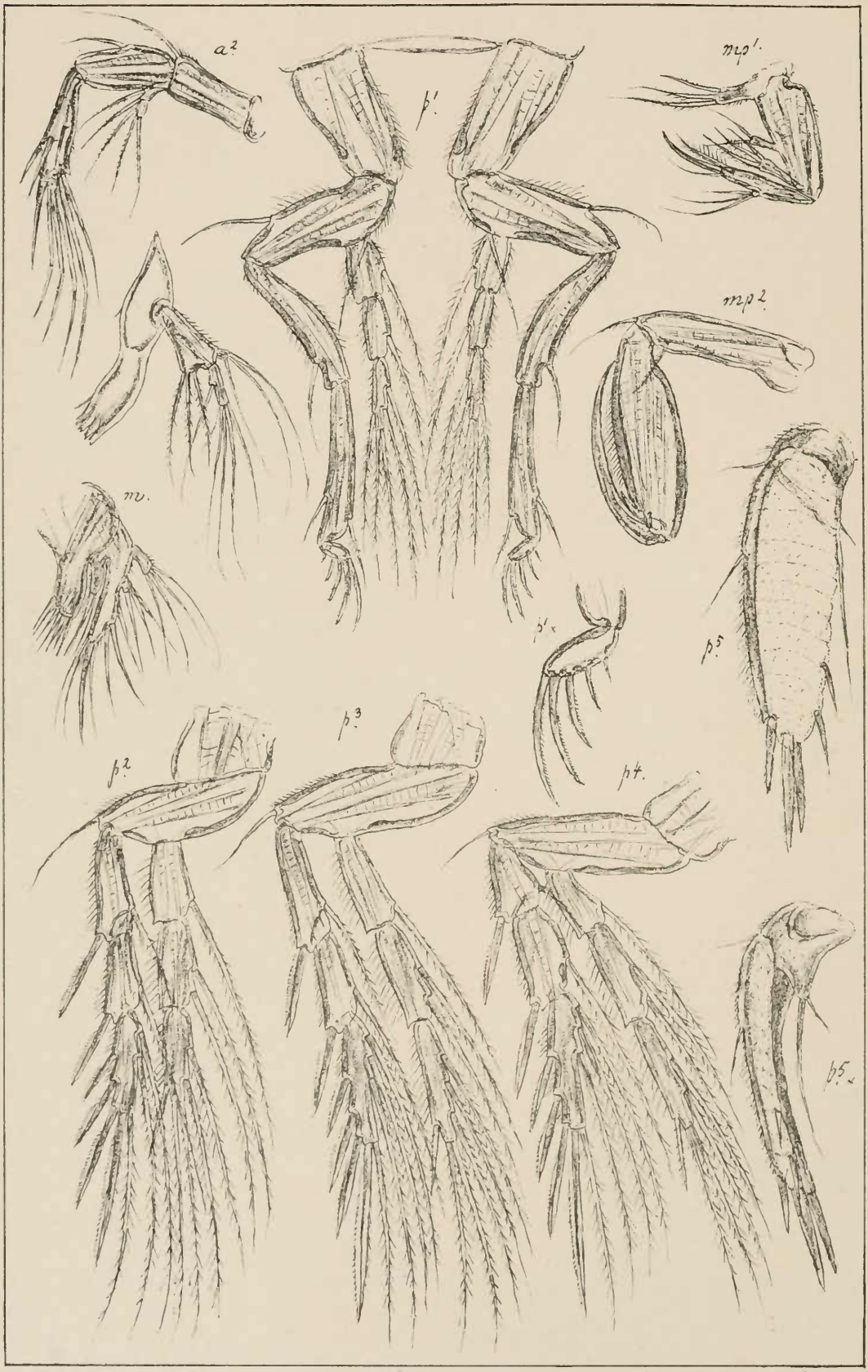


G.O. Sars autogr. Norsk Lithgr. Officin.

Alteutha interrupta (Goodsir.)

Copepoda

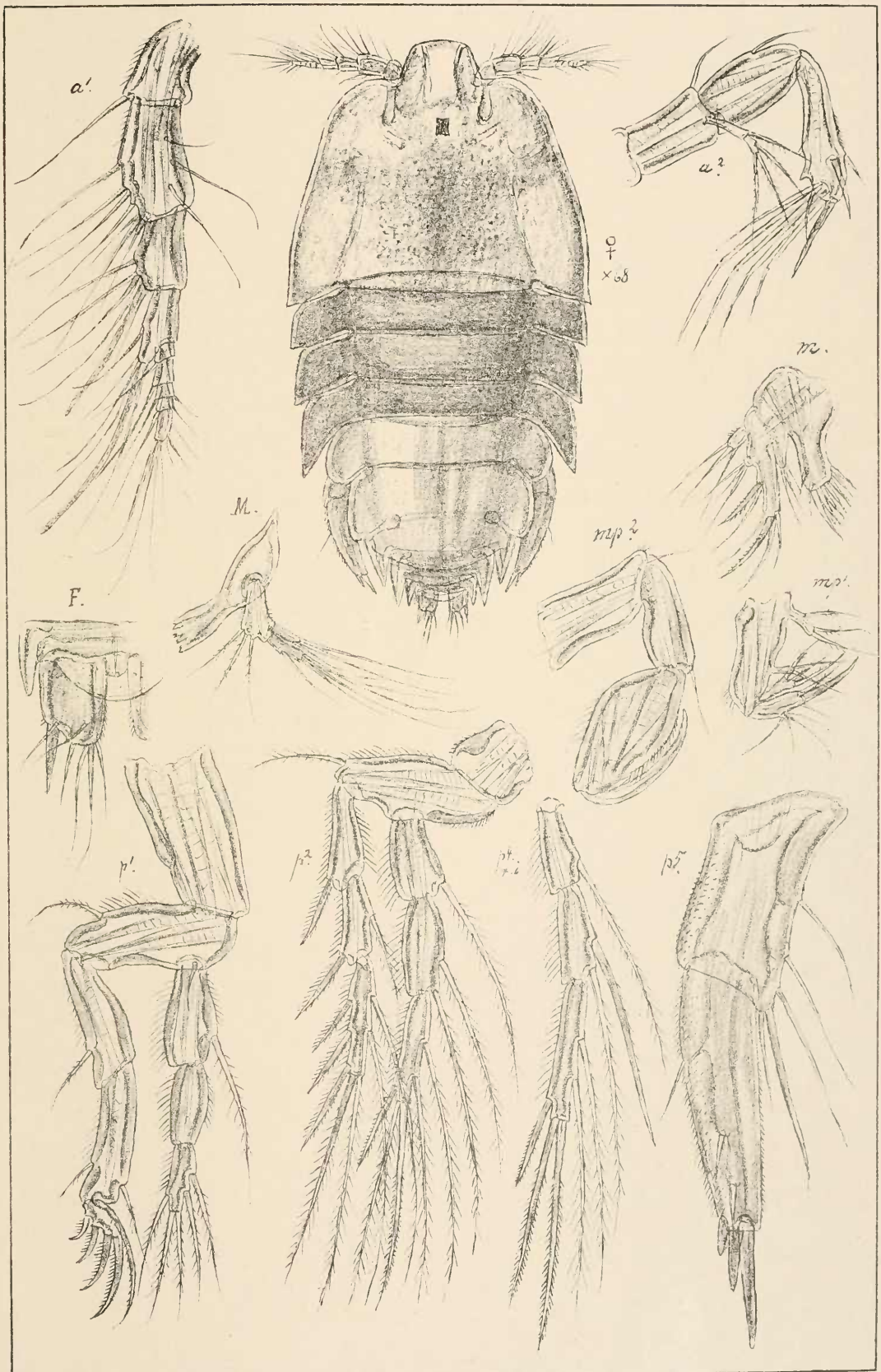
Peltidiidæ. Harpacticoida. Pl. XXXVII.



G.O. Sars autogr. Norsk Lithgr. Officin.

Alteutha interrupta (Goodsir.)
(continued)

Copepoda



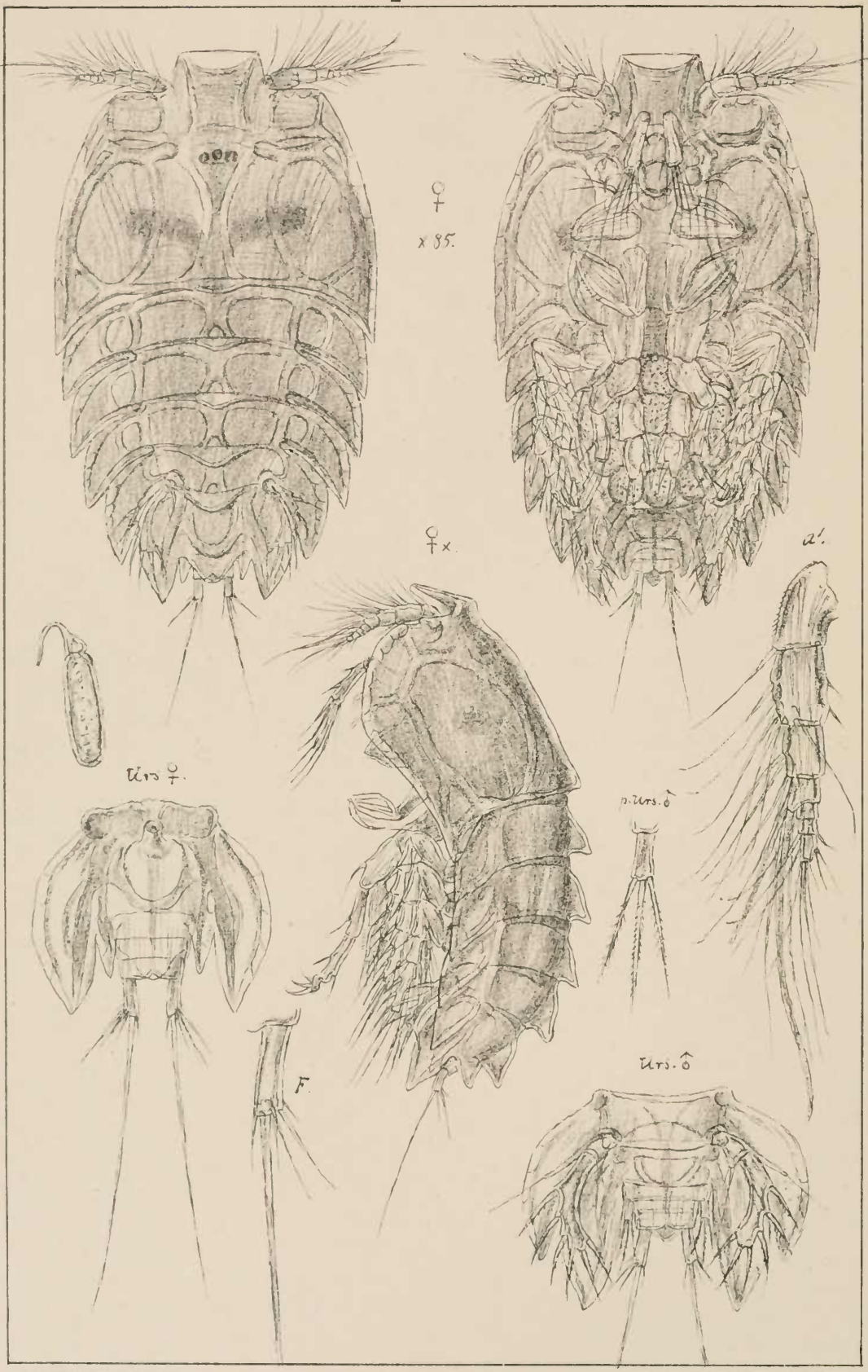
G.O. Sars autogr.

Alteutha depressa, Baird

Norsk Lithgr. Officin.

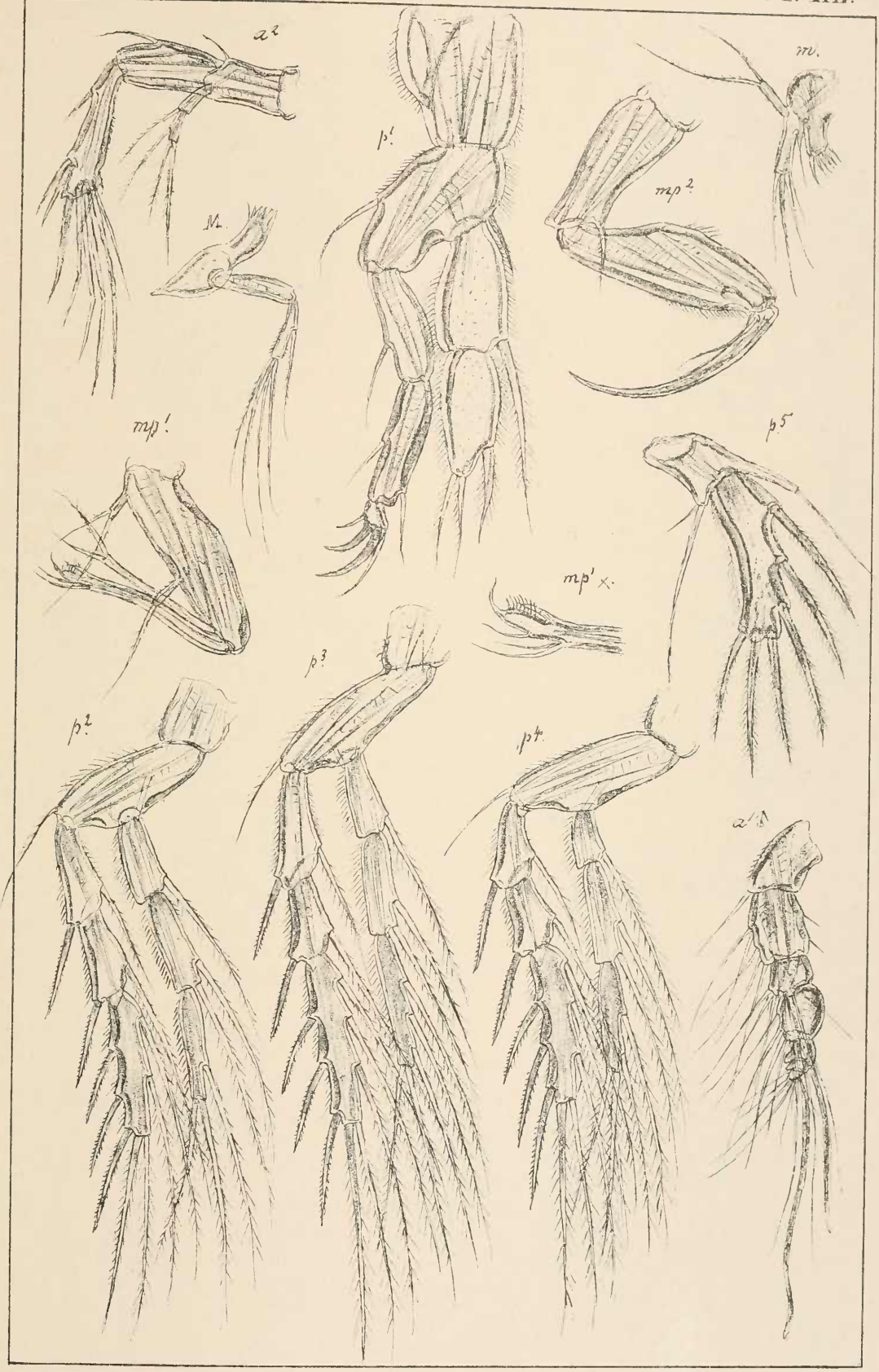
Copepoda

Peltidiidæ. Harpacticoida. Pl. XXXIX.



G.O. Sars autogr. Norsk Lithgr. Officin.

Peltidium purpureum, Phil.

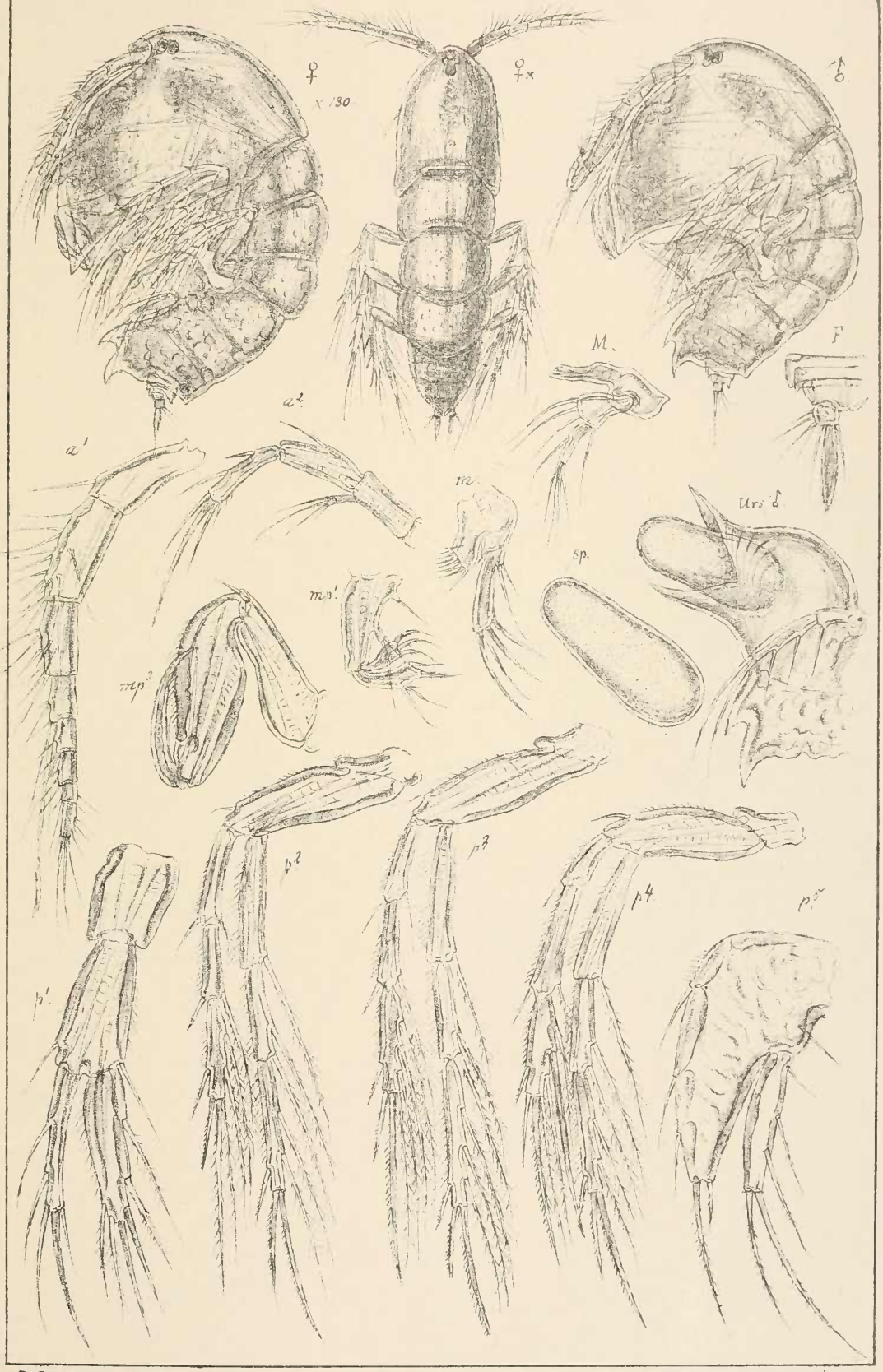


G O. Sars autogr. Norsk Lithgr. Officin.

Peltidium purpureum, Phil.
(continued)

Copepoda

Tegastidæ — Harpacticoida. — Pl. XLI.

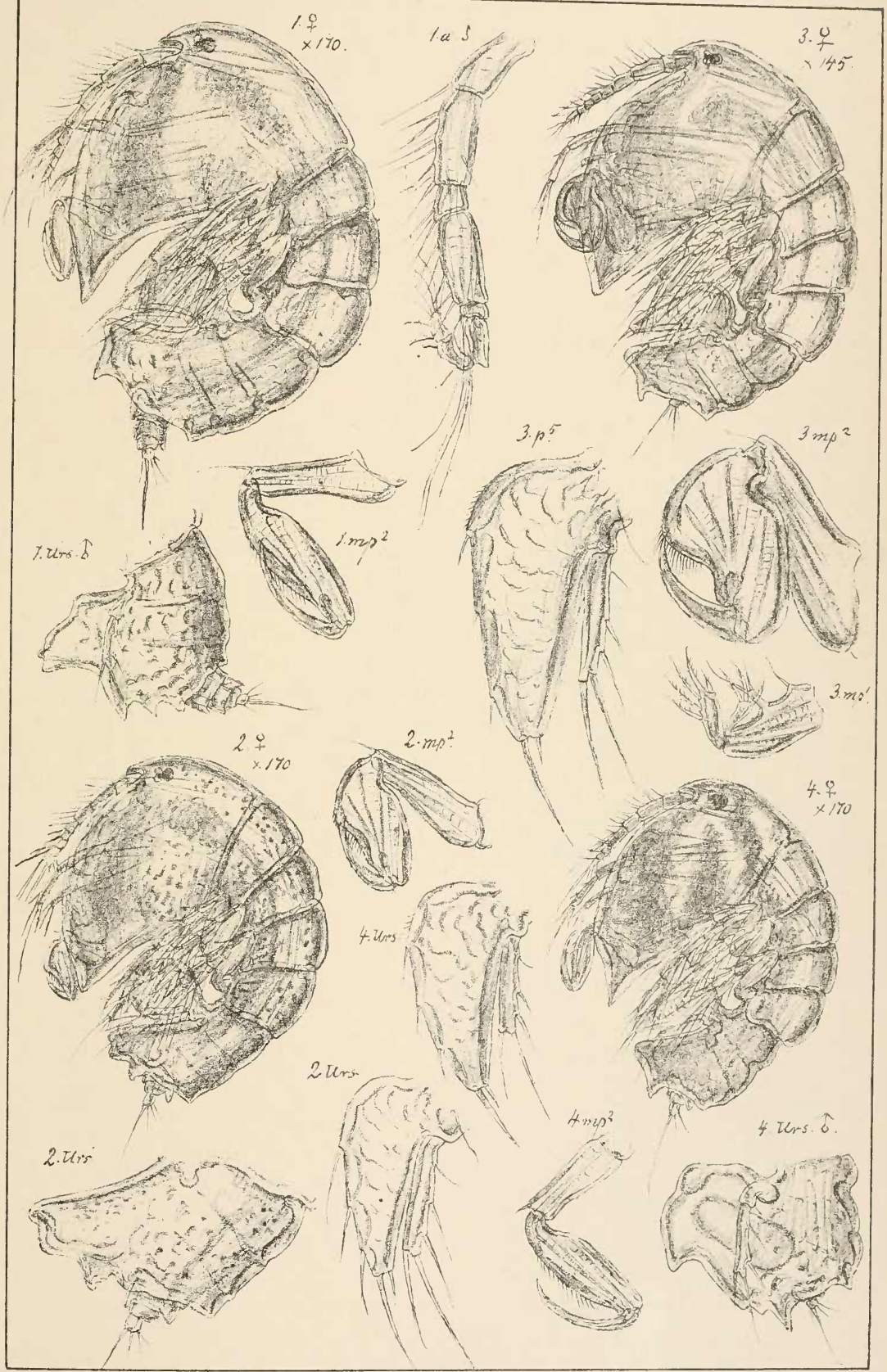


G. O. Sars autogr. — Norsk Lithgr. Officin.

Tegastes falcatus, Norman.

Copepoda

Tegastidæ — Harpacticoida. — PI. XLII



G.O. Sars autogr. — Norsk Lithgr. Officin.

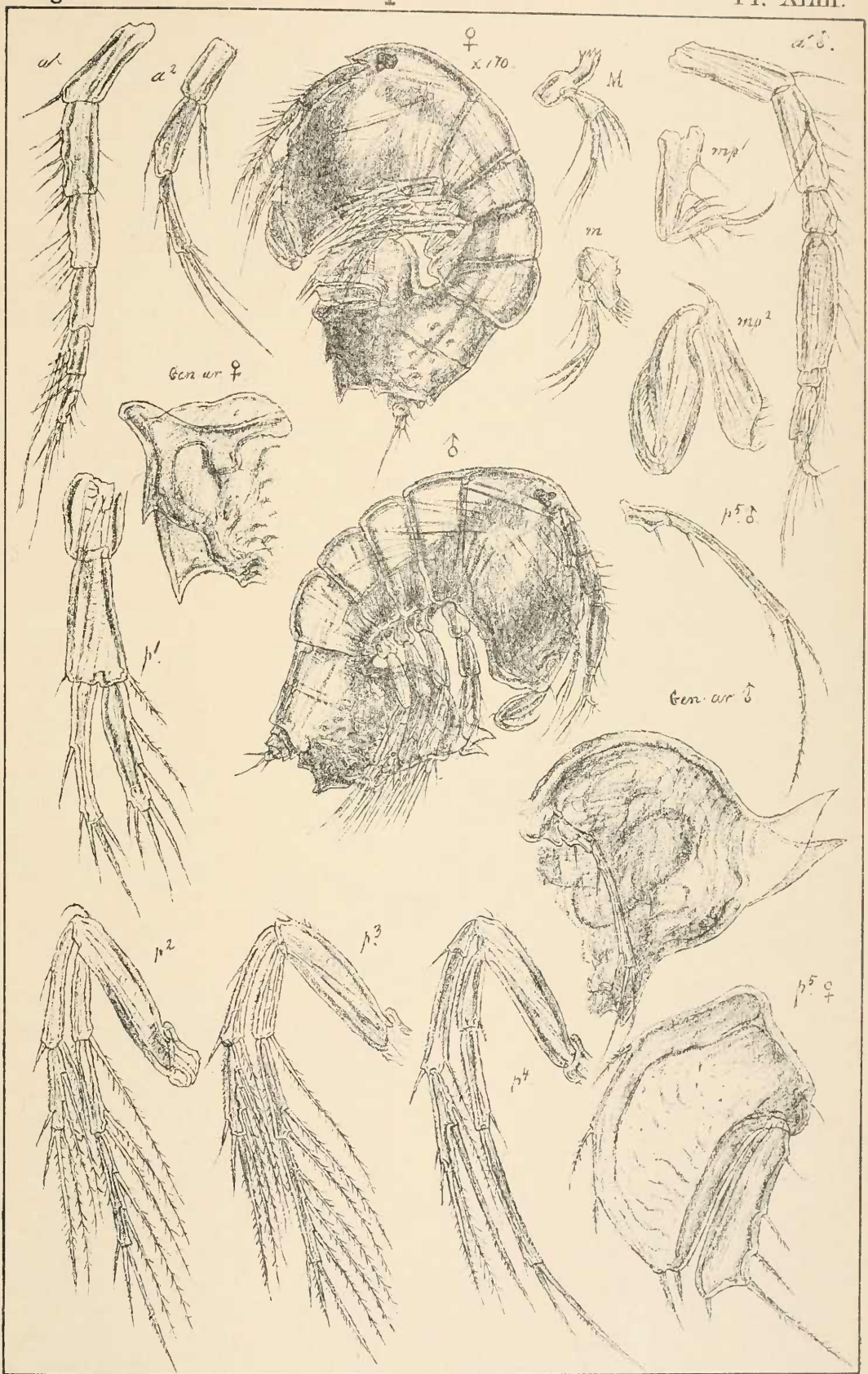
1. Tegastes flavidus, G.O. Sars. – 2. T. longimanus, (Cls). –
3. T. grandimanus, G.O. Sars. – 4. T. nanus, G.O. Sars.

Copepoda

Harpacticoida.

Tegastidæ

PI. XLIII.



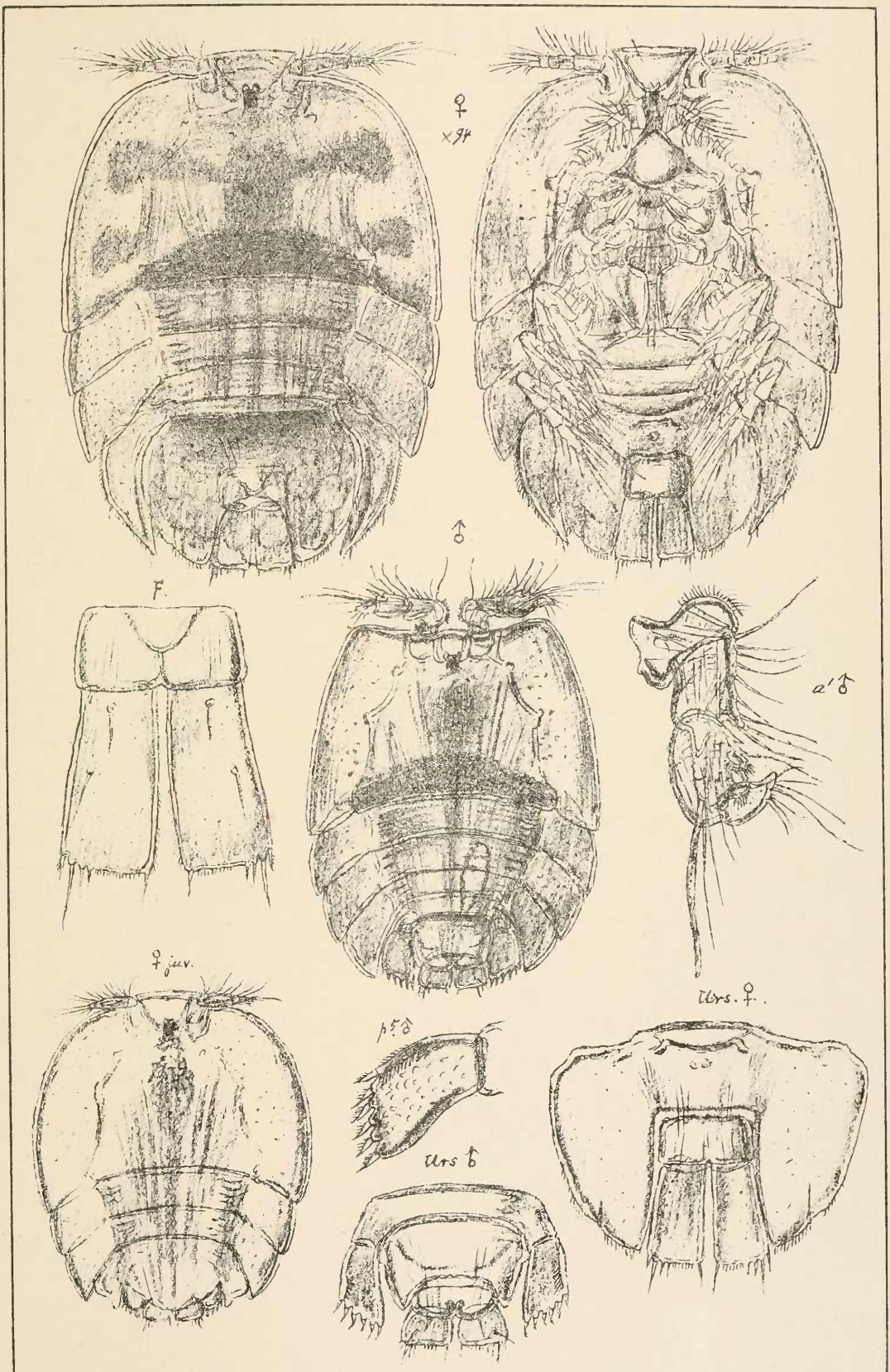
G.O. Sars autogr.

Norsk Lithgr. Officin.

Parategastes sphæricus (Claus)

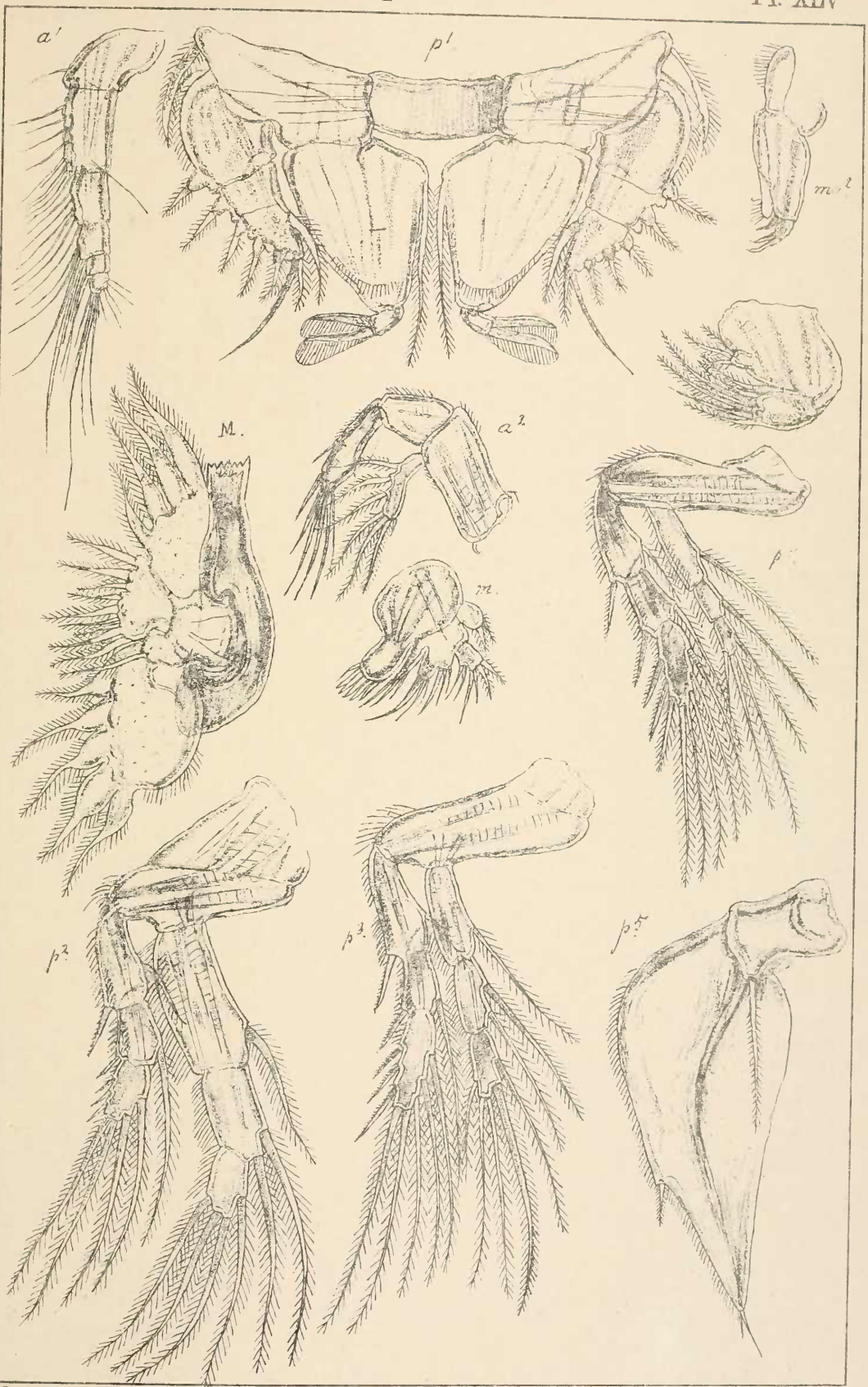
Copepoda

Harpacticoida.



G.O. Sars autogr. Norsk Lithgr. Officin.

Porcellidium fimbriatum, Cls.



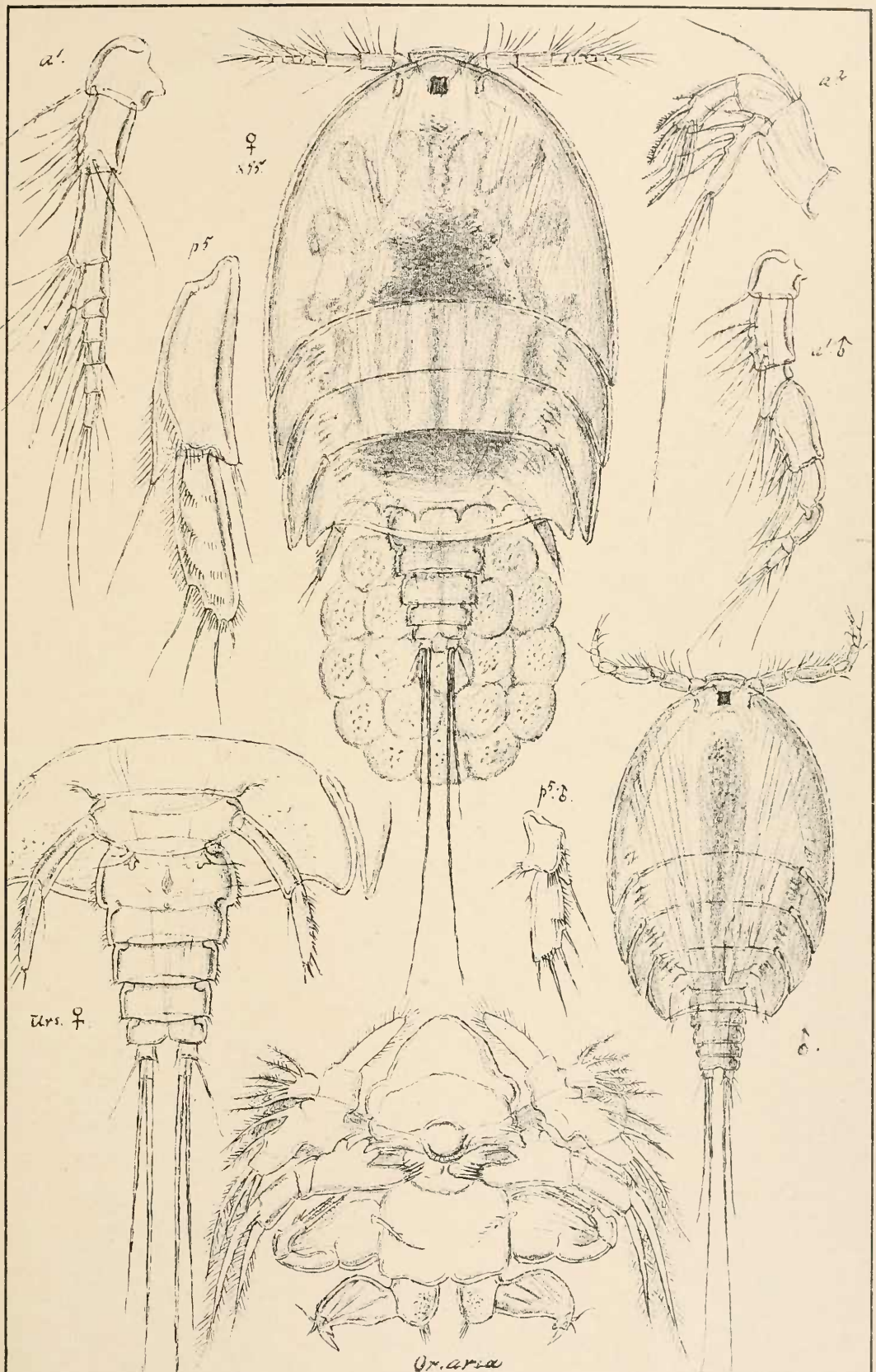
G.O. Sars autogr.

Norsk Lithgr. Officin.

Porcellidium fimbriatum Cls
(continued)

Copepoda

Harpacticoida.

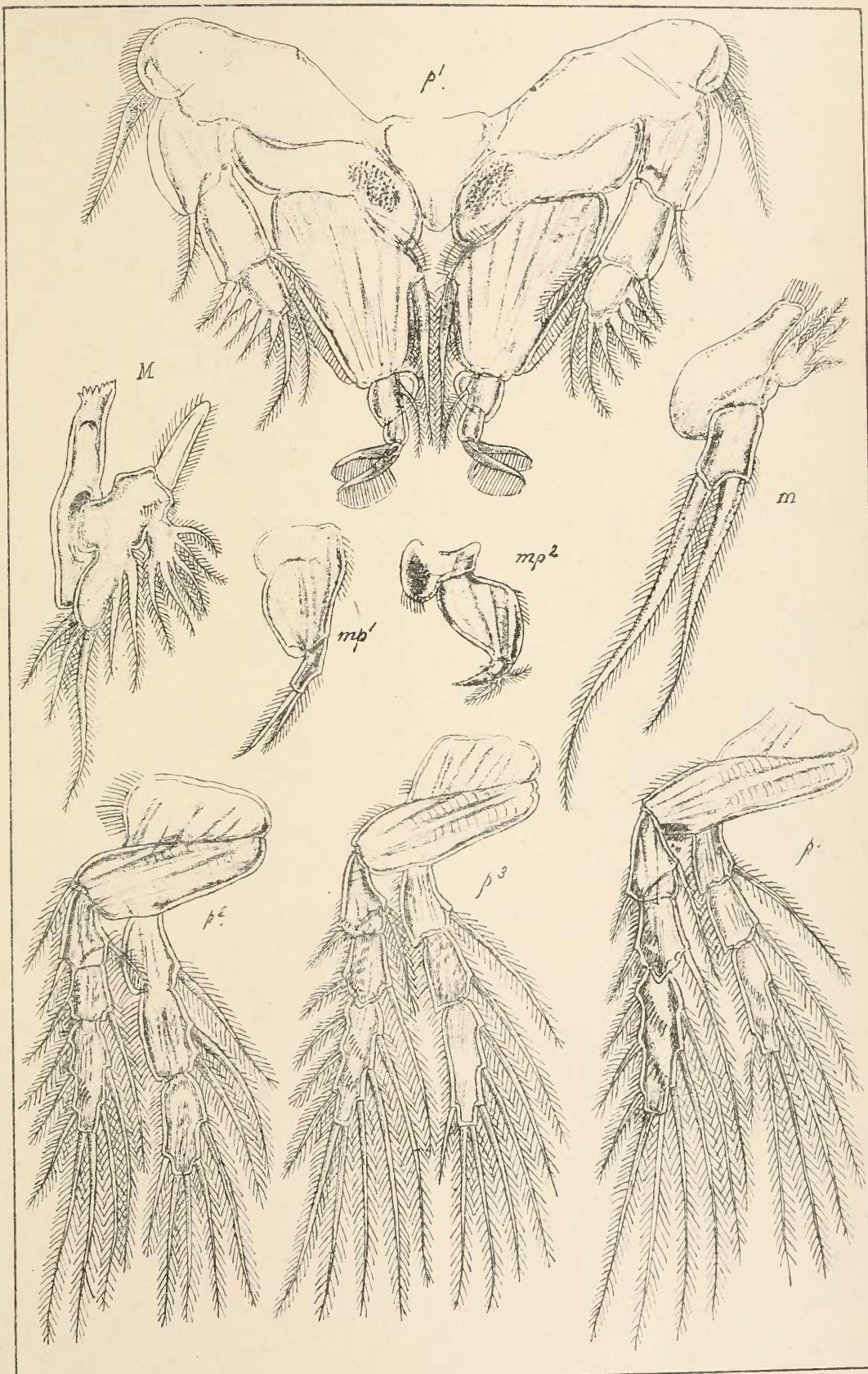


G.O. Sars autogr.

Norsk Lithgr. Officin.

Aspidiscus littoralis, G.O. Sars.

Copepoda



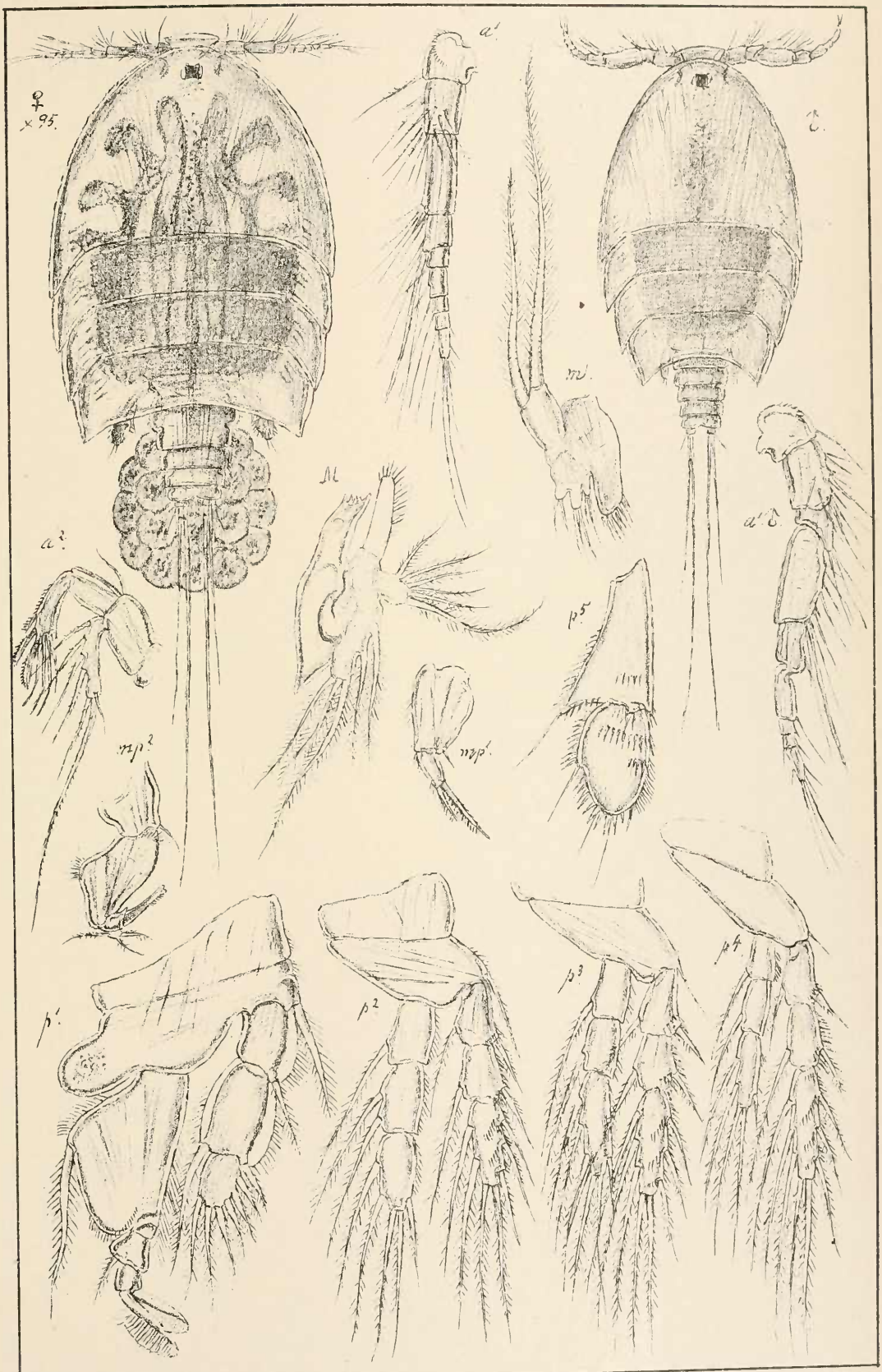
G.O. Sars autogr. Norsk Lithgr. Officin.

Aspidiscus littoralis, G.O. Sars.

(continued)

Copepoda

Harpacticoida.



G.O. Sars autogr.

Norsk Lithgr. Officin.

Aspidiscus falcatus, Norman.

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS VII & VIII

IDYIDÆ (continued), THALESTRIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
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1905

to the species here under discussion. It may easily be distinguished from Norman's species by its more robust form, and especially by the great development of the 2nd pair of epimeral plates in the female. The colour of the body is moreover rather different in the two species.

Occurrence.—I have taken this form rather abundantly in some places on the west coast of Norway, for instance, at Haugesund, Kopervik and Bukken. It is a sub-littoral form, being found close to the shore on the fronds of *Laminaria digitata* at low-water mark. The animal, like the species of *Porcellidium*, has the power of applying its body very firmly to any objects, so that it can only be loosened with considerable difficulty when alive. After the collecting-vessels have been emptied therefore, the greater number of the specimens remain in the bottles, firmly attached to the sides. On shaking the bottles with some fresh water, however, the specimens very soon leave their hold and can be emptied out with the water. In this manner I was enabled, during my last excursion, to secure a great number of specimens.

Distribution.—British Isles (Brady).

49. Aspidiscus fasciatus, Norman.

(Pl. XLVIII).

Aspidiscus fasciatus, Norman, Last Report on Dredging among the Shetland Isles. Brit. Assoc. Report for 1868, p. 298.

Specific Characters.—Female. Very like the preceding species in its general appearance, but of somewhat smaller size and less robust form of body. Anterior division broadly oval in outline, slightly narrowed both in front and behind. Rostrum somewhat more prominent than in *A. littoralis*, though exhibiting a very similar form. Epimeral plates of the first 3 free segments of metasome less produced behind, 2nd pair not extending nearly as far as the tip of the succeeding pair; posterior edge of 3rd segment straight, scarcely at all limbate. Last segment of metasome, as in the preceding species, wholly obtected by the fornicate hind part of the 3rd segment. Urosome with the segments somewhat less sharply defined than in *A. littoralis*. Caudal rami extremely small, but with the apical setæ excessively elongated, the innermost but one almost attaining the length of the whole body. Antennæ, oral parts and anterior pairs of legs of almost exactly the same structure as in *A. littoralis*. Last pair of legs, however, differing conspicuously in form; proximal joint less curved, and considerably dilated towards the end; distal joint shorter than the proximal one, and broadly oval or

lamelliform, being coarsely denticulate both at the edge and the outer face, marginal setæ very delicate, and only 3 in number.

Male resembling that of the preceding species, but somewhat more slender in form.

Body in both sexes of a pale yellow colour, with a broad transverse band of a rich crimson across the back, occupying the dorsal parts of the first 3 free segments of metasome.

Length of adult female 0.80 mm., of male 0.60 mm.

Remarks.—This is unquestionably the species originally described by Norman from the Shetland Isles under the above name. His statements about the colour of the animal[1]) leave no doubt as to the correctness of this assumption. Though very nearly related to the preceding species, this form may be easily distinguished by the less robust body, but especially by the uniform appearance of the epimeral plates. The form of the last pair of legs in the female is also conspicuously different, and, as above stated, the colour of the body is very characteristic.

Occurrence.—I have found this form not unfrequently in several places on the west coast of Norway, as also in the Trondhjem Fjord. It occurs only in depths varying from 6 to 20 fathoms, generally on *Laminaria saccharina*, but also on other algæ, and never in the littoral zone.

Distribution.—Shetland Isles (Norman).

Gen. 22. **Psamathe**, Philippi, 1840.

Syn: *Scutellidium*, Claus.

Generic Characters.—Anterior division of body somewhat depressed, though scarcely clypeiform, and without any hyaline rim at the edges. Rostral projection obtuse, not lamellar, nor distinctly defined at the base. Epimeral plates of the first 3 free segments of metasome discontiguous at the tips, not imbricate. Last segment of metasome freely exposed behind, very small, and without any distinct epimeral plates. Urosome more or less elongated, and slightly dilated in its anterior part. Caudal rami well developed, though rather short, apical setæ slender and somewhat divergent. Eye normally developed. Anterior antennæ

[1]) "Colour pale, with a ruby-coloured fascia on the 2nd and 3rd, or 2nd, 3rd, and 4th segments of cephalothorax." (Norman).

(in female) somewhat dilated in the middle, 9-articulate, terminal part abruptly narrowed. Posterior antennæ with the outer ramus less fully developed than in *Aspidiscus*. Mandibles, maxillæ and anterior maxillipeds of a structure very similar to that in the above-named genus. Posterior maxillipeds, however, differing in the presence of 3 strong claws at the tip. First pair of legs, as in *Aspidiscus*, very delicate, with both rami 3-articulate, though differing conspicuously in structure from those in that genus, outer ramus much shorter than the inner, with the terminal joint very small, and carrying on the tip a number of closely-disposed pulvilliform spines; inner ramus with the 2nd joint well developed, the last one carrying 2 densely fimbriate spines. Natatory legs with the middle joint of the inner ramus in all pairs carrying 2 setæ. Last pair of legs less strongly built than in *Aspidiscus*, proximal joint comparatively short and bilobed at the end, distal joint oblong, lamellar. Ovisac normal.

Remarks.—This genus was established by Philippi in the year 1840, to include a species found by him in the Mediterranean at Sorrento. The genus *Scutellidium* of Claus is unquestionably identical with Philippi's genus, and as that name is of much later date, it must cede the place to that proposed by Philippi. The genus is nearly allied to *Aspidiscus*, but differs in some characters rather conspicuously, both as regards the external appearance of the body and the anatomical details. In addition to the typical species, 2 other closely-related forms have been described, the one, *Scutellidium Arthuri* Poppe, from the Behring Sea, the other, *S. plumosum* Brady, from New Zealand.

50. Psamathe longicauda, Philippi.

(Pl. XLIX).

Psamathe longicauda, Philippi, in Wiegm. Archiv f. Naturgesch. 1840, p. 189, Pl. IV, fig. 1.

Syn: *Scutellidium thisboides*, Claus.

Specific Characters.—Female. Anterior division of body moderately expanded, oval in form, and scarcely at all narrowed behind. Cephalic segment occupying about half the length of the anterior division, and gradually contracted anteriorly, front narrowly rounded. Epimeral plates of the 3 succeeding segments of moderate size, discontiguous at the tips; 4th segment rather broad, with the posterior edge only very slightly incurved in the middle. Last segment of metasome extremely small, but wholly uncovered. Urosome about half the length of the anterior division, and gradually tapered behind; genital segment somewhat dilated in front, and imperfectly divided in the middle, lateral edges in this and

the 2 succeeding segments finely ciliated; anal segment comparatively short and deeply incised in the middle. Caudal rami about as long as they are broad and transversely truncated at the tip, apical setæ much elongated, the innermost but one exceeding twice the length of the urosome. Anterior antennæ rather robust and densely setiferous, the first 3 joints rather large and inflated, 4th joint much shorter and produced at the end anteriorly to a conical process carrying the sensory filament, terminal part abruptly attenuated and not attaining half the length of the proximal part, last joint linear and fully as long as the other 4 combined. Posterior antennæ with the outer ramus scarcely exceeding half the length of the inner, and 4-articulate. First pair of legs with the outer ramus scarcely longer than the basal joint of the inner, and carrying on the tip 4 pulvinular, recurved spines accompanied by a slender ciliated seta. Last pair of legs with the terminal joint more than twice as long as the basal one, and narrow lozenge-shaped in form, with one short apical seta and 4 more slender lateral ones, edges of the joint densely hairy.

Colour yellowish, with a more or less distinct rosy tinge, outer part of anterior antennæ dark violaceous.

Length of adult female 0.88 mm.

Remarks.—The above-described form is unquestionably that recorded by Claus and other authors as *Scutellidium thisboides*, the identity of which with Philippi's *Psamathe longicauda* I cannot doubt. Whether the 2 forms described as *Scutellidium Arthuri* Poppe and *S. plumosum* Brady, are in reality specifically distinct from the type, seems to me somewhat questionable.

Occurrence.—This form seems to be of very rare occurrence off the Norwegian coast. I only succeeded last summer in securing a few female specimens at Kopervik and Bukken in the lower part of the Stavanger Fjord. The specimens occurred together with *Aspidiscus littoralis* close to the shore on the fronds of *Laminaria digitata* at low-water mark.

Distribution.—British Isles (Brady), coast of France (Canu), Mediterranean (Philippi, Claus), Black Sea (Karawaiew), ? Franz Josef Land (Scott).

Gen. 23. **Machairopus**, Brady, 1883.

Generic Characters.—Anterior division of body much depressed, with the cephalic segment very large, rostral projection obtuse, not defined at the base.

Epimeral plates of the 3 succeeding segments discontiguous at the tips. Last segment of metasome very small, but wholly exposed. Urosome of moderate length and much narrower than the anterior division, genital segment distinctly divided in the middle. Caudal rami resembling those in *Psamathe*, but with the apical setæ less elongated. Eye quite normal. Anterior antennæ comparatively slender, 9-articulate, not dilated in the middle. Posterior antennæ with the outer ramus more fully developed than in *Psamathe*. Mandibles with the palp rather large, though of quite normal structure. Maxillæ with the epipodal lobe well developed and, as in *Psamathe*, carrying 2 large plumose setæ. Maxillipeds comparatively more strongly built than in that genus, the anterior ones with 2 well-developed lateral lobes, the one close to the base, the other at the junction with the slender unguiform terminal joint; the posterior ones terminating in a strong claw accompanied by 3 or 4 slender setæ. First pair of legs with the inner ramus much as in *Psamathe*, outer ramus rather short and stout, with the middle joint thickened, and armed on the lower face, close to the base, with a strong, claw-like spine curving outwards, last joint very short, with the 4 apical spines not pulvinular, being bent outwards and, like those in the genus *Idya*, densely ciliated along the outer part of the anterior edge. Middle joint of inner ramus in 2nd pair of legs with 2 natatory setæ, that in the 2 succeeding pairs with only a single such seta. Last pair of legs comparatively smaller than in *Psamathe*, and more lamellar.

Remarks.—This genus was established in the year 1883 by Prof. Brady, to include a species, *M. idyoides* Brady, found during the Challenger Expedition at the Kerguelen Islands. As observed by that author, the genus is somewhat intermediate between *Psamathe* (Scutellidium) and *Idya*, resembling in some particulars the former genus, in others the latter. Among the characters assigned to this genus by Prof. Brady, is the presence of 2 widely-distant eyes; but this statement must, I suppose, be due to a miscomprehension, the chitinous thickenings at the insertion of the anterior antennæ having in all probability been mistaken for eyes. The true visual organ, as in most other Harpacticoida, very soon becomes inconspicuous in preserved specimens through the dissolving action of the alcohol. There still remain, however, sufficient characters in support of this genus; and its validity is moreover now proved by the discovery in the northern ocean of another form, which, though closely agreeing with the type in all essential anatomical details, is yet evidently specifically distinct.

51. Machairopus minutus, G. O. Sars, n. sp.

(Pl. L).

Specific Characters.—Female. Form of body comparatively short and stout, with the anterior division broad and depressed, the posterior abruptly much narrower. Cephalic segment about the length of the 3 succeeding ones combined, and, seen dorsally, almost crescent-like, being evenly rounded in front and having the lateral corner much expanded. Penultimate segment nearly transversely truncated behind. Last segment of metasome very small, but wholly uncovered. Urosome scarcely attaining half the length of the anterior division, and gradually tapering behind, lateral edges of the segments finely ciliated. Caudal rami about as long as they are broad, and transversely truncated at the tip, innermost but one of the apical setæ not nearly attaining twice the length of the urosome. Anterior antennæ rather slender and gradually attenuated, 2nd joint but little longer than the 3rd, 4th about half the length of the latter, terminal part half as long as the proximal part, with the last joint shorter than the other 4 combined. Posterior antennæ with the outer ramus about half the length of the inner, and 4-articulate. First pair of legs of almost exactly the same structure as in the type species. Last pair of legs with the basal joint somewhat lamellar, and produced at the end inside to a conical process carrying 2 plumose setæ, terminal joint scarcely longer than the basal one, and of oval form, narrowly truncated at the tip, and provided with 3 apical and one lateral plumose seta.

Body of whitish colour, with a broad rosy band across the cephalic segment, and another of the same colour across the anterior part of the urosome.

Length of adult female 0.65 mm.

Remarks.—This is a much smaller species than that originally described by Brady, the length of which is recorded to be almost twice as large (1.30 mm.). In its external appearance this form looks very like some species of the genus *Idya*, especially *I. minor* Scott, and at the first sight may be easily confounded with that species. On a closer inspection, however, it is distinguished by the comparatively broader and more depressed anterior division, and by the rather different structure of the anterior antennæ. The colour also is rather characteristic.

Occurrence.—I have occasionally found this interesting form in several places on the west coast of Norway, for instance at Aalesund, Christiansund, Haugesund and Kopervik. It is a strictly littoral form, occurring close to the shore among algæ.

Distribution.—Polar islands north of Grinnell Land (2nd Fram Expedition).

Gen. 24. **Idya**, Philippi, 1843.

Syn: *Thisbe*, Lilljeborg.

Generic Characters.—Body more or less distinctly depressed, with the anterior and posterior divisions sharply defined. Cephalic segment of moderate size and narrowly produced in front, rostral projection short and obtuse, not defined at the base. Epimeral plates of the 3 succeeding segments rather broad, lamellar, obtuse at the tips. Last segment of metasome very small. Urosome moderately slender, with the genital segment in female more or less distinctly divided in the middle, genital tubercles in male each armed with a strong posteriorly-pointing spine. Caudal rami generally short but, with some of the apical setæ much elongated. Eye normal. Anterior antennæ more or less slender and attenuated, 8-articulate, sensory filament of 4th joint very fully developed; those of male slightly transformed, subprehensile. Posterior antennæ with the outer ramus well developed, 4-articulate. Anterior lip rather prominent, tapering distally, terminal edge minutely denticulate. Mandibles with the masticatory part rather slender and coarsely dentated at the tip, palp of comparatively simple structure, though distinctly biramous. Maxillæ with the palp only very slightly lobular, epipodal lobe wholly absent. Both pairs of maxillipeds uncinate at the tip, the anterior ones biarticulate, with a single very slender lateral lobe at the junction of the two joints, the posterior ones distinctly 3-articulate, with a single slender apical claw. First pair of legs with both rami 3-articulate, but rather unequal in size and structure, the inner one much longer than the outer and having the penultimate joint more or less prolonged, the last very small with 2 comparatively short claws; outer ramus with the spine of the 1st joint, as a rule, much elongated, that of 2nd joint issuing from near the end, last joint provided at the inner corner with 2 slender ciliated setæ, and along the obliquely truncated end with 4 outward-curving spines gradually increasing in length, and each, like that of the 2nd joint, penicillate at the tip, or clothed on one edge with a limited number of long cilia. Natatory legs comparatively largely developed, with the rami nearly equal and the joints rather broad sublamellar; middle joint of inner ramus in all pairs with 2 natatory setæ. Last pair of legs more or less slender, extended laterally, proximal joint only very slightly expanded inside, distal joint generally narrow, linear; those in male not very different, though somewhat smaller than in female.

Remarks.—This genus was established in the year 1843 by Philippi, to include a Mediterranean species, *I. barbigera* Phil. Prof. Lilljeborg did not recognise the Philippian genus, and established a new genus, *Thisbe*, for the reception

of the form, previously described by Baird as *Canthocamptus furcatus*, a species which is undoubtedly closely allied to, if not identical with, that recorded by Philippi. Boeck was the first to call attention to this fact, and therefore restored the Philippian genus, which is now generally accepted. The genus is chiefly characterised by the comparatively simple structure of the oral parts, and by the peculiar penicillate appearance of some of the spines issuing from the outer ramus of the 1st pair of legs. It seems to comprise numerous species, which, however, are so closely related that they were not recognized as such by earlier carcinologists, but only as accidental varieties of the same species. To Dr. Th. Scott is due the statement by a careful anatomical examination, that these supposed varieties in reality ought to be considered as distinct species, since their distinctive characters have proved to be perfectly constant and independent of external conditions. Dr. Scott has described 6 different species from the Scottish coast, and I have myself been enabled to distinguish no less than 9 Norwegian species, to be described below. The genus seems to be represented in all parts of the oceans, and I have even found one or two species of this genus in the Caspian Sea.

52. Idya furcata (Baird).

(Pl. LI, Pl. LII, fig. 1).

Canthocamptus furcatus, Baird, Brit. Entomostraca, p. 210, Pl. XXV, figs. 1 & 2, Pl. XXX, figs. 1—6.

? Syn: *Idya barbigera*, Philippi.

Specific Characters.—Female. Body moderately slender, with the anterior division, seen dorsally, regularly oval or elliptical in outline, being evenly narrowed both in front and behind. Urosome about half the length of the anterior division and gradually tapered behind, genital segment very distinctly divided in the middle. Caudal rami scarcely as long as the anal segment, outermost and innermost apical setæ comparatively short, the latter somewhat angularly bent at the base. Anterior antennæ of moderate length and gradually tapered distally, 2nd joint exceeding the 3rd in length, 4th joint shorter than either of these joints, terminal part about twice the length of the 4th joint. First pair of legs with the outer ramus extending somewhat beyond the 1st joint of the inner, 2nd joint of the latter but slightly attenuated, last joint very small, with the apical claws comparatively short and somewhat unequal, the one quite smooth, the other penicillate at the tip. Last pair of legs with the inner expansion of

the proximal joint broadly rounded and carrying 3 setæ, the middle one rather slender, the other 2 very small, distal joint moderately elongated, sublinear in form, with 5 slender setæ, 3 of which issue from the tip, 2 from the outer edge close to the end. Ovisac oval in form and generally very large, containing numerous ova or embryos, its colour varying, according to the development, from dark green to light yellowish red.

Male much smaller than female and of more slender form. Anterior antennæ more strongly built and distinctly geniculate. Last pair of legs of smaller size than in female, one of the apical setæ of the distal joint transformed to a strong ciliated spine.

Body in female of a whitish colour, and more or less distinctly banded transversally with a clear crimson; ovarial tubes generally of a very dark colour.

Average length of adult female about 1 mm., of male 0.65 mm.; maximum length of deep-water variety 1.50 mm.

Remarks.—The specific name *furcata* assigned to this form by Baird, refers to the strong development of the sensory filament issuing from the 4th joint of the anterior antennæ, which gives these organs the appearance of being bifurcate at the end. This is, however, a feature common to all the species of this genus. Whether the *Idya barbigera* of Philippi in reality belongs to this species or to some nearly-allied form, it is impossible at present to decide with perfect certainty; but as the present species is by far the commonest, there is good reason for believing the two to be identical. In any case, however, the specific name proposed by Baird must be retained as the older one. Besides the usual littoral form, another form of considerably larger size is occasionally met with in somewhat greater depths among decaying algæ. I have carefully compared this form with the usual one, but have failed to detect any perceptible anatomical difference.

Occurrence.—This is perhaps the commonest and most widely distributed of all our Harpacticoida, being found everywhere along the Norwegian coast, and generally in great numbers, close to the shore among algæ. It is also very often left in tidal pools together with other littoral forms. It is a very active little creature, swimming about with great speed, now and then affixing itself to the fronds of the algæ or to the walls of the vessel in which it is being observed.

Distribution.—Arctic Ocean, widely distributed, British Isles, Kattegat, coast of France, Mediterranean, the Red Sea (A. Scott), New Zealand (Brady), Chatham Islands (the present author).

53. Idya minor, Scott.

(Pl. LII, fig. 2).

Idya minor, Th. Scott, in Annals of Scottish Nat. Hist. 1896, p. 228, Pl. IV, figs. 11—17.

Specific Characters.—Female. Form of body on the whole considerably shorter and stouter than in *I. furcata*, with the anterior division only very slightly contracted behind, and the epimeral plates more closely contiguous. Urosome about half the length of the anterior division, and of nearly uniform width throughout. Caudal rami very short, with the apical setæ less elongated than in the other species. Anterior antennæ comparatively shorter than in *I. furcata*, with the 2nd and 3rd joints of about equal length. First pair of legs with the outer ramus scarcely extending beyond the 1st joint of the inner; 2nd joint of the latter comparatively longer and more attenuated than in *I. furcata*. Last pair of legs with the inner expansion of the proximal joint narrowly rounded at the tip, the outermost of the 3 marginal setæ considerably longer than the innermost; distal joint subspatulate in form, gradually widening towards the end.

Colour whitish.

Length of adult female 0.57 mm.

Remarks.—This is the smallest of the Norwegian species of *Idya*, and thus fully deserves the name given to it by Th. Scott. The size of the Norwegian specimens is even inferior to that recorded by Scott, which gives the length of the animal as 0.70 mm. It is, moreover, easily distinguished from *Idya furcata* by the much shorter and more compact form of body, in which respect it somewhat resembles the above-described *Machairopus minutus*.

Occurrence.—I have found this form occasionally in several places on the west coast of Norway in comparatively shallow water, on a muddy bottom.

Distribution.—Scottish coast (Scott), Franz Josef Land (same author).

54. Idya ensifera (Fischer).

(Pl. LIII, fig. 1).

Thisbe ensifera, Seb. Fischer in Abhandl. d. K. Bayer. Akad. Vol. VIII, p. 668, Pl. III, figs. 67—70.

Specific Characters.—Female. General form of body about as in *I. furcata*. Urosome, however, comparatively more slender, exceeding half the length of the anterior division. Caudal rami very short, apical setæ, on the other hand much elongated, the outermost and innermost ones being much longer than in *I. furcata*. Anterior antennæ likewise more elongated than in that species, and

more richly setiferous, 3rd joint rather narrow and somewhat exceeding in length the 2nd. First pair of legs with the inner ramus fully twice as long as the outer, 2nd joint comparatively slender, apical claws of about the same structure as in the 2 preceding species. Natatory legs with the rami more slender than in *I. furcata*, the 3rd joint of the outer ramus in 4th pair being especially of a very narrow form. Last pair of legs with the inner expansion of the proximal joint narrowly rounded and having all 3 marginal setæ well developed, distal joint exceedingly slender and elongated, narrow linear in form, and having one of the lateral setæ at some distance from the others.

Body of a whitish colour, faintly tinged with light red.

Length of adult female about 1 mm.

Remarks.—I think I am right in considering the above-described form to be identical with that recorded by Seb. Fischer as *Thisbe ensifera*. In size and external appearance it is very like *I. furcata*, and was also adduced to that species by Prof. Brady. On a closer examination, however, it is found to differ in the more elongated and more richly setiferous anterior antennæ, and especially in the exceedingly slender form of the distal joint of the last pair of legs. In the structure of the other legs also, and in the relative length of the caudal setæ, well-marked differences from *I. furcata* are found to exist.

Occurrence.—This form is by no means unfrequent off the Norwegian coast. In the upper part of the Christiania Fjord, for instance, it occurs rather plentifully in depths ranging from 6 to 20 fathoms; and I have also met with it in several localities on the west coast, and even in Finmark.

Distribution.—Madeira (Fischer).

55. Idya tenera, G. O. Sars, n. sp.

(Pl. LIII, fig. 2).

Specific Characters.—Female. Form of body very slender, with the anterior division, seen dorsally, oblong fusiform in outline, and the epimeral plates separated by deep lateral incisions. Urosome about half the length of the anterior division, and gradually tapering distally. Caudal rami very short, apical setæ somewhat less elongated than in *I. ensifera*. Anterior antennæ moderately slender, with the 3rd joint fully as long as the 2nd. First pair of legs with the inner ramus comparatively shorter than in *I. ensifera* and more resembling that in *I. furcata*, 2nd joint, however, scarcely longer than the 1st. Last pair of legs with

the proximal joint only very slightly expanded inside, but carrying the 3 usual marginal setæ; distal joint rather slender, resembling in form that in *I. furcata*.

Body of a whitish colour, without any distinct pigmentary ornament.

Length of adult female 0.78 mm.

Remarks.—This new species is nearly allied to *I. furcata*, but is of much smaller size and more slender form of body. In the relative length of the joints of the anterior antennæ, it somewhat resembles *I. ensifera;* but the structure of the 1st and last pairs of legs is rather different.

Occurrence.—I have found this form in considerable abundance in some localities on the west coast of Norway, for instance at Herø, Kopervik and Bukken, and occasionally also off the Finmark coast. It is a sublittoral form, generally occurring near the shores in campany with *I. furcata*, ovigerous females of both species being at once distinguished by their very different size.

56. Idya longicornis, Scott.

(Pl. LIV, fig. 1).

Idya longicornis, Th. Scott, in Ann. & Mag. of Nat. Hist. ser. 6, Vol. XV, p. 461, Pl. XVII, figs. 10—17.

Specific Characters.—Female. Form of body rather slender, with the anterior division, seen dorsally, oval fusiform in outline, epimeral plates comparatively broad, subcontiguous, except the last pair. Urosome about half the length of the anterior division and rather narrow, only slightly tapering distally. Caudal rami short, apical setæ, however, much elongated. Anterior antennæ exceedingly slender and attenuated, with the 3rd and 4th joints unusually narrow and elongated, both being of about equal length, and somewhat exceeding that of the 2nd joint; terminal part extremely narrow, and scarcely longer than the 4th joint. First pair of legs of inconsiderable size in proportion to the body, and somewhat resembling in structure those in *I. furcata*, the outer ramus extending considerably beyond the 1st joint of the inner. Last pair of legs with the proximal joint only very slightly expanded inside, the innermost of the marginal setæ comparatively short; distal joint very narrow, linear in form, being nearly 6 times as long as it is broad.

Body of a whitish colour, with a slight bluish green tinge, and exhibiting at the posterior part of the cephalic segment a short transverse band of a dark violaceous hue, and another similar band across the middle of the urosome; anterior antennæ with a small patch of the same colour near the end.

Length of adult female 1.50 mm.

Remarks.—This is one of the larger species of *Idya*, the length being recorded by Scott as even reaching 1.70 mm. The Norwegian specimens are not quite as large, but otherwise agree perfectly with the description given by that author. The species is especially characterised by the peculiar appearance of the anterior antennæ in the female, these appendages being quite unusually slender, and particularly distinguished by the great length and narrowness of the 3rd and 4th joints.

Occurrence.—I took this form, many years ago, at Christiansund and Sauesund, close to the shore among algæ; and even at that time I recognized it as a distinct species, to which the provisional name *I. nobilis* was given. It seems to be rather local in its occurrence, as no specimens have been found in the large material collected during recent years in other parts of the coast.

Distribution.—Scottish coast (Scott).

57. Idya elegantula, G. O. Sars, n. sp.

(Pl. LIV, fig. 2).

Specific Characters.—Female. Body moderately slender, with the anterior division, seen dorsally, oval in outline, being only slightly narrowed behind. Cephalic segment very large, considerably exceeding in length that of all the free segments of metasome combined, and gradually tapering in front to an obtuse point. Epimeral plates closely contiguous, and rounded at the tips. Urosome about half the length of the anterior division, and slightly attenuated distally, with the genital segment imperfectly divided in the middle. Caudal rami somewhat more produced than in the 4 preceding species, but otherwise of a very similar appearance. Anterior antennæ very slender, resembling in structure those in *I. longicornis*, but with the 3rd joint comparatively more elongated, exceeding in length both the preceding and succeeding joints. First pair of legs with both rami unusually slender, the inner one being, as usual, the longer, and having the 2nd joint much longer than the 1st and greatly attenuated distally; apical spines of outer ramus more slender than in any of the 4 preceding species. Last pair of legs with the distal joint much elongated, sublinear in form, one of the marginal setæ placed at rather a long distance from the others. Ovisac containing only a very limited number of comparatively large ova.

Body of a pale yellow colour, with several interrupted transverse bands of a clear chestnut brown across both the anterior and posterior divisions.

Length of adult female 0.80 mm.

Remarks.—In the structure of the anterior antennæ this form somewhat resembles *I. longicornis*. It is, however, of much inferior size, and moreover differs conspicuously from that species in the peculiarly slender form of the 1st pair of legs, in which respect it agrees more closely with the succeeding species, *I. gracilis*, Scott.

Occurrence.—Only a solitary female specimen of this beautiful species has as yet come under my notice. It was taken, many years ago, at Christiansund in a depth of 50—60 fathoms. The figure of the animal here given is a copy of the coloured drawing made from the specimen when still alive.

58. Idya gracilis, Scott.

(Pl. LV, fig. 1).

Idya gracilis, Th. Scott, Additions to the Fauna of the Firth of Forth; 13th Annual Report of the Fishery Board for Scotland, p. 171, Pl. IV, figs. 13—21.

Specific Characters.—Female. Body comparatively slender, attenuated behind. Cephalic segment rather broad, and somewhat exceeding in length that of the 3 succeeding segments combined. Epimeral plates broadly rounded, subcontiguous. Urosome considerably exceeding half the length of the anterior division, and gradually tapering distally. Caudal rami unusually produced, being nearly twice as long as they are broad, outermost and innermost of the apical setæ comparatively short, seta of the outer edge somewhat remote from the apex. Anterior antennæ of moderate length, 2nd joint the largest, 3rd and 4th of about equal length. First pair of legs with both rami very slender, somewhat resembling in structure those in *I. elegantula*, inner ramus, as usual, the longer, with the 2nd joint nearly twice as long as the 1st and much attenuated distally; apical claws of this ramus comparatively short. Terminal spines of outer ramus, on the other hand, exceedingly slender, each with only a few cilia at the tip. Last pair of legs with the proximal joint comparatively small, distal joint, however, rather elongated, oblong fusiform in shape, with one of the marginal setæ considerably remote from the others, issuing nearly from the middle of the outer edge.

Male not much smaller than female, and exhibiting the usual sexual differences. In the 2nd pair of legs, moreover, the seta of the 1st joint of the inner ramus is peculiarly modified, being transformed into a strong spine minutely bidentate at the tip.

Colour not yet determined.

Length of adult female about 1 mm.

Remarks.—This form, recently described by Th. Scott, may, on a close examination, be at once distinguished from any of the other species of *Idya* by the unusual production of the caudal rami. The structure of the 1st and last pair of legs, moreover, is rather characteristic.

Occurrence.—On examining the preserved material collected during the last 2 years from the sublittoral region off the west coast of Norway, at Aalesund, Kopervik and Bukken, I have succeeded in finding several specimens, both females and males, of this distinct species. It also occurs off the Finmark coast, as proved by the examination of some samples taken by Mr. Nordgaard and kindly forwarded to me.

Distribution.—Scottish coast (Scott).

59. Idya angusta, G. O. Sars, n. sp.

(Pl. LV, fig. 2).

Specific Characters.—Female. Body exceedingly slender and elongated, with the anterior division, seen dorsally, oblong in form. Cephalic segment exceeding in length that of the 3 succeeding segments combined, and, as usual, conically produced in front. Epimeral plates discontiguous, being separated by deep lateral incisions. Urosome extremely narrow, cylindrical in form, and exceeding half the length of the anterior division, genital segment distinctly divided in the middle. Caudal rami comparatively short, apical setæ, however, much elongated. Anterior antennæ slender, with the 3rd joint rather elongated, exceeding in length both the preceding and succeeding joints. First pair of legs less slender than in the 2 preceding species, 2nd joint of inner ramus scarcely longer than the 1st, last joint imperfectly defined and having the apical claws comparatively elongated and subequal, both penicillate at the tip. Last pair of legs unusually small, distal joint oval in form, being scarcely more than twice as long as it is broad, one of the marginal setæ attached to about the middle of the outer edge.

Colour not yet determined.

Length of adult female 0.87 mm.

Remarks.—In the exceedingly slender and narrow form of the body, this species bears a strong resemblance to a form described by Mr. A. Scott from the Irish Sea as *I. elongata.* It differs very essentially, however, in the much more slender and elongated anterior antennæ, these appendages in the Irish form being, on the contrary, unusually short and compact. The structure of the 1st and last pairs of legs also seems, to judge from the figures given, to be rather different in the 2 species.

Occurrence.—Only a solitary female specimen of this form has as yet come under my notice. It was taken, many years ago, at Herø, west coast of Norway, the depth not being recorded.

60. Idya finmarchica, G. O. Sars, n. sp.

(Pl. LVI).

Specific Characters.—Female. Body of comparatively robust form and much depressed, with the anterior division, seen dorsally, broadly oval in form. Cephalic segment considerably expanded, and about the length of the 3 succeeding segments combined. Epimeral plates broad and rounded at the tips, subcontiguous. Urosome about half the length of the anterior division, and gradually tapering distally, genital segment very distinctly divided in the middle, anal segment extremely small. Caudal rami somewhat produced, though comparatively shorter than in *I. gracilis*, innermost and outermost of the apical setæ comparatively short, seta of outer edge placed about in the middle. Anterior antennæ rather short and stout, not nearly attaining the length of the cephalic segment, 2nd joint the largest, though scarcely longer than the 3rd. Posterior antennæ and oral parts, as also the natatory legs, of exactly the same structure as in *I. furcata*. First pair of legs, however, rather different, with the rami comparatively more slender, the inner one being, as usual, the longer and having the 2nd joint of greater length than the 1st, though scarcely at all attenuated distally; last joint very small, but well defined, and carrying on the tip 2 remarkably slender subequal claws, both perfectly smooth. Terminal spines of outer ramus rather slender, each with only a few cilia at the tip. Last pair of legs rather fully developed, basal joint moderately expanded inside, with 2 of the marginal setæ very small, terminal joint large, oblong fusiform in shape and densely hairy, one of the marginal setæ remote from the others, and attached somewhat beyond the middle of the outer edge. Ovisac large.

Colour not yet determined.

Length of adult female 1.20 mm.

Remarks.—At first I believed this form to be the *I. clathæ* of Scott, on account of the peculiarly slender form of the apical claws of the inner ramus of the 1st pair of legs. Having recently, however, through the kindness of Th. Scott, had the opportunity of examining one of his specimens, I find that these 2 forms are evidently specifically distinct the one from the other. *I. clathæ* is a much smaller and more slender species, and has the anterior antennæ consider-

ably more elongated than the Norwegian species. Well-marked differences also seem to exist between the 2 species in the structure of the 1st and last pair of legs.

Occurrence.—Several specimens of this interesting form were found in some samples kindly forwarded to me by Mr. Nordgaard, who took them off the Finmark coast, partly at Repvaag, partly at Mehavn. Farther south this species does not seem to occur, being in all probability a true arctic form.

Gen. 25. **Idyopsis**, G. O. Sars, n.

Generic Characters.—Body short and depressed, somewhat resembling in form that in *Idya*, the anterior division being more or less expanded, the posterior abruptly much narrower. Rostral projection small, not defined at the base. Anterior antennæ not much elongated, 8-articulate, sensory filament of 4th joint much smaller than in *Idya*. Posterior antennæ with the outer ramus well developed, 3- or 4-articulate. Anterior lip of usual form. Mandibles with the palp rather fully developed, biramous. Maxillæ of quite normal structure, the epipodal lobe being well defined. Anterior maxillipeds of rather compact form, with all the lateral lobes distinctly developed, the outermost armed with one or two strong claws; terminal part distinct, 3-articulate, setiferous. Posterior maxillipeds well developed, 3-articulate, carrying on the tip 3 strong claws. First pair of legs with the outer ramus much shorter than the inner, and somewhat resembling that in *Idya*, the lateral and apical spines being provided along the outer part of one edge with slender cilia, inner ramus distinctly 3-articulate, with the 1st joint rather large, the other 2 much smaller and subequal in size, last joint carrying 2 slender claws on the tip, and inside 2 short setæ. Natatory legs resembling in structure those in *Idya*, middle joint of inner ramus, however, in the posterior pair with only a single seta. Last pair of legs, as in *Idya*, extended laterally, distal joint narrow and elongated.

Remarks.—This new genus somewhat resembles *Idya*, as regards the general form and composition of the body, but differs rather essentially in some of the anatomical details, especially in the structure of the oral parts. Two well-defined species of this genus occur off the Norwegian coast.

61. Idyopsis dilatata, G. O. Sars, n. sp.

(Pl. LVII, fig. 1).

Specific Characters.—Female. Anterior division of body much dilated, with the cephalic segment very largely expanded, and about twice as long as the 3 succeeding segments combined, lateral edges boldly curved, front bluntly rounded. Epimeral plates rather narrow, acutangular at the tips. Last segment of metasome extremely small, but wholly exposed. Urosome comparatively short, not attaining half the length of the anterior division, genital segment rather large and expanded, its lateral edges minutely indented in the middle and finely ciliated. Caudal rami about as long as they are broad, and obtusely truncated at the tip; apical setæ of moderate length. Eye well developed. Anterior antennæ comparatively slender, though not nearly attaining the length of the cephalic segment, 2nd joint much the largest, terminal part considerably shorter than the last 2 joints of the proximal part combined. Posterior antennæ with the first 2 joints imperfectly defined, outer ramus 3-articulate. First pair of legs with the outer ramus scarcely exceeding in length the 1st joint of the inner, and having all 3 joints of about equal size. Last pair of legs very narrow, with the proximal joint scarcely at all expanded inside, distal joint narrow fusiform in outline, with one of the marginal setæ attached to about the middle of the outer edge. Ovisac rounded, containing only a limited number of comparatively large ova.

Body of a pale yellowish colour, with a slight rosy tinge; ovarial tubes reddish brown, forming on each side, within the cephalic segment, a remarkably large cæcal dilatation.

Length of adult female about half a millimetre (0.48 mm.).

Remarks.—This form may be easily recognised by the remarkably broad and flattened cephalic segment, a character which has given rise to the specific name here proposed.

Occurrence.—Some few female specimens of this species have been found at different times off the west coast of Norway (Skjerjehavn, Sauesund) in depths ranging from 10 to 30 fathoms.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exped.).

62. Idyopsis pusilla, G. O. Sars, n. sp.

(Pl. LVII, fig. 2).

Specific Characters.—Female. Anterior division of body less expanded than in the preceding species. Cephalic segment moderately dilated, and not nearly twice as long as the 3 succeeding segments combined. Epimeral plates comparatively broader and less extant, especially those of the last pair, which are obtuse at the tip. Urosome, as in the preceding species, rather short, genital segment less expanded, but more deeply indented on each side in the middle. Eye inconspicuous. Anterior antennæ comparatively shorter and stouter than in *I. dilatata*, with the terminal part about the length of the 2 preceding joints combined. Posterior antennæ with the first 2 joints distinctly defined, outer ramus comparatively short, but distinctly 4-articulate. Anterior maxillipeds remarkably large and robust, claw of outermost lobe coarsely spinulose on the one edge. First pair of legs closely resembling in structure those in *I. dilatata*, but with the outer ramus somewhat longer than the 1st joint of the inner. Last pair of legs with the proximal joint quite short, but produced inside to a narrow linguiform lamellar expansion, carrying on the tip 3 setæ, the middle one rather elongated; distal joint narrow fusiform in outline, seta of outer edge placed close to the apex.

Colour whitish.

Length of adult female 0.43 mm.

Remarks.—Though nearly allied to the preceding species, and evidently congeneric with it, this form is at once distinguished by the less expanded anterior division of the body, as also by the comparatively shorter and stouter anterior antennæ. The last pair of legs, also, are rather different in the 2 species.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were found, many years ago, at Magerø, south of the entrance to the Trondhjem Fjord, in a depth of about 40 fathoms.

Gen. 26. **Idyella**, G. O. Sars, n.

Generic Characters.—General form of body rather resembling that in *Idya*, the 2 chief divisions being very sharply defined from one another. Anterior antennæ comparatively short, and angularly bent at the base, 8-articulate.

Posterior antennæ comparatively slender, 3-articulate, with the outer ramus short, biarticulate. Mandibles, maxillæ and anterior maxillipeds resembling in structure those parts in *Idyopsis*. Posterior maxillipeds, however, much more slender, and having a very movable articulation between the first 2 joints, last joint carrying an elongated claw accompanied by 2 or 3 slender setæ. First pair of legs with the outer ramus about as in *Idyopsis*, inner ramus, however, only composed of 2 joints very movably articulated together, the last one carrying outside 3 short setæ and at the tip 2 very slender claws. Natatory legs with the rami rather slender and subequal in length, middle joint of inner ramus carrying in the 2 anterior pairs 2 setæ, in the posterior pair 1. Last pair of legs slender and, as in *Idyopsis*, extended laterally.

Remarks.—This genus is nearly allied to *Idyopsis*, but differs in some particulars, especially as regards the structure of the posterior maxillipeds and that of the 1st pair of legs. Of this genus also, 2 well-defined species have been found off the Norwegian coast.

63. Idyella pallidula, G. O. Sars, n. sp.

(Pl. LVIII, fig. 1).

Specific Characters.—Female. Anterior division of body rather broad and depressed; seen dorsally, oval fusiform in outline, with the greatest width somewhat behind the middle. Cephalic segment very large, about twice as long as the 3 succeeding segments combined, and gradually tapering anteriorly, front conically produced. Epimeral plates sub-contiguous, obtuse at the tips. Last segment of metasome very small. Urosome not attaining half the length of the anterior division, genital segment produced on each side, somewhat in front of the middle, to an obliquely posteriorly-pointing triangular lobe; 2nd segment simple. Caudal rami short, with the usual number of setæ, one of them issuing from the middle of the outer edge, the 2 middle apical setæ rather slender. Eye wholly absent. Anterior antennæ scarcely attaining half the length of the cephalic segment and clothed with comparatively short setæ, 2nd joint the largest, terminal part about the length of the 2 preceding joints combined. Posterior maxillipeds with the middle joint scarcely at all dilated, sublinear in form. First pair of legs with the outer ramus much curved and somewhat exceeding half the length of the inner, proximal joint of the latter rather broad, lamellar, with a strong plumose seta in the middle of the inner edge, distal joint much narrower than the proximal one, and more than half its length. Last pair of legs very narrow,

proximal joint scarcely at all expanded inside, distal joint somewhat longer, with one of the marginal setæ attached to the outer edge in front of the middle.

Colour pale whitish, with a slight yellowish grey tinge.

Length of adult female about half a millimetre.

Remarks.—This form may be easily recognised by the conically produced frontal part, the peculiar form of the genital segment, and the total absence of any visual organ.

Occurrence.—I have only met with this peculiar Copepod in the upper part of the Christiania Fjord, where some few female specimens were found in a depth of about 30 fathoms, muddy bottom.

64. Idyella exigua, G. O. Sars, n. sp.

(Pl. LVIII, fig. 2).

Specific Characters.—Female. Anterior division of body somewhat less expanded than in the preceding species, with the cephalic segment of inferior size, not attaining twice the length of the 3 succeeding segments combined, and more evenly contracted anteriorly, front narrowly rounded. Urosome somewhat exceeding half the length of the anterior division, genital segment exhibiting on each side 2 successive triangular lobes separated by a deep median incision; 2nd segment with the posterior corners conically produced. Caudal rami about as in *I. pallidula*, but with the seta of the outer edge obsolete. Eye very conspicuous even in preserved specimens, exhibiting 4 dark-coloured lenticular bodies arranged in pairs in the usual place. Anterior antennæ comparatively more robust than in the preceding species, with the terminal part shorter, not attaining the length of the 2 preceding joints combined. Posterior maxillipeds with the 2nd joint conspicuously dilated beyond the middle. First pair of legs resembling in structure those in *I. pallidula*, but with the proximal joint of the inner ramus less broad and fully twice as long as the distal one. Last pair of legs less slender, proximal joint produced at the end inside to a narrow conical projection carrying 2 slender setæ; distal joint densely hairy, with one of the setæ issuing from the lower face in front of the middle. Ovisac rounded, only containing a limited number of comparatively large ova.

Colour not yet determined.

Length of adult female 0.44 mm.

Remarks.—This form is unquestionably congeneric with the preceding one, as it exhibits the same characteristic structure of the posterior maxillipeds and

of the 1st pair of legs. It may, however, at once be distinguished from that species by the very distinctly developed eye, and also by the characteristic form of the genital segment.

Occurrence.—On examining more closely some samples taken last summer at Bukken, in the lower part of the Stavanger Fjord, just below a steep hill, I succeeded in finding several specimens of this small Copepod. Among them was also a male specimen, which exhibited sexual differences from the female quite analogous to those found in the genus *Idya*.

Fam. 10. Thalestridæ.

Characters.—Body of rather variable form, in some cases much depressed, in others almost cylindrical or even compressed laterally, the 2 chief divisions, however, never being so sharply defined from each other as in the *Idyidæ*. Eye, as a rule, well developed, in some cases of rather complex structure. Anterior antennæ not much elongated, and generally composed of 8 or 9 articulations; those in male distinctly geniculate. Posterior antennæ with the first 2 joints imperfectly defined, outer ramus comparatively small. Oral parts on the whole normal; posterior maxillipeds terminating in a more or less strong clawed hand. First pair of legs with both rami, as a rule, prehensile, armed at the tip with unguiform spines. Natatory legs with both rami 3-articulate, the outer one the longer; inner ramus of 2nd pair of legs in male more or less transformed. Last pair of legs foliaceous, not extended laterally, and much larger in female than in male, covering the ovisac more or less entirely. The latter always single.

Remarks.—This is perhaps the most extensive of all the Harpacticoid families, comprising, as it does, even in the restriction here adopted, numerous genera and species. The family to which it bears the closest relationship, is unquestionably that of the *Diosaccidæ*, to be treated of farther on, the chief distinction between the two being the duplicity or non-duplicity of the ovisac.

Gen. 27. **Thalestris,** Claus, 1863.

Generic Characters.—Body robust, more or less curved ventrally, with very thick and tough integuments. Cephalic segment large and somewhat compressed in front, with the epimeral parts deflexed and more or less deep, including between them most of the oral parts; rostral projection short and thick, deflexed, not defined at the base. Epimeral plates of the 3 succeeding segments very thin and deflexed. Last segment of metasome not much narrower than the the others, though with the epimeral plates less fully developed. Urosome in female 4-articulate, with the genital segment more or less expanded and exhibiting only slight traces of a subdivision; that of male distinctly 5-articulate. Caudal rami with the apical setæ, as a rule, very unequally developed. Eye large, in some cases combined with lenticular thickenings of the integument. Anterior antennæ (in female) 9-articulate, 4th joint with the usual sensory filament. Posterior antennæ with the terminal joint rather coarse, and armed with strong claw-like spines and geniculated setæ; outer ramus comparatively small, biarticulate. Mandibles thickly incrusted, with the cutting edge coarsely dentate, palp well developed, biramous, with the basal part more or less expanded distally. Maxillæ with all parts well developed. Anterior maxillipeds short and compact, with a strong claw at the outermost of the lateral lobes. Posterior maxillipeds very powerful, hand more or less strongly dilated, terminal claw strong and curved. First pair of legs with both rami 3-articulate and rather slender, subequal in length, middle joint of outer ramus much elongated, last 2 joints of inner one short, number of apical claws on the inner ramus 2, on the outer 2 or 3. Second pair of legs with the middle joint of inner ramus carrying 2 natatory setæ, in male confluent with the last joint, and armed outside with one or 2 deflexed spines. Last pair of legs in female generally very large, with both joints foliaceous, the proximal one forming a broad lamellar expansion inside.

Remarks.—This genus, established by Claus, is here taken in a much more limited sense than has been done by that author and by most other carcinologists. In the restriction here adopted, it is chiefly characterised by the comparatively robust body (which generally exhibits a more or less pronounced ventral curvature), the unusually thick and tough integuments, and the nature of the rostrum, which forms the immediate continuation of the cephalic shield, without being defined from it by any suture or indentation at the base. There are 5 species belonging to the Norwegian fauna, which will be described below.

65. Thalestris longimana, Claus.

(Pl. LIX & LX).

Thalestris longimana, Claus, Die freilebenden Copepoden, p. 130, Pl. XVIII, figs. 1—11.

Specific Characters.—Female. Body very robust, with the back more or less curved, and the segments of the anterior division sub-imbricate dorsally. Cephalic segment of very large size, and conspicuously compressed in its anterior part, the epimeral parts being very deep and arcuate. Rostral projection short and blunt at the tip. Urosome scarcely exceeding half the length of the anterior division, and having the segments very sharply defined; genital segment large and broad, seen dorsally, quadrangular in form, with the lateral parts lamellarly expanded; last segment very small, often almost wholly concealed by the preceding segment. Caudal rami comparatively short, not much longer than they are broad, and transversely truncated at the tip, each with a short seta at about the middle of the outer edge, innermost but one of the apical setæ much coarser than the others, and about equal in length to the urosome. Eye large and very conspicuous in living specimens. Anterior antennæ scarcely exceeding half the length of the cephalic segment, 2nd joint much the largest, about equal in length to the 2 succeeding joints combined, terminal part of about the same length. Anterior maxillipeds less compact than in the other species, with the claw of the outermost lateral lobe smaller, terminal part distinctly developed, narrow cylindrical and biarticulate. Posterior maxillipeds exceedingly large and powerful, with the hand considerably dilated, and forming a prominent angular projection below, defining the palm in front, the latter deeply concaved in the middle, with the edge densely spinulose throughout; terminal claw very strong and provided at the base inside with a slender spine. First pair of legs with both rami of equal length, the outer one somewhat narrower than the inner, and angularly bent near the base, each ramus armed at the tip with 2 unequal claws finely denticulate along the concave edge, and accompanied inside by a small, hair-like bristle; terminal joint of outer ramus, moreover, exhibiting on the outer edge 2 minute spinules. Last pair of legs exceedingly large, extending beyond the limits of the genital segment; distal joint oblong oval in form, and evenly rounded at the tip; inner expansion of proximal joint extending as far as the distal one, and somewhat narrowed in its outer part; marginal setæ of both joints comparatively short and simple.

Male somewhat smaller than female, and easily recognised by the more strongly built and geniculate anterior antennæ and the distinctly 5-articulate urosome. Inner ramus of 2nd pair of legs transformed in the usual manner. Last

pair of legs rather unlike those in female, and much smaller, distal joint narrow oblong in form, with some of the marginal setæ spiniform, inner expansion of proximal joint quite short, scarcely extending to the middle of the distal joint, and provided with only 3 marginal setæ, the outermost one spiniform. Genital tubercles with 3 subequal setæ.

Body of a golden yellow colour, more or less variegated with a dark reddish brown pigment, especially along the ventral face and at the posterior edges of the segments.

Length of adult female 1.40 mm., of male 1.20 mm.

Remarks.—This form I regard as the type of the genus *Thalestris*, in the restriction here adopted. It is one of our larger Harpacticoids, and is moreover easily recognizable by its very robust form and the exceedingly powerfully developed posterior maxillipeds, which somewhat resemble those in *Harpacticus chelifer*.

Occurrence.—I have found this form not unfrequently in several localities of the west coast of Norway, as far as to the Trondhjem Fjord, in moderate depths among algæ. It moves in the usual somewhat jumping manner. When disturbed, it curves its body more or less sharply ventrally, and remains in this attitude quite motionless for some time.

Distribution.—British Isles (Brady), Heligoland (Claus), coast of France (Canu).

66. Thalestris gibba (Krøyer).

(Pl. LXI).

Harpacticus gibbus, Krøyer, in "Gaimard" Voyage en Scandinavie, Pl. 43, figs. 2, a—p.

Syn: *Thalestris polaris*, Scott.

Specific Characters.—Female. Body somewhat more slender than in the preceding species, otherwise of a very similar aspect, with the back more or less gibbously curved, and the integuments very thick and tough. Cephalic segment, as in *T. longimana*, of considerable size and somewhat compressed anteriorly, with the epimeral parts rather deep and curved in the middle; rostral projection more prominent than in that species, and acutangular at the tip. Posterior edges of all the segments minutely crenulated. Urosome considerably exceeding half the length of the anterior division, and having the segments very sharply defined, the genital one of moderate size and less expanded than in *T. longimana:* last segment very small. Caudal rami unusually produced, being nearly 3 times as long as they are broad, apical setæ, on the other hand, much shorter than in

the said species, the innermost but one scarcely attaining half the length of the urosome, seta of the outer edge placed near the tip, and, like the outermost of the apical setæ, reduced to a small, knob-like spine. Anterior antennæ with the 2nd joint somewhat shorter than in *T. longimana*, terminal part nearly half the length of the proximal part. Posterior maxillipeds less powerfully developed than in that species, with the hand less dilated and the palm only slightly concaved, being defined in front by an obtuse angle. First pair of legs resembling in structure those in *T. longimana*, but with the rami somewhat narrower, apical claws scarcely at all denticulate. Last pair of legs well developed, though not nearly as large as in *T. longimana*, extending only somewhat beyond the middle of the genital segment, distal joint rounded oval in form and somewhat exserted at the tip, inner expansion of the proximal joint broadly rounded at the end, and scarcely extending as far as the distal joint; marginal setæ of both joints comparatively more elongated, some of them spiniform and minutely ciliated.

Male differing from the female in a manner analogous to that in the preceding species. Last pair of legs rather similar, but having the distal joint more attenuated towards the end, and the inner expansion of the proximal joint still shorter, with the 3 marginal setæ very unequal, the middle one being much elongated, whereas the outermost one is much reduced in size.

Colour of body, except the dorsal face of the cephalic segment, very dark bluish grey or almost black.

Length of adult female 1.50 mm.

Remarks.—This form was first figured (but not described) by Krøyer in the above-quoted work as *Harpacticus gibbus*. It was subsequently described by Th. Scott as a new species under the name of *Thalestris polaris*, he not having been aware of the fairly recognizable figures given of this species by Krøyer. It is nearly allied to *T. longimana*, though easily distinguishable by its more slender form, and especially by the much more produced caudal rami. When alive, it is also recognized at once by the very dark colour of its body.

Occurrence.—I have found this form in several localities on the west coast of Norway, and northwards along the whole Finmark coast as far as Vadsø. In some places it occurred in great numbers on a muddy bottom covered with decaying algæ, the depth being about 20 fathoms.

Distribution.—Franz Josef Land (Scott).

67. Thalestris rufoviolacens, Claus.

(Pl. LXII).

Thalestris rufoviolacens, Claus, Die Copepodenfauna von Nizza, p. 33, Pl. IV, figs. 18—22.

Specific Characters.—Female. Body comparatively short and stout, somewhat resembling in form that in *T. longimana.* Cephalic segment very large, with the epimeral parts deep and greatly curved in the middle; rostral projection somewhat prominent and acute at the tip. Urosome comparatively short, scarcely attaining half the length of the anterior division, genital segment large and rather broad in its anterior part; last segment, as usual, very small. Caudal rami extremely short, considerably broader than they are long, and densely clothed at the end with delicate filaments, the 2 larger of the apical setæ rather slender, and issuing close together from a knob-like projection at the inner corner below, outermost seta rather elongated and distant from the others. Anterior antennæ of the usual structure, 2nd joint rather large and tumid, terminal part nearly half the length of the proximal part. Posterior maxillipeds of moderate size, resembling those in *T. gibba.* First pair of legs likewise rather similar, though with the inner ramus somewhat shorter than the outer. Last pair of legs of quite extraordinary size, extending even beyond the 2nd caudal segment, both joints broad, foliaceous, and ornamented on the surface with a peculiar, as it were bipinnate marking; marginal setæ of both joints comparatively small and simple. Ovisac small, rounded, and almost wholly concealed by the lamellæ of the last pair of legs.

Male exhibiting the usual sexual differences from the female.

Body of a whitish colour, variegated with irregular patches, partly of a reddish, partly of a deep violaceous hue.

Length of adult female 0.90 mm.

Remarks.—The above-described form is unquestionably identical with that originally recorded by Claus as *T. rufoviolacens.* On the other hand the form so named by Brady does not belong to this species, but apparently to the next. The most characteristic features of the present form are the peculiar structure of the caudal rami and the extraordinary size of the last pair of legs in the female.

Occurrence.—Only 2 or 3 specimens of this form have hitherto come under my notice. They were taken, many years ago, at Herø, west coast of Norway, in moderate depths among algæ.

Distribution.—Mediterranean at Nice (Claus).

68. Thalestris brunnea, G. O. Sars, n. sp.

(Pl. LXIII).

Syn: *Thalestris rufoviolacens*, Brady (not Claus).

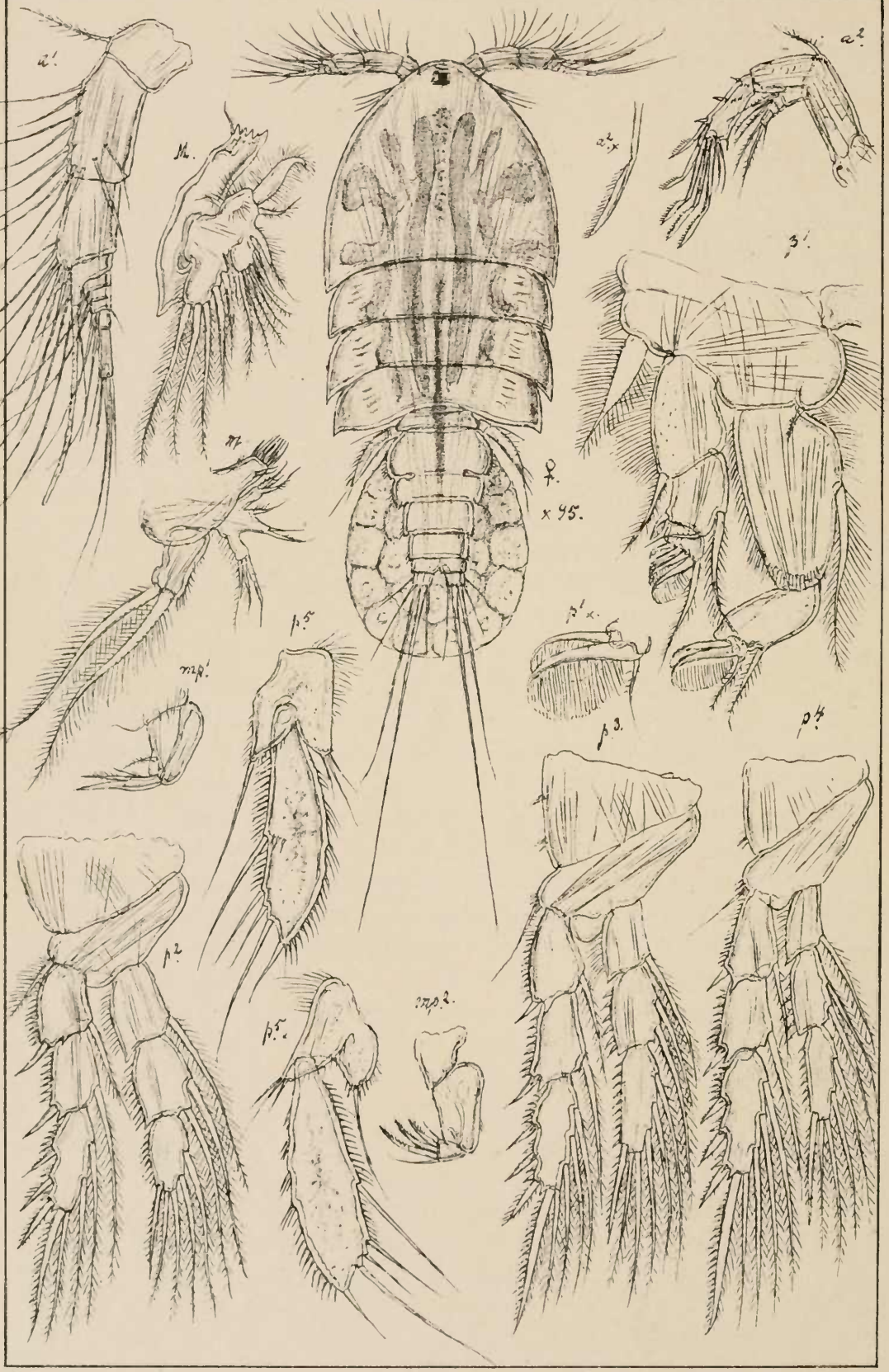
Specific Characters.—Female. Body very robust and somewhat depressed throughout its whole length; seen dorsally, slightly tapering behind. Integuments coarsely chitinized. Cephalic segment large and broad, occupying rather more than half the anterior division, epimeral parts less deep than in the 3 preceding species; rostral projection strong, deflexed, acutangular at the tip. Posterior edge of this and the 3 succeeding segments minutely crenulated. Urosome somewhat exceeding half the length of the anterior division, and slightly narrowed behind, genital segment almost twice as broad as it is long, and, like the 2 succeeding segments, having the lateral edges minutely ciliated; penultimate segment forming a triangular prominence behind, arching over the small last segment. Caudal rami short and broad, densely spinulose at the edges and with the apical setæ of inconsiderable length, the innermost but one being about half as long as the urosome. Eye very large and conspicuous in the living animal. Antennæ differing but little in structure from those in the other species. Mandibular palp, however, somewhat less fully developed, the basal part being only very slightly expanded distally. Anterior maxillipeds remarkably short and compact, with the innermost lateral lobe rather large, and divided into 2 diverging lappets, each carrying a thickish plumose seta, claw of outermost lobe very strong; terminal part rudimentary. Posterior maxillipeds likewise of an unusually compact structure, basal joint very short, hand much curved outside, palmar edge straight and imperfectly defined in front, terminal claw strong and much curved at the tip. First pair of legs with the outer ramus somewhat longer than the inner, and scarcely narrower, terminal joint armed with 3 unequal claws finely denticulated on the one edge, and moreover, at the inner corner, with a rather long curved seta, and outside the claws with a small spinule; inner ramus, as usual, carrying on the tip 2 claws, which are likewise finely denticulate and somewhat less unequal than in the preceding species. Last pair of legs of moderate size, extending somewhat beyond the middle of the genital segment, distal joint broadly oval in form and obtuse at the tip, inner expansion of proximal joint rather large, with 2 of the marginal setæ considerably produced and spiniform.

Colour of body, except the dorsal face of the cephalic segment, a deep brown, posterior edges of the segments still darker.

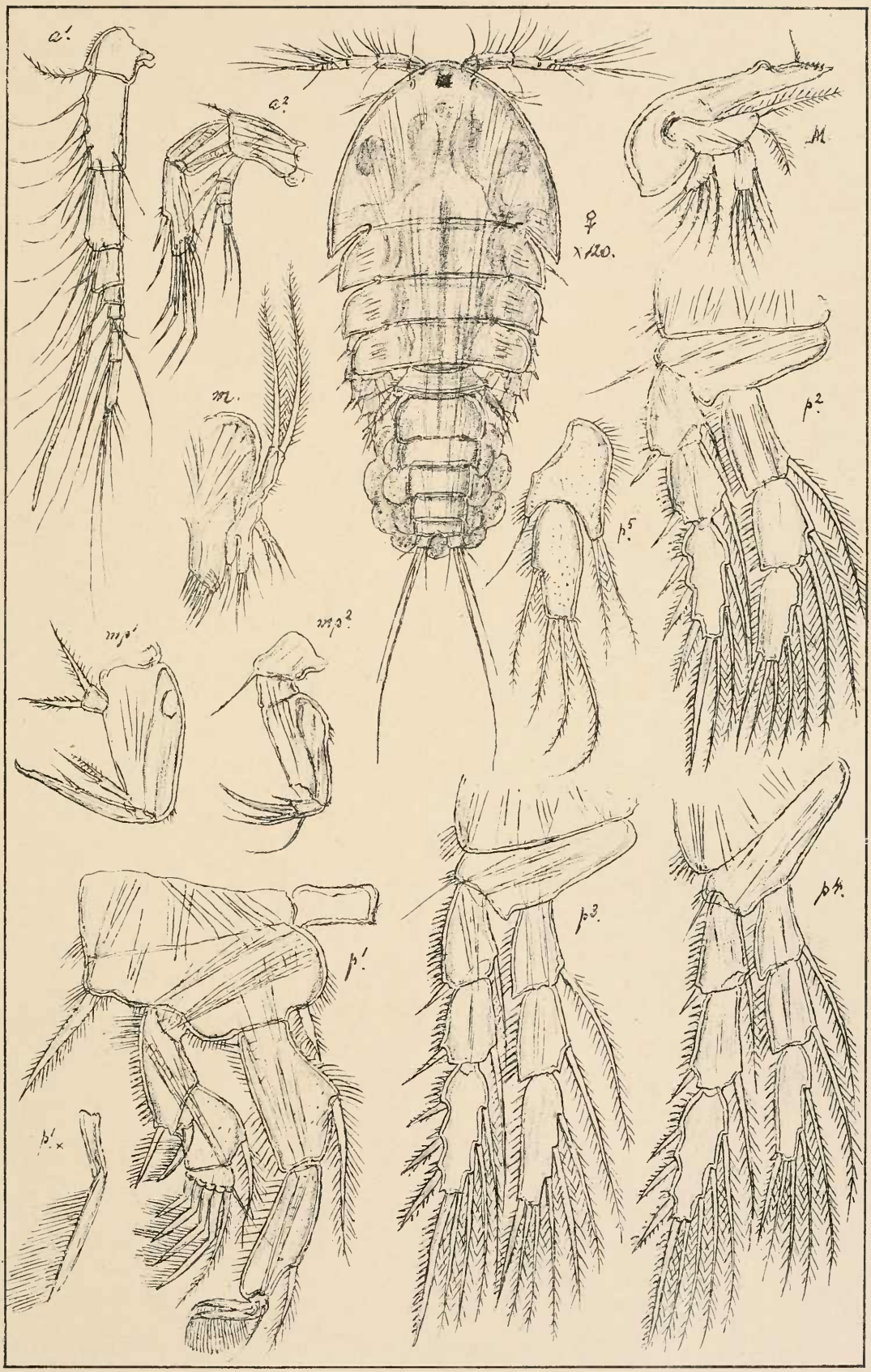
Length of adult female about 1 millimetre.

Copepoda

Harpacticoida.

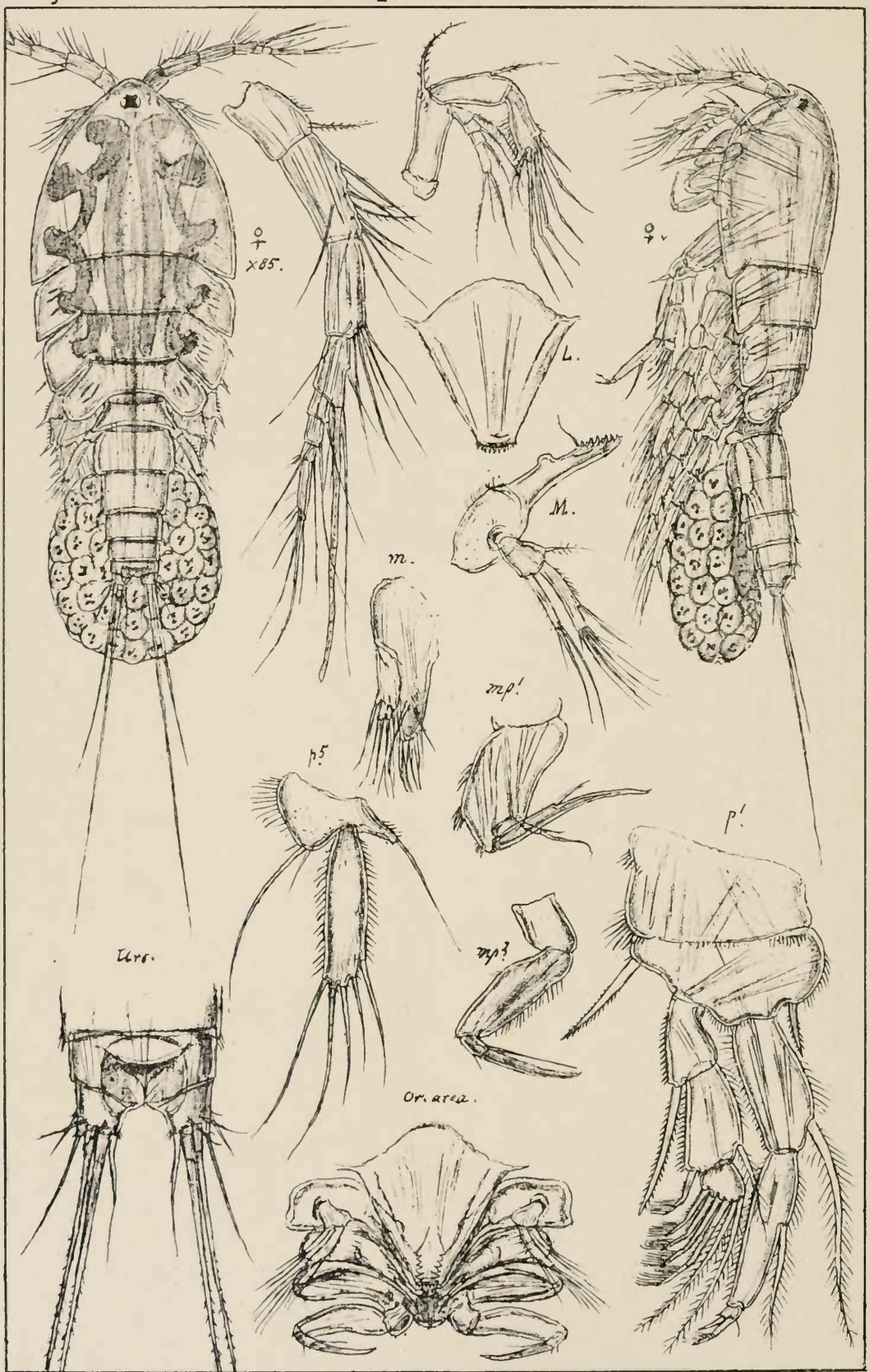


G.O. Sars autogr. Psamathe longicauda, Phil. Norsk Lithgr. Officin.



G.O. Sars autogr. Machairopus minutus, G.O. Sars. Norsk Lithgr. Officin.

Copepoda

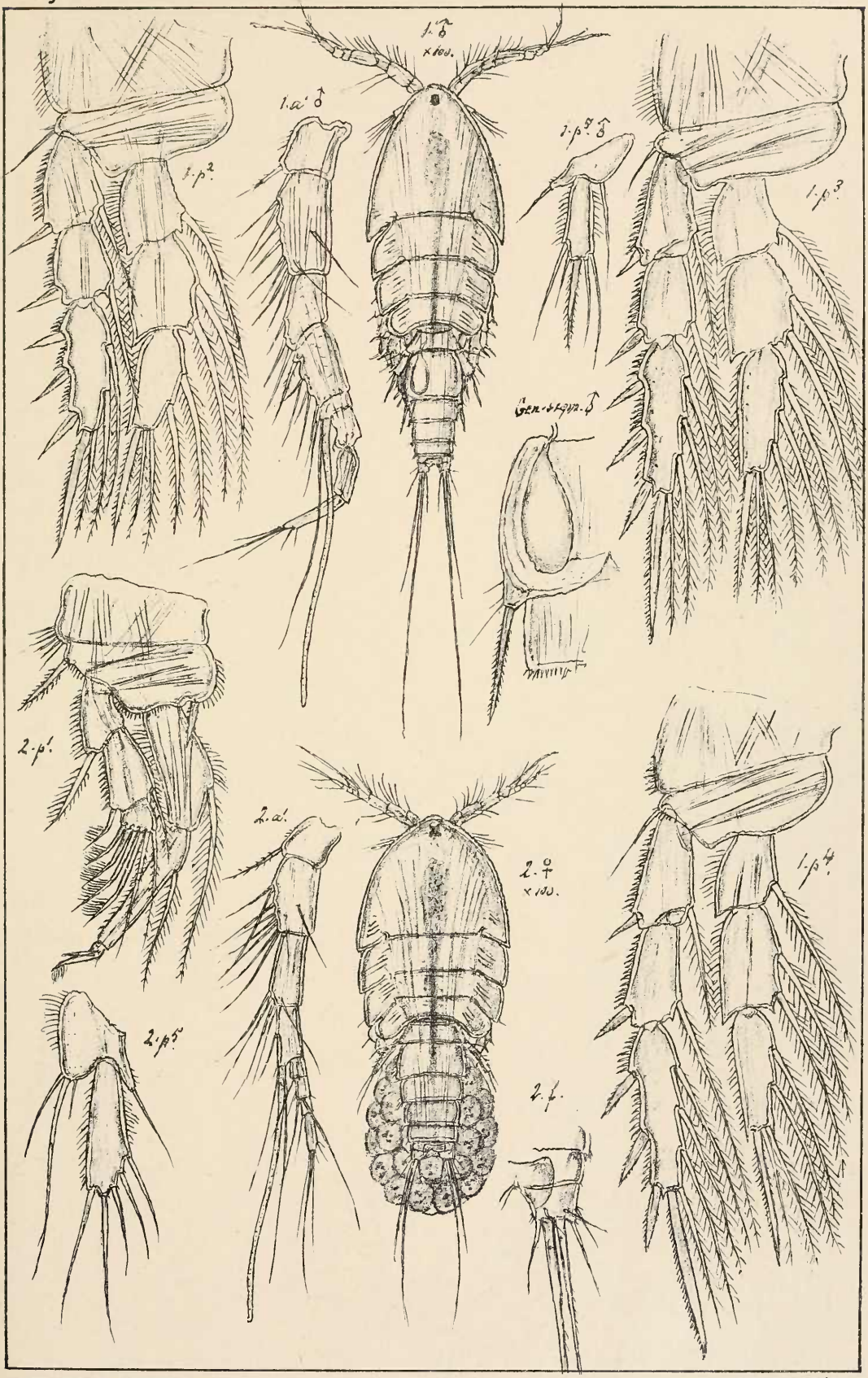


G.O. Sars autogr. Norsk Lithgr. Officin.

Jdya furcata, (Baird).

Copepoda

Harpacticoida.



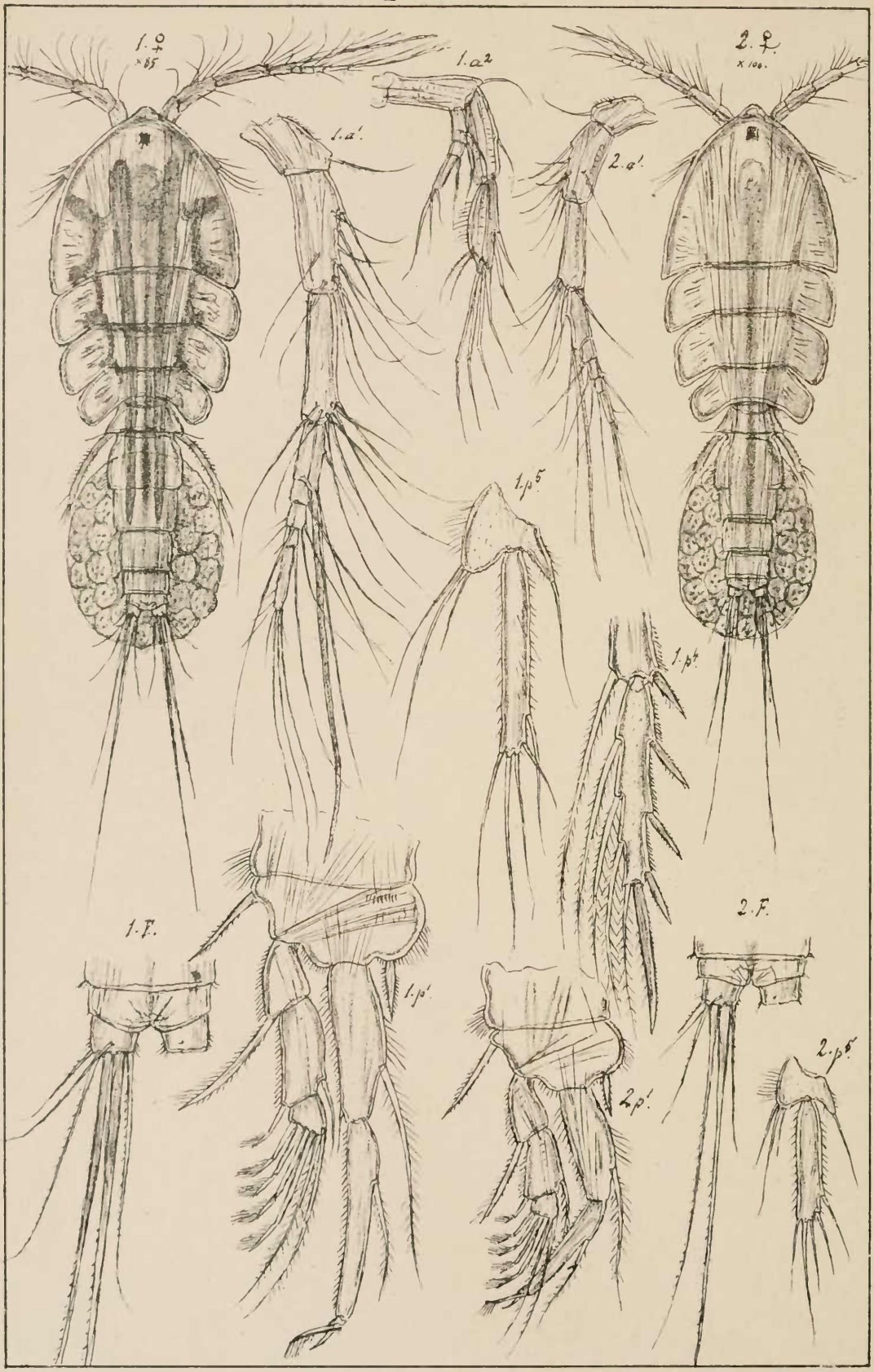
G.O. Sars autogr.

Norsk Lithgr. Officin.

1. Jdya furcata, (continued)

2. Jdya minor, Scott

Copepoda

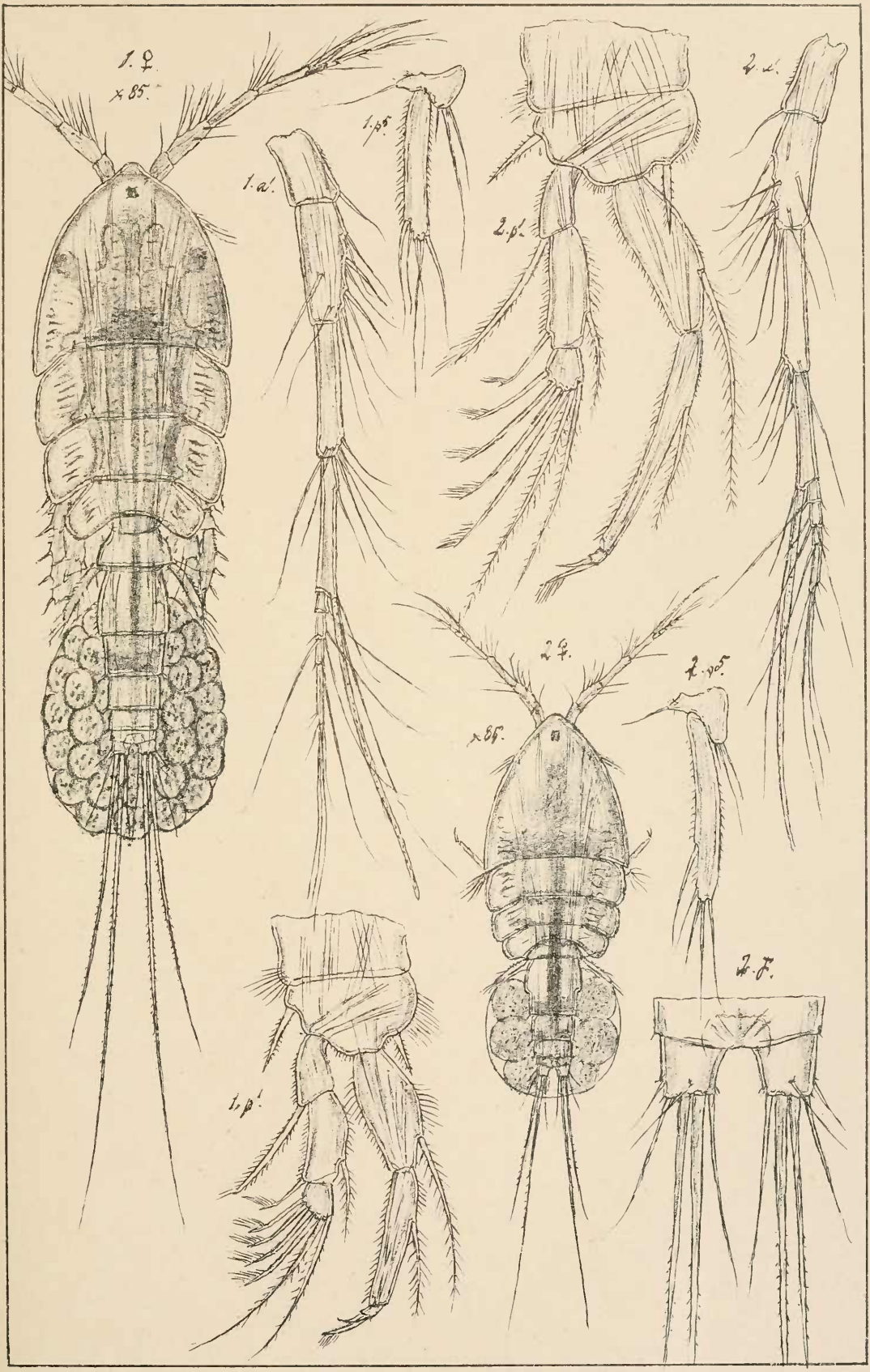


G.O. Sars autogr. Norsk Lithgr. Officin

1. Jdya ensifera (Fischer.)
2. Jdya tenera, G.O. Sars

Copepoda

Jdyidæ. Harpacticoida. Pl. LIV.



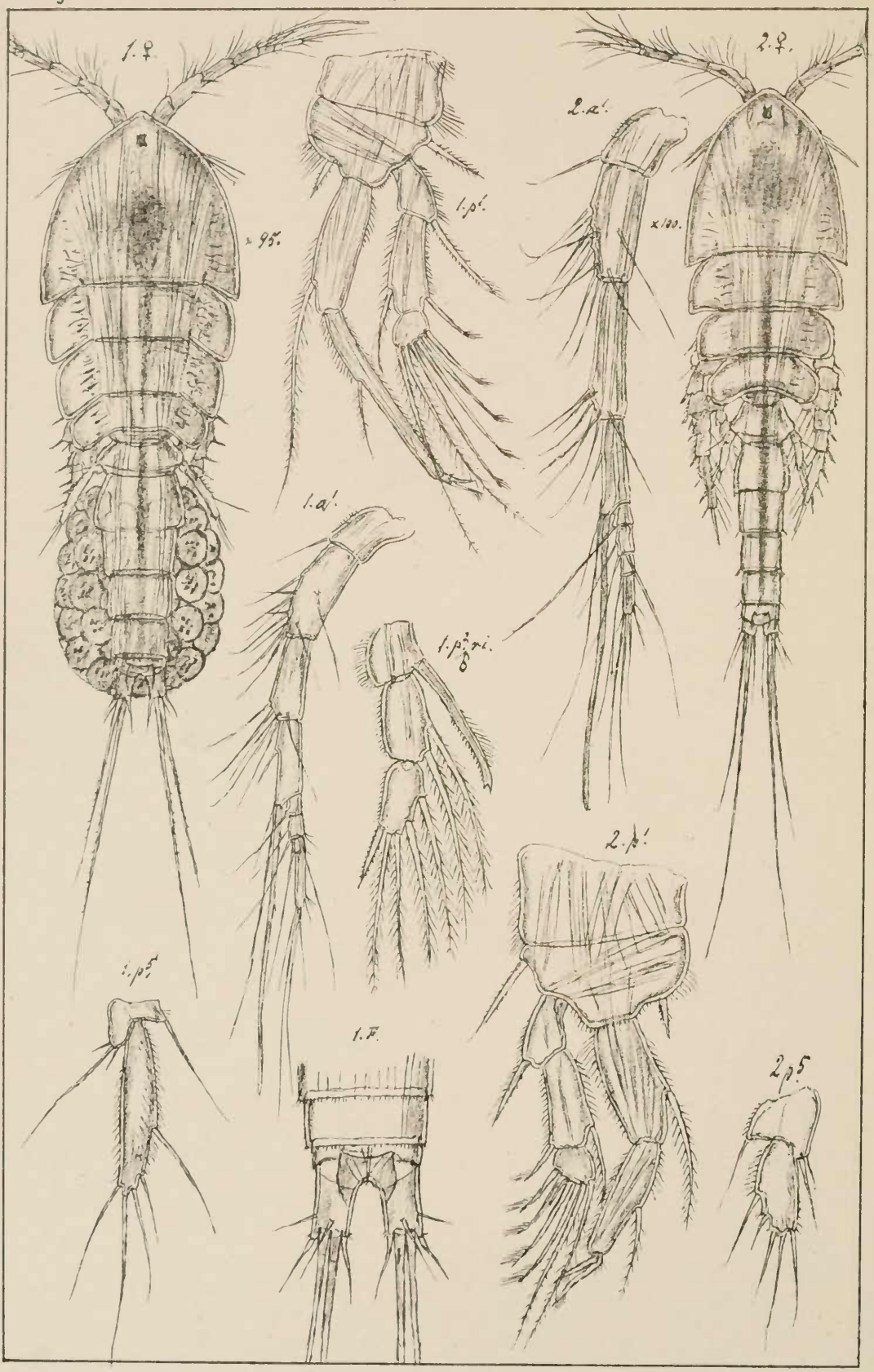
G.O. Sars autogr. Norsk Lithgr. Officin

1 Jdya longicornis, Scott.

2 Jdya elegantula, G.O. Sars

Copepoda

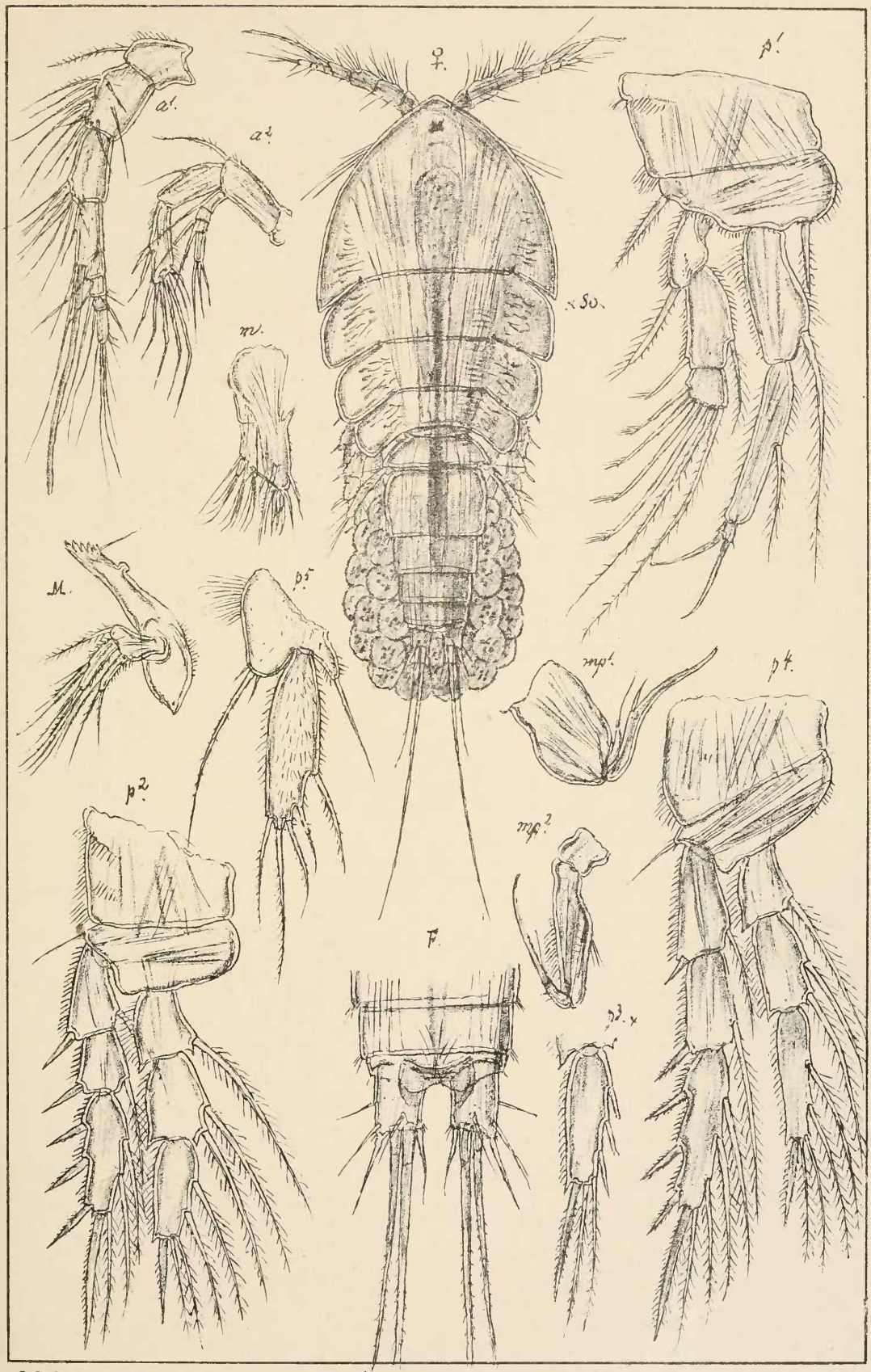
Harpacticoida.



G.O. Sars autogr.

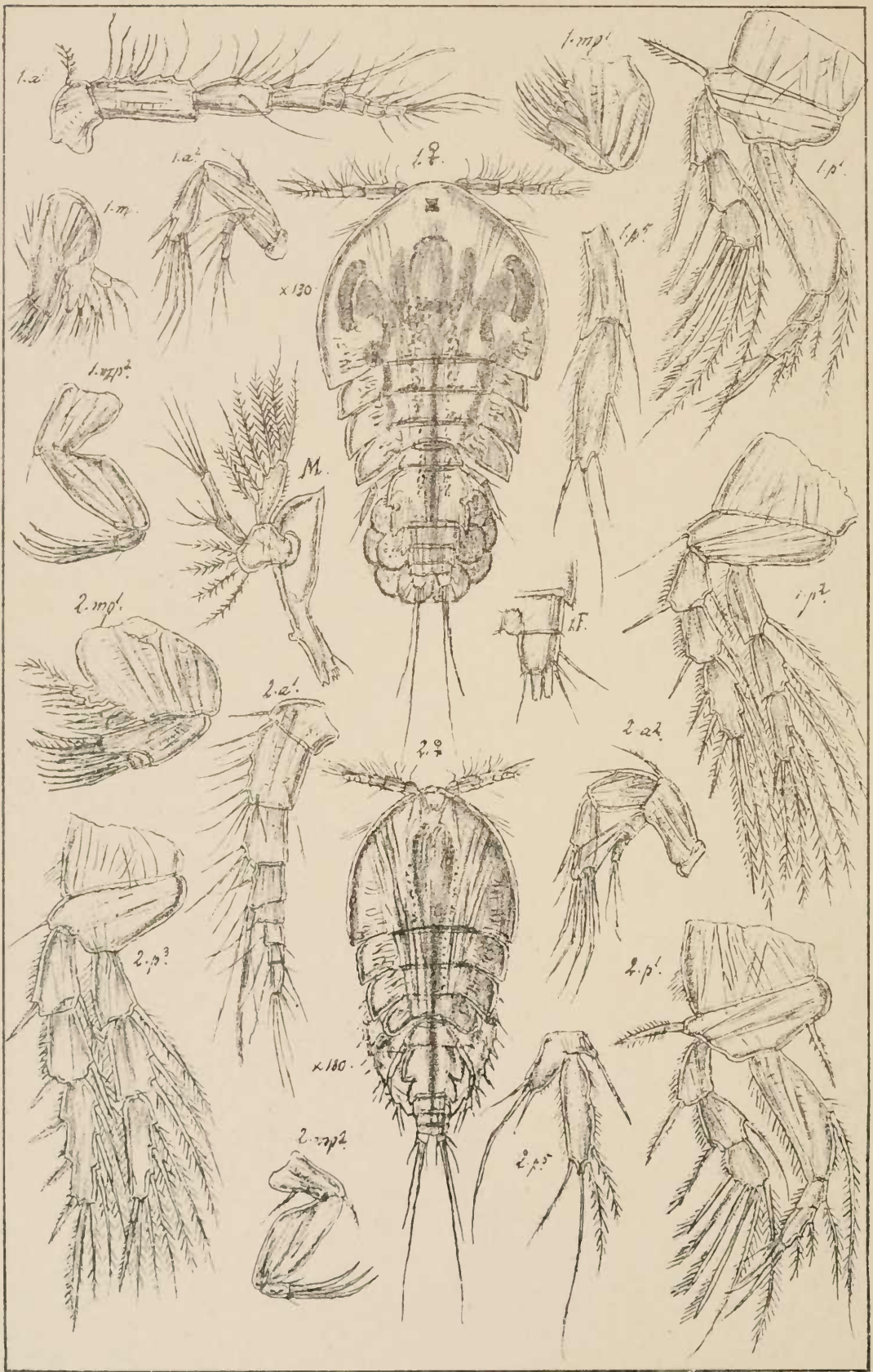
1. Jdya gracilis, Scott
2 Jdya angusta, G.O. Sars

Norsk Lithgr. Officin



G.O. Sars autogr. Norsk Lithgr. Officin

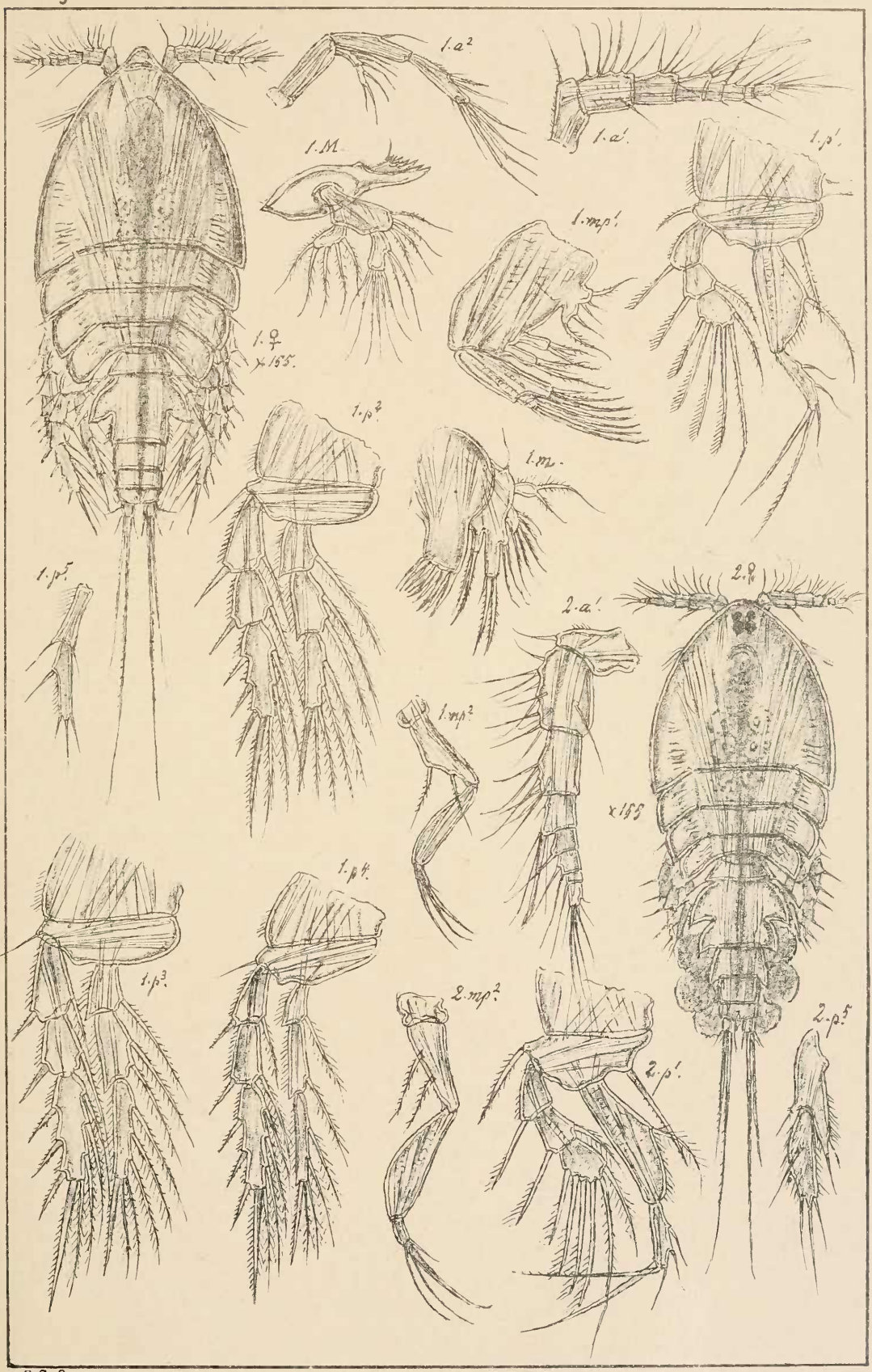
Jdya finmarchiça, G.O. Sars.



G.O. Sars autogr. Norsk Lithgr. Officin

1 Jdyopsis dilatata, G.O.Sars

2. Jdyopsis pusilla, G.O.Sars



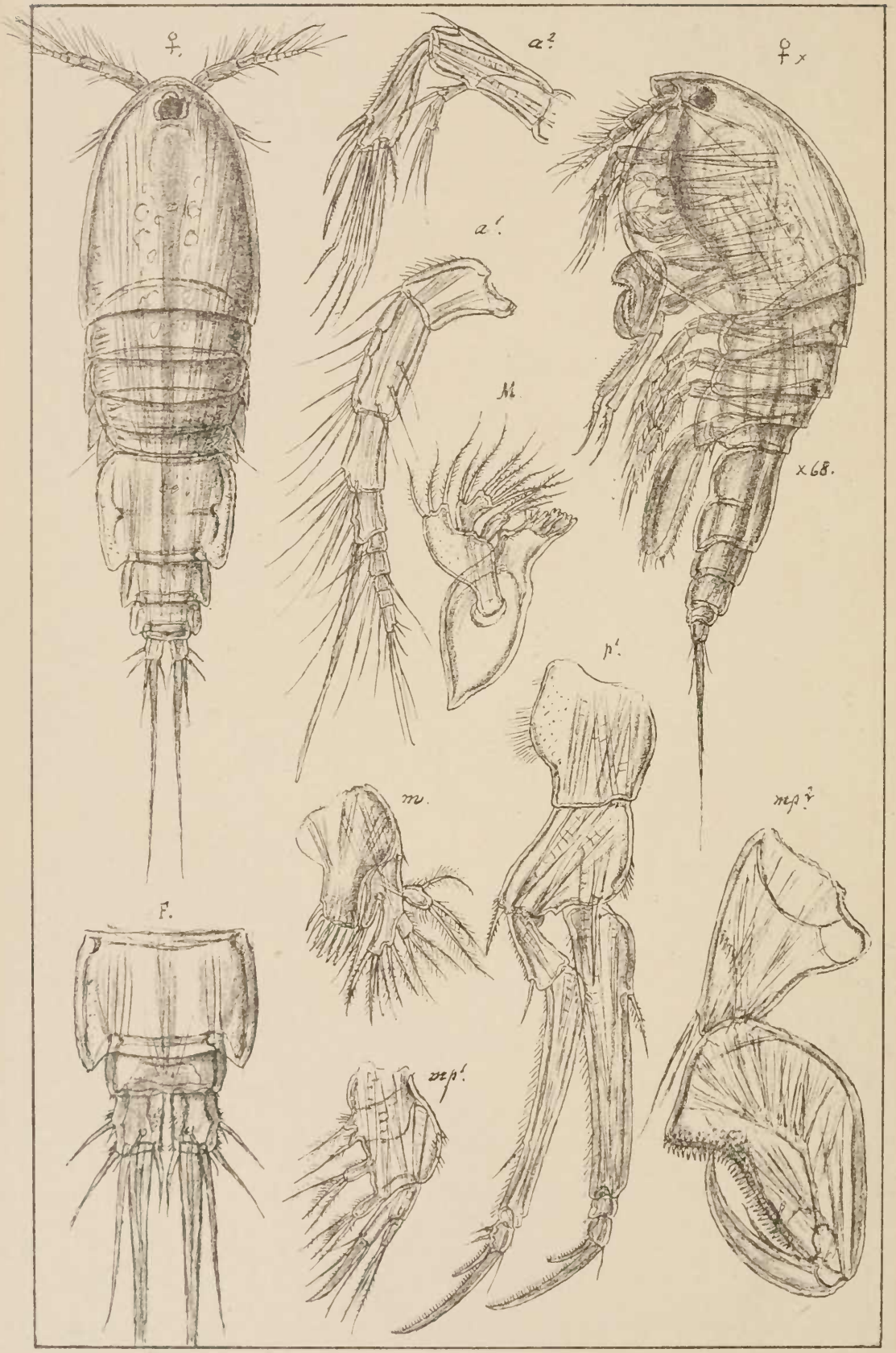
G.O. Sars autogr. Norsk Lithgr. Officin

1. Idyella pallidula G.O. Sars
2. Idyella exigua, G.O. Sars

Copepoda

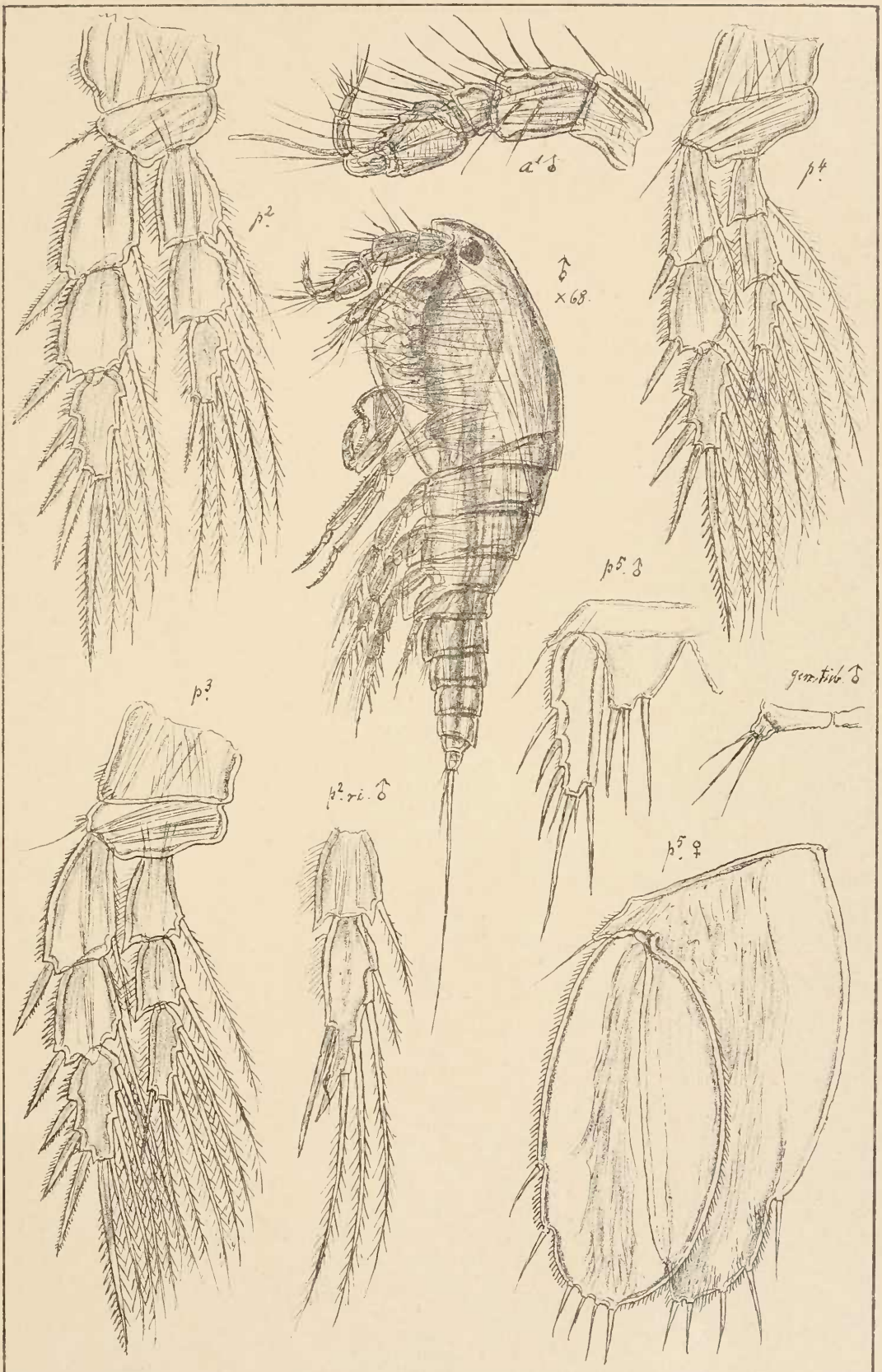
Harpacticoida.

Thalestridæ. Pl. LIX.



G.O. Sars autogr. Norsk Lithgr. Officin

Thalestris longimana, Cls.



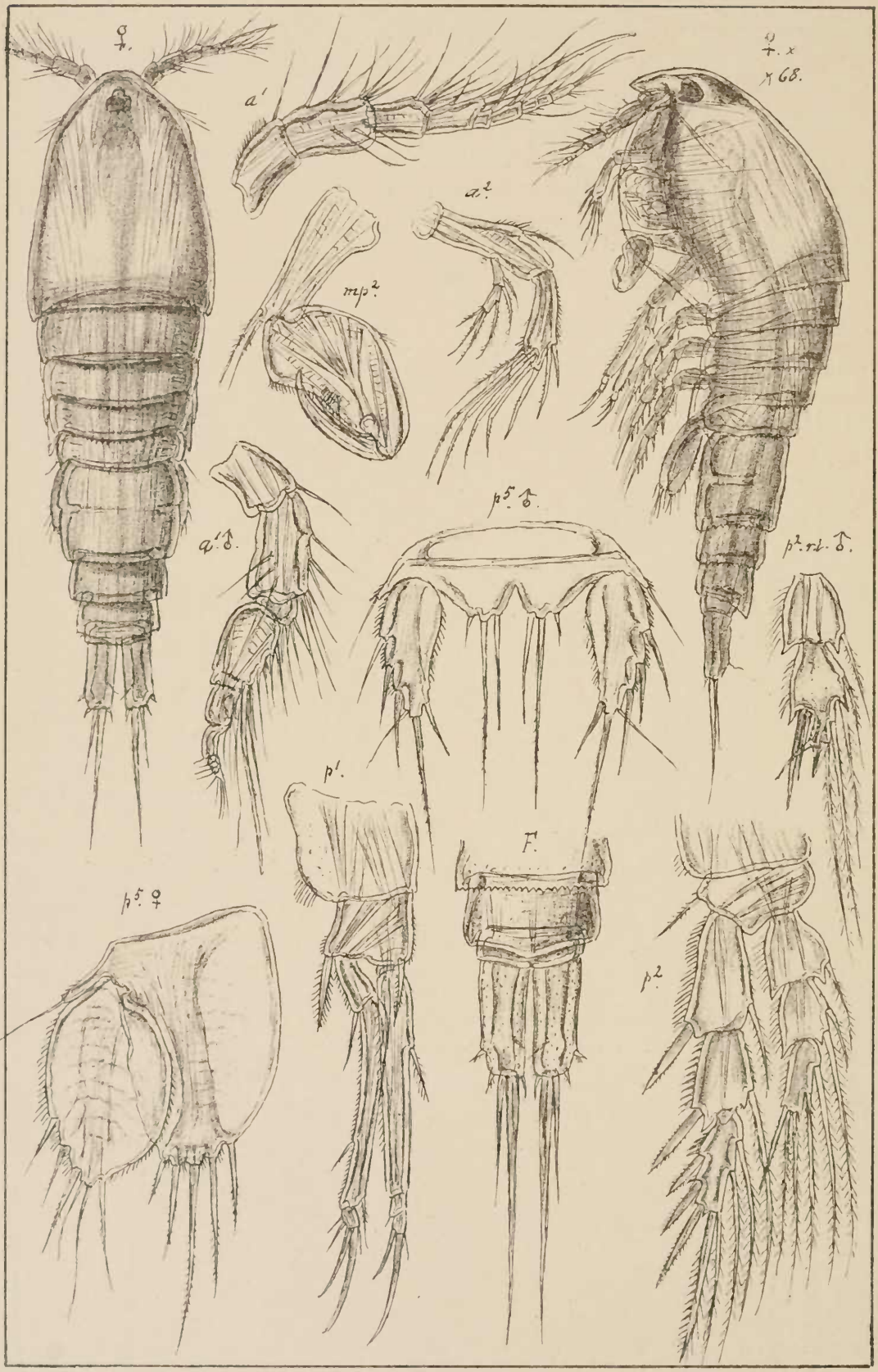
G.O. Sars autogr.

Thalestris longimana, Cls.
(continued)

Norsk Lithgr. Officin

Copepoda

Harpacticoida.



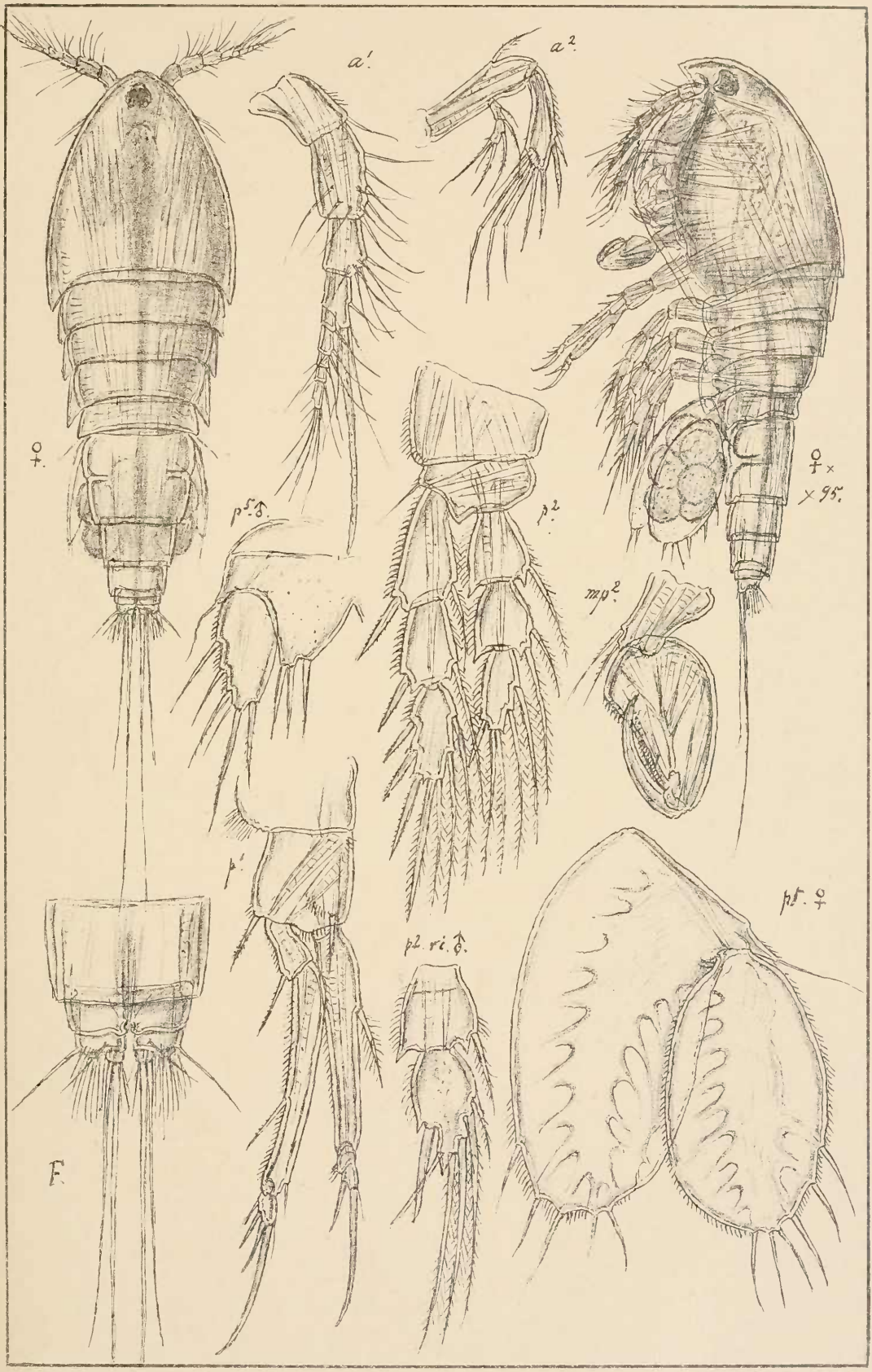
G.O. Sars autogr. Norsk Lithgr. Officin

Thalestris gibba (Kröyer)

Copepoda

Harpacticoida.

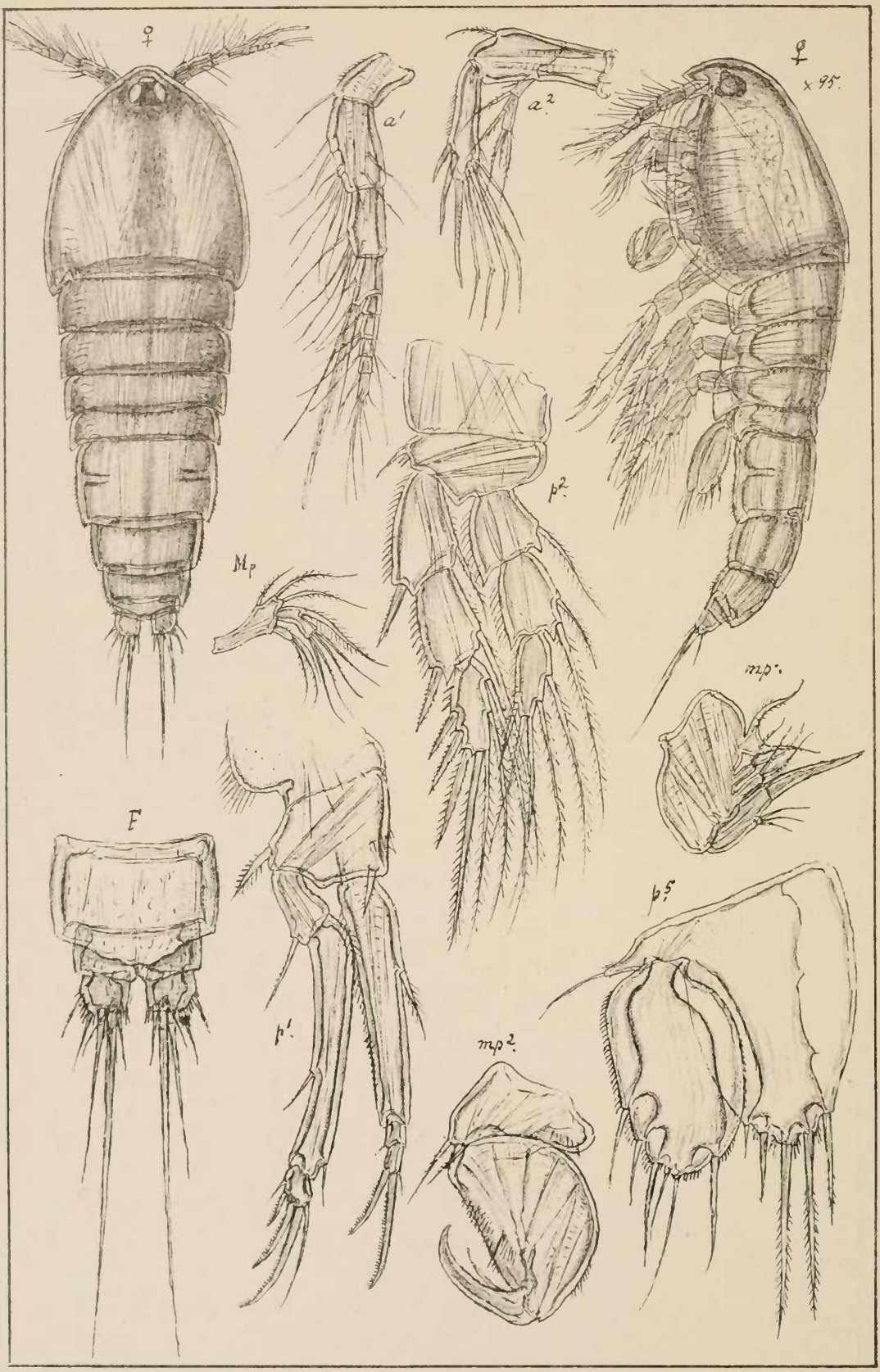
Thalestridæ. Pl. LXII.



G.O. Sars autogr. Thalestris rufoviolacens, Cls. Norsk Lithgr. Officin

Copepoda

Thalestridæ. Harpacticoida. Pl. LXIII.

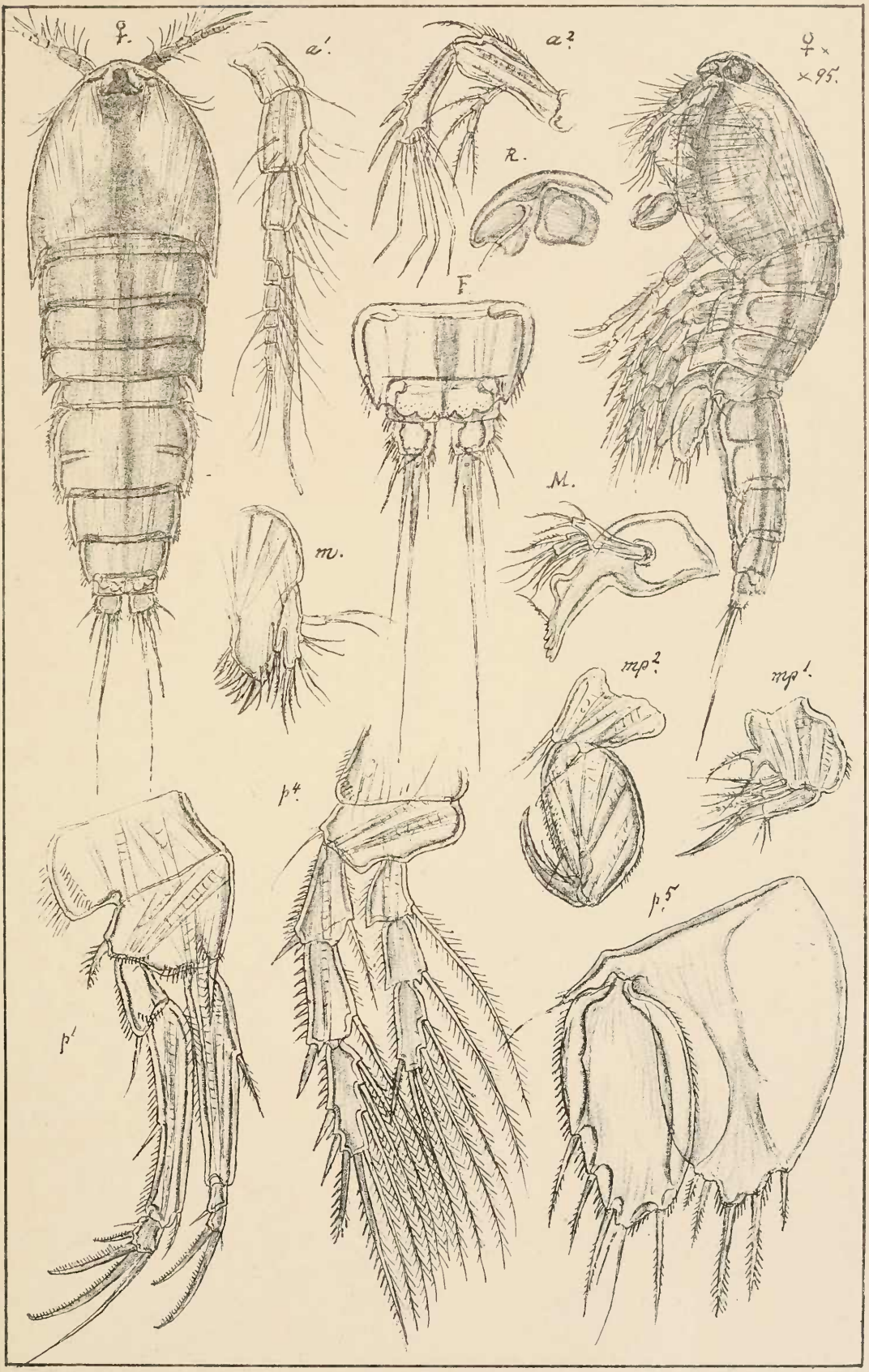


G.O. Sars autogr. Norsk Lithgr. Officin

Thalestris brunnea, G.O. Sars

Copepoda

Thalestridæ. Harpacticoida. Pl. LXIV.



G.O. Sars autogr. Norsk Lithgr. Officin

Thalestris purpurea, G.O. Sars

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS IX & X

THALESTRIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM
/ SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1905

Remarks.—This form has been erroneously identified by Prof. Brady with *T. rufoviolacens* of Claus, from which it differs conspicuously both as regards the general form of the body and some of the anatomical details. The figure of the animal given by Brady is somewhat misshapen, apparently owing to a strong pressure of the mounted specimen from which the drawing was made.

Occurrence.—Some few female specimens of this form were found, many years ago, off the west coast of Norway, at Molde and Christiansund.

Distribution.—British Isles (Brady).

69. Thalestris purpurea, G. O. Sars, n. sp.

(Pl. LXIV).

Specific Characters.—Female. General form of body very similar to that in *T. brunnea*, being conspicuously depressed throughout. Cephalic segment, however, seen dorsally, more regularly rounded in front, and having the lateral corners more produced. Rostral projection abruptly recurved, with the tip bluntly rounded. Penultimate segment of urosome forming a thin expansion behind, arching over the last segment and divided into 4 regularly rounded lobules. Caudal rami of much the same structure as in *T. brunnea*. Eye still larger than in that species, and on each side applied to a distinct lenticular thickening of the integument. Antennæ, mandibles, maxillæ and anterior maxillipeds almost exactly as in *T. brunnea*. Posterior maxillipeds, however, comparatively less powerfully developed, hand less curved outside, and not having the palm at all defined in front. First pair of legs resembling in structure those in *T. brunnea*, though having the apical claws of both rami somewhat more elongated. Last pair of legs likewise very similar, distal joint, however, more oblong in form, and the marginal spines of proximal joint less elongated.

Colour of body a deep crimson, dorsal face of cephalic segment somewhat lighter.

Length of adult female 0.96 mm.

Remarks.—This form is very closely allied to *T. brunnea*, and indeed preserved specimens of the two may be easily confounded. In the living state, however, the present form is at once recognized by the deep crimson colour of its body. On a closer comparison, some well-marked differences in the anatomical details are also found to exist, proving these 2 forms to be in reality specifically distinct. The shape of the rostrum is rather different, for instance, and the posterior maxillipeds are somewhat dissimilar in size. The regularly 4-lobate lamellar

expansion of the penultimate caudal segment is moreover very characteristic of the present species.

Occurrence.—I have only met with this form very occasionally, though in several places, on the west coast of Norway. It occurred in moderate depths, among algæ and Hydroida.

Gen. 28. **Parathalestris,** Brady & Robertson, 1873.

Generic Characters.—Body more slender than in *Thalestris*, generally cylindrical in form, or somewhat compressed laterally, never depressed, nor exhibiting the marked curvature of the anterior division characteristic of that genus. Cephalic segment of moderate size, with the epimeral parts less deep than in *Thalestris;* rostrum forming a short triangular plate movably articulated to the cephalic shield. Urosome more elongated than in the said genus, with none of the segments lamellarly expanded. Caudal rami generally short, but with the apical setæ much elongated. Eye well developed. Antennæ and oral parts on the whole resembling in structure those appendages in *Thalestris*. First pair of legs likewise rather similar, with both rami more or less slender and subequal in length, 2 of the apical claws of the outer one generally well developed. Inner ramus of 2nd pair of legs in male transformed in a similar manner to that in *Thalestris*, its middle joint in female carrying 2 natatory setæ, that of the 2 succeeding pairs only a single such seta. Last pair of legs of moderate size, with both joints lamellar, those in female, as usual, much larger than in male. Ovisac large, pyriform.

Remarks.—This genus was established in the year 1873 by Messrs. Brady and Robertson, to include a species previously recorded by Norman as *Thalestris Clausi*. It was, however, subsequently withdrawn by Prof. Brady, who did not find sufficient evidence for the generic separation of the said species. In subdividing the old genus *Thalestris*, however, into several nearly-allied genera, I find it convenient to restore the present genus, which, in addition to the above-named species, also comprises a number of other related forms, some of which will be described below. The genus is chiefly distinguished from *Thalestris* (in the restriction here adopted) by the more slender form of the body, the inferior size of the cephalic segment, and especially by the nature of the rostrum, which is sharply defined from the cephalic shield, and to a certain extent mobile. To the Norwegian fauna belong 4 species referable to this genus.

70. Parathalestris Clausi (Norman).

(Pl. LXV & LXVI).

Thalestris Clausi, Norman, Brit. Assoc. Report 1868, p. 297.

Specific Characters.—Female. Body moderately slender and conspicuously compressed, being rather strongly built, with the integuments highly chitinized. Cephalic segment about the length of the 4 succeeding segments combined, epimeral parts only slightly arched; rostrum very short and blunt at the tip. Urosome scarcely half as long as the anterior division, and without any distinct lateral rows of spinules on the segments, genital segment about the length of the remaining 3 segments combined. Caudal rami quadrangular and but slightly divergent, apical setæ of moderate length. Anterior antennæ comparatively short, 9-articulate, distal part about half the length of the proximal one. Posterior antennæ rather robust, with the distal joint considerably expanded at the end, spines of the anterior edge very strong and distinctly denticulate. Posterior maxillipeds powerfully developed, with the hand very broad, dactylus strong and curved. 1st pair of legs comparatively strongly built, with the outer ramus a little shorter than the inner but somewhat stouter, terminal joint lamellarly expanded and having the 2 innermost claws very strong and, like the much smaller 3rd one, finely pectinate on the concave edge; apical claws of inner ramus likewise distinctly pectinate and somewhat unequal, the inner one being the longer. Last pair of legs rather broad, foliaceous, distal joint rounded oval in form, inner expansion of proximal joint broadly triangular and extending as far as the distal one, marginal setæ of both joints comparatively short.

Male somewhat smaller than female, and exhibiting the usual sexual differences. Last pair of legs much smaller than in female, distal joint short and broad, cordate, with the marginal setæ more or less spiniform, inner expansion of proximal joint scarcely extending beyond the middle of the distal one, and carrying 3 marginal setæ, the outermost shorter than the others and spiniform.

Colour generally golden yellow.

Length of adult female 1.05 mm.

Remarks.—This form, first described by Norman, is closely allied to *P. harpacticoides* of Claus, but is of larger size, and on the whole of more robust build, both as regards the body itself and its appendages.

Occurrence.—I have met with this form rather abundantly along the whole Norwegian coast, from the Christiania Fjord to Vadsö, in the littoral zone among algæ, and, like other littoral forms, it is not infrequently left in tidal pools.

Distribution.—British Isles (Brady), coast of France (Canu).

71. Parathalestris harpacticoides (Claus).

(Pl. LXVII).

Thalestris harpactoides, Claus, Die freilebenden Copepoden, p. 133, Pl. XIX, figs. 2—11.

Specific Characters.—Female. Very like the preceding species, but of smaller size and on the whole less strongly built. Cephalic segment comparatively larger, considerably exceeding in length the 4 succeeding segments combined; rostrum somewhat more prominent. Urosome exceeding half the length of the anterior division and having the segments more sharply marked off from each other, all, except the last provided on each side with a very conspicuous oblique row of spinules. Caudal rami about as in *P. Clausi*. Anterior antennæ comparatively more slender, with the distal part exceeding half the length of the proximal one. Posterior maxillipeds far less powerful, with the hand oblong oval in form and the dactylus more slender. 1st pair of legs of a structure very similar to that in *P. Clausi*, though having the outer ramus comparatively narrower and scarcely shorter than the inner. Last pair of legs with the distal joint less broad, oblong oval in form, inner expansion of proximal joint likewise narrower and extending scarcely as far as the distal joint; marginal setæ of both joints more elongated than in *P. Clausi*.

Male exhibiting similar differences from the female to those in *P. Clausi*. Last pair of legs, however, conspicuously differing in shape from those in the male of that species, the distal joint being much narrower and scarcely at all dilated at the base, inner expansion of proximal joint very slight, with 3 marginal setæ, none of which are spiniform, innermost seta the shortest.

Colour generally dark olivaceous.

Length of adult female 0.73 mm.

Remarks.—As stated above, this form is closely allied to *P. Clausi*, exhibiting a very similar structure of the 1st pair of legs. On a closer comparison, however, some well-marked differences in the structural details are found to exist, proving these two forms to be in reality specifically distinct, though unquestionably congeneric. An easily recognizable external character is also found in the oblique rows of spinules on the sides of the caudal segments, of which scarcely any trace is found in *P. Clausi*.

Occurrence.—This is also a rather common form, being found along the whole south and west coasts of Norway in the littoral and sub-littoral regions among algæ. In the upper part of the Christiania Fjord this form is by far the most frequent.

Distribution.—Heligoland (Claus), British Isles (Brady), coast of Bohuslän (Coll. Cleve).

72. Parathalestris hibernica (Brady & Rob.).

(Pl. LXVIII).

Thalestris hibernica, Brady & Robertson, in Ann. & Mag. Nat. Hist., ser. 4, Vol. XII, p. 135, Pl. VIII, figs. 17—19.

Specific Characters.—Female. Body conspicuously compressed and very slender and elongated, with the integuments rather thin and pellucid. Cephalic segment scarcely exceeding in length the 4 succeeding segments combined, epimeral parts much curved in the middle, rostrum of moderate size. Urosome about half the length of the anterior division and having the segments quite smooth. Caudal rami short quadrangular, with the outermost of the apical setæ considerably thickened at the base. Eye very large and conspicuous in the living animal. Anterior antennæ rather slender, with the distal part exceeding half the length of the proximal one. Posterior antennæ less strongly built than in the 2 preceding species. Mandibular palp with the inner expansion of the basal part rather narrow and prominent, outer ramus small, with only a single apical seta. Posterior maxillipeds powerfully developed, with the hand large, sub-crescentic in shape, and irregularly angular, palmar edge deeply concaved and defined in front by a distinct projecting corner, dactylus very strong and curved. 1st pair of legs much feebler in structure than in the 2 preceding species, both rami slender and tapering distally, the outer one a little shorter than the inner, with the terminal joint scarcely at all expanded, claws slender and quite smooth, the innermost one very much elongated, equalling in length the 2 preceding joints combined; apical claws of inner ramus very unequal, the inner one much elongated, the outer very small. Last pair of legs considerably smaller than in the 2 preceding species, distal joint oval in form, inner expansion of proximal joint rather broad and extending considerably beyond the distal one. Ovisac generally very large, pyriform.

Male with the last pair of legs, as usual, less fully developed than in female, distal joint rather small and having only 5 marginal setæ, inner expansion of proximal joint not nearly extending as far as the distal one, and carrying 3 unequal setæ.

Body semipellucid, of a light greenish hue and generally filled with clear oil-bubbles.

Length of adult female 1.14 mm.

Remarks.—This is a very distinct and easily recognizable form, being especially distinguished by its slender and elongated body, as also by the structure of the posterior maxillipeds, and the 1st and last pairs of legs.

Occurrence.—I have met with this form occasionally in several places of the west coast of Norway, for instance at Kopervik, Aalesund and Christiansund, in the littoral region among algæ. It is, however, not nearly so common as the 2 preceding species.

Distribution.—British Isles (Brady).

73. Parathalestris Jacksoni (Scott).

(Pl. LXIX).

Thalestris Jacksoni, Th. Scott, Report on marine and fresh water Crustacea from Franz Josef Land, Linn. Soc. Journ. Vol. XXVII, p. 109, Pl. 8, figs. 3—9.

Specific Characters.—Female. Body elongated, but rather strongly built, with highly chitinized integuments and the segments very sharply marked off from each other. Cephalic segment about the length of the 4 succeeding segments combined, epimeral parts evenly curved, posterior edge, like that of the 3 succeeding segments, minutely crenulated; rostrum short and blunt, well defined at the base, tip minutely bifid. Urosome slender tapering distally, genital segment very distinctly divided in the middle. Caudal rami unusually prolonged, being more than twice as long as they are broad and slightly attenuated distally, apical setæ normal. Anterior antennæ of moderate length, with the distal part scarcely half as long as the proximal one. Anterior maxillipeds rather compact, with the claw of the outermost lobe unusually short. Posterior maxillipeds powerfully developed, hand large, oval fusiform, with the palmar edge slightly concaved. 1st pair of legs moderately strong, outer ramus fully as long as the inner, 2 of the apical claws very strong and curved; apical claws of inner ramus very unequal, the inner one more than 3 times as long as the outer. Last pair of legs well developed, foliaceous, distal joint very large, ovate, inner expansion of proximal joint scarcely extending beyond the middle of the distal one, marginal setæ of moderate length.

Male exhibiting the usual sexual differences.

Colour yellowish brown, somewhat darker at the end of the segments, dorsal face of cephalic segment of a lighter hue.

Length of adult female 2.20 mm.

Remarks.—This form was first described by Th. Scott from Franz Josef Land. It is one of the largest Harpacticoida, and by its strongly built body, the sharp demarcation of the segments, and the unusually prolonged caudal rami, somewhat resembles certain species of the genus *Thalestris* (in the restriction here

adopted), for instance, *T. gibba* Krøyer. It is however a true *Parathalestris*, as proved both by the structure of the rostrum and that of the several appendages.

Occurrence.—Off the Finmark coast this form is by no means rare. I found it, for instance, many years ago in considerable abundance at Vadsö; and in some samples taken by Mr. Nordgaard at Repvaag (Porsanger Fjord), and kindly sent to me for examination, it was also rather common. Though undoubtedly a true arctic form, it also occurs occasionally far out of the arctic region, for instance in the outer part of the Trondhjem Fjord, at Bejan, and in the Storfjord, inside Aalesund. A single specimen of this form was even taken as far south as Grimstad, off the south coast of Norway.

Distribution.—Franz Josef Land (Scott), Polar Islands north of Grinnell Land (2nd Fram Exped.).

Gen. **Phyllothalestris**, G. O. Sars, n.

Generic Characters.—Body somewhat compressed in front, more flattened behind, with the cephalic segment very large and deep. Rostrum abruptly deflexed and apparently immobile, though defined from the cephalic segment by a well marked suture. Epimeral plates of the 3 succeeding segments rather fully developed. Urosome of moderate length, with the genital segment in female very large and flattened. Eye large and of rather complicated structure. Anterior antennæ slender, 9-articulate; posterior ones less strongly built than in *Parathalestris*, outer ramus biarticulate. Oral parts on the whole normal. 1st pair of legs of a structure similar to that in *Thalestris*. Natatory legs likewise rather similar, though having the terminal spine of the outer ramus shorter. Last pair of legs in female of enormous size, foliaceous, wholly obtecting the ovisac below.

Remarks.—The type of this new genus is the *Thalestris mysis* of Claus, a form which in some characters, and more particularly in the enormous development of the last pair of legs in the female, differs conspicuously from the other *Thalestridæ*, so that it ought more properly to be generically separated. We do not at present know any other form that can be associated with it in the same genus.

74. Phyllothalestris mysis (Claus).

(Pl. LXX & LXXI).

Thalestris mysis, Die freilebenden Copepoden, p. 130, Pl. XVIII, figs. 12—16.

Specific Characters.—Female. Body moderately slender, with the anterior division slightly vaulted dorsally. Integuments rather thin, and exhibiting a finely squamous sculpture. Cephalic segment considerably exceeding in length the 4 succeeding segments combined, epimeral parts thin and pellucid, much curved in the middle, and almost wholly comprising between them the oral parts; rostrum very strong, acuminate, and pointing straight down. Epimeral plates of the 3 succeeding segments closely contiguous and acutangular behind. Last segment of metasome scarcely narrower than the preceding one, but much less deep. Urosome exceeding half the length of the anterior division, and having the genital segment very large and expanded, clypeiform. Caudal rami short, quadrangular, with the 2 middle apical setæ much elongated and somewhat divergent, the inner one about twice the length of the urosome. Eye very large and conspicuous in the living animal, with 2 successive pairs of lenticular bodies, anterior extremity, seen laterally, drawn out into 2 diverging lobules. Anterior antennæ with the distal part scarcely half as long as the proximal one. Posterior maxillipeds rather slender, with the hand narrow fusiform, palmar edge straight, outer edge angular in the middle, dactylus slender and elongated. 1st pair of legs with the rami slender and attenuated, the outer one somewhat longer than the inner, both having one of the apical claws strongly developed, falciform. Last pair of legs extending almost to the end of the penultimate caudal segment, both joints greatly expanded, foliaceous, the distal one oval or elliptical in form, with 6 short marginal setæ densely crowded together at the tip, the outermost but one very coarse, spiniform; inner expansion of proximal joint extending as far as the distal joint and carrying 5 short marginal setæ, 4 of which are attached close together at the bluntly rounded tip, the 5th at a considerable distance from these on the inner edge.

Male of smaller size than female, and exhibiting the usual sexual differences. Last pair of legs rather dissimilar and of much inferior size, distal joint narrow oval in shape, and provided with only 5 marginal setæ; inner expansion of proximal joint very slight, with only 2 unequal spines at the tip.

Body generally of a fine rosy or light carneous colour, with the tip of the urosome together with the caudal setæ very dark.

Length of adult female 1.40 mm.

Remarks.—This is an easily recognizable form and indeed one of our finest Harpacticoida, distinguishing itself both by its comparatively large size and the general form of the body, as also by its peculiar colour.

Occurrence.—I have met with this beautiful form in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, but nowhere in any considerable number. It is generally found in depths ranging from 6 to 20 fathoms among Laminariæ and other algæ. The movements of the animal are particularly rapid and graceful.

Distribution.—British Isles (Brady), Mediterranean (Claus), Gulf of Suez (A. Scott), Ceylon (same author).

Gen. 30. **Halithalestris,** G. O. Sars, n.

Generic Characters.—Body elongated, subcylindrical in form, with no sharp demarcation between the 2 chief divisions. Cephalic segment comparatively small and somewhat depressed, rostrum short, but well defined at the base. Epimeral plates poorly developed. Urosome very large and massive, with the caudal rami unusually prolonged and divergent. Eye normal. Anterior antennæ of usual structure, 9-articulate. Posterior antennæ with the outer ramus rather narrow, biarticulate. Oral parts on the whole normal; posterior maxillipeds, however, unusually compact. 1st pair of legs resembling in structure those in *Thalestris*. Natatory legs likewise of a very similar structure. Last pair of legs of moderate size, with the distal joint the more prominent.

Remarks.—This new genus is founded upon the peculiar form first recorded by Kröyer as *Harpacticus Croni,* and subsequently described by Brady under the name of *Thalestris serrulata.* According to the structure of the 1st pair of legs, this form is indeed more nearly related to *Thalestris* than to *Harpacticus,* and unquestionably belongs to the family *Thalestridæ.* It cannot however properly be referred to the genus *Thalestris* in the restriction here adopted, and it also differs very markedly from the other Thalestridæ, both in its whole external appearance and more particularly in its habits, it being one of the few Harpacticoida, which leads a true pelagic life. The generic name here proposed refers to this latter peculiarity.

75. Halithalestris Croni (Kröyer).

(Pl. LXXII).

Harpacticus Croni, Kröyer, in Gaimard's „Voyage en Scandinavie". Zool., Pl. 43, figs. 3, a—n.

Syn: *Thalestris serrulata*, Brady.

Specific Characters.—Female. Body very slender and elongated, and of a peculiar smooth appearance, recalling that found in the forms belonging to the family *Ectinosomidæ*. Cephalic segment scarcely exceeding in length the 3 succeeding ones combined, and tapering anteriorly to an obtuse point, epimeral parts but very slightly developed; rostrum short, somewhat deflexed. Epimeral plates of the 3 succeeding segments small, not covering laterally the basal parts of the legs. Last segment of metasome scarcely narrower than the preceding one. Urosome very greatly developed, exceeding the anterior division in length, and fully equal to it in depth, segments fringed along the posterior edge ventrally with delicate spinules, genital segment, as usual, the largest, though not attaining the length of the 2 succeeding segments combined, last segment rather short and deeply cleft at the end. Caudal rami very much elongated, almost attaining half the length of the urosome and more or less divergent, outer edge with 3 or 4 slight serrations, tip obliquely truncated, apical setæ not much elongated, the 2 middle ones distinctly denticulated. Eye rather large and conspicuous in the living animal. Anterior antennæ of moderate length, distal part somewhat exceeding half the length of the proximal one. Posterior maxillipeds of a very compact structure, hand much dilated, almost semicircular in outline, palmar edge straight and having inside a curved row of strong denticles, dactylus strong and curved. 1st pair of legs with the outer ramus fully as long as the inner, but much narrower, 3 of the apical claws well developed and finely denticulated on the concave edge; apical claws of inner ramus rather unequal, the inner one very strong and twice as long as the outer. Last pair of legs extending scarcely beyond the middle of the genital segment, distal joint oval in form, with 2 of the marginal setæ rather elongated, inner expansion of proximal joint triangular, extending somewhat beyond the middle of the distal one, the middle of the marginal setæ much longer than the others. Ovisac very large.

Body semipellucid of a light greenish hue, and generally filled with clear oil-bubbles of various sizes.

Length of adult female 2.30 mm.

Remarks.—As stated above, this form was first figured (but not described) by Kröyer in the well-known work by Gaimard, and referred to the genus *Harpacticus*. The *Thalestris serrulata* of Brady, described from a solitary male

specimen, is unquestionably identical with Kröyer's species. It is one of our largest Harpacticoida, and differs considerably in its outward appearance from the other Thalestridæ, a fact which may no doubt be accounted for by its very different habits.

Occurrence.—Only a very limited number of specimens of this peculiar form, all of them females, have hitherto come under my notice. They were taken partly off the Finmark coast, partly off the west coast of Norway, and in every instance in the open sea at a considerable distance from the shore and near the surface, together with other pelagic animals.

Distribution.—British Isles (Brady), coast of Spitsbergen (Scott).

Gen. 31. **Rhynchothalestris,** G. O. Sars, n.

Generic Characters.—Body more or less robust, with the 2 chief divisions rather sharply marked off from each other. Cephalic segment large and deep, with the rostrum very prominent and very mobile. Urosome comparatively short, with the anterior segments more or less expanded laterally. Caudal rami short, but with the apical setæ rather elongated. Eye well developed. Anterior antennæ of usual structure, 9-articulate. Posterior antennæ with the proximal part distinctly divided in the middle, outer ramus composed of 3 well-defined joints. Oral parts normal and rather fully developed. 1st pair of legs of a structure similar to that in *Thalestris*. Natatory legs with the spines of the outer ramus coarsely denticulate, middle joint of inner ramus in all the pairs carrying 2 setæ inside. Last pair of legs of moderate size, with the distal joint more prominent than the proximal one.

Remarks.—This new genus is chiefly characterised by the unusually sharp demarcation of the 2 divisions of the body, and more particularly by the strong development of the rostrum, a character which has given rise to the generic name here proposed. In the structure of the several appendages also some well-marked differences from the preceding genera are found to exist, especially as regards the posterior antennæ and the natatory legs. Two well-defined Norwegian species are referable to this genus, both having been previously described as species of the genus *Thalestris*.

76. Rhynchothalestris rufocincta (Norman).

(Pl. LXXIII & LXXIV).

Thalestris rufocincta Norman (M. S.), in Brady's Monograf of British Copepoda, Vol. II, p. 125, Pl. LVII, figs. 1—9.

Specific Characters.—Female. Body somewhat robust, with the anterior division evenly vaulted dorsally. Cephalic segment considerably exceeding in length the 4 succeeding segments combined, epimeral parts evenly arched and rather deep; rostrum very long and slightly curved, narrow linguiform in shape and acuminate at the tip. Epimeral plates of the 3 succeeding segments rather large, acutangular. Last segment of metasome considerably narrower than the preceding ones. Urosome scarcely exceeding half the length of the anterior division, genital segment very large and expanded, sub-quadrangular in outline and distinctly divided in the middle, posterior corners acutely produced and fringed with delicate spinules; 2nd segment likewise produced at the posterior corners, the 2 posterior segments simple. Caudal rami quadrangular, broader than they are long, outermost of the apical setæ spiniform and scarcely half as long as the innermost, the 2 middle setæ very strong and elongated. Anterior antennæ with the 1st joint unusually prolonged, distal part not nearly attaining half the length of the proximal one. Posterior antennæ with the outer ramus rather fully developed, middle joint much shorter than the other 2. Posterior maxillipeds of moderate size, hand oblong fusiform, with the outer edge sub-angular in the middle, inner straight, dactylus slender. 1st pair of legs with the rami not very slender, the outer one a little longer than the inner, with 2 of the apical claws well developed, apical claws of inner ramus rather unequal. Natatory legs with the inner ramus shorter, but broader, than the outer. Last pair of legs with the distal joint broadly oval in form, inner expansion of proximal joint rather large, though not extending as far as the distal one.

Male with the inner ramus of both the 2nd and 3rd pairs of legs peculiarly transformed, that of 2nd pair having the 2 outer joints coalesced and carrying on the tip a remarkably strong somewhat hamiform spine, that of 3rd pair distinctly 3-articulate, with the last joint obliquely tapered and terminating in a small lamella provided inside with a short flexuose bristle, inner edge with a regular series of 5 strong setæ. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint shorter and provided with only 3 spine-like setæ.

Body of a clear yellowish hue, more or less distinctly banded with dark reddish brown, sometimes, especially in male specimens, with the whole of the

1st free segment of the metasome and part of the 2nd dark red, anterior antennæ and basal part of the legs more or less tinged with chestnut brown.

Length of adult female slightly exceeding 1 mm.

Remarks.—This form was first detected by Normand and was described and figured under the MSname proposed by that author in Brady's well-known Monograf. It is a very fine and easily recognizable species, being especially distinguished by the very prominent rostrum, and in the living state also by the beautiful colouring of the body.

Occurrence.—I have met with this form occasionally in several places both off the south and west coasts of Norway, as also in the outer part of the Trondhjem Fjord. It generally occurs in depths ranging from 6 to 20 fathoms among Laminariæ and other algæ.

Distribution.—British Isles (Brady), coast of France (Canu).

77. Rhynchothalestris helgolandica (Claus).

(Pl. LXXV).

Thalestris helgolandica, Claus, Die freilebenden Copepoden, p. 131, Pl. XVII, figs. 12–21.

Syn: *Thalestris curticauda*, Boeck.

Specific Characters.—Female. Body comparatively short and stout, with the anterior division somewhat depressed and very sharply marked off from the posterior. Cephalic segment large and deep, with the epimeral parts abruptly curved in front of the middle; rostrum somewhat smaller than in the preceding species but of a very similar structure. Last segment of metasome abruptly much narrower than the others, with the epimeral parts very small, acute. Urosome unusually short, not nearly attaining half the length of the anterior division, genital segment imperfectly divided in the middle, and much dilated, with the lateral edges lamellar and strongly arcuate; posterior corners of this and the succeeding segment slightly produced. Caudal rami very short, apical setæ of moderate length. Anterior antennæ rather slender and of a similar structure to that in *R. rufocincta*. Posterior antennæ likewise rather similar, though having the outer ramus less fully developed, with the terminal joint much shorter. Posterior maxillipeds unusually slender and elongated, with the hand rather narrow and almost crescent-like in shape, dactylus very long, falciform. 1st pair of legs much more slender than in the preceding species, with both rami rather narrow, the outer one being the longer and having the terminal joint scarcely at all expanded, one of the claws much longer than the others; inner ramus likewise with

one of the apical claws very slender and elongated. Natatory legs with the rami more slender than in *R. rufocincta* and nearly equal in length, middle joint of inner ramus considerably produced at the outer corner, terminal joint of same ramus rather elongated, with the outermost of the setæ of the inner edge transformed to a slender, coarsely denticulated spine. Last pair of legs with the distal joint much elongated, narrow oblong in form, inner expansion of proximal joint comparatively short, triangular, not nearly extending to the middle of the distal joint. Ovisac comparatively small, rounded.

Male with the inner ramus of the 2nd pair of legs only very slightly transformed. Last pair of legs with the distal joint considerably shorter than in female and having the marginal setæ spiniform; inner expansion of proximal joint very slight, almost obsolete, with only 2 unequal marginal spines.

Body of a dark yellowish hue, with the posterior half of the anterior division tinged, especially along the ventral face, with deep chocolate brown.

Length of adult female 0.74 mm.

Remarks.—This form, first described by Claus, may be easily recognized by its short, stout body, and especially by the unusual shortness of the urosome. Moreover the very sharp demarcation between the 2 chief divisions of the body is rather characteristic. Though differing rather conspicuously in some of the anatomical details from *R. rufocincta,* it ought in my opinion to be referred to the same genus, since in other respects these 2 forms exhibit a perfect agreement. The *Thalestris curticauda* of Boeck is unquestionably identical with Claus's species.

Occurrence.—I have taken this form occasionally off the south coast, more frequently off the west coast, of Norway, in localities similar to those in which *R. rufocincta* occurs.

Distribution.—Heligoland (Claus), British Isles (Brady), Spitsbergen (Scott), Franz Josef Land (same author).

Gen. 32. **Microthalestris,** G. O. Sars, n.

Generic Characters.—Body slender, subcylindrical in form, with no very obvious demarcation between the 2 divisions. Cephalic segment of moderate size, rostrum small, but well defined. Epimeral plates poorly developed. Urosome with none of the segments expanded laterally; caudal rami short. Anterior antennæ attenuated, 9-articulate. Posterior antennæ with the proximal joint not

divided, outer ramus small, biarticulate. Oral parts on the whole less fully developed than in the preceding genera. 1st pair of legs with the rami very narrow and rather unequal, the inner one being much the longer and only composed of 2 joints, the distal one very small; outer ramus with 3 well-developed claws at the tip. Natatory legs slender, with the outer ramus much longer than the inner, setæ of the inner edge in both rami poorly developed; inner ramus of 3rd pair of legs in male slightly transformed. Last pair of legs with the distal joint much more prominent than the proximal one.

Remarks.—This new genus is founded upon the form recorded by Claus as *Thalestris forficula,* a species which has proved to differ very markedly in several respects from the other Thalestridæ, not being referable to any of the genera treated of in the preceding pages. We do not know at present with certainty more than a single species, to be described below.

78. Microthalestris forficula (Claus).

(Pl. LXXVI).

Thalestris forficula, Claus, Die freilebenden Copepoden, p. 131, Pl. XVII, figs. 7—11.

Syn: *Thalestris karmensis*, Boeck.
„ — *forficuloides*, Scott.

Specific Characters.—Female. Body narrow and elongated, seen dorsally, almost linear in form, with rather thin and flexible integuments. Cephalic segment scarcely longer than the 3 succeeding ones combined, epimeral parts not very deep, but evenly curved; rostrum very narrow, lanceolate. Epimeral plates of the 3 succeeding segment small and rounded behind. Last segment of metasome scarcely narrower than the preceding ones. Urosome considerably exceeding in length half the anterior division, and cylindric in form, with the segments densely spinulose at the hind edge both ventrally and laterally, genital segment about the length of the 2 succeeding ones combined, and distinctly divided in the middle. Caudal rami very short, with the innermost but one of the apical setæ greatly developed, abruptly bent at the base, and about twice as long as the urosome. Anterior antennæ of moderate length and densely clothed with rather long setæ, distal part considerably exceeding half the length of the proximal one. Posterior antennæ with the distal joint but slightly dilated, apical setæ comparatively strong, spiniform, outer ramus small, with the 2 joints subequal in length. Mandibular palp with the basal part only slightly expanded, outer ramus very small. Posterior maxillipeds not very strong, hand oval in form, with the palmar

edge slightly convex and carrying in the middle a slender seta. 1st pair of legs with the outer ramus much shorter than the inner, spine of the middle joint attached close to the end, apical claws rather slender and gradually increasing in length inwards, inner ramus with the proximal joint very narrow and elongated, seta of the inner edge attached far in front of the middle, distal joint very small and slightly expanded outside, apical claws of moderate size, the inner one twice as long as the outer. Natatory legs with the terminal joint of the outer ramus fully as long as the other 2 combined, and of narrow linear form, setæ of the inner edge in both rami much reduced in number. Last pair of legs with the distal joint oblong hastate in form, densely spinulose on the edges, and provided with 8 marginal setæ, 3 of which issue from the inner edge; inner expansion of proximal joint triangular and not nearly extending to the middle of the distal one.

Male considerably smaller than female, and having the inner ramus of 3rd pair of legs (not that of 2nd pair) transformed, the terminal joint being produced at the tip to a long mucroniform spine. Last pair of legs very small, with the distal joint subdivided into 2 or 3 successive segments.

Colour pale yellow.

Length of adult female 0.58 mm.

Remarks.—This form was first described by Claus from the Mediterranean, at Messina, and has subsequently been found to occur also in the northern oceans. The *Thalestris karmensis* of Boeck is unquestionably identical with Claus's species, and the form recorded by Th. Scott under the name of *T. forficuloides* has also proved to be the same species. By its slender cylindrical and very flexible body this form differs conspicuously from the other Thalestridæ, and so far exhibits a pronounced similarity to certain forms belonging to the family *Canthocamptidæ*.

Occurrence.—I have met with this form not unfrequently in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, in the littoral region among algæ. On account of its small size and inconspicuous colour, it is, however, easily overlooked.

Distribution.—Mediterranean (Claus), British Isles (Scott), ? Gulf of Guinea (same author), coast of Bohuslän (coll. Cleve), Spitsbergen (Scott), Franz Josef Land (do.), Polar Islands north of Grinnell Land (2nd Fram Exped.).

Gen. 33. **Dactylopusia**, Norman, 1903.

Syn: *Nauplius*, Philippi (not Müller).
„ *Dactylopus*, Claus (not Gill).

Generic Characters.—Body, as a rule, rather stout, tapering behind, with the anterior division more or less depressed and generally not sharply marked off from the posterior. Cephalic segment large, but not very deep, rostrum well defined at the base. Urosome with none of the segments expanded laterally; caudal rami short. Anterior antennæ comparatively short, with a somewhat varying number of joints. Posterior antennæ with the proximal joint not divided in the middle, outer ramus composed of 3 well-defined joints. Oral parts normal. 1st pair of legs with the outer ramus generally much shorter and stouter than the inner, terminal joint lamellar and armed with 4 strong outward-curving claws and a slender seta inside the latter; inner ramus distinctly 3-articulate, with the outer 2 joints quite short, the last carrying 2 strong claws. Natatory legs well developed, with the rami rather broad, the inner one somewhat shorter than the outer and having 2 setæ inside the middle joint; inner ramus of 2nd pair of legs in male conspicuously transformed, biarticulate, with a strong spine outside the distal joint. Last pair of legs in female with both joints generally broad and lamellar; those of male, as usual, much smaller.

Remarks.—This genus was established as early as the year 1840 by Philippi; but the name he applied to the genus, *Nauplius*, cannot properly be accepted, since it was used by O. Fr. Müller in a very different sense, and at present is in general use to distinguish the well-known earliest larval stage of lower Crustacea. Nor can the generic name proposed by Claus, *Dactylopus*, be employed, as it was appropriated some years previously by Gill for a genus of fishes. For this reason, the Rev. A. M. Norman has recently proposed the change of the Clausian name to *Dactylopusia*.[1]) The genus was taken by Claus in a much wider sense than here adopted, and Boeck had already called attention to the fact that some of the Clausian species of *Dactylopus* ought to be separated generically. Still, however, recent British authors refer to this genus forms, which, by the presence of 2 ovisacs, clearly show themselves to belong to quite a different family, viz., the *Diosaccidæ*, to be treated of farther on. Even in the restriction here adopted, this genus seems to comprise a great number of species from different parts of the oceans. To the Norwegian fauna belong at least 5 well-defined species, to be described below.

[1]) Should perhaps more properly have been *Dactylopodia*.

79. Dactylopusia thisboides (Claus).

(Pl. LXXVII & LXXVIII, fig. 1).

Dactylopus thisboides, Claus, Die freilebenden Copepoden, p. 127, Pl. XVI, figs. 24—28.

Specific Characters.—Female. Body moderately slender, conspicuously dilated in front and gradually tapered behind. Cephalic segment rather broad, depressed, evenly arcuate in front, and scarcely longer than the 3 succeeding segments combined; rostrum of moderate size, obtuse at the tip. Epimeral plates of the 3 succeeding segments comparatively small and rounded at the posterior corners. Urosome exceeding half the length of the anterior division, genital segment of moderate size and considerably broader in front than behind. Caudal rami short and broad, apical setæ, however, rather elongated, the innermost but one almost twice as long as the urosome. Anterior antennæ rather short and densely setiferous, composed of 8 joints, 4 of which belong to the distal part, the latter about as long as the 3 preceding joints combined. Posterior antennæ with the outer ramus well developed, terminal joint about the length of the other 2 combined. 1st pair of legs moderately strong, outer ramus scarcely more than half as long as the inner, apical claws only slightly curved and finely spinulose on the concave edge; inner ramus scarcely narrower than the outer, with the apical claws strong and distinctly spinulose, the outer one exceeding half the length of the inner. Last pair of legs with the distal joint not very large, rounded oval in form and more or less exstant, so as to be generally wholly visible in the dorsal view of the animal, marginal setæ 6 in number, some of them very slender and elongated; inner expansion of proximal joint very large and broad, foliaceous, extending beyond the tip of the distal joint, and provided inside the inner edge with a regular row of short transverse chitinous stripes. Ovisac large, pyriform.

Male much smaller than female, and exhibiting the usual sexual differences. Inner ramus of 2nd pair of legs with the distal joint somewhat curved at the tip, which carries 2 rather unequal spines, spine of outer edge very strong and conspicuously expanded at the base. Last pair of legs much smaller than in female, distal joint short, cordate in form, with only 5 marginal setæ, 2 of them spiniform; inner expansion of proximal joint very slight, with 3 subequal marginal spines.

Body of a golden yellow hue, with a chestnut-coloured transverse band across the anterior part of the genital segment.

Length of adult female about 1 mm.

Remarks.—This form I regard as the type of the present genus. It is the largest and finest of the Norwegian species, and is moreover easily recognizable

by the general form of the body and more particularly by the structure of the last pair of legs in the female.

Occurrence.—Off the west coast of Norway this form is by no means of rare occurrence in the littoral region. I have taken it rather plentifully at Aalesund and Christiansund, as also in the outer part of the Trondhjem Fjord, and it is also recorded by Th. Scott from the Finmark coast.

Distribution —British Isles (Brady), coast of France (Canu), Mediterranean (Claus), the Red Sea (A. Scott), Bear Island (T. Scott), Franz Josef Land (same author).

80. Dactylopusia neglecta, G. O. Sars, n. sp.

(Pl. LXXVIII. fig. 2).

Dactylopus thisboides (brackish water variety), Brady, Monograph of British Copepoda, Vol. 11, p. 108, Pl. LIV, figs. 14—16.

Specific Characters.—Female. Body somewhat more slender than in *D. thisboides*, and less regularly tapered behind. Cephalic segment less broad, with the rostrum more prominent. Urosome with the segments more sharply marked off from each other, each with a very conspicuous transverse row of spinules near the hind edge ventrally and laterally. Anterior antennæ comparatively more slender and distinctly 9-articulate, distal part exceeding the length of the 3 preceding joints combined. Posterior antennæ with the outer ramus comparatively smaller. 1st pair of legs with the outer ramus considerably exceeding half the length of the inner, apical claws of moderate length and scarcely spinulose, apical claws of inner ramus very unequal, the inner one more than twice as long as the outer. Last pair of legs rather different in shape from those in *D. thisboides*, distal joint comparatively larger, oval cordate in form and edged with 7 not much elongated setæ, 2 of which issue from the inner edge; inner expansion of proximal joint much smaller than in *D. thisboides*, extending only slightly beyond the middle of the distal joint; none of the marginal setæ remarkably elongated.

Male having the distal joint of the inner ramus of 2nd pair of legs scarcely curved at the tip, apical spines subequal in length, spine of outer edge more slender than in *D. thisboides* and attached rather in front of the middle. Last pair of legs resembling in shape those of female, but of smaller size and with only 3 marginal spines on the proximal joint.

Colour pale yellow.

Length of adult female 0.85 mm.

Remarks.—This form was considered by Prof. Brady as only a variety of *D. thisboides*. It is, however, certainly specifically distinct, as is clearly proved, both by the distinctly 9-articulate anterior antennæ and by the rather different structure of the last pair of legs. Moreover, the inner transformed ramus of the 2nd pair of legs in the male exhibits characteristic differences from that in the male of *D. thisboides*.

Occurrence.—I have hitherto only observed this form in a single locality, viz. in the immediate vicinity of Trondhjem, where some few specimens were taken from tidal pools.

Distribution.—British Isles (Brady).

81. Dactylopusia vulgaris, G. O. Sars (new name).

(Pl. LXXIX, fig. 1).

Dactylopus Strömi, Claus, Die freilebenden Copepoden, p. 126, Pl. XVI, figs. 1—6 (not = *Canthocamptus Strömi*, Baird).

Specific Characters.—Female. Body considerably shorter and stouter than in the 2 preceding species, and conspicuously depressed throughout. Cephalic segment fully as long as the 4 succeeding ones combined; rostrum well developed and somewhat curved. Urosome scarcely exceeding half the length of the anterior division, all the segments fringed at the hind edge ventrally with delicate spinules, genital segment scarcely broader in front than behind. Caudal rami about as in *D. neglecta*. Anterior antennæ of moderate length and distinctly 9-articulate, distal part about the length of the 3 preceding joints combined. 1st pair of legs resembling in structure those in *D. neglecta*, though having the apical claws of both rami somewhat stronger and distinctly denticulated. Last pair of legs with the distal joint broadly ovate or cordate in form, tip narrowly exserted and carrying 2 unequal bristles, outer edge with 3 subequal setæ, inner one with a single somewhat stronger seta; inner expansion of proximal joint rather large, though less broad than in *D. thisboides*, and extending about as far as the distal joint, both joints exhibiting inside the inner edge a row of short transverse chitinous stripes.

Male with the inner ramus of 2nd pair of legs resembling in shape that in *D. neglecta*, apical spines, however, less strong, and spine of outer edge attached to about the middle of the distal joint. Last pair of legs with the distal joint much shorter than in female and provided with an additional seta inside, inner expansion of proximal joint extending as far as the distal joint and carrying 3 marginal setæ.

Colour dark yellow changing to olivaceous brown.

Length of adult female 0.70 mm.

Remarks.—This form has been identified by Claus with the *Canthocamptus Strömi* of Baird, and all subsequent authors have followed Claus in this view. In my opinion, however, such an identification cannot properly be maintained, as the figures given by Baird clearly show his form to be not a *Dactylopusia* but without doubt a *Laophonte*, and in all probability the species recorded by Boeck as *Laophonte curticauda*. I have therefore found it necessary to give the present form a new specific name, and to transfer that proposed by Baird to the above-named species of *Laophonte*. The form here in question is nearly related to the 2 preceding species, though easily distinguishable by its much shorter and stouter body, as also by the structure of the last pair of legs in the female.

Occurrence.—This is by far the most common of our Dactylopusiæ and perhaps one of the commonest Harpacticoida, occurring along the whole Norwegian coast, everywhere in the littoral region among algæ, and often also found abundantly in tidal pools.

Distribution.—Heligoland (Claus), coast of Bohuslän (coll. Cleve), British Isles (Brady), coast of France (Canu).

82. Dactylopusia micronyx, G. O. Sars, n. sp.

(Pl. LXXIX. fig. 2).

Specific Characters.—Female. Body resembling in its general form that of *D. vulgaris*, though somewhat more slender and more tapered behind. Anterior antennæ very small, 9-articulate, penultimate and antepenultimate joints less distinctly defined. 1st pair of legs with the outer ramus short and stout, scarcely exceeding half the length of the inner, terminal joint lamellar, with the 2 outermost claws extremely small; apical claws of inner ramus very unequal, the inner one much elongated, 3 times as long as the outer. Last pair of legs with the distal joint comparatively smaller than in *D. vulgaris* and of a more regular oval form, marginal setæ 7 in number, 2 of them issuing from the inner edge; inner expansion of proximal joint large, triangular, extending as far as the distal joint, none of the joints with chitinous stripes inside the edge.

Male with the inner ramus of 2nd pair of legs similar to that in *D. vulgaris*, but having the apical spines more elongated and rather unequal, the outer one slender, setiform, the inner very strong and somewhat lamellar at the tip.

Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint shorter and provided with only 3 marginal setæ.

Colour pale yellow, with dark red intestine.

Length of adult female 0.65 mm.

Remarks.—This form may be easily distinguished from the preceding species by the small size of the anterior antennæ and by the structure of the 1st and last pairs of legs. The small size of the 2 outermost apical claws on the outer ramus of the 1st pair of legs is especially characteristic, and has given rise to the specific name here proposed.

Occurrence.—I have met with this form occasionally in the upper part of the Christiania Fjord, as also in the neigbourhood of Trondhjem, in depths ranging from 6 to 20 fathoms, muddy bottom.

83. Dactylopusia brevicornis (Claus).

(Pl. LXXX).

Dactylopus brevicornis, Claus, Die Copepodenfauna von Nizza, p. 29, Pl. III, figs. 20—25.

Syn: *Dactylopus latipes*, Boeck (not Scott).

Specific Characters.—Female. Body comparatively short and stout, with the 2 divisions more sharply defined than in most other species. Cephalic segment rather large and broad, about the length of the 4 succeeding segments combined; rostrum of moderate size, obtuse at the tip. Urosome considerably narrower than the anterior division and only very slightly attenuated behind. Caudal rami twice as broad as they are long, apical setæ rather slender and divergent, the innermost but one almost twice the length of the urosome. Anterior antennæ remarkably short and robust, densely setiferous, and consisting of only 5 distinctly defined joints, 2 of which belong to the distal part, 3rd joint rather expanded and exhibiting a slight indication of a subdivision into 2 segments. Posterior antennæ with the terminal joint of the outer ramus very short. 1st pair of legs rather strongly built, with both rami comparatively short and broad, the inner one being only slightly longer than the outer, apical claws of both rami remarkably strong and curved, minutely denticulated on the concave edge. Last pair of legs with the distal joint oblong oval, somewhat tapering distally, and more or less extant, being visible in the dorsal view of the animal, marginal setæ 6 in number and rather slender; inner expansion of proximal joint of moderate size, scarcely however extending as far as the distal joint, marginal setæ rather unequal, the middle one much longer than the others. Ovisac narrow oblong in form.

Male with the inner ramus of 2nd pair of legs rather unlike that in the other species, the distal joint being considerably shortened, and having the outer edge fringed with long delicate cilia, tip armed with a remarkably strong angularly bent spine. Last pair of legs with the distal joint of about same shape as in the female, but of smaller size and only provided with 5 marginal setæ; inner expansion of proximal joint, as usual, far less prominent and carrying 3 spiniform setæ.

Colour pale yellow, urosome and part of metasome tinged with orange. Length of adult female 0.63 mm.

Remarks.—This is a very distinct and easily recognizable form, differing in some points rather markedly from the other species. The *Dactylopus latipes* of Boeck is unquestionably identical with Claus's species. This is however not the case with the form described by Scott under the same name from the Gulf of Guinea.

Occurrence.—I have only met with this form quite occasionally in the upper part of the Christiania Fjord, as also in some places on the west coast of Norway. The specimens were found among algæ in the littoral region. Th. Scott also records this form from the Finmark coast.

Distribution.—Mediterranean (Claus), British Isles (Brady).

Gen. 34. **Dactylopodella,** G. O. Sars, n.

Generic Characters.—Body much dilated and slightly depressed in front, attenuated behind. Cephalic segment large and expanded, with the rostrum well developed and deflexed. Urosome much narrower than the anterior division; caudal rami short, apical setæ normal. Anterior antennæ comparatively small, with the number of articulations reduced. Posterior antennæ with the outer ramus of moderate size, biarticulate. Oral parts normally developed. 1st pair of legs with the outer ramus shorter than the inner and somewhat resembling that in the genus *Dactylopusia*, though having the apical claws much more slender and geniculate; inner ramus only composed of 2 joints, the proximal one only slightly dilated, distal joint armed with 2 very strong subequal claws. Natatory legs with the outer ramus much longer than the inner and densely spinulose outside; inner ramus of 2nd pair of legs with the 2 outer joints in both sexes confluent, in male tipped with a strong spine, outer edge unarmed. Middle joint of same ramus

in 3rd and 4th pairs with only a single natatory seta inside. Last pair of legs poorly developed, distal joint very small, with some of the marginal setæ spiniform.

Remarks.—This new genus is founded upon the form recorded by Claus as *Dactylopus flavus*, which on a closer examination has proved to differ in some of the anatomical details rather conspicuously from the other species of the old genus *Dactylopus*, so that it more properly ought to be generically separated.

84. Dactylopodella flava (Claus).

(Pl. LXXXI).

Dactylopus flavus, Claus, Die Copepoden-Fauna von Nizza, p. 28, Pl. III, figs. 13—16.

Specific Characters.—Female. Body short, pyriform in outline, with rather strongly chitinized integuments. Cephalic segment very large and broad, fully twice as long as the 3 succeeding segment combined, dorsal face evenly vaulted; rostrum rather strong, pointing straight below, tip blunted. Epimeral plates of the 3 succeeding segments small, rounded behind. Last segment of metasome considerably narrower than the preceding ones. Urosome scarcely attaining half the length of the anterior division and slightly tapered behind; posterior edge of the segments finely spinulose ventrally. Caudal rami broader than they are long, middle apical setæ rather elongated, innermost seta small and simple. Anterior antennæ composed of 6 joints only, 2 of which belong to the distal part. 1st pair of legs with the outer ramus shorter than the proximal joint of the inner, terminal joint lamellar, with the apical claws very slender and gradually increasing in length inwards, seta attached inside the claws much elongated; inner ramus with the seta of the proximal joint attached beyond the middle, distal joint short, slightly widening towards the tip, apical claws very strong, falciform, and distinctly denticulated on the concave edge. Spines of the outer ramus in all the legs densely pectinate outside. Last pair of legs with the distal joint very small, subcordate, with 5 very unequal and partly spiniform marginal setæ; inner expansion of proximal joint rather broad and likewise provided with 5 marginal setæ, the outermost but one much longer than the others. Ovisac comparatively small.

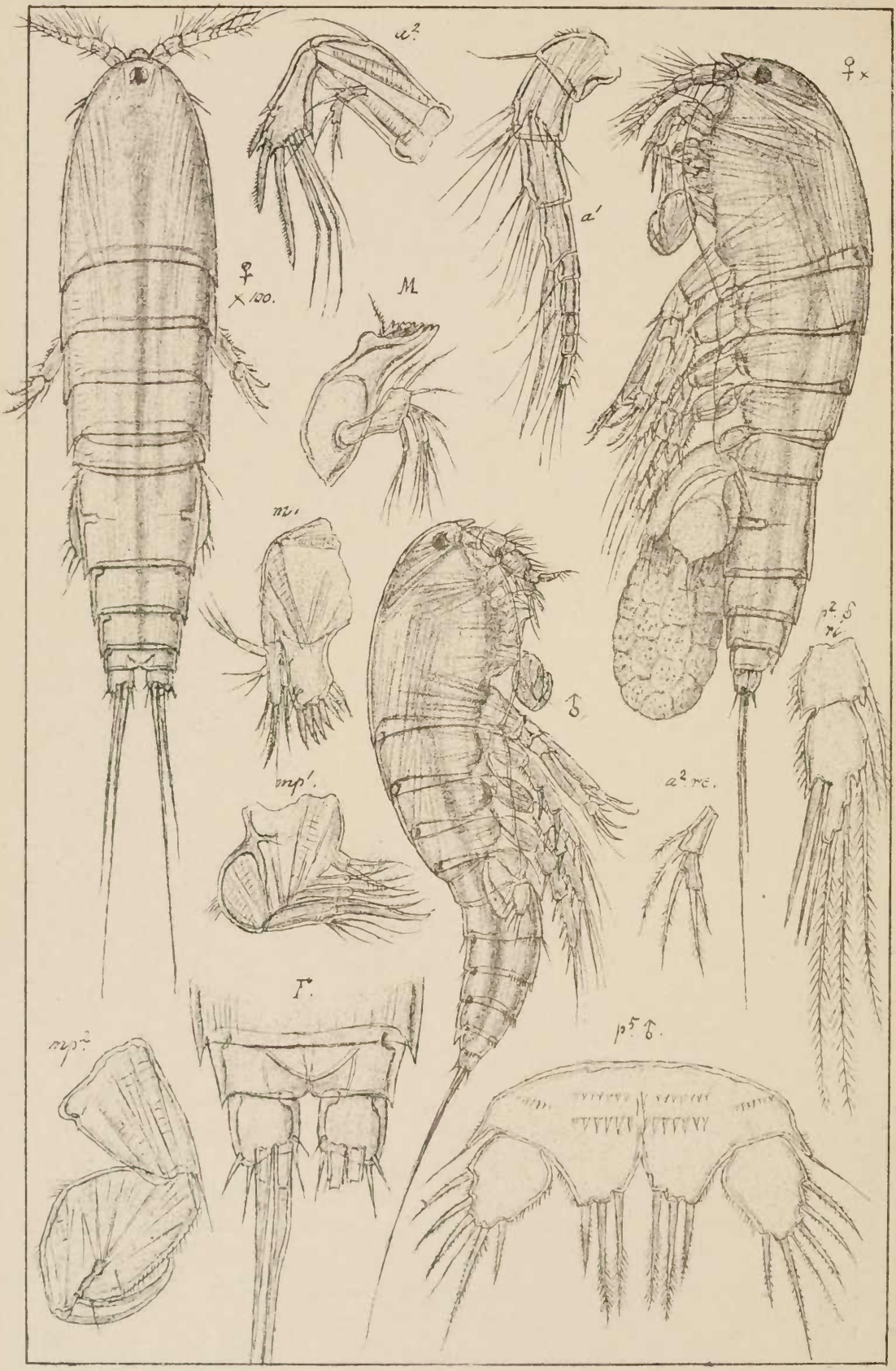
Male agreeing with the female both in general form and structure, though exhibiting the usual sexual differences. Anterior antennæ very stout and apparently only composed of 4 joints, the penultimate much dilated, vesicular, the last hamiform and very mobile. Inner ramus of 2nd pair of legs tipped with a strong spine. Last pair of legs resembling those in female, but having the inner expansion of the proximal joint much less prominent and only provided with 2 marginal setæ.

Copepoda

Harpacticoida

Thalestridæ

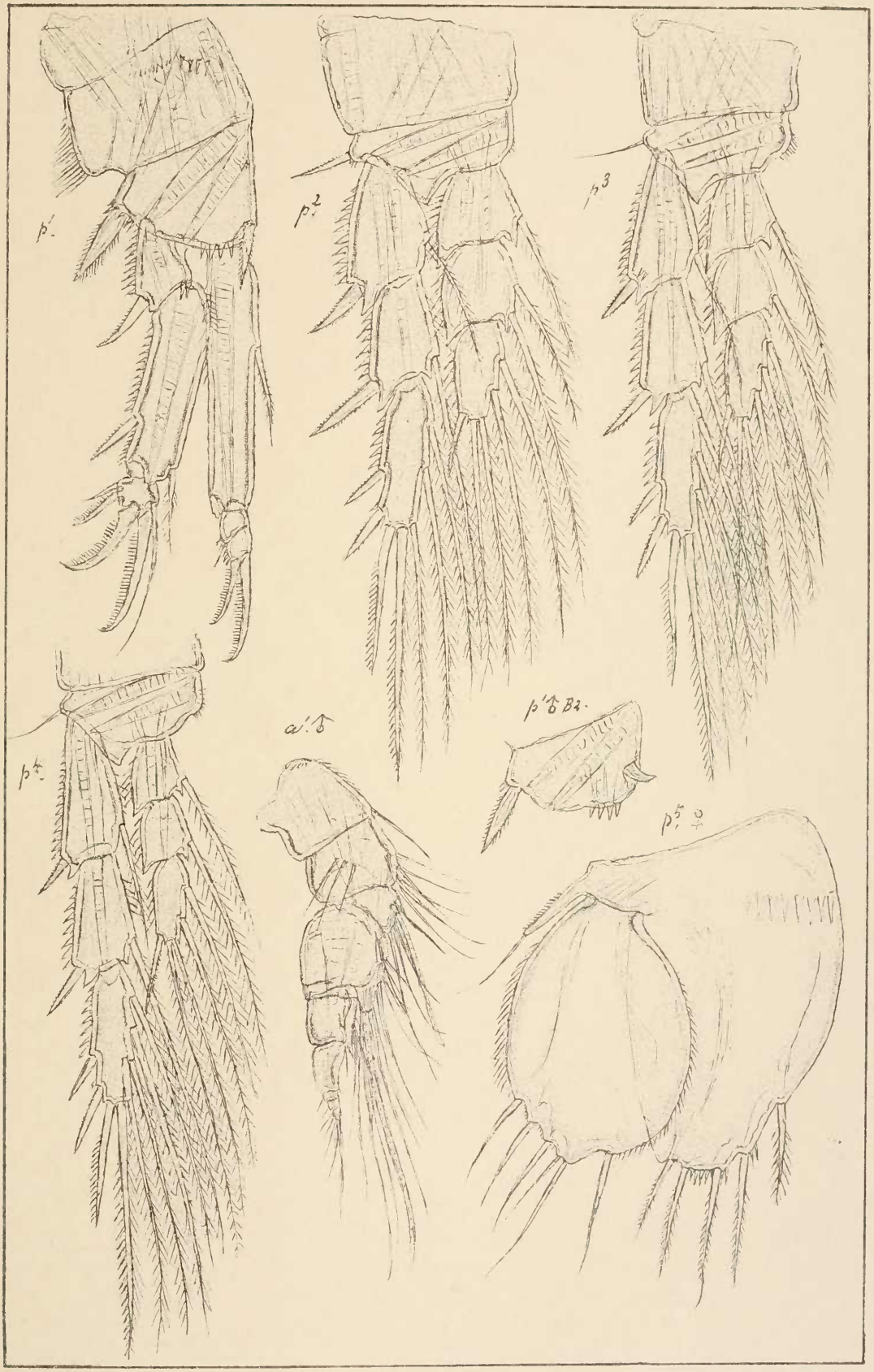
Pl. LXV.



G.O. Sars, autogr.

Norsk Lithgr. Officin.

Parathalestris Clausi, (Norman.)



G.O. Sars, autogr. Norsk Lithgr. Officin.

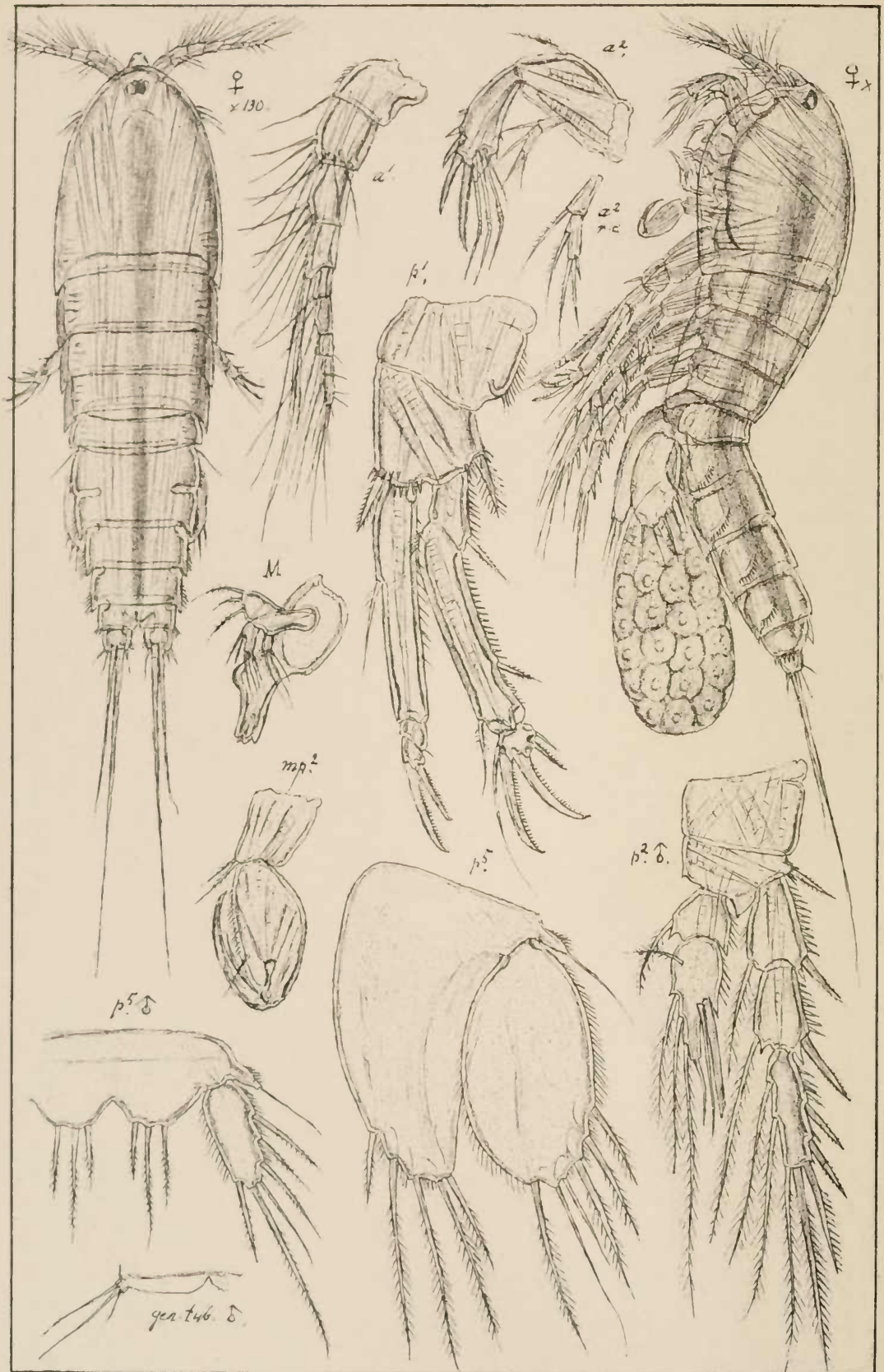
Parathalestris Clausi, (Norman.)
(continued)

Copepoda

Harpacticoida

Thalestridæ

Pl. LXVII



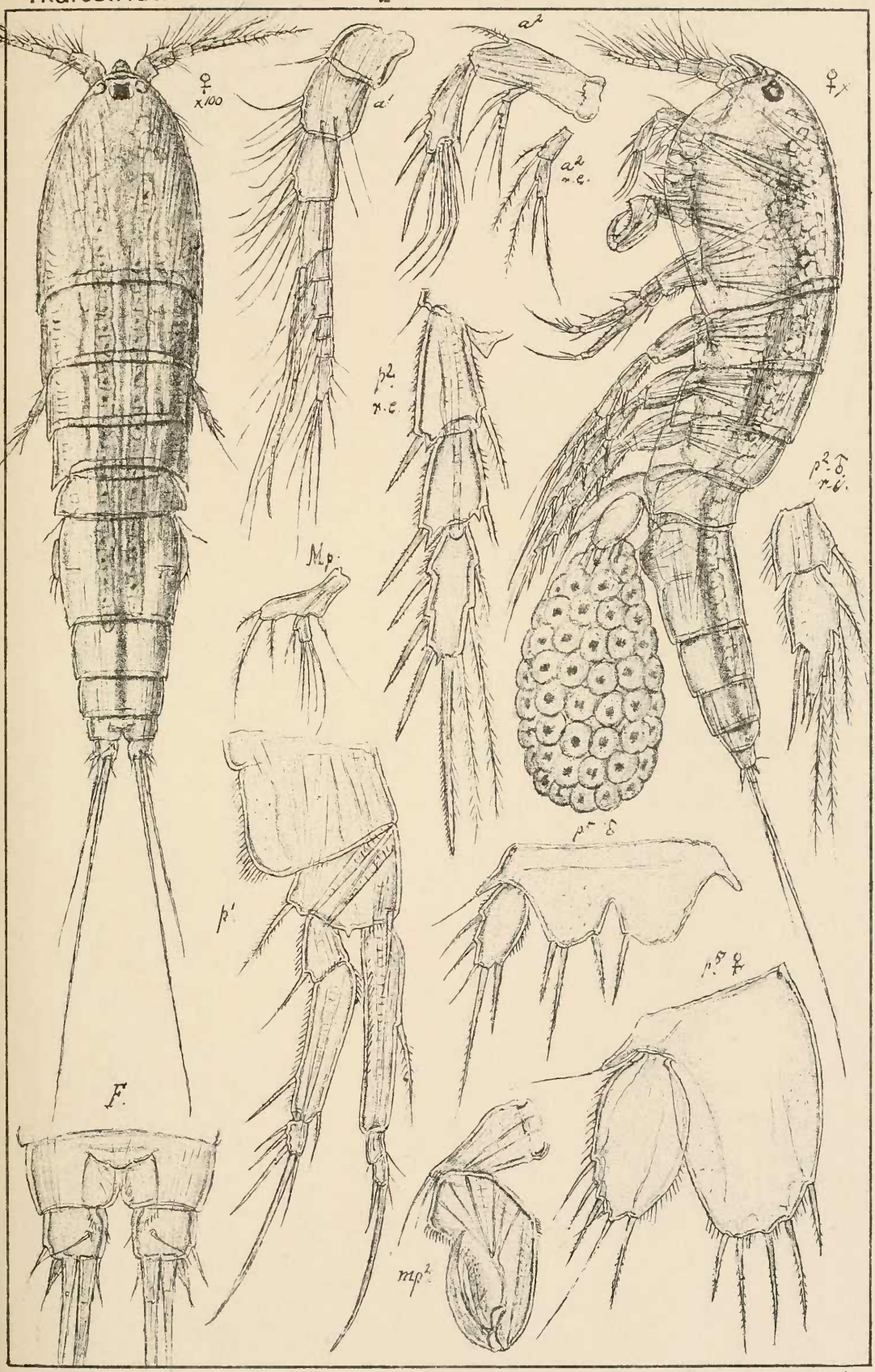
G.O. Sars, autogr.

Parathalestris harpacticoides, (Claus).

Norsk Lithgr. Officin.

Copepoda

Harpacticoida



G.O. Sars, autogr.

Parathalestris hibernica, (Brady & Rob.)

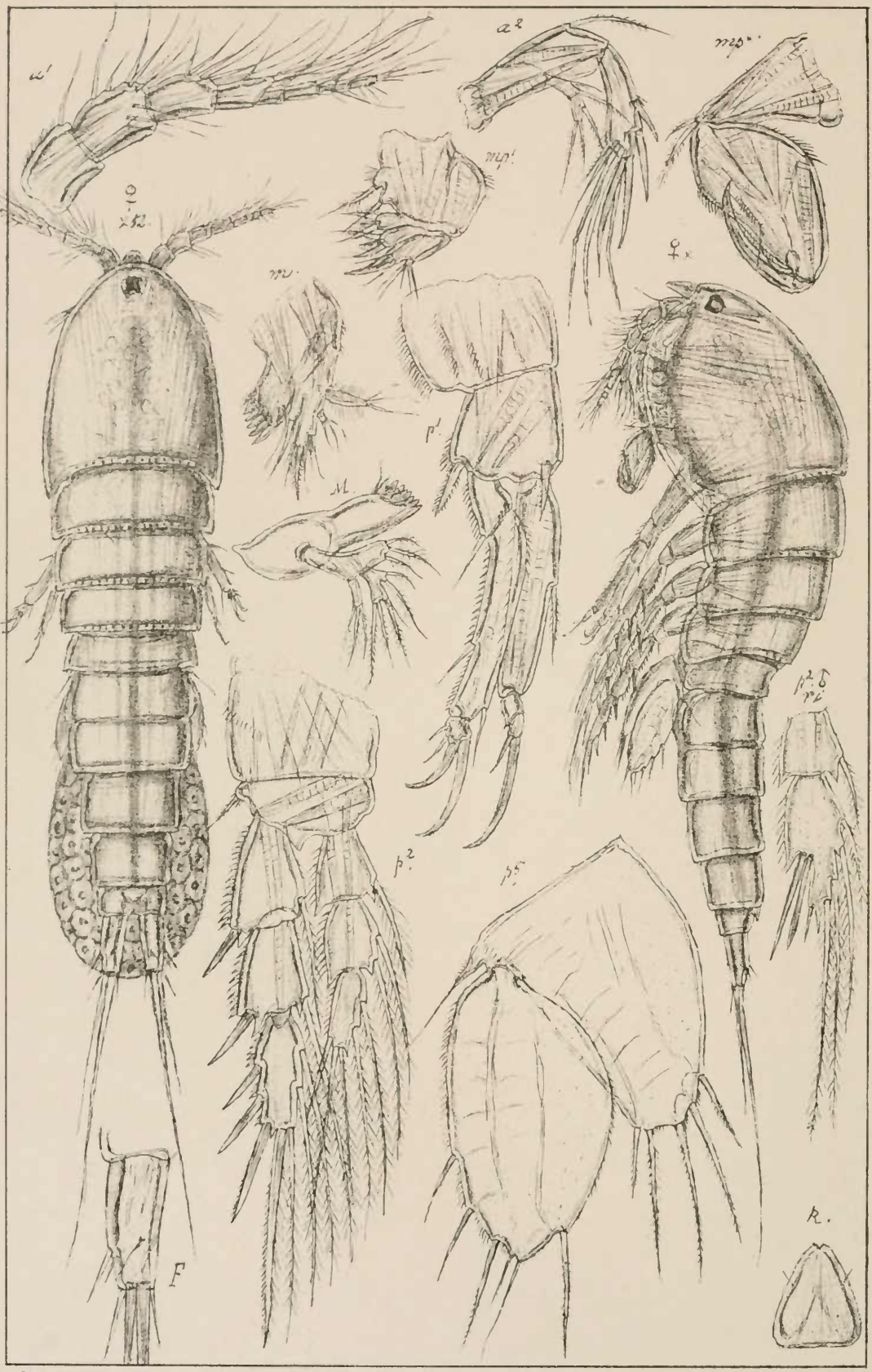
Norsk Lithgr. Officin.

Copepoda

Harpacticoida

Thalestridæ

Pl. LXIX.



G.O. Sars, autogr.

Norsk Lithgr. Officin.

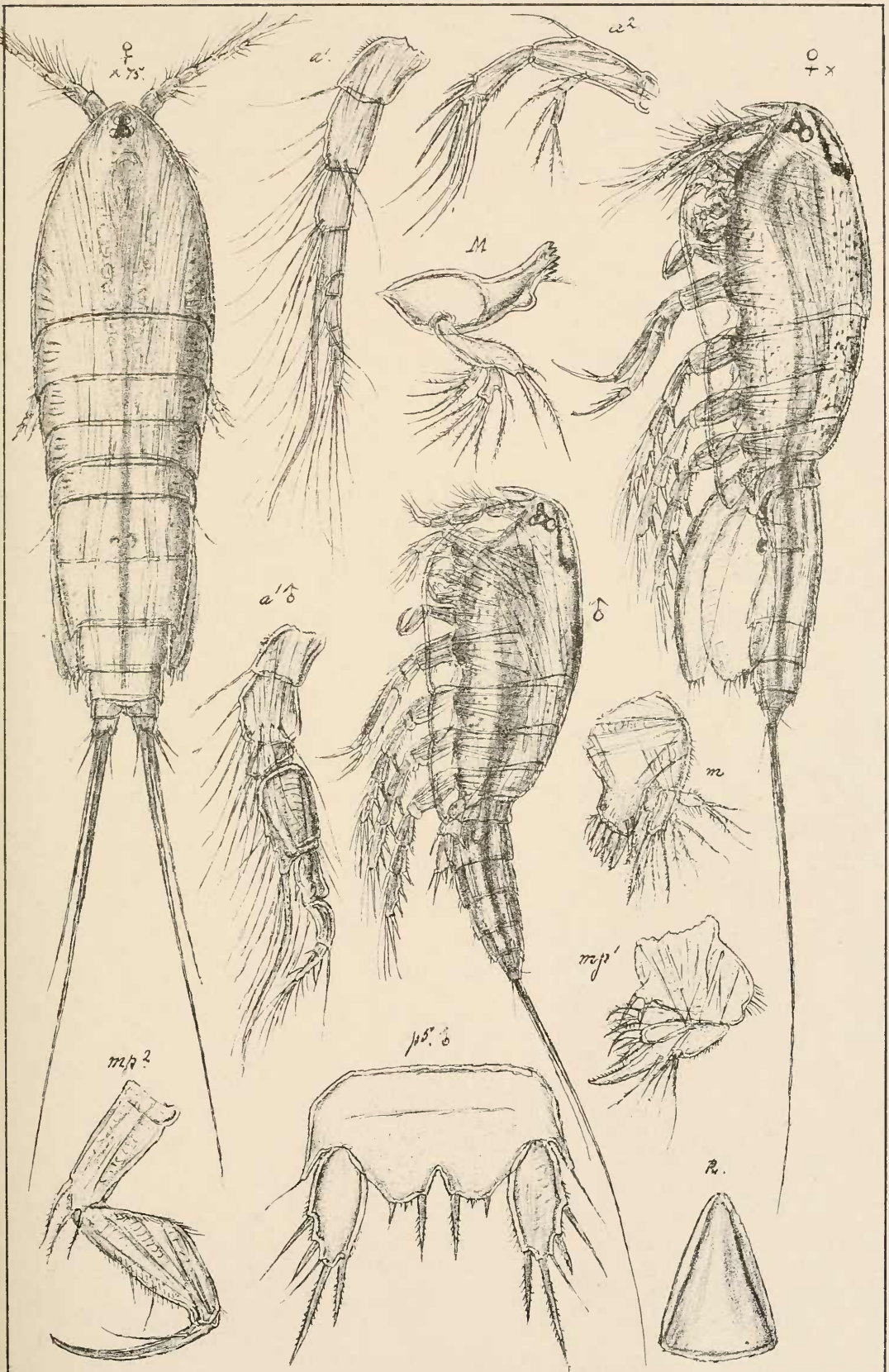
Parathalestris Jacksoni, (Scott.)

Copepoda

Harpacticoida

Thalestridæ

Pl. LXX.



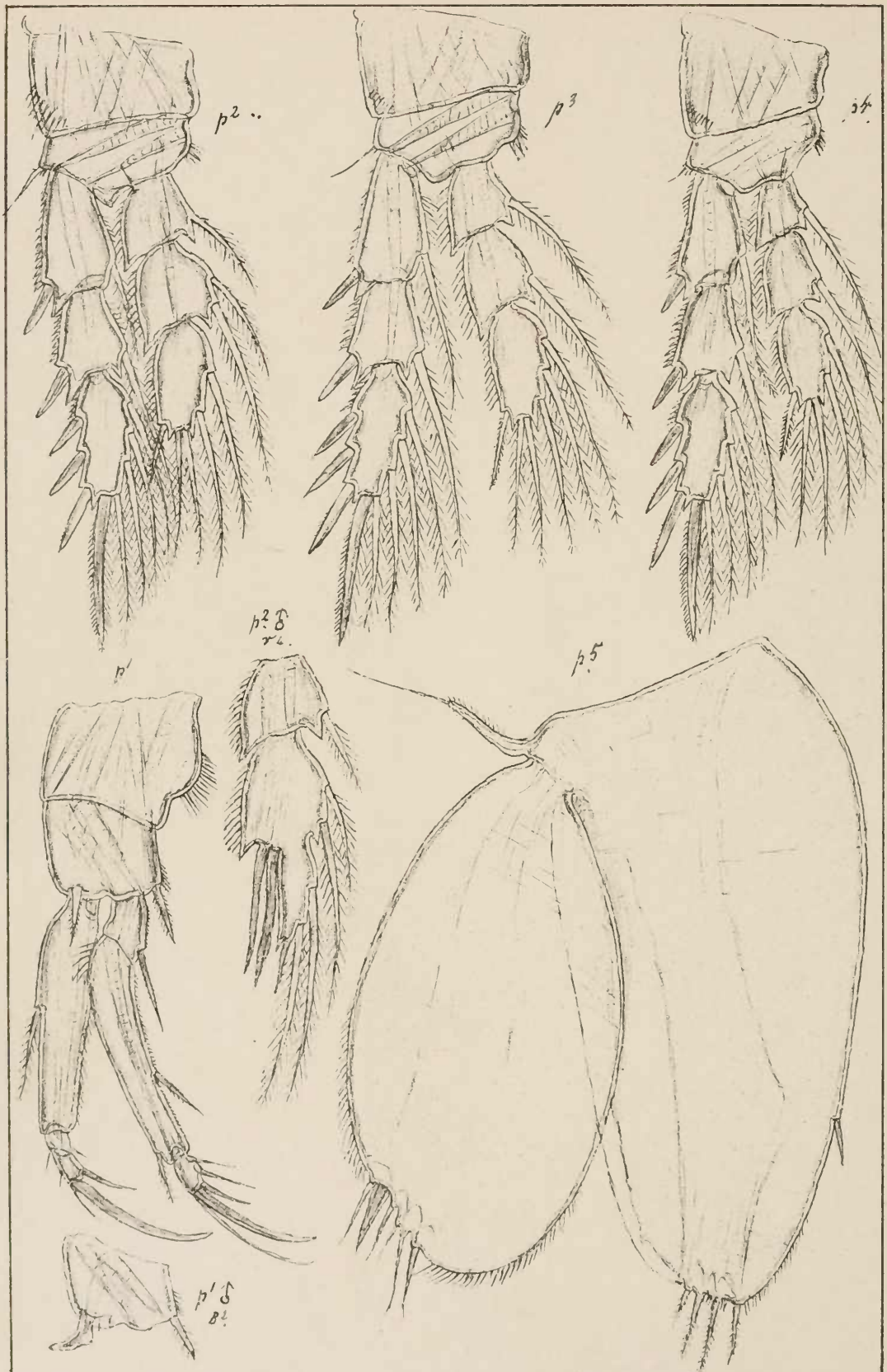
G.O. Sars, autogr.

Norsk Lithgr. Officin.

Phyllothalestris mysis, (Claus)

Copepoda

Harpacticoida



G.O. Sars, autogr. Norsk Lithgr. Officin.

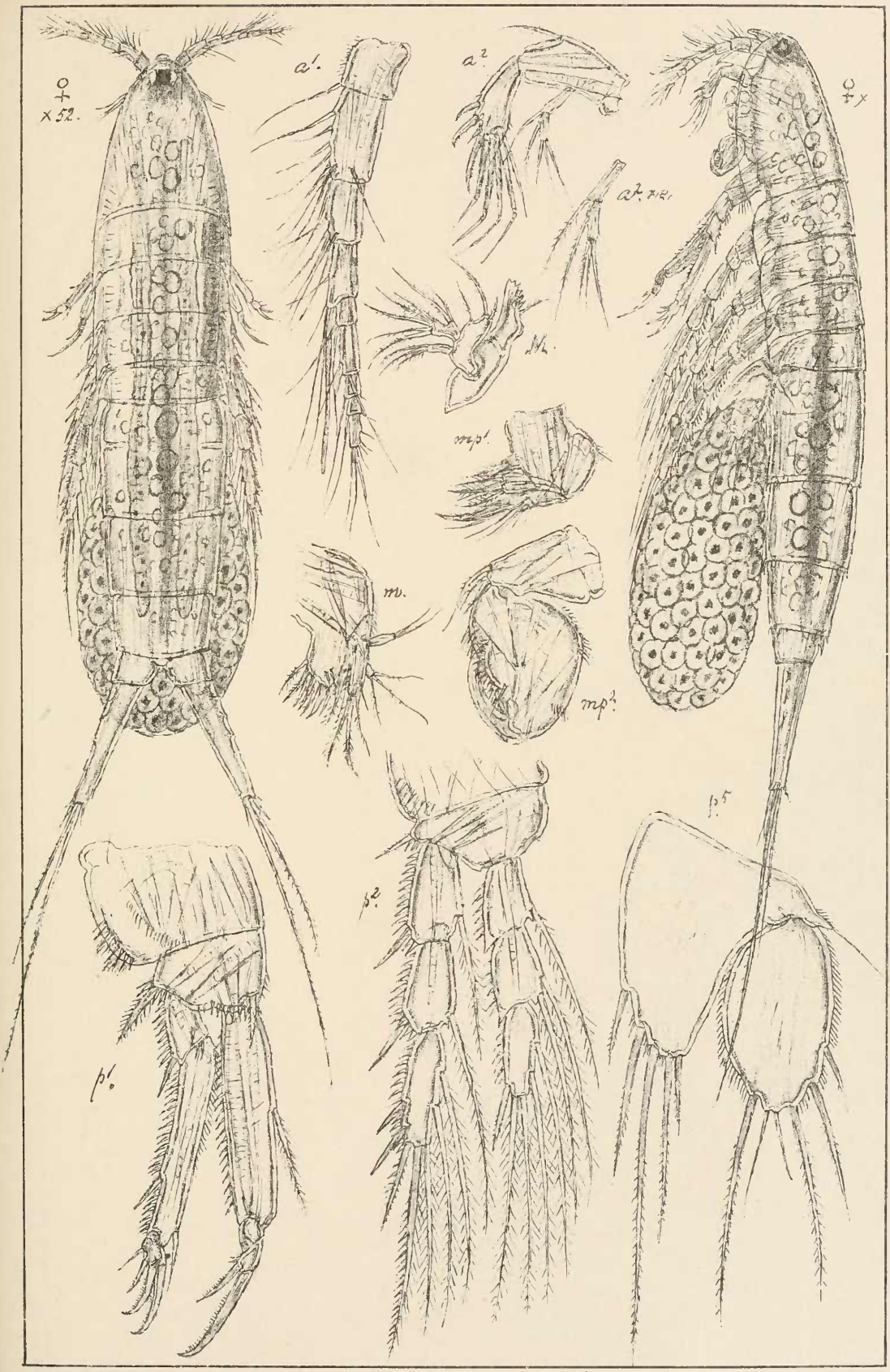
Phyllothalestris mysis, (Claus)
(continued)

Copepoda

Harpacticoida

Thalestridæ

Pl. LXXII.

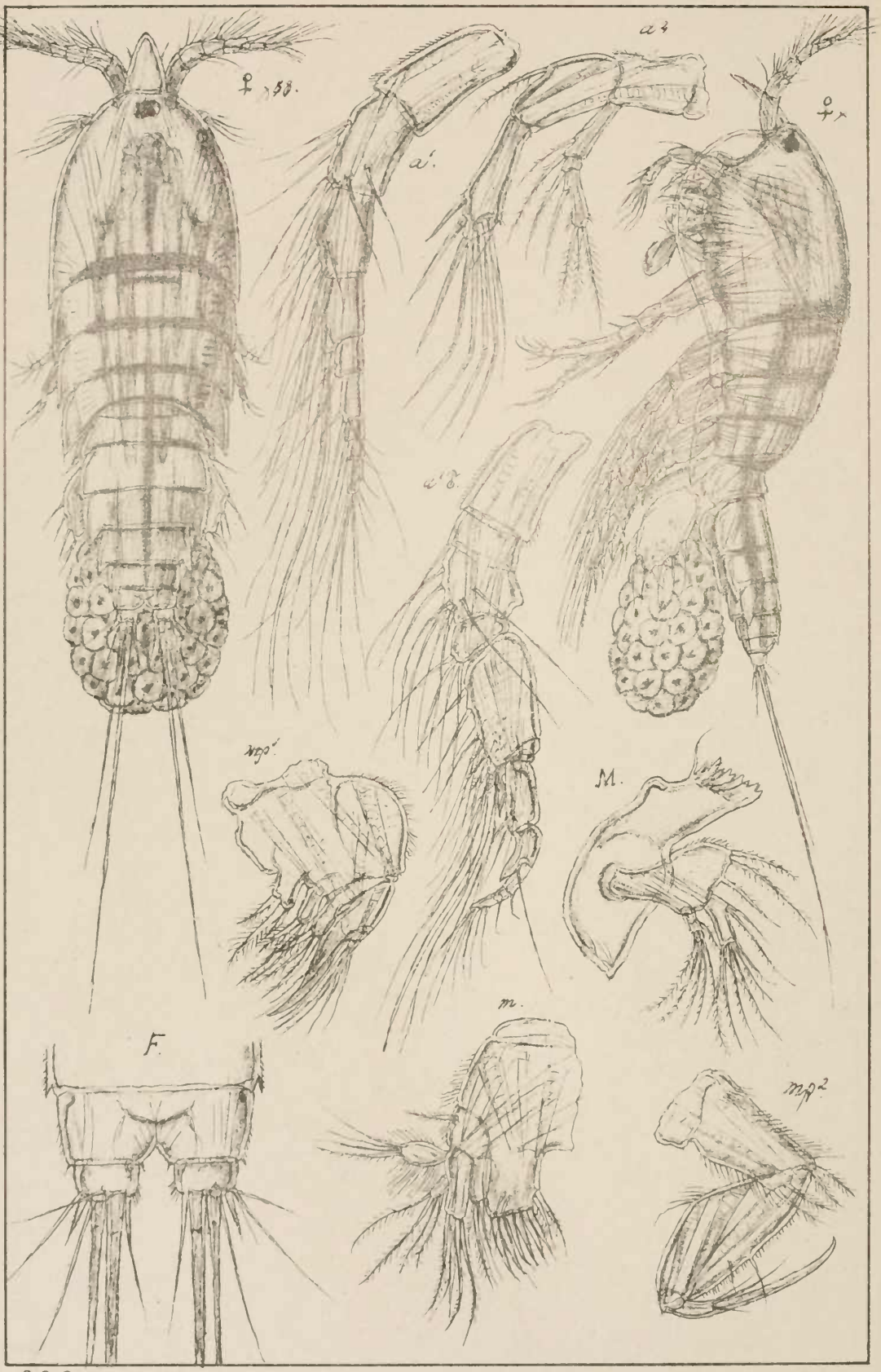


G.O. Sars, autogr.

Norsk Lithgr. Officin.

Halithalestris Croni, (Kröyer.)

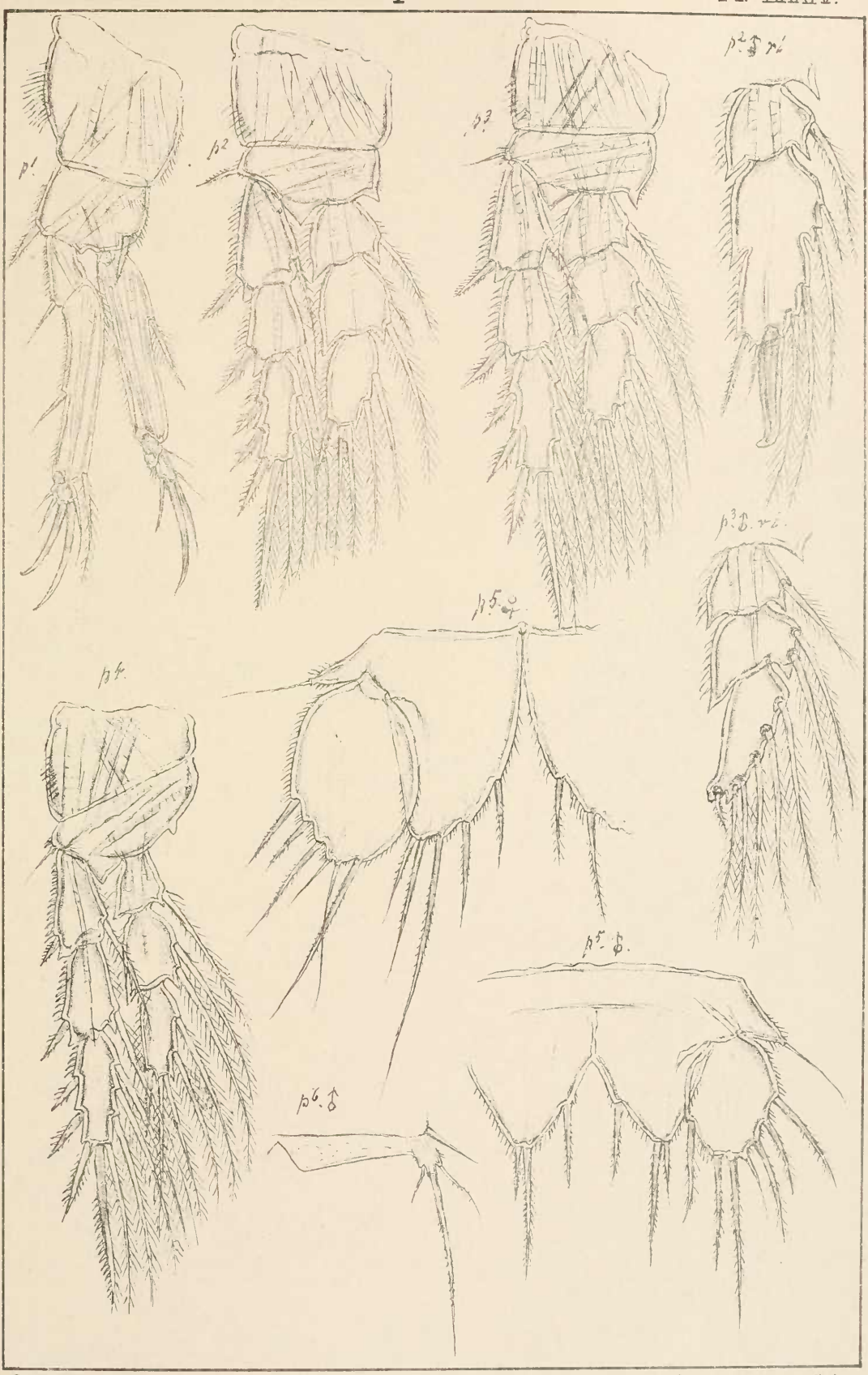
Copepoda



G. O. Sars. autogr. Norsk Lithgr. Officin.

Rhynchothalestris rufocincta, (Norm.)

Copepoda



G.O. Sars, autogr. Norsk Lithgr. Officin.

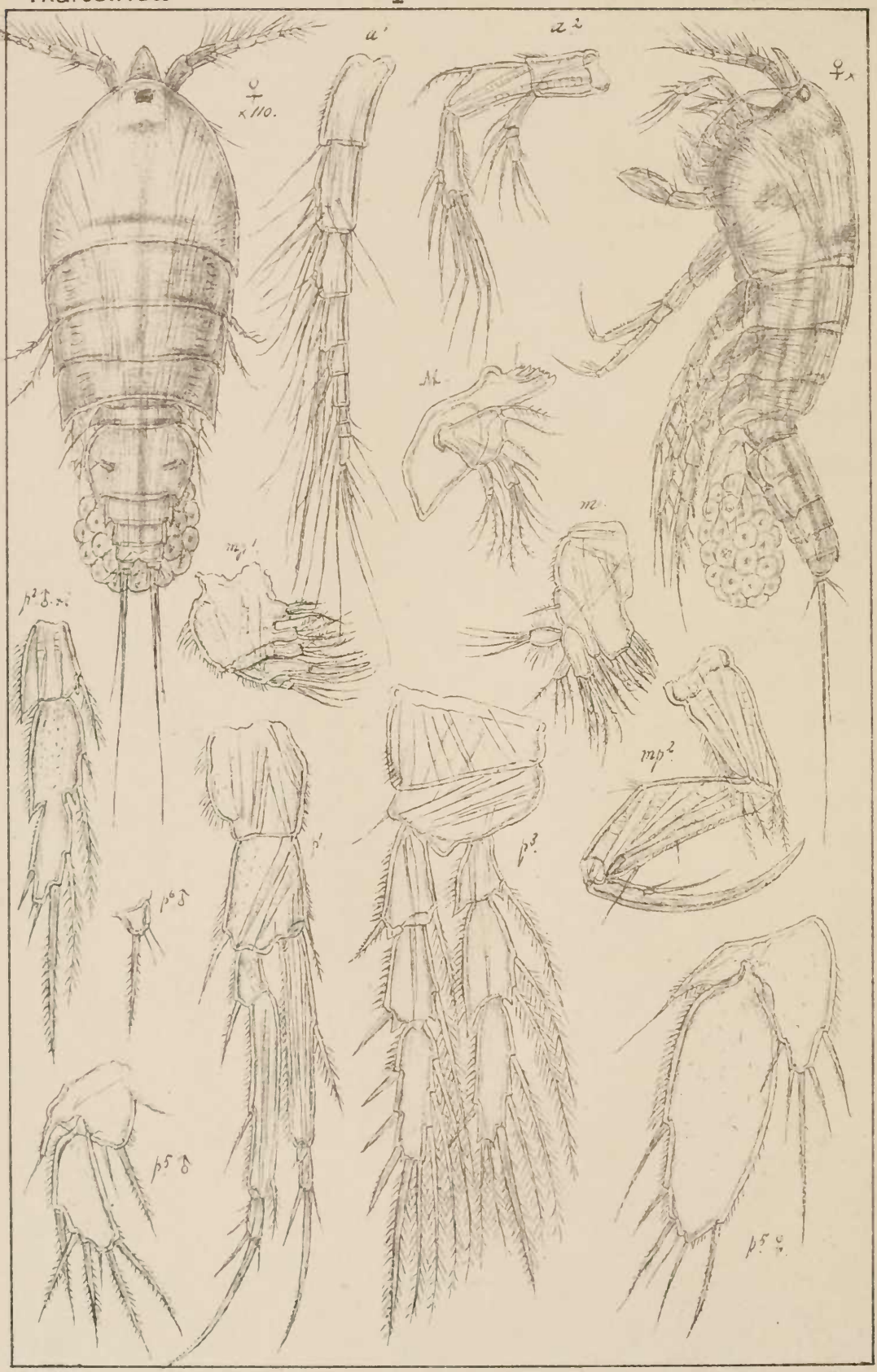
Rhynchothalestris rufocincta, (Norm.)
(continued)

Copepoda

Harpacticoida

Thalestridæ

Pl. LXXV.



G.O. Sars autogr.

Norsk Lithgr. Officin.

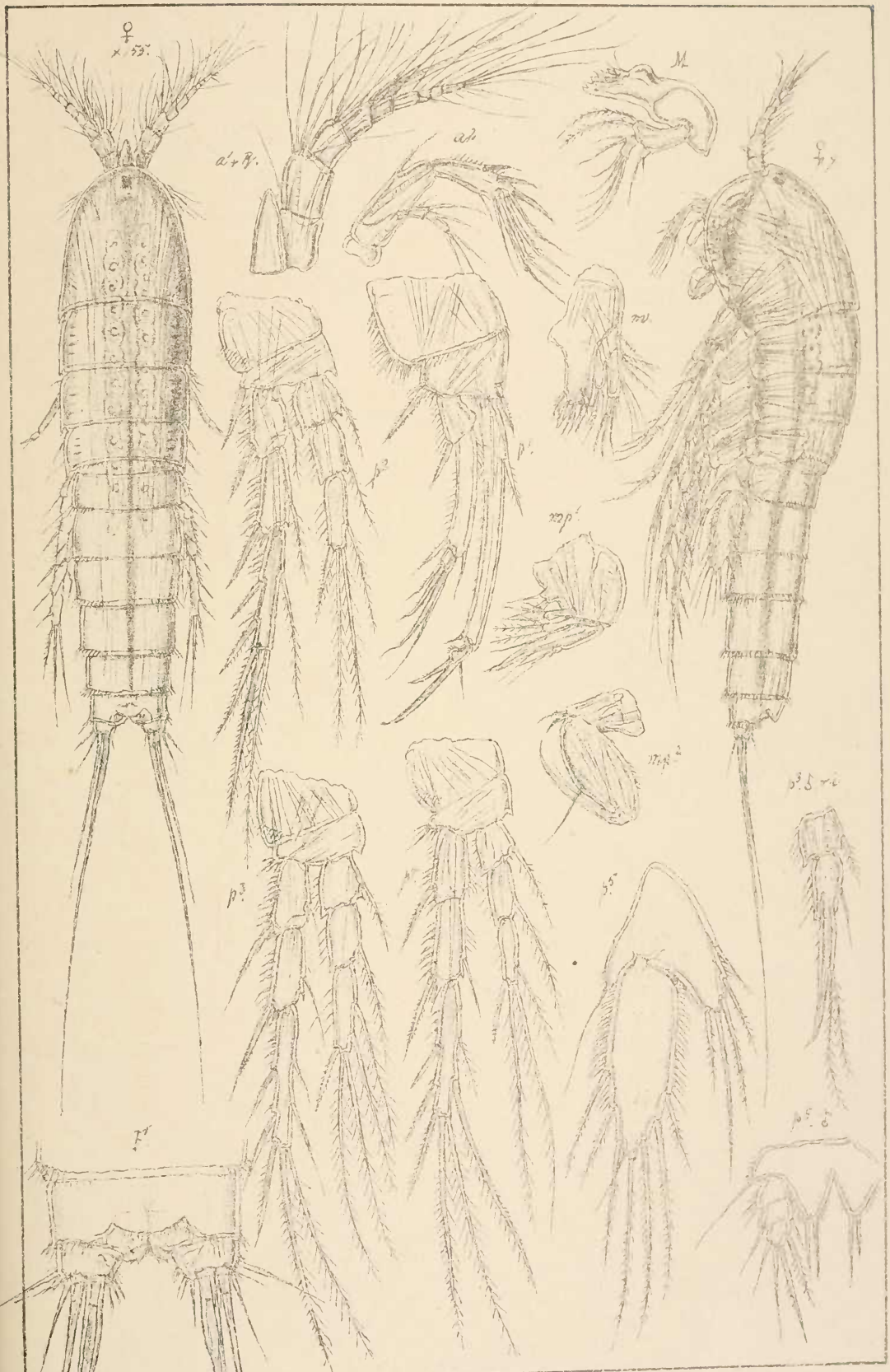
Rhynchothalestris helgolandica, (Claus)

Copepoda

Harpacticoida

Thalestridæ

Pl. LXXVI



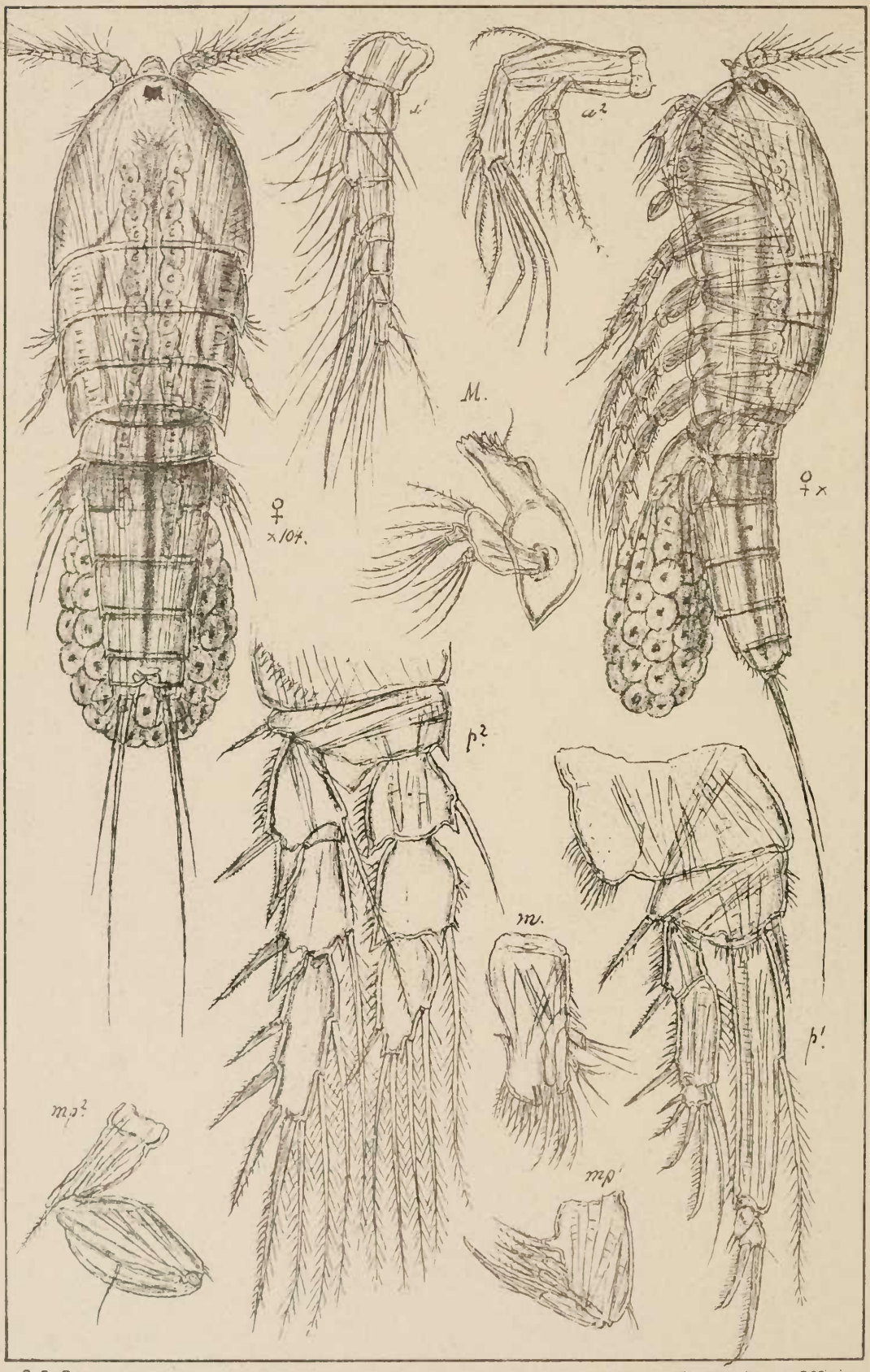
G.O. Sars, autogr.

Norsk Lithgr. Office.

Microthalestris forficula, (Claus.)

Copepoda

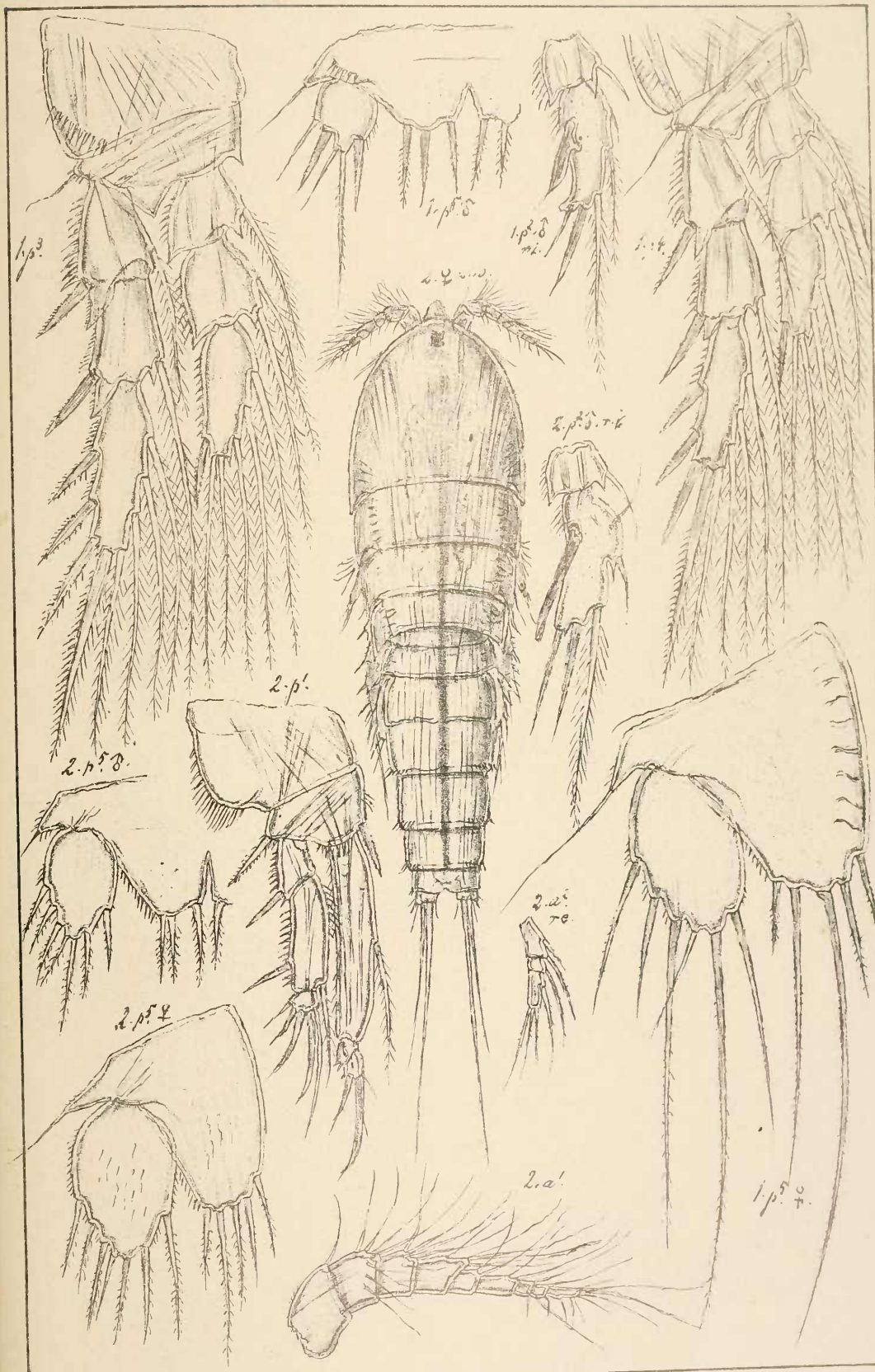
Thalestridæ — Harpacticoida — Pl. LXXII



G.O. Sars. autogr. — Norsk Lithgr. Officin.

Dactylopusia thisboides (Claus.)

Copepoda



G.O. Sars, autogr. Norsk Lithgr. Officin.

Dactylopusia thisboides (Claus.)
(continued)
Dactylopusia neglecta, G.O. Sars

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XI & XII

THALESTRIDÆ (concluded), DIOSACCIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1906

Colour yellowish.

Length of adult female 0.50 mm.

Remarks.—The above-described form is unquestionably that originally recorded by Claus as *Dactylopus flavus*. Prof. Brady has confounded this species with another very different form, to be described below as *Idomene forficata* Philippi, only the female being referable to the present species, whereas the male belongs to the Philippian species.

Occurrence.—I have only met with this form very occasionally, though in several localities off both the south and west coasts of Norway. It occurs in moderate depths, ranging from 6 to 20 fathoms, among algæ and Hydroida.

Distribution.—British Isles (Brady), Mediterranean off Nice (Claus).

Gen. 35. **Idomene**, Philippi, 1843.

Generic Characters.—Body pronouncedly depressed throughout, with the anterior division broad and flattened. Cephalic segment rounded in front, without any true rostrum. Urosome much narrower than the anterior division, though distinctly depressed, last segment deeply cleft behind. Caudal rami produced, divergent, inner apical seta spiniform. Eye absent. Anterior antennæ in female comparatively small, 6- or 7-articulate, in male much larger and very subchelate. Posterior antennæ with the outer ramus well developed, biarticulate. Mandibular palp largely developed, with the basal part very broad, and both rami of unusual size, the outer one armed outside with a number of strong falciform spines. Maxillæ and maxillipeds normal. 1st pair of legs with the basal part very broad and flattened, both rami 3-articulate, the outer one shorter than the inner, and armed outside with strong denticulated spines, inner ramus with the 1st joint large and dilated, carrying inside a strong plumose setæ, last joint armed at the tip with 2 slender claws and a ciliated seta inside them. Natatory legs with the rami nearly equal-sized; inner ramus of 2nd pair of legs in male only slightly transformed. Last pair of legs not very large, distal joint armed outside with strong spines.

Remarks.—This genus was established in the year 1843 by Philippi, to include a small Copepod found by him in the Mediterranean at Naples. As only a solitary specimen was observed, the exact structure of the appendages could of course not be made out, and the detail-figures given merely represent some parts

of the limbs as occasionally seen extended beyond the edges of the body. The genus is chiefly characterised by the flat clypeiform body, the absence of an eye and of a true rostrum, the great development of the mandibular palps, and the structure of the 1st pair of legs. In addition to the typical species described below, the 2 forms recorded by A. Scott from Ceylon as *Dactylopusia laticaudata* and *D. æmula*, seem to be referable to the present genus.

85. Idomene forficata, Philippi.

(Pl. LXXXII).

Idomene forficata, Philippi, Fernere Beobachtungen über die Copepoden des Mittelmeeres. Archiv f. Naturgeschichte 1843, p. 65, Pl. III, fig. 4.

Syn: *Dactylopus flavus* Brady, male (not Claus).

Specific Characters.—Female. Body comparatively short, clypeiform, attenuated behind. Cephalic segment large and expanded, evenly rounded in front, lateral corners acutely produced. Epimeral plates of the 3 succeeding segments laterally extended and terminating behind in an acute point. Last segment of metasome much narrower than the preceding ones, and without distinct epimeral plates. Urosome scarcely more than half the length of the anterior division, genital segment nearly twice as broad as it is long, and imperfectly divided in the middle, last segment cleft almost to the base. Caudal rami considerably longer than they are broad, and slightly tapering distally, apical setæ comparatively short, the innermost one transformed to a strong mucroniform spine. Anterior antennæ narrow and gradually tapering distally, 7-articulate, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, and provided with 6 setæ, 4 lateral and 2 apical. Mandibular palp with the basal part very broad and expanded, having a transverse row of delicate spinules across the middle, and 4 marginal setæ; rami of about equal size, the outer one armed outside with 3 remarkably strong spines, finely ciliated along one of the edges. 1st pair of legs with the inner corner of the 2nd basal joint considerably projecting and armed with a strong deflexed spine; outer ramus a little shorter than the 1st joint of the inner, exterior margin, as also the spines, coarsely spinulose, last joint short and obliquely truncated at the tip, carrying 3 spines and 2 geniculate setæ; 1st joint of inner ramus oblong trigonal in form, inner edge angularly bent in the middle, the outer 2 joints comparatively short, each with a ciliated seta inside, apical claws strong and slightly unequal in length. Last pair of legs with the distal joint comparatively small and armed with 5 marginal spines, the 3 outer ones very

strong, inner expansion of proximal joint not very prominent, and broadly rounded at the end, with 5 subequal setæ, none of which are spiniform.

Male, as usual, somewhat smaller than female, and having the urosome distinctly 5-articulate. Anterior antennæ very strongly built, with the 4th joint bulbously inflated, and the terminal part claw-like. First pair of legs of exactly the same structure as in the female. Inner ramus of 2nd pair, as in the female, distinctly 3-articulate, only differing in having the apical setæ shortened and spiniform. Last pair of legs with the distal joint more oblong in form, and armed outside with 4 very strong spines, inner expansion of proximal joint very slight, and provided with only 2 marginal setæ.

Colour yellowish, changing to a light chestnut-brown.

Length of adult female 0.54 mm.

Remarks.—I think I am right in considering the present form to be identical with that recorded by Philippi under the above name. The general form of the body, at any rate, agrees fairly well with the rough figure given by Philippi. As stated above, Prof. Brady has confounded this form with *Dactylopus flavus* of Claus, only the female described being referable to Claus's species, whereas the male unquestionably belongs to the form here treated of.

Occurrence.—I have found this form occasionally in several localities off both the south and west coasts of Norway, from the Christiania Fjord at least to the Trondhjem Fjord. It occurs in moderate depths, ranging from 6 to 20 fathoms, among algæ and Hydroida. As is the case with the species of the genera *Aspidiscus* and *Porcellidium*, the animal has the power of applying its flat body so firmly to any object that it can only with considerable difficulty be detached when alive. On coming in contact with the surface of the water, it remains floating upon it, like some other Copepoda, and may thus easily be picked up from any freshly taken sample.

Distribution.—British Isles (Brady), Mediterranean at Naples (Philippi).

Gen. 36. **Amenophia**, Boeck, 1865.

Generic Characters.—Body flat, shield-like, recalling in general appearance that found in the species of the genus *Zaus:* rostrum, however, obsolete. Eye quite normal. Anterior antennæ of the usual structure, 9-articulate, in male only slightly dilated, though distinctly prehensile. Posterior antennæ with the outer

ramus rather small, biarticulate. Oral parts on the whole normal. 1st pair of legs somewhat resembling in structure those in *Thalestris*, both rami being distinctly prehensile and subequal in length, armed at the tips with strong claw-like spines. Natatory legs comparatively slender, with both rami 3-articulate, the outer one being the longer; inner ramus of 2nd pair of legs in male transformed in a similar manner to that in *Thalestris*. Last pair of legs with the inner expansion of the proximal joint very broad but only slightly projecting, distal joint narrow, sub-falciform in shape, and extended laterally.

Remarks.—This genus was established in the year 1865 by Boeck, to include a species found by him off the west coast of Norway. It was however not accepted by Prof. Brady, who in his Monograph referred the species described by Boeck to the genus *Thalestris;* and all subsequent British authors have followed him in this view. True, one of the characters on which Boeck based his genus, viz., the supposed duplicity of the eye, must be wholly cancelled, being due to a miscomprehension; but there still remain several peculiarities which seem to warrant the maintenance of this genus. In no other Thalestridæ does the body exhibit such a pronounced shield-like form, and indeed, for this reason, Claus would certainly have referred the genus to his family *Peltidiidæ*. Moreover the structure of the 1st and last pair of legs is somewhat different from that in other Thalestridæ. Two closely-related species of this genus occur off the Norwegian coast.

86. Amenophia peltata, Boeck.

(Pl. LXXXIII, Pl. LXXXIV, fig. 1).

Amenophia peltata, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder, Chr. Vid. Selsk. Forhandl. 1864, p. 269.

Syn: *Thalestris peltata*, Brady.

Specific Characters.—Female. Body oblong oval in outline, about twice as long as it is broad, the greatest width occurring somewhat in front of the middle. Cephalic segment very large and expanded, slightly contracted, anteriorly, front obtusely produced, lateral corners acuminate. Epimeral plates of the 3 succeeding segments extended laterally, and terminating behind in an acute point. Last segment of metasome much narrower than the preceding ones. Urosome about half the length of the anterior division, and, like the latter, distinctly depressed, genital segment twice as broad as it is long, and imperfectly divided in the middle, lateral edges of this and the 2 succeeding segments densely ciliated.

Caudal rami short, quadrangular, apical setæ of moderate length. Anterior antennæ scarcely more than half the length of the cephalic segment, and only slightly attenuated, distal part about half as long as the proximal one. Posterior antennæ with the outer ramus considerably shorter than the terminal joint of the inner, and provided with 5 setæ, 3 lateral and 2 apical. 1st pair of legs comparatively strongly built, outer ramus fully as long as the inner, and having the middle joint rather elongated, spine of this and the preceding joint coarsely pectinate on the one edge, last joint short, lamelliform, and armed with 2 small, and 2 very strong claws, inside which a slender ciliated seta is attached; inner ramus with the seta of the 1st joint attached about in the middle, the 2 outer joints short and thick, apical claws rather unequal, the inner one very strong, the outer shorter and much narrower. Last pair of legs with the distal joint rather narrow and densely hairy outside, inner edge straight, outer convex and carrying in its distal part one large, and 2 very short setæ, tip provided with 3 setæ, the 2 outer of which are very thin and unciliated; inner expansion of proximal joint broadly rounded at the end, and carrying 5 unequal setæ. Ovisac large, rounded and distinctly applanated.

Male somewhat smaller than female, and having the urosome comparatively less broad and distinctly 5-articulate. Anterior antennæ more strongly built and distinctly prehensile, the hinge occurring between the first 2 joints of the terminal part. Spine inside the 2nd basal joint of the 1st pair of legs transformed into a strong hook. Inner ramus of 2nd pair of legs with the 2 outer joints confluent, and at their junction, outside, provided with 2 closely juxtaposed slender spiniform appendages, tip produced in 2 short and somewhat unequal spines. Last pair of legs with the distal joint comparatively shorter than in female, and having the 3 setæ of the outer edge of equal size; inner expansion of proximal joints very slight, with only 3 marginal setæ.

Body in both sexes of a light yellowish colour, with 2 or 3 dark violaceous transverse bands across the anterior division, and several less distinctly defined bands of a similar hue across the urosome.

Length of adult female 0.74 mm.

Remarks.—This form was recorded by Boeck as early as in the year 1865, and was subsequently also found off the British Isles by Prof. Brady, who, as stated above, referred it to the genus *Thalestris*. In its external appearance it somewhat resembles *Zaus spinatus*, though, on a closer inspection, easily distinguished by the want of a true rostrum and by the peculiar colour of the body when alive.

Occurrence.—I have met with this form occasionally in several localities both on the south and west coasts of Norway, from the Christiania Fjord up to the Trondhjem Fjord. It is not, like *Zaus spinatus*, a strictly littoral species, but only occurs in moderate depths ranging from 6 to 20 fathoms.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve).

87. Amenophia pulchella, G. O. Sars, n. sp.

(Pl. LXXXIV, fig. 2).

Specific Characters.—Female. Body comparatively shorter and stouter than in the preceding species, rounded oval in outline, with the greatest width considerably exceeding half the length, and occurring about in the middle. Cephalic segment very large and only slightly constricted in front. Epimeral plates of the 3 succeeding segments closely imbricate and greatly exstant laterally. Urosome comparatively short and broad, scarcely half as long as the anterior division, the first 3 segments considerably produced at the lateral corners, and densely fimbriate at the edges. Caudal rami about as in *A. peltata*. Anterior antennæ somewhat more attenuated distally, terminal part very slender. Posterior antennæ and oral parts scarcely different from those in *A. peltata*. 1st pair of legs likewise of a very similar structure, differing, however, in the somewhat greater length of the inner ramus as compared with the outer, and having the seta of the 1st joint attached beyond the middle. Last pair of legs with the terminal joint of the same structure as in *A. peltata:* inner expansion of proximal joint however slightly different, being narrowly produced in the middle.

Body of a clear yellowish colour, with a bright pink band across the middle, occupying the whole of the first 3 free segments of metasome, and bordered in front by a light orange shade.

Length of adult female 0.50 mm.

Remarks.—This new species is closely allied to *A. peltata*, but is of smaller size and considerably more robust form of body, differing also slightly in the structure of the 1st and last pairs of legs. In the living state, it is moreover at once distinguished by its peculiar and beautiful colour.

Occurrence.—Some few specimens of this form, all of the female sex, were taken many years ago at Christiansund, on the west coast of Norway.

Gen. 37. **Westwoodia**, Dana, 1855.

Syn: *Pseudothalestris*, Brady.
„ *Pseudowestwoodia*, Scott.

Generic Characters.—Body short and stout, sub-pyriform in shape, with the anterior segments more or less imbricate dorsally. Cephalic segment very large and boldly vaulted above, rostral projection deflexed, not defined at the base. Urosome comparatively small, attenuated. Caudal rami short and broad. Eye well developed. Anterior antennæ with the articulations more or less reduced in number. Posterior antennæ with the outer ramus of moderate size, 3-articulate. Oral parts differing somewhat in structure from those in the other Thalestridæ. Anterior lip very prominent. Mandibles with the masticatory part narrowly produced, palp well developed, with the basal part oblong in form, and both rami short, the outer one abruptly reflexed and carrying long plumose setæ. Maxillæ with the masticatory lobe likewise considerably produced, and terminating in a claw-like projection. Anterior maxillipeds short and stout, with a strong incurved claw at the end, lateral lobes comparatively simple. Posterior maxillipeds powerfully developed and of normal structure. 1st pair of legs with the rami very unequal, the outer one being quite short and composed of only 2 joints, which in some cases are confluent in one, inner ramus elongated, 3-articulate, resembling in structure that in the genus *Thalestris*. Natatory legs normally developed, having the proximal joints of the rami rather broad; inner ramus of 2nd pair of legs in male transformed, being only composed of 2 joints, the last one more or less lamellar, with 2 unequal spines at the tip, and another issuing near the base outside. Last pair of legs with the distal joint comparatively small, proximal joint more or less lamellarly expanded inside; marginal setæ generally much elongated.

Remarks.—This genus was established by Dana as early as the year 1855, to include the form described by Baird as *Arpacticus nobilis*. The genus *Pseudothalestris* of Brady cannot in my opinion be supported, as the only distinguishing character, the biarticulated structure of the outer ramus of the 1st pair of legs, is also found in a species — to be described below — which so closely resembles the type of the genus *Westwoodia*, that it may easily be confounded with it. As to the systematic position of the present genus, the opinions of carcinologists have been somewhat at variance. Boeck associated this genus with *Idya* in his subfamily *Idyinæ*, on account of the narrowly-produced mandibles, whereas Prof. Brady rightly removed it from that place, and included it in his subfamily *Harpacticinæ*, which, however, contains forms referred in the present account to 4

different families. I think the genus ought more properly to be placed within the family *Thalestridæ* as here defined, though in some respects it certainly differs conspicuously from the other genera. Off the Norwegian coast occur 4 species referable to this genus.

88. Westwoodia nobilis (Baird).

(Pl. LXXXV & LXXXVI).

Arpacticus nobilis, Baird, British Entomostraca, p. 214, Pl. 28, figs. 2, 2 a—e.

Specific Characters.—Female. Body very robust, somewhat compressed in front, attenuated behind. Cephalic segment occupying almost half the length of the entire body, and rather deep; dorsal face strongly vaulted, rostral projection triangular, acute at the tip and pointing straight down. Epimeral plates of the 3 succeeding segments of moderate size, deflexed and rounded behind. Last segment of metasome much narrower than the preceding ones. Urosome scarcely more than $^1/_3$ as long as the anterior division, and gradually tapering behind, genital segment about the length of the 2 succeeding ones combined, and imperfectly divided in the middle. Caudal rami broader than they are long, and transversely truncated at the tip, apical setæ rather elongated and divergent. Anterior antennæ comparatively short and stout, composed of only 5 articulations, 2 of which belong to the terminal part; middle joint much the largest and formed by the fusion of 2 joints. Posterior antennæ with the outer ramus shorter than the terminal joint of the inner, 1st joint about the length of the other 2 combined. 1st pair of legs with the outer ramus scarcely $^1/_3$ as long as the inner, and consisting of only a single joint, no trace of any subdivision being visible; inner ramus with the seta of 1st joint attached considerably in front of the middle, apical claws finely pectinate on the one edge and rather unequal, the inner one being more than twice as long as the outer. Last pair of legs with the distal joint small and rounded in shape, carrying 5 slender setæ; inner expansion of proximal joint extending as far as the distal joint, and edged with 5 very slender and elongated setæ. Ovisac large, pyriform, extending considerably beyond the end of the urosome.

Male differing only slightly, in its external appearance, from the female. Anterior antennæ transformed in the usual manner, and consisting of 7 well-defined joints, the 2 sensory appendages of moderate length. 1st pair of legs differing from those in female only as regards the spine attached to the inner corner of the 2nd basal joint, which is quite short, tap-shaped, and terminating in an

obtuse point. Inner ramus of 2nd pair of legs scarcely more than half as long as the outer, distal joint obliquely oval in form, basal spine slender setiform, inner apical spine much coarser than the outer, which terminates in a setiform point. Last pair of legs considerably smaller than in female, inner expansion of proximal joint less prominent and provided with only 3 setæ.

Body variously ornamented with a more or less deep brownish red pigment.

Length of adult female 0.87 mm.

Remarks.—This form was recorded by Baird as early as the year 1845,[1]) and was subsequently described and figured by the same author in his well-known work on the British Entomostraca. Since that time it has been noted by several authors, being an easily recognizable form, owing both to its unusually robust body and to its gorgeous colour.

Occurrence.—I have met with this form in several localities both on the south and west coasts of Norway, but nowhere in any abundance. It occurs in the littoral and sublittoral zones among algæ, and is sometimes even left in tidal pools. Th. Scott records this form also from Svolvær, in the Lofoten Islands.

Distribution.—British Isles (Baird), Heligoland (Claus), coast of France (Canu), coast of Bohuslän (coll. Cleve).

89. Westwoodia assimilis, G. O. Sars, n. sp.

(Pl. LXXXVII).

Specific Characters.—Female. Very like the preceding species both as to size and general appearance. Rostrum, however, somewhat shorter and less acute at the tip. Segments of anterior division distinctly imbricate dorsally, and more evenly vaulted than in the type species. Anterior antennæ still shorter and stouter than in that species, but exhibiting the same number of articulations. Posterior antennæ and oral parts almost exactly as in *W. nobilis*. 1st pair of legs, however, differing conspicuously in the structure of the outer ramus, which is distinctly biarticulate and about half as long as the 1st joint of the inner; seta of this joint attached nearly in the middle. Last pair of legs likewise differing slightly from those in the type species, the distal joint being comparatively larger and more oval in form, with 6 marginal setæ; inner expansion of proximal joint comparatively narrower, and not extending quite as far as the distal joint.

[1]) Transact. Berw. Nat. Club, Vol. II, p. 155.

Male exhibiting the usual sexual differences from the female. Anterior antennæ of a structure similar to that in the male of *W. nobilis*, being, however, clearly distinguished by the enormous development of the 2 sensory filaments. First pair of legs, as in the female, with the outer ramus distinctly biarticulate. Inner ramus of 2nd pair of legs differing slightly from that in the male of *W. nobilis* in the form and armature of the distal joint, the basal spine being quite short, whereas the inner apical spine is rather strong and peculiarly transformed, falciform and finely denticulated along the concave edge. Last pair of legs very like those of the male of *W. nobilis*, differing, however, in the comparatively larger size of the distal joint, which is moreover provided with 6, instead of 5, setæ.

Colour not yet determined.

Length of adult female 0.82 mm.

Remarks.—According to the structure of the 1st pair of legs, this form should really have been referred to the genus *Pseudothalestris* of Brady; but it is evident that such an arrangement would be quite unreasonable, since in all other respects the present species agrees so closely with the type of the genus *Westwoodia*, that a very close examination is needed in order to distinguish the two species from one another. I think that the present species clearly shows that the genus *Pseudothalestris* ought to be cancelled.

Occurrence.—I have hitherto only seen 2 females and one male specimen of this form. They were recently found among a number of specimens of *W. nobilis* collected at different times and from different places, and I am therefore at present unable to state the locality in which the specimens occurred.

90. Westwoodia minuta, Claus.

(Pl. LXXXVIII, fig. 1).

Westwoodia minuta, Claus, Die freilebenden Copepoden, p. 118, Pl. XXI, figs. 10—14.

Syn: *Pseudothalestris monensis*, Brady.
„ — *major*, Scott.

Specific Characters.—Female. Body very short and stout, pronouncedly pyriform in shape, with the segments of the anterior division deeply imbricate dorsally. Cephalic segment very large and deep, occupying rather more than half the length of the entire body; rostral projection quite short, triangular. Eye very conspicuous in the living animal. Anterior antennæ comparatively slender and attenuated, composed of 6 well-defined articulations, 2 of which belong to the terminal part, 3rd and 4th joints the largest and nearly equal in length. Posterior

antennæ more slender than in the 2 preceding species, but otherwise of a similar structure. Oral parts likewise constructed upon the very same type. 1st pair of legs with the outer ramus distinctly biarticulate and about half the length of the 1st joint of the inner ramus; seta of this joint attached considerably in front of the middle, apical claws of the same ramus very slender. Last pair of legs with the distal joint very small, carrying 5 slender setæ; inner expansion of proximal joint considerably produced, extending far beyond the distal joint.

Male of about the same size as female, and not very different in external appearance. Anterior antennæ transformed in the usual manner. Inner ramus of 2nd pair of legs with the distal joint oblong oval in form, apical spines about as in *W. nobilis*, basal spine, however, much stronger. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint less prominent, and provided with only 3 setæ.

Colour light chestnut-brown, with a very dark shade on each side of the cephalic segment behind.

Length of adult female 0.50 mm.

Remarks.—There cannot, in my opinion, be any doubt that the above-described form is that originally recorded by Claus as *Westwoodia minuta*, and that both *Pseudothalestris monensis* of Brady and *P. major* of Scott belong to the very same species. In its structural details it shows a near relationship to the 2 preceding species, and cannot by any means be generically separated from them.

Occurrence.—I have found this form occasionally in several localities on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths among algæ; and Th. Scott also records it from the Finmark coast. A peculiarity of this species is that in the living state, when disturbed, the animal secretes a clear viscid fluid in considerable quantity. From which organ this matter is derived, I have not yet been enabled to determine.

Distribution.—British Isles (Brady, Scott), Heligoland (Claus).

91. Westwoodia pygmæa (Scott).

(Pl. LXXXVIII, fig. 2).

Pseudowestwoodia pygmæa, Scott, Ann. & Mag. Nat. Hist. for January, 1895, p. 55, Pl. VI, figs. 8—16.

Syn: *Pseudothalestris pygmæa*, Scott.

Specific Characters.—Female. Body still shorter and stouter than in *W. minuta*, with the segments of the anterior division very pronouncedly imbricate dorsally. Cephalic segment of quite an extraordinary size, almost twice as long

as the remainder of the body, and dorsally overlapping the greater part of the succeeding segment; rostral projection rather short. Anterior antennæ comparatively shorter than in *W. minuta*, though composed of 7 well-defined articulations, 3 of which belong to the terminal part. Posterior antennæ and oral parts scarcely different from those in the said species. 1st pair of legs likewise of a very similar structure, only differing in having the seta of the 1st joint of the inner ramus attached about in the middle. Last pair of legs, on the other hand, of a rather different appearance, the inner expansion of the proximal joint being very slight, whereas the distal joint is considerably exserted at the tip.

Male differing from that of *W. minuta* chiefly in the structure of the inner ramus of the 2nd pair of legs, the distal joint of which is rather broad and angular in form, projecting both at the outer edge and at the tip in a dentiform projection, inner apical spine very strong and curved, outer feeble, setiform.

Colour yellowish with light brown shading.

Length of adult female 0.35 mm.

Remarks.—This form bears a general resemblance to *W. minuta*, but is of much smaller size and shorter form of body. It also differs conspicuously in the structure of the anterior antennæ and the last pair of legs.

Occurrence.—I have met with this dwarf form not unfrequently in several localities both on the south and west coasts of Norway, in moderate depths among algæ. It moves in a peculiar, tremulous manner, much as do the species of the genus *Tegastes*.

Distribution.—Scottish coast (Scott).

Fam. 11. Diosaccidæ.

Characters.—Body of somewhat varying form in the different genera, but never depressed as in some of the *Thalestridæ;* body-segments, as a rule, not very sharply marked off from each other. Rostrum well defined at the base, more or less mobile. Anterior antennæ short or of moderate length, generally 8-articulate, in male distinctly prehensile. Posterior antennæ with the basal joint not divided, outer ramus comparatively small. Oral parts of somewhat different structure in the different genera. 1st pair of legs with the rami, as a rule, very unequal, the outer one being generally much shorter than the inner, and less distinctly prehensile than in the *Thalestridæ*. Natatory legs more or less slender,

with both rami in female 3-articulate. Inner ramus of 2nd pair of legs in male transformed. Last pair of legs foliaceous, much larger in female than in male. Ovisac double.

Remarks.—The chief character distinguishing this family is the duality of the ovisac, a feature otherwise very rarely met with in the Harpacticoida. In other respects this family exhibits a certain resemblance both to the *Thalestridæ* and to the *Canthocamptidæ*. To the Norwegian fauna belong 3 well defined genera, to be treated of below.

Gen. 38. **Diosaccus**, Boeck, 1872.

Syn: *Dactylopus*, Claus (part).

Generic Characters.—Body pronouncedly compressed in front, attenuated hind, with the cephalic segment very large and deep, and the rostrum very prominent. Anterior antennæ comparatively slender, 8-articulate. Posterior antennæ with the outer ramus very small, uniarticulate. Mandibles with the masticatory part considerably dilated, cutting edge undivided, palp apparently simple, with only a slight rudiment of an outer ramus. Maxillæ distinguished by the shortness of the masticatory lobe and the spines with which it is armed, palp well developed. Anterior maxillipeds comparatively small, with only 3 lateral lobes carrying short and thick digitiform spines. Posterior maxillipeds powerfully developed, and of normal structure. 1st pair of legs with the outer ramus small, not prehensile, inner much elongated and resembling in structure that in *Thalestris*, though having the seta of the 1st joint attached close to the end. 2nd pair of legs with the terminal joint of the outer ramus comparatively smaller than in the succeeding pairs, and provided with only 2 spines outside; inner ramus of same pair in the male very short, biarticulate, terminating in a strong spine. Last pair of legs not very large, with short, partly spiniform setæ; in male still smaller, and having the 2 joints confluent.

Remarks.—This genus was established by Boeck in the year 1872, to include 2 of the species referred by Claus to his genus *Dactylopus*, viz., *D. tenuicornis* and *D. longirostris*. These 2 forms, though alike in having 2 ovisacs, are however evidently generically different, and the Boeckian genus must of course be confined to one of them. This has indeed been done by Prof. Brady, who describes the first-named species as the type of the genus *Diosaccus*. The other

form, which was unknown to Prof. Brady, as also the form named by Boeck *Diosaccus abyssi*, belongs to the genus *Amphiascus*, recently established by the present author. The genus *Diosaccus*, in the restriction here adopted, differs conspicuously from the other 2 genera included in the present family, both in external appearance and in several of the anatomical characters. In addition to the typical form, another nearly-allied, though evidently distinct species has been described by Th. Scott as *Diosaccus propinquus*. Only the type species has as yet been found off the Norwegian coast.

92. Diosaccus tenuicornis (Claus).

(Pl. LXXXIX & XC).

Dactylopus tenuicornis, Claus, Die freilebenden Copepoden, p. 127, Pl. XVI, figs. 17—23.

Specific Characters.—Female. Body moderately robust, with the anterior division considerably broader than the posterior. Cephalic segment more than twice as long as all the free segments of metasome combined, and evenly vaulted above; epimeral parts very fully developed and much curved in the middle, embracing between them the oral parts, only the posterior maxillipeds projecting beyond their edges. Rostrum somewhat lamellar and very prominent, being slightly curved. Epimeral plates of the 3 succeeding segments of moderate size, deflexed and angular behind. Last segment of metasome narrower than the preceding ones, and without distinct epimeral plates. Urosome scarcely more than half the length of the anterior division, and rapidly tapering behind; genital segment considerably dilated in front, and divided in the middle by a somewhat curved transverse line; last caudal segment longer than the preceding one. Caudal rami closely juxtaposed and somewhat applanated, being slightly longer than they are broad at the base, outer edge armed with a short spine beyond the middle, apical setæ scarcely diverging at all, the innermost but one much the longest. Anterior antennæ unusually slender, with the joints of the proximal part considerably prolonged, the 2nd joint being the largest, terminal part not nearly attaining half the length of the proximal part. Posterior antennæ likewise rather slender, with the terminal joint long and narrow, outer ramus not nearly half as long as the latter, and provided with 4 setæ, 2 apical and 2 lateral. Posterior maxillipeds with the hand very large and deeply concaved inside, dactylus strong and curved. 1st pair of legs rather slender, rami very unequal, the outer one scarcely more than half as long as the inner, last joint somewhat shorter than the other 2, and provided with 3 spines successively increasing in length, and a

moderately long seta at the inner corner; inner ramus with the outer 2 joints short, apical claws slender and very unequal, the inner one fully twice as long as the outer. Last pair of legs with the distal joint oblong in form and provided in its outermost part with 6 rather unequal setæ, inner expansion of proximal joint considerably produced, narrow linguiform in shape, and extending beyond the distal joint, marginal setæ 5 in number, the middle one very thin, the others thick, spiniform and coarsely denticulated. Ovisacs large, pyriform, and somewhat divergent.

Male smaller than female, and exhibiting the usual sexual differences. Anterior antennæ transformed into strong prehensile organs composed of the same number of joints as in the female. 1st pair of legs exhibiting inside the 2nd basal joint a small linguiform lappet, not found in the female. Inner ramus of 2nd pair of legs scarcely as long as the 1st joint of the outer, distal joint rounded and carrying a slender setiform spine outside, inside a long plumose seta, tip produced to a strong, somewhat flexuous spiniform projection. Last pair of legs rather unlike those in female, distal joint very short and imperfectly defined at the base, carrying 3 denticulated spines and a small seta, inner expansion of proximal joint almost obsolete, and only provided with 2 short setæ. Genital lobes each with a strong denticulated spine and 2 slender setæ.

Colour generally a golden yellow, ventral face and bases of legs tinged with dark indigo-blue.

Length of adult female 0.80 mm.

Remarks.—This is an easily recognizable form, being especially distinguished by the large and deep cephalic segment, and the unusually slender anterior antennæ.

Occurrence.—It is one of our commonest Harpacticoida, occurring rather abundantly along the whole Norwegian coast in the littoral zone among algæ, and not infrequently left in tidal pools together with other littoral forms.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve), Mediterranean (Claus).

Gen. 39. Amphiascus, G. O. Sars, 1905.

Syn: *Dactylopus*, Claus (part.
„ *Diosaccus*, Boeck (part).
„ *Stenhelia*, Brady, Scott (not Boeck).
„ *Schizopera*, G. O. Sars.

Generic Characters.—Body more or less slender, cylindrical in form, with the anterior and posterior divisions not sharply marked off from each other. Cephalic segment of moderate size and not very deep, rostrum well defined and very mobile. Urosome with the genital segment in female imperfectly divided in the middle, and scarcely dilated in front, posterior edge of all the caudal segments finely spinulose on the ventral and lateral faces. Caudal rami generally short, apical setæ slender. Anterior antennæ of usual structure, and as a rule composed of 8 articulations, 4 of which belong to the terminal part. Posterior antennæ with the terminal joint more or less dilated distally, and armed outside with strong spines, at the tip with slender geniculate setæ; outer ramus very narrow, generally 3-articulate, middle joint quite short and in some cases imperfectly defined. Oral parts normal. 1st pair of legs with both rami triarticulate, the outer one much shorter than the inner, and in some cases resembling in structure that in the genus *Dactylopusia*, inner ramus with the 1st joint slender and elongated, seta of inner edge attached close to the end. Inner ramus of 2nd pair of legs in male more or less conspicuously transformed, outer 2 joints confluent. Last pair of legs foliaceous, with the proximal joint more or less expanded inside; those in male much smaller than in female.

Remarks.—This genus was established by the present author in a recently published paper on Pacific Crustacea[1]), and on that occasion he called attention to the fact that the genus *Stenhelia* of British authors does not by any means answer to that genus as defined by Boeck, the latter being in reality very different, and closely related to, if not identical with, the genus *Delavalia* of Brady. It therefore appeared necessary to substitute another generic name, to include the species erroneously referred to Boeck's genus. The genus *Schizopera* established by the present author to include a Pacific species, I am now disposed to withdraw, as some of the characters upon which this genus was founded have proved to occur also in certain species unquestionably belonging to the genus *Amphiascus*. It may here be noted that several of the species referred by Claus, and also by recent British authors, to the genus *Dactylopusia* ought likewise to be included in the present genus, which seems to be very abundantly represented in

[1]) "Pacifische Plankton Crustaceen" II, in Zool. Jahrbucher 1905, p. 380.

different parts of the Oceans. I have been enabled to distinguish off the Norwegian coast rather a large number of species, to be described in the following pages. They all exhibit a very uniform external appearance, and of course are not easy to distinguish when preserved, though in the living state they may in most cases be at once recognized by differences in the colouring of the body.

93. Amphiascus cinctus (Claus).

(Pl. XCI & XCII).

Dactylopus cinctus, Claus, Die Copepodenfauna von Nizza, p. 27, Pl. III, figs. 8—12.

Specific Characters.—Female. Body moderately slender, with the anterior division but little broader than the posterior. Cephalic segment about the length of the 4 succeeding segments combined, epimeral parts not very deep, and evenly rounded in front. Rostrum strongly prominent, lanceolate and slightly curved at the tip. Epimeral plates of the 3 succeeding segments of moderate size and slightly angular behind. Last segment of metasome scarcely narrower than the preceding one. Urosome about $^2/_3$ as long as the anterior division, and tapering only very slightly behind, genital segment equalling in length the 2 succeeding ones combined, anal segment somewhat shorter than the preceding one. Caudal rami quadrangular in form, broader than they are long, the 2 middle apical setæ rather strong, spine of outer corner shorter than the corresponding ramus. Anterior antennæ moderately slender and densely setiferous, 8-articulate, the first 2 joints much larger than the others, 3rd and 4th of about equal size, terminal part about half the length of the proximal. Posterior antennæ rather strongly built, outer ramus with the middle joint well defined, setiferous. 1st pair of legs with the outer ramus about half the length of the inner, middle joint much the largest, terminal joint small, lamelliform and armed with 4 claw-like spines, inside which a slender seta is attached; inner ramus with the 2 outer joints short, the last one armed on the tip with 2 very strong claws, the inner one the longer. Natatory legs moderately slender and of normal structure. Last pair of legs very large and foliaceous, distal joint of considerable size, rounded quadrangular in form, and provided with 6 marginal setæ, the outermost one the shortest and attached at rather a long distance from the base; inner expansion of proximal joint triangular, scarcely extending beyond the middle of the distal joint, and carrying 5 setæ, the outermost one much the shortest. Ovisacs of moderate size, oblong pyriform in shape.

Male somewhat smaller than female, and having the urosome distinctly 5-articulate. Anterior antennæ more strongly built, and transformed in the usual manner. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs of extraordinary size and somewhat sigmoid in form. Inner ramus of 2nd pair of legs nearly as long as the outer, distal joint carrying 2 closely juxtaposed spiniform appendages outside, of which the proximal is very strong, tip armed with another somewhat more slender appendage curving outwards. Last pair of legs much smaller than in female, distal joint oval in form, inner expansion of proximal joint with only 2 marginal setæ.

Body in both sexes of a whitish colour, with a broad transverse band of a deep pink hue across the middle, occupying the whole of the first 3 free segments of metasome; dorsal face moreover exhibiting along the middle a narrow longitudinal band of a light orange colour.

Length of adult female 0.84 mm.

Remarks.—This form was originally described by Claus from the Mediterranean as a species of his genus *Dactylopus*, the specific name apparently referring to the peculiar colouring of the animal. It does not seem to have been observed by subsequent authors; for the suggestion put forward by Prof. Brady, that it might only be a variety of *Dactylopus Strömi* Cls. (= *D. vulgaris* G. O. Sars), is so extremely unreasonable, that it is impossible to believe that the true Clausian species has been observed by that author.

Occurrence.—Some few specimens of this pretty form were found many years ago off the west coast of Norway. Last summer, I found it again not unfrequently in 2 different localities on the south coast, viz., Risör and Lillesand. It occurs in moderate depths among algæ, and in the living state is at once recognizable, even with the naked eye, from any other species of this genus, by the peculiar and beautiful colour of the body, which seems to be perfectly constant in all specimens, both male and female.

Distribution.—Mediterranean off Nice (Claus).

94. Amphiascus obscurus, G. O. Sars, n. sp.

(Pl. XCIII).

Specific Characters.—Female. Body of comparatively more robust form than in the preceding species, otherwise of a very similar appearance. Urosome with the segments coarsely spinulose along the ventral and lateral edges. Caudal rami comparatively more massive than in *A. cinctus*, with the spine of the outer

corner more elongate, somewhat exceeding in length the corresponding ramus. Anterior antennæ comparatively shorter and stouter, 8-articulate, distal part exceeding half the length of the proximal one. Posterior antennæ and oral parts almost exactly as in the preceding species. 1st pair of legs likewise of a very similar structure, though having the outer ramus a little longer in proportion to the inner. Last pair of legs with the distal joint very large and expanded, of a broadly rounded form, and carrying 7 marginal setæ, the outermost one somewhat longer than the next, and occurring not far from the base; inner expansion of proximal joint extending somewhat beyond the middle of the distal joint, and having the outermost seta longer than the 2 innermost ones. Ovisacs about as in the preceding species.

Male resembling that of *A. cinctus* in its external appearance, as also in the structure of the anterior antennæ and the inner ramus of 2nd pair of legs. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs comparatively smaller than in the male of *A. cinctus*, and almost straight. Last pair of legs with the distal joint comparatively shorter and broader, and the inner expansion of proximal joint less prominent.

Body all over, except on the dorsal face of the cephalic segment, of a very dark chocholate-brown colour, changing to a deep indigo-blue on the caudal rami and ventral appendages.

Length of adult female about 1 mm.

Remarks.—This new species is closely allied to *A. cinctus*, Claus, but is of considerably larger size and more robust form of body, differing also slightly in the structure of the anterior antennæ and of the 1st and last pairs of legs. In the living state it is moreover at once distinguished by the very different colour of the body.

Occurrence.—I found this form last summer at Risör and Lillesand, on the south coast of Norway, in moderate depths among algæ. On account of the relatively large size of the specimens and their very dark colour, it was a comparatively easy task to select them from the freshly-taken bottom-samples, even without the aid of a magnifying lens.

95. Amphiascus similis (Claus).

(Pl. XCIV).

Dactylopus similis, Claus, Die Copepoden-Fauna von Nizza, p. 25, Pl. II, figs. 29, 30.

Specific Characters.—Female. Body very slender and pronouncedly cylindric in form, the anterior and posterior divisions being of almost uniform width

throughout. Cephalic segment scarcely longer than the 3 succeeding segments combined; rostrum very long and evenly curved. Urosome nearly as long as the anterior division, and tapering only very slightly behind, last segment about the length of the preceding one, and having the anal opercle finely spinulose. Caudal rami quadrate in form and slightly instricted at the base, each having, somewhat beyond the middle of the outer edge, a notch carrying a slender seta and a short spine, middle apical setæ of moderate length. Anterior antennæ comparatively short and gradually attenuated distally, 8-articulate, 1st joint much the largest, terminal part not attaining half the length of the proximal. Posterior antennæ comparatively less robust than in the 2 preceding species, outer ramus very narrow, with the middle joint extremely minute and without any seta. 1st pair of legs rather slender, outer ramus considerably exceeding half the length of the inner, middle joint much the longest, terminal joint small, with only 3 claw-like spines and a slender seta at the inner corner; inner ramus with the 2 outer joints very short and subequal, apical claws rather unequal, the outer one being scarcely half as long as the inner and nearly straight. Last pair of legs with the distal joint large, oval in form, carrying 6 rather unequal setæ, 4 of which issue from the somewhat exserted and obliquely-truncated extremity; inner expansion of proximal joint comparatively short, triangular, not nearly extending to the middle of the distal joint, marginal setæ 5 in number, the outermost one very small. Ovisacs rather short, extending, as a rule, only slightly beyond the middle of the urosome.

Male of still more slender form than female. Anterior antennæ considerably more elongated, and transformed in the usual manner. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs falciform, incurved and obliquely cut off at the tip. Inner ramus of 2nd pair of legs with the distal spiniform appendage of the outer edge peculiarly transformed, terminating in a broad securiform lamella, apical spine replaced by an ordinary plumose seta. Last pair of legs very small, distal joint cordate in shape, with only 4 marginal setæ, the outermost but one very small, hair-like; inner expansion of proximal joint very slight, with only 2 unequal setæ.

Body of a light yellowish colour with some of the segments bordered with reddish brown.

Length of adult female about 1 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Claus as *Dactylopus similis*, and subsequently mentioned by Prof. Brady under the same name in his well-known Monograph. The suggestion of the latter author, that this form, being so nearly related to *Dactylopus Strømi* (= *D.*

vulgaris G. O. Sars), ought perhaps more properly to be considered as merely a variety of that species, is quite unintelligible to me. I consider, on the contrary, that the present form is so very different, both as regards its general appearance and structural details, that it cannot even be placed in the same genus.

Occurrence.—This is one of our commonest Harpacticoida, occurring rather abundantly along the whole south and west coasts of Norway, from the Christiania Fjord at least to the Trondhjem Fjord. It is not, however, a strictly littoral form, but is only found in moderate depths among algæ.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve), Mediterranean at Nice (Claus).

96. Amphiascus nasutus (Boeck).

(Pl. XCV).

Dactylopus nasutus, Boeck, M. S.

Syn: *Dactylopus Strömi*, var. *arctica*, Scott.

Specific Characters.—Female. Body resembling somewhat in its general appearance that of *A. similis*, though comparatively more strongly built and less pronouncedly cylindrical in form. Cephalic segment comparatively larger and broader. Rostrum likewise broader and less acute at the tip, which is abruptly curved downwards. Urosome slightly tapering distally, with all the segments coarsely spinulose at the hind edge ventrally and laterally, last segment shorter than the preceding one. Caudal rami scarcely instricted at the base, quadrangular in form, notch of the outer edge occurring close to the tip. Anterior antennæ still shorter and stouter than in *A. similis*, but composed of 9 well-defined articulations, of which the first 2 are much larger than the others. Posterior antennæ more strongly built, but otherwise of the very same structure as in the above-mentioned species. 1st pair of legs likewise rather similar, but less slender in form, differing moreover in having the terminal joint of the outer ramus more expanded and armed with 4 strong claw-like spines in addition to the seta of the inner corner. Last pair of legs resembling in shape those of *A. similis*, though having the distal joint comparatively broader, and the outermost seta of the inner expansion of the proximal joint more fully developed. Ovisacs comparatively larger, extending considerably beyond the middle of the urosome.

Male agreeing with that of *A. similis* in most of the anatomical details, but differing very conspicuously in the structure of the inner ramus of 2nd pair of legs. The distal joint of this ramus is considerably dilated at the base, and

armed outside with an exceedingly strong spiniform appendage; while another peculiarly transformed appendage projects from near the tip, and is connected with the base of the former by a narrow chitinous strip running along the under surface of the joint, the freely projecting part of the appendage being folded abruptly upon itself in a peculiar manner, and terminating in a very narrow upturned point.

Body in both sexes of a pale yellowish green colour, and generally filled with numerous refracting oil-globules.

Length of adult female about 1 mm.

Remarks.—The above-described species is unquestionably identical with a form recorded by Th. Scott from the Arctic Ocean under the name of *Dactylopus Strömi*, var. *arctica*. As this form in reality is very different from *Dactylopus Strömi* Cls. (= *D. vulgaris* G. O. Sars), I have felt justified in reviving for it a MSname given to this form by the late Dr. A. Boeck. Its nearest ally is evidently *A. similis*, from which species it may be easily distinguished, however, by its more robust body, the distinctly 9-articulated anterior antennæ, and the structure of the 1st pair of legs and that of the inner ramus of the 2nd pair in the male.

Occurrence.—I have found this form occasionally off the west coast of Norway at Christiansund and Aalesund in moderate depths among algæ. Off the Finmark coast, this species is much more frequently met with. I have myself taken it at Hammerfest and Vadsö, and in some samples taken by Mr. Nordgaard at Repvaag in the Porsanger Fjord, and kindly sent to me for examination, this form occurred rather abundantly.

Distribution.—Arctic Ocean, off Franz Josef Land (Scott), and polar islands north of Grinnell Land (2nd Fram Exped.).

97. Amphiascus minutus (Claus).

(Pl. XCVI).

Dactylopus minutus, Claus, Die freilebenden Copepoden, p. 126, Pl. XVI, figs. 14, 15.

Syn: *Diosaccus abyssi*, Boeck.
„ *Dactylopus longirostris*, Scott (not Claus).

Specific Characters.—Female. Body moderately slender and slightly attenuated behind. Cephalic segment about the length of the 3 succeeding segments combined; rostrum well developed and of usual appearance. Urosome about $^2/_3$ the length of the anterior division of the body, last segment much shorter than the preceding one. Caudal rami very short, being almost twice as broad as they are

long, and somewhat obliquely truncated at the tip, setæ normal. Anterior antennæ rather slender and attenuated, 8-articulate, 4th joint considerably longer than 3rd, and about equal in length to the 2nd, terminal part nearly half as long as the proximal one. Posterior antennæ with the outer ramus of moderate size, middle joint well defined and setiferous. 1st pair of legs rather slender, outer ramus slightly exceeding half the length of the inner, and, as in the 4 preceding species, having the middle joint much larger than the others, last joint small and armed with 3 claw-like spines and 2 geniculate setæ inside the latter; inner ramus with the 1st joint very slender, the other 2 quite short, subequal, and as a rule bent outwards at nearly a right angle with the 1st, last joint armed with a strong, distinctly pectinate claw and a slender geniculate seta inside it. Natatory legs very slender, otherwise of normal structure. Last pair of legs with the distal joint of moderate size and broadly ovate in form, with 6 not very elongated marginal setæ; inner expansion of proximal joint rather large, extending considerably beyond the middle of the distal joint, marginal setæ 5 in number and rather strong. Ovisacs comparatively large, extending to the end of the urosome.

Male having the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs forming, inside, 2 strongly chitinized dentiform projections in addition to the usual spine, which latter does not exhibit any difference from that in the female. Inner ramus of 2nd pair of legs with 2 closely juxtaposed spiniform appendages outside near the tip, the latter unarmed. Last pair of legs with the distal joint much smaller than in female, and sub-cordate in form; inner expansion of proximal joint with only 2 unequal marginal setæ.

Colour whitish, with a slight rosy tinge.

Length of adult female 0.64 mm.

Remarks.—The above-described form is unquestionably identical with that recorded by Prof. Brady as *Dactylopus minutus*, Claus. The description and figures given by Claus are certainly very scanty; but I believe that there is no reason to doubt the correctness of Prof. Brady's identification. The form recorded by Boeck as *Diosaccus abyssi* is this species, and this is also evidently the case with the form described by Th. Scott from Franz Josef Land as *Dactylopus longirostris* Claus. The present species is easily distinguished from any of the 4 preceding ones, both by its much inferior size and by the structure of the anterior antennæ and 1st pair of legs.

Occurrence.—I have found this form occasionally in the Christiania Fjord, as also off the south and west coasts of Norway in moderate depths among algæ.

Distribution.—British Isles (Brady), Heligoland (Claus), Franz Josef Land (Scott).

98. Amphiascus imus (Brady).

(Pl. XCVII).

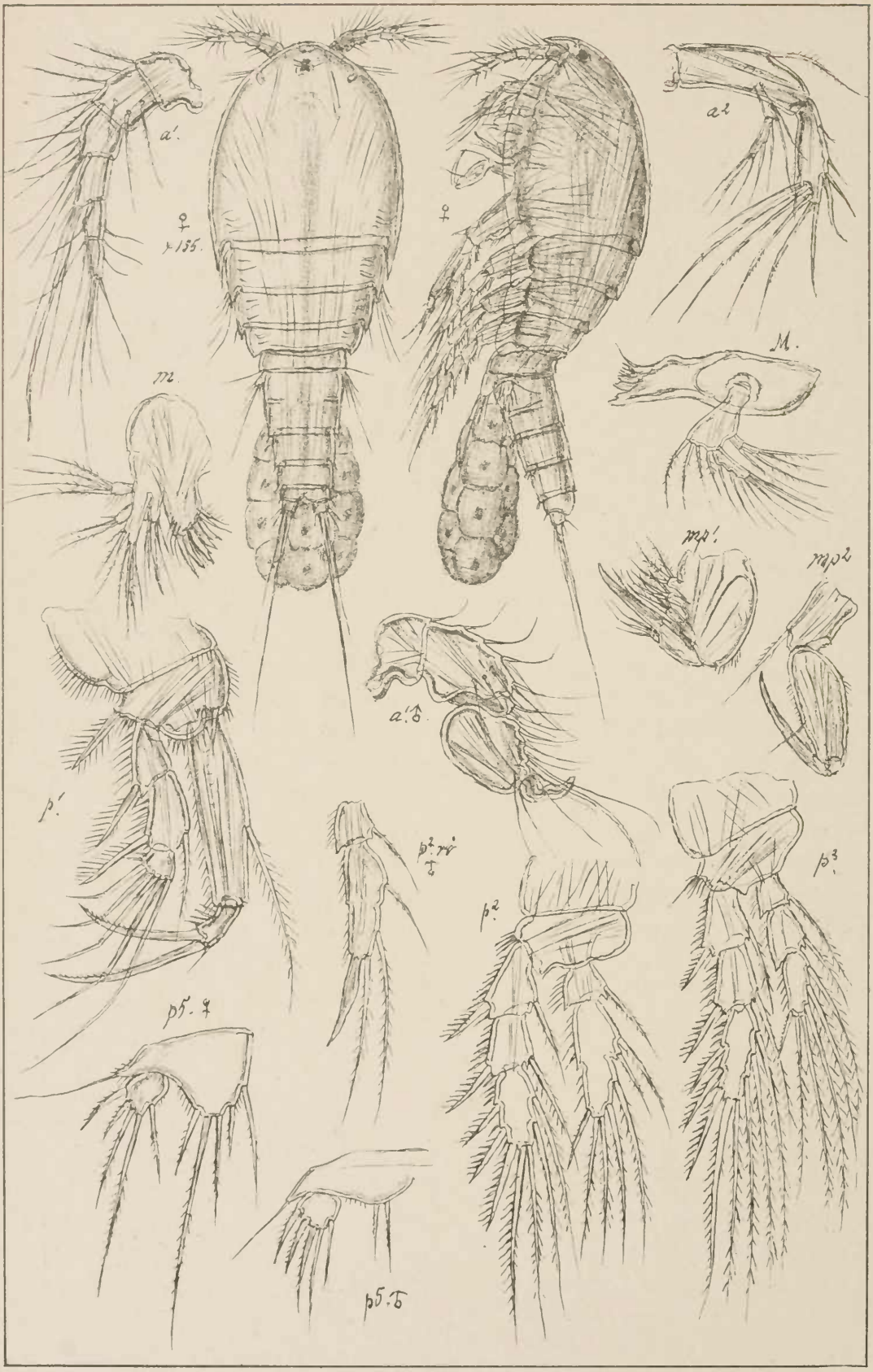
Stenhelia ima, Brady, Monograph of British Copepoda, vol. II, p. 35, Pl. XLIII, figs. 1—14.

Specific Characters.—Female. Body exceedingly slender and elongated, sub-linear in form, with the anterior division scarcely broader than the posterior. Cephalic segment about the length of the 3 succeeding segments combined; rostrum very long, lanceolate in form, with the tip acutely produced. Urosome a little shorter than the anterior division, last segment about the length of the preceding one. Caudal rami very short, being almost twice as broad as they are long, and obliquely truncated at the tip, inner corner more prominent than outer, the 2 middle apical setæ considerably thickened at the base, and distinctly spinulose in their outer part. Anterior antennæ very slender, 8-articulate, 2nd joint the largest, 4th joint considerably longer and narrower than 3rd, terminal part not nearly attaining half the length of the proximal one. Posterior antennæ with the outer ramus rather slender and elongated, middle joint well defined and setiferous. 1st pair of legs comparatively slender, with the outer ramus about half as long as the inner, middle joint scarcely longer than the 1st, terminal joint but little smaller, and armed with 3 spines and 2 geniculate setæ; inner ramus with the 1st joint long and narrow, more than twice as long as the other 2 combined, last joint considerably longer than the 2nd, and linear in form, finely spinulose outside, and carrying on the tip a slender claw, a somewhat longer seta, and a small hair-like bristle inside the latter. Natatory legs rather slender and of normal structure. Last pair of legs with the distal joint comparatively narrow, oblong in form, with only 5 marginal setæ, the 2 apical ones slender, hair-like, the other 3 rather small; inner expansion of proximal joint large, triangular, extending considerably beyond the middle of the distal joint, marginal setæ 5 in number, and all well developed. Ovisacs very narrow and only slightly divergent.

Male of a narrow and slender form similar to that of the female, and having the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs forming, inside, 3 strongly chitinised dentiform projections in addition to the usual spine. Inner ramus of 2nd pair of legs considerably shorter than the outer, distal joint only slightly longer than the proximal one, and carrying outside near the tip 2 closely juxtaposed spiniform appendages of unequal size, the proximal one being much the stronger. Last pair of legs rather unlike those in

Copepoda

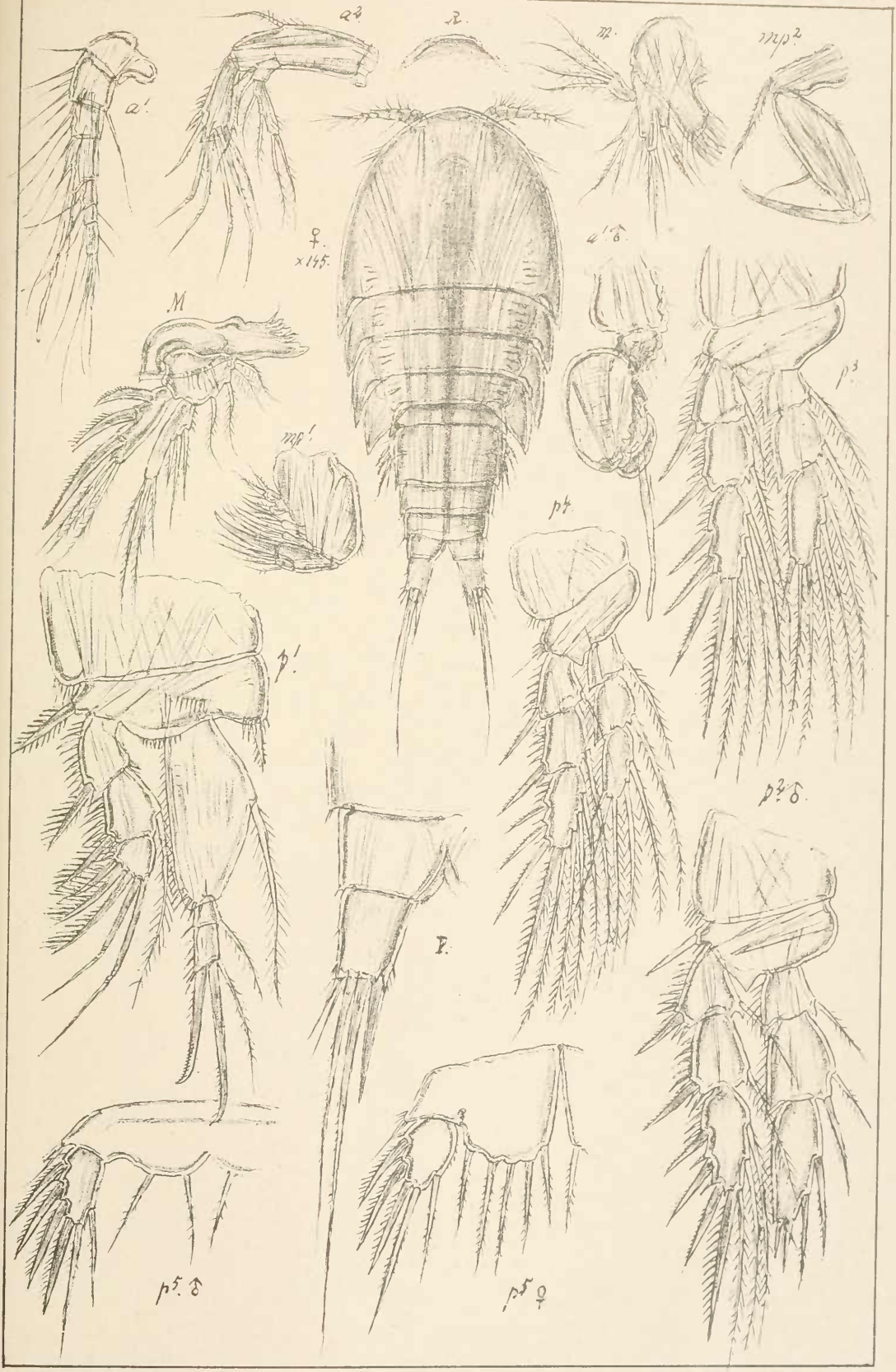
Harpacticoida



G.O. Sars, autogr.

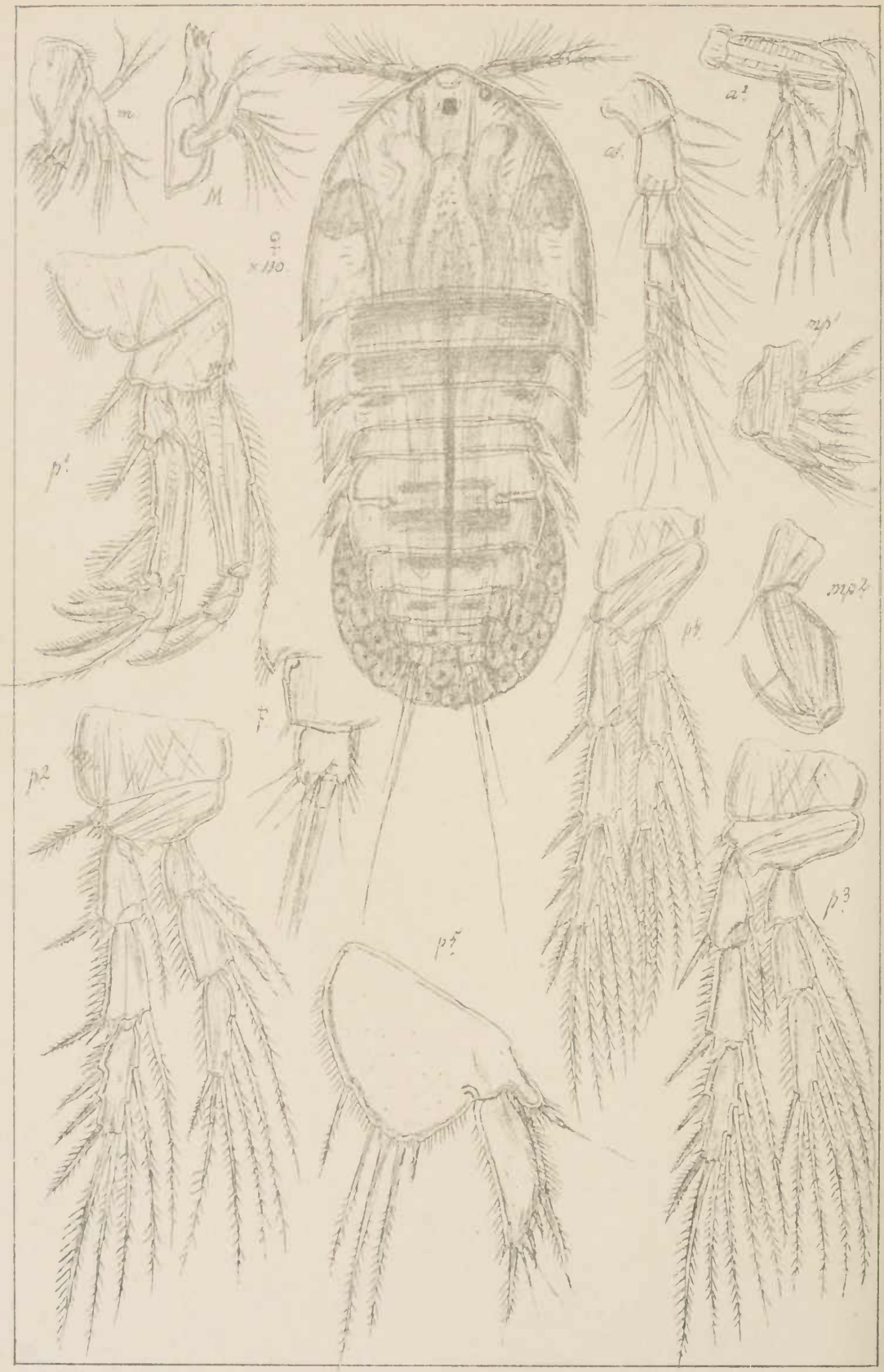
Norsk Lithgr. Officin.

Dactylopodella flava (Claus)



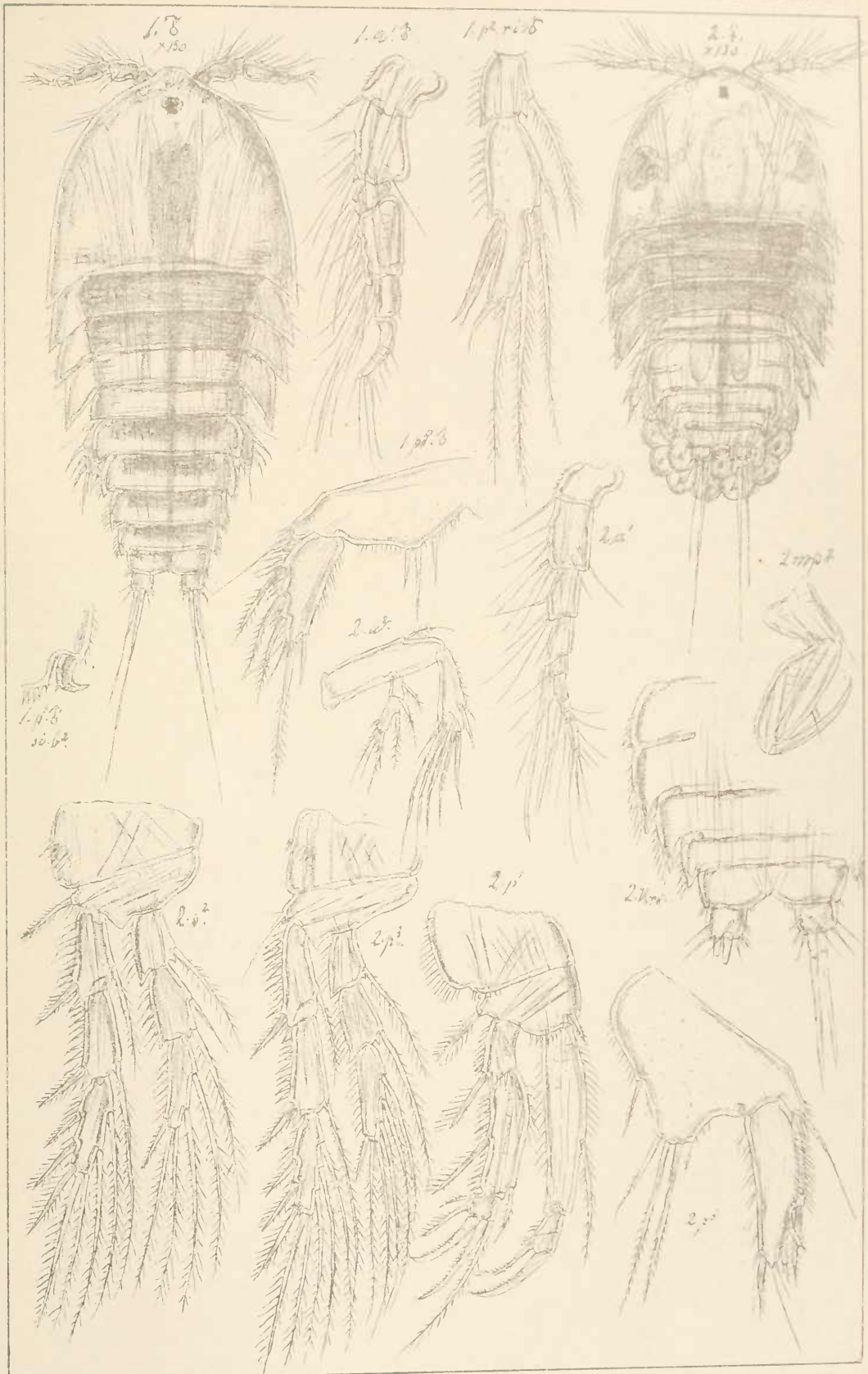
G.O. Sars, autogr. Norsk Lithgr. Officin.

Idomene forficata, Philippi



G. O. Sars, autogr. Norsk Lithgr. Officin.

Amenophia peltata, Boeck



G.O. Sars. autogr. Norsk Lithgr. Officin.

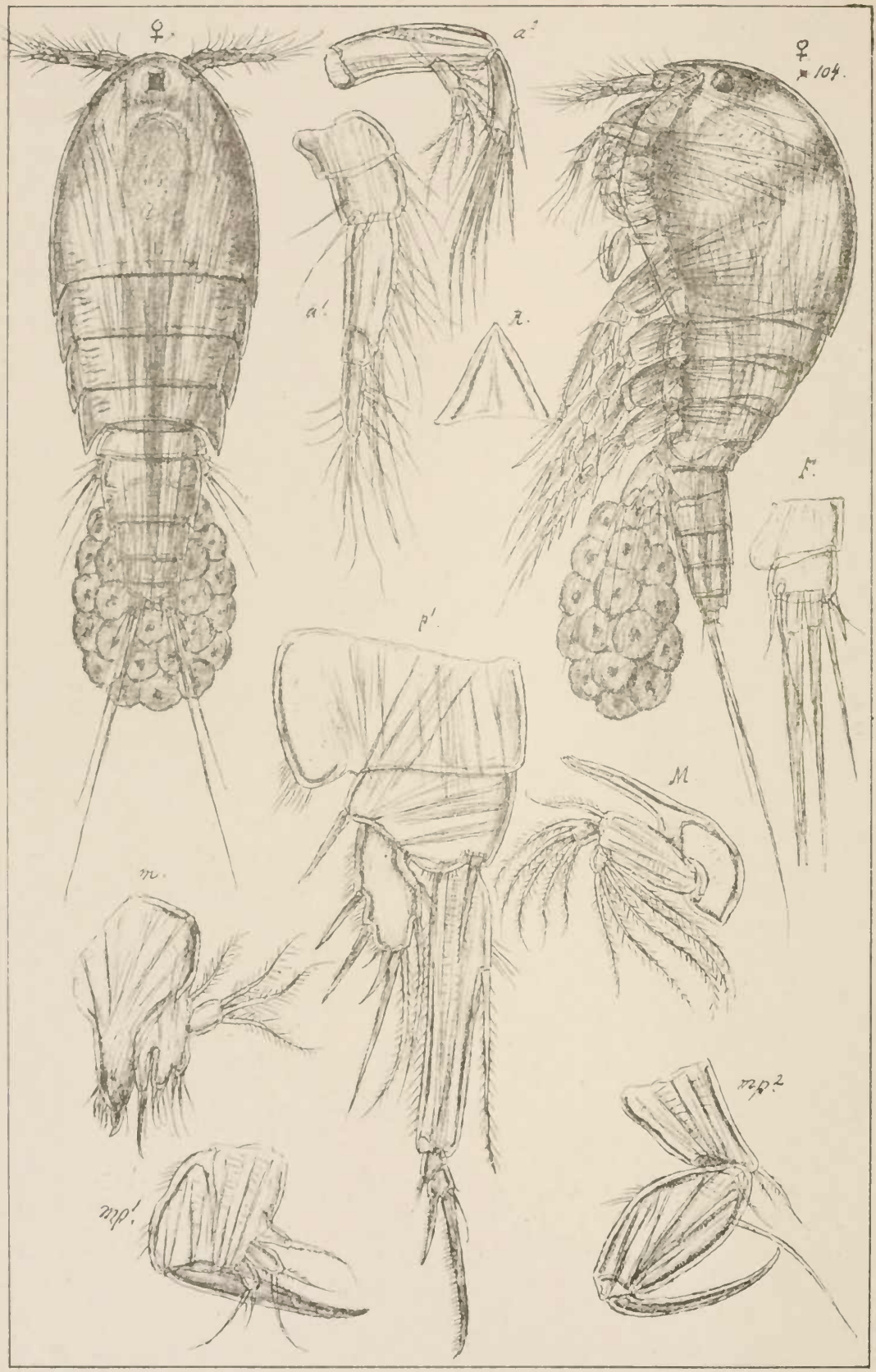
1 Amenophia peltata, Boeck
(continued)
2 Amenophia pulchella, G.O. Sars

Copepoda

Harpacticoida

Thalestridæ

Pl. LXXXV



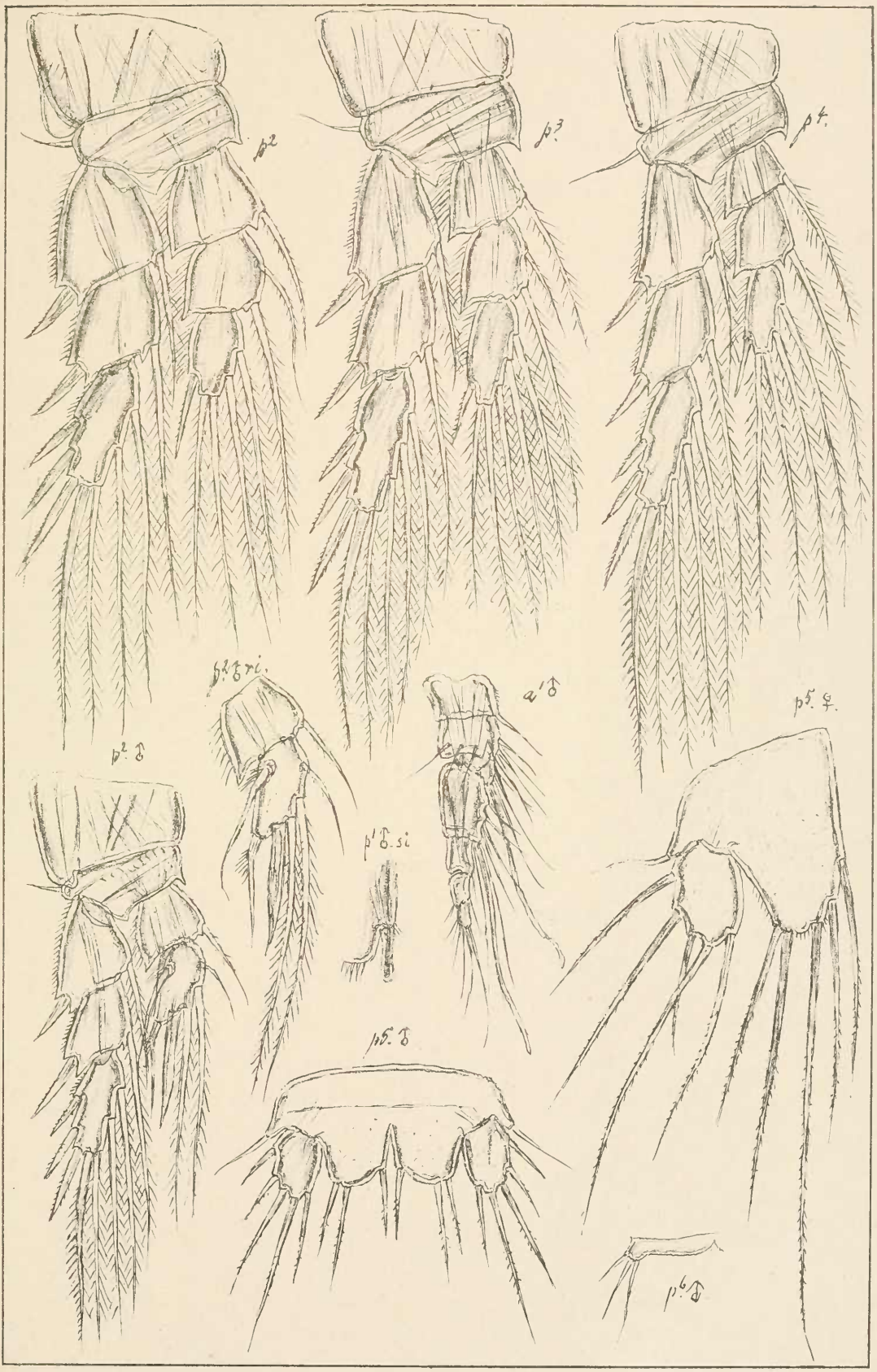
G. O. Sars, autogr.

Norsk Lithgr. Officin.

Westwoodia nobilis (Baird)

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXVI

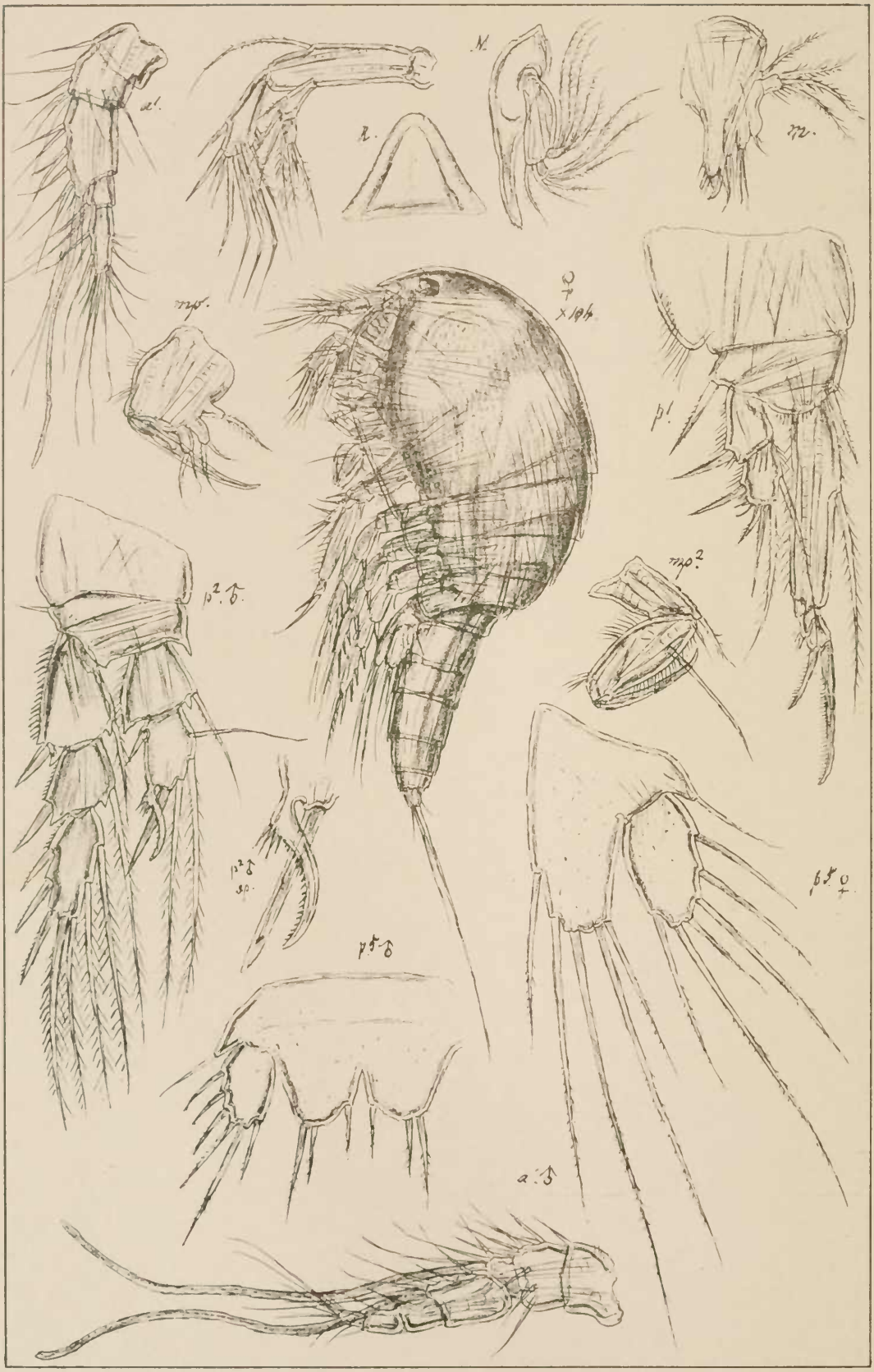


G. O. Sars. autogr. — Norsk Lithgr. Officin.

Westwoodia nobilis (Baird)
(continued)

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXVII

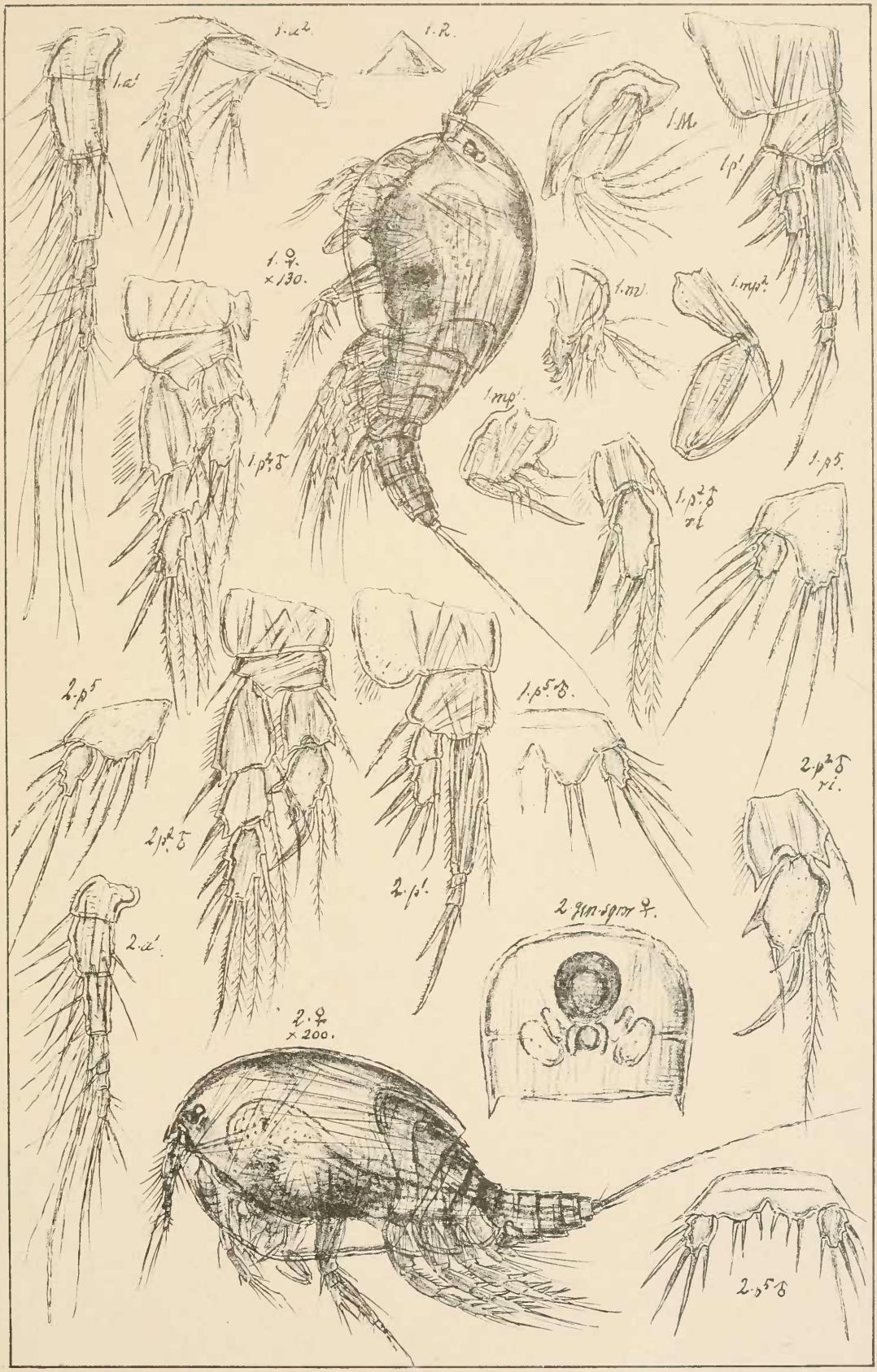


G.O. Sars, autogr. — Norsk Lithgr. Officin.

Westwoodia assimilis, G.O. Sars.

Copepoda

Thalestridæ — Harpacticoida — Pl LXXXVIII



G.O. Sars, autogr. — Norsk Lithgr. Officin.

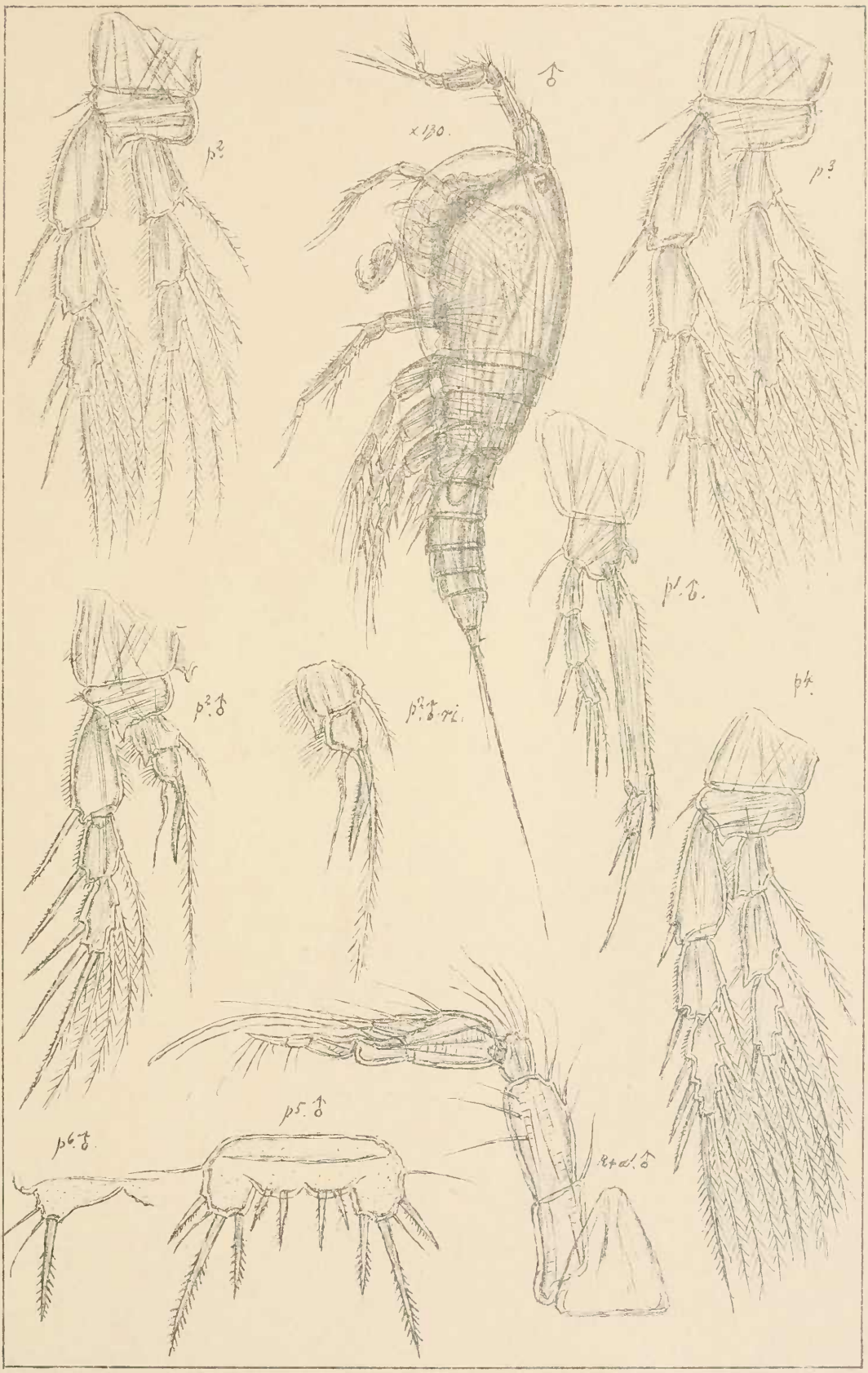
Westwoodia minuta (Claus)

Westwoodia pygmæa (Scott)



G.O. Sars. autogr. Norsk Lithgr. Officin.

Diosaccus tenuicornis, (Claus)

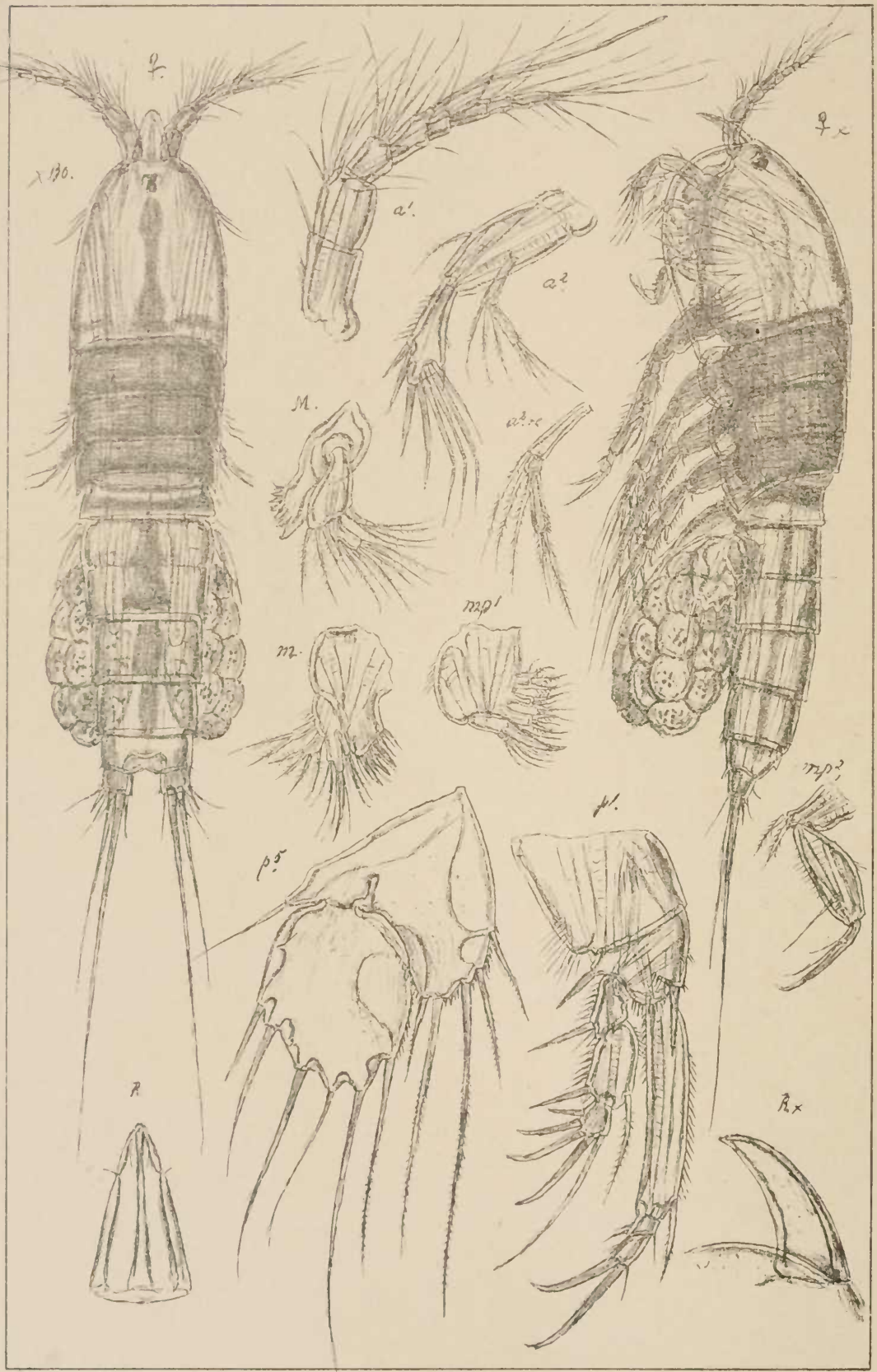


G.O. Sars, autogr.

Norsk Lithgr. Officin.

Diosaccus tenuicornis, (Claus)
(continued)

Copepoda

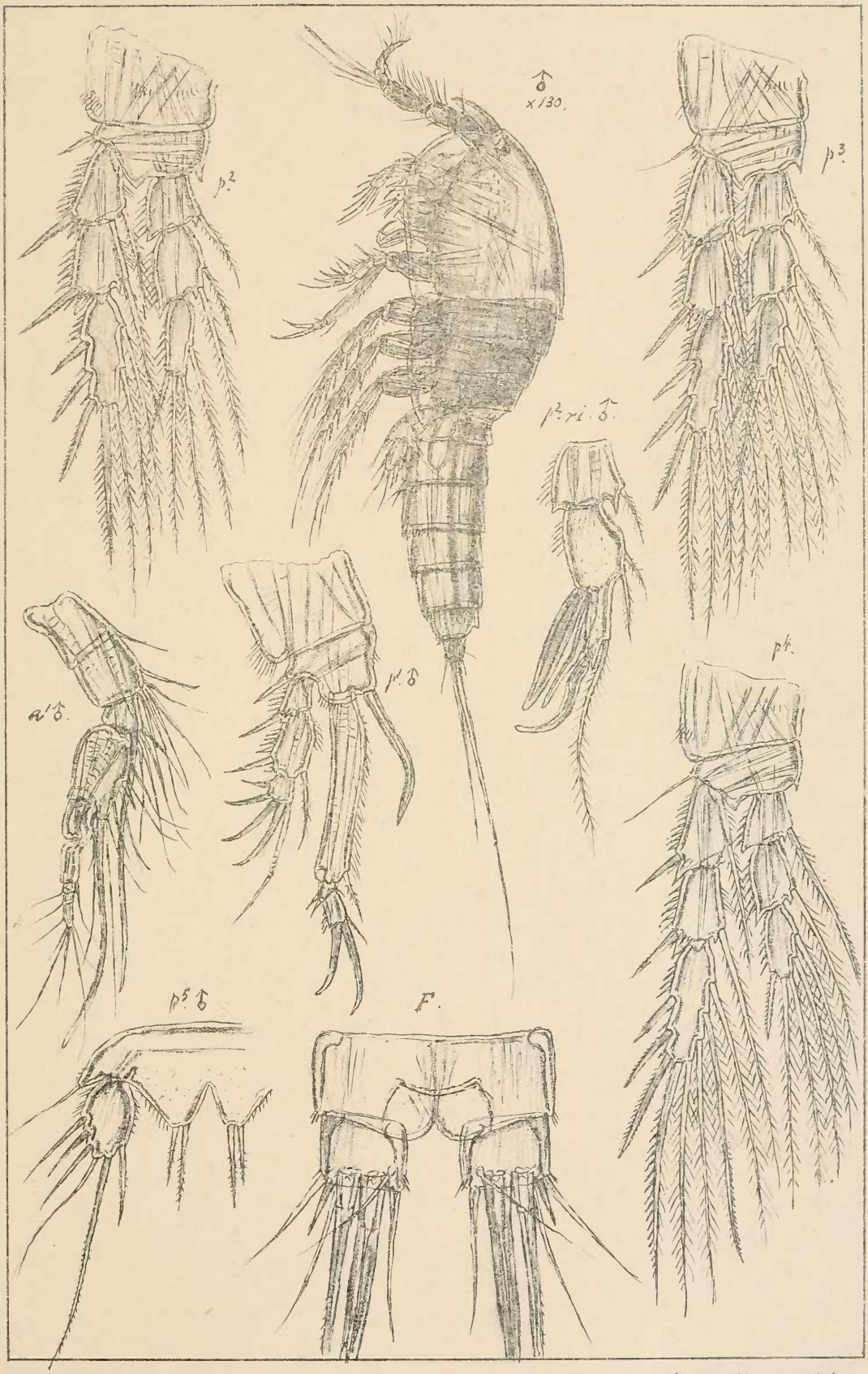


G.O. Sars. autogr. Norsk Lithgr. Officin.

Amphiascus cinctus (Claus)

Copepoda

Harpacticoida



G.O. Sars, autogr.

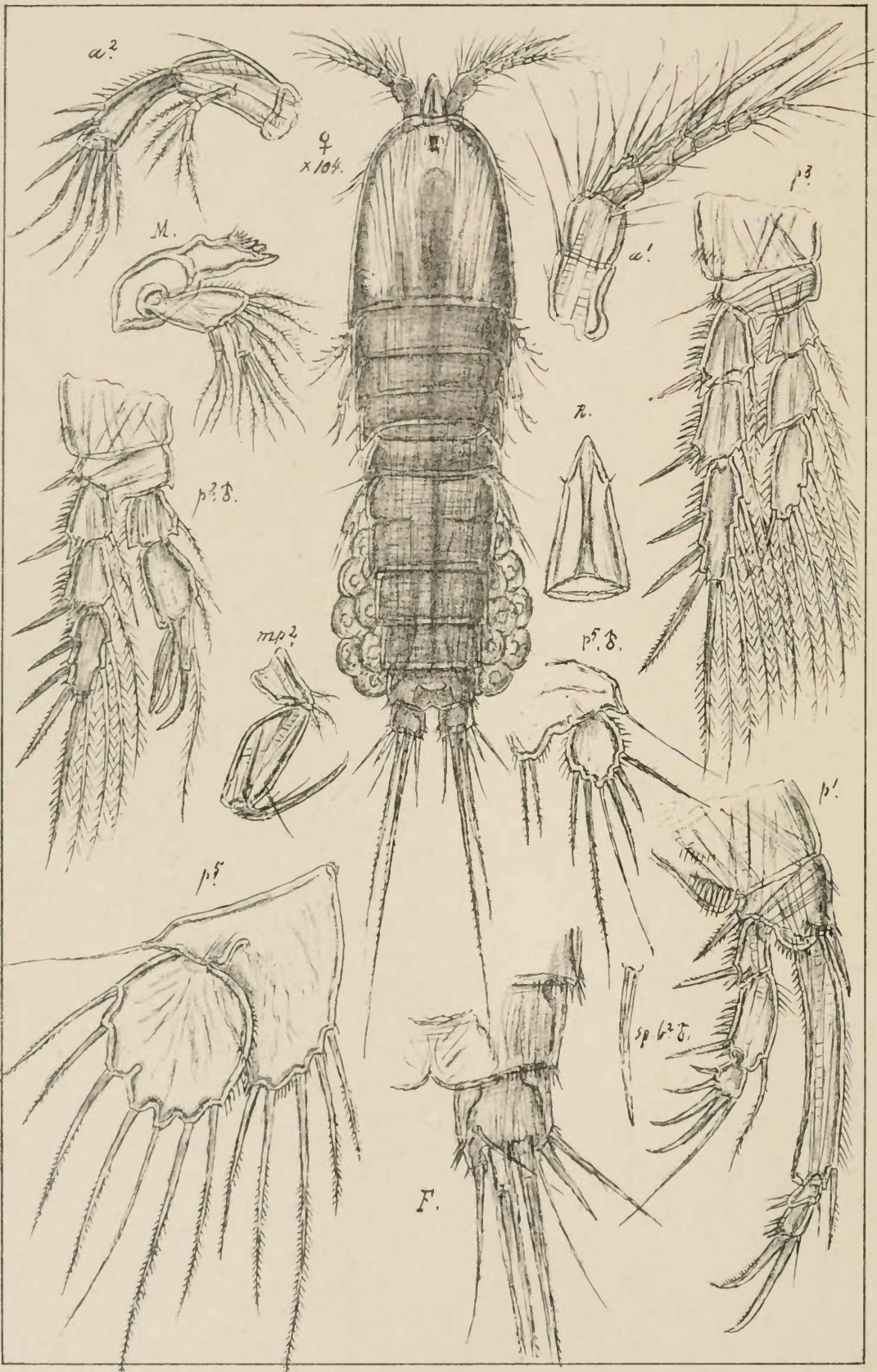
Norsk Lithgr. Officin.

Amphiascus cinctus (Claus)

(continued)

Copepoda

Harpacticoida

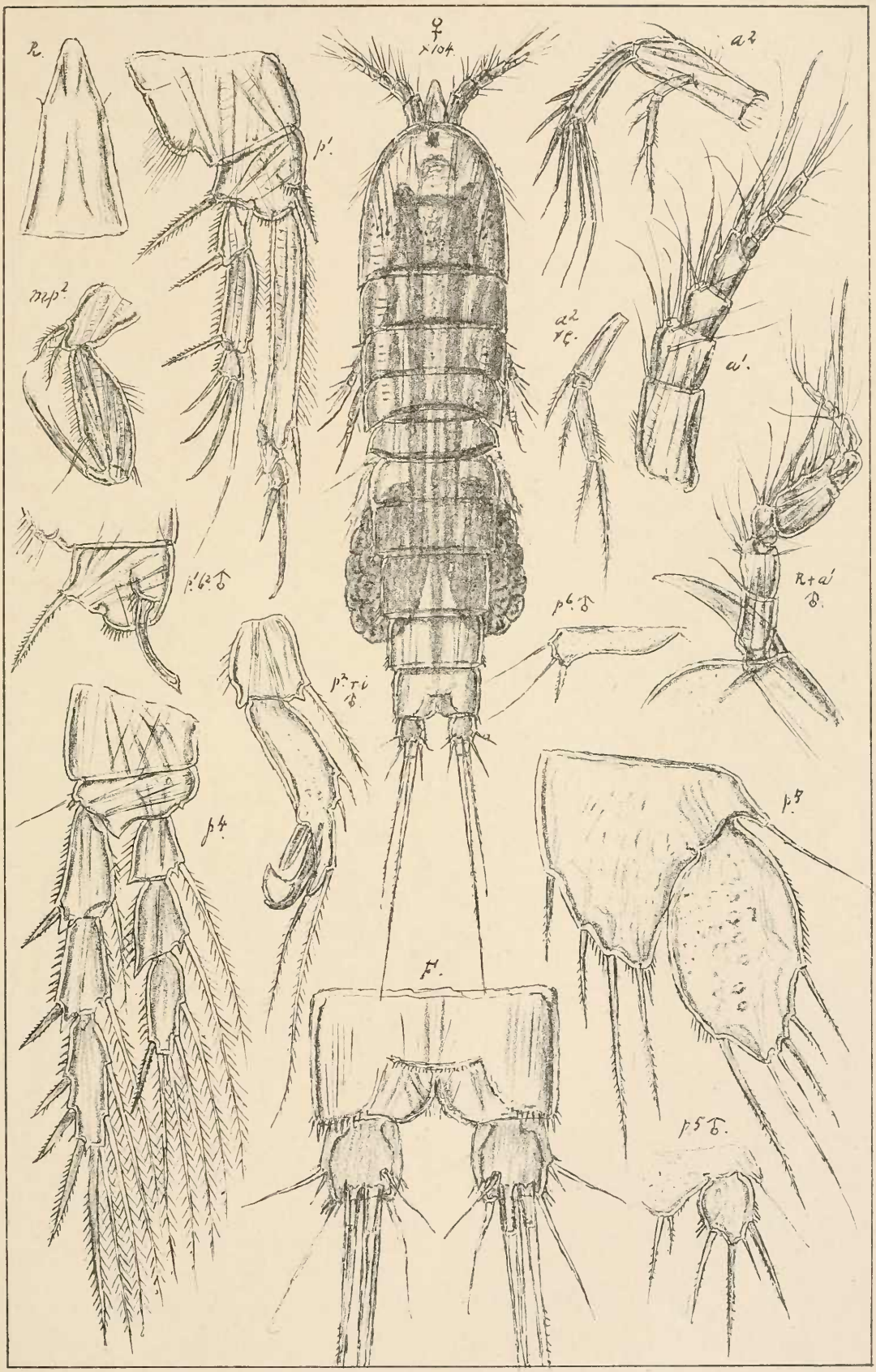


G.O. Sars. autogr. Norsk Lithgr. Officin.

Amphiascus obscurus, G.O.Sars

Copepoda

Harpacticoida

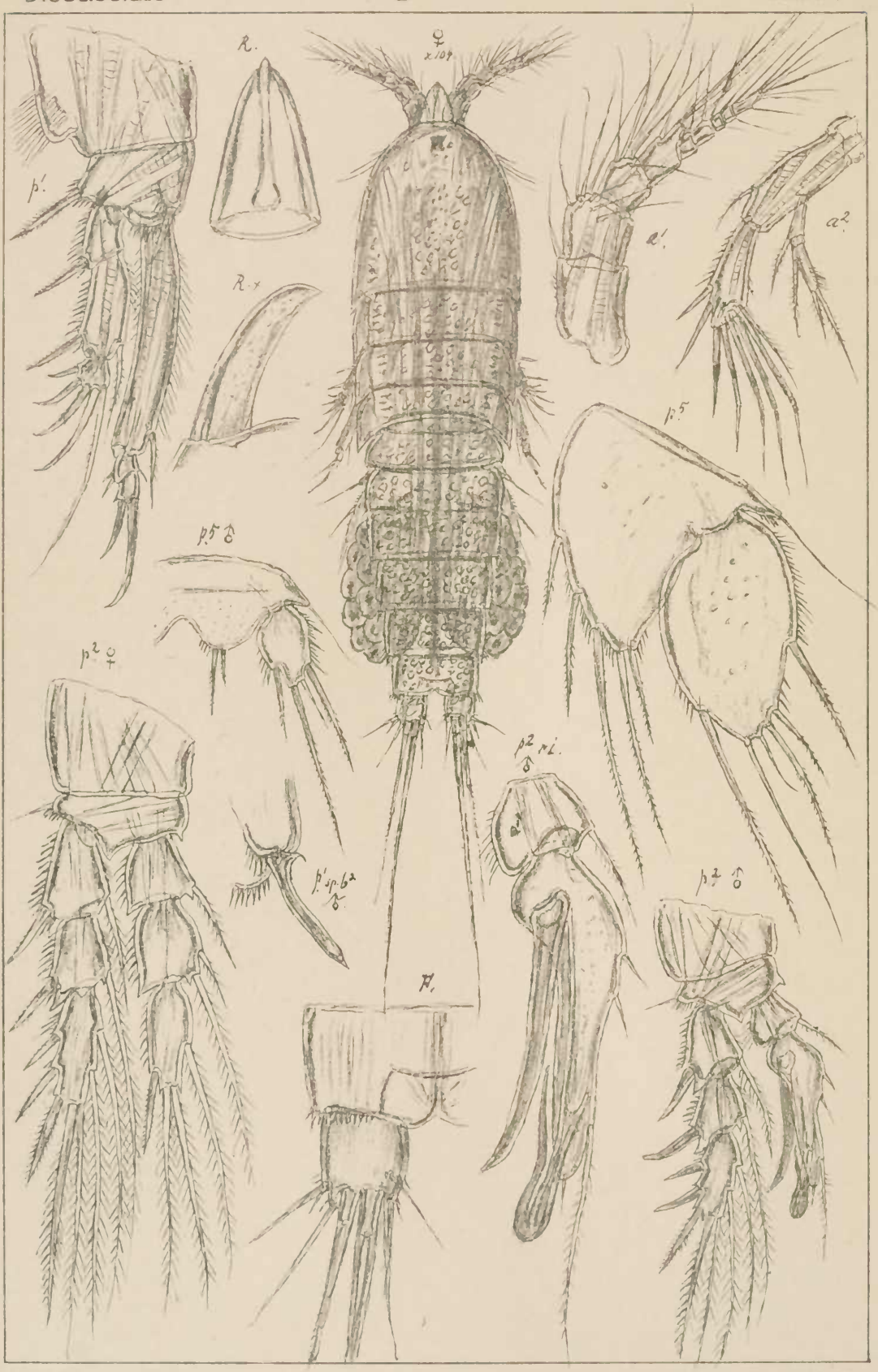


G.O. Sars, autogr. Norsk Lithgr. Officin.

Amphiascus similis. (Claus)

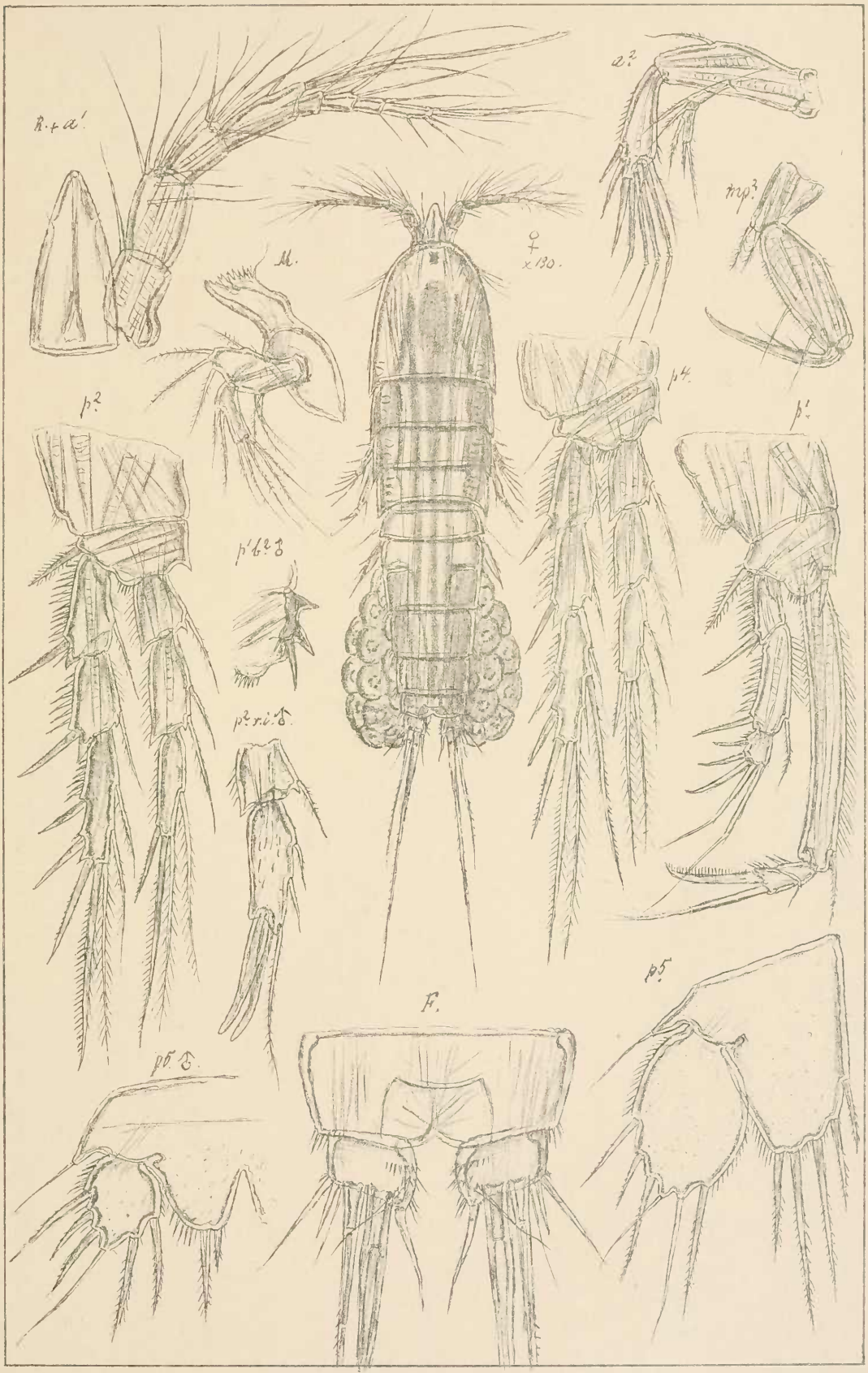
Copepoda

Harpacticoida



G.O. Sars. autogr. Norsk Lithgr. Officin.

Amphiascus nasutus (Boeck)



G.O. Sars, autogr. Norsk Lithgr. Officin.

Amphiascus minutus, (Claus)

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XIII & XIV

DIOSACCIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
PUBLISHED BY THE BERGEN MUSEUM
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1906

female, distal joint short and sub-cordate in form, inner expansion of proximal joint slightly produced, and carrying 2 setæ and a short spine outside the latter.

Body in both sexes of a whitish colour, without any obvious pigmentary ornament.

Length of adult female 0.77 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Prof. Brady as *Stenhelia ima*, though the figure he gives of the last pair of legs in the female does not exactly agree with my own drawings. It unquestionably belongs to the present genus, and may easily be recognized by its exceedingly slender and narrow body, the very long rostrum, and the shape of the last pair of legs in the female.

Occurrence.—I have met with this species occasionally both off the south and west coasts of Norway in moderate depths among algæ. The rostrum seems to be more mobile in this species than in any of the others, being often found, in preserved specimens, deflexed to such an extent, that it forms quite a right angle with the axis of the body.

Distribution.—British Isles (Brady).

99. Amphiascus Giesbrechti, G. O. Sars, n. sp.

(Pl. XCVIII).

Syn: *Stenhelia ima*, Giesbrecht (not Brady).

Specific Characters.—Female. Body rather slender and somewhat attenuated behind, with the anterior division considerably broader than the posterior. Cephalic segment of moderate size; rostrum narrow triangular in form, and comparatively shorter than in *A. imus*. Epimeral plates rather small and rounded behind. Urosome not nearly attaining the length of the anterior division, anal segment somewhat shorter than the preceding one. Caudal rami of moderate size and quadrangular in form, being about as long as they are broad, and transversely truncated at the tip; innermost but one of the apical setæ peculiarly dilated at the base, forming outside, immediately behind the articulation, a very conspicuous bag-like swelling protruding over the base of the adjacent seta. Anterior antennæ moderately slender and gradually attenuated distally, 1st and 2nd joints the largest and of about equal size, 4th joint longer than 3rd, terminal part considerably exceeding half the length of the proximal part. Posterior antennæ with the outer ramus rather short, middle joint very small and without any seta. 1st pair of legs with the outer ramus considerably longer than the 1st joint of the

inner, middle joint about the length of the 1st, terminal joint a little longer and armed with 4 spines and a slender geniculated seta inside them; inner ramus with the 1st joint not much longer than the other 2 combined, last joint linear in form and twice as long as the 2nd, carrying a slender claw, a somewhat longer seta, and a small hair-like bristle. Natatory legs resembling in structure those in *A. imus;* middle joint of inner ramus in 3rd pair of legs, however, like that in 2nd pair, with 2 setæ inside. Last pair of legs with the distal joint oblong oval in form, carrying 6 marginal setæ, 3 outside, one inside, and 2 very slender ones at the tip; inner expansion of proximal joint narrow triangular in form and extending almost as far as the distal joint, marginal setæ 5 in number. Ovisacs less narrow than in *A. imus*.

Colour light yellowish grey.

Length of adult female 1.16 mm.

Remarks.—The above-described form is unquestionably that recorded by Dr. Giesbrecht as *Stenhelia ima*. It is, however, most certainly distinct from Brady's species, differing, as it does, both in size and in several of the anatomical details. One character which distinguishes the present species in a marked degree, and which is well described by Dr. Giesbrecht, is the peculiar bag-like dilatation of the largest of the caudal setæ, a feature which ensures the immediate recognition of this species from any of the others known.

Occurrence.—Only a solitary, but well preserved female specimen of this form has hitherto come under my notice. It was taken many years ago off the west coast of Norway, the exact locality not being stated.[1])

Distribution.—Bay of Kiel (Giesbrecht).

100. Amphiascus propinqvus, G. O. Sars, n. sp.

(Pl. XCIX).

Specific Characters.— Female. Body moderately slender and only slightly attenuated behind. Cephalic segment about the length of the 4 succeeding segments combined; rostrum well developed, lanceolate, extending nearly to the end of the 2nd joint of the anterior antennæ. Urosome almost attaining the length of the anterior division, last segment fully as long as the preceding one. Caudal rami short, quadrangular, broader than they are long, the 2 middle apical setæ only slightly dilated at the base. Anterior antennæ slender and attenuated, 8-articulate, the first 2 joints much the largest, 4th joint nearly twice as long as

[1]) Found this summer occasionally at Flekkerö, south coast of Norway.

the 3rd, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus distinctly 3-articulate, middle joint well defined and setiferous. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, terminal joint about as long as the middle one, and armed with 2 spines and 2 geniculated setæ; inner ramus with the 1st joint very slender and almost 3 times as long as the other 2 combined, last joint linear and twice as long as the 2nd, tipped with a slender claw, a rather long seta, and a hair-like bristle. Natatory legs about as in *A. imus*. Last pair of legs also of a rather similar appearance, the distal joint being narrow oblong in form, but with 3 instead of 2 setæ outside; inner expansion of proximal joint comparatively short, triangular, extending scarcely beyond the middle of the distal joint. Ovisacs of moderate size and somewhat more divergent than in *A. imus*.

Male with the 2nd basal joint of the 1st pair of legs produced inside to 3 blunt spiniform projections. Inner ramus of 2nd pair of legs resembling in structure that in the male of *A. imus*. Last pair of legs likewise of a very similar appearance.

Colour whitish, with a faint yellowish tinge.

Length of adult female 0.57 mm.

Remarks.—This species is closely allied to *A. imus*, but is of smaller size and less slender form of body. It moreover differs somewhat in the structure of the 1st and last pairs of legs.

Occurrence.—Some few specimens of this form were found last summer off the south coast of Norway, at Risør and Lillesand.

101. Amphiascus longirostris (Claus).

(Pl. C & CI).

? *Dactylopus longirostris*, Claus, Die freilebenden Copepoden, p. 127. Pl. XVIII, figs. 4—6.

Syn: *Diosaccus longirostris*, Boeck.
„ *Dactylopus longirostris*, var. *arctica*, Scott.

Specific Characters.—Female. Body moderately robust and slightly attenuated behind. Cephalic segment comparatively large and deep, rostrum rather prominent and evenly curved, terminating in an acute point. Urosome shorter than the anterior division, with the hind edge of the segments finely spinulose ventrally and laterally. Caudal rami quadrangular, being about as long as they are broad, innermost but one of the apical setæ exhibiting near the base a conspicuous bulging outside, overlapping the adjacent seta; spine of outer corner

rather strong, innermost seta very small and hair-like. Anterior antennæ slender and attenuated, 8-articulate, 4th joint more than twice as long as the 3rd, terminal part exceeding half the length of the proximal one. Posterior antennæ with the outer ramus very narrow and composed of only 2 joints, the middle one not being defined. Oral parts quite normal. 1st pair of legs with the outer ramus nearly as long as the 1st joint of the inner, last joint scarcely shorter, but narrower than the middle one, and armed with 4 spines and inside them with a geniculated seta; inner ramus with the 1st joint very narrow and more than twice as long as the other 2 combined, last joint linear and about twice as long as the 2nd, apical claw rather strong and distinctly denticulate on the one edge. Natatory legs well developed and of normal structure. Last pair of legs with the distal joint oval in form and provided with 6 marginal setæ, the 2 apical ones very slender; inner expansion of proximal joint rather broad and obliquely truncated at the end, extending beyond the middle of the distal joint, marginal setæ 5 in number, the 2 innermost ones spiniform, minutely bifid at the tip. Ovisacs comparatively large and somewhat diverging.

Male with the 2nd basal joint of the 1st pair of legs produced inside to 2 or 3 strong spiniform projections, in front of which is a small knob-like prominence. 2nd pair of legs with the 2 first joints of the outer ramus considerably produced at the outer corner, and having the spines, especially that of the 2nd joint, much coarser than in female; inner ramus transformed in the usual manner. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint conical in form and carrying 2 rather thick setæ on the tip.

Body of a light yellow colour, with a more or less distinct reddish tinge; intestine generally dark-coloured.

Length of adult female 0.80 mm.

Remarks.—It seems to me rather questionable if the above-described form is in reality that originally recorded by Claus as *Dactylopus longirostris*. It is however beyond doubt that Boeck's *Diosaccus longirostris* is the present species, as also the form recorded by Th. Scott from Finmark as *Dactylopus longirostris*, var. *arctica*. For this reason, and as the description and figures given by Claus are too imperfect to admit of any certain identification, I think that the specific name *longirostris* ought more properly to be applied to the present species. The *Stenhelia longirostris* of Norman & Scott is a very different species; and as it belongs to the same genus as Claus's species, its specific name must be altered.

Occurrence.—I have met with this form in several places both on the south and west coasts of Norway; and Mr. Scott also records it from the Finmark coast. It generally occurs in depths ranging from 20 to 50 fathoms.

Distribution.—? Heligoland (Claus), British Isles (Scott).

102. Amphiascus tenuiremis (Brady).

(Pl. CII).

Dactylopus tenuiremis, Brady, Monogr. Brit. Copepoda, p. 115, Pl. LVI, figs. 12—18.

Specific Characters.—Female. Body comparatively short and stout, somewhat depressed in front, and slightly attenuated behind. Rostrum rather large, lanceolate. Urosome much shorter than the anterior division, anal segment not quite as long as the preceding one. Caudal rami short, broader than they are long, middle apical setæ moderately thickened at the base. Anterior antennæ slender and attenuated, 8-articulate, 4th joint twice as long as the 3rd, terminal part very narrow and about half the length of the proximal one. Posterior antennæ with the outer ramus distinctly 3-articulate, middle joint well defined and setiferous. 1st pair of legs comparatively strongly built, outer ramus, however, as usual, small, scarcely attaining half the length of the inner, and having the 3 joints of about equal size, the last one carrying 3 spines and 2 geniculated setæ; 1st joint of inner ramus rather large and slightly curved, being almost 4 times as long as the other 2 combined, last joint not much longer than the 2nd and tipped with an unusually strong and evenly curved claw-like spine, a slender seta and a very small hair-like bristle. Natatory legs rather slender, but otherwise of normal structure. Last pair of legs with the distal joint narrow oblong in form, tapering towards the end, and densely ciliated both outside and inside, marginal setæ rather unequal and 6 in number; inner expansion of proximal joint triangular, extending somewhat beyond the middle of the distal joint, marginal setæ rather elongated.

Male exhibiting the usual sexual differences from the female.

Body whitish, with a more or less distinct reddish tinge.

Length of adult female 0.63 mm.

Remarks.—This species was recorded by Messrs. Brady and Robertson as early as the year 1875, and was subsequently described and figured (though rather imperfectly) by the first-named author in his well-known Monograph. It is a true *Amphiascus*, and may be easily distinguished from most other species of that genus by its comparatively short and stout form, and by the structure of the 1st and last pairs of legs.

Occurrence.—I have found this form in considerable abundance in several places both on the south and west coasts of Norway, in depths ranging from 10 to 30 fathoms. It is also recorded by Mr. Scott from the Finmark coast.

Distribution.—British Isles (Brady), Arctic Ocean, off Spitsbergen and Franz Josef Land (Scott).

103. Amphiascus parvus, G. O. Sars, n. sp.

(Pl. CIII).

Specific Characters.—Female. Body moderately slender, sublinear in form, with the anterior division not much broader than the posterior. Rostrum of moderate size and of the usual form. Caudal rami very short, much broader than they are long, middle apical setæ slightly thickened at the base. Anterior antennæ somewhat less slender than in the preceding species, 4th joint only little longer than 3rd, terminal part not attaining half the length of the proximal one. Posterior antennæ with the outer ramus shorter than the terminal joint of the inner, its middle joint very small and without any seta. 1st pair of legs with the outer ramus extending but little beyond the middle of the 1st joint of the inner, its middle joint of about the same size as the 1st, and having no seta inside, last joint somewhat smaller and armed with 3 strong spines and 2 geniculated setæ; 1st joint of inner ramus very slender, straight, being almost 4 times as long as the other 2 combined, last joint not much longer than the 2nd, apical claw of moderate length and almost straight. Natatory legs rather slender, terminal joint of outer ramus in the 2nd and 3rd pairs with only a single seta inside. Last pair of legs with the distal joint broadly ovate in form and carrying 6 marginal setæ, the 2 apical ones very slender and quite smooth; inner expansion of proximal joint comparatively short, triangular, not extending to the middle of the distal joint. Ovisacs of moderate size, and containing a limited number of rather large ova.

Colour not yet ascertained.

Length of adult female 0.46 mm.

Remarks.—This new species somewhat resembles in its general appearance *A. minutus*, but is of much smaller size, and may moreover be distinguished by the less slender anterior antennæ and by the structure of the legs.

Occurrence.—Some few female specimens of this form were selected from samples taken last summer off the south coast of Norway, at Risør and Lillesand.

104. Amphiascus debilis (Giesbr.).

(Pl. XCIV).

Dactylopus debilis, Giesbrecht, Die freilebenden Copepoden der Kieler Föhrde, p. 122 (numerous figures).

Syn: *Dactylopus parvus*, Scott.

Specific Characters.—Female. Body moderately slender, sublinear in form, being almost of uniform width throughout. Rostrum rather prominent, conically

tapered distally. Urosome with the segments finely spinulose at the hind margin ventrally and laterally, last segment much shorter than the preceding one. Caudal rami exceedingly short, being about twice as broad as they are long, middle apical setæ slightly thickened at the base, seta of outer corner unusually strong, spiniform. Anterior antennæ comparatively short, 8-articulate, 4th joint scarcely longer than 3rd, terminal part not attaining half the length of the proximal one. Outer ramus of posterior antennæ with the middle joint very small and without any seta. Oral parts quite normal. 1st pair of legs with the outer ramus extending somewhat beyond the middle of the 1st joint of the inner, middle joint without any seta inside, last joint of about the same length, and carrying on the tip only 2 spines and 2 geniculated setæ; 1st joint of inner ramus slender, linear, and about twice as long as the other 2 combined, last joint twice as long as the 2nd, apical claw slender and nearly straight. Natatory legs with the rami very narrow and the setæ of the inner edge much reduced in number: 1st joint of outer ramus in all pairs without any seta inside; last joint of same ramus in 2nd pair having the inner edge also quite smooth, and in the 2 succeeding pairs carrying only a single seta inside; last joint of inner ramus in 2nd and 4th pairs with a single seta on the inner edge, in 3rd pair with 2 setæ. Last pair of legs with the distal joint oval in form, and provided with only 5 marginal setæ, that issuing from the tip being very slender and quite smooth; inner expansion of proximal joint rather large, extending about as far as the distal joint, marginal setæ rather coarse and 5 in number. Ovisacs comparatively large, but containing a rather limited number of ova.

Male with the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs produced inside to 2 strongly chitinized diverging projections. Inner ramus of 2nd pair fully as long as the outer, distal joint produced at the end to a strong mucroniform projection not defined from the joint. Last pair of legs much smaller than in female, with only 2 setæ on the inner expansion of the proximal joint.

Body of a whitish colour, with a slightly reddish tinge, intestine generally of a dark violaceous hue.

Length of adult female 0.46 mm.

Remarks.—This form has been very minutely described and figured by Dr. Giesbrecht as a species of the gen. *Dactylopus*. It belongs, however, beyond doubt to the genus *Amphiascus*, as here defined, having, like the other species, 2 ovisacs. The species is chiefly characterised by the comparatively short anterior antennæ and the considerable reduction in the number of the natatory setæ on the legs.

Occurrence.—I have met with this small species in several places on the south and west coasts of Norway, from the Christiania Fjord at any rate up to the Trondhjem Fjord. It occurs here and there, together with other species of the genus, in moderate depths among algæ and Hydroida.

Distribution.—Bay of Kiel (Giesbrecht), Scottish coast (Scott).

105. Amphiascus pallidus, G. O. Sars, n. sp.

(Pl. CV).

Specific Characters.—Female. Body comparatively robust, with the anterior division somewhat broader than the posterior, and slightly depressed. Rostrum rather broad at the base, triangular. Urosome much shorter than the anterior division, and having the segments densely spinulose at the hind edge ventrally and laterally. Caudal rami short, a little broader than they are long, the 2 middle apical setæ only slightly thickened at the base. Eye not visible in the living animal. Anterior antennæ rather slender, 4th joint scarcely longer than 3rd, terminal part exceeding half the length of the proximal, and with none of the setæ ciliated. Posterior antennæ with the outer ramus scarcely as long as the terminal joint of the inner, middle joint very small and without any setæ. 1st pair of legs rather strongly built, outer ramus extending beyond the 1st joint of the inner, its middle joint somewhat larger than the other 2, and with a well-developed seta inside, last joint armed with 3 spines and 2 geniculated setæ; 1st joint of inner ramus somewhat exceeding the length of the other 2 combined, last joint more than twice as long as the 2nd, apical claw rather strong. Natatory legs well developed, with the full number of setæ. Last pair of legs with the distal joint rounded oval in form, carrying 6 marginal setæ, 2 of which, attached to the tip, are very narrow and quite smooth; inner expansion of proximal joint extending somewhat beyond the middle of the distal joint, and obliquely truncated at the tip, marginal setæ 5 in number. Ovisacs of moderate size, containing numerous ova.

Male with the 2nd basal joint of 1st pair of legs produced inside to 2 blunt spines, in front of which is a small knob-like prominence. 2nd pair of legs with the spines of the outer ramus much coarser than in female, inner ramus much shorter than the outer and transformed in the usual manner, distal joint considerably dilated in the middle, one of its spiniform appendages being exceedingly strong. Last pair of legs much smaller than in female, distal joint rather

narrow, inner expansion of proximal joint triangular and provided with only 2 spiniform setæ at the tip.

Body of a whitish colour, with a very faint yellowish grey tinge.

Length of adult female 0.71 mm.

Remarks.—This new species is especially distinguished by its comparatively robust and pale-coloured body, as also by the apparent total absence of eye. In the anatomical details it on the whole rather resembles the succeeding species, though differing conspicuously in some few points.

Occurrence.—I found this form many years ago at Christiansund, west coast of Norway, in a depth of 50—60 fathoms, muddy bottom.

106. Amphiascus abyssi (Boeck).

(Pl. CVI).

Dactylopus abyssi, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 56.

Specific Characters.—Female. Body rather robust and only slightly attenuated behind, anterior division scarcely at all depressed. Cephalic segment broadly rounded in front, rostrum of moderate size, terminating in an acute point. Epimeral plates of the 3 succeeding segments acutely produced behind; last segment narrower than the preceding one. Urosome much shorter than the anterior division, and having the segments coarsely spinulose at the hind edge ventrally and laterally, last segment shorter than the preceding one. Caudal rami resembling in form those in *A. pallidus*, though armed both inside and outside with small spinules, the 2 middle apical setæ distinctly spinulose and slightly thickened at the base. Eye well developed, with the pigment of a very pale yellowish hue. Anterior antennæ remarkably short and stout, much curved and densely clothed with setæ, some of which are very strong and coarsely ciliated, 4th joint scarcely longer than 3rd, and very obliquely truncated at the end, terminal part about half the length of the proximal one, with the first 2 joints remarkably short and broad. Posterior antennæ with the outer ramus rather large, exceeding in length the terminal joint of the inner, but otherwise of much the same structure as in *A. pallidus*. 1st pair of legs somewhat less strongly built than in that species, outer ramus scarcely longer than the 1st joint of the inner, and densely spinulose outside, its middle joint shorter than both the 1st and last, and provided inside with a rather large ciliated seta, last joint armed with 3 spines and 2 strong ciliated setæ, which are not geniculated; 1st joint of inner ramus about the length of the other 2 combined, last joint very slender, linear

being more than twice as long as the 2nd, apical claw comparatively short. Natatory legs of almost exactly the same structure as in *A. pallidus*. Last pair of legs also of a very similar shape, though the distal joint is more oblique and the inner expansion of the proximal joint comparatively broader, marginal setæ rather short and very distinctly ciliated. Ovisacs unusually small, each containing, as a rule, only 2 ova.

Male with the inner ramus of the mandibular palp peculiarly transformed, vesicular in shape, with only a single small seta on the inner edge. 2nd basal joint of 1st pair of legs produced inside to an obtuse conical prominence, beyond which is a comb-like series of 5 blunt spines. Inner ramus of 2nd pair of legs transformed in the usual manner. Last pair of legs much smaller than in female, distal joint broader than in the male of *A. pallidus*, and the end obliquely truncated.

Colour dark grey.

Length of adult female 1.20 mm.

Remarks.—This form was erroneously referred by Boeck to the genus *Dactylopus*. As proved by the double ovisac and the structure of the several appendages, it is however unquestionably a true *Amphiascus*, nearly related to *A. pallidus*, though easily distinguished from it by its much larger size and the short and stout anterior antennæ, with their coarsely ciliated setæ.

Occurrence.—This is a true deep-water species, and thus fully deserves the specific name given to it by Boeck. I have found it occasionally in the upper part of the Christiania Fjord and also in several places on the west coast of Norway, in depths ranging from 40 to 100 fathoms, muddy bottom. It moves with great dexterity through the loose mud, and very seldom leaves the bottom.

107. Amphiascus hispidus (Norman).

(Pl. CVII & CVIII).

Stenhelia hispida, Brady, Monogr. Brit. Copepoda, p. 32, Pl. XLII, figs. 1—14.

Specific Characters.—Female. Body rather slender, cylindric in form, with the integuments strongly chitinised. Cephalic segment narrowly rounded in front, and not very deep; rostrum rather prominent and somewhat curved. Epimeral plates of the 3 succeeding segments small and rounded behind; last segment scarcely narrower than the preceding one. Urosome nearly as long as the anterior division and having the segments very sharply defined, genital segment distinctly divided in the middle, and, like the 2 succeeding segments,

clothed laterally, at some distance from the hind edge, with an oblique series of small spinules; last segment much shorter than the preceding one. Caudal rami unusually produced, being rather longer than they are broad, and oblong quadrangular in form, apical setæ comparatively short and distinctly spinulose, the outer median seta with a conspicuous bulging on the outer side near the base. Anterior antennæ not much elongated, 8-articulate, 4th joint somewhat longer than 3rd, terminal part scarcely attaining half the length of the proximal. Posterior antennæ with the outer ramus rather small, middle joint exceedingly minute and without any seta. Oral parts quite normal. 1st pair of legs with the outer ramus somewhat longer than the 1st joint of the inner and densely spinulose outside, middle joint without any seta inside, last joint shorter than the middle one and carrying on the tip 2 claw-like spines and 2 geniculated setæ; 1st joint of inner ramus twice the length of the other 2 combined, last joint somewhat longer than the 2nd, apical claw rather strong, nearly straight, and distinctly spinulose on one of the edges. Natatory legs with the setæ much reduced in number, 1st joint of outer ramus in all the pairs without any seta inside, terminal joint of same ramus in 2nd pair likewise without any setæ on the inner edge, and in the 3rd pair with only a single seta; terminal joint of inner ramus in the 2nd and 4th pairs with only one seta inside. Last pair of legs with the distal joint rounded in form and carrying 5 rather slender marginal setæ, inner expansion of proximal joint extending almost as far as the distal joint, marginal setæ 5 in number. Ovisacs narrow oblong and only slightly divergent. Spermatophore attached to the genital segment unusually large, extending to the end of the antepenultimate caudal segment.

Male, as usual, of smaller size than female, and having the urosome distinctly 5-articulate and somewhat thicker than in that sex. Anterior antennæ highly chitinised and distinctly prehensile, with the 4th joint strongly dilated. 1st pair of legs with the 2nd basal joint armed inside with a very strong deflexed tenon-like projection, blunted at the tip and of a very dark colour, 1st joint of inner ramus considerably thicker than in female, and having inside close to the base a darkly-coloured nodiform prominence. Inner ramus of 2nd pair of legs with the distal joint highly chitinised and projecting at the end in a strong bayonet-shaped process, on the inner side of which a more slender spiniform appendage is attached. Last pair of legs much smaller than in female, distal joint rather narrow, with 2 of the outer setæ spiniform, inner expansion of proximal joint very slight, with 2 unequal spines and numerous small spinules.

Colour dark yellowish grey.

Length of adult female 1.15 mm., of male 0.98 mm.

Remarks.—This form was first detected by Canon A. M. Norman, and was subsequently described and figured by Prof. Brady in his well-known Monograph under the name originally proposed by Norman. It is a very distinct and easily recognizable species, being especially distinguishable by the slender cylindrical form of the body, the highly chitinised integuments, and the unusual production of the caudal rami. It is also of rather large size as compared with the other species of this genus.

Occurrence.—I have found this form not unfrequently at Aalesund and Christiansund, on the west coast of Norway, in moderate depths among algæ. It also occurs off the Finmark coast, several specimens having been taken many years ago at Vadsö.

Distribution.—British Isles (Brady).

108. Amphiascus affinis, G. O. Sars, n. sp.

(Pl. CIX).

Specific Characters.—Female. General form of body similar to that of *A. hispidus*, being rather slender, subcylindrical. Rostrum of moderate size and blunted at the tip. Caudal rami short, being considerably broader than they are long, the 2 middle apical setæ remarkably strong, dark-coloured and considerably thickened at the base. Anterior and posterior antennæ of much the same structure as in *A. hispidus*. 1st pair of legs likewise of a very similar appearance, though having the outer 2 joints of the inner ramus shorter and nearly equal in size. Natatory legs exhibiting a reduction in the number of the setæ similar to that found in the above species. Last pair of legs with the inner expansion of the proximal joint comparatively shorter than in *A. hispidus*, extending only slightly beyond the middle of the distal joint, which latter exhibits a rounded form very similar to that in the above-named species. Ovisacs somewhat more divergent.

Colour not yet ascertained.

Length of adult female 0.82 mm.

Remarks.—This form closely resembles *A. hispidus*, both as regards general appearance and structural details. It is however of rather inferior size, and is moreover easily distinguished by the form of the rostrum and the much shorter caudal rami.

Occurrence.—Some few specimens of this form, all of the female sex, were collected from samples taken during the summer of 1905 at Risör and Lillesand, on the south coast of Norway.

109. Amphiascus intermedius (Scott).

(Pl. CX).

Stenhelia intermedia, Th. Scott, Marine Invertebrata of Loch Fyne, 15th Ann. Rep. of the Fishery Board for Scotland, p. 169, Pl. II, figs. 10—21.

Specific Characters.—Female. Body much shorter and stouter than in the 2 preceding species. Cephalic segment rather broad and evenly rounded in front; rostrum distinctly bifid at the tip. Caudal rami much broader than they are long, apical setæ remarkably short and moderately thickened at the base. Anterior antennæ of a structure similar to that in the 2 preceding species, though having the last joint somewhat larger, nearly equal in length to the 3 preceding joints combined. Posterior antennæ scarcely differing in their structure from those in the above-mentioned species. 1st pair of legs likewise of a very similar structure, outer 2 joints of inner ramus rather short, together scarcely attaining half the length of the 1st. Natatory legs almost exactly as in the 2 preceding species. Last pair of legs with the distal joint somewhat tapered distally and the marginal setæ comparatively shorter than in those species; inner expansion of proximal joint triangular, extending slightly beyond the middle of the distal joint. Ovisacs rather large and diverging considerably.

Male with the 2nd basal joint of 1st pair of legs produced inside to a highly chitinized tenon-like projection similar to that found in the male of *A. hispidus*, the tip of the projection, however, being less blunted. Inner ramus of 2nd pair of legs transformed in a manner very similar to that in the male *A. hispidus*, the bayonet-shaped terminal projection being, however, somewhat shorter and having on the outer side 2 strong serrulations not found in that species.

Colour yellowish grey.

Length of adult female 0.74 mm.

Remarks.—This is unquestionably the species recorded by Th. Scott in the above-named paper as *Stenhelia intermedia*. Though closely related to the 2 preceding species, it may be at once distinguished from either of them by its much shorter and stouter body, as also by the distinctly bifid rostrum and the unusually short caudal setæ.

Occurrence.—Some few specimens of this form were taken at Levanger, on the Trondhjem Fjord, and at Kopervik, on the west coast of Norway, in depths ranging from 20 to 30 fathoms.

Distribution.—Scottish coast (Scott).

110. Amphiascus typhlops, G. O. Sars, n. sp.

(Pl. CXI).

Specific Characters.—Female. Body very slender, sublinear in form, with the 2 chief divisions nearly equal in length. Rostrum much attenuated, terminating in an acute point. Caudal rami unusually prolonged, being fully twice as long as they are broad, apical setæ of moderate length and only slightly thickened at the base. Eye wholly absent. Anterior antennæ moderately elongated and less attenuated than in most other species, 8-articulate, 4th joint not much longer than 3rd, terminal part scarcely attaining half the length of the proximal. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, middle joint very small and without any seta. Oral parts normal. 1st pair of legs with the outer ramus about as long as the 1st joint of the inner, middle joint with a well-developed seta inside, last joint somewhat longer than the middle one, oblong oval in form, and armed with 4 slender spines and a still more slender ciliated seta inside the spines; 1st joint of inner ramus about the length of the other 2 combined, last joint very slender, linear, 3 times as long as the 2nd, apical claw very long and evenly curved. Natatory legs with the rami rather narrow and with a larger number of setæ than in the 3 preceding species, outer apical seta of inner ramus spiniform. Last pair of legs with the distal joint very narrow, oblong in form, and carrying 6 rather slender marginal setæ; inner expansion of proximal joint narrow triangular, and extending to about the middle of the distal joint, marginal setæ 5 in number. Ovisacs comparatively small, with a very limited number of ova.

Male with the 2nd basal joint of 1st pair of legs produced inside at the base to a small knob-like prominence, beyond which is a comb-like series of 4 blunt spines. Inner ramus of 2nd pair of legs rather slender, being fully as long as the outer, and transformed in the usual manner, the distal joint carrying outside, at some distance from the tip, 2 spiniform appendages, the outer of which is shorter and thicker than the inner. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint obtusely conical in form, and carrying on the tip 2 spiniform setæ of somewhat unequal length.

Colour whitish.

Length of adult female 0.93 mm.

Remarks.—This is a very distinct and easily recognizable species, being especially characterised by the very slender linear form of the body, the narrowly tapered rostrum, and the unusually prolonged caudal rami. Not the slightest trace of an eye could be detected in the living animal.

Occurrence.—Only 2 specimens, male and female, of this form have hitherto come under my notice. They were taken at the same time in the upper part of the Christiania Fjord from a depth of 30—40 fathoms, muddy bottom.[1])

111. Amphiascus attenuatus, G. O. Sars, n. sp.

(Pl. CXII).

Specific Characters.—Female. Body moderately robust and very conspicuously attenuated behind, exhibiting in the dorsal view of the animal a somewhat clavate form. Cephalic segment very large and broad, evenly rounded in front; rostrum rather broad, triangular. Urosome much narrower than the anterior division and evenly tapering behind, last segment about the length of the preceding one. Caudal rami quadrangular in form, being a little broader than they are long, the 2 middle apical setæ, but especially the inner one peculiarly expanded near the base. Anterior antennæ rather slender and composed of 9 well-defined joints, the first 4, composing the proximal part, being nearly equal in length, terminal part comparatively short, scarcely exceeding $^1/_3$ of the proximal one. Posterior antennæ likewise of rather slender form, outer ramus very small and composed of only 2, not very distinctly defined joints. Oral parts, on the whole, normal. 1st pair of legs differing somewhat in structure from those in the other species, outer ramus much shorter than the 1st joint of the inner, its largest joint being the middle one, with a comparatively short seta at the end inside, last joint rather small and armed with 3 spines and 2 geniculated setæ; 1st joint of inner ramus very slender, linear, being about 3 times as long as the other 2 combined, last joint not much longer than the 2nd and slightly expanded distally, carrying on the tip 2 strong claws and a small hair-like bristle inside them. Natatory legs rather strongly developed, with the full number of setæ. Last pair of legs with the distal joint oval in form, and carrying 6 comparatively short marginal setæ; inner expansion of proximal joint rather broad, extending to about the middle of the distal joint, marginal setæ 5 in number, spiniform, the outermost one very small. Ovisacs of moderate size.

Colour whitish, with rosy ovaries, and the ovisacs generally of a dark purple hue.

Length of adult female 0.87 mm.

Remarks.—This form differs in some respects rather conspicuously from the other species, especially as regards the structure of the two pairs of antennæ

[1]) Found occasionally this summer at Farsund, south coast of Norway.

and the 1st pair of legs; and it ought perhaps more properly to be referred to the genus *Pseudodiosaccus* recently established by Th. Scott. The oral parts, however, which in this genus are said to be built upon the same type as in *Diosaccus*, are quite normal in the present species, and the inner ramus of the 4th pair of legs is composed of 3 well-defined joints.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were found in a sample taken at Kopervik, on the west coast of Norway.[1])

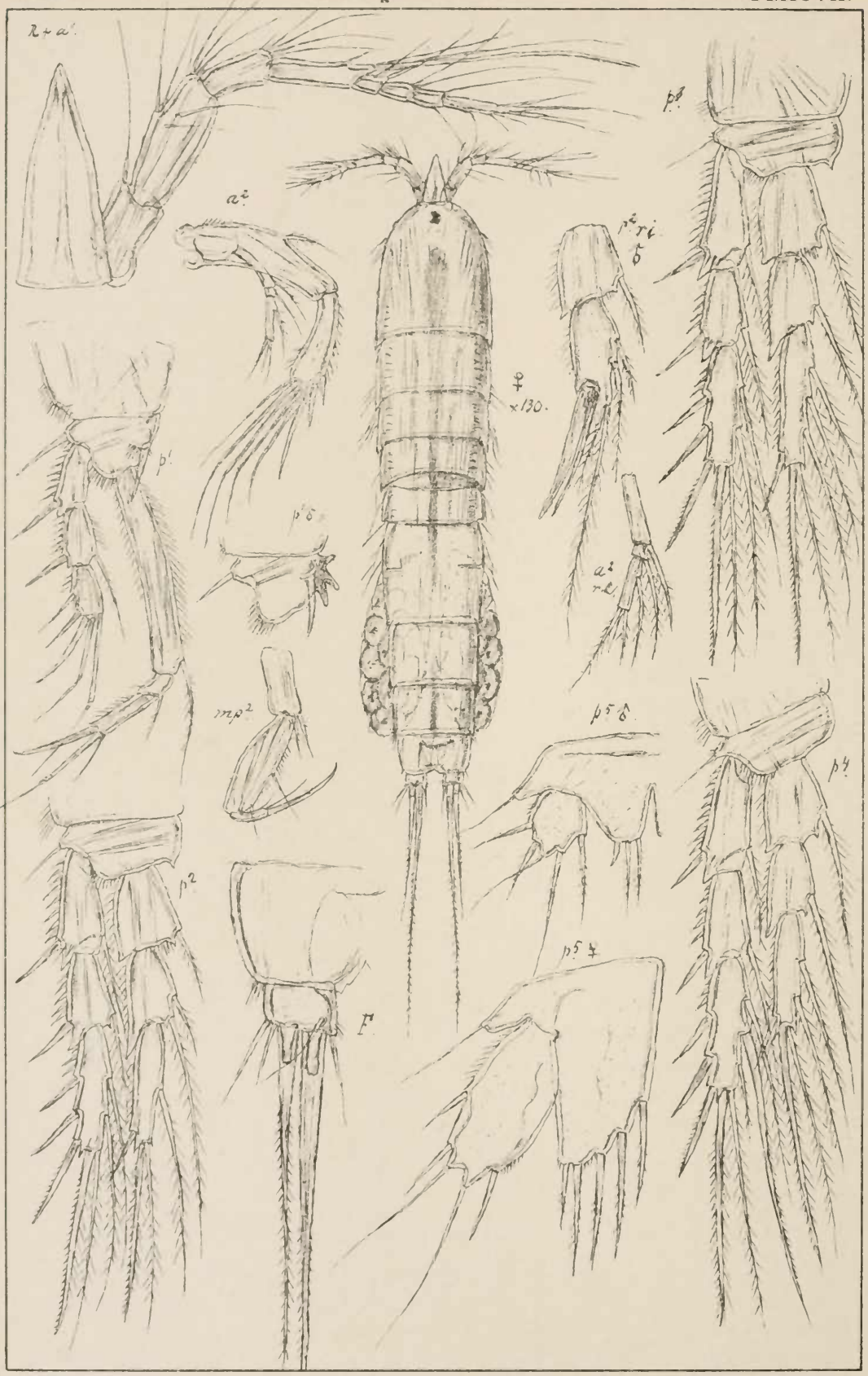
112. Amphiascus phyllopus, G. O. Sars, n. sp.

(Pl. CXIII).

Specific Characters.—Female. Body comparatively short and stout, only slightly tapered behind. Cephalic segment rather large, fully as long as the 4 succeeding segments combined, and obtusely rounded in front; rostrum prominent, obtusely acuminate at the tip. Urosome not much shorter than the anterior division, segments sharply defined and coarsely spinulose at the hind edge ventrally and laterally, genital segment large, quadrangular, imperfectly divided in the middle, last segment somewhat shorter than the preceding one. Caudal rami comparatively large, quadrangular in form, being nearly as long as they are broad, middle apical setæ rather elongated and somewhat thickened in their proximal part. Anterior antennæ unusually short, 8-articulate, the first 4 joints gradually diminishing in size, terminal part about half the length of the proximal. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, middle joint very small and imperfectly defined, without any seta. 1st pair of legs rather strongly built, outer ramus much shorter than the 1st joint of the inner, the middle joint being much the largest, with a small seta at the end inside, last joint small, rounded, with 4 strong claw-like spines and a slender seta on the inner side; outer 2 joints of inner ramus very short, the last one armed at the tip with 2 strong claws of unequal length. Natatory legs well developed, with the rami rather broad and exhibiting the full number of setæ. Last pair of legs very large, foliaceous, distal joint of unusual size, forming a broadly oval lamella fringed with 6 marginal setæ of rather unequal length; inner expansion of proximal joint very broad, but scarcely extending to the middle of the distal joint, marginal setæ 5 in number, the outermost one very small, the 3rd much longer than the others. Ovisacs of moderate size.

[1]) Found this summer rather abundantly at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand.

Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

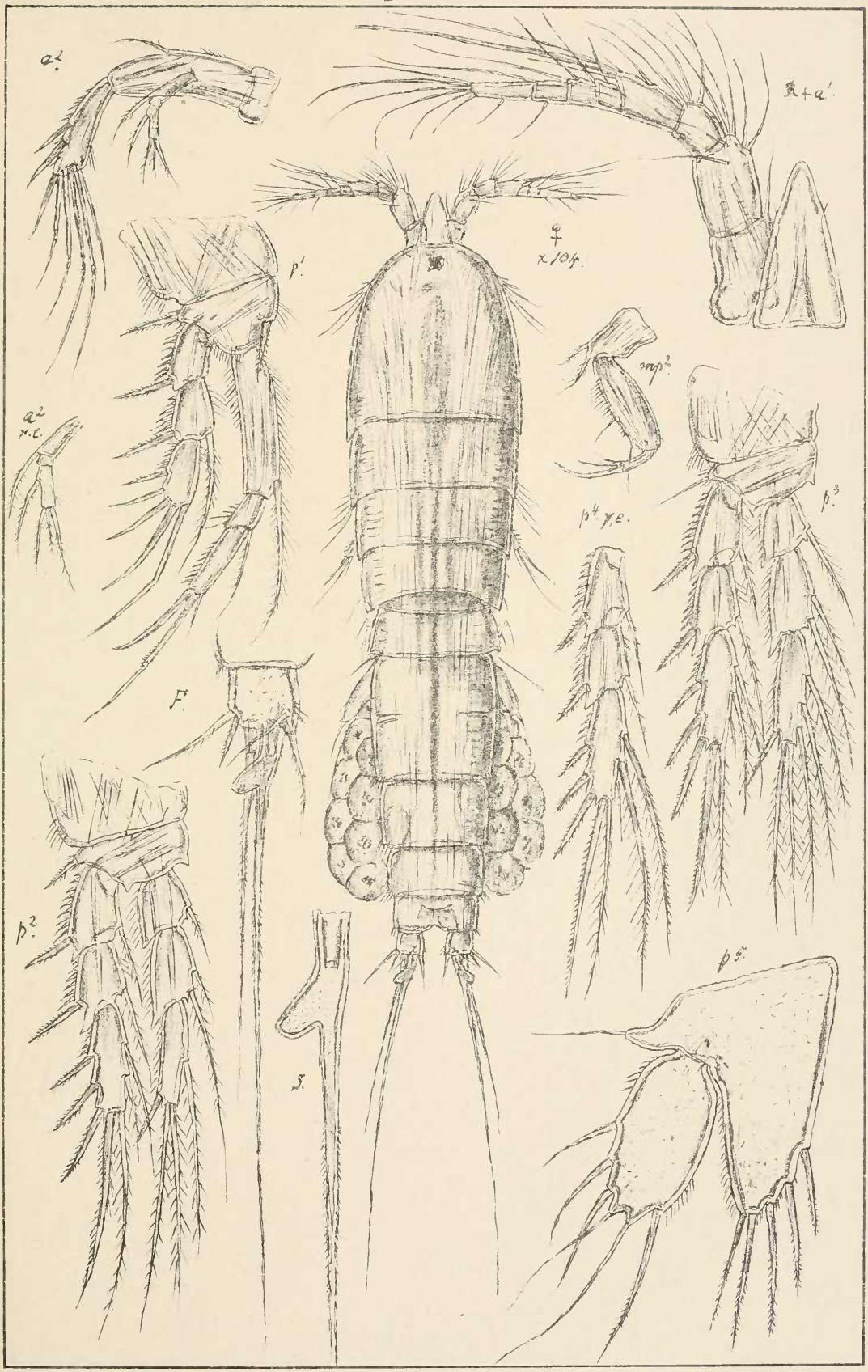
Amphiascus imus (Brady)

Copepoda

Harpacticoida

Diosaccidæ

Pl.XCVIII.



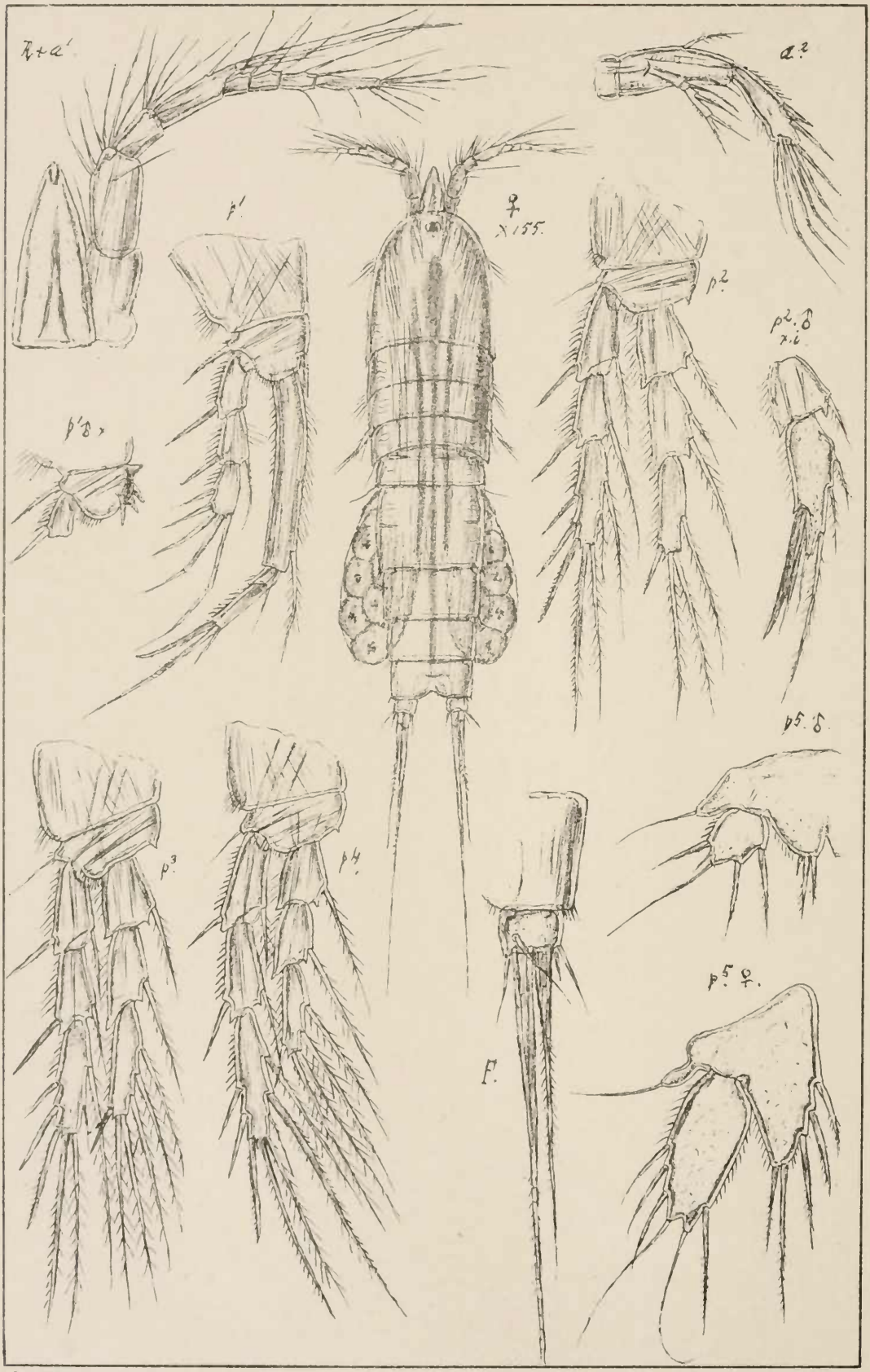
G.O.Sars autogr.

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Amphiascus Giesbrechti G.O.Sars.

Copepoda

Diosaccidæ — Harpacticoida. — Pl.XCIX.



G.O.Sars autogr — Norsk lithgr. Officin

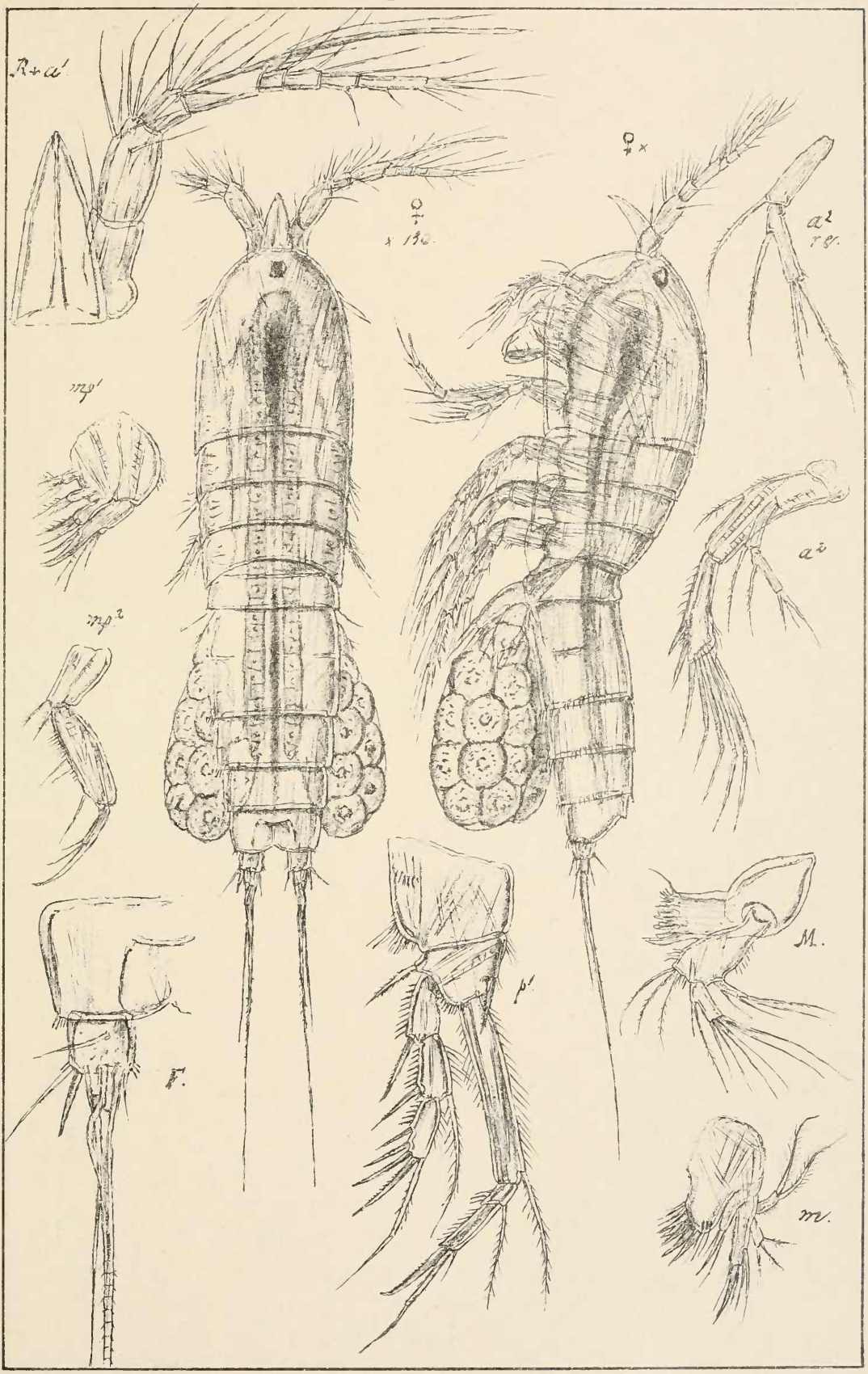
Amphiascus propinqvus G.O.Sars.

Copepoda

Harpacticoida

Diosaccidæ

Pl.C.

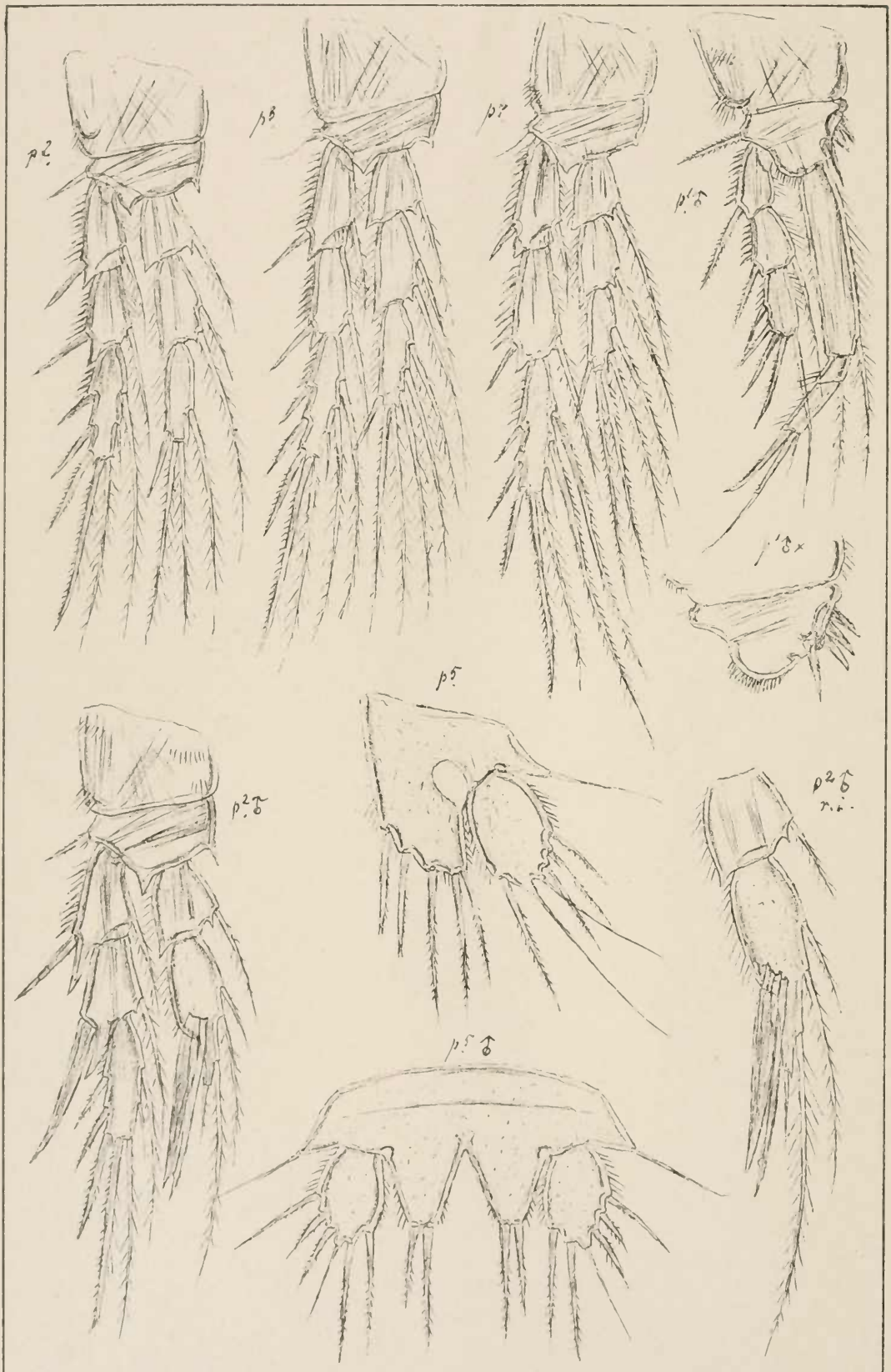


G.O.Sars autogr.

Amphiascus longirostris,(Claus)

Norsk lithgr Officin

Copepoda

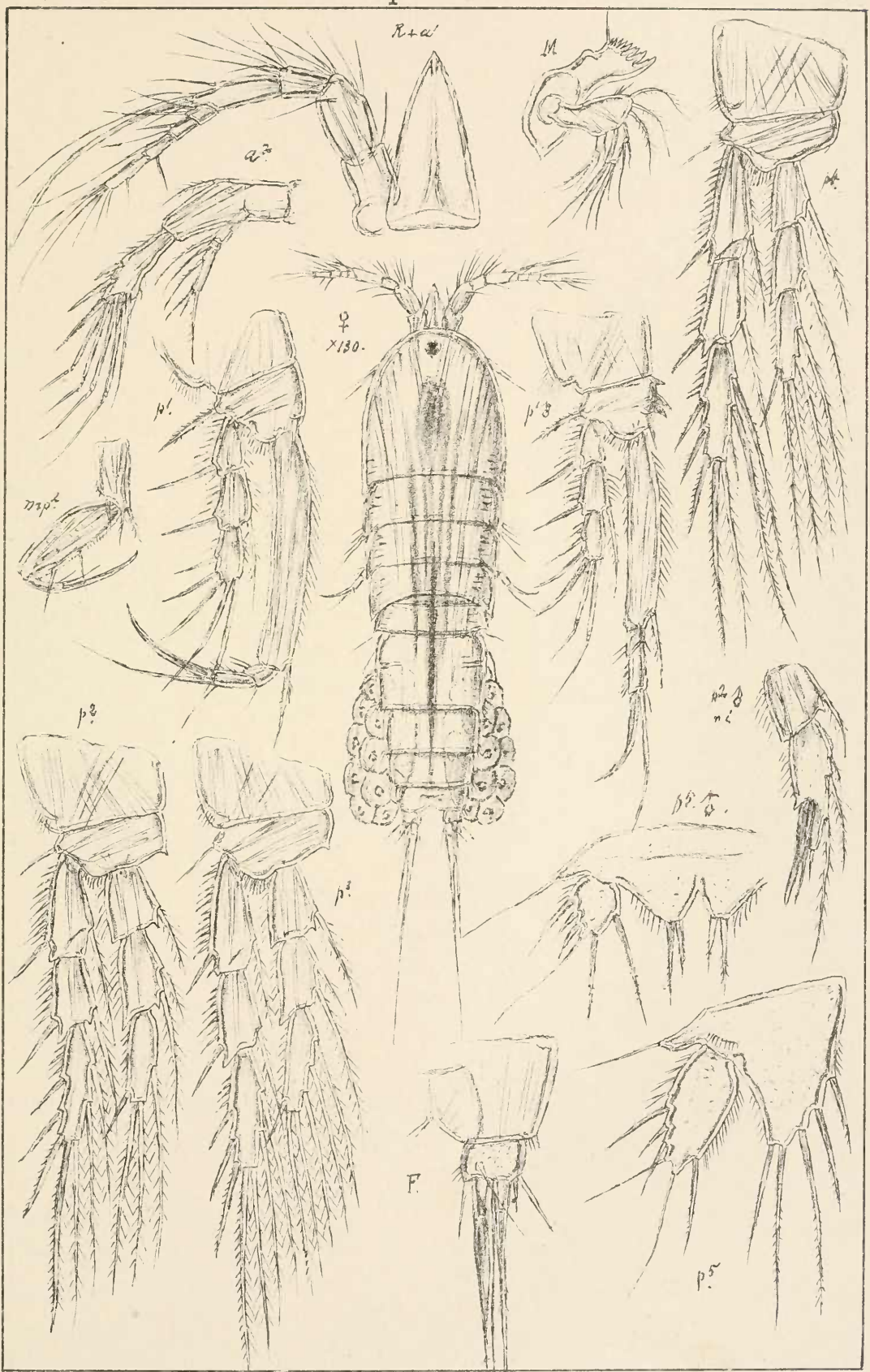


G.O. Sars autogr.

Amphiascus longirostris, (Claus)
(continued)

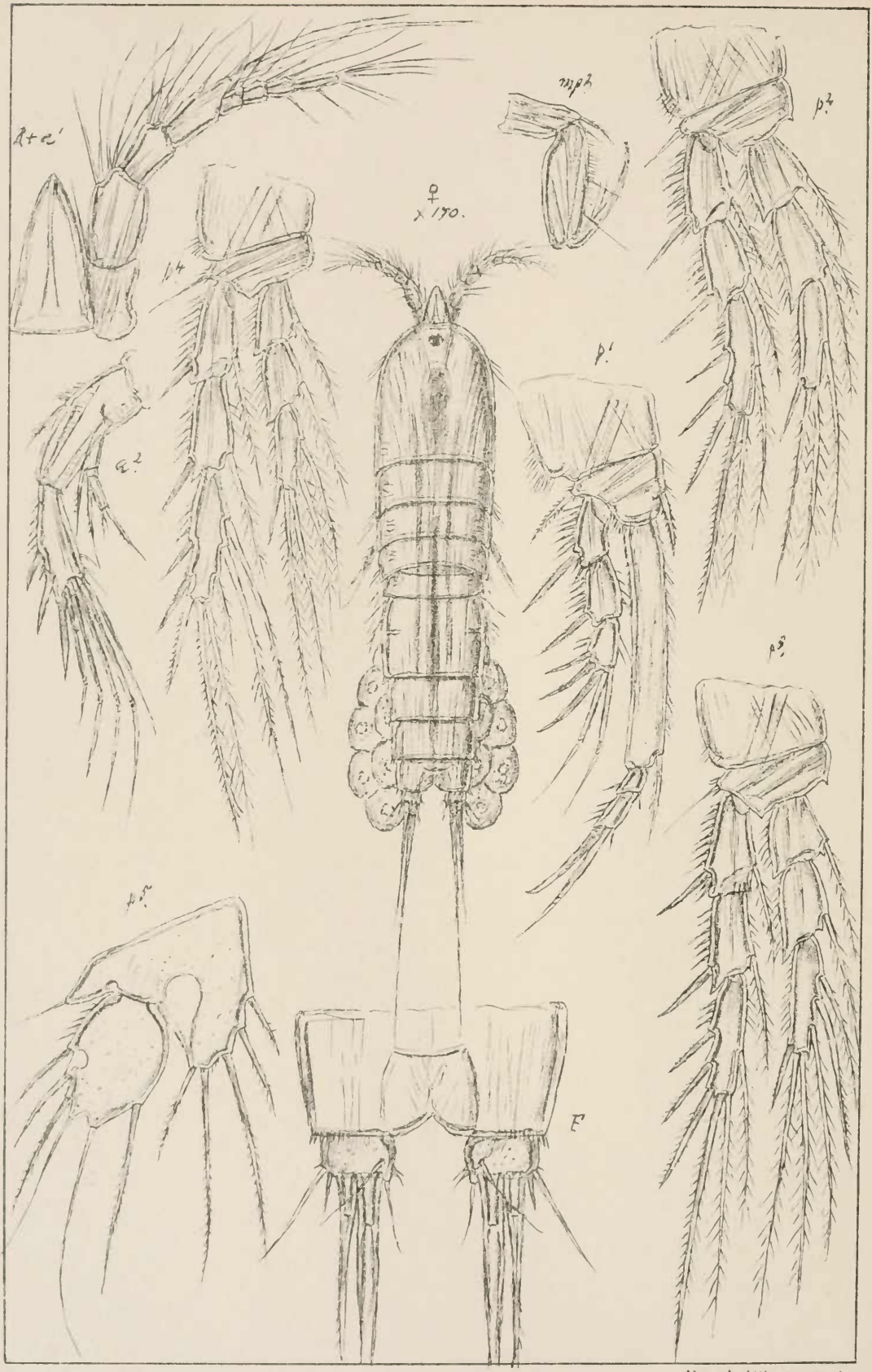
Norsk lithgr. Officin

Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

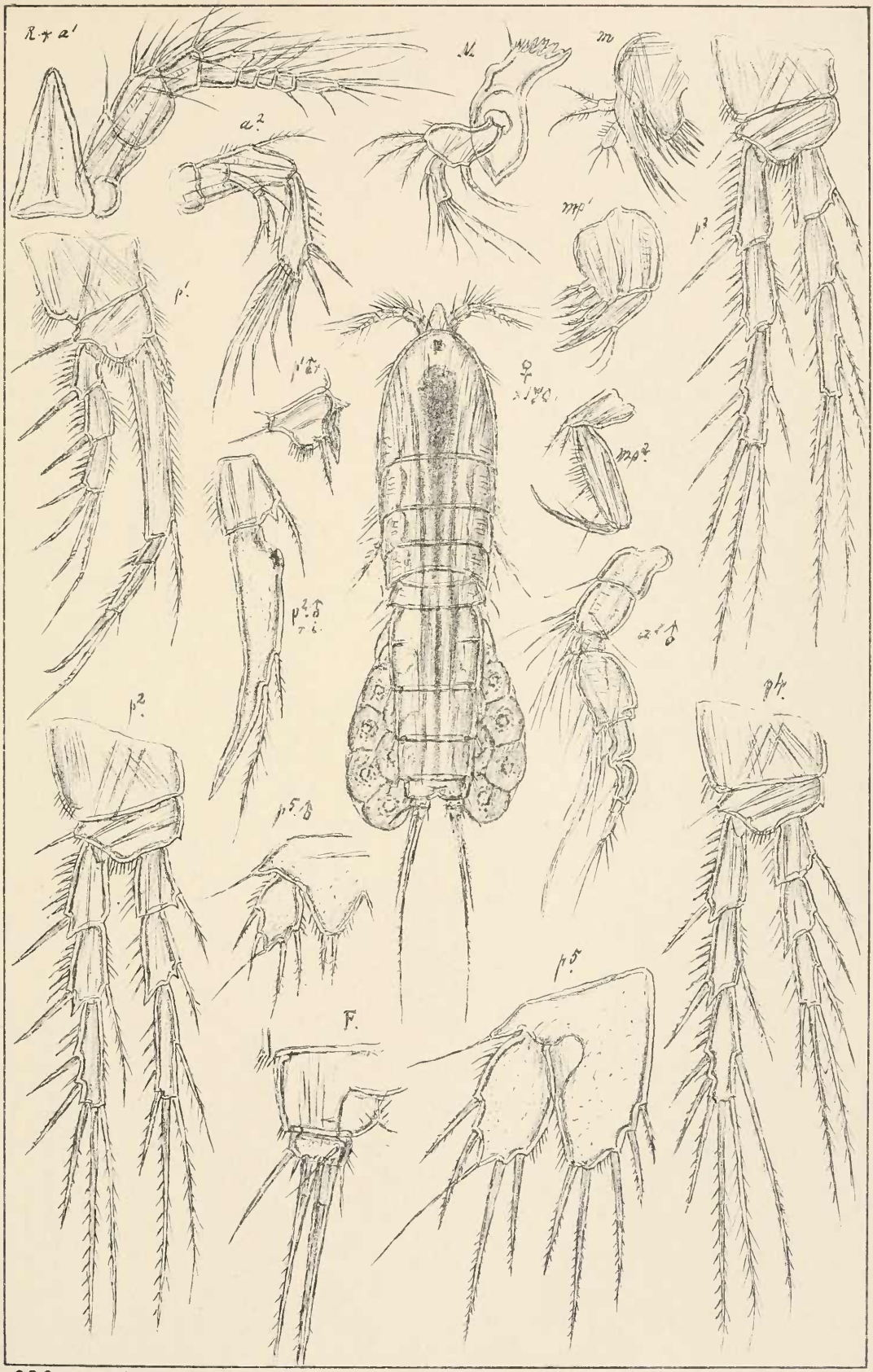
Amphiascus tenuiremis, (Brady.)



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus parvus. G.O.Sars.

Copepoda

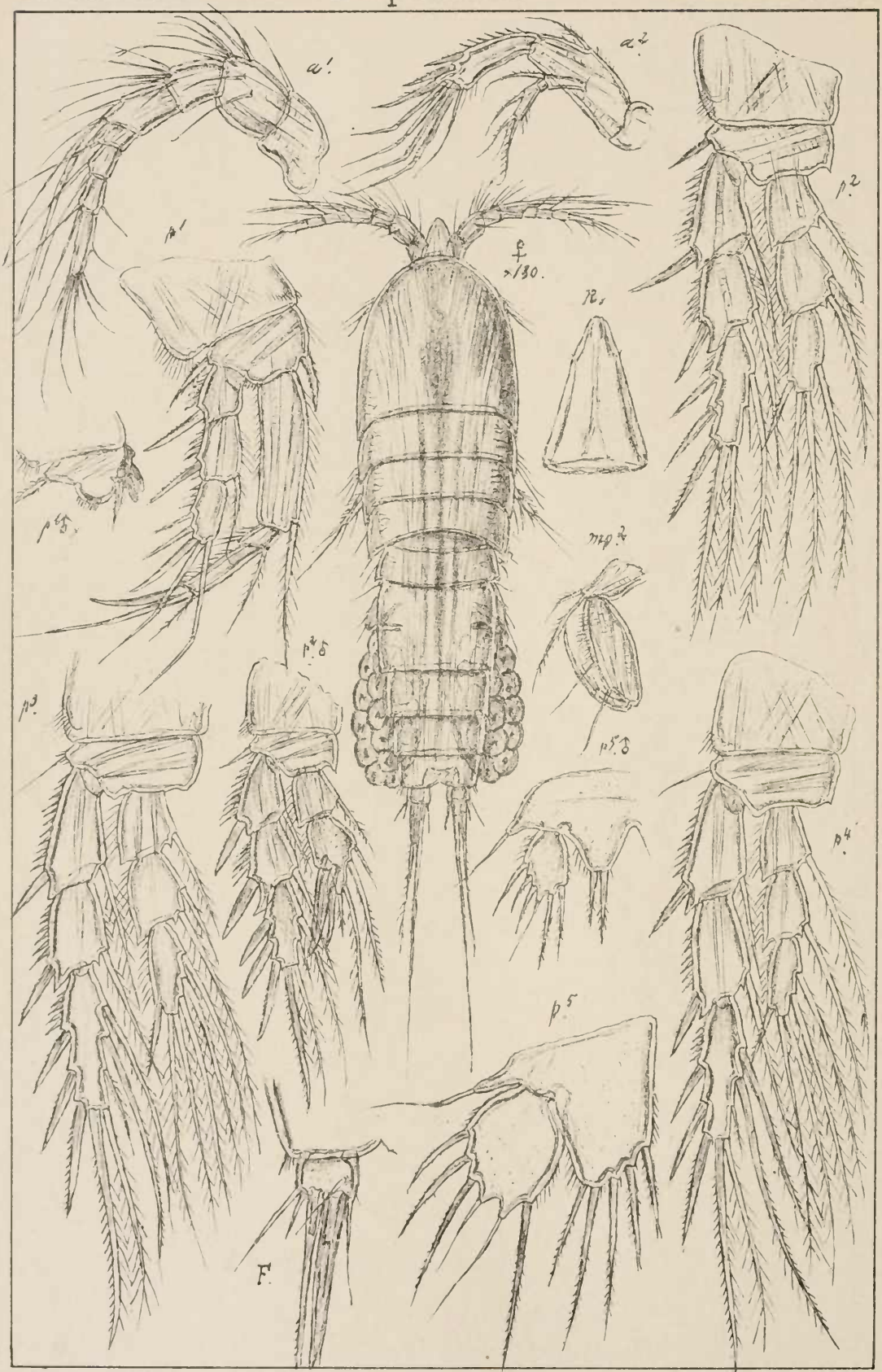


G.O.Sars autogr

Norsk lithgr. Officin

Amphiascus debilis, (Giesbr.)

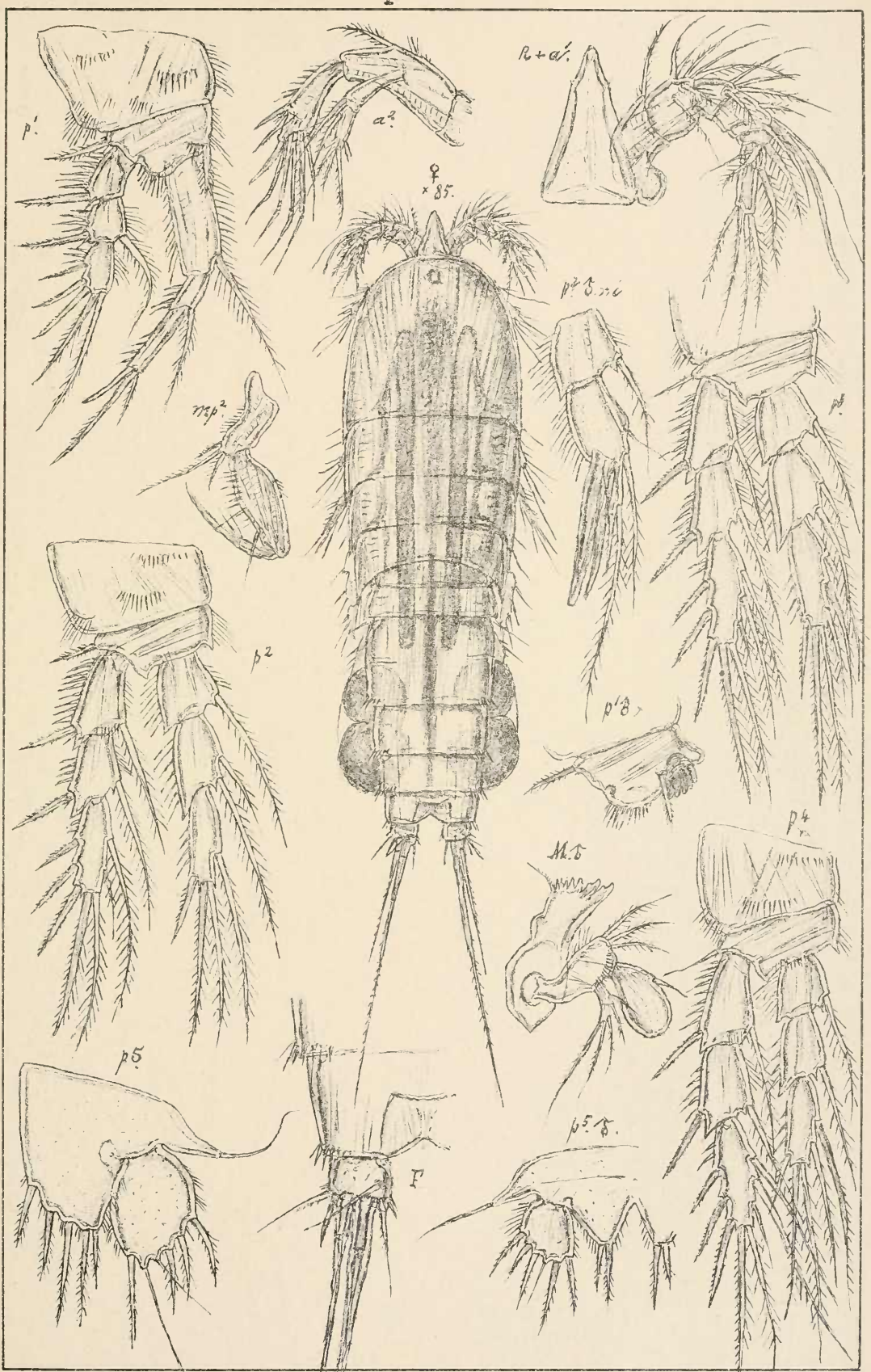
Copepoda



G.O.Sars autogr. Norsk lithgr Officin

Amphiascus pallidus, G.O.Sars

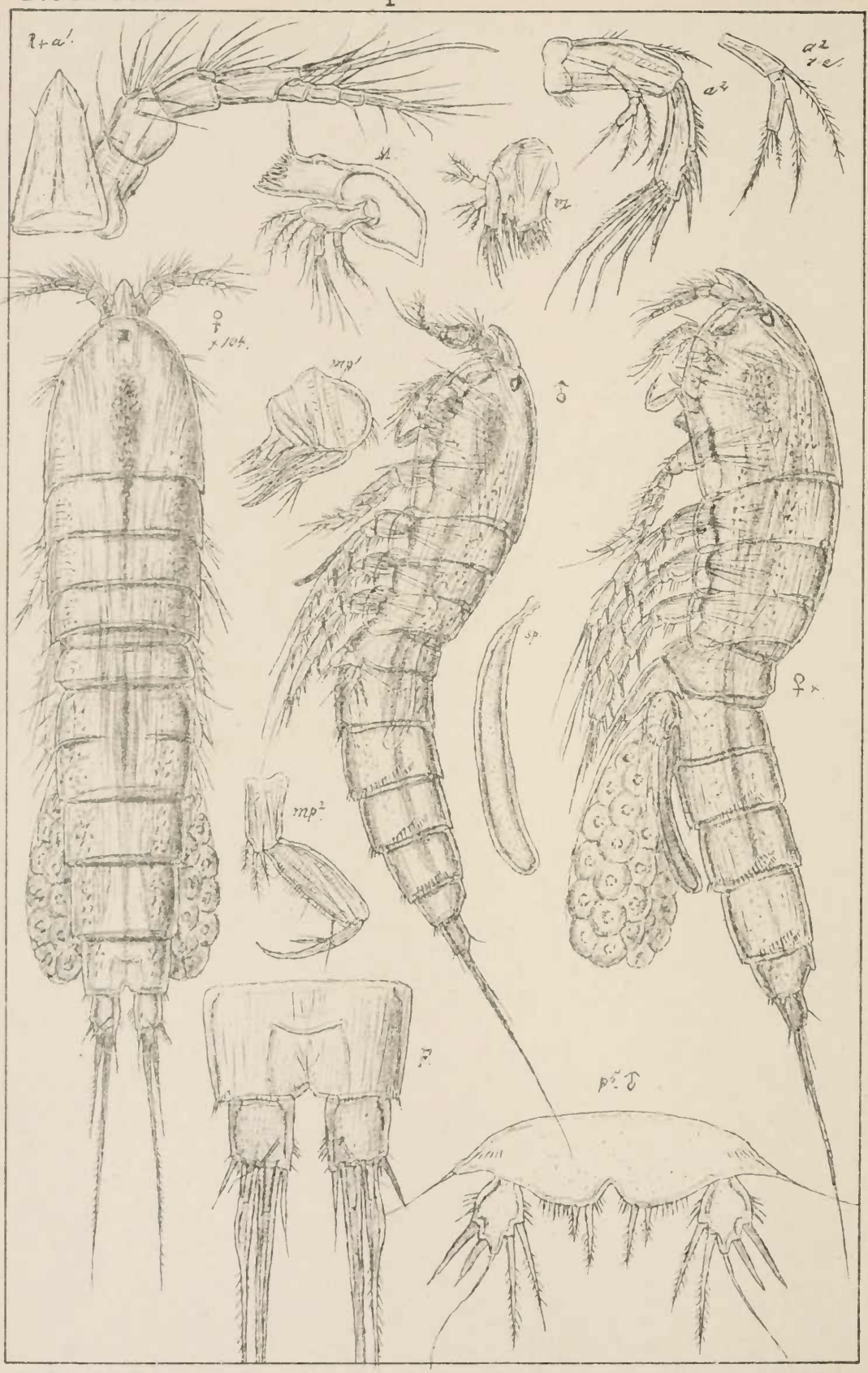
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus abyssi, (Boeck)

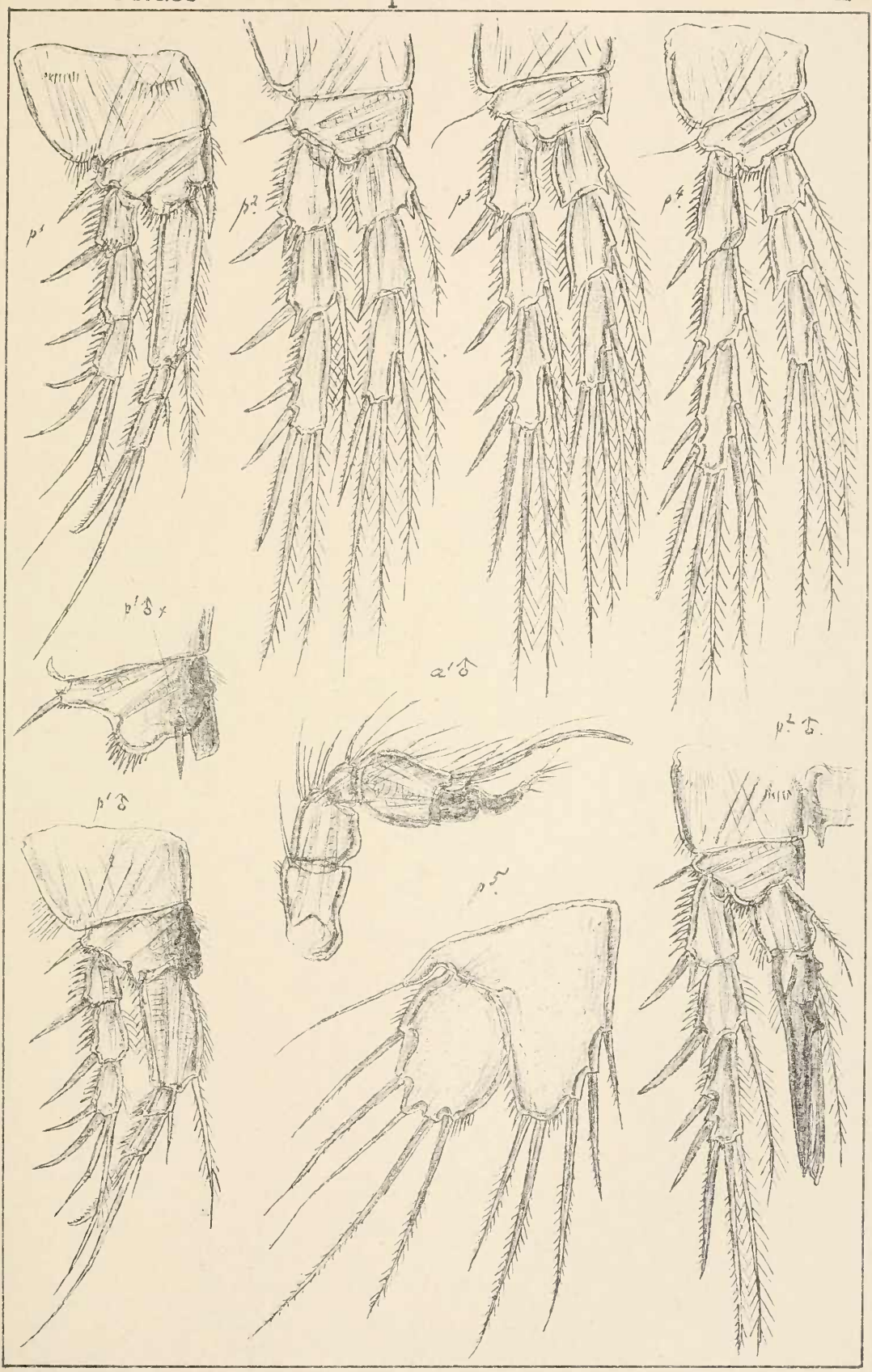
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus hispidus, (Norm.)

Copepoda

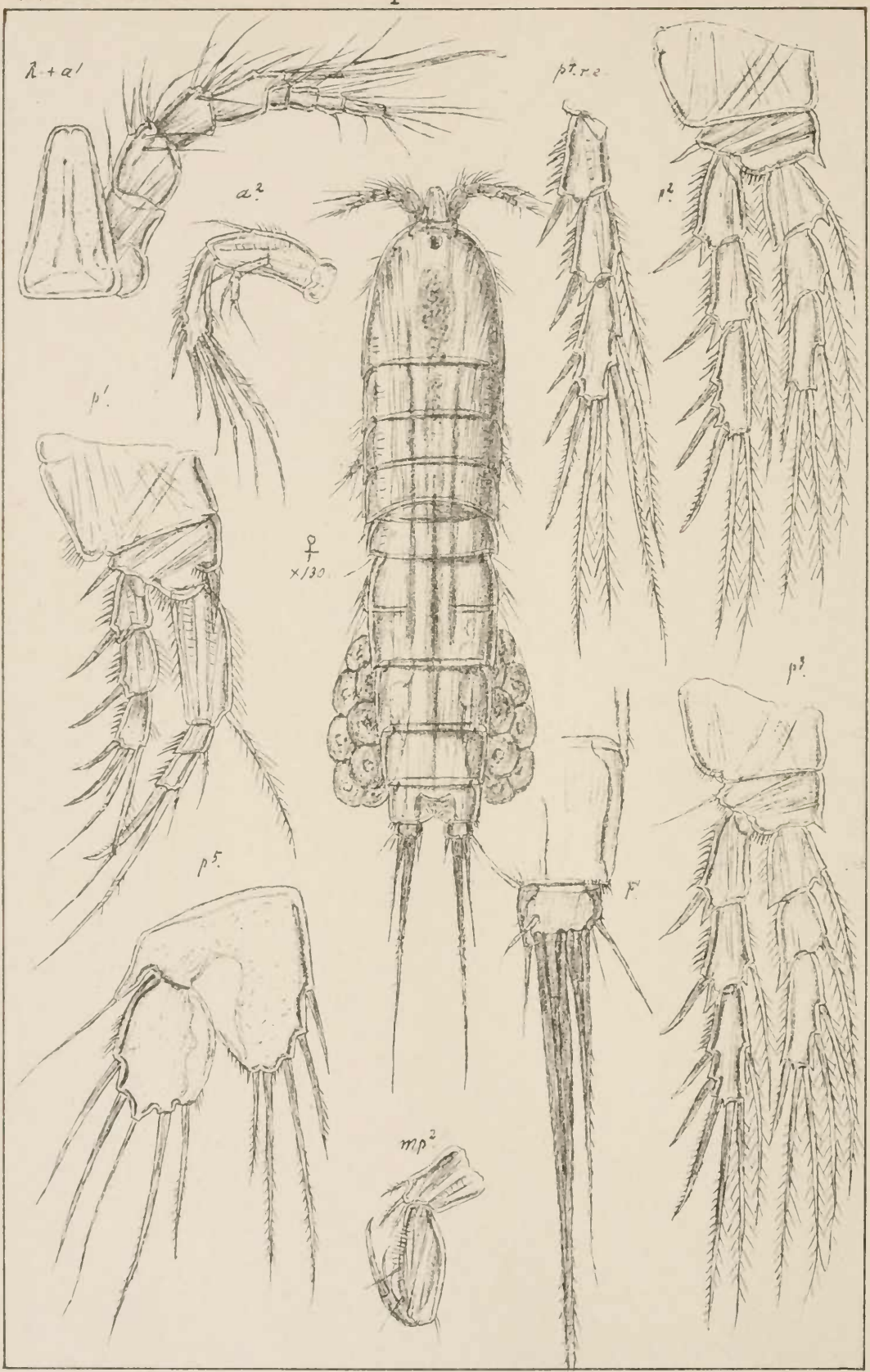


G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus hispidus, (Norm.)

(continued)

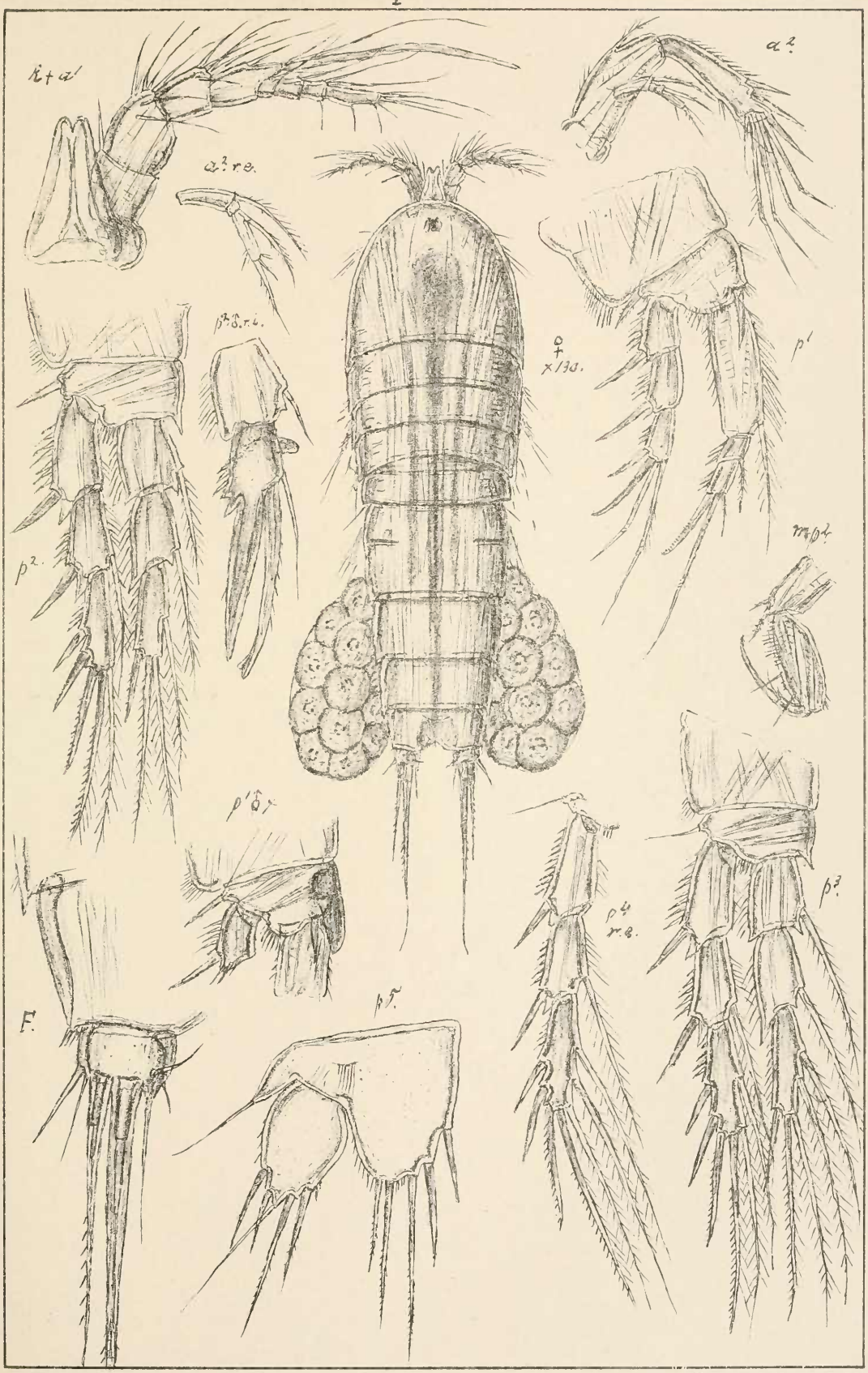
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus affinis G.O.Sars.

Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

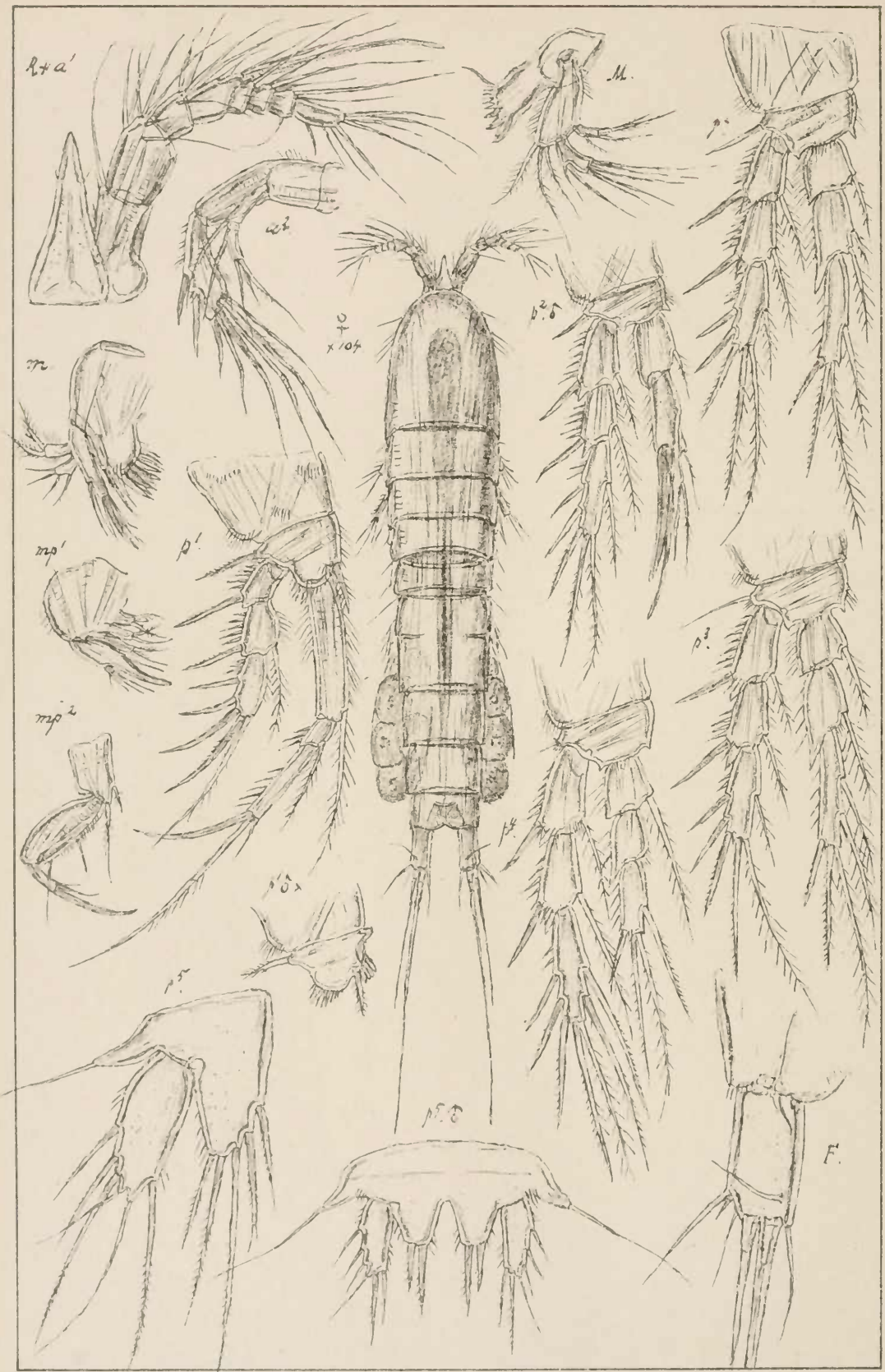
Amphiascus intermedius,(Scott.)

Copepoda

Harpacticoida

Diosaccidæ

Pl.CXI



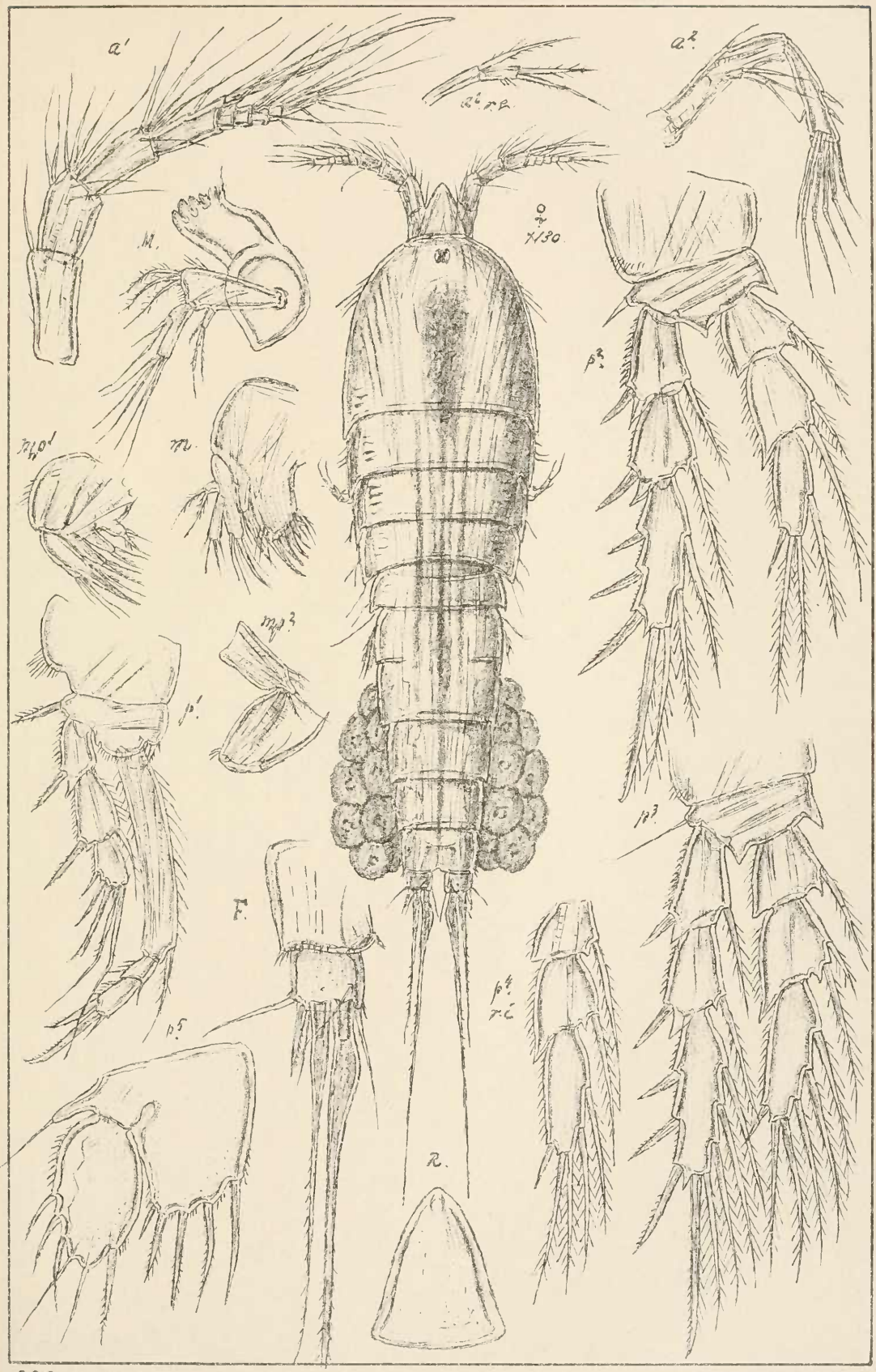
G.O.Sars autogr.

Norsk lithgr. Officin

Amphiascus lyphlops, G.O.Sars

Copepoda

Diosaccidæ — Harpacticoida



G.O.Sars autogr.

Norsk lithgr. Officin

Amphiascus attenuatus, G.O.Sars

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XV & XVI

DIOSACCIDÆ (concluded), CANTHOCAMPTIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1906

Male with the 2nd basal joint of 1st pair of legs armed inside with a second small spine in addition to that occurring in the female. Inner ramus of 2nd pair of legs only slightly transformed, biarticulate, distal joint lamellar, with a small dentiform projection at about the middle of the outer edge, and beyond it a comparatively small spine, tip armed with a slightly curved spine and a slender seta outside the latter, inner edge with 3 ciliated setæ. Last pair of legs much smaller than in female, distal joint of insignificant size, and having only 4 partly spiniform setæ; inner expansion of proximal joint very slight, with a slender seta and a very small spinule at the tip.

Colour not yet ascertained.

Length of adult female 0.74 mm.

Remarks.—This new species is nearly related to *A. similis* Claus, and *A. nasutus* Boeck, and somewhat intermediate between these 2 species. It is however easily distinguished from either of them by the much shorter and stouter form of the body. In the structure of the anterior antennæ it agrees with *A. similis*, whereas that of the 1st pair of legs more resembles that in *A. nasutus*. The last pair of legs are built upon the same type as in these 2 species, but are of still larger size and pronouncedly foliaceous, whence the specific name here proposed. In the male, the inner ramus of the 2nd pair of legs is very unlike that in the 2 above-named species, and is far less conspicuously transformed.

Occurrence.—Some few specimens of this form were found in a sample taken last summer at Risör, on the south coast of Norway.

113. Amphiascus nanus, G. O. Sars, n. sp.

(Pl. CXIV, fig. 1).

Specific Characters.—Female. Body comparatively short and stout, slightly tapering behind, with the cephalic segment very large. Rostrum of moderate size and usual form. Urosome much shorter than the anterior division. Caudal rami very short, being about twice as broad as they are long, middle apical setæ of moderate length and slightly thickened at the base. Anterior antennæ rather elongated, 8-articulate, 4th joint somewhat longer than 3rd, terminal part considerably exceeding half the length of the proximal one. Posterior antennæ with the outer ramus shorter than the terminal joint of the inner, middle joint very small and without any seta. 1st pair of legs rather slender, outer ramus scarcely exceeding half the length of the inner, middle joint without the seta on the inner edge, last joint somewhat smaller and carrying on the tip 2 spines and 2

geniculated setæ; 1st joint of inner ramus very long and narrow, being more than 3 times as long as the other 2 combined, last joint only slightly longer than the 2nd, and carrying at the tip a slender claw and a somewhat longer geniculated seta. Natatory legs with the rami rather narrow, the inner one considerably shorter than the outer, setæ exhibiting a similar reduction in number to that found in *A. debilis*. Last pair of legs of moderate size, distal joint oval in form and somewhat tapered towards the end, with 5 rather short marginal setæ; inner expansion of proximal joint comparatively short, triangular in form, and extending scarcely beyond the middle of the distal joint, marginal setæ 5 in number. Ovisacs small and only slightly divergent, each containing, as a rule, only 3 ova arranged in a single row.

Colour not yet ascertained.

Length of adult female 0.36 mm.

Remarks.—This is one of the smallest of the species of the present genus, and exhibits, in the structural details, some resemblance to *A. debilis* (Claus). It is however easily distinguished from that species by its much shorter and stouter body; and on a closer comparison, some well-marked differences are also found in the structure of the several appendages.

Occurrence.—Some few specimens of this dwarfed form, all of the female sex, were found in the same sample in which *A. phyllopus* occurred.

114. Amphiascus exiguus, G. O. Sars, n. sp.

(Pl. CXIV, fig. 2).

Specific Characters.—Female. Body very narrow, sublinear in form, scarcely tapering at all behind. Cephalic segment of moderate size and narrowly rounded in front; rostrum rather produced, lanceolate. Urosome almost as long as the anterior division, segments coarsely spinulose at the hind edge ventrally and laterally. Caudal rami comparatively small, about as long as they are broad, apical setæ of normal appearance. Eye not visible in the living animal. Anterior antennæ comparatively short, 8-articulate, 2nd joint much the largest, fully as long as the 2 succeeding ones combined, terminal part not nearly half as long as the proximal part, and having the 3 first joints very small, and combined scarcely longer than the last joint. Posterior antennæ about as in the preceding species. 1st pair of legs with the outer ramus considerably exceeding half the length of the inner, middle joint without any seta inside, last joint of about the same size, and armed with 2 spines and 2 geniculated setæ; inner ramus with the 1st

joint comparatively short, not attaining the length of the 2 remaining joints combined, last joint linear and longer than the preceding one. Natatory legs moderately slender, and having the number of setæ somewhat reduced, inner ramus in the 2 anterior pairs considerably longer than the outer, with the last joint very narrow, and only provided inside with a single seta, 1st and last joints of the outer ramus in these pairs quite smooth inside. Last pair of legs comparatively small, distal joint oblong in form, scarcely contracted at the base, and carrying 6 marginal setæ, the 2 apical ones hair-like; inner expansion of proximal joint short, triangular, with 4 setæ, the 2 innermost very strong, spiniform. Ovisacs small, each with only 3 ova arranged in a single row.

Male unknown.

Colour whitish.

Length of adult female 0.32 mm.

Remarks.—This form is still smaller than the preceding one, and indeed one of the smallest Harpacticoida known. It is moreover easily recognized by its very narrow body, comparatively short anterior antennæ, and by the structure of the legs.

Occurrence.—Only a solitary specimen, an ovigerous female, has hitherto come under my notice. It was taken last summer at Farsund, south coast of Norway, from a depth of about 30 fathoms, muddy sand.

115. Amphiascus productus, G. O. Sars, n. sp.

(Pl. CXV).

Specific Characters.—Female. Body exceedingly slender and elongated, linear in form, being everywhere of uniform width. Rostrum much produced, narrow lanceolate. Urosome nearly as long as the anterior division, segments apparently without the usual circlets of spinules. Caudal rami very much produced, being considerably longer than the anal segment and about 4 times as long as they are broad, apical setæ normal. Eye wholly absent. Anterior antennæ rather elongated, 8-articulate, with the first 2 joints of unusual size and combined exceeding half the length of the antenna, 3rd and 4th joints of about equal size, terminal part scarcely exceeding in length $^1/_3$ of the proximal part. Posterior antennæ without the usual seta on the anterior edge of the proximal part, outer ramus rather elongated, with the middle joint very small and without any seta. 1st pair of legs slender, outer ramus about the length of the 1st joint of the inner, middle joint with a well-developed seta inside, last joint somewhat

longer, oblong oval in form, carrying 4 spines, and inside them a slender seta; inner ramus with the last joint very slender and narrow, being more than 3 times as long as the preceding joint, the two combined a little shorter than the 1st. Natatory legs with the rami rather narrow, the inner one in the 2 anterior pairs slightly exceeding in length the outer, in 4th pair considerably shorter, number of setæ less reduced than in the 2 preceding species. Last pair of legs of moderate size and highly chitinized, distal joint narrow oblong in form, terminating in a hook-like, outwards-curving projection, inside which 2 small hair-like bristles are attached, outer edge irregularly indented and provided with only a single seta, inner edge with 2 setæ near the end, the distal one very slender and elongated; inner expansion of proximal joint narrow linguiform, extending beyond the middle of the distal joint, and carrying 5 marginal setæ, the 2 apical ones rather small and somewhat unequal, the 2 innermost spiniform. Ovisacs comparatively small, and containing a very limited number of ova.

Male somewhat smaller than female and exhibiting the usual sexual differences. 2nd basal joint of 1st pair of legs with 2 obtuse projections inside in addition to the spine. Inner ramus of 2nd pair of legs transformed in the usual manner. Last pair of legs smaller than in female, but with the distal joint of a very similar shape, inner expansion of proximal joint less developed, and provided with only 2 unequal spines bifid at the tip.

Colour whitish.

Length of adult female 1.14 mm.

Remarks.—This is a very distinct and easily recognizable species. In the total absence of eye, and the unusually produced caudal rami, it somewhat recalls the above-described *A. typhlops*. It is however of still more slender form of body, and moreover differs in the much more elongated anterior antennæ, as also in the peculiar structure of the last pair of legs in both sexes.

Occurrence.—Several specimens of this remarkable form were taken last summer at Farsund, south coast of Norway, from a depth of from 30—50 fathoms, muddy sand.

116. Amphiascus tenellus, G. O. Sars, n. sp.

(Pl. CXVI).

Specific Characters.—Female. Body rather slender, though not to such a degree as in the preceding species, being slightly attenuated behind. Integuments very thin and pellucid. Rostrum narrow, lanceolate. Urosome shorter than the

anterior division, and having the segments finely spinulose at the hind edge ventrally and laterally. Caudal rami short, being considerably broader than they are long, apical setæ normal. Eye inconspicuous. Anterior antennæ very slender and attenuated, 8-articulate, 2nd joint much the largest, 4th joint very narrow and twice as long as 3rd, terminal part not quite attaining half the length of the proximal one. Posterior antennæ with the outer ramus about as long as the terminal joint of the inner, middle joint well defined and setiferous. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, middle joint with a well-developed seta inside, last joint scarcely larger, and armed with 3 spines and 2 geniculated setæ; inner ramus with the 1st joint very narrow, last joint more than twice as long as the preceding one, the two together about half the length of the 1st. Natatory legs with the rami nearly equal-sized, and having the normal number of setæ. Last pair of legs very delicate, distal joint regularly oval in form, with the tip obtusely blunted, marginal setæ rather small and 6 in number; inner expansion of proximal joint triangular, extending considerably beyond the middle of the distal joint, and produced at the end outside to a small tooth-like projection, inside which a row of 5 setæ occur. Ovisacs narrow oblong, with a very limited number of ova.

Male having the 2nd basal joint of 1st pair of legs armed inside with 2 closely-set spines, in front of which is a small knob-like prominence. Inner ramus of 2nd pair of legs transformed in the usual manner. Last pair of legs very small, with the distal joint short and broad, and the inner expansion of the proximal joint very slight, tipped with 3 unequal spines.

Colour whitish.

Length of adult female 0.54 mm.

Remarks.—This form is chiefly characterised by the very thin and pellucid integuments, the unusually slender anterior antennæ, and the structure of the 1st and last pairs of legs. No eye could be detected in the living animal.

Occurrence.—Some few specimens of this handsome species were taken last summer in the same locality in which *A. productus* occurred.

117. Amphiascus linearis, G. O. Sars, n. sp.

(Pl. CXVII).

Specific Characters.—Female. Body very slender and elongated, linear in form, being of equal width almost throughout. Rostrum less produced than in most other species, narrow lanceolate in shape. Urosome almost attaining the

length of the anterior division. Caudal rami very small, somewhat narrowed distally, apical setæ normal. Eye small, but distinct. Anterior antennæ rather slender and attenuated, 8-articulate, 2nd joint the largest, 4th joint scarcely twice as long as 3rd, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus very small, being much shorter than the last joint of the inner, middle joint without any seta. 1st pair of legs with the outer ramus about as long as the 1st joint of the inner, middle joint without any seta inside, last joint considerably longer, and armed with 2 spines and 2 geniculated setæ; inner ramus with the last joint more than twice as long as the preceding one, both together somewhat exceeding half the length of the 1st. Natatory legs with the rami almost equal-sized, number of setæ much reduced. Last pair of legs with the distal joint oblong, narrowly exserted at the tip, and carrying 5 somewhat unequal marginal setæ, that issuing from the tip being the longest; inner expansion of proximal joint narrow linguiform, and extending somewhat beyond the middle of the distal joint, marginal setæ 5 in number, the 2 innermost comparatively short and spiniform. Ovisacs rather narrow and only slightly divergent.

Male with the 2nd basal joint of 1st pair of legs produced inside to 2 coarse diverging projections. Inner ramus of 2nd pair of legs large, and of a structure similar to that in the male of *A. debilis*, the distal joint being exserted at the end in a long mucroniform projection. Last pair of legs resembling in structure that in the male of *A. tenellus*, but having the distal joint more exserted at the tip.

Colour whitish.

Length of adult female 0.63 mm.

Remarks.—In its external appearance this species somewhat resembles *A. imus* (Brady), exhibiting a similar very slender form of body. It is however of much inferior size, and moreover differs in its less prominent rostrum and in the structure of the natatory legs, which latter are built on the very same type as in *A. debilis*.

Occurrence.—Some specimens of this form were found last summer together with the 2 preceding species at Farsund, south coast of Norway.

118. Amphiascus sinuatus, G. O. Sars, n. sp.

(Pl. CXVIII).

Specific Characters.—Female. Body moderately slender, resembling in shape that of *A. longirostris*, though perhaps somewhat less robust. Cephalic

segment comparatively large, being fully as long as the 4 succeeding segments combined, epimeral parts exhibiting in front of the middle a very conspicuous sinus. Rostrum very prominent, lanceolate. Urosome almost as long as the anterior division, and slightly attenuated behind, anal segment scarcely shorter than the preceding segment. Caudal rami short, quadrangular, broader than they are long, apical setæ only slightly thickened at the base. Eye well developed. Anterior antennæ rather slender, 8-articulate, 4th joint almost twice as long as 3rd, terminal part half the length of the proximal part. Posterior antennæ with the outer ramus about as long as the terminal joint of the inner, and distinctly 3-articulate, middle joint well defined and setiferous. 1st pair of legs comparatively slender, outer ramus considerably shorter than the 1st joint of the inner, middle joint with a well-developed seta inside, last joint of about the same length, and armed with 3 spines and 2 geniculated setæ; inner ramus with the 1st joint very slender, more than twice as long as the other 2 combined, last joint about twice as long as the preceding one. Natatory legs with the inner ramus in the 2 anterior pairs scarcely shorter than the outer, last joint of outer ramus in these pairs with only a single seta inside. Last pair of legs with the distal joint rather large, broadly oval in form, and provided with 6 marginal setæ, the 2 apical ones very thin, hair-like; inner expansion of proximal joint narrow triangular, extending beyond the middle of the distal joint, and carrying 5 spiniform marginal setæ of nearly equal size. Ovisacs of moderate size.

Male with the inner ramus of 2nd pair of legs transformed in the usual manner. Last pair of legs much smaller than in female, with the distal joint of far inferior size, and only provided with 5 setæ; inner expansion of proximal joint conically produced, and carrying 2 subequal setæ on the tip.

Colour not yet ascertained.

Length of adult female 0.80 mm.

Remarks.—This form, both in size and general appearance, bears a perplexing resemblance to *A. longirostris* Claus. It may, however, be at once distinguished from this form, in its lateral aspect, by the shallower cephalic segment, and still more by the very conspicuous sinus which the epimeral parts form in front of the middle, a character which has given rise to the specific name here proposed. Moreover the structure of the outer ramus of the posterior antennæ, and that of the legs, is somewhat different. Finally, the innermost but one of the caudal setæ does not exhibit any trace of the peculiar bulging at the base found in *A. longirostris*.

Occurrence.—This species was also found last summer occasionally in the same locality in which the 3 preceding new species occurred.

Gen. 40. **Stenhelia,** Boeck, 1864 (not Brady).

Syn: *Delavalia*, Brady.
„ *Beatricella*, Scott.

Generic Characters.—Body more or less pyriform in shape, with the cephalic segment very large and tumid. Rostrum quite immobile, though distinctly defined at the base, forming a broad triangular plate slightly indented on each side of the tip, and provided ventrally with a projecting carina. Epimeral plates of the 3 succeeding segments small, rounded. Urosome comparatively short and gradually tapered behind. Caudal rami more or less produced, with the normal number of setæ. Eye well developed. Anterior antennæ comparatively short and densely setiferous, 8-articulate, with the joints of the proximal part very sharply defined and gradually diminishing in size; those of male transformed in the usual manner. Posterior antennæ with the terminal joint rather large, apical spines scarcely geniculated, outer ramus well developed, triarticulate. Mandibles very strong, palp large, with the basal part much produced, inner ramus bent abruptly backwards, and carrying on the tip a very strong, elongated falciform seta, accompanied by one or two smaller ones, outer ramus very delicate, forming a thin setiferous lamella. Maxillæ and anterior maxillipeds of normal structure. Posterior maxillipeds very small, in some cases not prehensile. 1st pair of legs of exactly the same structure in the two sexes, outer ramus triarticulate, inner in some cases distinctly 3-articulate and prehensile, in other cases composed of only 2 joints. Natatory legs strongly built, with both rami triarticulate and nearly equal in size, except in the 4th pair; inner ramus of 2nd pair in male transformed. Last pair of legs with the distal joint very mobile, forming a more or less broad lamella generally extended laterally; inner expansion of proximal joint short and broad; those in male much smaller than in female, in some cases quite rudimentary. Ovisacs more or less divergent, sub-lateral.

Remarks.—This genus was established in the year 1864 by Boeck, to comprise 2 Norwegian species, viz., *S. gibba* and *S. longicaudata*. Brady wrongly referred to this genus 2 species belonging to the genus *Amphiascus*, as here defined, whereas 3 other species, which undoubtedly belong to Boeck's genus, were referred by him to the new genus *Delavalia*, and all subsequent British authors have followed Brady in this respect. Dr. Giesbrecht also described a species of *Amphiascus* as a *Stenhelia*, though he seems to have been aware of the disagreement of Boeck's definition of the genus with that given by Brady. The genus *Beatricella* recently established by Th. Scott is also unquestionably identical with Boeck's genus, being indeed founded upon the type of the latter genus. The most pro-

minent character of the present genus is the very peculiar structure of the mandibular palp, to which also Boeck has called attention. Moreover the feeble development of the posterior maxillipeds, and the peculiar shape of the last pair of legs, are characteristic features of this genus. Finally the rostrum is quite immobile, and in form also differs from that in the 2 preceding genera. We know at present of 8 species belonging to this genus, 7 of which occur off the Norwegian coast, and will be described below.

119. Stenhelia gibba, Boeck.

(Pl. CXIX & CXX, fig. 1).

Stenhelia gibba, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandlinger f. 1864, p. 271.

Syn: *Delavalia mimica*, Scott.
„ *Beatricella mimica*, Scott.

Specific Characters.—Female. Body rather robust, pyriform, with the cephalic segment very large and tumid, being gibbously vaulted above. Rostrum triangular, about as long as it is broad at the base, tip obtusely blunted and defined on each side by a distinct ledge carrying a small hair. Urosome much shorter than the anterior division, and rapidly tapered distally, genital segment scarcely constricted in the middle, though much broader in front than behind. Caudal rami scarcely divergent, being about twice as long as they are broad, and transversely truncated at the tip, apical setæ rather slender. Anterior antennæ much shorter than the cephalic segment, and somewhat curved, 1st joint much the largest, being about as long as the 2 succeeding joints combined, terminal part somewhat exceeding half the length of the proximal part. Posterior antennæ with the outer ramus about the length of the last joint of the inner, and carrying 6 setæ, 3 apical and 3 lateral, middle joint short, the other 2 of about equal size. Posterior maxillipeds small, with the hand somewhat lamellar, dactylus short but distinctly biarticulate. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, middle joint without any seta inside, last joint somewhat smaller and obliquely truncated at the end, carrying 3 slender spines and a still more slender seta inside them; inner ramus distinctly triarticulate and sub-prehensile, 1st joint very large, being about 3 times as long as the other 2 combined, the latter subequal in size and bent at an angle to the 1st, last joint armed on the tip with a slender claw-like spine, an elongated seta, and a small hair-like bristle. Inner ramus of the 2 succeeding pairs about the length of the outer, that of 4th pair much shorter, not extending beyond the 2nd joint of the outer.

Last pair of legs with the distal joint oval in form and carrying 6 marginal setæ, 2 on the outer edge, 2 on the inner, and 2 on the somewhat exserted tip, proximal seta of outer edge rather coarse, spiniform; inner expansion of proximal joint rather broad, but only slightly prominent, and armed with 5 rather short and somewhat unequal marginal spines, the innermost but one much thicker than the others and provided on each side of the short triangular point with a single small hair. Ovisacs rather large and widely divergent.

Male somewhat smaller than female, and easily recognizable by the prehensile character of the anterior antennæ. Inner ramus of 2nd pair of legs biarticulate, distal joint rather dilated at the base and exserted at the end in a slender setiform appendage having in the middle a somewhat oblique row of very delicate cilia, inner edge provided with 3 setæ, the distal one much elongated. Last pair of legs with the distal joint very small and quite immobile, marginal setæ only 4 in number and spiniform; inner expansion of proximal joint very slight, and armed with a single thick spine of the same appearance as the innermost but one in the female, and accompanied outside by an extremely minute spinule. Genital lobes with 2 hair-like bristles, inside which is an outward-curving spine.

Body in both sexes of a more or less distinct reddish colour.

Length of adult female 0.62 mm.

Remarks.—This is the form at first recorded by Boeck as the type of his genus *Stenhelia*. The *Delavalia mimica* of Scot is unquestionably identical with Boeck's species. The said author has recently established a new genus, *Beatricella*, for this species, on account of the prehensile character of the inner ramus of the 1st pair of legs; but as the present form in all other respects agrees perfectly with the other species referred by that author to the genus *Delavalia* of Brady, I cannot find any reasonable support for such a generic distinction. It will also be shown below, that in one of the species, described by Th. Scott as *Delavalia æmula*, the inner ramus of the 1st pair of legs, though distinctly triarticulate, has wholly lost its prehensility, as in most other species of the present genus.

Occurrence.—This form is rather common in the upper part of the Christiania Fjord in depths ranging from 6 to 20 fathoms, muddy bottom. It also occurs along the whole south and west coasts of Norway, as also in the Trondhjem Fjord (Levanger).

Distribution.– Scottish coast (Scott).

120. Stenhelia proxima, G. O. Sars, n. sp.

(Pl. CXX, fig. 2).

Specific Characters.—Female. Very like the preceding species, but of somewhat smaller size and more robust form of body. Rostrum resembling in shape that in *S. gibba*, though having the tip slightly emarginated. Caudal rami somewhat more divergent, otherwise of a very similar appearance. Antennæ and oral parts almost exactly as in *S. gibba*. 1st pair of legs with the outer ramus longer than the 1st joint of the inner, last joint somewhat longer than the middle one; inner ramus, as in *S. gibba*, triarticulate and prehensile, the 2 outer joints short and bent at an angle to the 1st, which is more than twice as long as those joints combined. Natatory legs of much the same structure as in the typical species, inner ramus, however, a little shorter. Last pair of legs with the distal joint broader, sub-spatulate in form, innermost seta considerably longer than the other, inner expansion of proximal joint less broad than in *S. gibba*, all the marginal setæ much longer than in that species, the innermost but one stronger than the others, and terminating in a slender ciliated lash. Ovisacs comparatively smaller and less divergent, with a more limited number of ova.

Male resembling that of *S. gibba*. Inner ramus of 2nd pair of legs transformed in a very similar manner, terminal appendage however comparatively shorter, and having in the middle a whorl of a few rather coarse denticles. Last pair of legs resembling those in the male of *S. gibba*, the 2 spines attached to the proximal joint inside, however, more elongated, the larger one terminating in a slender lash. Genital lobes, as in the male of *S. gibba*, provided with 2 hair-like bristles, and within them with a somewhat hooked spine.

Colour pale reddish.

Length of adult female 0.49 mm.

Remarks.—This form is closely allied to *S. gibba*, and may easily be confounded with it. It is however of far inferior size, and moreover differs somewhat in the structure of the 1st and last pairs of legs.

Occurrence.—I have met with this form not unfrequently off the south coast of Norway, at Flekkerö and Farsund, in depths ranging from 10 to 30 fathoms.

121. Stenhelia æmula (Scott).

(Pl. CXXI).

Delavalia æmula, Scott, Additions to the Fauna of the Firth of Forth; Eleventh Report of the Fishery Board for Scotland, p. 204, Pl. IV, figs. 36—47.

Specific Characters.—Female. Body of the usual short pyriform shape, being perhaps still more robust than in the 2 preceding species. Rostrum somewhat more attenuated, with the tip transversely truncated. Caudal rami a little longer than the anal segment, and slightly tapered distally. Antennæ and oral parts scarcely different from those in the typical species. 1st pair of legs with the outer ramus about as in that species, the last joint being somewhat shorter than the middle one, which is without any seta inside; inner ramus longer than the outer, and distinctly 3-articulate, 1st joint, however, much shorter than in the 2 preceding species, being scarcely longer than the other 2 combined, the latter not bent upon the former, and of about equal size. Natatory legs very strongly built, with the 1st joint of the inner ramus considerably dilated, and in 4th pair carrying inside an unusually strong deflexed seta. Last pair of legs with the distal joint spatulate in form, the tip being obtusely blunted, marginal setæ rather slender, none of them spiniform; inner expansion of proximal joint very slight, and carrying 4 slender ciliated setæ, the outermost shorter than the other 3. Ovisacs not very large, and containing a limited number of ova.

Colour not yet ascertained.

Length of adult female 0.50 mm.

Remarks.—The above-described form is unquestionably that recorded by Th. Scott as *Delavalia æmula*, though somewhat inferior in size. It is chiefly characterised by the structure of the inner ramus of the 1st pair of legs, which, though distinctly triarticulate, as in the 2 preceding species, is scarcely at all prehensile, a character which gives it a place between those two and the succeeding species. Th. Scott has also examined the male of this species, and gives a figure of the 2nd pair of legs, the inner ramus of which appears to be transformed in much the same manner as in the 2 preceding species.

Occurrence.—Only some few specimens of this form, all of the female sex, have hitherto come under my notice. They were taken last summer off the south coast of Norway, at Flekkerö and Farsund.

Distribution.—Scottish coast (Scott).

122. Stenhelia palustris (Brady).

(Pl. CXXII).

Delavalia palustris, Brady, Monogr. Brit. Copepoda, Vol. II, p. 43, Pl. 4, figs. 1—8.

Specific Characters.—Female. Body, as in the 3 preceding species gradually tapered behind, but somewhat less robust, with the segments more sharply marked of from each other. Rostrum with the apical part less sharply defined and somewhat retuse at the tip. Urosome much shorter than the anterior division, anal segment coarsely spinulose at the hind edge ventrally and laterally. Caudal rami exceeding in length the anal segment, and somewhat constricted at the base, apical setæ comparatively shorter than in the other species and more divergent. Anterior antennæ with the last 3 joints imperfectly defined, otherwise of the usual structure. Posterior antennæ, mandibles, maxillæ and anterior maxillipeds scarcely different from those parts in the 3 preceding species. Posterior maxillipeds very delicate and not at all prehensile, the propodal joint being lamelliform, and the dactylus replaced by a simple seta. 1st pair of legs with the outer ramus coarsely spinulose outside, middle joint with a well-developed seta inside, last joint a little longer and obliquely truncated at the tip, carrying 2 strong spines and 2 unequal setæ, neither of which is geniculated; inner ramus scarcely as long as the outer, and consisting of only 2 joints, the 1st provided inside, as in the other species, with a strong plumose seta, last joint longer and narrower than the 1st, and without any seta inside, outer edge clothed with 2 oblique rows of spinules, tip produced outside to a short dentiform point, inside which a slender denticulated spine and a somewhat shorter seta are attached. Natatory legs strongly built and of normal structure. Last pair of legs with the distal joint almost quadrangular in shape, tip obtusely rounded, and carrying 6 not much elongated setæ, proximal joint not expanded inside, and confluent with that of the other side, the posterior edge carrying 2 unequal setæ at a short distance from the insertion of the distal joint, and farther inwards an extremely small hooked spinule and a short bristle. Ovisacs very large and divergent.

Male with the inner ramus of 2nd pair of legs biarticulate, distal joint oblong oval in form, scarcely tapering behind, and terminating in a short dentiform point, outside which quite a short curved seta is attached, coarsely ciliated in the middle, inner edge carrying in front of the middle 2 unequal setæ and near the end a very coarse deflexed spine, bifid at the tip, and having inside a few spinules. Last pair of legs quite rudimentary, being reduced to a narrow transverse plate carrying on each side a strong spine and 3 simple setæ. Genital lobes somewhat unequal, each with 3 hair-like bristles.

Colour whitish, with a slight yellowish tinge.

Length of adult female 0.80 mm.

Remarks.—This form was recorded by Prof. Brady as early as the year 1868, and was subsequently described and figured by the same author in his well-known Monograph as the type of the genus *Delavalia*. Though differing in some points from the 3 preceding species, it ought, in my opinion, to be considered as congeneric with them, the differences being of only specific value. It is much the largest of the Norwegian species.

Occurrence.—I have only met with this form in a single locality not far from Christiania. It occurred there not unfrequently at a depth of about 3 fathoms, muddy bottom.

Distribution.—British Isles (Brady).

123. Stenhelia reflexa (Brady).

(Pl. CXXIII).

Delavalia reflexa, Brady, Monogr. British Copepoda, Vol. II, p. 45, Pl. LI, figs. 1—8, 11, 13 (not figs. 9, 10, 12, 14).

Specific Characters.—Female. Body short and robust, with the anterior division considerably dilated, the posterior much narrower and slightly tapered behind. Rostrum rather prominent and rapidly attenuated, with the apical part narrowly linguiform in shape. Urosome not much shorter than the anterior division, genital segment conspicuously dilated in front, anal segment larger than the preceding segment. Caudal rami about the length of the anal segment, and slightly tapered distally, apical setæ slender, the outermost one of unusual length. Anterior antennæ somewhat more slender than in the preceding species, otherwise of the usual structure, all the joints well defined. Posterior antennæ with the outer ramus much shorter than the last joint of the inner, terminal joint not attaining the length of the 1st. Mandibular palp with the basal part somewhat dilated in the middle, inner ramus very narrow and abruptly reflexed, carrying on the tip only 2 setæ, the one, as usual, much elongated and falciform. Maxillæ and maxillipeds about as in *S. gibba*. 1st pair of legs with the outer ramus about the length of the inner, middle joint with a well-developed seta inside, last joint of about the same size, and carrying 3 slender spines and 2 somewhat unequal setæ; inner ramus, as in *S. palustris*, consisting of only 2 joints, the last one equal in length to the 1st, and carrying near the base inside a ciliated seta, tip armed with a slender spine and 2 somewhat longer setæ. Natatory legs rather strongly

built, with some of the setæ spiniform. Last pair of legs, with the distal joint spatulate in form, being conspicuously constricted at the base and broadly blunted at the tip, which carries 5 setæ, 2 of which are very small, hair-like; inner expansion of proximal joint broadly rounded, and provided with 4 slender, nearly equal ciliated setæ. Ovisacs of moderate size. Spermatophore, attached to the genital opening, unusually large, pyriform.

Male, as usual, smaller than female, but having the caudal rami of exactly the same shape. Inner ramus of 2nd pair of legs rather slender, biarticulate, distal joint gradually tapered and exserted at the end in a comparatively short denticulated spiniform projection, outside which is a still shorter outward-curving spine, inner edge carrying 4 somewhat unequal setæ. Last pair of legs with the distal joint very small and imperfectly defined at the base, proximal joint forming inside, at some distance from the insertion of the distal joint, a short conical lobe tipped with a slender seta.

Colour pale yellowish.

Length of adult female 0.52 mm.

Remarks.—It seems to me beyond doubt, that Prof. Brady under the name of *Delavalia reflexa* has confounded two distinct species, some of the figures given, especially those representing the 1st pair of legs and the male caudal rami, being unquestionably referable to a very different form, viz., *Stenhelia longicaudata* Boeck, to be described farther on. The name *reflexa* proposed by Prof. Brady for the present form is somewhat inappropriate, referring as it does to a pecularity common to all the species of this genus, as also to some other Copepoda, viz., that in preserved specimens the posterior part of the body is often found abruptly bent dorsally upon the anterior. The present species is especially characterised by the form of the rostrum and the structure of the 1st and last pairs of legs. In the living state it is moreover easily recognized by the pale yellow colour of the body, for which reason, before recognizing its identity with Brady's species, I had noted it under the provisional name *S. flavida.*

Occurrence.—I have met with this species in 3 different localities of the Norwegian coast, viz., in the upper part of the Christiania Fjord, at Farsund, south coast of Norway, and at Bejan, entrance to the Trondhjem Fjord. In all 3 localities it occurred very sparingly at a depth of about 20 fathoms.

Distribution.—British Isles (Brady).

124. Stenhelia Giesbrechti (Scott).

(Pl. CXXIV, fig. 1).

Delavalia Giesbrechti, Th. Scott, On some new and rare Copepoda from the Clyde; Annals of Scottish Nat. Hist. 1896, p. 225, Pl. IV, figs. 1—10.

Specific Characters.— Female. Body of the usual short pyriform shape, though scarcely as robust as in the preceding species, the anterior division being less dilated in front. Rostrum broadly triangular, with the apical part well defined and slightly bifid at the tip. Urosome considerably shorter than the anterior division and somewhat attenuated distally, genital segment conspicuously dilated at the base, anal segment shorter than the preceding one. Caudal rami not much produced, being scarcely twice as long as they are broad and rather approximate, innermost but one of the apical setæ slender and elongated, and conspicuously ciliated in the middle, the adjacent seta on the outer side very peculiarly transformed, being remarkably dilated throughout the greater part of its length, almost sausage-shaped, and terminating in a very thin and slender hair-like lash, the dilated part coarsely ciliated on both edges distally. Anterior antennæ comparatively short and of the usual structure. Posterior antennæ with the outer ramus very slender, exceeding in length the last joint of the inner. Oral parts of the usual structure. 1st pair of legs with the outer ramus about the length of the inner, middle joint provided inside with a distinct, though rather small seta, last joint a little longer and armed with 2 slender spines and 2 still longer setæ; inner ramus biarticulate, distal joint longer and narrower than the proximal one, and provided at the tip with a slender spine and a ciliated seta, inside with 2 similar setæ. Natatory legs moderately strong and of the usual structure. Last pair of legs with the distal joint oblong quadrangular in form, carrying on the somewhat obliquely truncated end 5 setæ, the middle one being very small, hair-like; inner expansion of proximal joint rather slight and subangular inside, carrying 4 slender ciliated setæ, the 2 outermost ones smaller than the other 2, and arranged close together. Ovisacs comparatively small and but slightly divergent, containing a very limited number of ova.

Male unknown.

Colour whitish.

Length of adult female 0.44 mm.

Remarks.—This is a very small form, and at once recognizable from any of the other species of the genus by the peculiar transformation of the outer one of the 2 middle caudal setæ, as also by the comparatively small and appressed ovisacs.

Occurrence.—Several specimens of this form, all of the female sex, were found last summer at Farsund, south coast of Norway, at a depth of from 20—30 fathoms, muddy sand.

Distribution.—Scottish coast (Scott).

125. Stenhelia Normani (Scott).

(Pl. CXXIV, fig. 2).

Delavalia Normani, Th. Scott, Notes on British Copepoda, Ann. Mag. Nat. Hist. ser. 7, Vol. XVI, p. 569.

Specific Characters.—Female. Very like the preceding species both in size and general appearance. Genital segment however more abruptly constricted in the middle, and the remaining part of the urosome narrower and scarcely at all attenuated behind. Caudal rami more divergent and having the setæ of quite normal appearance. Anterior antennæ comparatively shorter and stouter than in *S. Giesbrechti*. Posterior antennæ with the outer ramus very slender, considerably exceeding in length the last joint of the inner. 1st pair of legs of almost exactly the same structure as in *S. Giesbrechti*. Natatory legs likewise very similar. Last pair of legs with the distal joint comparatively shorter and broader, and having the setæ more elongated; inner expansion of proximal joint carrying 4 slender setæ arranged in a manner similar to that in *S. Giesbrechti*. Ovisacs comparatively larger and more divergent.

Male with the inner ramus of 2nd pair of legs somewhat unlike that in the other species, distal joint rather large and slightly dilated in the middle, carrying on the tip 2 unequal straight spines, outer edge with a small dentiform projection beyond the middle, inner edge provided with 2 setæ in the middle and near the end with an elongated deflexed spine, coarsely denticulated in its outer part. Last pair of legs with the distal joint very small and imperfectly defined at the base, carrying 3 spines, the outermost of which is rather strong; proximal joint scarcely at all expanded inside, but provided with 2 unequal setæ in its innermost part.

Colour whitish.

Length of adult female 0.46 mm.

Remarks.—This form was at first regarded by Th. Scott as only a variety of *S. Giesbrechti*. Recently he has however vindicated its specific distinctness, and has proposed for it the above name. It is indeed closely allied to the said species, but on a closer comparison some differences are found to exist which

seem to be fairly constant, the most conspicuous of them being the structure of the caudal setæ and the form of the ovisacs.

Occurrence.—I have found this form not unfrequently off the south coast of Norway, at Risör and Lillesand, at moderate depths among algæ.

Distribution.—Scottish coast (Scott).

126. Stenhelia longicaudata, Boeck.

(Pl. CXXV, fig. 1).

Stenhelia longicaudata, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 49.

Syn: *Delavalia reflexa*, Brady (part).
„ — *minutissima*, Scott.

Specific Characters.—Female. Body rather short, and robust resembling somewhat that of *S. reflexa*. Rostrum rather prominent and attenuated distally, apical part very minute and transversely truncated at the end. Genital segment conspicuously dilated in its proximal half, remaining part of urosome only slightly attenuated, anal segment about the length of the preceding one. Caudal rami very narrow and elongated, exceeding in length the 2 preceding segments combined, and widely apart, apical setæ of moderate length and normal appearance. Anterior antennæ of the usual structure. Posterior antennæ with the outer ramus shorter than the last joint of the inner. Oral parts of quite normal structure. 1st pair of legs with the outer ramus considerably longer than the inner, middle joint provided inside with a short seta, last joint rather shorter and armed with 2 slender spines and 2 setæ; inner ramus biarticulate, distal joint quite short, scarcely half as long as the proximal one, and provided inside with a small seta, tip carrying 3 setæ, the middle one being much the largest and remarkably thickened at the base, terminating in a very delicate and finely ciliated lash. Natatory legs of the usual structure. Last pair of legs with the distal joint pronouncedly spatulate in form, and provided with 6 setæ, 2 of which issue from the outer edge, innermost seta very slender and elongated; inner expansion of proximal joint very slight and exhibiting near the insertion of the distal joint a small, but rather conspicuous incision, marginal setæ slender and 4 in number, the outermost issuing close to the next, and being smaller than the others. Ovisacs of moderate size and rather divergent.

Male with the inner ramus of 2nd pair of legs rather peculiar in shape, the proximal joint being strongly dilated and without any seta inside, distal joint

exhibiting inside in the middle a deep excavation and carrying on the tip a single slender spine, inner edge below the excavation provided with a similar spine, and in front of it with a simple seta. Inner ramus of 3rd pair of legs also somewhat transformed, though consisting of 3 well-defined joints, the last of which, however, is considerably larger than in female, and provided with an additional seta inside. Last pair of legs with the distal joint well defined, but very small, not dilated towards the end and only provided with 4 small setæ; inner expansion of proximal joint very slight and carrying 2 subequal setæ.

Colour more or less distinctly reddish.

Length of adult female 0.48 mm.

Remarks.—This form has been very imperfectly characterised by Boeck, and was therefore not recognised by Mr. Scott, who described it as a new species under the nama of *Delavalia minutissima*. Some of the figures given by Prof. Brady of his species *Delavalia reflexa* (for instance figs. 9 and 14) undoubtedly refer to the present form. The most prominent feature of this species is unquestionably the very narrow and elongated caudal rami, a character which indeed has given rise to the specific name *longicaudata* proposed by Boeck. In the structure of the 1st pair of legs it somewhat resembles *Delavalia robusta* of Brady, a species which also may be referred to the Norwegian fauna, as it is recorded by Th. Scott from Finmark.

Occurrence.—I have met with this form occasionally in the upper part of the Christiania Fjord, as also at Flekkerö, south coast of Norway, in moderate depths among algæ.

Distribution.—British Isles (Brady, Scott).

Gen. 41. **Stenheliopsis**, G. O. Sars, n.

Generic Characters.—General form of the body somewhat resembling that in *Stenhelia*, being rather short and stout. Rostrum immobile, forming a thin linguiform plate, without any ventral carina. Urosome much narrower than the anterior division. Caudal rami long and narrow, divergent. Anterior antennæ short and much curved, with the number of articulations reduced. Posterior antennæ rather strongly built, but with the apical setæ comparatively small, outer ramus of moderate size, biarticulate. Mandibles with the palp of quite normal appearance. Maxillæ and anterior maxillipeds likewise of usual structure. Poste-

rior maxillipeds terminating in a well-developed prehensile hand. 1st pair of legs with the inner ramus biarticulate and not prehensile. Natatory legs not very different in structure from the 1st pair, all having the inner ramus biarticulate and much coarser than the outer. Last pair of legs very small, distal joint quite rudimentary and not defined at the base; proximal joint only slightly expanded inside. Ovisacs small, containing a very limited number of ova. *Male* unknown.

Remarks.—This new genus is somewhat allied to *Stenhelia*, but differs very materially in several of the anatomical characters. It contains as yet only a single species, to be described below.

127. Stenheliopsis divaricata, G. O. Sars, n. sp.

(Pl. CXXV, fig. 2).

Specific Characters.—Female. Body short and stout, with the anterior division considerably dilated, the posterior rather narrower. Cephalic segment very large and vaulted above. Rostrum rather prominent, forming a very thin linguiform plate, evenly rounded at the tip. Urosome almost as long as the anterior division, and only slightly attenuated behind, genital segment scarcely at all dilated in front. Caudal rami exceedingly slender and elongated, attaining about half the length of the urosome, and curving outwards, apical setæ extended laterally, the innermost but one rather coarse, with the distal part closely annulated and clothed with short cilia; outer edge of the rami carrying a short seta at some distance from the tip. Eye wholly absent. Anterior antennæ abruptly curved in their outer part and densely setiferous, 6-articulate, the first 2 joints much the largest, and together about twice as long as the remaining part, 4th and 5th joints very small, terminal joint long and narrow. Posterior antennæ with the distal joint fully as long as the proximal one, outer ramus scarcely more than half as long, and provided with 6 setæ, 4 of which belong to the distal joint. Mandibular palp with the basal part comparatively short and broad, rami a little unequal, the inner one being the larger, both clothed with simple setæ. 1st pair of legs with the 2nd basal joint produced at the end inside to a conical process carrying a strong deflexed spine, outer ramus narrow, with no seta inside the middle joint, last joint somewhat larger and armed with 3 spines and a slender seta; inner ramus about the length of the outer, but somewhat broader, proximal joint without any seta inside, distal joint a little longer and narrower, and provided inside in front of the middle with a small seta, tip carrying 2 unequal

spines and a slender seta. Natatory legs all of the same structure, though slightly differing in size, the 4th pair being considerably smaller than the other 2; outer ramus in all of them rather narrow, with no seta inside the 1st and last joints; inner ramus much coarser than the outer, proximal joint with a strong seta inside, distal joint considerably larger, with 2 thickish setæ inside, 2 others at the tip, and a short spine outside near the end. Last pair of legs having outside a small knob-like prominence carrying a slender hair-like bristle, and immediately inside it another knob-like prominence tipped with 2 spines and representing the rudimentary distal joint, innermost part of each leg forming a short lamellar expansion carrying 3 subequal ciliated setæ. Ovisacs very small and extended laterally, each containing only one or two ova.

Colour whitish.

Length of adult female 0.50 mm.

Remarks.—This form may be easily recognized from any of the other Harpacticoida by the unusual appearance of the caudal rami, which are extremely slender and curved outwards in a most peculiar manner, their apical setæ being extended straight laterally, not as usual behind. This peculiarity has indeed given rise to the specific name *divaricata* here proposed.

Occurrence.—Only 3 female specimens of this remarkable Copepod have hitherto come under my notice. One of these specimens was taken at Bukken, west coast of Norway, the other 2 at Farsund. In both localities it occurred at a depth of about 50 fathoms, muddy bottom.

Fam. 12. Canthocamptidæ.

Characters.—Body, as a rule, slender, more or less cylindrical in form, with no sharp demarcation between the anterior and posterior divisions. Rostrum in most cases very small, and not distinctly defined behind. Anterior antennæ more generally 8-articulate, and distinctly hinged in the male. Posterior antennæ with the outer ramus comparatively small. Mandibular palp likewise in most cases of insignificant size. Posterior maxillipeds terminating in a well-developed clawed hand. 1st pair of legs more or less distinctly prehensile, the inner ramus being generally longer than the outer and bent in its outer part. Natatory legs more or less slender, with the outer ramus always longer than the inner, which in some cases becomes much reduced. Last pair of legs in female more or less

lamellar, with the distal joint generally well defined and the proximal joint expanded inside. Only a single ovisac present in female.

Remarks.—To this family I refer a number of genera, which, as regards both the external appearance and the structure of some of the appendages, exhibit a perplexing similarity to the more typical *Diosaccidæ (Amphiascus)*, though differing materially in a few points. Thus in all the forms only a single ovisac is present in the female, and the rostrum never attains that full development which is characteristic of the *Diosaccidæ*, being in most cases reduced to a very minute immobile point. The outer ramus of the posterior antennæ is very small, and this is also generally the case with the mandibular palp. As to the legs, the 1st pair are often built upon a very similar type to that in the *Diosaccidæ*, the inner ramus being generally longer than the outer, and more or less prehensile. On the other hand, this ramus, in the natatory legs, is as a rule less fully developed than in the *Diosaccidæ*. The present family is represented both in fresh water and in the sea, some forms also in brackish water.

Gen. 42. **Canthocamptus,** Westwood, 1836.

Syn: *Canthocarpus.* Baird.

Generic Characters.—Body slender, cylindric in shape, and very flexible, with the anterior division only little broader than the posterior. Cephalic segment of moderate size and not very deep; rostral projection very small, and rudimentary. Epimeral plates of the 3 succeeding segments comparatively small and rounded behind; last pedigerous segment scarcely narrower than the preceding one, but without true epimeral plates. Urosome well developed, with the segments spinulose at the hind edge ventrally and laterally, genital segment in female large and imperfectly divided in the middle, last segment short, with a distinct anal opercle edged with regular spinules. Caudal rami slightly produced and provided outside with 2 hair-like bristles, apical setæ normal. Eye well developed. Anterior antennæ more or less slender, 8-articulate, those in male strongly hinged. Posterior antennæ with the outer ramus rather small, biarticulate, distal joint the smaller. Oral parts on the whole poorly developed. Mandibular palp simple, biarticulate. Maxillæ without distinctly defined exopodal and epipodal plates. Anterior maxillipeds provided with only 2 digitiform lobules inside the unguiferous joint. Posterior maxillipeds normally developed. 1st pair of legs with the inner

ramus distinctly 3-articulate and longer than the outer, being more or less bent at the end. Natatory legs very slender, with the inner ramus much shorter than the outer and in the 2 anterior pairs 3-articulate, in 4th pair biarticulate; those in male having the inner ramus in all the pairs, or only in the 2 anterior ones, transformed. Last pair of legs with the distal joint comparatively small, inner expansion of proximal joint more or less prominent, marginal setæ of both joints rather coarse, spiniform.

Remarks.—This genus was established as early as the year 1836 by Westwood, to include the well-known fresh-water species, *C. staphylinus* Jurine. In recent times, several new species have been added, most of them likewise from fresh water; and a subdivision of the original genus into several nearly-allied genera has been carried out by some recent authors. The present genus is therefore now generally taken in a much more restricted sense than previously. It still comprises several well-defined species, 2 of which belong to the Norwegian fauna.

123. Canthocamptus staphylinus (Jurine).

(Pl. CXXVI & CXXVII).

Monoculus staphylinus, Jurine, Historie des Monocles, p. 74, Pl. VII, figs. 1—17.

Syn: *Canthocamptus minutus,* Baird (not Claus).

Specific Characters.—Female. Body moderately slender and slightly constricted in the middle. Cephalic segment scarcely longer than the 3 succeeding segments combined; rostrum forming a very small triangular projection between the insertion of the anterior antennæ. Urosome a little shorter than the anterior division, and having the segments rather sharply marked off from each other, genital segment exceeding in length the 2 succeeding ones combined, last segment much the smallest and produced at the end on each side in a short dentiform projection, anal opercle rather prominent, semilunar, and armed with a regular row of simple spinules. Caudal rami about the length of the anal segment, being twice as long as they are broad, and of uniform width throughout, the outer one of the 2 middle apical setæ comparatively short and very distinctly denticulate, the inner rather elongated, exceeding half the length of the body. Anterior antennæ comparatively slender and elongated, exceeding in length the cephalic segment, and clothed with rather short setæ, terminal part very narrow and about the length of the proximal part. Posterior antennæ of moderate size, proximal joint with 2 widely separated setæ on the anterior edge, distal joint of about the same length,

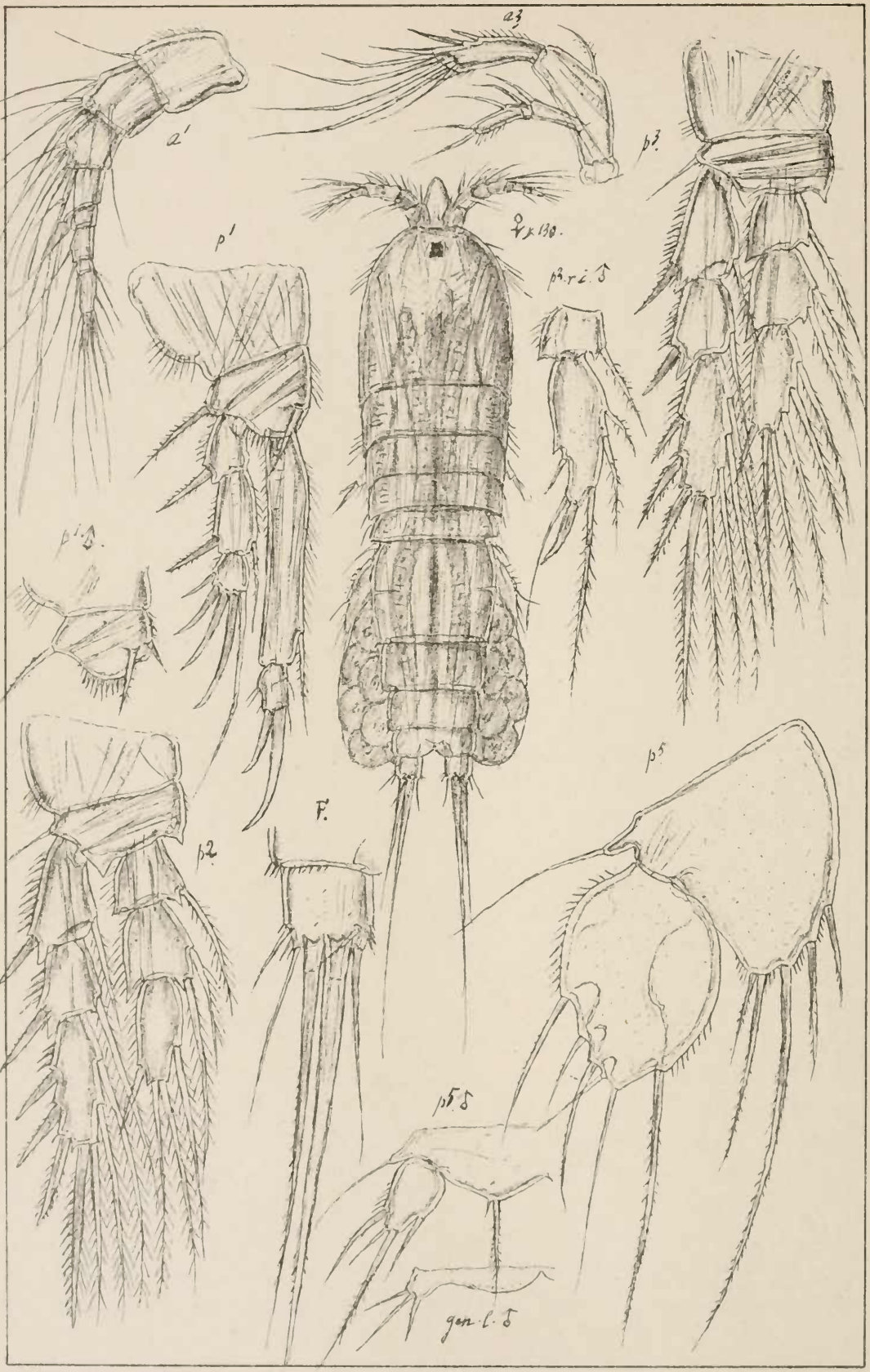
outer ramus scarcely half as long, and carrying 4 short setæ, 3 of which belong to the last joint. 1st pair of legs with the outer ramus about the length of the 1st joint of the inner, last joint somewhat larger than the preceding one, and armed with 2 spines and 2 geniculated setæ; inner ramus twice as long as the outer and very slender, 1st joint about the length of the other 2 combined, the latter somewhat unequal, the terminal one being much the longer and very narrow linear, carrying on the tip a slender denticulated spine, a long seta, and a small hair-like bristle. Natatory legs exceedingly slender, inner ramus of the 2 anterior pairs extending considerably beyond the 2nd joint of the outer, that of 4th pair to about the middle of that joint. Last pair of legs with the distal joint narrow oblong in form, and armed with 5 spines, 3 on the outer edge, one very small one on the inner edge near the end, and one very long apical one; inner expansion of proximal joint broadly rounded, and not extending to the middle of the distal joint, marginal spines 5 in number and somewhat unequal. Ovisac short and rounded, sub-globose in form, never extending beyond the end of the urosome. Spermatophore attached to the genital opening very large, sabre-like, and often of a very dark brownish colour.

Male not much smaller than female and easily recognizable by the prehensile anterior antennæ and the complete division of the anterior caudal segment. 1st pair of legs of exactly the same structure as in the female. Inner ramus of all the 3 succeeding (natatory) pairs conspicuously transformed, that of 2nd pair rather slender, with the outer 2 joints imperfectly defined, the last one armed inside with a short deflexed spine, and carrying on the somewhat obliquely rounded extremity 3 setæ, the outermost of which is much elongated; that of 3rd pair considerably shortened, middle joint produced at the end inside to a strong deflexed mucroniform process, last joint short, oval in form, and tipped with a small bristle; that of 4th pair with the distal joint produced at the end outside to a short spiniform projection, inside which 3 closely-set, long, curved and somewhat spiniform setæ are attached. Last pair of legs smaller than in female, distal joint of a similar shape, but provided inside near the base with an additional slender spine; inner expansion of proximal joint quite short, and provided with only 2 unequal spines. Genital lobes armed with 2 spines and a hair-like bristle.

Colour somewhat variable, in some cases yellowish green, in others more reddish; that of male more generally of the last-named colour.

Length of adult female about 1 mm.

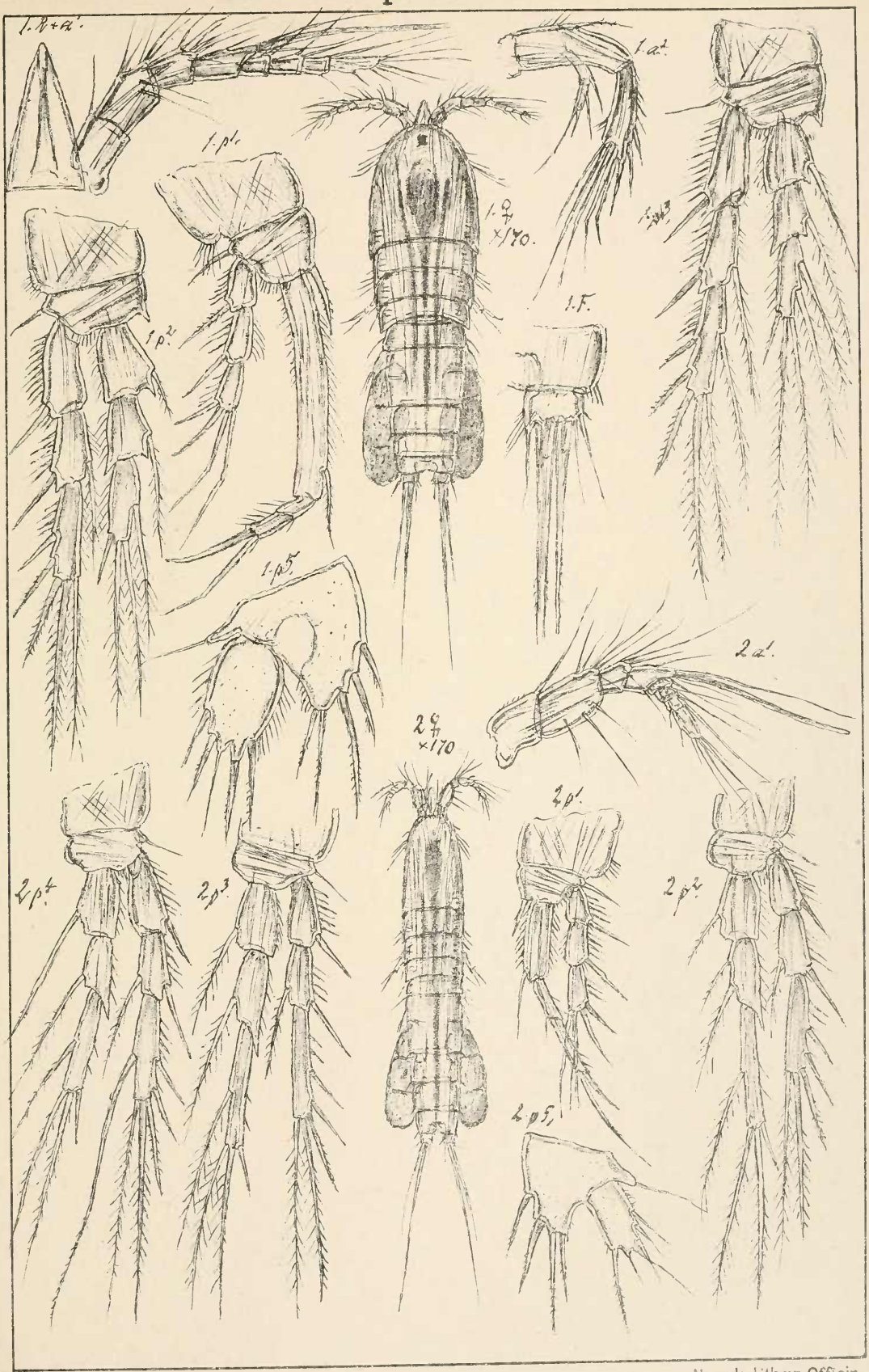
Remarks.—It is very probable, that the *Cyclops minutus* of O. Fr. Müller refers to the present species, and that thus the identification made by earlier authors is quite correct. But in any case the name *minutus* would be very inap-



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus phyllopus, G.O.Sars.

Copepoda

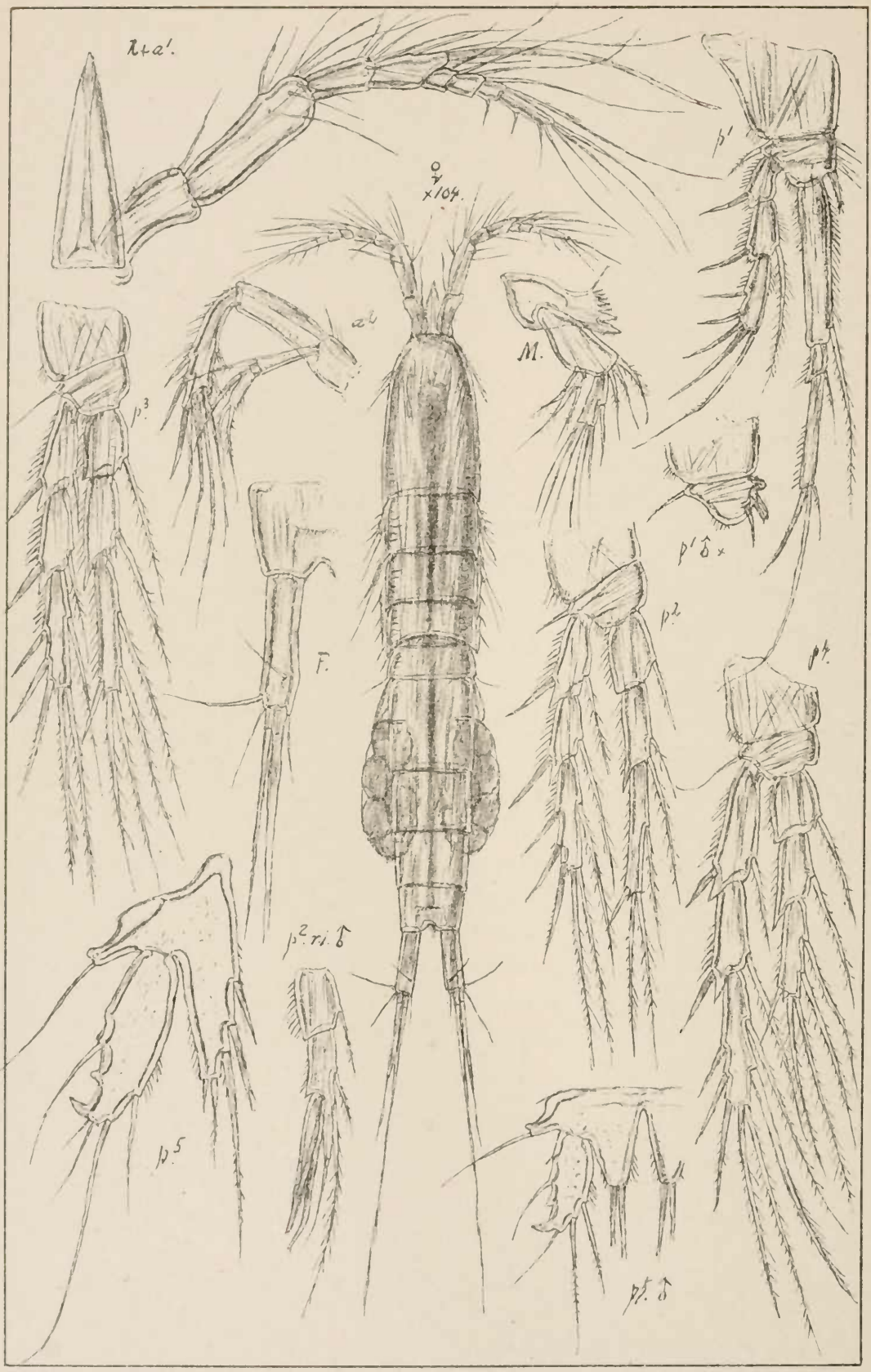


G.O.Sars autogr. Norsk lithgr. Officin

1. Amphiascus nanus. G.O.Sars.
2. " exiguus, G.O.Sars.

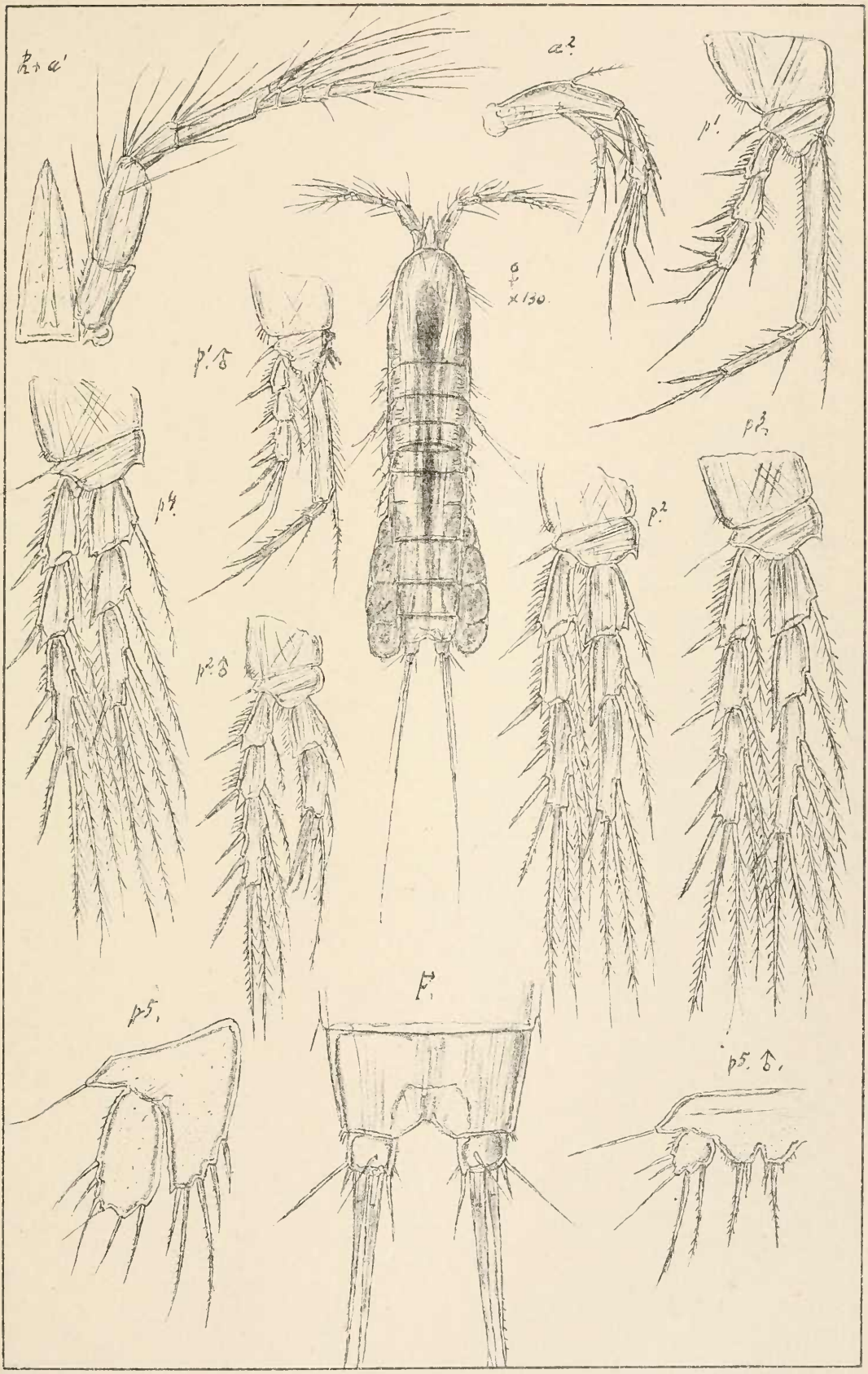
Copepoda

Diosaccidæ. Harpacticoida Pl. CXV.



G.O.Sars autogr Norsk lithgr. Officin

Amphiascus productus, G.O.Sars.

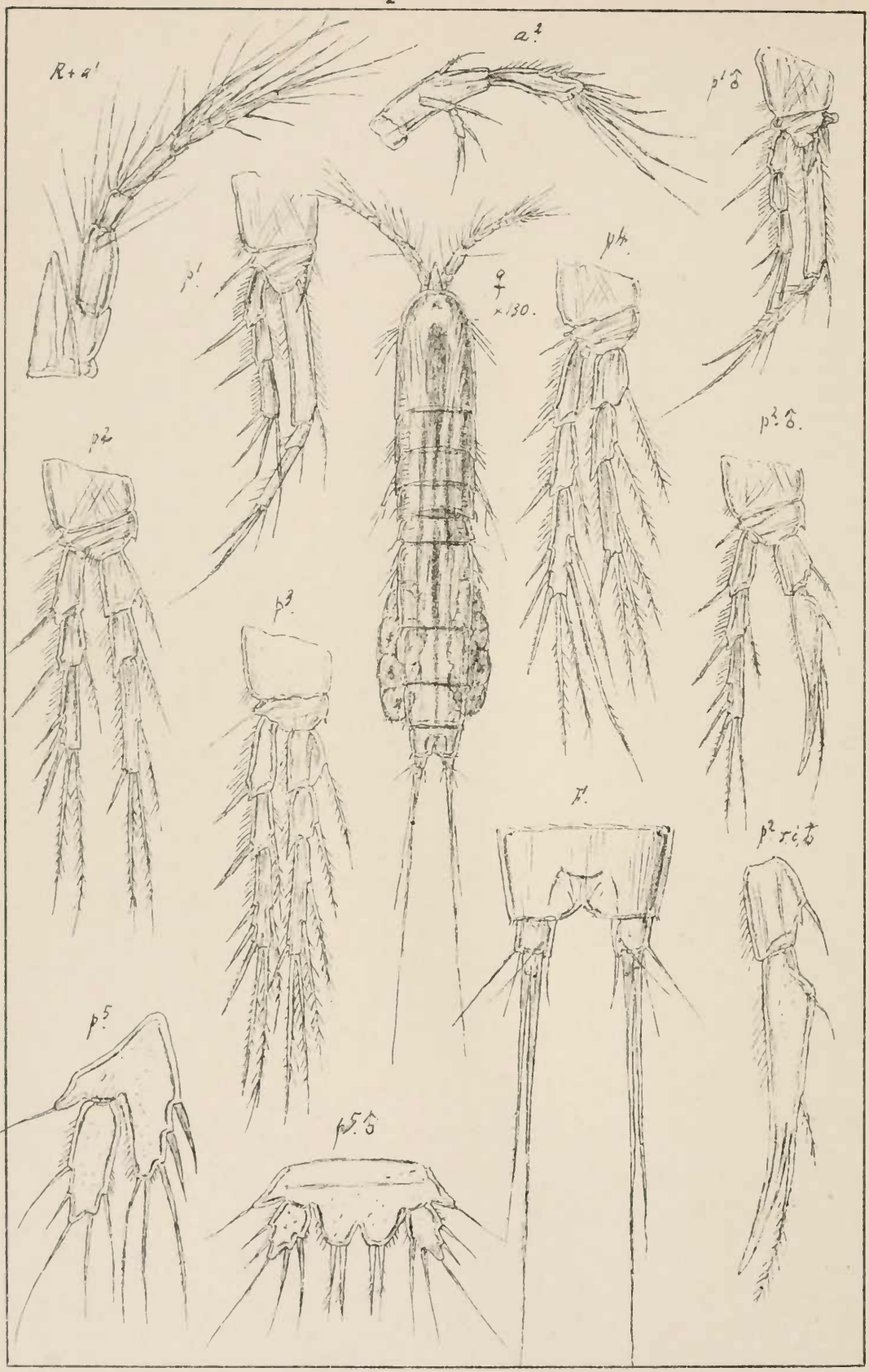


G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus tenellus, G.O.Sars.

Copepoda

Diosaccidæ. Harpacticoida Pl.CXVII.



G.O.Sars autogr. Norsk lithgr. Officin

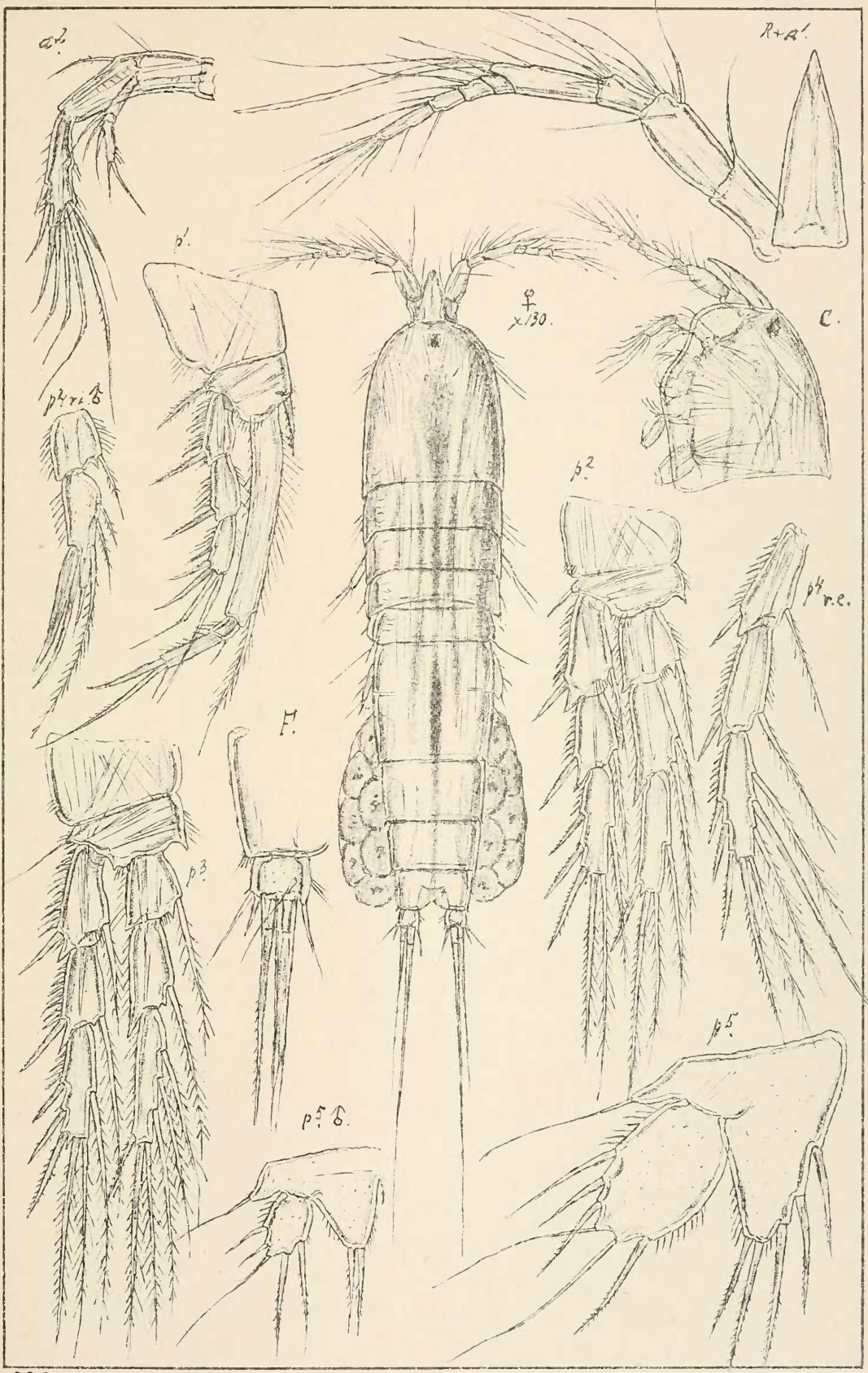
Amphiascus linearis, G.O.Sars.

Copepoda

Harpacticoida

Diosaccidæ.

Pl. CXVIII.



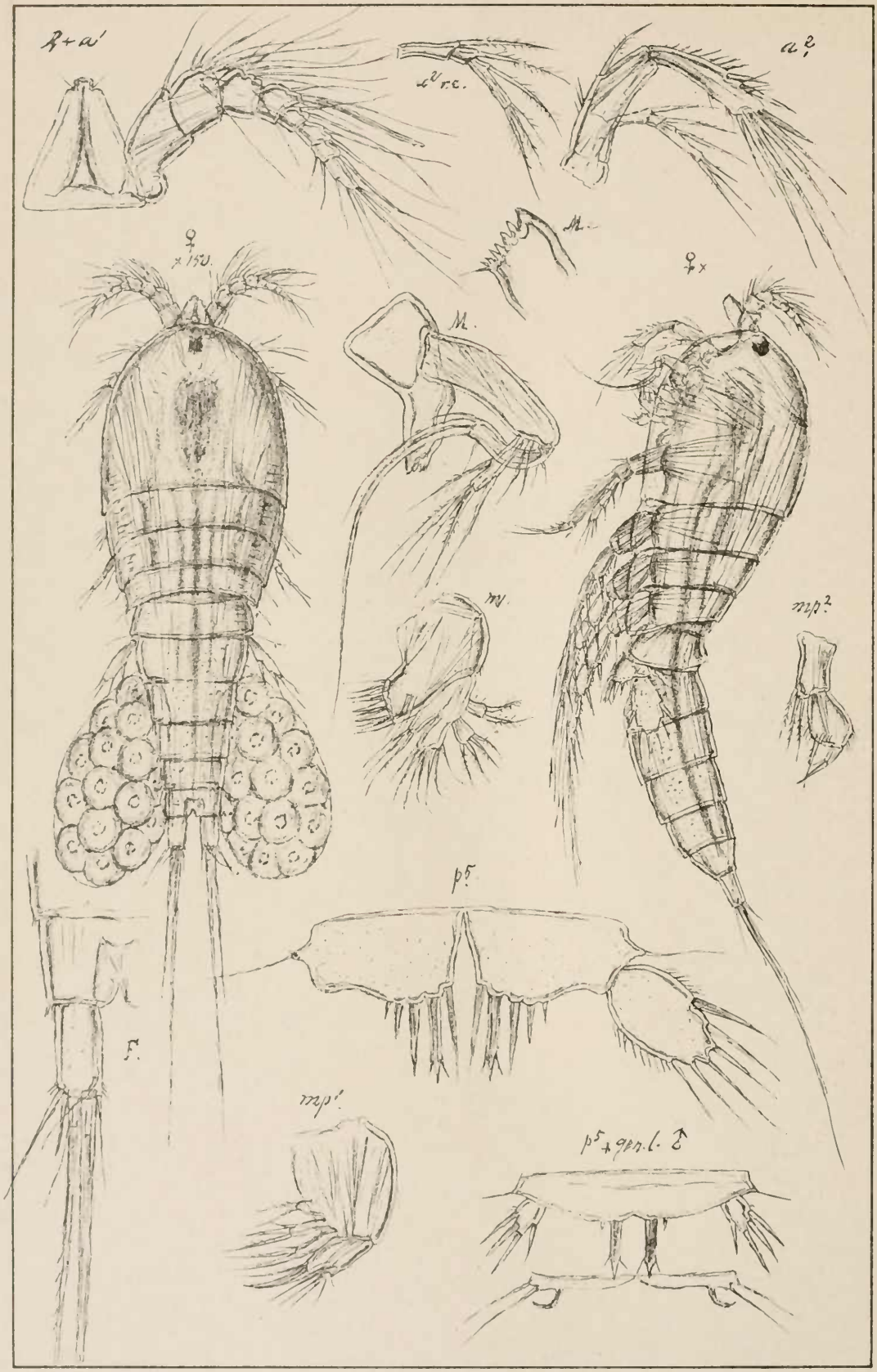
G.O.Sars autogr

Norsk lithgr. Officin

Amphiascus sinuatus, G.O.Sars

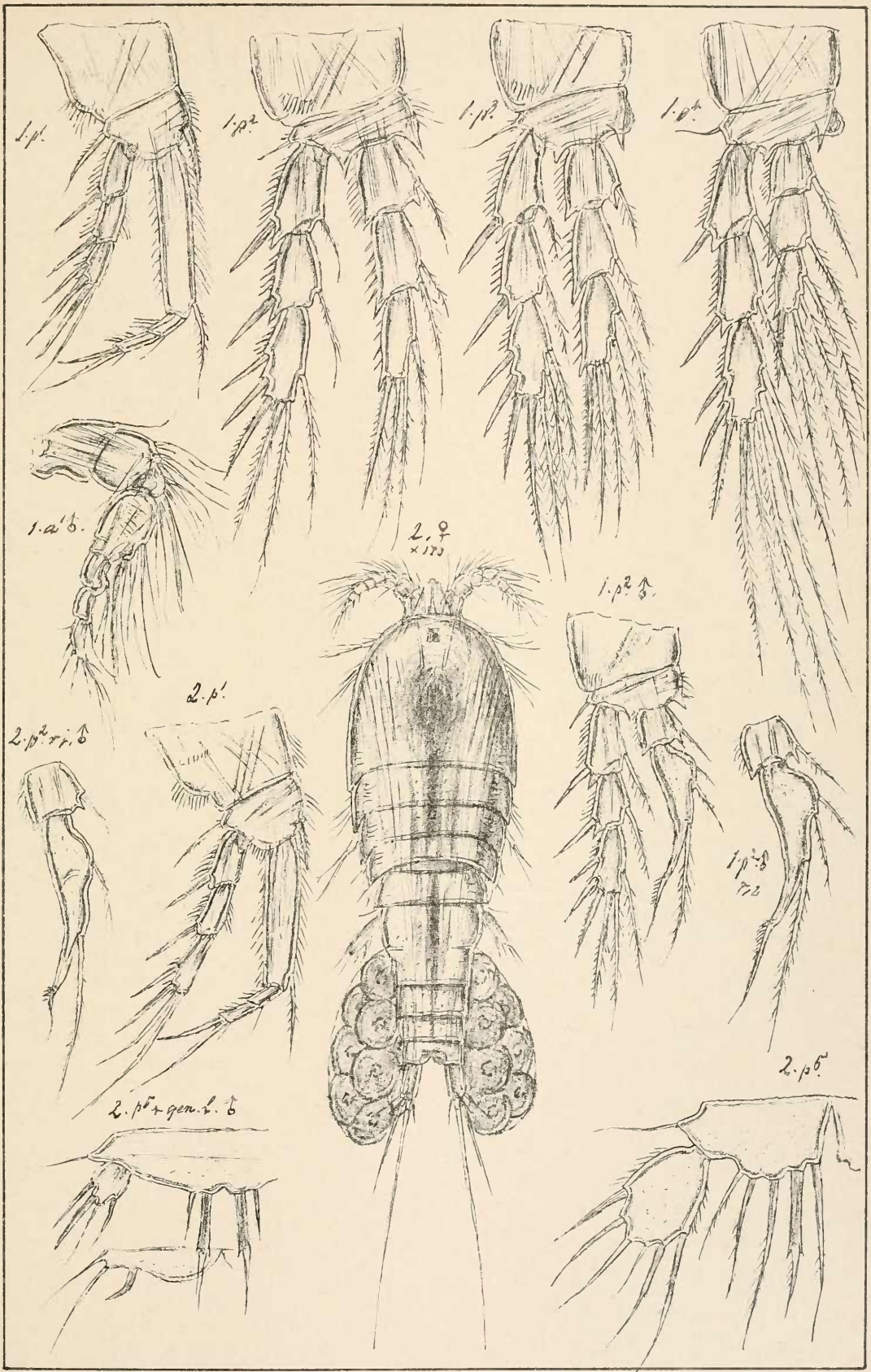
Copepoda

Diosaccidæ. Harpacticoida Pl. CXIX.



G.O.Sars autogr. Norsk lithgr. Officin

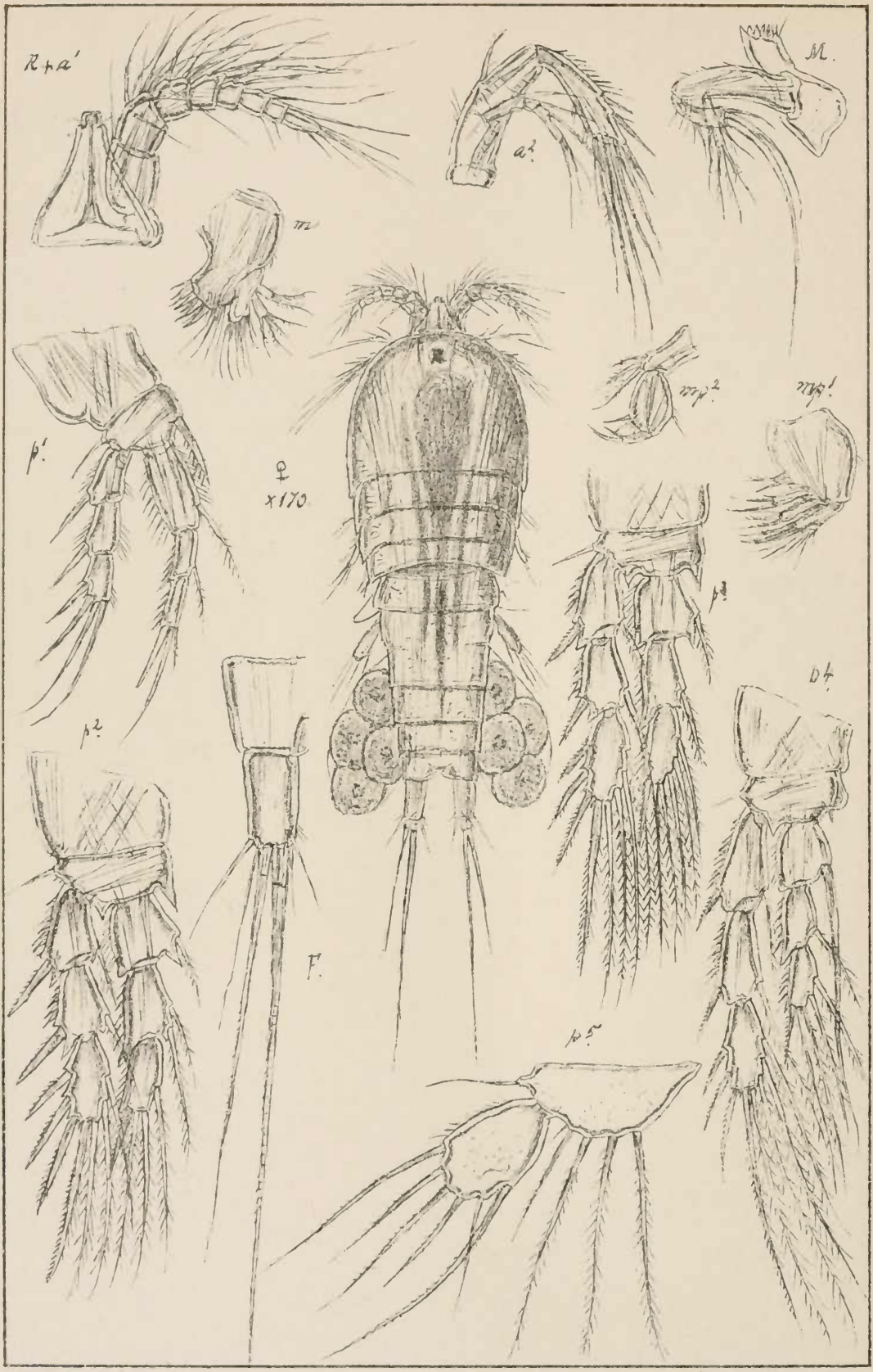
Stenhelia gibba, Boeck



G.O.Sars autogr. Norsk lithgr. Officin

1. Stenhelia gibba, Boeck
(continued)
2. " proxima, G.O.Sars.

Copepoda

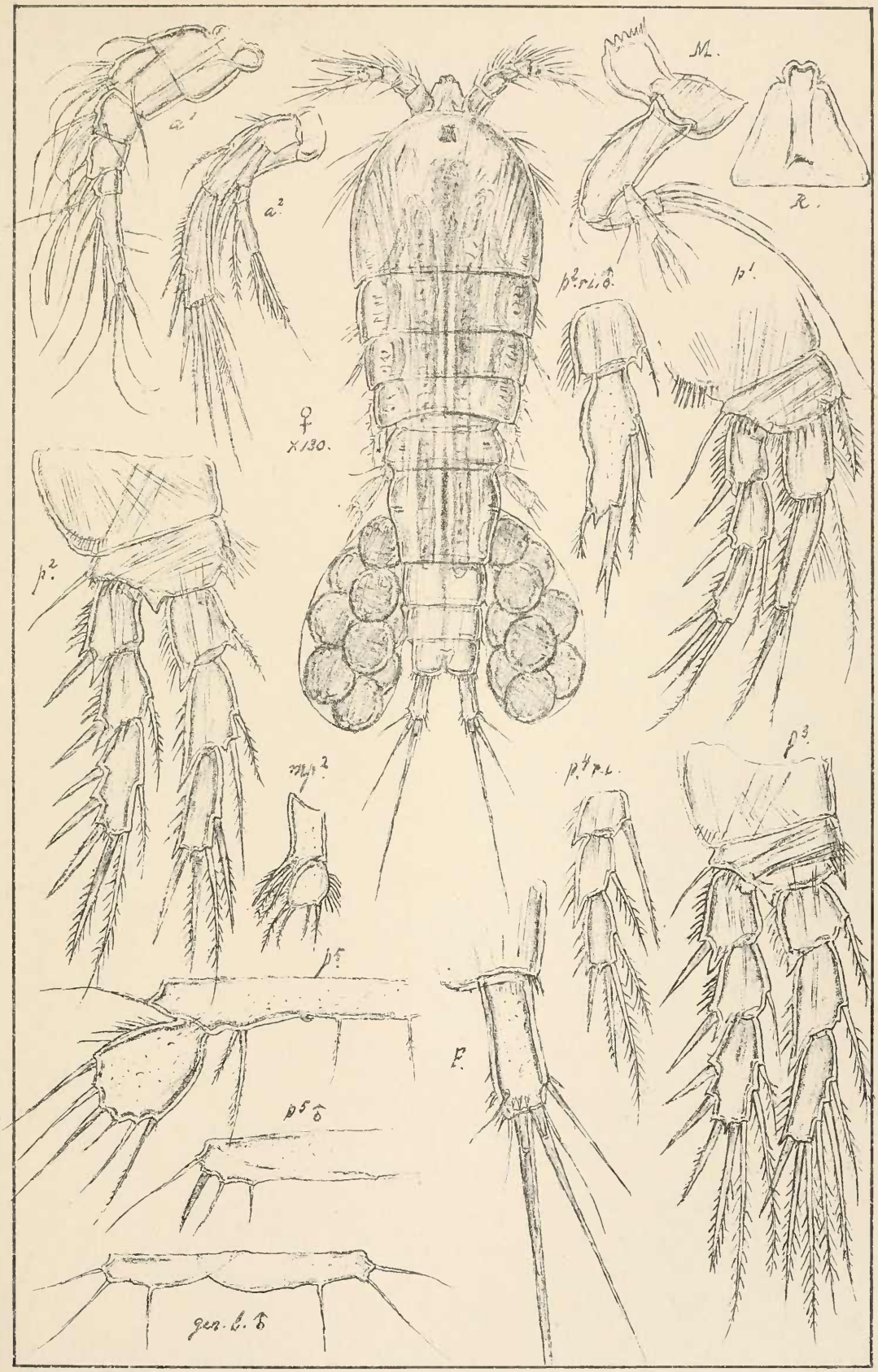


G.O.Sars autogr. Norsk lithgr. Officin.

Stenhelia æmula, (Scott).

Copepoda

Diosaccidæ. Harpacticoida Pl. CXXII

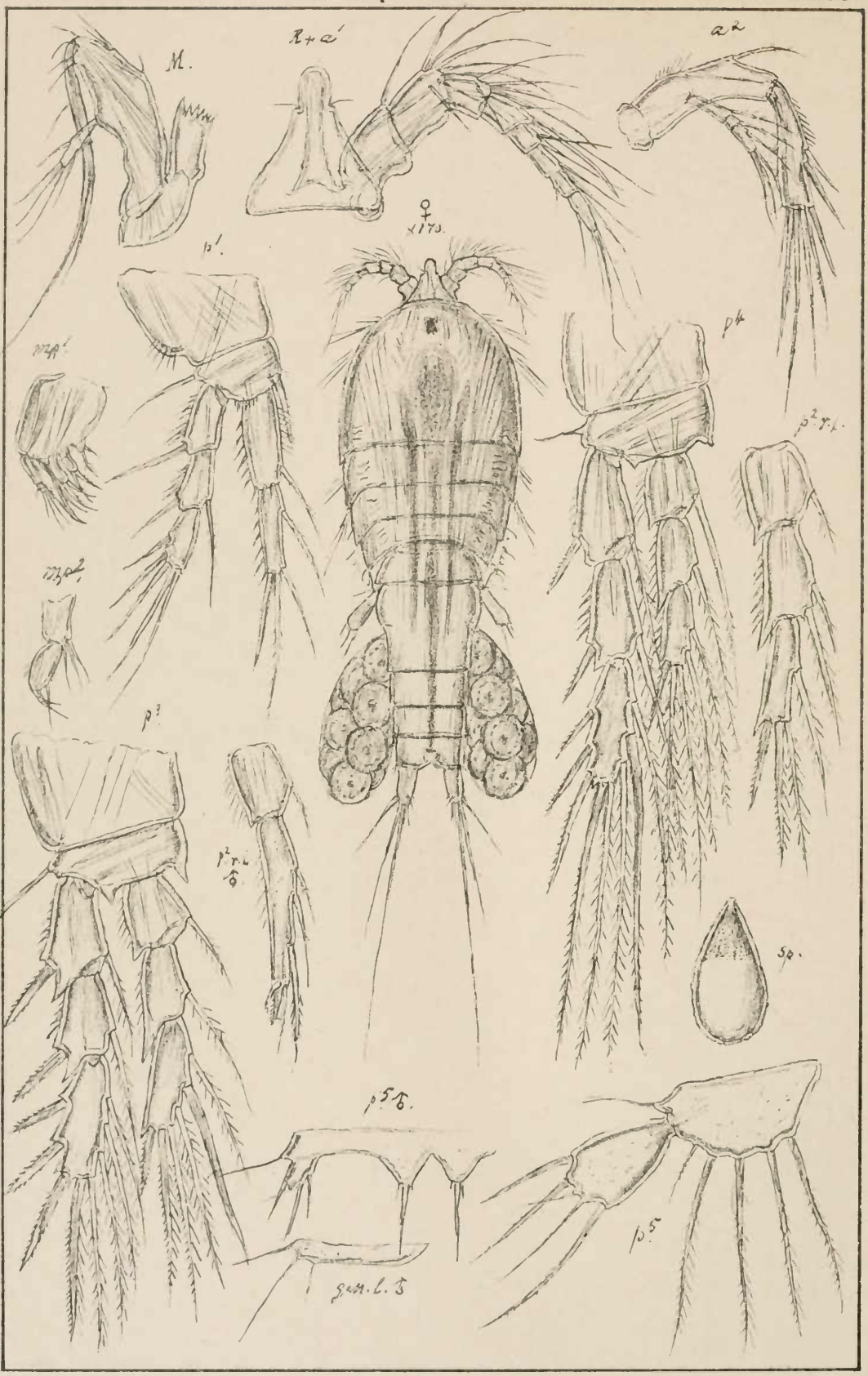


G.O.Sars autogr. Norsk lithgr. Officin

Stenhelia palustris, (Brady).

Copepoda

Diosaccidæ. Harpacticoida Pl. CXXIII.



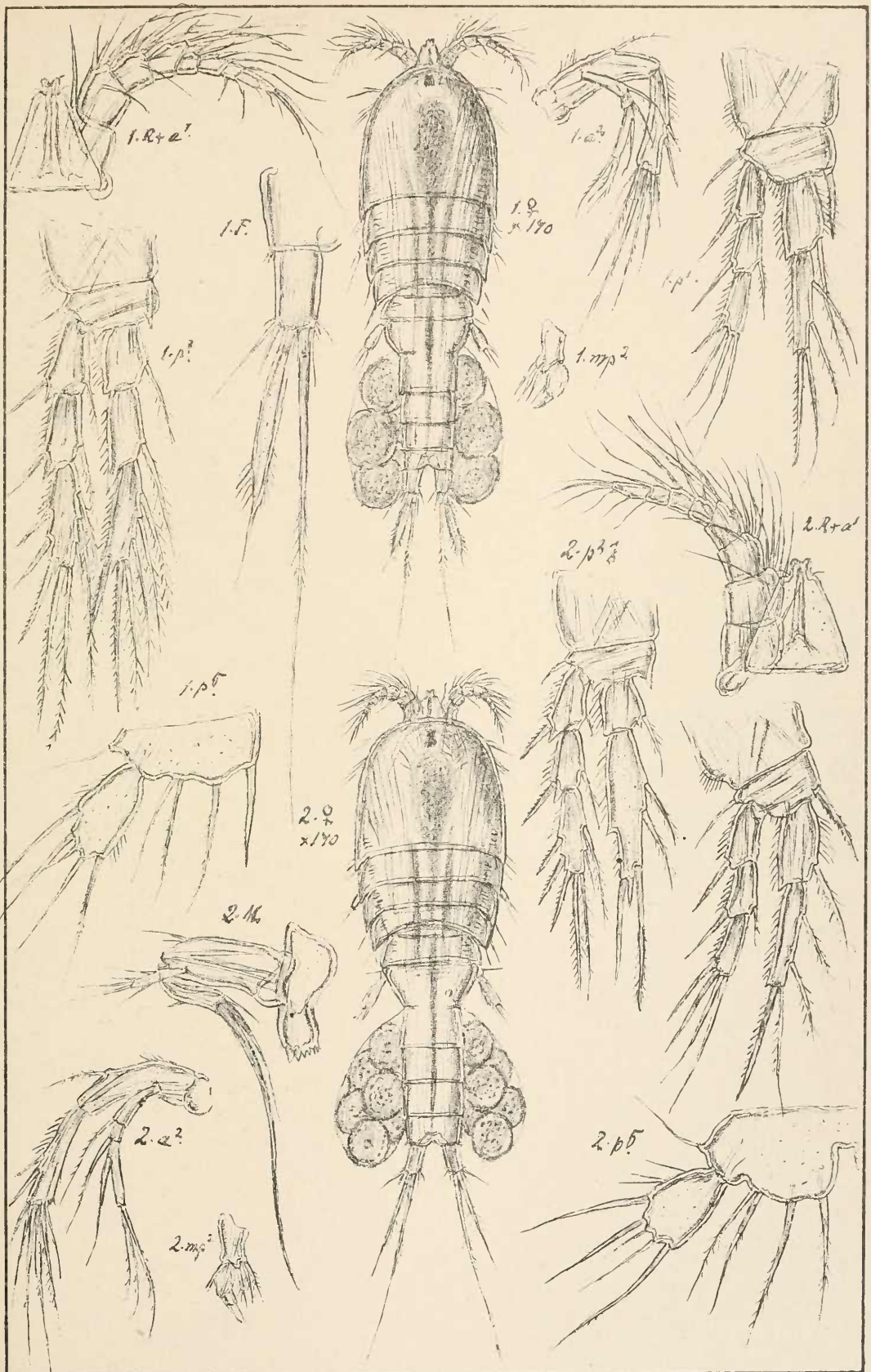
G.O. Sars autogr. Norsk lithgr. Officin

Stenhelia reflexa (Brady)

Copepoda

Harpacticoida

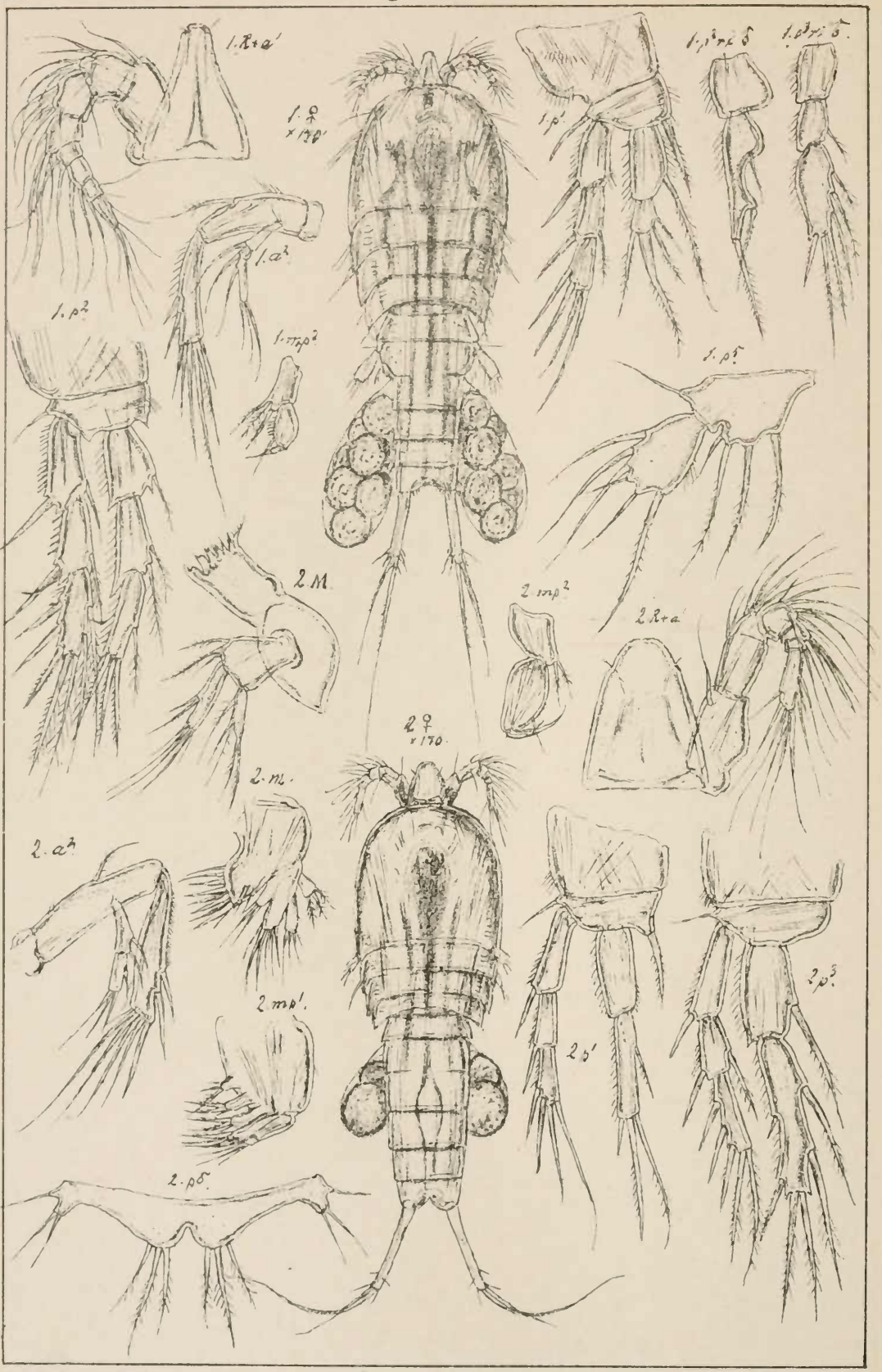
Diosaccidæ. Pl. CXXIV.



G.O.Sars autogr. Norsk lithgr. Officin

1. Stenhelia Giesbrechti, (Scott).
2 " " Normani, (Scott).

Copepoda



G.O.Sars autogr

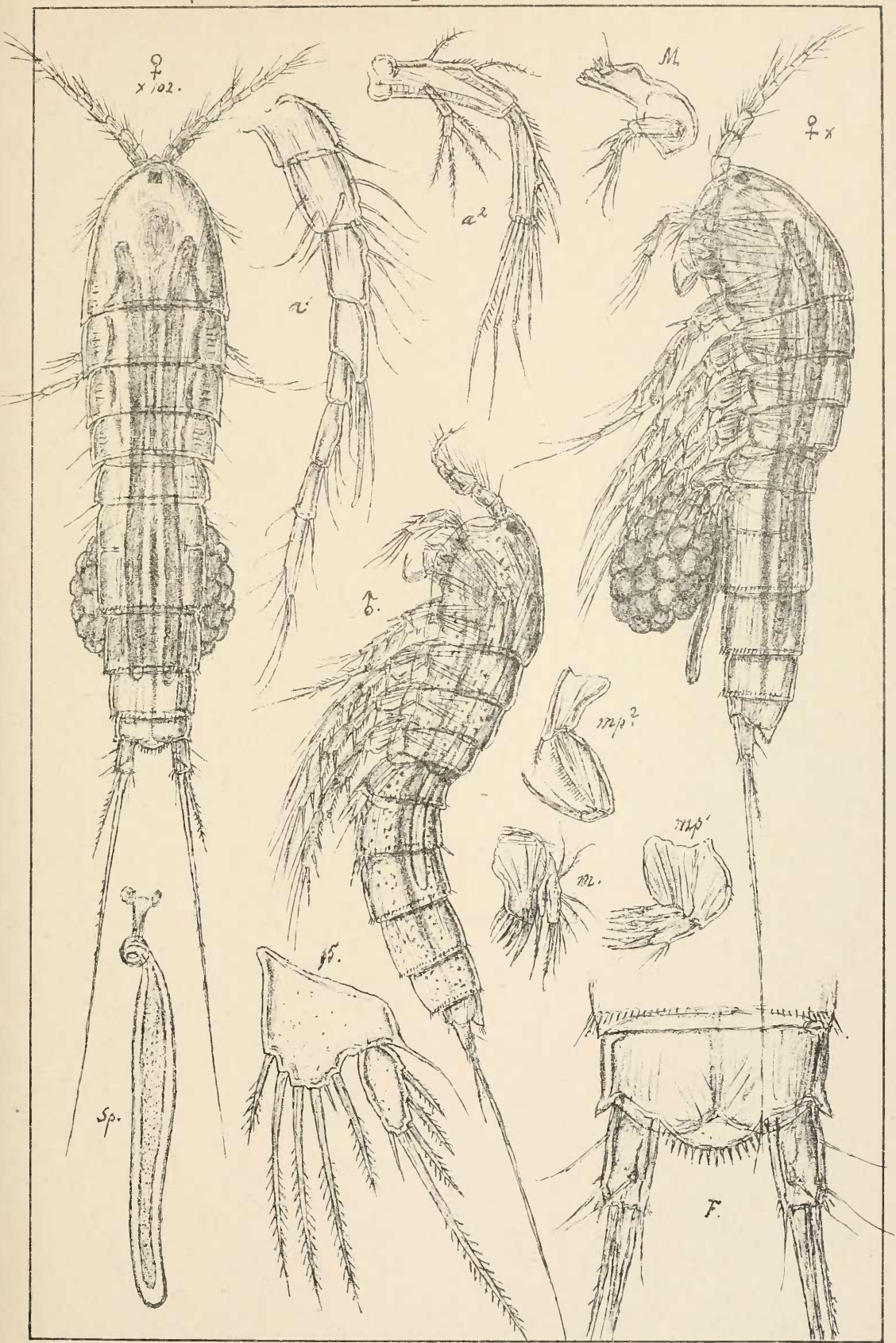
Norsk lithgr. Officin

1. Stenhelia longicaudata, Boeck

2. Stenheliopsis divaricata, G.O.Sars

Copepoda

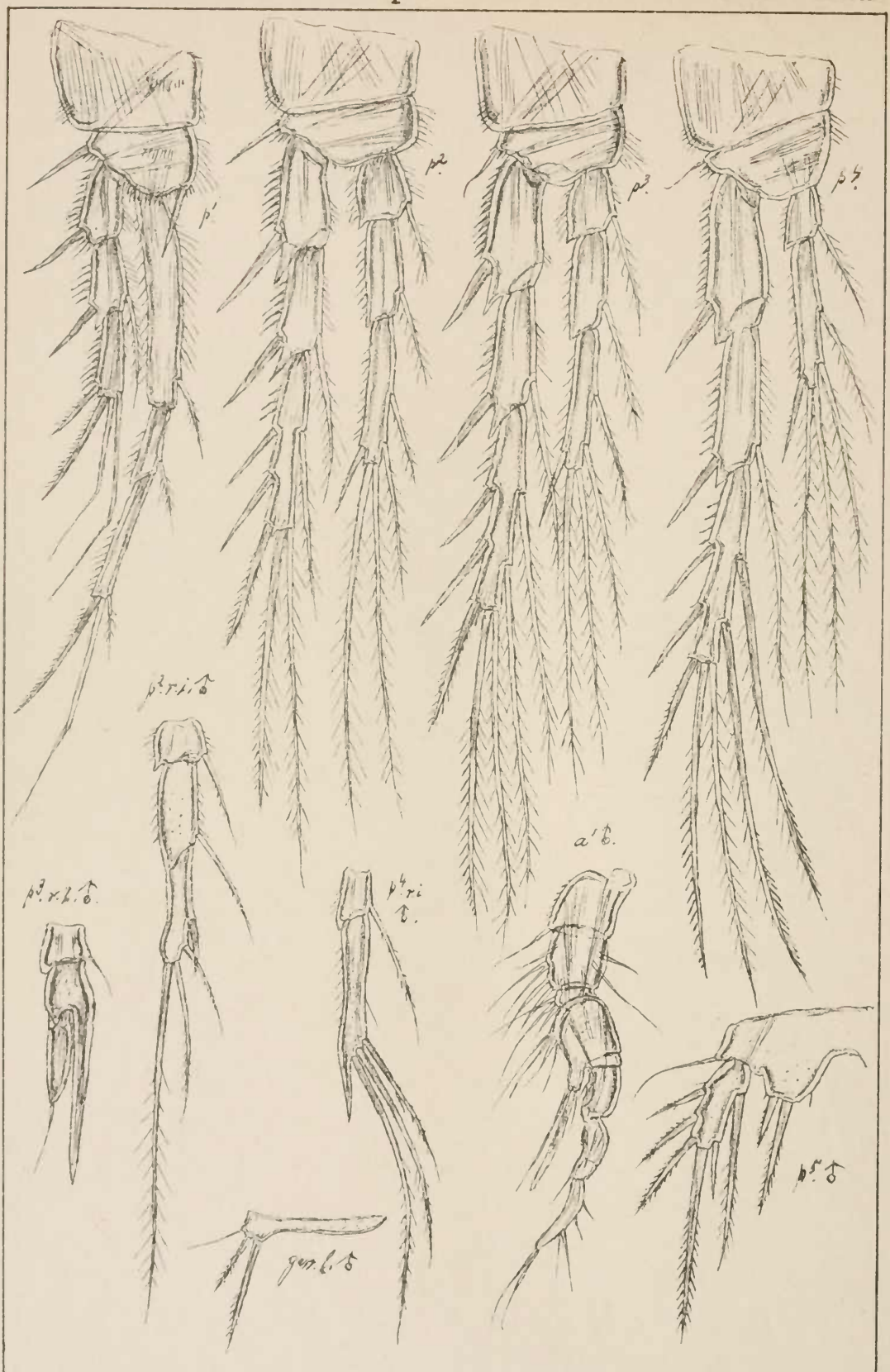
Canthocamptidæ. Harpacticoida Pl. CXXVI.



G.O Sars autogr. Norsk lithgr. Officin

Canthocamptus staphylinus, (Jurine).

Copepoda



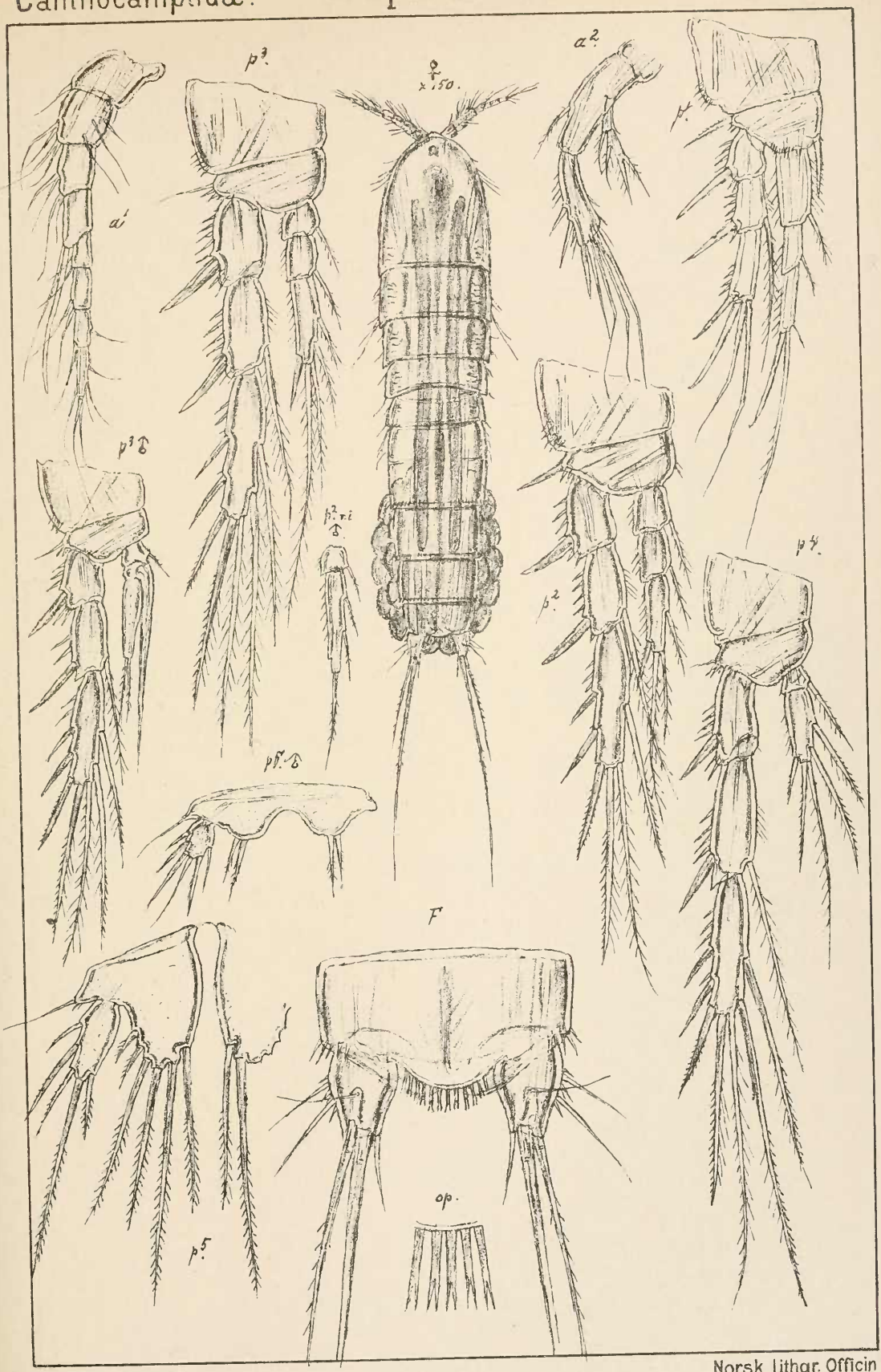
G.O.Sars auctogr. Norsk lithgr. Officin

Canthocamptus staphylinus, (Jurine).

(continued).

Copepoda

Canthocamptidæ. Harpacticoida Pl. CXXVIII.



G.O.Sars autogr. Norsk lithgr. Officin

Canthocamptus minutus, Claus

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XVII & XVIII

CANTHOCAMPTIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1907

propriate for the present form, which in reality is much the largest of all the known species of this genus. It is for this reason that recent authors now generally apply to the present species the name *staphylinus*, proposed by Jurine, though it is of somewhat later date, the name *minutus* being confined to another species so named by Claus. In every case the present species must be regarded as the type of the genus *Canthocamptus* and at the same time as the type of the whole family *Canthocamptida*.

Occurrence.—This form is very common in the neighbourhood of Christiania, especially early in the spring, and in all probability is distributed over the greater part of the country. It generally occurs in shallow ponds and ditches together with other fresh-water Entomostraca, more rarely in larger lakes. Male and female specimens occur with almost equal frequency, and are often found tied together in copula, the female being grasped by the anterior antennæ of the male at the base of the caudal setæ. The swimming movements of the animal are not very rapid, and are effected in a somewhat reeling manner. It also moves with great dexterity on the bottom, or along the leafs and stems of aquatic plants, by curving and twisting its very flexible body, and applying its legs as levers.

Distribution.—British Isles, Sweden, Denmark, Central Europe, North America, Novaja Zemlja.

124. Canthocamptus minutus, Claus.

(Pl. CXXVIII).

Canthocamptus minutus, Claus, Die freilebenden Copepoden, p. 22, Pl. XII, fig. 1, Pl. XIII, fig. 2.

Syn: *Canthocamptus lucidulus*, Rehberg.

Specific Characters.—Female. Body slender and elongated, sublinear in form, being of almost equal width throughout. Urosome with the segments less sharply marked off than in the type species, genital segment scarcely longer than the 2 succeeding ones combined, last segment without any dentiform projections at the end outside, anal opercle somewhat less prominent and edged with about 12 spinules, which are all bifid at the end. Caudal rami scarcely as long as the anal segment, and conspicuously thickened in the middle, the outer edge being very convex and provided with 3 small denticles and 2 hair-like bristles, tip somewhat exserted and obliquely truncated, apical setæ rather slender, the innermost but one about twice as long as the adjacent seta on the outer side. Anterior antennæ much shorter than in *C. staphylinus*, otherwise of a very similar structure. Posterior antennæ and oral parts likewise of essentially the same structure

as in the typical species. 1st pair of legs with the outer ramus of moderate size, seta attached inside the middle joint of unusual length, last joint almost as long as the other 2 combined, and carrying at the tip 2 spines and 2 geniculated setæ; inner ramus only slightly exceeding in length the outer, and less distinctly prehensile than in the typical species, 1st joint much shorter than the other 2 combined, last joint somewhat longer than the middle one, and, as in *C. staphylinus*, carrying on the tip a slender spine, a still more slender seta, and a very small hair-like bristle. Natatory legs comparatively less slender than in that species, with the inner ramus shorter in proportion to the outer, though of the structure characteristic of the genus. Last pair of legs resembling in shape those of *C. staphylinus*, inner expansion of proximal joint, however, comparatively larger, extending beyond the middle of the distal joint and provided with 6 marginal spines, the 2 outermost ones much shorter than the others. Ovisac oblong oval in form, extending to the end of the urosome.

Male with the inner ramus of 2nd pair of legs conical in form, and having the outer 2 joints wholly confluent, sub-apical spine wanting; that of 3rd pair transformed in a similar manner to that in the male of *C. staphylinus*, the mucroniform process of 2nd joint, however, still longer, terminating in a very slender point; inner ramus of 4th pair not differing from that in the female, except in the smaller number of setæ, that of the 1st joint and the proximal one of the last joint being absent. Last pair of legs with the distal joint comparatively smaller than in the male of *C. staphylinus*, differing also somewhat in shape.

Colour whitish.

Length of adult female 0.56 mm.

Remarks.—This form was first recorded, though rather imperfectly, by Claus under the above name, and was subsequently described by Dr. Rehberg as a new species under the name of *C. lucidulus*. It is easily distinguished from the typical species by its much smaller size and shorter anterior antennæ. Another character by which this form differs from all other known species, and to which also Claus has called attention, is the peculiar structure of the spinules fringing the anal opercle, all of them being bifid at the tip.

Occurrence.— Only some few specimens of this form have hitherto come under my notice. They were taken in the neighbourhood of Christiania, from a shallow ditch in company with *Attheyella pygmæa* G. O. Sars.

Distribution.—Sweden (Lilljeborg), Germany (Claus), Holland (v. Breemen), British Isles (Scott).

Gen. 43. **Attheyella**, Brady, 1880.

Generic Characters.—General form of body about as in *Canthocamptus*. Anterior antennæ comparatively short, 8-articulate, and distinctly hinged in the male. Posterior antennæ with the basal part not subdivided, outer ramus of moderate size and generally uniarticulate, with 4 setæ, 2 lateral and 2 apical. Oral parts scarcely different from those in *Canthocamptus*. 1st pair of legs imperfectly prehensile, with the inner ramus in most cases only consisting of 2 joints and scarcely longer than the outer, more rarely 3-articulate and somewhat more elongated. Inner ramus of the 3 succeeding pair of legs poorly developed, biarticulate, with the 1st joint, as a rule, very small; that of 3rd pair in male conspicuously transformed. Last pair of legs of somewhat varying shape in the different species.

Remarks.—This genus, established by Brady, is closely allied to *Canthocamptus*, and its validity may perhaps be disputed, especially as the structure of the 1st pair of legs, at least in 2 of the species, approaches rather nearly to that found in the above-named genus. Yet in all the species of the present genus the inner ramus of the 2 succeeding pairs differs conspicuously from that in *Canthocamptus*, being much shorter and, like that of the 4th pair, only consisting of 2 joints. The genus comprises several species, 5 of which belong to the fauna of Norway. They are all exclusively freshwater forms.

125. Attheyella crassa, G. O. Sars.

(Pl. CXXIX).

Canthocamptus crassus, G. O. Sars, Oversigt af de indenlandske Ferskvandscopepoder. Chr. Vid. Selsk. Forh. f. 1862, p. 23.

Syn: *Attheyella spinosa*, Brady.
„ *Paratachidius inermis*, Brady.

Specific Charakters.—Female. Body comparatively short and thick, cylindric of form, slightly tapered behind. Cephalic segment broadly rounded in front, with the rostral projection very small. Urosome much shorter than the anterior division, and having the segments fringed at the end ventrally and laterally with unusually long and closely set spinules; last segment somewhat shorter than the preceding one, anal opercle quite smooth. Caudal rami about the length of the anal segment, and of rather a peculiar appearance, being instricted at the base and sub-pyriform in shape, with the inner edge strongly convex and the end narrowed to an obtuse point, apical setæ more or less strongly twisted and bent

outwards, the 2 setæ of the outer edge rather slender and remote from the apex. Anterior antennæ much shorter than the cephalic segment and rather thick at the base, terminal part not attaining the length of the proximal one. Posterior antennæ with the outer ramus exceeding half the length of the terminal joint and uniarticulate. 1st pair of legs with the inner ramus distinctly 3-articulate and somewhat longer than the outer, 1st joint much shorter than the other 2 combined. Natatory legs rather strongly built, with the first 2 joints of the outer ramus considerably thickened and densely spinulose, spines of outer edge very coarse. Last pair of legs rather large, with very long and slender marginal setæ, distal joint narrow oblong, tapered towards the end and fringed with 5 setæ, inner expansion of proximal joint narrow linguiform, extending somewhat beyond the middle of the distal joint, marginal setæ 6 in number.

Male considerably smaller than female and of more slender form of body. Caudal rami rather unlike those in female and of quite normal appearance. Legs of 3rd pair with the spine of the middle joint of the outer ramus exceedingly strong and deflexed; inner ramus 3-articulate, with the middle joint produced inside to a slender deflexed stylet, last joint oblong oval in form, tipped with 2 unequal setæ. Last pair of legs rather small, with the inner expansion of proximal joint very slight and only provided with 2 denticulated spines.

Colour whitish grey.

Length of adult female 0.62 mm.

Remarks. This form was described (but not figured) by the present author as early as the year 1862 as a species of the genus *Canthocamptus*. It was subsequently observed by Prof. Brady, who regarded it as new, and described it in his well-known Monograph as the type of the genus *Attheyella*, under the name of *A. spinosa*. The form recorded by the same author at a later date as *Paratachidius inermis*, I am unable to distinguish from the present species. The peculiar shape of the caudal rami in the female will suffice at once to distinguish this species from any of the other forms of *Attheyella*.

Occurrence.—I have only met with this form in larger lakes, on a muddy bottom at a depth of some few fathoms. It was first observed in two lakes near Christiania, Sognsvand and Maridalsvand, and I have subsequently also found it in our largest lake, Mjösen, as also in some other lakes in the southern part of the country. It moves rather slowly, and more frequently keeps to the bottom, twisting its very flexible body between the loose mud, into which it is also enabled to bury itself with great dexterity.

Distribution.—Sweden (Lilljeborg), British Isles (Brady), Germany (Schmeil), Holland (v. Breemen).

126. Attheyella gracilis, G. O. Sars.

(Pl. CXXX).

Canthocamptus gracilis, G. O. Sars, l. c. p. 22.

Syn: *Canthocamptus inornatus*, Scott.

Specific Characters.—Female. Body exceedingly slender and elongated, linear in form, with the two chief divisions of almost equal length. Cephalic segment narrowly rounded in front, rostral projection very small. Caudal segments without distinct whorls of spinules at the hind edge; last segment of about same length as the penultimate one, and having the anal opercle finely ciliated at the edge. Caudal rami slender and narrow, being more than twice as long as they are broad, and slightly tapered distally, tip narrowly truncated, apical setæ of moderate length and only slightly divergent, setæ of outer edge remote from the apex. Anterior antennæ rather slender, being only very slightly dilated at the base, terminal part almost as long as the proximal one. Posterior antennæ with the outer ramus small, not attaining half the length of the terminal joint. 1st pair of legs with both rami narrow, the inner one the longer and 3-articulate, with the 1st joint a little shorter than the other 2 combined. Natatory legs with the outer ramus much narrower than in the preceding species, that of 4th pair very slender and elongated. Last pair of legs with the distal joint rather small, oblong in form, inner expansion of proximal joint very slight and provided with 4 slender setæ. Ovisac oblong in form, with a very limited number of ova arranged in a single layer. Spermatophore, attached to the genital segment, narrow lageniform.

Male much smaller than female and exhibiting the usual sexual differences. 3rd pair of legs of much the same structure as in the male of *A. crassa*, but less strongly built. Inner ramus of 4th pair with the number of setæ much reduced. Last pair of legs exceedingly small, proximal joint without any setiferous expansion inside.

Body semipellucid, of a light yellowish red colour.

Length of adult female 0.70 mm.

Remarks.—This form is at once distinguished from any of the other species of the present genus by its very slender and narrow body. The structure of the last pair of legs is also rather characteristic.

Occurrence.—I have met with this form occasionally in the neighbourhood of Christiania, as also in some other places of the southern part of the country. It is generally found near the edges of small lakes with rich vegetation.

Distribution.—Sweden (Lilljeborg), British Isles (Scott), Germay (Schmeil), Holland (v. Breemen), North America (Herrick).

127. Attheyella pygmæa, G. O. Sars.

(Pl. CXXXI).

Canthocamptus pygmæus, G. O. Sars, l. c. p. 21.

Syn: *Attheyella cryptorum*, Brady.
„ *Canthocamptus Borcherdingi*, Poppe.

Specific Characters.—Female. Body not much elongated, cylindric of form, being only slightly attenuated behind. Rostral projection almost obsolete. Urosome much shorter than the anterior division, its segments distinctly spinulose at the hind edge ventrally and laterally; last segment shorter than the preceding one, and having the anal opercle rather prominent and edged with about 10 coarse spinules. Caudal rami comparatively short and thick, being scarcely longer than they are broad, and armed, in addition to the setæ, with several small denticles both inside and outside, outer edge angularly curved in the middle, inner straight, tip transversely truncated; apical setæ rather elongated and distinctly spinulose, distal seta of the outer edge attached close to the apex. Anterior antennæ short, with the proximal joints rather dilated, terminal part fully as long as the proximal one. Posterior antennæ with the outer ramus of moderate size and distinctly biarticulate. 1st pair of legs rather short, with the rami subequal in length, the inner one composed of 2 joints only, both of about same length. Natatory legs rather strongly built and of a similar structure to that in *A. crassa*. Last pair of legs with the distal joint small, of rounded form, with 5 marginal setæ, the innermost of which is quite short, inner expansion of proximal joint rather large, broadly linguiform and extending beyond the distal joint, maginal setæ rather unequal and 6 in number.

Male exhibiting the usual sexual differences. 2nd pair of legs somewhat unlike those in female, the outer ramus being comparatively shorter and stouter, with the spines of the outer edge much coarser, inner ramus extending nearly as far as the outer and narrowly exserted at the tip, which carries a single slender seta. Inner ramus of 3rd pair of legs transformed in a similar manner to that in the 2 preceding species, though having only a single apical seta; that of 4th pair exceedingly small and apparently uniarticulate, with 2 unequal setæ on the tip. Last pair of legs, as usual, much smaller than in female, with the inner expansion of proximal joint less produced and only provided with 2 unequal spiniform setæ.

Colour whitish, sometimes with a slight reddish tinge.

Length of adult female 0.52 mm.

Remarks.—This is the smallest of the Norwegian species of the present genus, and is moreover easily recognised by the coarsely spinous anal opercle

and the short and broad caudal rami. The *Attheyella cryptorum* of Brady is unquestionably identical with the present species, and this is also the case with the form recorded by Poppe as *Canthocamptus Borcherdingi.*

Occurrence.—I have met with this form not unfrequently in the neighbourhood of Christiania, as also in some other places of the country. It is generally found in small ditches and shallow streams, more rarely in larger lake near the border.

Distribution.—Sweden (Lilljeborg), British Isles (Brady), Germany (Poppe), Holland (v. Breemen).

128. Attheyella arctica (Lilljeborg).

(Pl. CXXXII).

Canthocamptus arcticus, Lilljeborg, Synopsis Harpacticidarum aqvæ dulcis Sveciæ, Kgl. Svenska Vet. Akad. Handl. Bd. 36, p. 37, Pl. II, fig. 23, Pl. III, figs. 1—4.

Specific Characters.—Female. Body somewhat more slender than in *A. nygmæa* and gradually attenuated behind. Rostral projection small, but distinct. Urosome with the segments minutely spinulose at the hind edge ventrally and laterally, last segment about the length of the preceding one, anal opercle fringed with about 16 comparatively small denticles. Caudal rami of moderate size and somewhat divergent, broad at the base and slightly tapering distally, dorsal face exhibiting a rounded gibbosity fringed with a transverse series of thin setiform spinules, tip transversely truncated, apical setæ rather elongated, distal seta of outer edge attached close to the apex. Anterior antennæ of moderate length, with the proximal joints slightly dilated, terminal part rather narrow and fully as long as the proximal one. Posterior antennæ with the outer ramus comparatively small, uniarticulate. 1st pair of legs with the rami of about equal length, the inner one biarticulate, distal joint shorter than proximal. Natatory legs with the outer ramus very strongly built, that of 4th pair scarcely more slender than in the other 2 pairs and abruptly bent inwards. Last pair of legs comparatively large, distal joint oval in form, inner expansion of proximal joint broadly linguiform and extending beyond the distal joint, marginal setæ 6 in number and, except the outermost one, very long and curved.

Male with the inner rami of the natatory legs more or less differing in shape and armature from those in female, that of 3rd pair, as usual, the most conspicuously transformed, being composed of 3 joints, the middle one exserted inside to a deflexed lanceolate process, last joint terminating in a short spine, inside which a likewis short angularly bent seta is attached. Last pair of legs

very small, with the inner expansion of proximal joint not extending beyond the middle of the distal joint and armed with 2 spiniform setæ only.

Colour whitish.

Length of adult female 0.65 mm.

Remarks.—This form, recently described by Prof. Lilljeborg, is nearly allied to *A. pygmæa*, but of larger size, and moreover differs in the shape of the caudal rami, as also in the structure of some of the appendages.

Occurrence.—Only a few specimens of this form have hitherto come under my notice. They were taken many years ago from a shallow swamp in eastern Finmark, at some distance from Vardö.

Distribution.—Northern part of Sweden (Lilljeborg).

129. Attheyella Duthiei, Scott.

(Pl. CXXXIII).

Attheyella Duthiei, Scott, On some new and rare British Copepoda. Ann. Mag. Nat. Hist. ser. 6, Vol. XVIII, p. 4, Pl. II, figs. 1—13.

Syn: *Canthocamptus Duthiei*, Lilljeborg.

Specific Characters.—Female. Body moderately slender, slightly tapering behind. Cephalic segment comparatively large and produced in front to a rather prominent rostral projection obtusely rounded at the tip. Caudal segments fringed at the hind edge ventrally and laterally with small spinules; last segment shorter than the preceding one, anal opercle small, somewhat angular in the middle, and perfectly smooth. Caudal rami comparatively large and thick, slightly divergent and somewhat tapered distally, dorsal face exhibiting a slight carina terminating in a knob-like prominence outside which the dorsal seta issues; setæ of the outer edge very slender and elongated, the distal one remote from the apex. Anterior antennæ of moderate length, and gradually attenuated distally, terminal part not attaining the length of the proximal one. Posterior antennæ with the outer ramus uniarticulate. 1st pair of legs with the outer ramus a little shorter than the inner, middle joint wanting the usual seta inside; inner ramus biarticulate, with the distal joint fully as long as the proximal one, but much narrower and provided inside, in about the middle, with a slender seta not found in the other species. Natatory legs moderately strong, with the proximal joint of the inner ramus more fully developed than in the other species; outer ramus of 2nd pair of legs without any setæ inside. Last pair of legs with the distal joint rather large and oval in form, being finely ciliated inside, inner expansion of proximal joint narrow

linguiform, not extending as far as the distal one, marginal setæ rather elongated and 6 in number.

Male with the inner rami of the 2nd and 3rd pairs of legs peculiarly transformed; that of 2nd pair provided at the end of the proximal joint with 2 juxtaposed knob-like prominences, that of 3rd pair biarticulate, distal joint terminating in 2 slender spines forming together a kind of forceps. Last pair of legs, as usual, much smaller than in female, inner expansion of proximal joint with only 2 spiniform setæ.

Colour whitish.

Length of adult female 0.71 mm.

Remarks.—This form was first described under the above name by Th. Scott, and was subsequently recorded by Prof. Lilljeborg as a species of the genus *Canthocamptus*, the genus *Attheyella* being not accepted by that author. It is an easily recognizable form, being especially distinguished by the prominent rostral projection and the comparatively large and thick caudal rami, the 2 outer setæ of which are moreover unusually elongated.

Occurrence.—The only place where I have hitherto met with this species is in the "Songsvand", near Christiania. It occurred in the northern part of this lake, on a muddy bottom at a depth of about 3 fathoms.

Distribution.—Sweden (Lilljeborg), Scotland (Scott).

Gen. 44. **Moraria,** Scott, 1893.

Syn: *Ophiocamptus,* Mrázek.

Generic Characters.—Body slender, cylindric in form, and very flexible, with the segments rather sharply defined. Cephalic segment produced in front to a distinctly prominent rostral projection. Anal opercle smooth, angularly produced behind. Caudal rami rather large, oblong in form, with 2 slender bristles outside, apical setæ comparatively short. Anterior antennæ in female 7-articulate, the terminal part being only composed of 3 joints; those of male strongly hinged. Posterior antennæ rather stout, with the outer ramus very small and uniarticulate. Mandibular palp likewise small, biarticulate. Maxillæ and maxillipeds about as in *Canthocamptus*. Legs very short, with the natatory setæ imperfectly developed, 1st pair not much different in structure from the 3 succeeding ones, inner ramus of the latter biarticulate and much shorter than the outer, being only slightly

transformed in the male. Last pair of legs foliaceous, with the proximal joint more or less expanded inside.

Remarks.—This genus was established in the year 1893 by Th. Scott, and in the same year, though somewhat later, Mr. Mràzek established his genus *Ophiocamptus*, which undoubtedly is identical with Scott's genus. Prof. Lilljeborg did not, however, accept neither this nor the preceding genus, including the species of both in the old genus *Canthocamptus*. Yet, in spite of the near relationship of these 3 genera, I find it convenient to keep them apart, as there are some anatomical characters which seem to distinguish them pretty well from each other. As to the present genus, it is chiefly characterised by the reduced number of joints in the anterior antennæ, and more especially by the poor development of the natatory legs, which indeed seems to render the animal very little apt to move freely in the water. In addition to the type species described below, in recent time 3 other species have been recorded agreeing in all essential characters with the former, though evidently specifically distinct. They all are true fresh-water forms.

130. Moraria brevipes, G. O. Sars.

(Pl. CXXXIV).

Canthocamptus brevipes, G. O. Sars. Oversigt af de indenlandske Ferkvandscopepoder. Chr. Vid. Selsk. Forh. 1862, p. 24.

Syn: *Canthocamptus gracilis*, Poppe (not G. O. Sars).
„ *Moraria Anderson-Smithi*, Scott.
„ *Ophiocamptus Sarsii*, Mràzek.

Specific Characters.—Female. Body rather slender and elongated, with the anterior division scarcely broader than the posterior. Cephalic segment about the length of the 3 succeeding segments combined, rostral projection well marked and tipped with a small knob-like prominence. Urosome fully as long as the anterior division, segments sharply defined and finely spinulose at the hind edge ventrally and laterally, last segment scarcely shorter than the preceding one. Caudal rami exceeding somewhat in length the anal segment, narrow oblong in form and distinctly keeled dorsally, apical setæ comparatively short, setæ of outer edge remote from the apex. Anterior antennæ rather short and thickened at the base, terminal part nearly as long as the proximal one. 1st pair of legs with the inner ramus scarcely as long as the outer, and having the distal joint shorter and narrower than the proximal one. Last pair of legs with the terminal joint comparatively small, rounded oval in form, with 5 short marginal setæ, 3 of which

are spiniform, inner expansion of proximal joint rather produced, linguiform, extending far beyond the distal one, marginal setæ 6 in number, all short and spiniform.

Male with the inner ramus of 3rd pair of legs biarticulate, distal joint projecting inside to a strong deflexed spiniform process and carrying on the tip 2 short setæ. Last pair of legs poorly developed, with the inner expansion of proximal joint quite short and carrying 2 spiniform setæ.

Colour whitish grey.

Length of adult female 0.60 mm.

Remarks.—This form was described by the present author as early as the year 1862 as a species of the genus *Canthocamptus*, and was subsequently also observed in Germany by Dr. Poppe, who however erroneously identified it with *Canthocamptus gracilis* G. O. Sars. The *Ophiocamptus Sarsii* of Mràzek appears to be the present species, whereas that named by him *O. brevipes* is specifically distinct (= M. Mràzeki Scott). The form recorded by Th. Scott as the type of the genus *Moraria* and named *M. Anderson-Smithi*, is unquestionably identical with the present species. The most conspicuous distinguishing character of the latter is found in the structure of the last pair of legs.

Occurrence.—I have hitherto only met with very few specimens of this form. They were found many years ago in a small shallow lake in the neighbourhood of Christiania.

Distribution.—Sweden (Lilljeborg), Germany (Poppe), Scotland (Scott).

Gen. 45. **Mesochra**, Boeck, 1865.

Syn: *Paratachidius*, Brady & Robertson.

Generic Characters.—Body, as a rule, not much elongated, tapering behind. Cephalic segment comparatively large and produced in front to a more or less prominent flattened rostral projection. Anal opercle not spinulose. Caudal rami short, transversely truncated at the tip. Anterior antennæ comparatively short, with the number of articulations reduced, those in male hinged in the usual manner. Posterior antennæ with the basal part not subdivided, outer ramus very small and narrow, uniarticulate. Mandibular palp, as a rule, biarticulate, with the basal joint not expanded. Maxillæ and maxillipeds about as in the preceding genera. 1st pair of legs distinctly prehensile, with the inner ramus much longer

than the outer and more or less bent at the end. Natatory legs with the inner ramus biarticulate, but comparatively more fully developed than in *Attheyella;* that of 3rd pair slightly transformed in the male. Last pair of legs with the distal joint very small, inner expansion of proximal joint in female much produced, linguiform.

Remarks.—This genus also is very nearly allied to *Canthocamptus*, and has partly been confounded with it by other authors. It differs, however, in the reduced number of articulations in the anterior antennæ, and in the more pronounced prehensile character of the 1st pair of legs, as also in the inner ramus of the natatory legs being biarticulate, with the proximal joint well developed. Several species of this genus have been described by different authors, partly from the sea, partly from brackish water. None of them are, however, strictly fresh-water forms, as is the case with the species belonging to the 3 preceding genera. To the fauna of Norway belong 3 species, to be described below.

131. Mesochra Lilljeborgi, Boeck.

(Pl. CXXXV).

Mesochra Lilljeborgi, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 275.

Syn: *Canthocamptus Strömi*, Lilljeborg (not Baird).
„ *Paratachidius gracilis*, Brady & Robertson.

Specific Characters.—Female. Body moderately slender and gradually attenuated behind, with the cephalic segment about as long as the 3 succeeding segments combined. Rostral projection distinctly prominent, obtuse at the tip. Urosome much shorter than the anterior division and having the segments minutely spinulose at the hind edge ventrally and laterally; last segment about the length of the preceding one. Caudal rami scarcely longer than they are broad, apical setæ of moderate length. Anterior antennæ much shorter than the cephalic segment, 7-articulate, terminal part 3-articulate and shorter than the proximal one. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, middle joint with a small seta inside; inner ramus biarticulate, the 2 outer joints being coalescent and scarcely exceeding in length $^1/_3$ of the 1st joint, seta inside the latter joint attached considerably behind the middle. Last pair of legs with the distal joint rounded oval in form, inner expansion of proximal joint much produced, linguiform with 6 slender marginal setæ.

Male with the inner ramus of 3rd pair of legs biarticulate, last joint armed inside with a deflexed spine and at the tip with 2 unequal setæ. Last

pair of legs with the inner expansion of proximal joint extending scarcely beyond the distal joint and provided with 3 comparatively short setæ.

Colour whitish, with a more or less distinct yellowish green tinge.

Length of adult female 0.67 mm.

Remarks.—This form was first described by Prof. Lilljeborg, but erroneously identified by him with *Canthocamptus Strömi* of Baird, for which reason Boeck proposed for it the above specific name, regarding it moreover as the type of his new genus *Mesochra*. The form subsequently recorded by Mrss. Brady and Robertson under the name of *Paratachidius gracilis* is the same species.

Occurrence.—This is a strictly littoral form, occurring rather plentifully in many places both of the south and west coasts of Norway, at least up to the Trondhjem Fjord. It is generally found close to the beach in shallow bays, where the water is more or less brackish. Like other littoral species, it is not seldom left in tidal pools, but is scarcely ever found in purely fresh water.

Distribution.—Coast of Sweden (Lilljeborg), British Isles (Brady), bay of Keel (Giesbrecht), coast of France (Canu), Novaja Zemlia (Scott).

132. Mesochra pygmæa (Claus).

(Pl. CXXXVI).

Dactylopus pygmæus, Claus, Die freilebenden Copepoden, p. 127, Pl. XVII, fig. 3.

Syn: *Canthocamptus parvus,* Scott.

Specific Characters.—Female. Body comparatively short and stout, attenuated behind. Cephalic segment rather large, exceeding somewhat in length the 3 succeeding segments combined, rostral projection less prominent than in the preceding species. Last segment of urosome shorter than the preceding one. Caudal rami very short, being scarcely as long as they are broad, and transversely truncated at the tip, apical setæ rather elongated and somewhat thickened at the base. Anterior antennæ rather small and only composed of 6 joints, the 3rd and 4th being coalescent, terminal part nearly as long as the proximal one. 1st pair of legs with the outer ramus scarcely more than half as long as the inner and somewhat curved at the base, middle joint without any seta inside; inner ramus distinctly 3-articulate, with the 1st joint somewhat dilated at the base and having the seta of the inner edge attached in front of the middle, last joint a little longer than 2nd, and both together not attaining half the length of the 1st. Natatory legs of a very similar structure to those in the type species. Last pair of legs likewise rather similar, though having the distal joint somewhat larger

and obliquely truncated at the end, inner expansion of proximal joint less broad and only provided with 5 marginal setæ. Ovisac generally rather large, though containing a limited number of ova.

Male with the inner ramus of 3rd pair of legs transformed in a similar manner to that in the type species. Last pair of legs with the inner expansion of proximal joint scarcely extending as far as the distal joint, and only provided with 2 spiniform setæ.

Colour dark yellowish grey.

Length of adult female 0.38 mm.

Remarks.—This form was rather imperfectly described by Claus as a species of the genus *Dactylopus*. Boeck justly removed it from that genus, and included it in his new genus *Mesochra*. Indeed, saving the distinctly 3-articulate inner ramus of the 1st pair of legs, it agrees in all essential characters closely with the type species, *M. Lilljeborgi*. The *Canthocamptus parvus* of Scott is unquestionably identical with the present species.

Occurrence.—I have met with this very small form not unfrequently along the whole south and west coast of Norway, at least up to the Trondhjem Fjord in moderate depths among algæ. It is a strictly marin form, being scarcely ever found in brackish water. In the living state it is readily observed by its dark colour.

Distribution.—Heligoland (Claus), Scottish coast (Scott), Franz-Josef Land (Scott).

133. Mesochra hirticornis (Scott).

(Pl. CXXXVII).

Canthocamptus hirticornis, Scott, Thirteenth Rep. Fishery Board for Scotland, Part III, p. 251, Pl. IX, figs. 13—26.

Syn: *Canthocamptus megalops*, Lilljeborg.

Specific Characters.—Female. Body comparatively short and somewhat depressed anteriorly, tapering gradually behind. Rostral projection well marked, obtusely rounded at the tip. Urosome much shorter than the anterior division, last segment scarcely as long as the preceding one. Caudal rami about as long as they are broad at the base and slightly contracted behind, apical setæ of moderate length. Eye unusually large. Anterior antennæ short, 7-articulate, resembling in structure those in *M. Lilljeborgi*. Posterior antennæ likewise almost exactly as in that species. Mandibular palp with the distal joint not defined from

the basal one. 1st pair of legs with the outer ramus much shorter than the inner, though extending about as far as the 1st joint of the latter, middle joint provided inside with a small seta; inner ramus distinctly 3-articulate, 1st joint with the seta of the inner edge attached near the end, the last 2 joints combined considerably exceeding half the length of the 1st. Natatory legs of the structure characteristic of the genus. Last pair of legs with the distal joint very small, inner expansion of proximal joint much produced, linguiform, and provided with 6 marginal setæ, one of which is much elongated. Ovisac of moderate size, oval in forme.

Colour, according to Prof. Lilljeborg, greyish white.

Length of adult female 0.50 mm.

Remarks.—This form, first described by Th. Scott as a species of the genus *Canthocamptus*, is unquestionably congeneric with the 2 preceding species, exhibiting, as it does, all essential characters of the gen. *Mesochra*. According to Th. Scott, the form recorded some years later by Prof. Lilljeborg as *Canthocamptus megalops* is identical with the present species. It is easily recognised by its comparatively short depressed body and by the structure of the 1st pair of legs, the inner ramus of which has the 2 outer joints considerably more fully developed than in the 2 other species.

Occurrence.—I have only met with this form in a single locality, viz., in a brackish tarn off the sout coast of Norway, "Ostravigtjernet", in which artificial cultivation of oysters was for the first time established by the late Prof. H. Rasch. It occurred here only quite occasionally. Only female specimens were found.

Distribution.—Scottish coast (Scott), Baltic coast of Sweden (Lilljeborg).

Gen. 46. **Nitocra**, Boeck, 1865.

Generic Characters.—Body of slender cylindric form, resembling somewhat that in the genus *Canthocamptus*. Segments of urosome coarsely spinulose at the hind edge ventrally and laterally, last segment exhibiting also a dorsal series of spinules, anal opercle regularly denticulated at the edge. Caudal rami short, more or less covered with spinules in addition to the usual setæ. Rostral projection very small, narrow conical in form. Anterior antennæ of moderate size, 8-articulate, and densely fringed with slender bristles; those in male transformed in the usual manner. Posterior antennæ with the basal part distinctly subdivided,

outer ramus short, uniarticulate, dilated distally, and carrying 3 strong setæ. Mandibular palp biarticulate, with the basal joint slightly dilated. Maxillæ with the exopodal and epipodal lobules well defined, accessory lobe wanting. Maxillipeds of the usual structure. 1st pair of legs rather strongly built and distinctly prehensile, inner ramus 3-articulate, with the outer 2 joints more or less bent upon the 1st. Natatory legs rather fully developed, with the inner ramus in all of them distinctly 3-articulate. None of these legs transformed in male. Last pair of legs with the distal joint comparatively large, inner expansion of proximal joint less produced than in the gen. *Mesochra*.

Remarks.—This genus was rather imperfectly characterised by Boeck, and indeed was not accepted by any of the British authors. Dr. Giesbrecht, however, supported the Boeckian genus, though confounding it partly with another genus established by Boeck, viz., *Ameira*. None of the 2 species originally recorded by Boeck as members of the present genus were recognized by subsequent authors. The genus is well characterised from any of the 4 preceding ones by the distinctly 3-articulate inner rami of the natatory legs, as also by some other structural differences mentioned in the above diagnosis. We know at least of 4 distinct species referable to this genus, 2 of which belong to the fauna of Norway.

134. Nitocra typica, Boeck.

(Pl. CXXXVIII).

Nitocra typica, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 274.

Syn: *Canthocamptus palustris*, Brady.
„ *Nitocra oligochæta*, Giesbrecht.
„ *Ameira amphibia*, Brady.

Specific Characters.—*Female*. Body very slender, sublinear in form, with the anterior division scarcely broader than the posterior. Cephalic segment not attaining the length of the 3 succeeding segments combined, rostral projection extremely small. Urosome very slightly tapered behind, last segment shorter than the preceding one and coarsely spinulose at the end both dorsally and ventrally; anal opercle fringed with about 12 coarse denticles. Caudal rami much broader than they are long and somewhat obliquely truncated at the end, apical setæ rather slender. Anterior antennæ almost as long as the cephalic segment and gradually attenuated distally, 3rd joint a little longer than 4th, terminal part not fully attaining the length of the proximal one. 1st pair of legs with the outer ramus much shorter than the inner, middle joint with a short seta inside, last

joint armed with 3 strong claw-like spines and 2 geniculated setæ; inner ramus with the last joint a little larger than the middle one, both together about half the length of the 1st. Natatory legs with the setæ on the terminal joints of the rami somewhat reduced in number. Last pair of legs not very large, distal joint oval in form and provided with 6 marginal setæ, inner expansion of proximal joint extending to about the middle of the distal joint, marginal setæ 5 in number.

Colour whitish.

Length of adult female 0.64 mm.

Remarks.—This is the form originally recorded by Boeck as the type of his genus *Nitocra*. The *Canthocamptus palustris* of Brady is unquestionably identical with Boeck's species, and I am quite unable to see any difference between it and the form recorded by the same author some years later as *Ameira amphibia*. Dr. Giesbrecht described the species under another name, viz., *Nitocra oligochæta*.

Occurrence.—I have met with this form in several places of the west coast of Norway, as also in the Trondhjem Fjord. It is a strictly littoral species, found in more or less brackish water and occasionally also in tidal pools.

Distribution.—British Isles (Brady), bay of Keel (Giesbrecht), Dutsh coast (v. Breemen), coast of France (Canu), Novaja Zemlia (Scott).

135. Nitocra spinipes, Boeck.

(Pl. CXXXIX).

Nitroca spinipes, Boeck, l. c. p. 274.

Syn: *Canthocamptus palustris*, var. *elongata*, Scott.

Specific Characters.—Female.—Very like the preceding species, but of larger size and still more slender form of body. Last segment of urosome, as in that species, coarsely spinulose at the end, and having the anal opercle edged with strong denticles. Caudal rami spinulose not only on the edge, but also dorsally. Anterior antennæ resembling in structure those of *N. typica*, but with the 2 basal joints comparatively more dilated and the 3rd joint shorter than 4th. 1st pair of legs with the inner ramus scarcely as long as the outer, the last 2 joints of about equal size and combined attaining almost the length of the 1st, the latter with a series of spinules outside its distal part. Natatory legs with the setæ of the terminal joints less reduced in number. Last pair of legs resembling in shape those in *N. typica*, distal joint however with only 5 marginal setæ,

and inner expansion of proximal joint extending beyond the middle of the distal joint; those in male, as usual, of smaller size, with the inner expansion of proximal joint less prominent and only provided with 3 short setæ.

Body of whitish colour, with a more or less distinct yellowish tinge.

Length of adult female 0.76 mm.

Remarks.—This species is closely allied to the preceding one, and may easily be confounded with it. On a closer comparison, it is however found to be well distinguished, not alone by its larger size and more slender form of body, but also by some well-marked structural differences mentioned in the above diagnosis. The form recorded by Th. Scott as *Canthocamptus lacustris*, var. *elongata*, is unquestionably identical with the present species.

Occurrence. –I have found this form rather abundantly in the upper part of the Christiania Fjord close to the beach of shallow bays near the town. Boeck records it also from the west coast of Norway (Karmöen).

Distribution.—Scottish coast (Scott).

Gen. 47. **Ameira**, Boeck, 1865.

Generic Characters.—Body, as a rule, rather slender and somewhat compressed in its anterior part. Rostral projection very small, almost obsolete. Segments of urosome less coarsely spinulose than in the genus *Nitocra;* anal opercle perfectly smooth. Caudal rami more generally short and scarcely spinulose. Anterior antennæ 8-articulate, with the last 2 joints very small and less perfectly defined. Posterior antennæ with the basal part distinctly subdivided, outer ramus narrow, uniarticulate. Mandibular palp more fully developed than in the preceding genera, biarticulate, with the basal joint more or less dilated, forming inside a well defined setiferous expansion. Maxillæ with the exopodal and epipodal lobules not defined, accessory lobe present. Anterior maxillipeds with only a single setiferous lobe inside the terminal claw-bearing part. 1st pair of legs distinctly prehensile, but more slender than in the genus *Nitocra,* inner ramus always much longer than the outer and distinctly 3-articulate. Natatory legs with both rami well developed, 3-articulate, the inner one not transformed in the male. Last pair of legs comparatively small, distal joint more or less contracted distally, inner expansion of proximal joint not much produced.

Remarks.—This is also one of the genera established by Boeck, the exact definition of which has proved to be rather difficult, on account of the imperfect

manner in which it was at first characterised. Thus Dr. Giesbrecht was quite unable to distinguish it from the genus *Nitocra*, and the form recorded by Prof. Brady as *Ameira longipes* Boeck, is not an *Ameira* at all, as clearly shown by the structure of the mandibular palp. Th. Scott also did not recognise the exact limits of this genus; for among the numerous species described by him there are some which unquestionably ought to be discarded and transferred to other genera. In the restriction here adopted the present genus is chiefly distinguished from *Nitocra* by the less coarsely spinulose caudal segments, the perfectly smooth anal opercle, as also by some well marked differences in the structure of the antennæ, oral parts and legs mentioned in the above diagnosis. Although, as above stated, several of the species referred to this genus by other authors must be discarded, there still remain a number of nearly-allied species, which may be regarded as true *Ameiras*. Some of these will be described in the following pages.

136. Ameira longipes, Boeck.

(Pl. CXL).

Ameira longipes, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 273 (not Brady).

Specific Characters.—Female. Body moderately slender, with the 2 chief divisions of almost equal length. Last caudal segment scarcely shorter than the preceding one. Caudal rami short, quadrangular, finely ciliated inside, apical setæ rather slender and elongated. Anterior antennæ scarcely as long as the cephalic segment, 2nd joint much the largest and rather dilated, terminal part about half the length of the proximal one. Mandibular palp with 2 setæ inside the basal joint, the outer one very delicate and fringed with long cilia. 1st pair of legs with the outer ramus rather narrow, and scarcely more than half as long as the inner, spines of outer edge comparatively slender and elongated; inner ramus with the 1st joint more than twice as long as the other 2 combined and having the seta of the inner edge somewhat remote from the end, last joint narrow linear in form and about twice as long as the preceding one. Natatory legs of normal structure, with the 2 proximal joints of inner ramus rather broad. Last pair of legs with the distal joint of moderate size, somewhat dilated at the base and narrowed towards the end, inner expansion of proximal joint extending somewhat beyond the middle of the distal joint and provided with 4 marginal setæ, the outermost but one much elongated.

Male much smaller than female and easily recognisable by the strongly hinged anterior antennæ. 1st pair of legs with the spine attached inside the 2nd

basal joint slightly transformed, being somewhat thickened in its outer part, with the tip obtusely pointed. Last pair of legs very small, with the distal joint quite short and the inner expansion of the proximal joint only provided with 3 small setæ.

Body semipellucid, with a slight reddish tinge.

Length of adult female 0.75 mm.

Remarks.—This is the form originally recorded by Boeck as the type of the genus *Ameira*. It is the largest of the Norwegian species and moreover recognizable by the comparatively less elongated anterior antennæ and by the structure of the 1st and last pairs of legs. As mentioned above, the form recorded by Prof. Brady in his well-known Monograph under this name, is quite certainly not Boeck's species, and even belong to a different genus, to be treated off farther on.

Occurrence.—I have met with this form occasionally off the west coast of Norway, at Haugesund and Kopervik, in moderate depths among algæ. It also occurs off the Finmark coast, several specimens being found in a sample taken by Mr. Nordgaard at Repvaag, Porsangerfjord, and kindly sent to me for examination.

Distribution.—Franz-Joseph Land (Scott), Novaja Zemlia (Scott), Polar Islands north of Elsemer Land (2nd Fram Expedition).

137. Ameira minuta, Boeck.

(Pl. CXLI).

Ameira minuta, Boeck, l. c. p. 273.

Syn: *Ameira ambigua*, Scott.

Specific Characters.—Female. Body very slender, sublinear in form, with the anterior division scarcely at all dilated. Last caudal segment shorter than the preceding one. Caudal rami about as in the preceding species, but with the apical setæ comparatively longer. Anterior antennæ rather slender and elongated, exceeding in length the cephalic segment, the first 2 joints much larger than the others. Mandibular palp with 3 setæ inside the basal joint, the middle one the longest. 1st pair of legs with the outer ramus somewhat exceeding half the length of the inner, the last 2 joint of the latter short, subequal, and combined scarcely attaining $^1/_3$ of the length of the 1st. Natatory legs almost exactly as in *A. longipes*. Last pair of legs with the distal joint of regular oval form, inner expansion

of proximal joint rather broad, but scarcely extending beyond the middle of the distal joint, marginal setæ 4 in number.

Body of whitish colour, with a more or less distinct bluish tinge.

Length of adult female 0.64 mm.

Remarks.—The specific name *minuta* proposed by Boeck for this species is somewhat inappropriate, since it in reality cannot properly be said to range among the smaller species of this genus, although being somewhat inferior in size to the type species. The form described by Th. Scott as *A. ambigua* agrees with the present species in the structural details and especially in the shortness of the last joint of the inner ramus of the 1st pair of legs, for which reason I am inclined to believe it to be identical with Boeck's species, though the habitus-figure (side-view of the animal) looks somewhat different by its more robust form. This may however be due to an accidental contraction of the specimen drawn.

Occurrence.—This species is not uncommon in the upper part of the Christiania Fjord in moderate depths among algæ, and I have also found it occasionally off the west coast of Norway, at Haugesund and Kopervik.

Distribution.—Scottish coast (Scott).

138. Ameira tenuicornis, Scott.

(Pl. CXLII).

Ameira tenuicornis, Scott, in 20th Ann. Report of the Fishery Board for Scotland. Part III, p. 549, Pl. XXIV, figs. 1—9.

Specific Characters.—Female. Body somewhat less slender than in the preceding species, with the cephalic segment rather large and deep. Last segment of urosome smaller than the preceding one. Caudal rami short, transversely truncated at the tip. Anterior antennæ very slender and considerably exceeding in length the cephalic segment, the 2 basal joints much less dilated than in the 2 preceding species, terminal part not attaining half the length of the proximal one. Mandibular palp with 2 setæ inside the basal joint, the outer one rather small and finely ciliated. 1st pair of legs with the outer ramus scarcely half as long as the inner, the latter very slender, with the last joint narrow linear in form and much longer than the very small 2nd joint, both together not attaining half the length of the 1st. Natatory legs normal. Last pair of legs with the distal joint oblong in form, distal seta of outer edge very small, inner expansion of proximal joint scarcely extending to the middle of the distal joint, marginal setæ 4 in number.

Body whitish, with a slight yellow tinge.

Length of adult female 0.44 mm.

Remarks.—In the slender form of the anterior antennæ and in the structure of the 1st and last pairs of legs, this species seems to agree exactly with the form described by Th. Scott under the above name. The size of the Norwegian specimens is however much inferior to that recorded by Th. Scott (0.67 mm.), and for this reason the identity of these 2 forms may perhaps appear somewhat doubtful.

Occurrence.—I have met with this small species not unfrequently in several places both off the south and west coasts of Norway in moderate depths among algæ.

Distribution.—Scottish coast (Scott).

139. Ameira tau (Giesbrecht).

(Pl. CXLIII).

Nitocra tau, Giesbrecht, Die freilebenden Copepoden des Kieler Föhrde, p. 117, Pl. I, figs 9, 13 &c.

Specific Characters.—Female. Body rather slender, sublinear in form, with the cephalic segment less deep than in the preceding species. Last caudal segment shorter than the preceding one. Caudal rami about as long as they are broad and transversely truncated at the tip, apical setæ of moderate length. Anterior antennæ shorter than the cephalic segment, and having the 2 basal joints rather dilated, terminal part not attaining half the length of the proximal one. Mandibular palp with a single thickish seta inside the basal joint. 1st pair of legs with the outer ramus about half the length of the inner, terminal joint of the latter very slender, linear in form, being about 3 times as long as the 2nd, both together nearly as long as the 1st. Last pair of legs resembling those in *A. tennicornis*, but with the distal joint comparatively smaller.

Colour whitish.

Length of adult female 0.50 mm.

Remarks.—The above-described form is unquestionably that recorded by Dr. Giesbrecht as *Nitocra tau*. It is however a true *Ameira*, exhibiting, as it does, all the essential characters of that genus. From the 3 preceding species it is especially distinguished by the structure of the inner ramus of the 1st pair of legs.

Occurrence.—I have met with this form occasionally both of the south and west coasts of Norway, as also in the Trondhjem Fjord. It is a strictly

littoral form, occurring, as a rule, close to the beach in shallow bays, sometimes also in rockpools or in more or less brackish water.

Distribution.—Bay of Keel (Giesbrecht).

140. Ameira simplex, Scott.

(Pl. CXLIV).

Ameira simplex, Norman and Scott, New Crustacea from Devon and Cornwall. Ann. Mag. Nat. Hist. ser. 7, Vol. XV, p. 291.

Specific Characters.—Female. Body moderately slender, with the 2 chief divisions of almost equal length. Cephalic segment scarcely longer than the 3 succeeding segments combined, and conspicuously narrowed in front. Last caudal segment about the length of the preceding one. Caudal rami somewhat longer than they are broad and transversely truncated at the tip. Eye apparently wanting. Anterior antennæ comparatively short, scarcely exceeding half the length of the cephalic segment, the 2 basal joints much the largest and combined almost as long as the remaining part of the antenna. Posterior antennæ with the basal part imperfectly subdivided. Mandibular palp comparatively small, with only a single seta inside the basal joint. 1st pair of legs with the outer ramus somewhat exceeding half the length of the inner, terminal joint of the latter very slender, about twice as long as the 2nd and scarcely shorter than the 1st, setæ inside these joints unusually long and distinctly ciliated. 3rd pair of legs with the terminal joint of inner ramus almost as long as the other 2 combined, and provided inside with 3 natatory setæ. Terminal joint of outer ramus in the 4th pair of legs likewise with 3 setæ inside, the outermost of which however is very small. Last pair of legs with the distal joint oval in form, slightly narrowed towards the end, inner expansion of proximal joint extending to about the middle of the distal joint and provided with 5 setæ, the outermost out one much the longest.

Colour whitish.

Length of adult female 0.60 mm.

Remarks.—This species has been recently described by Th. Scott in the above-quoted Journal, and the following year it was also figured in a separate work "On Crustacea from Devon and Cornwall". It is a somewhat anomalous form, differing in several respects conspicuously from the preceding species, and approaching the new genus *Parameira* (see below), to which it perhaps more properly should be referred. The shape of the last pair of legs however seems to agree better with that found in *Ameira*.

Occurrence.—I have hitherto only met with this form in the uppert part of the Christiania Fjord, at a short distance from the town. It occurred here not unfrequently in a depth of 3—6 fathoms on a muddy bottom covered with decaying algæ.

Distribution.—British Isles (Scott).

141. Ameira tenella, G. O. Sars, n. sp.

(Pl. CXLV).

Specific Characters.—Female. Body exceedingly slender, narrow linear in form, with the posterior division fully as long as the anterior. Last caudal segment about the length of the preceding one. Caudal rami unusually much produced, being about 3 times as long as they are broad, and slightly tapered distally, apical setæ much elongated. Anterior antennæ very slender, considerably exceeding in length the cephalic segment, and clothed in their outer part with exceedingly long setæ, 3rd and 4th joints of about equal length, terminal part scarcely longer than those 2 joints combined. Posterior antennæ with the outer ramus less narrow than in the other species. 1st pair of legs moderately slender, outer ramus somewhat exceeding half the length of the inner, terminal joint of the latter narrow linear, fully 3 times as long as the very small 2nd joint, both together a little shorter than the 1st. Natatory legs slender, with the setæ somewhat reduced in number. Last pair of legs with the distal joint very narrow, sublinear in form, densely ciliated along the outer edge and the proximal part of the inner, apical seta very slender and elongated, inner expansion of proximal joint comparatively short, with 4 marginal setæ.

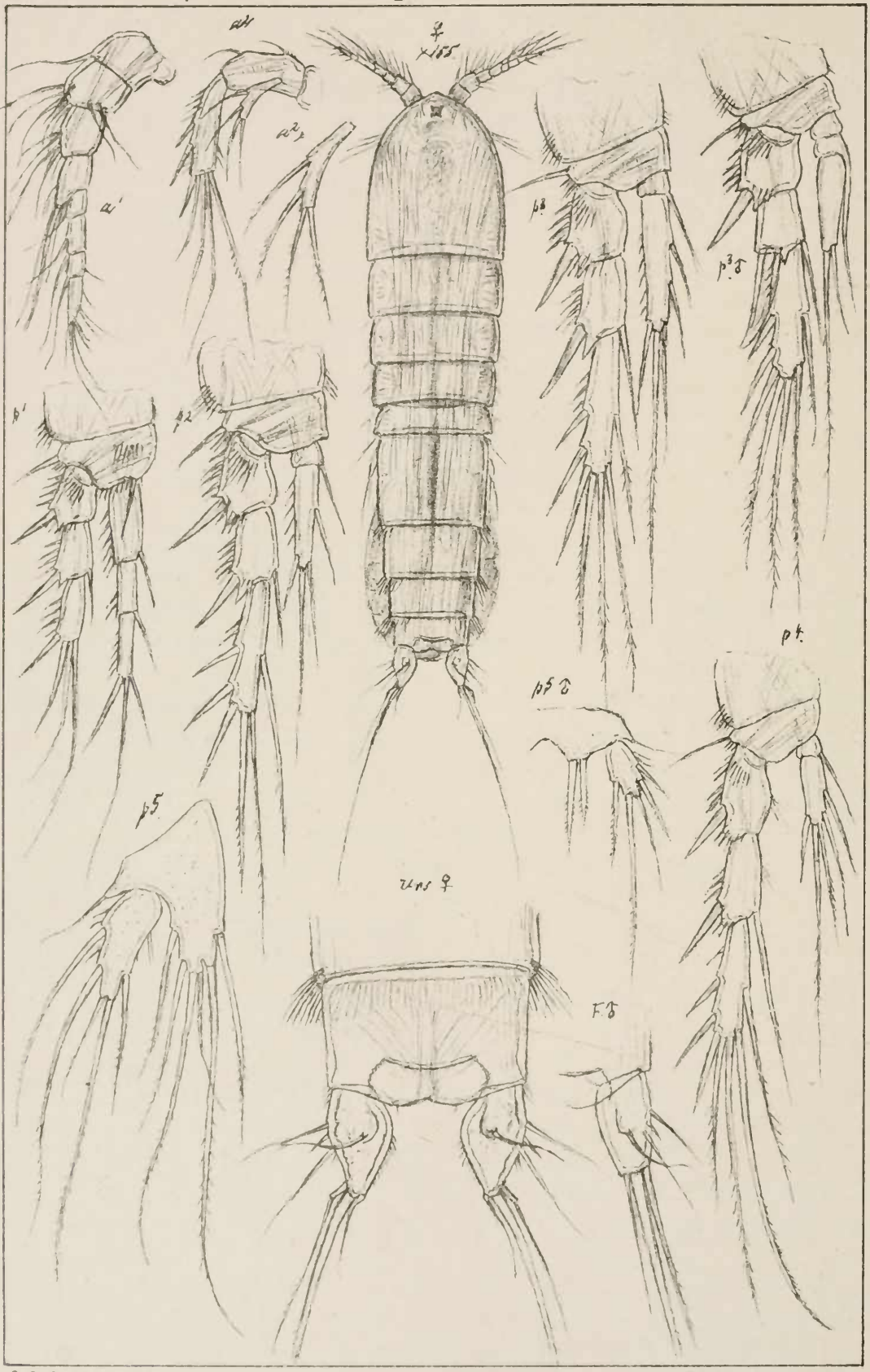
Colour not yet ascertained.

Length of adult female 0.53 mm.

Remarks.—By the very slender form of the body, the elongated anterior antennæ and the unusually much produced caudal rami, this form exhibits a perplexing similarity to a species described by Mr. A. Scott under the name of *Ameira gracilis*, and indeed at first I believed both to be identical. On a closer examination of the specimens, I have however found some very striking differences in the structure of the appendages, which seem to forbid such an identification. Thus the shape of the last pair of legs is totally different, and also the mutual relation in length of the articulations in the anterior antennæ appears to be very unlike.

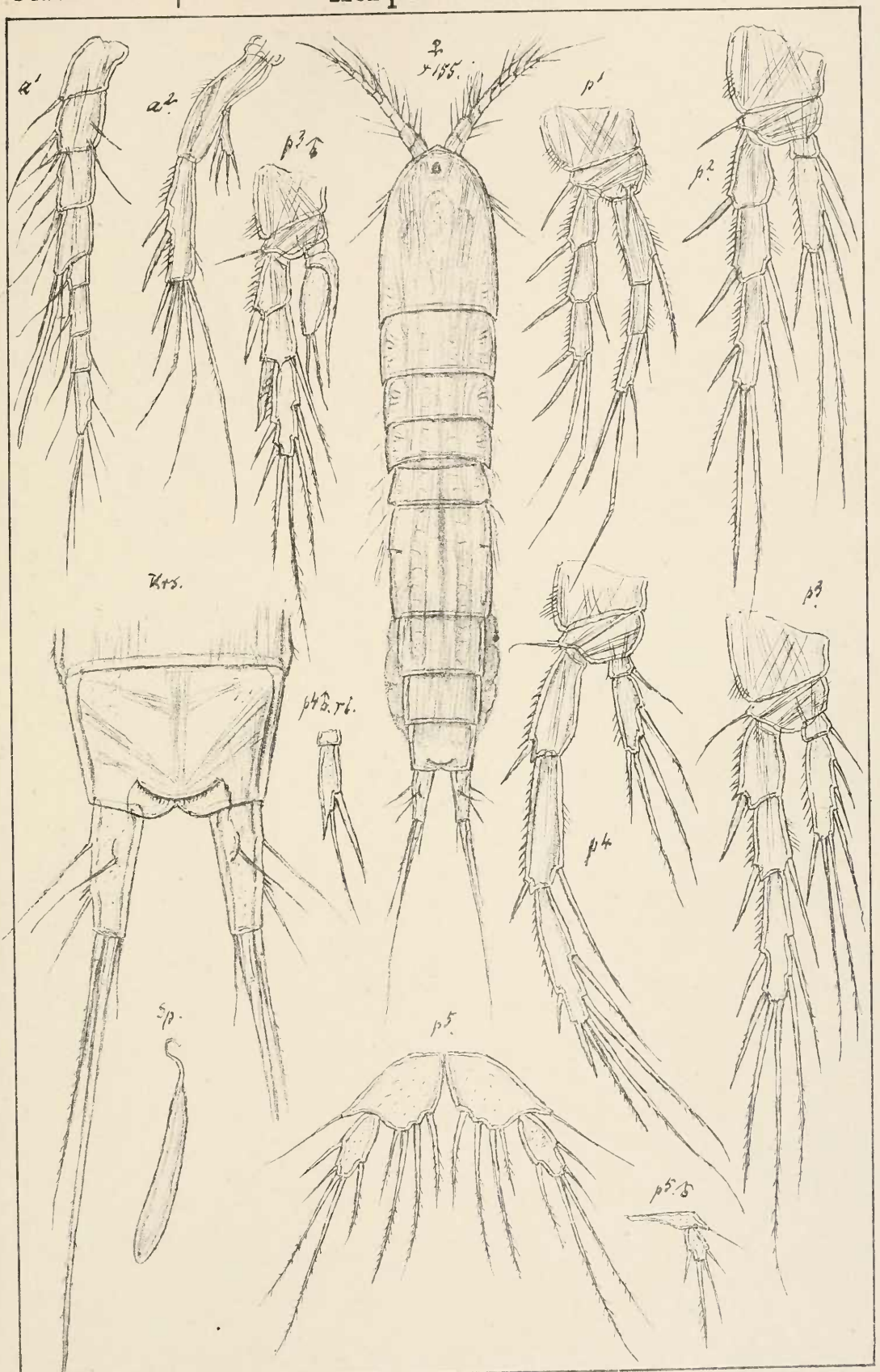
Copepoda

Canthocamptidæ Harpacticoida Pl.CXXIX



G.O. Sars, autogr. Norsk Litogr. Officin.

Attheyella crassa G.O.Sars

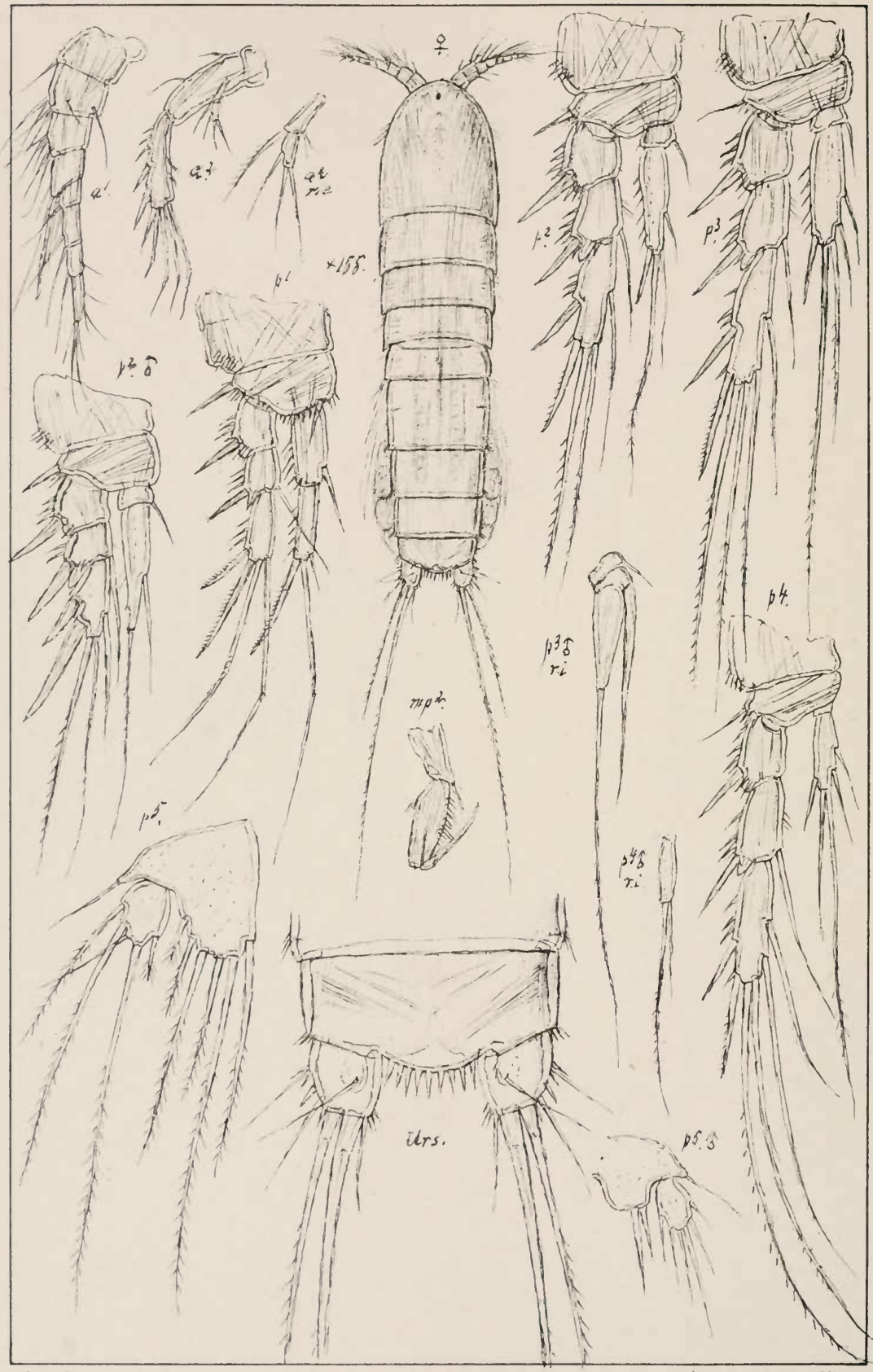


G.O. Sars, autogr. Norsk Litogr. Officin.

Attheyella gracilis, G.O.Sars.

Copepoda

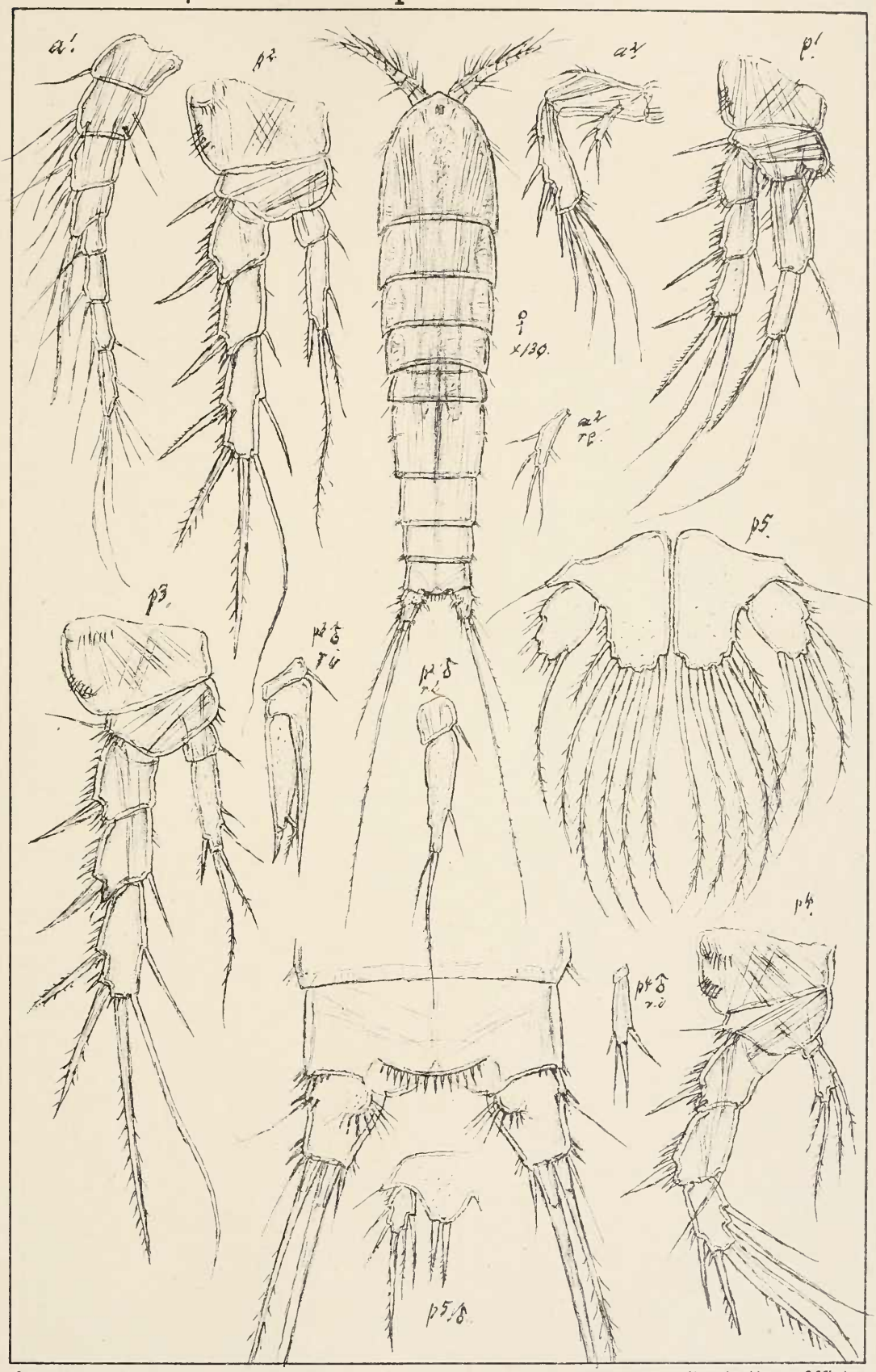
Canthocamptidæ — Harpacticoida — Pl. CXXXI



G. O. Sars, autogr. — Norsk Litogr. Officin.

Attheyella pygmæa, C. O. Sars

Copepoda

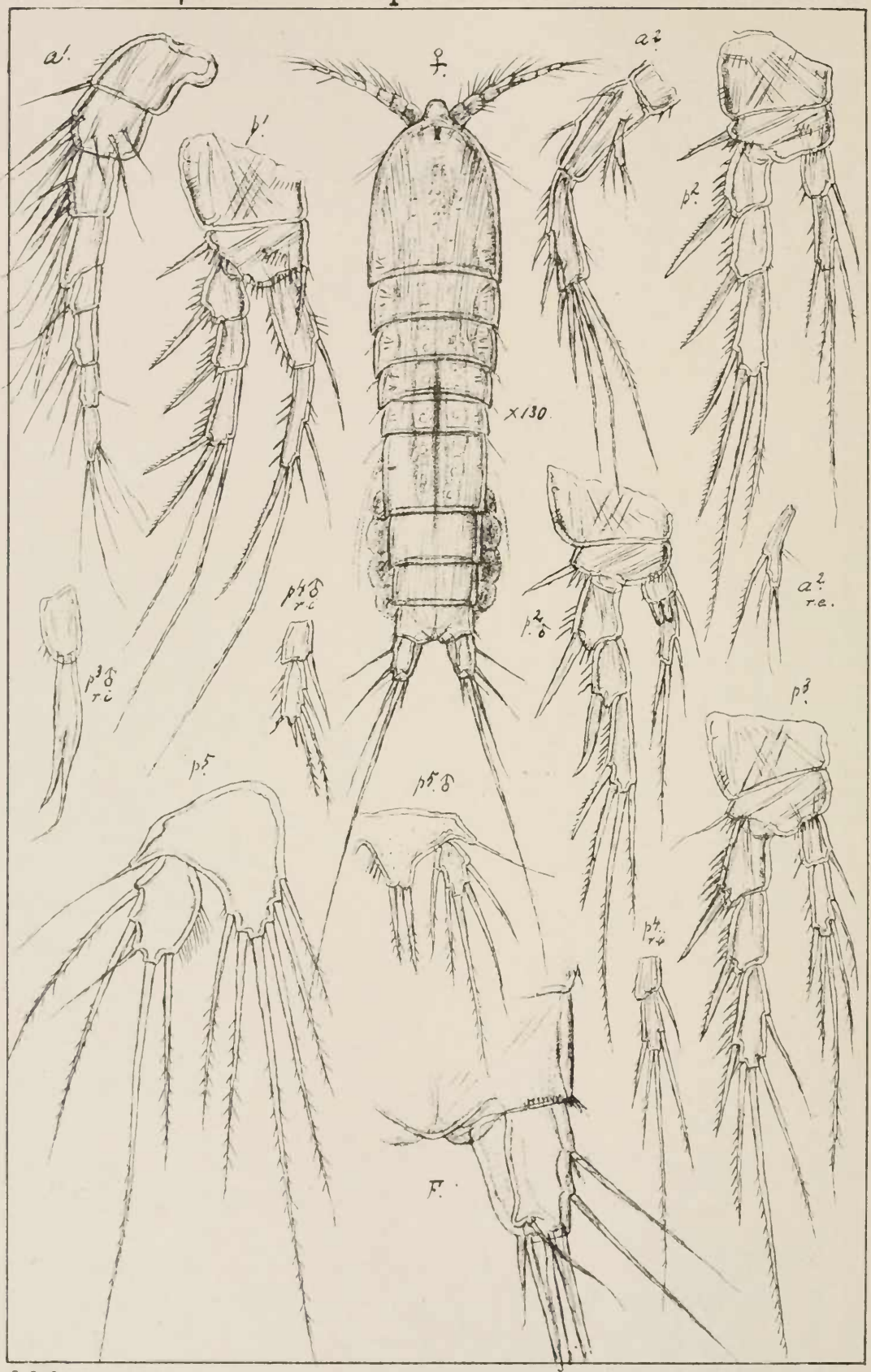


G. O. Sars, autogr.

Norsk Litogr. Officin.

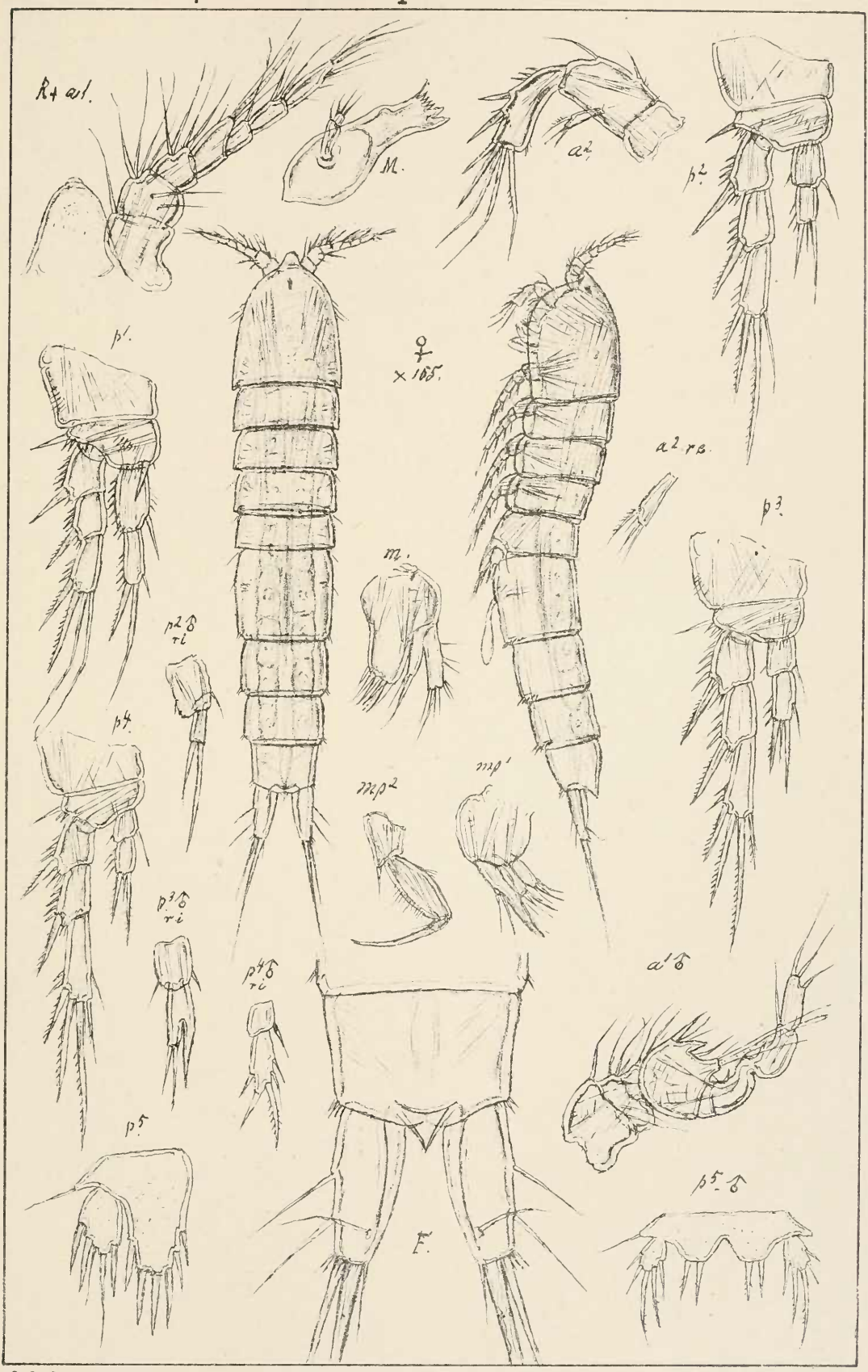
Attheyella arctica (Lilljeborg).

Copepoda



G.O. Sars, autogr. Norsk Litogr. Officin.

Attheyella Duthieri, (Scott).

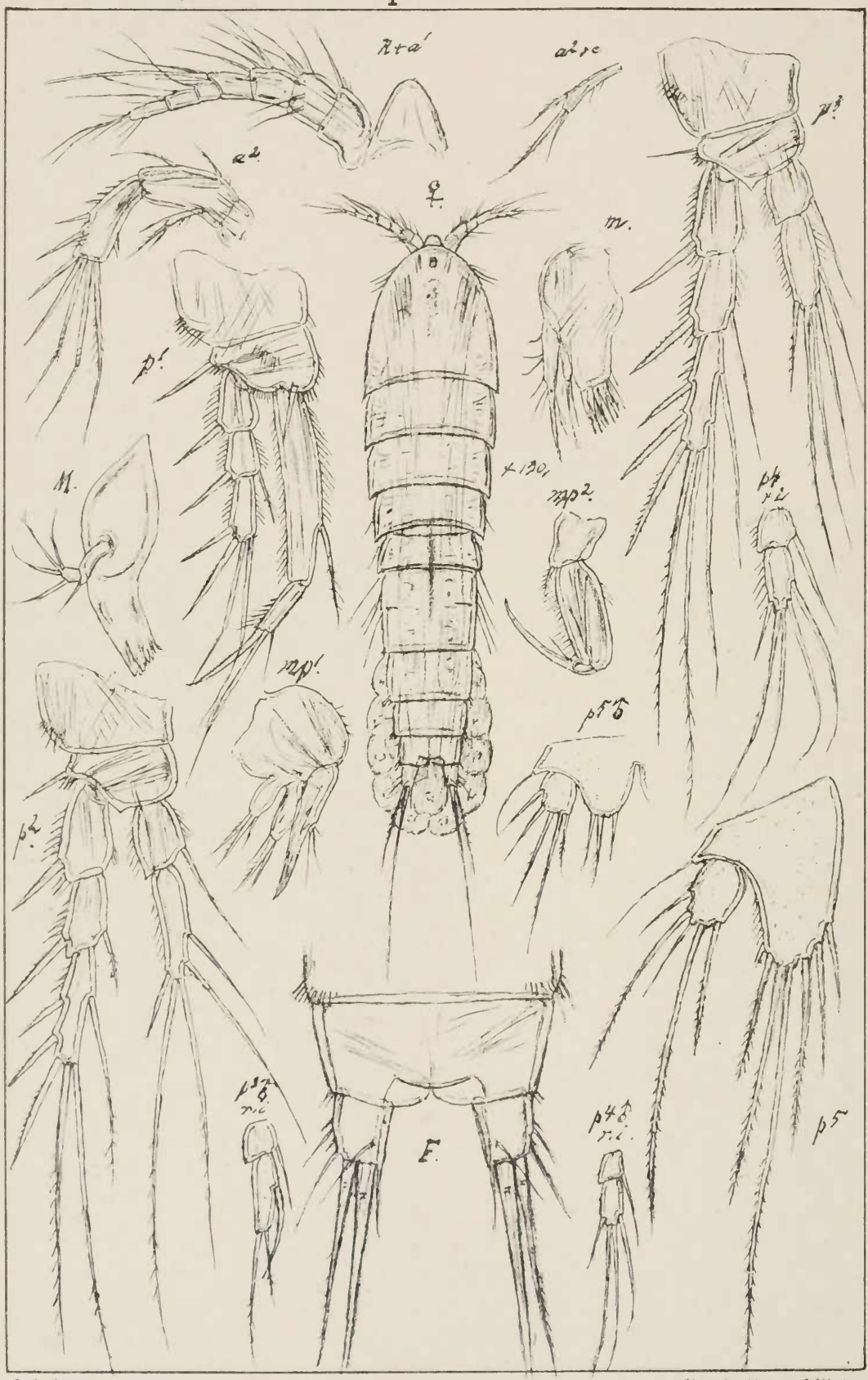


G.O. Sars, autogr. Norsk Litogr. Officin.

Moraria brevipes G.O.Sars

Copepoda

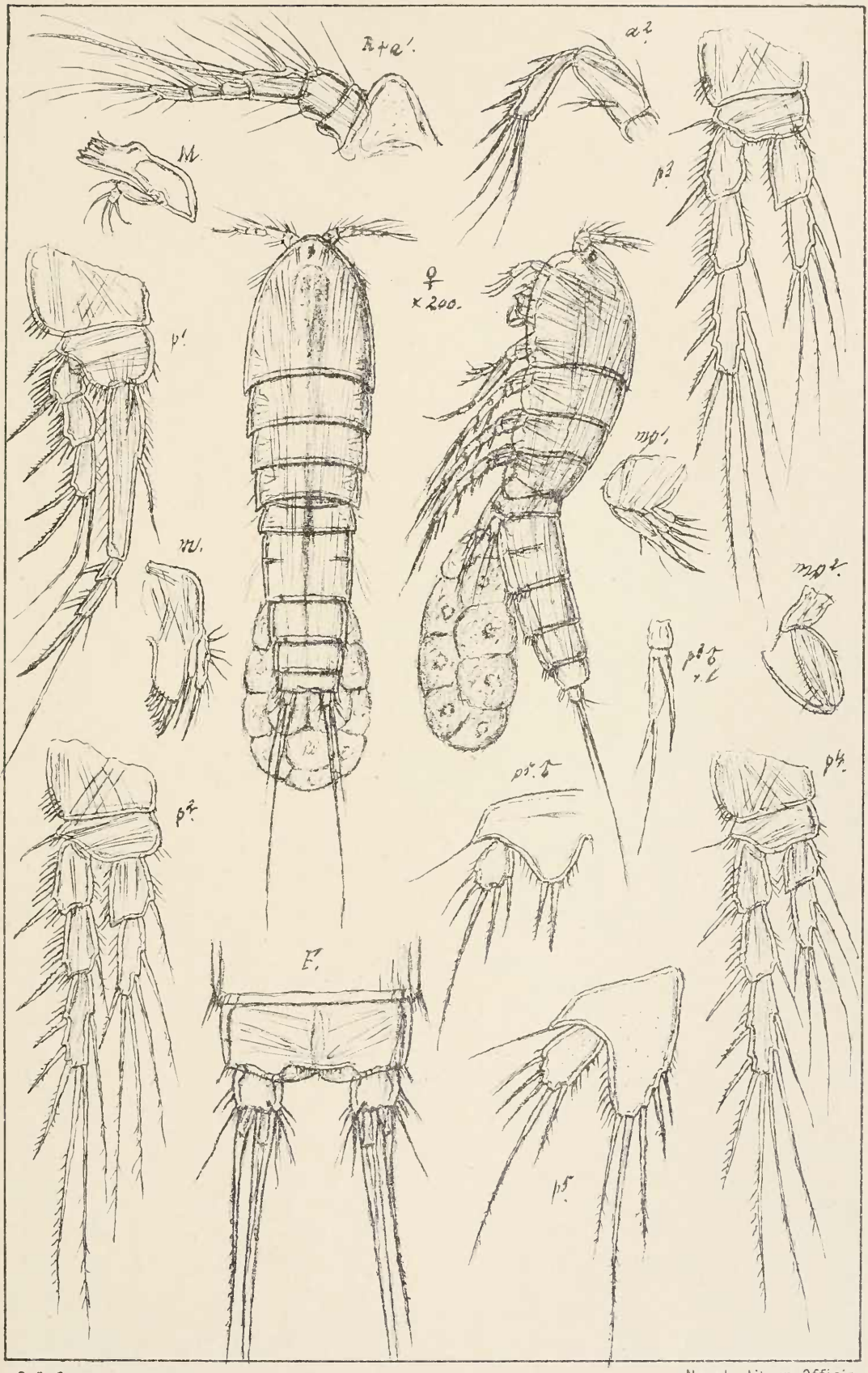
Canthocamptidæ — Harpacticoida — Pl. CXXXV



G.O. Sars, autogr. — Norsk Litogr. Officin.

Mesochra Lilljeborgi, Boeck

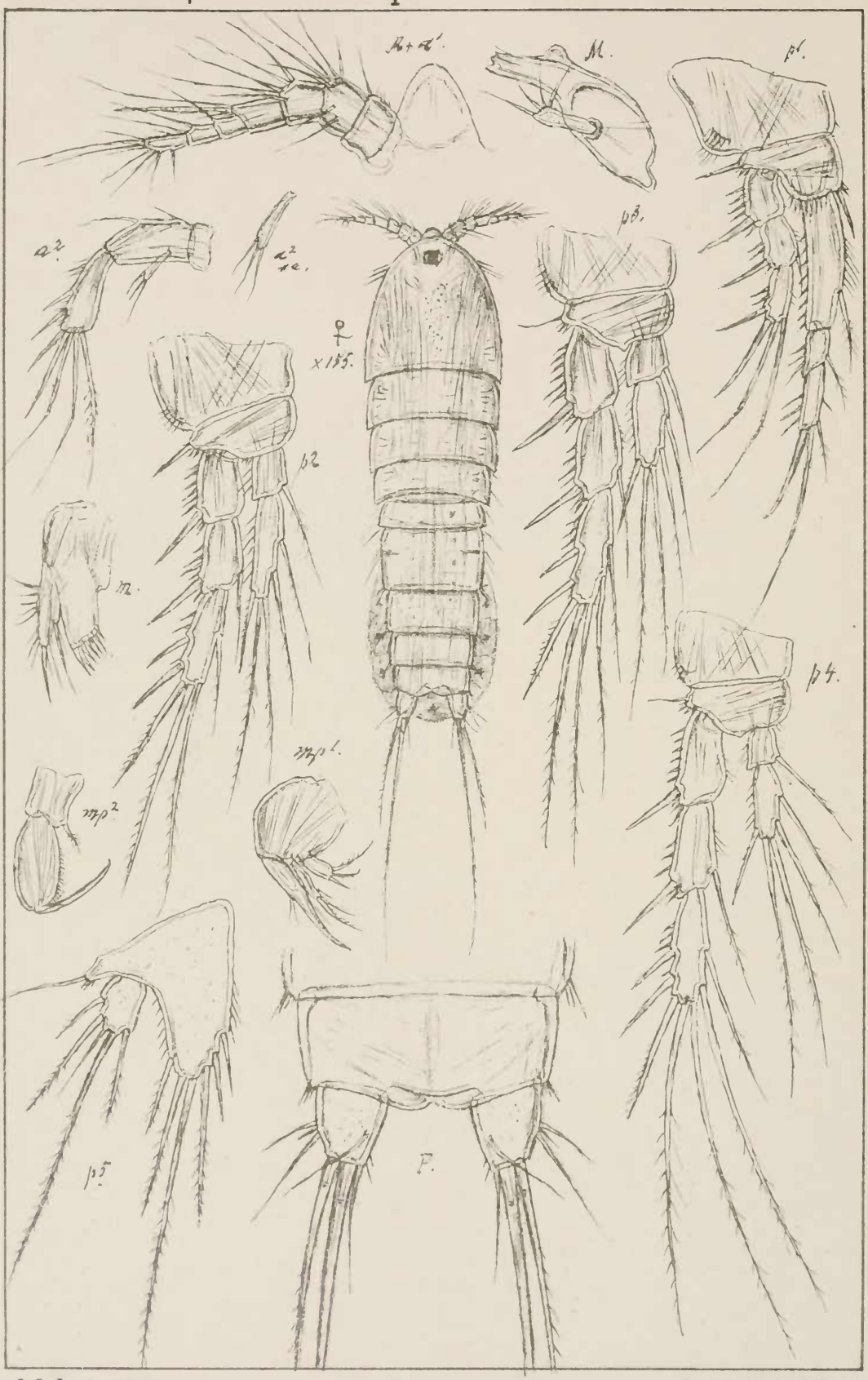
Copepoda



G.O. Sars, autogr. Norsk Litogr. Officin.

Mesochra pygmæa, (Claus).

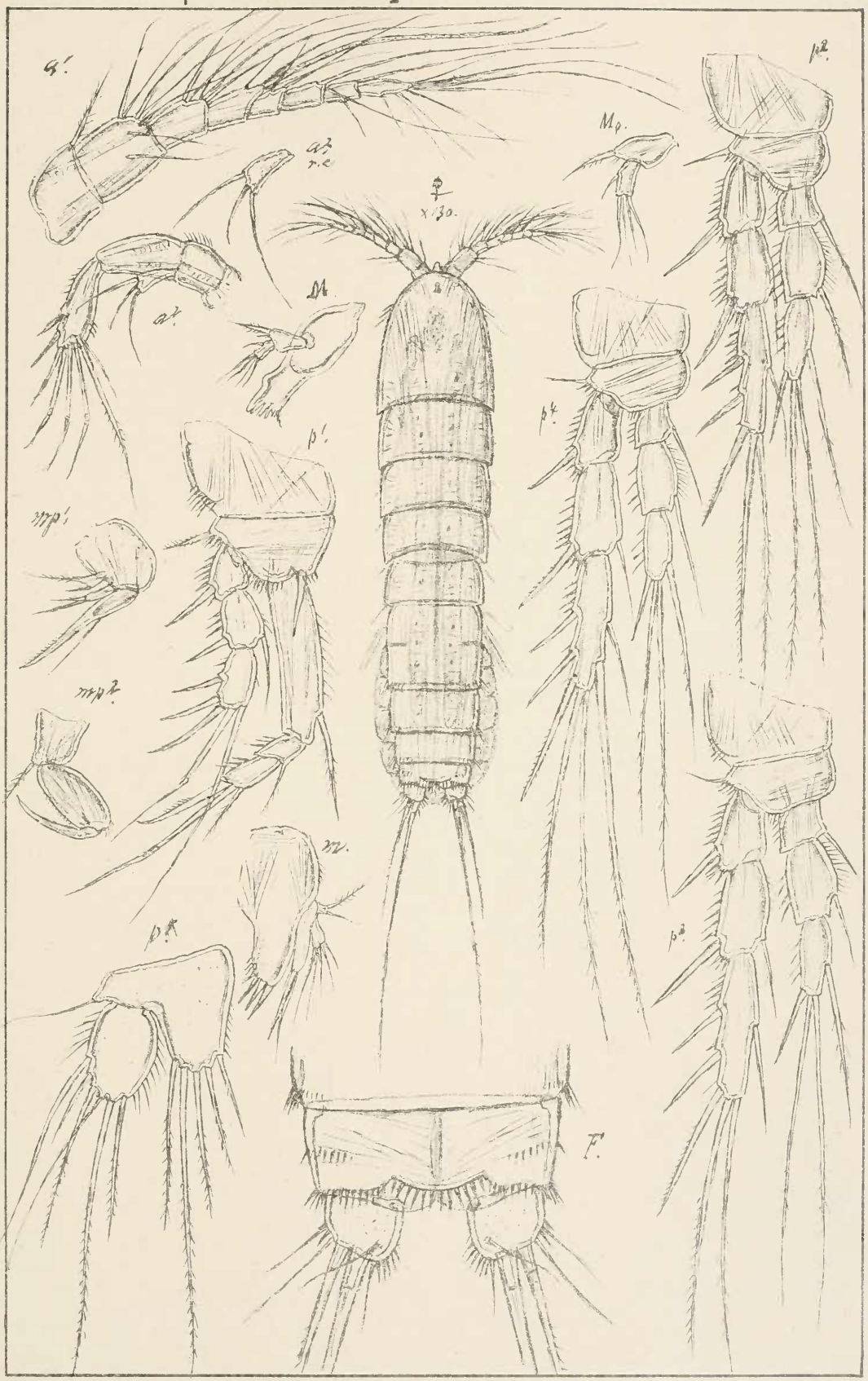
Copepoda



G.O. Sars. autogr. Norsk Litogr. Officin.

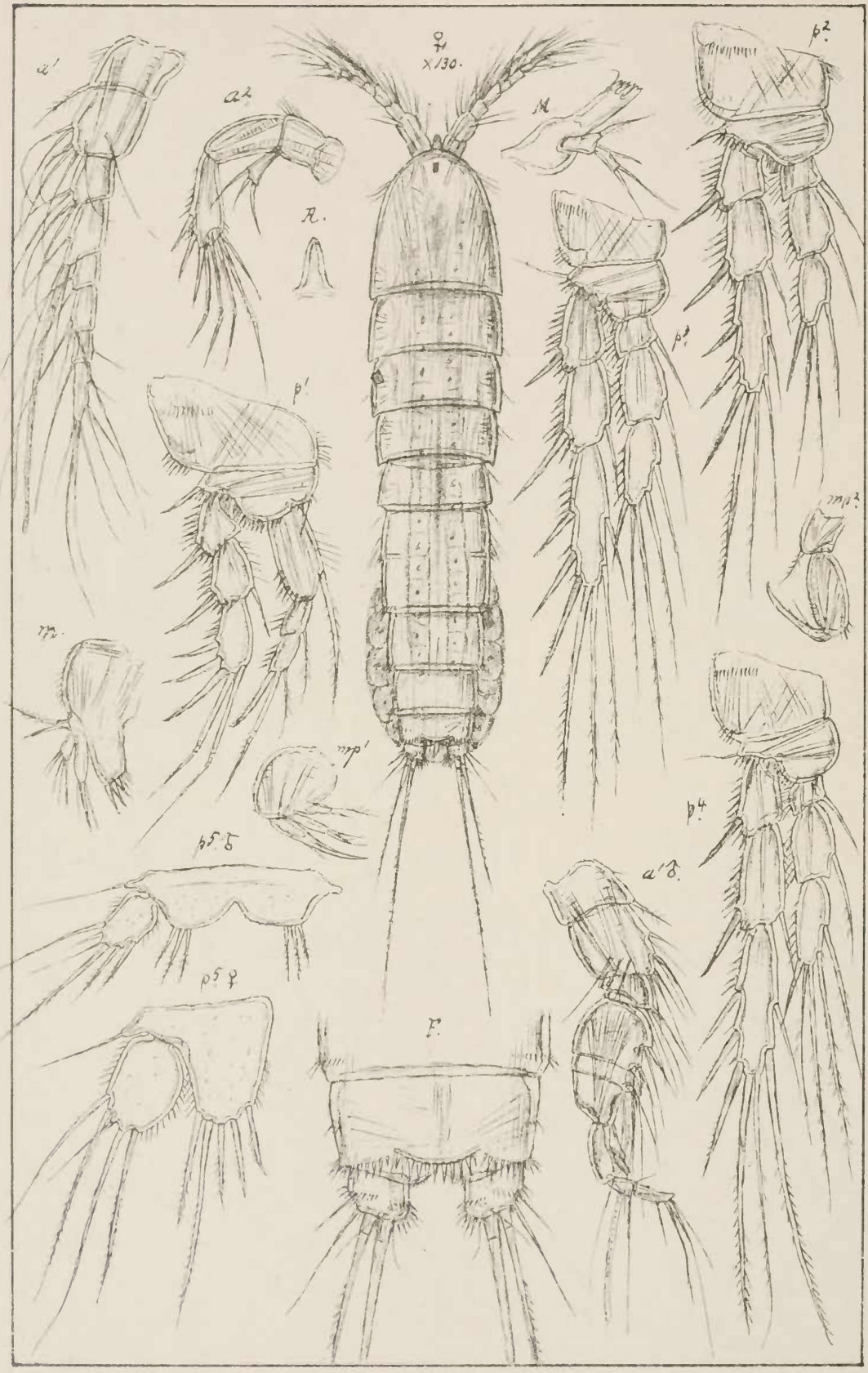
Mesochra hirticornis, (Scott)

Copepoda



G. O. Sars, autogr. Norsk Litogr. Officin.

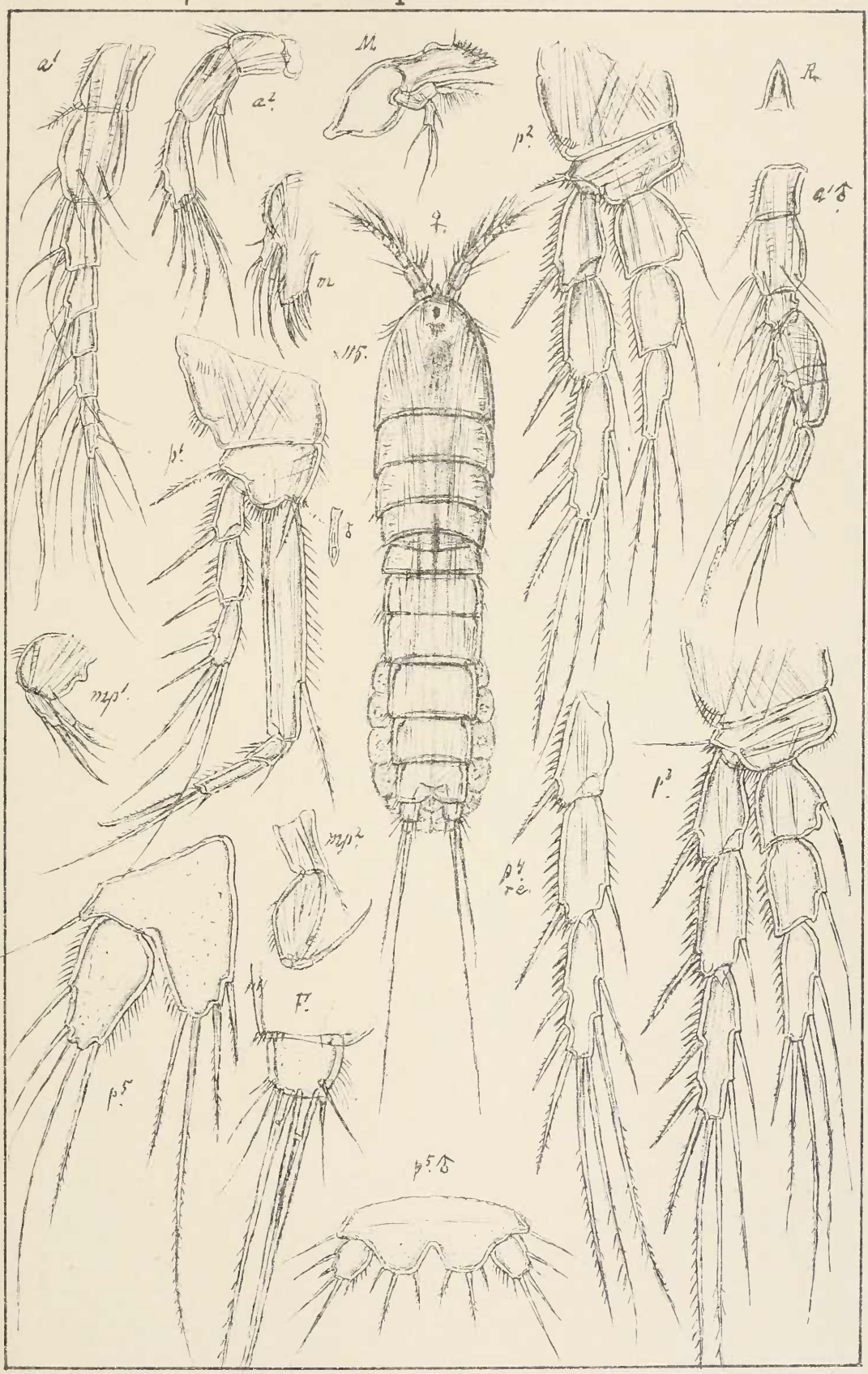
Nitocra typica Boeck



G.O. Sars, autogr. Norsk Litogr. Officin.

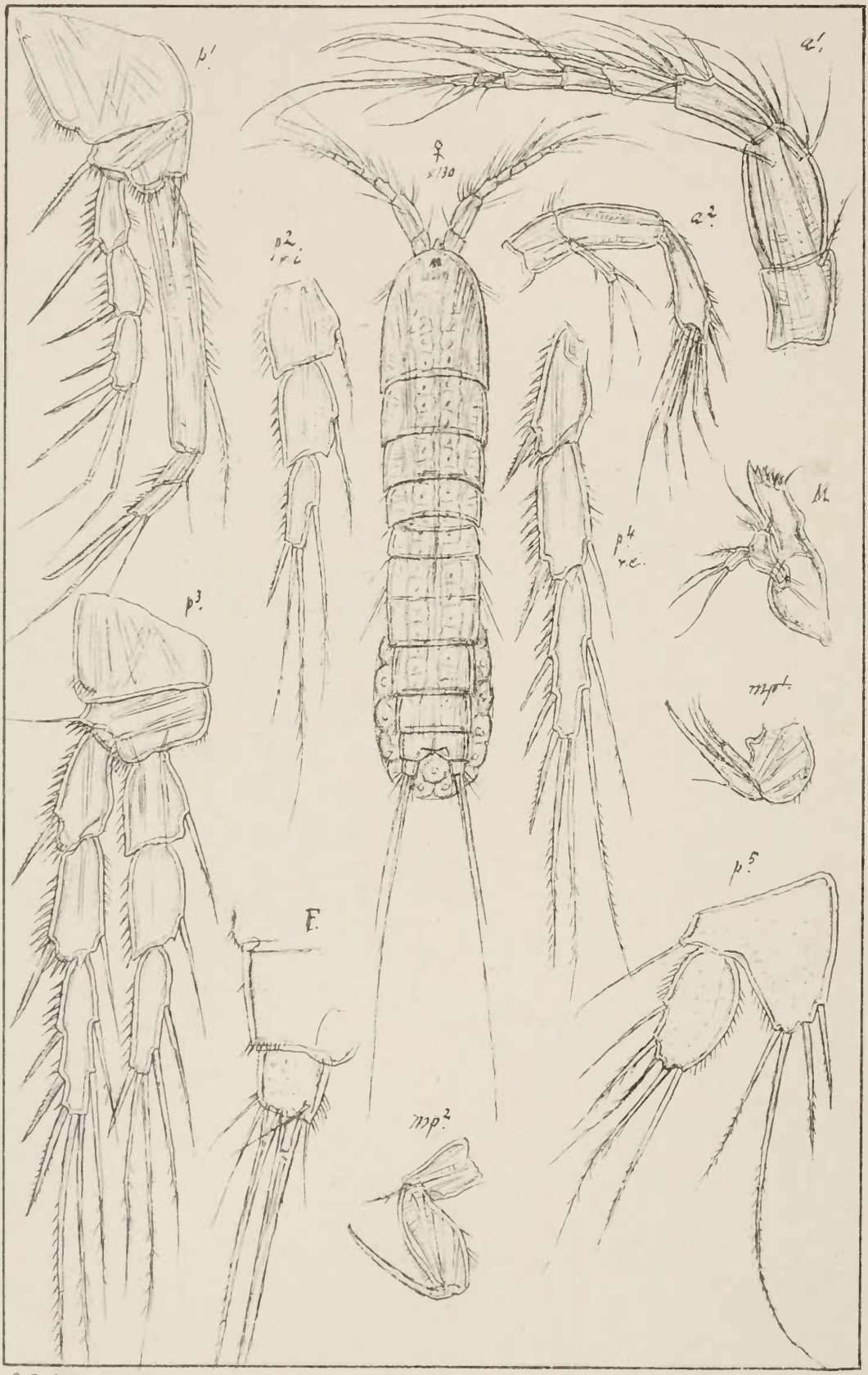
Nitocra spinipes, Boeck

Copepoda



G. O. Sars, autogr. Norsk Litogr. Officin.

Ameira longipes, Boeck

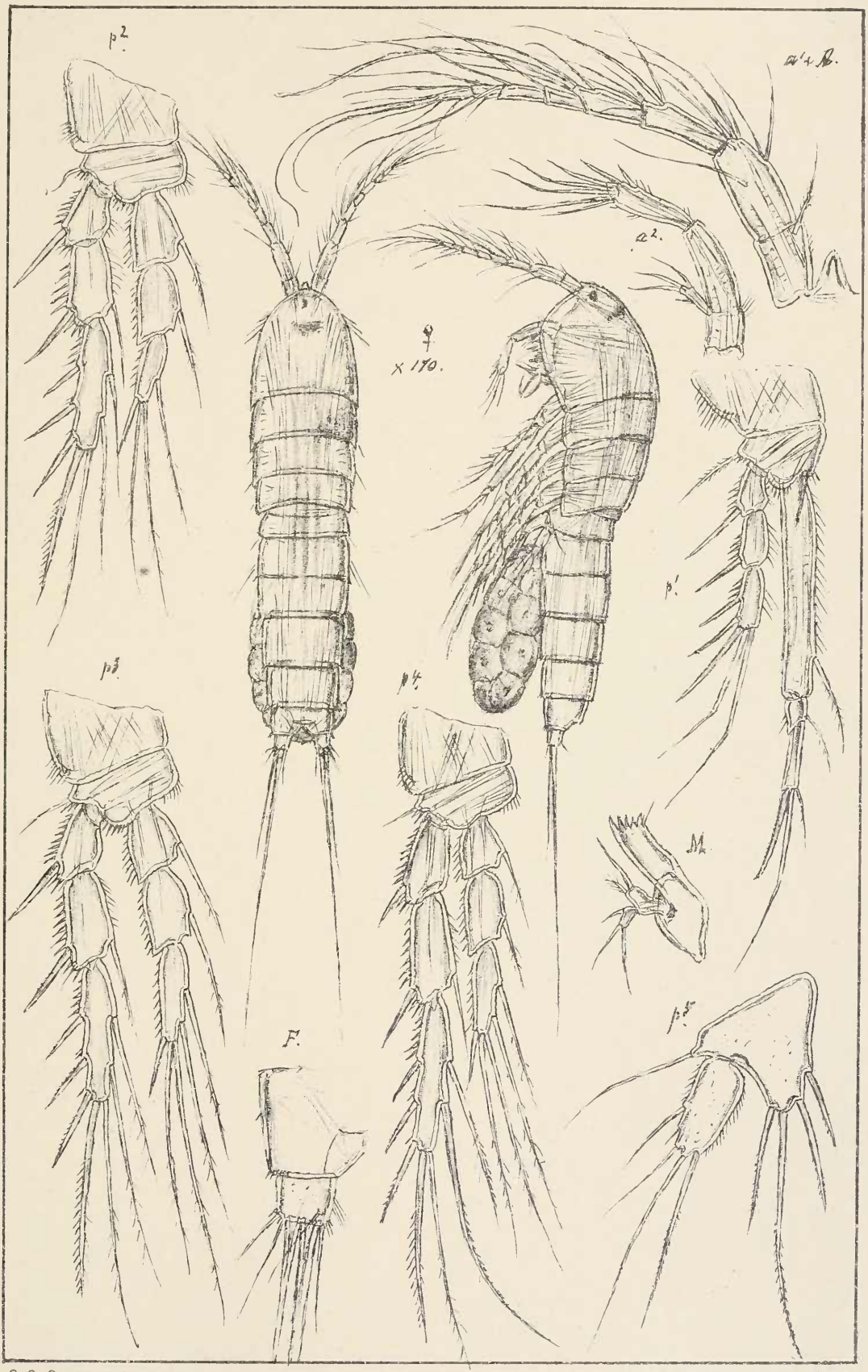


G.O. Sars, autogr. Norsk. Litogr. Officin.

Ameira minuta, Boeck

Copepoda

Canthocamptidæ — Harpacticoida — Pl. CXLII



G.O. Sars, autogr. — Norsk Litogr. Officin.

Ameira tenuicornis, Scott

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA

HARPACTICOIDA

PARTS XIX & XX

CANTHOCAMPTIDÆ (concluded), LAOPHONTIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

BERGEN

PUBLISHED BY THE BERGEN MUSEUM

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1907

Occurrence.—Only some few female specimens of this form have hitherto come under my notice. They were collected from some samples taken off the south coast of Norway, at Risör and Farsund, from moderate depths.

Gen. 48. **Parameira,** G. O. Sars, n.

Generic Characters.—Body comparatively short and stout, cylindrical in form, with rather thin and pellucid integuments. Cephalic segment not very large, rostral projection obsolete. Urosome unusually thick, and scarcely at all attenuated behind, segments only spinulose at the hind edge ventrally; anal opercle smooth and more or less projecting. Caudal rami small. Eye wholly absent. Anterior antennæ comparatively short, 8-articulate, with the setæ of the anterior edge stout and curved, in some cases plumose. Posterior antennæ with the basal part imperfectly subdivided, outer ramus small, uni- or biarticulate. Mandibular palp simple, biarticulate, proximal joint scarcely expanded inside. Maxillæ and maxillipeds about as in *Ameira*. 1st pair of legs imperfectly prehensile, inner ramus somewhat longer than outer, and 3-articulate, with the 1st joint much shorter than the other 2 combined, the latter scarcely at all bent upon the 1st. Natatory legs with both rami well developed, 3-articulate, last joint of outer ramus in the 3rd and 4th pairs of legs and that of the inner ramus in the 3rd pair with 3 setæ inside. Last pair of legs with the distal joint narrow, inner expansion of proximal joint comparatively short.

Remarks.—This new genus is nearly allied to *Ameira,* yet differing in the less slender form of the body, the want of any distinct rostrum, and also in a somewhat different structure of the antennæ and legs. Two Norwegian species will be described below, and I am now of opinion that also the form described above as *Ameira simplex* Norm. should more properly be referred to this genus. Moreover the 2 species recorded by Th. Scott as *Ameira reflexa* and *A. longiremis* are undoubtedly congeneric with those here described.

142. Parameira parva (Boeck).

(Pl. CXLVI).

Ameira parva, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. f. 1872, p. 49.

Syn: *Ameira longiremis*, var. *intermedia*, Scott.

Specific Characters.—Female. Body short and stout, with the anterior division scarcely longer and but very little broader than the posterior. Cephalic segment shorter than the 3 succeeding ones combined, and somewhat narrowed in front. Last segment of urosome shorter than the preceding one, anal opercle greatly prominent, semilunar. Caudal rami very small, scarcely longer than they are broad and somewhat obliquely truncated at the tip, apical setæ not much prolonged. Anterior antennæ scarcely more than half as long as the cephalic segment, some of the setæ of the anterior edge distinctly ciliated. Posterior antennæ with the outer ramus very small and uniarticulate, carrying only 2 setæ at the tip. 1st pair of legs comparatively small, 2nd basal joint produced at the inner corner to a conical process tipped with a strong denticulated spine, inner ramus only slightly exceeding in length the outer, 1st joint rather thick, oval in form, last joint about same length, but much narrower, linear, and, like the 2 preceding joints, fringed outside with coarse spinules, each of the joints carrying inside a well-developed plumose seta. Natatory legs with the rami comparatively narrow, and in the 2 anterior pairs, only little different in length. Last pair of legs with the distal joint conical in form, being narrowly exserted at the tip, marginal setæ 5 in number and rather unequal, the 2 apical ones much smaller than the others; inner expansion of proximal joint narrow triangular in shape, and extending nearly to the middle of the distal joint, marginal setæ 4 in number, 2 of them issuing from the inner edge.

Colour whitish grey.

Length of adult female 0.63 mm.

Remarks.—This form was first briefly described by Boeck as a species of his genus *Ameira*. The form recorded by Th. Scott as *Ameira longiremis*, var. *intermedia*, seems to be identical with Boeck's species, which may be regarded as the type of the present genus.

Occurrence.—I have met with this form occasionally in several places of both the south and west coasts of Norway, as also in the Trondhjem Fjord. It is generally found in depths ranging from 20 to 50 fathoms, muddy bottom. Not the slightest trace of eye could be detected in the living animal.

Distribution.—Scottish coast (Scott).

143. Parameira major, G. O. Sars, n. sp.

(Pl. CXLVII).

Specific Characters.—Female. Very like the preceding species in its general appearance, but of larger size and somewhat more slender form of body. Cephalic segment scarcely longer than the 2 succeeding ones combined, and evenly rounded in front. Last caudal segment fully as large as the preceding one, anal opercle far less prominent than in *P. parva*. Caudal rami, on the other hand, more produced, being almost twice as long as they are broad, and transversely truncated at the tip. Anterior antennæ resembling in structure and seize those in the preceding species; none of the setæ however ciliated. Posterior antennæ with the outer ramus distinctly biarticulate and carrying 3 setæ, 2 apical and one lateral. 1st pair of legs comparatively larger than in *P. parva*, inner ramus considerably longer than the inner, with the 1st joint oblong in form. Natatory legs with the inner ramus much shorter than the outer, joints of both rami rather expanded. Last pair of legs rather unlike those in the preceding species, distal joint narrow oblong in form, scarcely at all attenuated towards the end, which is obliquely truncated, one of the apical setæ very slender and elongated; inner expansion of proximal joint short and broad, all 4 setæ issuing from the bluntly truncated end.

Colour whitish.

Length of adult female 0.82 mm.

Remarks.—This form, though nearly related to *P. parva*, is evidently specifically distinct, differing, as it does, both by its larger size and in the structure of some of the appendages, as pointed out in the above diagnosis. It also differs from the 2 species described by Th. Scott as *Ameira reflexa* and *A. longiremis*.

Occurrence.—Only some few specimens of this form have as yet come under my notice. They were found at Farsund, south coast of Norway, in a depth of about 30 fathoms, muddy sand.

Gen. 49. **Ameiropsis**, G. O. Sars, n.

Generic Characters.—Body resembling in form that in the genus *Ameira*, though being somewhat more robust, with the urosome broader and somewhat depressed in its anterior part. Rostral projection small, but distinct. Caudal

rami short. Anterior antennæ 8-articulate, with the first 2 articulations much the largest. Posterior antennæ with the basal part distinctly subdivided, outer ramus biarticulate, last joint small, but well defined. Mandibular palp distinctly biramous, with both rami uniarticulate and of equal size. Maxillæ with the exopodal and epipodal lobes well defined. Anterior maxillipeds with 2 digitiform lobes inside the claw-bearing joint. 1st pair of legs rather strongly built and distinctly prehensile, inner ramus, as usual, longer than the outer and 3-articulate, with the last 2 joints comparatively short and bent upon the 1st. Natatory legs well developed, resembling in structure those in the genus *Parameira*, inner ramus of 3rd pair of legs not transformed in male. Last pair of legs with the distal joint more or less produced, tapering towards the end; inner expansion of proximal joint of moderate size, triangular in form.

Remarks.—This new genus also bears a close relation to *Ameira*, as indicated by the name here proposed. It is however prominently distinguished by the much fuller development of the oral parts, and more particularly by the distinctly biramous mandibular palp. In the structure of the posterior antennæ and legs also some well-marked differences are found to exist. The form recorded by Brady in his Monograph as *Ameira longipes* Boeck, according to the structure of the mandibles, undoubtedly belongs to the present genus, and this is also the case with some of the new species of *Ameira* described by Th. Scott. In the following pages 3 Norwegian species will be described.

144. Ameiropsis brevicornis, G. O. Sars, n. sp.

(Pl. CXLVIII).

? Syn: *Ameira longipes*, Brady (not Boeck).

Specific Characters.—Female. Body comparatively robust, with the anterior division somewhat tumefied in front. Cephalic segment of moderate size and evenly rounded in front, rostral projection very small. Urosome much shorter than the anterior division, last segment about the size of the preceding one, anal opercle very small. Caudal rami scarcely as long as they are broad, and somewhat obliquely truncated at the tip, apical setæ of moderate length. Eye imperfectly developed. Anterior antennæ rather short and stout, scarcely exceeding half the length of the cephalic segment, proximal part about twice the length of the terminal one. Outer ramus of posterior antennæ with the proximal joint smooth inside and gradually widening somewhat towards the end, last joint transversely truncated at the end, with the 2 apical setæ somewhat unequal in length.

1st pair of legs with the outer ramus about the length of the 1st joint of the inner, last joint a little longer than the 2nd and armed with 3 claw-like spines and 2 geniculate setæ; inner ramus with the 1st joint about twice the length of the other 2 combined, seta of the inner edge somewhat remote from the apex, last joint longer than the 2nd, and armed at the tip with a very slender claw and 2 unequal setæ. Last pair of legs with the distal joint oblong conical in form and obliquely truncated at the tip, both edges densely ciliated; inner expansion of proximal joint scarcely extending to the middle of the distal joint, and armed with 4 strong spiniform setæ, the outermost but one much the longest.

Colour dark yellow.

Length of adult female 0.63 mm.

Remarks.—The present species seems to be that described by Brady in his monograph as *Ameira longipes* Boeck. It is quite certainly very different from the form so named by Boeck, of which a description has been given above. The form recorded by Brady as the male does not belong to the species described, but more properly to a species of *Amphiascus*, as clearly shown by the prominent rostrum and the transformed inner ramus of the 3rd pair of legs.

Occurrence.—I have met with this species occasionally off the south coast of Norway, at Risør, Lillesand and Farsund, in moderate depths, among algæ. In the living animal no distinctly defined eye could be detected, but only some irregularly disposed dark pigmentary patches occupying its place.

Distribution.—British Isles (Brady).

145. Ameiropsis longicornis, G. O. Sars, n. sp.

(Pl. CXLIX).

Specific Characters.—Female. Body somewhat more slender than in the preceding species, with the anterior division scarcely longer than the posterior. Cephalic segment about the length of the 3 succeeding segments combined and rather deep, rostral projection very small. Last caudal segment shorter than the preceding one. Caudal rami broader than they are long and transversely truncated at the tip. Eye in living specimen distinctly perceptible and of light red colour. Anterior antennæ much more elongated than in the preceding species, exceeding even in length the cephalic segment, proximal part considerably more than twice as long as the terminal one. Outer ramus of posterior antennæ with the proximal joint narrow fusiform in shape and edged inside with small spinules, terminal joint very small, with the 2 apical setæ of equal size. 1st pair of legs

with the outer ramus shorter than the 1st joint of the inner, its last joint about the size of the middle one; inner ramus with the 1st joint 3 times as long as the other 2 combined, and having the seta of the inner edge attached close to the apex, last joint scarcely longer than the 2nd. Last pair of legs with the distal joint almost exactly as in the preceding species, inner expansion of proximal joint, however, more produced and armed with 5 setæ, the outermost one rather small.

Colour whitish with a faint yellow tinge.

Length of adult female 0.60 mm.

Remarks.—This species is at once distinguished from the preceding one by the much greater length of the anterior antennæ. It also exhibits some minor differences in the structure of the outer ramus of the posterior antennæ and in that of the 1st and last pairs of legs.

Occurrence.—I have met with this form occasionally in the same places, in which the preceding species occurred.

146. Ameiropsis mixta, G. O. Sars, n. sp.

(Pl. CL).

Specific Characters.—Female. Body resembling in its general appearance closely that of the 2 preceding species. Rostral projection, however, somewhat more prominent. Anterior antennæ about the length of the cephalic segment, proximal part twice the length of the terminal one. Outer ramus of posterior antennæ with the proximal joint narrow linear in form and quite smooth inside, distal joint comparatively larger than in the 2 preceding species, and having one of the setæ remarkably thickened, sabre-like. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, its last joint somewhat smaller than the middle one; inner ramus with the 1st joint rather narrow, and having the seta of the inner edge far remote from the apex and attached about in the middle of the joint, last 2 joints slightly unequal in size, and combined not attaining half the length of the 1st. Last pair of legs with the distal joint very narrow, sublinear in form; inner expansion of proximal joint comparatively short, with only 4 marginal setæ.

Colour not yet ascertained.

Length of adult female 0.60 mm.

Remarks.—This species is closely related to the 2 preceding ones, and may easily be confounded with them. On a closer examination, however, it is found to differ from any of them in some of the anatomical details, occupying, as it were, and intermediate range; hence the specific name here proposed.

Occurrence.—Only very few specimens of this form have hitherto come under my notice. One of these was found at Haugesund, west coast of Norway, the others at Lillesand, belonging to the south coast of the country, the depth ranging from 20 to 50 fathoms.

Gen. 50. **Stenocopia,** G. O. Sars, n.

Generic Characters.—Body moderately slender and somewhat depressed in its anterior part, with the segments more or less sharply marked off from each other and clothed at the hind edge with small spinules or setæ. Rostral projection small. Caudal rami much produced and narrow linear in form. Eye absent. Anterior antennæ exceedingly slender and only sparingly setiferous, 8-articulate, with the 1st joint much the largest; those in male hinged in the usual manner. Posterior antennæ likewise slender, basal part distinctly subdivided, outer ramus uni- or biarticulate. Buccal area greatly prominent. Oral parts on the whole resembling in structure those in the genus *Ameiropsis*. Legs very slender and elongated. 1st pair distinctly prehensile, with the inner ramus 3-articulate and longer than the outer, last 2 joints more or less bent upon the 1st. Natatory legs with both rami narrow and elongated, number of setæ about as in the genus *Ameiropsis;* inner ramus of 3rd pair in male not transformed. Last pair of legs with the distal joint long and narrow, inner expansion of proximal joint lamellar, with a varying number of marginal setæ.

Remarks.—This new genus in some points exhibits a remote affinity to *Ameiropsis*, especially as regards the structure of the oral parts. It differs however both from this and the other genera comprised within the present family, in the general appearance of the body, the greatly produced caudal rami, and the slender and narrow form of the antennæ and of the rami of the natatory legs. It is from this last character that the name of the genus here proposed has been derived. Two very distinct Norwegian species of this genus will be described below, one of them having been previously recorded by Th. Scott as a species of the genus *Ameira*. Both species are true deep-water forms.

147. Stenocopia longicaudata (Scott).

(Pl. CLI & CLII).

Ameira longicaudata, Th. Scott, Additions to the Fauna of the Firth of Forth: 10th Ann. Rep. of the Fishery Board for Scotland, Part III, p. 250, Pl. IX, figs. 1—18.

Specific Characters.—Female. Body comparatively slender, and, viewed dorsally, of almost equal width throughout. Cephalic segment rather large and deep, with the lower edges strongly curved, rostral projection small but distinct, blunt at the tip. All the body-segments finely spinulose at the hind edge dorsally. Urosome, including the caudal rami, exceeding in length the anterior division, genital segment not dilated in front, and almost as long as the 3 succeeding segments combined; last segment considerably smaller than the preceding one, anal opercle small and finely ciliated at the edge. Caudal rami exceedingly slender and narrow, equalling in length the 3 posterior caudal segments combined, apical setæ much elongated. Anterior antennæ fully twice the length of the cephalic segment and gradually attenuated distally, 1st joint about the length of the 2 succeeding joints combined, terminal part of about same length, and having the last joint much the largest. Posterior antennæ with the outer ramus rather slender and distinctly biarticulate, last joint very small and carrying one apical and one lateral seta. 1st pair of legs moderately slender, outer ramus shorter than the 1st joint of the inner, its last joint nearly as long as the middle one, and armed with 3 clawlike spines and 2 geniculate setæ; inner ramus with the 1st joint more than twice as long as the other 2 combined, seta of the inner edge remote from the apex, last joint a little longer than the preceding one, and carrying on the tip a moderately long claw and 2 unequal setæ. Natatory legs of normal appearance, inner ramus shorter than the outer, especially in the 4th pair. Last pair of legs with the distal joint narrowly exserted at the end, and only ciliated along the outer edge, marginal setæ 5 in number and sowewhat unequal; inner expansion of proximal joint rather broad and extending to about the middle of the distal joint, marginal setæ 5 in number.

Male resembling the female in its general appearance, though easily recognizable by the hinged anterior antennæ. 1st pair of legs with the spine inside the 2nd basal joint slightly transformed, being somewhat hamate at the tip. Last pair of legs with the distal joint much smaller than in female and fusiform in outline, having an additional seta inside; inner expansion of proximal joint very slight, with only 3 marginal setæ.

Colour in both sexes a dark grey.

Length of adult female 0.82 mm.

Remarks.—This form was described by Th. Scott in the above quoted paper as a species of the genus *Ameira*. It cannot, however, by no means be referred to that genus, as defined by Boeck, differing, as it does, very essentially both in its outer appearance and in the structure of the several appendages. Nor can it in my opinion be referred to any of the other genera comprised within the present family, for which reason I have felt justified to establish for its reception a new genus.

Occurrence.—I found this peculiar form many years ago in the upper part of the Christiania Fjord at a depth of about 30 fathoms, muddy bottom, and I have recently also collected it in another place, viz., at Farsund, south coast of Norway in about the same depth. In none of these places it occurred in any abundance, but only quite occasionally. No trace of any true eye could be detected in the living animal.

Distribution.—Scottish coast (Scott).

148. Stenocopia setosa, G. O. Sars, n. sp.

(Pl. CLIII & CLIV).

Specific Characters.—Female. Body somewhat less slender than in the preceding species, with the anterior division broader than the posterior, and having the segments sharply marked off from each other, with conspicuous lateral incisions between them. Integuments very thin and pellucid, being clothed both at the hind edge of the segments and laterally with slender curved hairs. Cephalic segment comparatively short and broad, exhibiting on each side behind a knob-like setiferous prominence, rostral projection very slight, almost obsolete. Urosome (including the caudal rami) about the length of the anterior division, but rather narrower, genital segment projecting at the base on each side to a rounded prominence clothed with hair-like setæ, last segment larger than the preceding one, and carrying behind, to each side of the anal fissure, a remarkably long and slender hair pointing straight behind, anal opercle finely ciliated at the edge. Caudal rami about the length of the 2 posterior segments combined, and very narrow, linear in form, apical setæ much elongated. Anterior antennæ resembling in structure those in the preceding species, though not fully as long, proximal part scarcely attaining twice the length of the terminal one. Outer ramus of posterior antennæ rather small and uniarticulate, with only 2 unequal apical setæ. Oral parts agreeing in structure perfectly with those in the preceding species. 1st pair of legs, however, of comparatively larger size, outer ramus shorter than

the 1st joint of the inner, and having the middle joint much the largest, last joint somewhat dilated, and armed with 5 geniculated spines of exactly same appearance, though gradually increasing in length distally; inner ramus very slender, with the 1st joint scarcely at all dilated and twice the length of the other 2 combined, apical claw slender and elongated. Natatory legs with the basal part bent in an elbow-like manner, rami extending at right angle to the basal part, and extremely narrow, being less unequal than in the preceding species; terminal joint of outer ramus in 4th pair with only a single seta inside. Last pair of legs with the distal joint exceedingly narrow, linear in form, and ciliated on both edges, number of marginal setæ as in *S. longicaudata;* inner expansion of proximal joint rather small and narrowly exserted at the tip, with only 3 apical setæ.

Body pellucid, of whitish colour.

Length of adult female 0.83 mm.

Remarks.—The present species is easily distinguished from the preceding one, both by the general form of the body, and by the numerous slender hairs clothing it both dorsally and laterally, the last named character having given rise to the specific name here proposed. It also differs conspicuously in the structure of some of the appendages, though on the whole agreeing in the more essential characters, so as more properly to be regarded as congeneric with that species.

Occurrence.—Only a very limited number of specimens of this remarkable form have hitherto come under my notice. They were taken partly in the upper part of the Christiania Fjord, partly at Farsund, south coast of Norway, from depths ranging from 30 to 50 fathoms, muddy bottom.

Gen. 51. **Phyllopodopsyllus,** Scott, 1906.

Generic Characters.—Body more or less slender, but comparatively strongly built, with rather hard integuments. Anterior divison somewhat compressed and having the last segment defined in front by a conspicuous constriction. Cephalic segment comparatively large and deep, projecting in front to a short and blunt immobile rostrum. Urosome well developed and attenuated behind, genital segment (in female) large and somewhat depressed, being imperfectly subdivided in the middle, 2nd segment produced at the end ventrally. Caudal rami more or less lamellarly expanded inside, and each carrying on the tip a strong seta bulbously dilated at the base. Eye well developed. Anterior antennæ rather elongated, and composed of 8 or 9 articulations, the 1st of which is much the largest,

2nd joint produced behind into a strong claw-like process. Posterior antennæ slender, with the basal part distinctly subdivided, outer ramus small, uniarticulate, with 3 setæ, 2 apical and one lateral. Mandibular palp rather large and distintly biramous, inner ramus much the longer. Maxillæ with the exopodal and epipodal lobes well defined. Anterior maxillipeds with 4 distinct digitiform lobes inside the claw-bearing joint, and having moreover 2 or 3 small setiferous terminal joints. Posterior maxillipeds rather slender, with the terminal claw distinctly biarticulate. 1st pair of legs more or less slender, and distinctly prehensile, inner ramus much longer than the outer, and only consisting of 2 joints, the distal one small and bent upon the 1st, carrying on the tip a slender claw and a single seta. Natatory legs with the rami very unequal, the inner one being much shorter than the outer and only consisting of 2 joints. Setæ of both rami much reduced in number. 4th pair of legs conspicuously differing from the 2 preceding pairs by the excessive length of the outer ramus and the rudimentary condition of the inner one. Last pair of legs (in female) very large, foliaceous, each constituting an oval concave plate without any distinct subdivision. These plates are so arranged as to form, immediately beneath the genital segment, a large bivalvular case, into which the ova are received, without being hold together by any membranous envelop.

Male unknown.

Remarks.—This genus has recently been established by Th. Scott, to include a species previously referred by him to the genus *Tetragoniceps* of Brady.[1]) The most obvious character of the present genus is unquestionably the very peculiar transformation of the last pair of legs in the female, a feature not found in any other known Copepod. It is indeed from this character that the somewhat inconvenient polysyllabic generic name proposed by Th. Scott has been derived. Two Norwegian species of this genus will be described below.

149. Phyllopodopsyllus Bradyi, Scott.

(Pl. CLV).

Tetragoniceps Bradyi, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Rep. of the Fishery Board for Scotland. Part III, p. 253, Pl. IX, figs. 19—32.

Specific Characters.— Female. Body moderately slender and conspicuously constricted in the middle. Cephalic segment fully as long as the 4 succeeding

[1]) Some other species, likewise at first referred to that genus, have by the same author been removed as types of distinct genera *(Pteropsyllus, Evansia, Leptastacus).*

segments combined, rostral projection forming a small lamella transversely truncated at the tip. Urosome nearly as long as the anterior division, genital segment attaining the length of the 3 succeeding segments combined, 2nd segment forming behind, on the ventral face, a projecting fold; last segment smaller than the preceding one, and having the anal opercle perfectly smooth. Caudal rami about the length of the anal segment, and forming inside near the base a very conspicuous rounded lamellar expansion, tip obliquely truncated, and firmly connected with the bulbously dilated base of the apical seta. Anterior antennæ about the length of the cephalic segment, and composed of 9 well defined articulations, 5 of which belong to the terminal part; 1st joint very large, occupying rather more than $^1/_3$ of the length of the whole antenna, 2nd joint produced behind to a strong conical projection, terminal part about the length of the 3 preceding joints combined, its last joint much the largest. 1st pair of legs rather slender, spine inside the 2nd basal joint far remote from the apex, outer ramus much shorter than the 1st joint of the inner, and without any seta inside, last joint smaller than the other 2, and armed with 2 spines and 2 geniculated setæ; distal joint of inner ramus scarcely attaining $^1/_4$ of the length of the proximal one. The 2 anterior pairs of natatory legs of essentially the same structure, outer ramus of moderate size and having no seta inside the middle joint and only 2 spines outside the terminal one; inner ramus scarcely more than half the length of the outer, with both joints narrow and subequal in length, the distal one armed at the tip with a spine and 2 unequal setæ, inner edge smooth. 4th pair of legs with the outer ramus almost twice as long as that of the 2 preceding pairs and very slender, each of the joints carrying inside a single seta; inner ramus scarcely longer than the 1st joint of the outer, and having the proximal joint very small. Last pair of legs exceeding in length $^1/_3$ of the whole animal, each plate produced at the postero-superior corner to a short tooth-like projection, inside which 2 unequal hair-like setæ are attached, outer edge straight and carrying 4 small setæ, inner edge slightly arcuate and inflexed, with 2 small setæ, the one in front of the middle, the other near the end, the latter finely ciliated.

Colour yellowish, with irregular brownish shadows.

Length of adult female 0.80 mm.

Remarks.—As above mentioned, this form was at first described by Th. Scott as a species of the genus *Tetragoniceps* of Brady, to which genus it certainly bears some affinity. Its separation from that genus may, however, be regarded as fully justified, and this view is still more corroborated by the detection of another species, to be described below, which agrees with the type in all essential characters, though being evidently specifically distinct.

Occurrence.—Only 3 specimens of this interesting form have hitherto come under my notice. One of these specimens was taken at Flekkerö, the other 2 at Farsund, both localities belonging to the south coast of Norway.

Distribution.—Scottish coast (Scott).

150. Phyllopodopsyllus furciger, G. O. Sars, n. sp.

(Pl. CLVI).

Specific Characters.—Female. General form of body very similar to that in the preceding species. Cephalic segment, however, still somewhat larger, exceeding in length the 4 succeeding segments combined. Urosome with the 2nd segment produced ventrally at the hind edge, as in the type species; last segment rather small, with the anal opercle more prominent and finely ciliated at the edge. Caudal rami much larger than in *P. Bradyi*, being twice as long as the anal segment, and having the inner edge evenly convex, dorsal face distinctly keeled; apical seta forming at the base a very strong dilatation projecting inside to a rounded lobule. Anterior antennæ scarcely as long as the cephalic segment, and only composed of 8 articulations, the penultimate and antepenultimate ones being fused together, 1st joint considerably exceeding in length $^1/_3$ of the whole antenna, 2nd joint produced behind to a very strong claw-like process, broader and more curved than in the type species. Posterior antennæ and oral parts of a similar structure to that in *P. Bradyi*. 1st pair of legs comparatively smaller with the joints of the outer ramus of nearly equal size, distal joint of inner ramus exceeding $^1/_3$ of the length of the proximal one, apical claw and seta extremely slender. Natatory legs almost exactly as in the type species. Last pair of legs also very similar, each plate however exhibiting in front of the middle a faint suture crossing the plate, and indicating the line of union between the two original joints, inner edge of the plate carrying, immediately in front of the suture, a series of 3 slender hair-like setæ.

Colour not yet ascertained.

Length of adult female 0.73 mm.

Remarks.—The above-described form is closely allied to *P. Bradyi*, though evidently specifically distinct, being at once distinguished by the much greater size and different form of the caudal rami. On a closer comparison moreover some other minor differences are found to exist.

Occurrence.—The solitary specimen of this form observed was found in a sample taken at Farsund, south coast of Norway, from a depth of about 30 fathoms, muddy sand.

Fam. 13. Laophontidæ.

Characters.—Body somewhat varying in shape, but having always the segments very sharply marked off from each other, with conspicuous constrictions between them, their hind edge more or less raised and generally fringed with small spinules. Genital segment in female distinctly subdivided. Anterior antennæ with the number of articulations more or less reduced, those in male strongly hinged, with the last joint of the proximal part greatly swollen. Posterior antennæ with the outer ramus generally small and uniarticulate, in some cases obsolete. Oral parts on the whole normal. 1st pair of legs with the rami very unequal, the outer one of insignificant size, the inner one powerfully developed and distinctly prehensile, biarticulate, clawed at the tip. Natatory legs generally poorly developed, with the inner ramus much smaller than the outer and only consisting of 2 joints; inner ramus of 3rd pair in male transformed. Last pair of legs of varying structure in the different genera. Ovisac in the great majority of cases single.

Remarks.—This family has recently been established by Th. Scott, to comprise the well-known genus *Laophonte* and some nearly related genera. As to the outer appearance, the forms belonging to this family may be easily recognized by the very sharp demarcation of the segments, whereby the body assumes a more or less scalariform appearance. Of the anatomical details the most obvious character is found in the structure of the 1st pair of legs, the inner ramus of which in most cases is very powerfully developed, though only consisting of 2 joints, whereas the outer ramus is of quite insignificant size. All the forms belonging to the present family are strictly marine, though some of the species of *Laophonte* may be occasionally found in more or less brackish water.

Gen. 52. Laophonte, Philippi, 1840.

Syn: *Cleta*, Claus.

Generic Characters.—Body more or less slender, scalariform, with no sharp demarcation between the anterior and posterior divisions. Cephalic segment of moderate size, and projecting in front in a lamellar rostral prominence not distinctly defined behind. Segments of urosome, except the last, more or less lamellarly expanded laterally. Caudal rami of varying shape in the different species.

Eye in most cases present Anterior antennæ, as a rule, not much elongated, their articulations never exceeding 7 in number. Posterior antennæ with the basal part not subdivided, 2 of the apical setæ converted to claw-like spines, outer ramus very small. Mandibular palp simple and generally of insignificant size. Maxillæ with the exopodal and epipodal lobes very small or obsolete. Anterior maxillipeds with 2 digitiform lobes inside the claw-bearing joint. Posterior maxillipeds rather fully developed, terminating in a strongly clawed hand. 1st pair of legs with the outer ramus feably developed, bi- or 3-articulate, and apparently quite immobile, inner ramus very powerful, with no seta inside the proximal joint, distal joint short and tipped with a single strong claw. Natatory legs with the outer ramus comparatively narrow, though in some cases much coarser in male than in female; inner ramus with the distal joint the larger, that of 3rd pair in male distinctly 3-articulate with the middle joint produced at the end. Last pair of legs with both joints well defined, the proximal one being more or less lamellarly expanded inside; those in male much smaller than in female. A single ovisac present in the female.

Remarks.—This genus was established by Philippi as early as the year 1840, to include a species found by him at Naples. The genus *Cleta* of Claus is undoubtedly identical with Philippi's genus. The species belonging to this genus are easily recognizable by the slender scalariform body, and the greatly produced and clawed inner ramus of the 1st pair of legs. The genus seems to be very rich in species, and is represented in all parts of the Oceans. In the following pages will be described a rather great number of species belonging to the Norwegian fauna.

151. Laophonte cornuta, Philippi.

(Pl. CLVII & CLVIII).

Laophonte cornuta, Philippi, Zoologische Bemerkungen. Archiv für Naturgeschichte 1840, p. 189, Pl. III, fig. 13.

Syn: *Cleta forcipata*, Claus.
„ *Laophonte serrata*, Brady (not Claus).
„ *? Harpacticus fortificationis*, Fischer.

Specific Characters.—Female. Body rather slender, sub-cylindric in shape, with well-marked constrictions between the segments, which are somewhat raised dorsally. All segments fringed at the hind edge with knob-like spinules having between them a fine hair. Integuments very hard, and exhibiting under the microscope a peculiar pitted appearance. Cephalic segment about the length of

the 4 succeeding segments combined and rather deep, with a transversal depression about in the middle dorsally; rostral projection rather broad and terminating in an obtuse point. Urosome about as long as the anterior division, genital segment, like the succeeding one, slightly expanded laterally; last segment quadrangular in shape, anal opercle tipped with a somewhat erect spine. Caudal rami about as long as the anal segment and slightly attenuated distally, without any spinules, but with a slender seta about in the middle of the outer edge and another close to the tip, the latter carrying a single very strong spiniform seta not jointed at the base. Anterior antennæ not nearly attaining the length of the cephalic segment and of a very coarse structure, consisting of only 4 articulations, the last 2 joints of the proximal part and all of the terminal part being fused together into single joints. 1st and 2nd joints each produced behind to a claw-like projection, that of the 2nd joint being much the larger. Posterior antennæ likewise rather strongly built, with the 2 apical spines claw-like, outer ramus very small and somewhat lamellar, carrying 4 comparatively short setæ. Mandibular palp of insignificant size and rather narrow, with 4 somewhat unequal setæ at the end. Posterior maxillipeds of moderate size. 1st pair of legs with the outer ramus only consisting of 2 joints, and scarcely more than half as long as the 1st joint of the inner; the latter exceedingly powerful, with the apical claw strong and slightly curved at the tip. Natatory legs exhibiting the structure characteristic of the genus, proximal joint of inner ramus with a well-developed seta inside Last pair of legs comparatively large, foliaceous, distal joint oblong oval in form, and carrying 6 marginal setæ along the outer edge and the tip, 2 of them being very thin and hair-like; inner expansion of proximal joint narrow linguiform and extending to about the middle of the distal joint, its surface exhibiting a peculiar areolated structure, marginal setæ 5 in number, one of them being far remote from the others and attached in front of the middle of the inner edge. Ovisac comparatively small and of rounded form.

Male resembling the female in its general appearance, but easily recognizable by the strongly hinged anterior antennæ, the 4th joint of which is greatly dilated and produced in front near the base to a hamiform process. Inner ramus of 3rd pair of legs with a straight posteriorly pointing mucroniform process issuing from the middle joint outside and extending far beyond the last joint. Last pair of legs much smaller than in female, distal joint with only 4 spiniform setæ; inner expansion of proximal joint very slight, with 2 subequal setæ.

Colour in both sexes a dark brownish gray, with still darker, almost black shadows more conspicuous on the genital segment.

Length of adult female about 1 mm.

Remarks.—The above-described form seems to be that originally recorded by Philippi as the type of his genus *Laophonte*. It has erroneously been identified by Brady and other British authors with *Cleta serrata* of Claus, which is a different species, to be described below. On the other hand, is the form described by Claus from a male specimen as *Cleta forcipata* undoubtedly identical with the present species. I am also of opinion that the form recorded by Seb. Fischer as *Harpacticus fortificationis* is referable to the same species. It is one of the largest species, and is moreover easily recognizable both by its general appearance and by the structure of the anterior antennæ and that of the 1st and last pairs of legs.

Occurrence.—This pretty species is not unfrequently found along the whole south and west coast of Norway, at least up to the Trondhjem Fjord in moderate depths among algæ, and is at once distinguished from most other species by its comparatively large size and the very dark colour of the body.

Distribution.—Mediterranean (Philippi), Madeira (Fischer), British Isles (Brady).

152. Laophonte serrata (Claus).

(Pl. CLIX).

Cleta serrata, Claus, Die freilebenden Copepoden, p. 124, Pl. XV, figs. 13—20.

Syn: *Laophonte propinqva*, Scott.

Specific Characters.—Female. General form of body rather like that in the preceding species, though perhaps somewhat less slender. All segments very sharply marked off from each other by deep constrictions, whereby the dorsal line acquires a pronouncedly jagged or serrate appearance; posterior edge of the segments fringed with densely crowded short spinules acute at the tip. Cephalic segment comparatively larger than in the type species, rostral projection rather prominent and terminating in 2 juxtaposed knob-like points. Urosome shorter than the anterior division of the body, all its segments, except the last, lamellarly expanded laterally; last segment about the length of the preceding one, anal opercle fringed with uniform spinules. Caudal rami scarcely as long as the anal segment and not tapering distally, being, in addition to the setæ, clothed both outside and inside with scattered spinules, tip transversely truncated and carrying 2 well-developed setæ jointed near the base, the inner one much the longer, setæ of the outer edge approximate and attached considerably behind the middle. Anterior antennæ scarcely exceeding half the length of the cephalic segment, but

composed of 7 well-defined articulations, the 2nd of which is produced behind to a strong conical projection. Posterior antennæ and oral parts nearly as in *L. cornuta*. 1st pair of legs comparatively more slender, with the outer ramus distinctly 3-articulate and exceeding half the length of the 1st joint of the inner, apical claw of the latter ramus rather elongated, being fully 3 times as long as the distal joint. Natatory legs resembling in structure those in *L. cornuta*, yet differing in the absence of any seta inside the proximal joint of the inner ramus. Last pair of legs much smaller than in the type species, distal joint narrow fusiform in outline, inner expansion of proximal joint triangular in form and scarcely extending to the middle of the distal joint, number of marginal setæ in both joints as in *L. cornuta*.

Male exhibiting the usual sexual differences from the female. Inner ramus of 3rd pair of legs with the projection of the middle joint peculiarly transformed, being converted to a sigmoid lamella with 2 knob-like prominences of the outer edge and partly covering the last setiferous joint. Last pair of legs with the distal joint narrow linear in form and carrying 5 setæ, one of which, attached to the inner edge, is rather strong, spiniform; inner expansion of proximal joint almost obsolete, with 2 unequal setæ.

Colour yellowish, tinged with light red or orange.

Length of adult female 0.76 mm.

Remarks.—This is unquestionably the species originally described by Claus under the name of *Cleta serrata*, as clearly shown by the figures he gives of the 1st and last pairs of legs. The form recorded by Th. Scott as *Laophonte propinqva* is identical with Claus's species. It is well distinguished from *L. cornuta* by the distinctly 7-articulate anterior antennæ, the 3-articulate outer ramus of the 1st pair of legs and the rather different shape of the last pair of legs. Moreover the anal opercle wants the erect spine found in *L. cornuta*, and the caudal rami carry each at the tip 2 normally developed setæ instead of a single such.

Occurrence.—I have met with this species not unfrequently in many places both of the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths, among algæ. Male specimens appear to be equally frequent as female ones.

Distribution.—Heligoland (Claus), Scottish coast (Scott), coast of France (Canu).

153. Laophonte depressa, Scott.

(Pl. CLX).

Laophonte depressa, Th. Scott, Additions to the Fauna of the Firth of Forth. 12th Ann. Rep. of the Fishery Board for Scotland; Part III, p. 245, Pl. VI, figs. 24—31, Pl. VII, figs. 1—3.

Specific Characters.—Female. Body comparatively shorter and stouter than in the 2 preceding species and pronouncedly depressed, with all the segments, also the cephalic one, finely ciliated laterally and minutely spinulose along the hind edge. Cephalic segment rather large and broad, impressed dorsally, and projecting in front to a lamellar rostrum of moderate size, terminating in an obtuse point. Urosome considerably shorter than the anterior division of the body, and having all the segments, except the last, lamellarly expanded laterally; anal opercle finely ciliated. Caudal rami very short, quadrangular, being scarcely longer than they are broad, and clothed, in addition to the setæ, with small spinules, some of which assume an hair-like appearance; apical setæ of moderate length and normal structure. Anterior antennæ exceeding somewhat half the length of the cephalic segment, and distinctly 7-articulate, 2nd joint simple, without any projection behind. Posterior antennæ rather robust, resembling in structure those in the 2 preceding species. Posterior maxillipeds very powerfully developed, with the terminal claw unusually strong and curved at the tip. 1st pair of legs likewise of very considerable size, with the inner ramus exceedingly strong and terminating in a falciform claw, outer ramus distinctly 3-articulate, and about half the length of the proximal joint of the inner, middle joint much the longest. Natatory legs resembling in structure those in the 2 preceding species, though having the setæ of both rami somewhat reduced in number. Last pair of legs with the distal joint rather large and subfusiform in outline, with 6 marginal setæ; inner expansion of proximal joint, on the other hand, very small and narrow, with only 3 marginal setæ at the tip.

Male with the inner ramus of the 3rd pair of legs transformed in a similar manner to that in the male of *L. serrata*, process of the middle joint, however, much narrower, not lamellar. Last pair of legs with the distal joint shorter and broader than in the male of *L. serrata*.

Colour not yet ascertained.

Length of adult female 0.70 mm.

Remarks.—The present species, recently described by Th. Scott under the above name, is easily distinguished from any of the 2 preceding species by the pronouncedly depressed form of the body, the short caudal rami, and the want of a spiniform process on the 2nd joint of the anterior antennæ. Moreover the unusually strong development of the posterior maxillipeds and of the 1st pair of

legs is rather characteristic, as also the shape of the last pair of legs in the female.

Occurrence.—A solitary femal specimen of this form was taken, some years ago, at Bukken, west coast of Norway, from moderate depth. Moreover some few male and female specimens of the same form occurred in a sample kindly sent to me from Mr. Nordgaard, who took it in the Skjærstad Fjord, immediately North of the Polar circle.

Distribution.—Scottish coast (Scott).

154. Laophonte thoracica, Boeck.

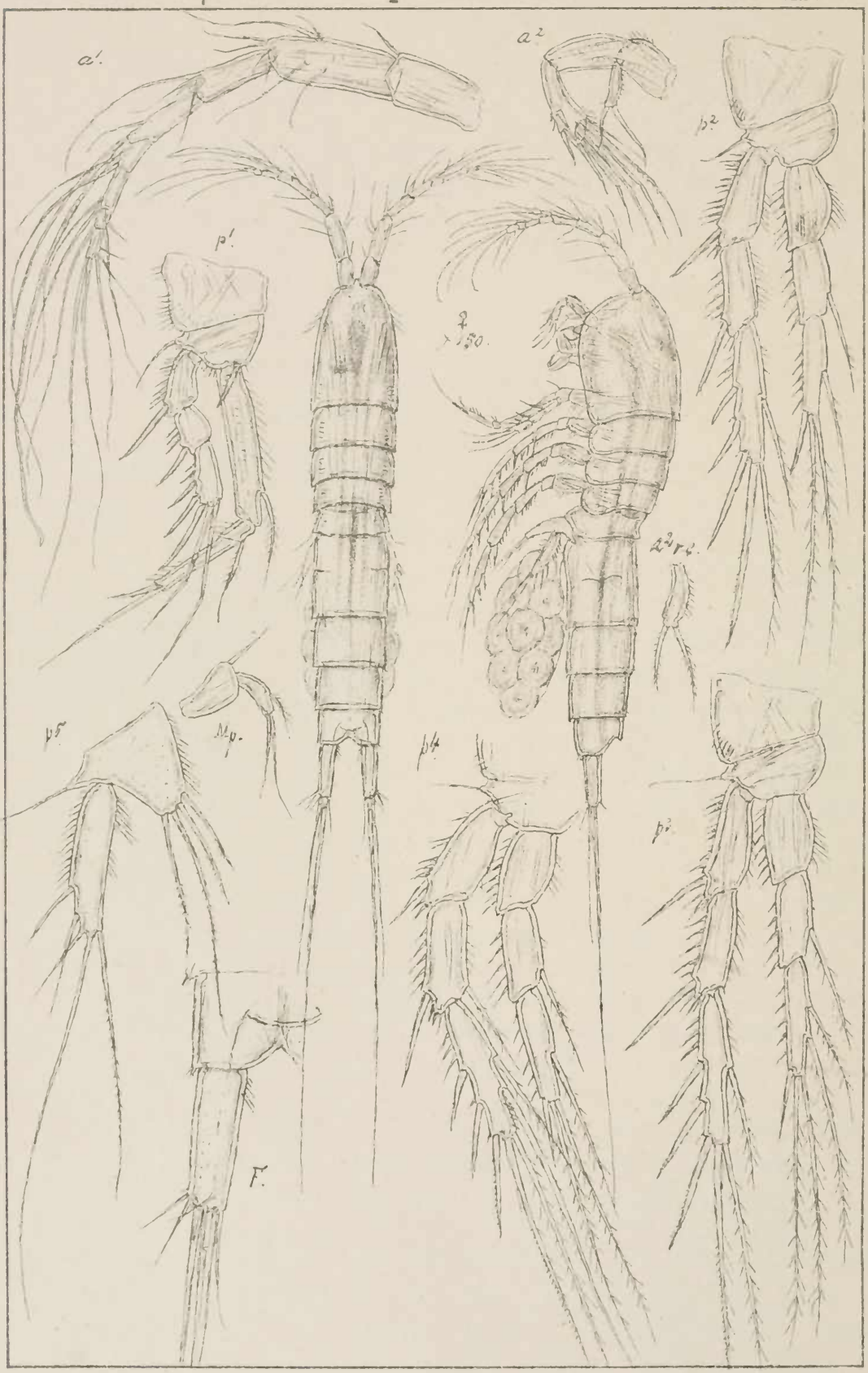
(Pl. CLXI).

Laophonte thoracica, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. f. 1864, p. 278.

Syn: *Tetragoniceps longiremis*, Brady & Robertson.

Specific Characters.—Female. Body moderately slender and gradually tapering behind, with all the segments sharply marked off form each other and fringed at the hind edge with small spinules, laterally with delicate cilia. Cephalic segment comparatively large and deep, with the lateral parts abruptly curved in the middle, dorsal face smooth, without any perceptible depression, rostral projection comparatively small and rounded at the tip. Urosome nearly as long as the anterior division, and having the anterior segments slightly expanded laterally; last segment shorter than the preceding one, and having the anal opercle smooth. Caudal rami rather much produced, being almost twice as long as the anal segment and slightly divergent, apical setæ normal. Anterior antennæ scarcely as long as the cephalic segment and rather narrow, 6-articulate, the last 2 joints being confluent, 2nd joint the largest and without any process behind. Posterior antennæ less robust than in the 3 preceding species, outer ramus small. Posterior maxillipeds slender and elongated, with the hand only slightly dilated. 1st pair of legs far less robust than in the 3 preceding species, basal part rather narrow, outer ramus scarcely attaining half the length of the 1st joint of the inner, and distinctly 3-articulate. Natatory legs with the rami comparatively narrow, last joint of the outer one in all the pairs with only a single seta inside, proximal joint of inner ramus without any seta. Last pair of legs with the distal joint narrow fusiform in outline, marginal setæ 5 in number, that issuing from the narrowly exserted tip very delicate, hair-like; inner expansion of proximal joint quite short, carrying 4 marginal setæ, one at the tip and 3 along the inner edge. Ovisac rounded.

Copepoda



G. O. Sars. autogr

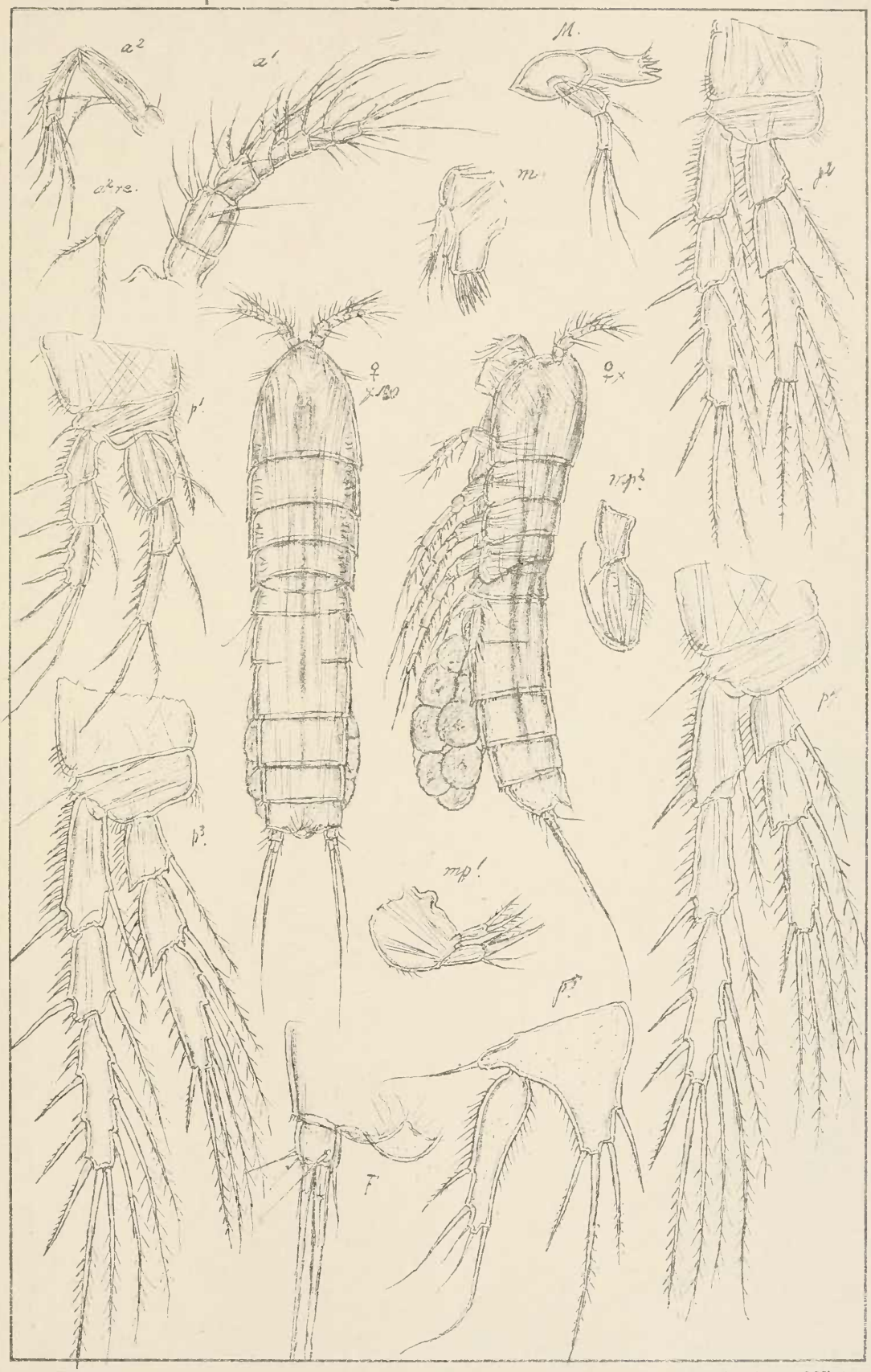
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Ameira tenella, G. O. Sars

Copepoda

Canthocamptidæ Harpacticoida

PL. CXLVI

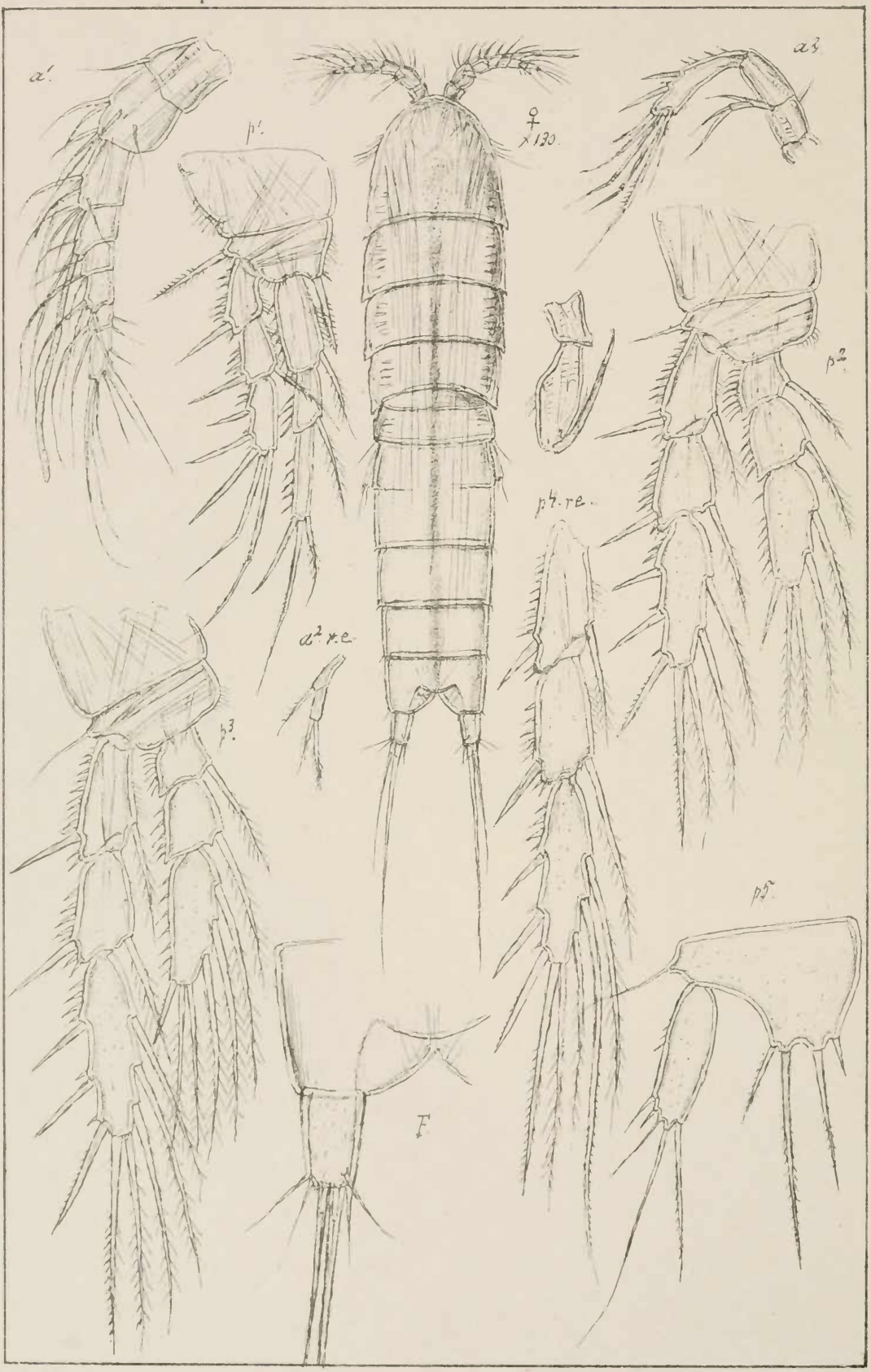


G. O. Sars, autogr.

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Parameira parva (Boeck.)

Copepoda



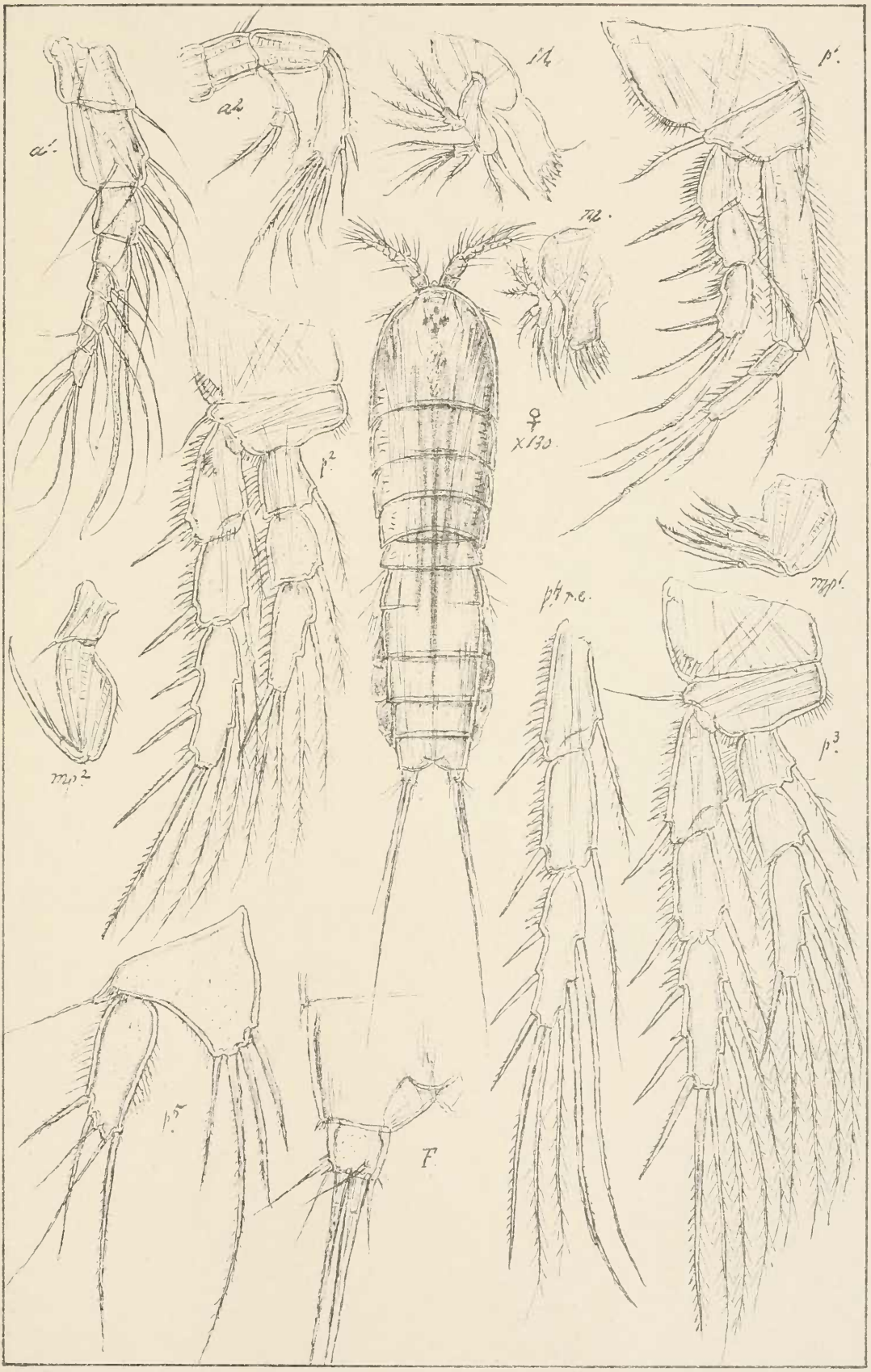
G. O. Sars, autogr. Norsk Litogr. Officin.

Parameira major, G.O.Sars

Copepoda

Canthocamptidæ Harpacticoida

PL. CXLVIII



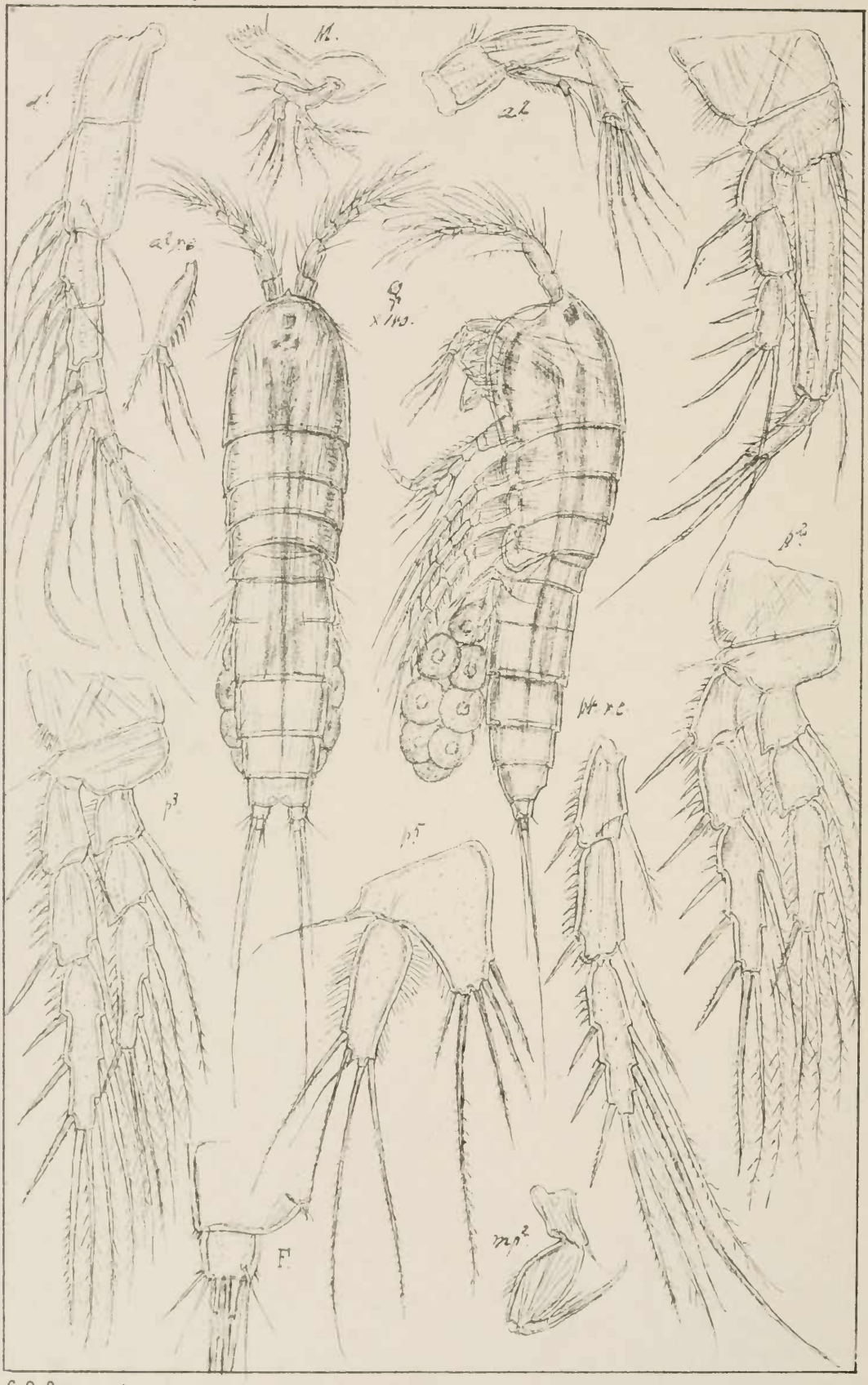
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Ameiropsis brevicornis, G.O.Sars

Copepoda

Canthocamptidæ Harpacticoida PL. CXLIX



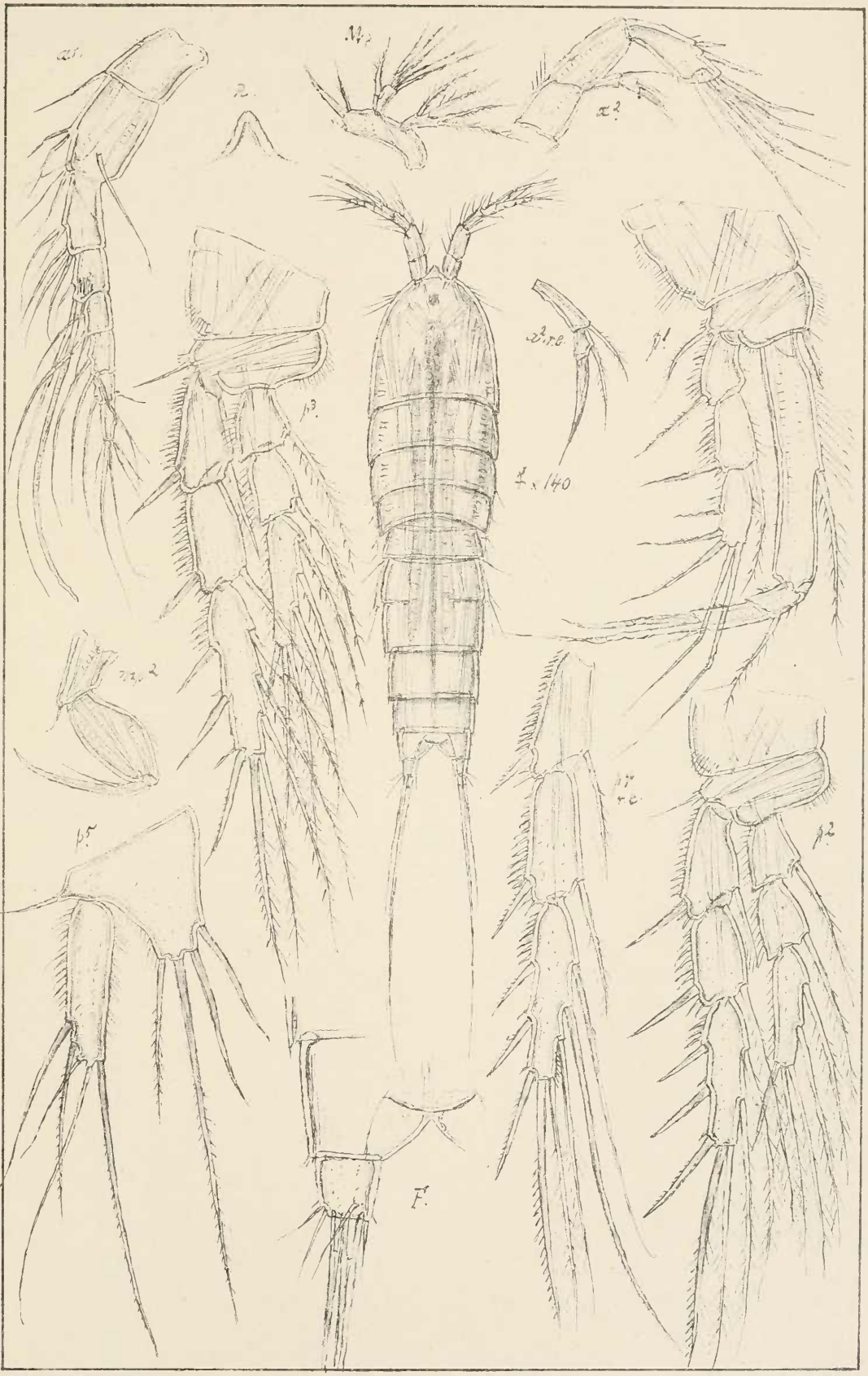
G. O. Sars. autogr. Norsk Litogr. Officin.

Ameiropsis longicomis, G. O. Sars.

Copepoda

Canthocamptidæ Harpacticoida

PL. CL



G. O. Sars, autogr.

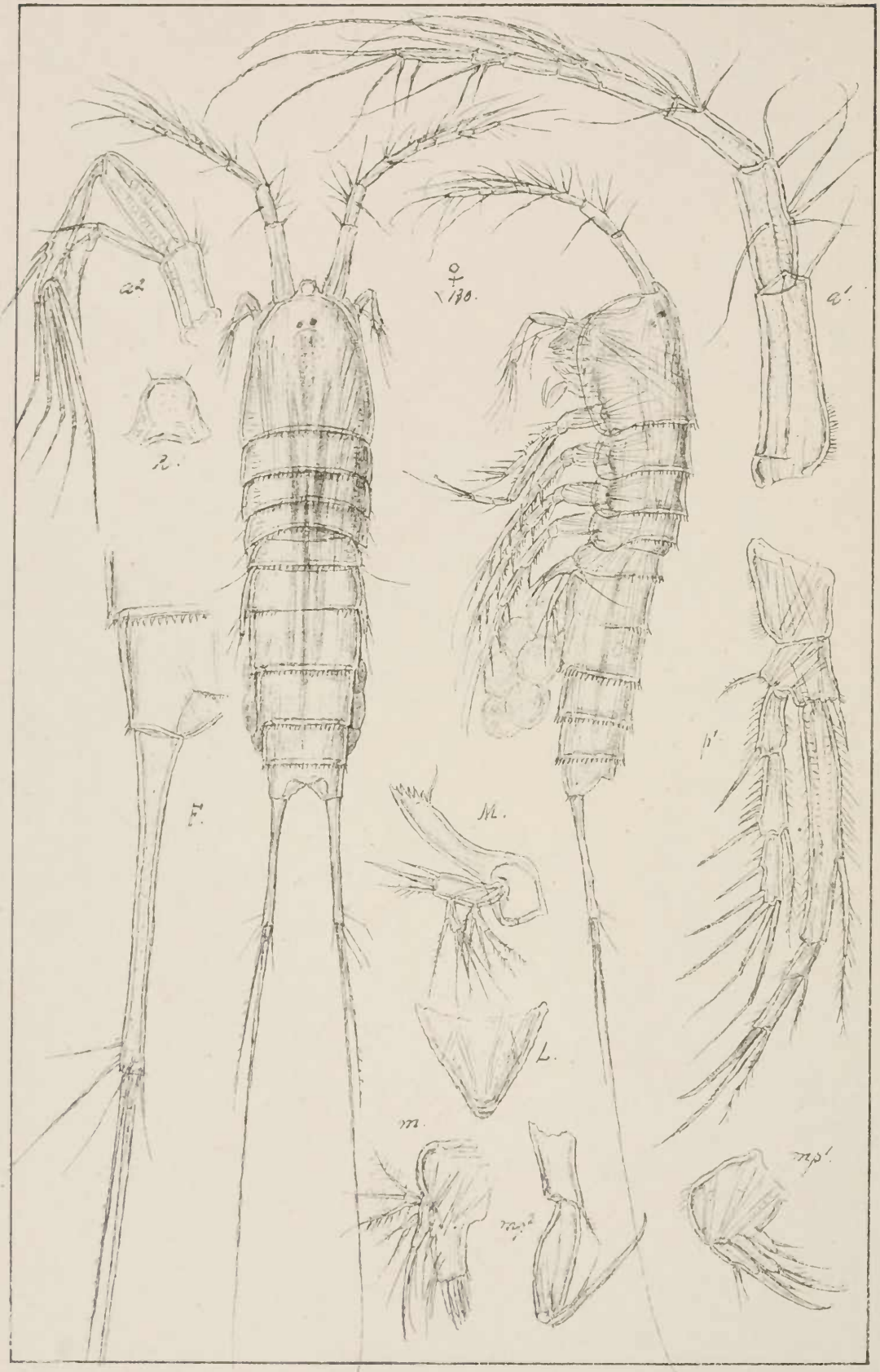
Norsk Litogr. Officin.

Ameiropsis mixta, G.O.Sars.

Copepoda

Canthocamptidæ Harpacticoida

PL.CLI



G.O. Sars, autogr.

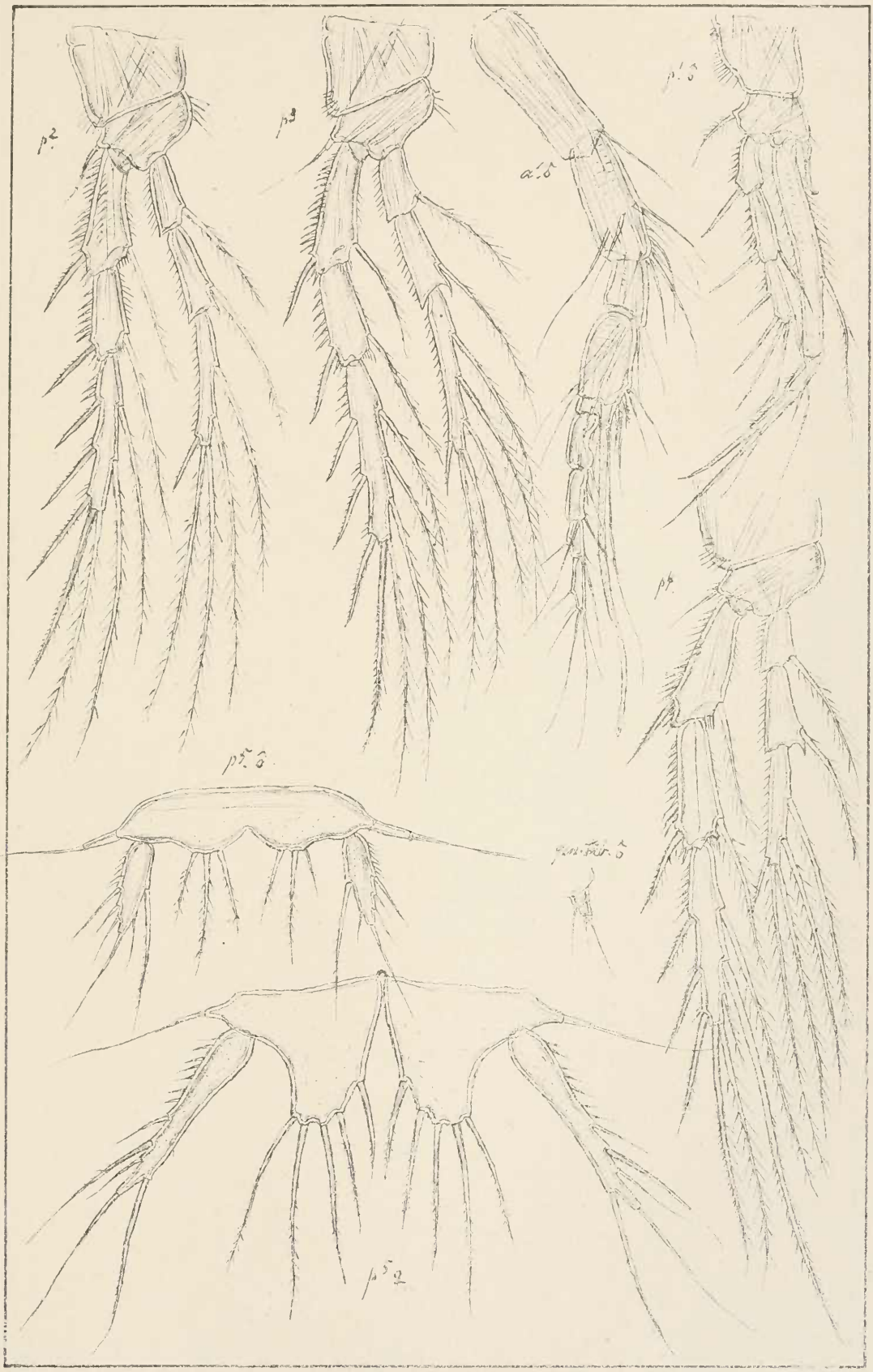
Norsk Litogr. Officin.

Stenocopia longicaudata (Scott.)

Copepoda

Canthocamptidæ Harpacticoida

PL.CLII



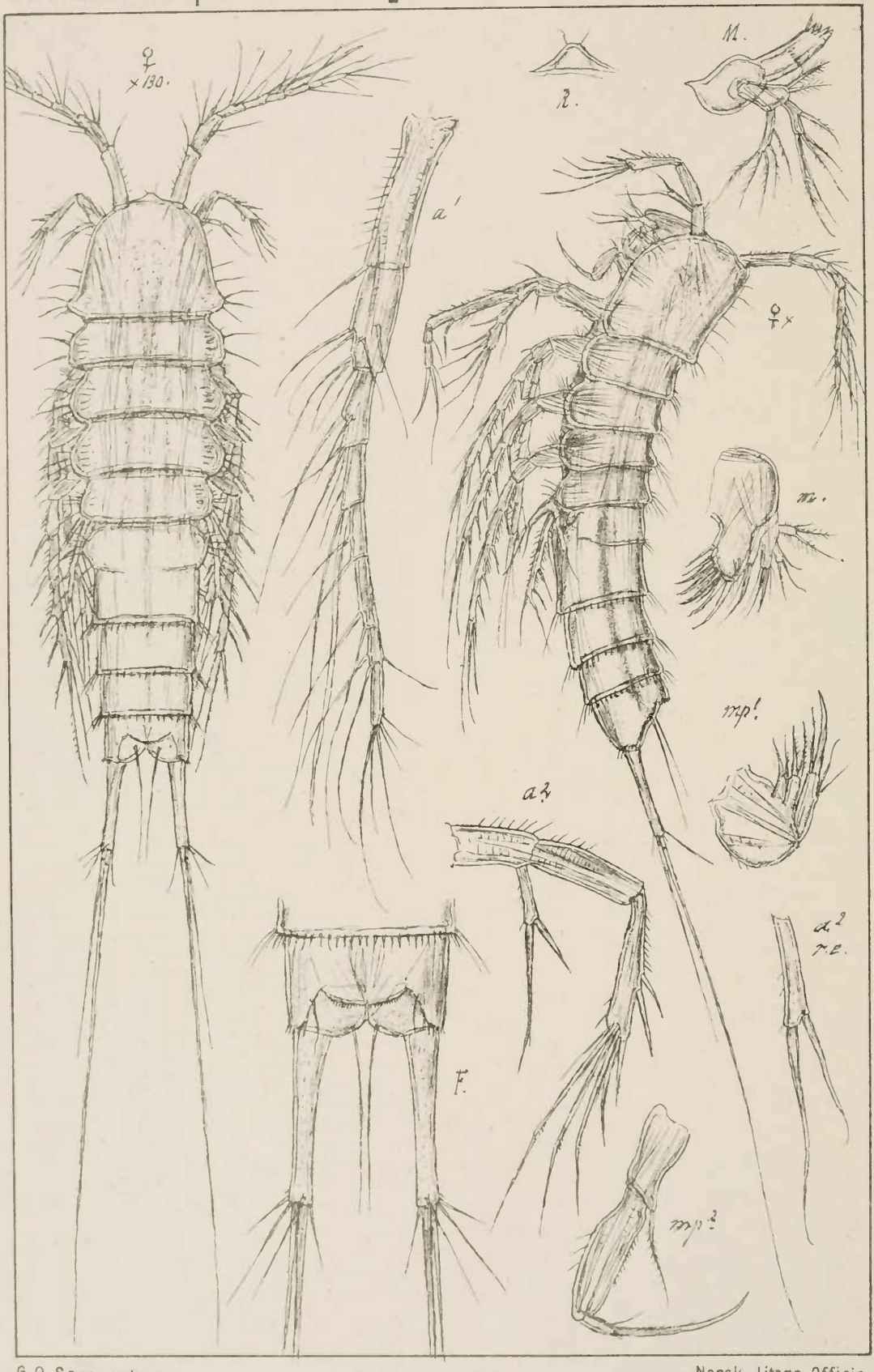
G.O. Sars, autogr.

Norsk. Litogr. Officin.

Stenocopia longicaudata (Scott)

(continued)

Copepoda



G. O. Sars. autogr. Norsk Litogr. Officin.

Stenocopia setosa G.O.Sars.

Copepoda



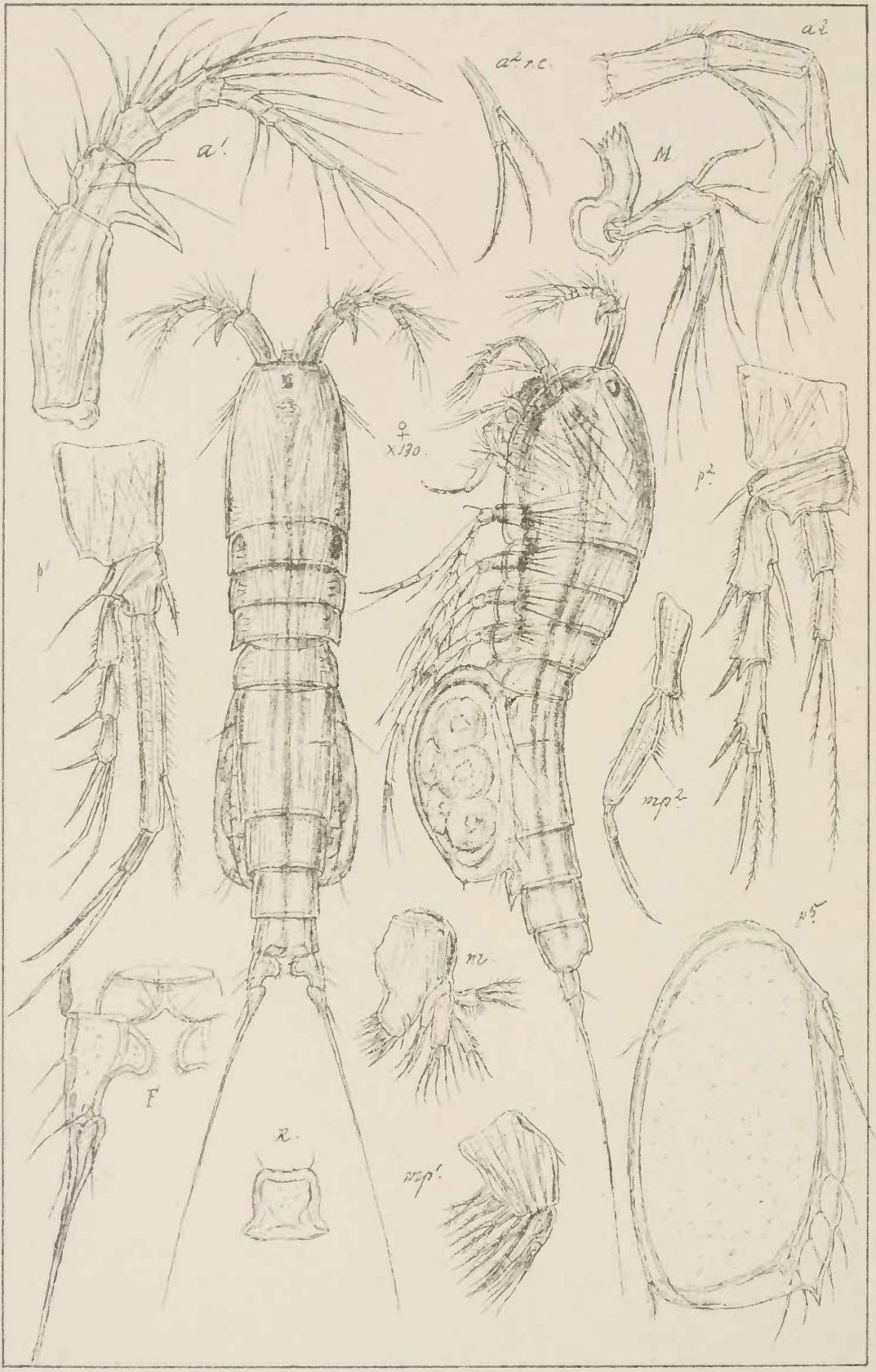
G.O. Sars, autogr. Norsk Litogr. Officin.

Stenocopia setosa G.O.Sars.
(continued)

Copepoda

Canthocamptidæ Harpacticoida

PL. CLV

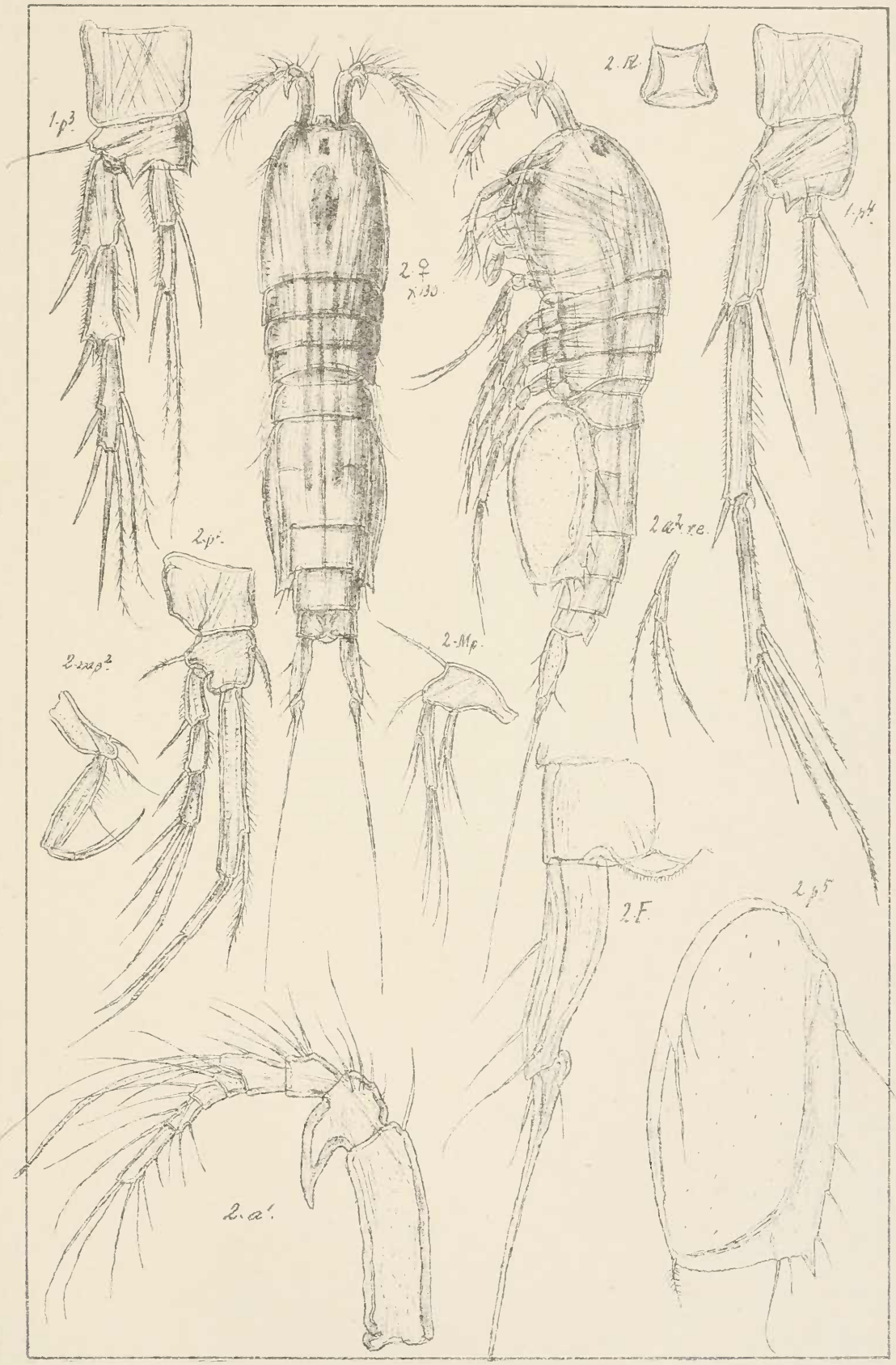


G. O. Sars, autogr

Norsk Litogr. Officin.

Phyllopodopsyllus Bradyi (Scott)

Copepoda

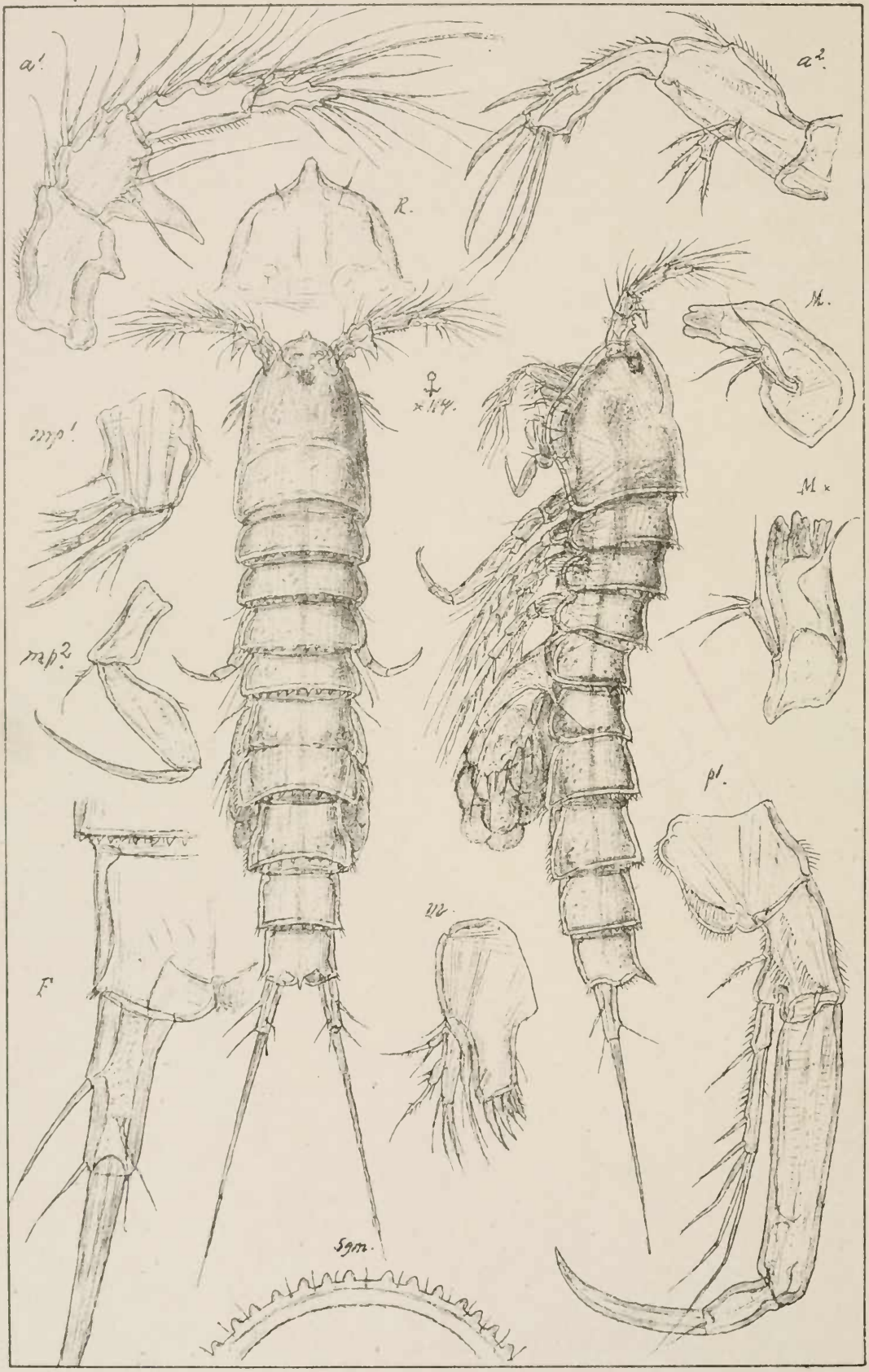


G.O. Sars, autogr. Norsk Litogr. Officin.

1. Phyllopodopsyllus Bradyi Scott (continued)

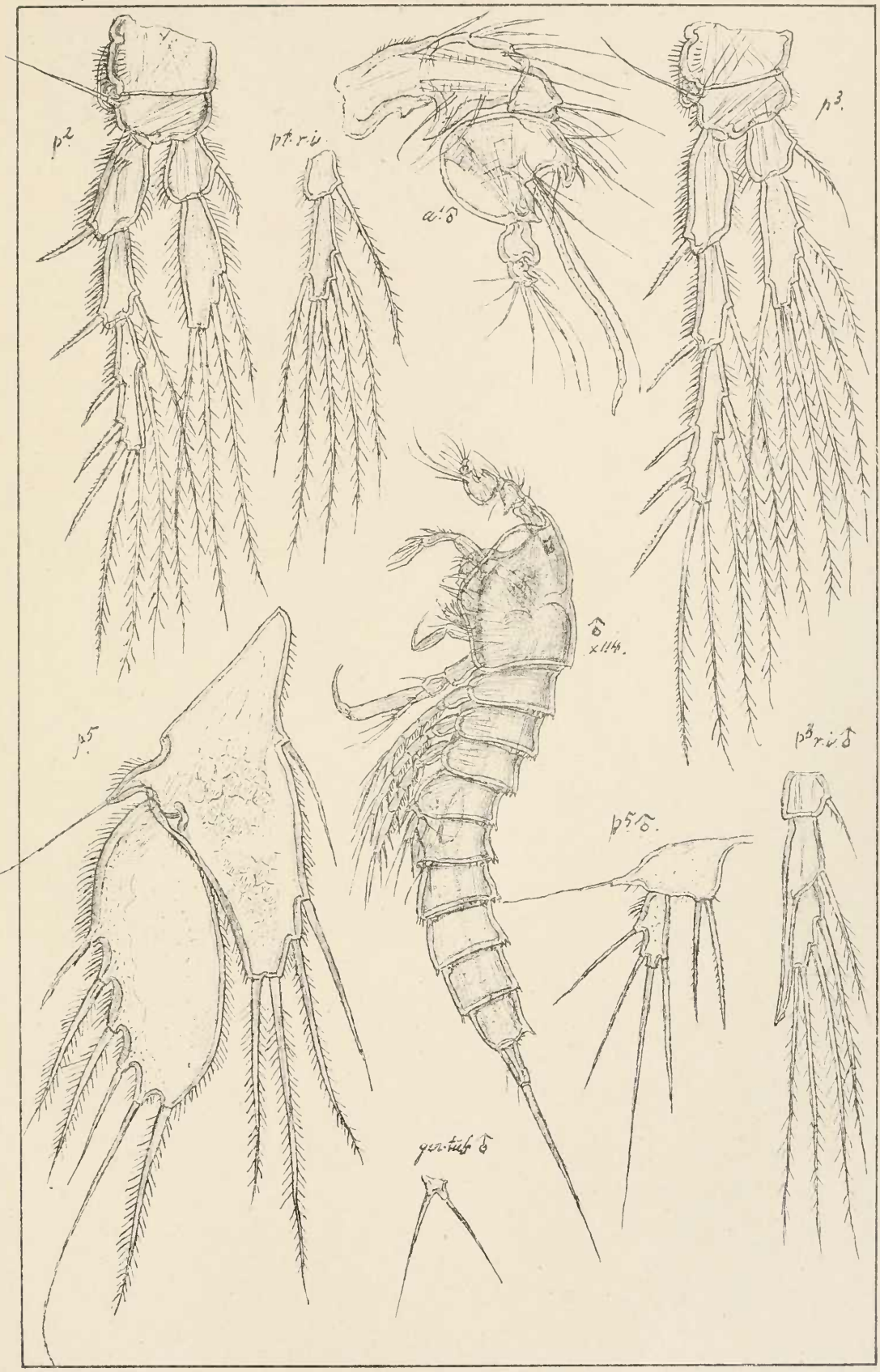
2 " furcifer G.O.Sars

Copepoda



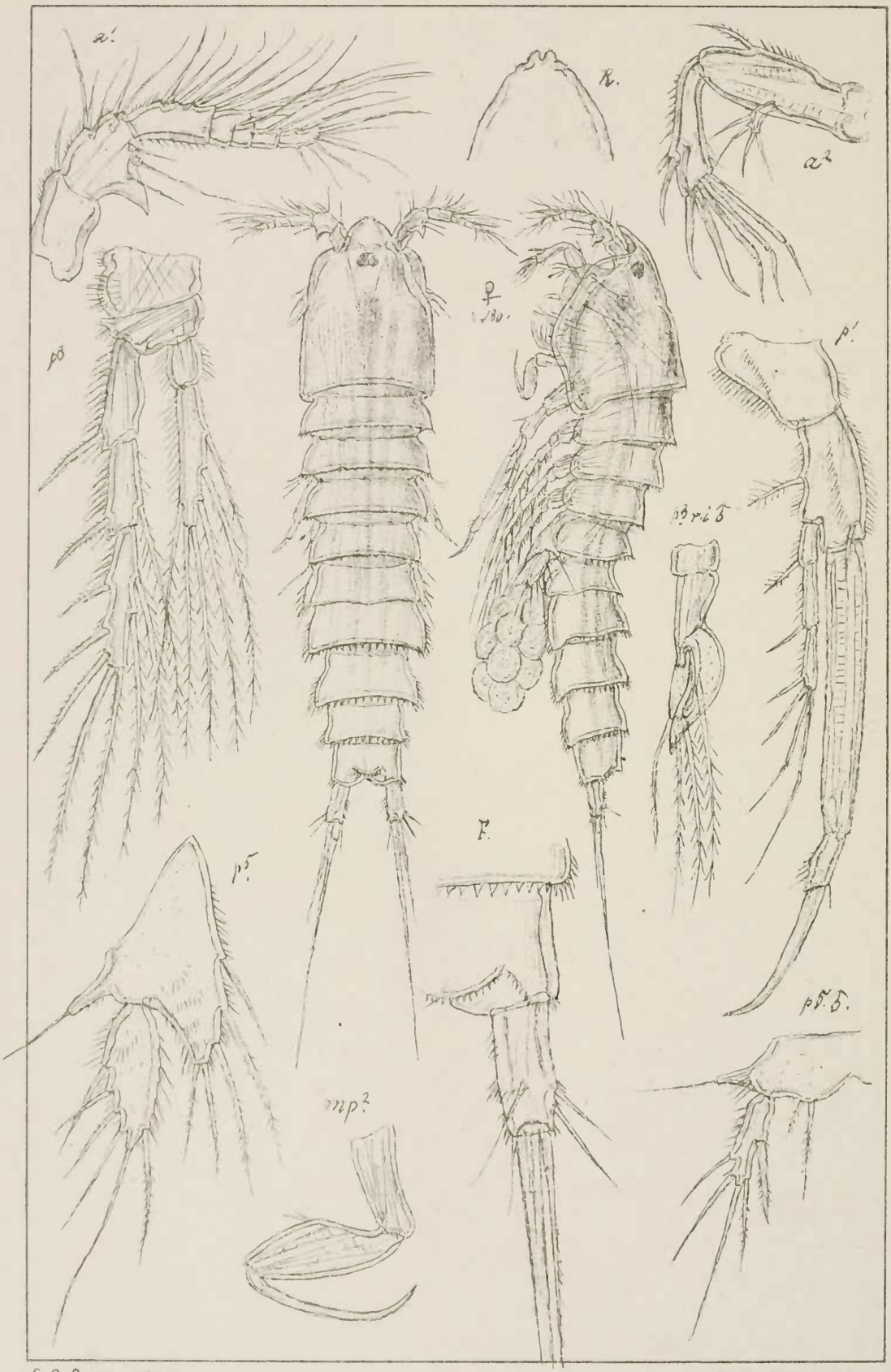
G.O. Sars, autogr. Norsk Litogr. Officin.

Laophonte cornuta, Phil



G.O. Sars, autogr. Norsk Litogr. Officin.

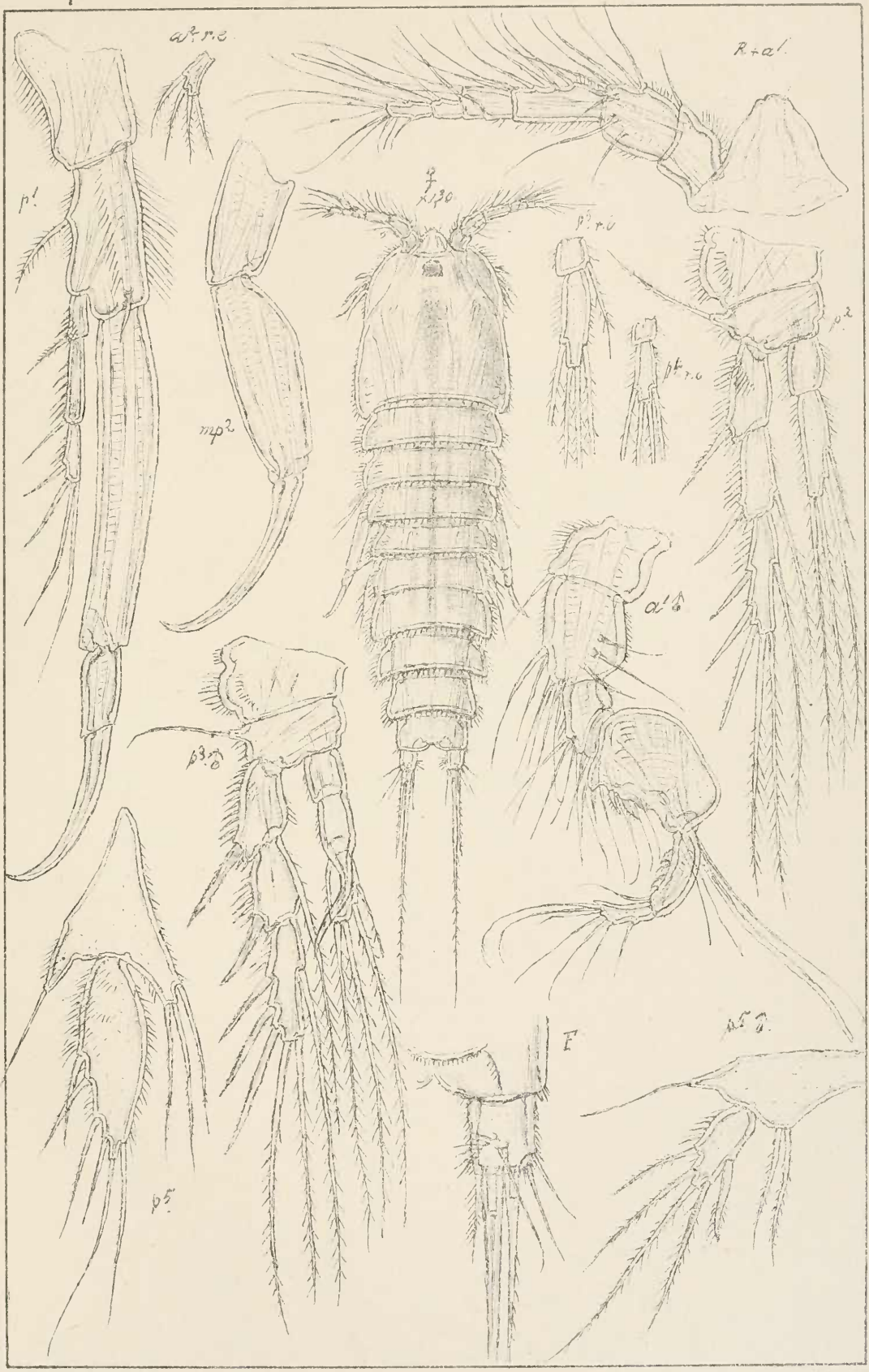
Laophonte cornuta, Phil
(continued)



G.O. Sars. autogr.

Norsk Litogr. Officin.

Laophonte serrata (Claus)



G.O. Sars, autogr. Norsk Litogr. Officin.

Laophonte depressa, Scott.

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XXI & XXII

LAOPHONTIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1908

Male with the inner ramus of 3rd pair of legs transformed in a similar manner to that in the male of *L. depressa*. Last pair of legs very small, with the distal joint rounded, and the inner expansion of proximal joint almost obsolete.

Colour yellowish grey.

Length of adult female 0.55 mm.

Remarks.—This form, first described by Boeck, belongs to the smaller species of the genus. It is moreover easily distinguished from any of the 3 preceding species by the narrow and produced caudal rami, and by the slender form of the posterior maxillipeds and of the legs.

Occurrence.—I have met with this form not unfrequently in many places, both of the south and west coasts of Norway, as also in the Trondhjem Fjord, and Th. Scott also records it from Finmark. It is found in moderate depths, ranging from 6 to 20 fathoms, among algæ.

Distribution.—British Isles (Brady), coast of France (Canu).

155. Laophonte elongata, Boeck.

(Pl. CLXII).

Laophonte elongata, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 50.

Specific Characters.—Female. Body slender and elongated, with the segments sharply marked off from each other, and fringed at the posterior edge with delicate spinules. Cephalic segment comparatively large and deep, with the lower edges strongly curved in the middle; rostral projection of moderate size and truncated at the tip. Urosome nearly as long as the anterior division, lateral expansions of genital segment and the 2 succeeding ones densely setiferous; last segment shorter than the preceding one. Caudal rami exceedingly slender and elongated, almost attaining half the length of the urosome, and scarcely at all divergent, apical setæ of moderate length. Anterior antennæ rather slender, almost attaining the length of the cephalic segment, and composed of 6 articulations only, the last 2 being confluent, 2nd joint the largest and without any projection of the hind edge. Posterior antennæ about as in *L. thoracica*. 1st pair of legs, as in that species, very slender, with the basal part much elongated, outer ramus small and only composed of 2 joints. Natatory legs slender and elongated, resembling in structure those in *L. thoracica*. Last pair of legs with the distal joint considerably narrower than in that species, otherwise of a rather similar structure.

Colour pale yellowish, with scattered orange patches along the sides of urosome; ovaria dark green.

Length of adult female 0.60 mm.

Remarks.—This form is nearly allied to *L. thoracica*, though easily distinguishable by its more slender body, and especially by the very narrow and elongated caudal rami, which moreover are not divergent, as in that species, but extended straight behind. Of the structural details, the biarticulate outer ramus of the 1st pair of legs and the very narrow distal joint of the last pair in the female may be mentioned as well-marked distinguishing characters. The form recorded by Th. Scott from Franz Josef Land as *L. longicaudata* Boeck, seems to be the present species, as the outer ramus of the 1st pair of legs is indicated to be biarticulate.

Occurrence.—I have found this form occasionally in several localities both of the south and west coasts of Norway in moderate depths among algæ.

Distribution.—Frans Josef Land (Scott).

156. Laophonte typhlops, G. O. Sars, n. sp.

(Pl. CLXIII).

Specific Characters.—Female. Body moderately slender, with the segments sharply marked off from each other. Cephalic segment rather broad, though comparatively shorter than in *L. elongata*, rostral projection obtusely rounded at the tip. Urosome shorter than the anterior division, lateral expansions of genital segment and the 2 succeeding ones well marked and finely setous; last segment about the length of the preceding one. Caudal rami rather produced, considerably exceeding in length the last segment, slightly divergent and attenuated distally, apical setæ very slender, the longest of them almost attaining the length of the whole body. Eye wholly absent. Anterior antennæ slender and elongated, being fully as long as the cephalic segment, and distinctly 7-articulate. Posterior antennæ with the distal joint long and narrow, outer ramus well developed, about half the length of the proximal joint. 1st pair of legs with the basal part less narrow than in the 2 preceding species, outer ramus distinctly 3-articulate and exceeding half the length of the 1st joint of the inner, the latter much longer than the basal part. Natatory legs with the rami long and slender, 1st joint of inner ramus provided inside with a well-marked seta. Last pair of legs comparatively large, distal joint, however, extremely narrow, sublinear, tip conically produced; inner expansion of proximal joint narrowly exserted at the tip, marginal setæ 5 in number, 2 of them issuing from the tip, proximal seta of inner edge attached at rather a long distance from the others close to the base.

Male with the anterior antennæ hinged in the usual manner, but having the last joint of the proximal part only slightly dilated. Inner ramus of 3rd pair of legs only differing from that in female in the seta of the outer edge being transformed to a short spine. Last pair of legs, as usual, much smaller than in female, distal joint narrow fusiform; inner expansion of proximal joint very slight, with a single seta.

Colour whitish, pellucid.

Length of adult female 0.64 mm.

Remarks.—In most of the structural details the present form closely agrees with a species recently described by Th. Scott as *L. longiremis*. It is however very conspicuously distinguished from that species by the much more produced caudal rami. In *L. longiremis*, both according to the figures and the description given by Scott, these rami are comparatively short, not exceeding in length the last segment, whereas in the present species they are almost twice as long and much more slender in form. Another character distinguising this species is the total absence of any visual organ, a feature which has given rise to the specific name here proposed.

Occurrence.—Some few specimens of this form were found in the summer 1906 at Flekkerö, south coast of Norway, in a depth of about 20 fathoms.

157. Laophonte longicaudata, Boeck.

(Pl. CLXIV).

Laophonte longicaudata, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. 1864, p. 279.

Syn: *Laophonte Hodgei*, Brady.

Specific Characters.—Female. Body rather slender, with the segments of the anterior division less sharply marked off from each other than in the preceding species. Cephalic segment large and contracted in front, rostral projection strongly prominent and somewhat curved as the tip, which is minutely trilobate. Urosome with the lateral expansions of the anterior segments rather slight and only sparingly setous; last segment about the length of the preceding one. Caudal rami very long and slender, equalling in length the last 2 segments combined, and extending straight behind, apical setæ comparatively short. Anterior antennæ scarcely exceeding half the length of the cephalic segment, and distinctly 7-articulate, 2nd joint the largest and exhibiting in the middle behind a short dentiform projection. Posterior antennæ of rather feeble structure, outer ramus well developed. 1st pair of legs less robust than in most other species, outer ramus

3-articulate, and exceeding half the length of the 1st joint of the inner, the latter about the length of the basal part, terminal claw very slender. Natatory legs well developed, with the inner ramus larger and broader than in most other species, its proximal joint only in the 4th pair setiferous. Last pair of legs comparatively small, distal joint narrow oval in form, with the inner edge straight; inner expansion of proximal joint short and broad, with 5 marginal setæ, the apical one the longest.

Male with the inner ramus of 3rd pair of legs transformed in the usual manner. Last pair of legs very small, distal joint well defined and somewhat widening towards the end, with 4 marginal setæ; inner expansion of proximal joint almost obsolete.

Body in female of whitish colour, with 3 light orange transversal bands, the 1st across the cephalic segment, the 2nd occupying the posterior part of the genital segment, the 3rd the anal segment.

Length of adult female 0.73 mm.

Remarks.—This form, first recorded under the above name by Boeck, is a very distinct species, easily distinguished by its slender form of body, the greatly prominent rostral projection, and the long and narrow caudal rami. In the living state it is also readily recognized by its peculiar and beautiful colouring.

Occurrence.—I have met with this form occasionally off the west coast of Norway, as also in the Trondhjem Fjord, in moderate depths among algæ.

Distribution.—British Isles (Brady).

158. Laophonte similis (Claus).

(Pl. CLXV).

Cleta similis, Claus, Die Copepoden-Fauna von Nizza, p. 20, Pl. V, figs. 13, 14.

Syn: *Laophonte setosa*, Boeck.
„ — *affinis*, Boeck.

Specific Characters.—Female. Body rather slender, with the segments of the anterior division not very sharply marked off from each other. Cephalic segment of moderate size, with the rostral projection short and broad, obtusely rounded at the tip. Urosome almost as long as the anterior division, lateral expansions of the segments not much prominent, last segment shorter than the preceding one. Caudal rami rather produced, exceeding in length the anal segment, and scarcely at all divergent, apical setæ much elongated. Anterior antennæ rather slender, almost attaining the length of the cephalic segment, and only composed of 6 ar-

ticulations, the outer 2 being confluent, 2nd joint somewhat shorter than 3rd, with a small nodiform projection in the middle behind. Posterior antennæ with the outer ramus comparatively short, but of usual structure. 1st pair of legs much stronger than in *L. longicaudata,* with the inner ramus rather elongated, outer ramus about half the length of the 1st joint of the inner, and only composed of 2 joints, the distal one very slender, linear in form. Natatory legs well developed and of normal structure, proximal joint of inner ramus in all of them without any seta inside. Last pair of legs of moderate size, distal joint oblong oval in form and densely ciliated on both edges, marginal setæ 5 in number, the apical one very slender, hair-like; inner expansion of proximal joint linguiform, extending somewhat beyond the middle of the distal joint, marginal setæ 4 in number, the outermost but one much the longest. Ovisac rounded oval in form.

Male with the inner ramus of 3rd pair of legs transformed in the usual manner. Last pair of legs very small, with the distal joint quite short and only provided with 4 setæ, the innermost rather strong, spiniform; inner expansion of proximal joint almost obsolete, though carrying a single well-developed seta.

Colour dark yellowish.

Length of adult female 0.90 mm.

Remarks.—This form was first described by Claus under the name of *Cleta similis,* and was subsequently also recorded by Prof. Brady. Boeck, however, did not recognise the species, but described it under another name, viz., *L. setosa.* The form subsequently named by the same author *L. affinis* is scarcely different from that species. On the other hand, is the form described by Canu as *L. similis* evidently not that species, as clearly shown by the very different structure of the anterior antennæ and the last pair of legs. The present form is one of the larger species of the genus, and may be easily recognised by its slender and graceful body and the very long caudal setæ.

Occurrence.—I have met with this form not unfrequently in the upper part of the Christiania Fjord, as also occasionally off the south and west coasts of Norway in moderate depths among algæ.

Distribution.—Mediterranean at Nizza (Claus), British Isles (Brady), ? Franz Josef Land (Scott).

159. Laophonte horrida, Norman.

(Pl. CLXVI & CLXVII).

Laophonte horrida, Norman, Report of the "Valorous" Expedition. Proceed. Royal Soc. London 1876, p. 206.

Syn: *Cleta minuticornis*, Buchholtz.

Specific Characters.—Female. Body elongated, with all the segments very sharply marked off from each other by deep instrictions. Cephalic segment, seen dorsally, almost quadrangular in form, dorsal face produced behind into a strong backwards-curving spiniform projection. Rostrum strongly prominent, conspicuously constricted at the base, and exhibiting on each side in the middle an angular ledge carrying a delicate bristle, terminal part linguiform, with the tip narrowly rounded. The 4 succeeding segments angularly produced laterally, and each carrying dorsally 2 juxtaposed strong denticulated spines curving backwards; hind edge of the segments coarsely spinulose, except between the 2 dorsal spines. Urosome almost as long as the anterior division, the 2 divisions of the genital segment and the succeeding segment each with 2 dorsal spines similar to those on the anterior division, but more closely juxtaposed; lateral parts of these segments triangularly expanded and densely setiferous. Penultimate segment with the posterior edge divided dorsally in the middle into 4 peculiar spines, branching in a hand-like manner; last segment simple and shorter than the preceding one. Caudal rami rather produced, considerably longer than the anal segment, and each carrying a very strong, almost spiniform apical seta exceeding in length the urosome, the other setæ small and hair-like. Anterior antennæ rather slender, exceeding in length the cephalic segment (without the rostrum), and 6-articulate, 2nd joint the largest, and provided at the hind edge beyond the middle with a small nodiform projection, 3rd joint exceeding in length the outer 3 joints combined. Posterior antennæ strongly developed, being fully as long as the anterior ones, outer ramus of normal structure. Posterior maxillipeds comparatively large, with the basal part narrow, hand fusiform in shape, dactylus much elongated and curved at the end. 1st pair of legs slender and elongated, with the 2nd basal joint very narrow, outer ramus small and only consisting of 2 joints; inner ramus with the proximal joint quite smooth, and somewhat exceeding in length the 2nd, basal joint, apical claw long and slender. Natatory legs with both rami very narrow, distal joint of inner ramus provided in the 2nd and 4th pairs with 3, in the 3rd pair with 4 setæ, none of which issue from the outer edge. Last pair of legs of moderate size, distal joint however very small and somewhat obliquely truncated at the end, with only 3 setæ; inner expansion of proximal joint rather

broad at the base, but narrowly exserted at the tip, extending beyond the distal joint, marginal setæ 4 in number.

Male almost of same size as the female, but of more slender form. Anterior antennæ strongly hinged, with the last joint of the proximal part considerably dilated, distal part terminating in a claw-like point. Outer ramus of 3rd pair of legs very powerfully developed, with all the joints considerably thickened and having the spines very coarse, setæ of inner edge short and spiniform; inner ramus transformed in the usual manner. 4th pair of legs likewise with the outer ramus much coarser than in female and with the setæ of the inner edge spiniform. Last pair of legs very small, with the inner expansion of proximal joint obsolete.

Colour dark yellowish brown.

Length of adult female 1.30 mm.

Remarks.—This remarkable form was first described by Buchholtz from the German Arctic Expedition, but was erroneously identified with Müller's *Cyclops minuticornis*, for which reason Norman proposed for it a new specific name, viz., *horrida*. It is one of the largest species of the genus, and is moreover easily recognised by the strong spinous armature of the body, which latter character has given rise to the specific name proposed by Norman.

Occurrence.—I have found this form rather abundantly in the upper part of the Christiania Fjord in a depth of from 10 to 20 fathoms, muddy bottom. It also occurs occasionally both of the south and west coasts of Norway at least up to the Trondhjem Fjord, and Th. Scott records it moreover from the Finmark coast. The specimens are in most cases so densely coated with mud, that the peculiar spinous armature of the body is only faintly traced. In some cases, however, the body appears cleaner, so as to reveal the regular arrangement of the spines more clearly. The movements of the animal are rather clumsy, and, as in most other species, are effected in a somewhat jerking manner.

Distribution.—British Isles (Brady), Greenland (Buchholtz), Polar islands north of Grinnels Land (2nd Fram Expedition), Franz Josef Land (Scott), off Bear Island and Spitsberg (Scott).

160. Laophonte brevispinosa, G. O. Sars, n. sp.

(Pl. CLXVIII).

Specific Characters.—Female. Body resembling in its general form that of the preceding species, and having a rather similar dorsal armature. Cephalic segment, however, somewhat different in shape, bulging considerably to each side in its posterior part, and having the lower edges produced in front to rounded

projecting lobes; dorsal process much shorter thad in *L. horrida*. Rostrum rather narrow, being scarcely at all dilated in the middle, tip minutely bilobate. The 4 succeeding segments rounded laterally, dorsal spines very short and perfectly smooth, edges of the segments not spinulose. Urosome with the lateral expansions of the anterior segments less produced, dorsal spines larger than those of the anterior division; penultimate segment with the hind edge divided dorsally in the middle into 2 well-defined branching appendages, to each side of which 3 densely crowded simple spines occur. Caudal rami resembling in form and structure those in *L. horrida*. Anterior antennæ, as in that species, very slender and 6-articulate, 2nd joint however quite simple, without any projection of the hind edge, 3rd joint shorter than the 3 outer joints combined. Posterior antennæ less robust than in *L. horrida*, not attaining the length of the anterior ones, outer ramus very narrow. 1st pair of legs likewise of feebler structure, with the proximal joint of the inner ramus scarcely longer than the 2nd basal joint, outer ramus, as in *L. horrida*, biarticulate. Natatory legs about as in that species. Last pair of legs rather small, with the distal joint almost transversely truncated at the tip; inner expansion of proximal joint not extending beyond the distal joint; number of setæ on both joints as in the preceding species.

Male with the outer rami of 3rd and 4th pairs of legs far less robust than in *L. horrida*, setæ of inner edge not transformed.

Colour dark brownish grey.

Length of adult female about 1 mm.

Remarks.—This form looks very like the preceding species, and may easily be confounded with it. On a closer examination, it is however found to differ very markedly in some points, both as regards the armature of the body and the structure of the appendages.

Occurrence.—I have hitherto only met with this form in 2 localities, viz., Hvalör, at the entrance of the Christiania Fjord, and at Lillesand, south coast of Norway. In both localities it occurred on a muddy bottom, in a depth of about 10 fathoms.

161. Laophonte Koreni, Boeck.

(Pl. CLXIX).

Laophonte Koreni, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. 1872, p. 51.

Specific Characters.—Female. Body comparatively short and broad, conspicuously depressed, with the segments sharply marked off from each other.

Cephalic segment about the length of the 4 succeeding segments combined, and slightly contracted in front; rostral projection not much prominent and triangular in form, tip narrowly rounded. The 3 succeeding segments with the lateral parts rounded off and densely setiferous. Urosome much shorter than the anterior division, all the segments, except the last, with well-marked lateral expansions densely fringed with delicate bristles. Caudal rami short and thick, of rounded quadrangular form, and somewhat divergent, being clothed inside with hair-like spinules partly arranged in transversal rows, apical setæ slender and divergent. Anterior antennæ of moderate length and somewhat thickened at the base, 7-articulate, with the 3rd joint the longest. Posterior antennæ rather stout, with the outer ramus of normal structure. Posterior maxillipeds powerfully developed. 1st pair of legs likewise rather strong, with the 2nd basal joint comparatively broad, bulging considerably inside, outer ramus distinctly 3-articulate, and exceeding half the length of the 1st joint of the inner, the latter fully as long as the basal part, and ciliated on the inner edge, apical claw strong and curved at the tip. Natatory legs well developed, inner ramus however comparatively short, with only 4 setæ on the terminal joint. Last pair of legs with the distal joint rather large and oblong oval in form, carrying 5 comparatively short setæ, that issuing from the conically produced tip very thin, hair-like; inner expansion of proximal joint only slightly produced, with 5 marginal setæ, the outer 2 closely juxtaposed and smaller than the others. Ovisac large, rounded oval in form.

Male with the anterior antennæ strongly hinged, last joint of proximal part almost globose, terminal part armed at the base outside with a strong claw-like projection. 3rd and 4th pairs of legs very conspicuously transformed, outer ramus in both pairs much stronger than in female, with the spines considerably thickened; inner ramus of 3rd pair only biarticulate, distal joint produced outside to a short triangular projection, and carrying on the tip 2 unequal setæ; inner ramus of 4th pair reduced to a small nodiform joint carrying 2 thickish diverging setæ. Last pair of legs, as usual, much smaller than in female, distal joint slightly widening towards the end and provided with 4 setæ only; inner expansion of proximal joint almost obsolete, though carrying 2 small setæ.

Colour light yellowish grey.

Length of adult female 0.70 mm.

Remarks.—This form, first recorded by Boeck under the above name, may be easily recognised by its broad depressed body, the sharp demarcation of the segments, and the long diverging caudal setæ. The transformation of the inner rami of the 3rd and 4th pairs of legs in the male is rather unlike that generally met with in the present genus.

Occurrence.—I have found this form occasionally in the upper part of the Christiania Fjord, as also off the west coast of Norway in moderate depths among algæ. Out of Norway it has not yet been recorded.

162. Laophonte proxima, G. O. Sars, n. sp.

(Pl. CLXX).

Specific Characters.—Female. Body more slender than in the preceding species, though, as in that form, conspicuously depressed, with the segments sharply marked off from each other. Cephalic segment about as in *L. Koreni;* the 3 succeeding segments however more angular and less densely setous. Urosome rather short, and having the lateral expansions of the segments less produced. Caudal rami comparatively longer than in *L. Koreni* and gradually tapering distally, apical setæ less divergent. Anterior antennæ more slender, with the 2nd and 3rd joints of about equal length. Posterior antennæ resembling in structure those in *L. Koreni.* 1st pair of legs somewhat less robust than in that species, otherwise of a very similar structure. Natatory legs also rather similar, except that the distal joint of the inner ramus in the 3rd pair of legs has 5 setæ, and that the outer ramus of the 4th pair is somewhat shorter and stouter. Last pair of legs differing more conspicuously from those in *L. Koreni,* the distal joint being much shorter and broader, obliquely oval in form, and very densely hispid, marginal setæ 6 in number, 2 of them on the outer edge closely juxtaposed.

Colour not yet ascertained.

Length of adult female 0.84 mm.

Remarks.—The present form is closely allied to *L. Koreni,* differing however in the more slender form of the body, as also in some of the structural details, for instance in the shape of the distal joint of the last pair of legs. Only the female sex is as yet known.

Occurrence.—Some few specimens of this form were picked up from a sample taken at Kopervik, west coast of Norway, from moderate depth.

163. Laophonte Strömi (Baird).

(Pl. CLXXI & CLXXII).

Canthocamptus Strömii, Baird, Brit. Entomostraca, p. 208, Pl. XXVII, fig. 3 (not Lilljeborg, nor *Dactylopus Strömi* Claus).

Syn: *Laophonte curticauda*, Brady (not Boeck).

Specific Characters.—Female. Body rather slender, gradually attenuated behind, with the segments well marked off from each other. Cephalic segment of moderate size, with the rostral projection very short and rounded at the tip. Urosome with the anterior segments slightly expanded laterally, last segment about the length of the preceding one. Caudal rami about twice as long as they are broad, smooth, with the tip transversely truncated, apical setæ slender and elongated. Anterior antennæ rather slender, almost as long as the cephalic segment, and distinctly 7-articulate. Posterior antennæ with the stem itself of normal structure, outer ramus however very small, and having the setæ imperfectly developed. 1st pair of legs with the outer ramus 3-articulate, and exceeding half the length of the proximal joint of the inner, the latter rather strong and ciliated on both edges. Natatory legs well developed, with the normal number of spines and setæ. Last pair of legs of moderate size, distal joint rather broad and obliquely oval in form, with 6 marginal setæ, the innermost of which is quite short and arising from a nodiform projection bordered inside by a strongly chitinized rim; inner expansion of proximal joint rather broad, but scarcely extending beyond the middle of the distal joint, marginal setæ 5 in number, the outermost one very small. Ovisac large, oval in form.

Male somewhat smaller than female, and having the 2 anterior free segments of metasome considerably larger than the 2 succeeding ones. Urosome much narrower than in female, almost cylindrical in form, with the segments scarcely at all expanded laterally. Anterior antennæ very powerfully developed and strongly hinged, with the last joint of the proximal part globularly dilated, distal part biarticulate and terminating in a sharp point. 2nd and 3rd pairs of legs conspicuously transformed and much larger than in female, with the outer rami very powerful, their terminal joint more or less incurved and having the spines largely developed and divergent, setæ of inner edge much reduced in size. Inner ramus of 2nd pair with the proximal seta of the distal joint transformed to a spine-like appendage pointing straight inwards and terminating in a hamiform point; that of 3rd pair biarticulate, with the distal joint much dilated and produced outside to a short and thick spiniform projection flanked at the base with a row of 4 strong denticles, marginal setæ 4 in number, 2 of them issuing from the

somewhat produced tip. 4th pair of legs of exactly same structure as in the female. Last pair of legs very much reduced, distal joint obsolete, and replaced by 3 hair-like setæ.

Colour light yellowish.

Length of adult female 0.88 mm., of male 0.77 mm.

Remarks.—This is in my opinion the form originally recorded by Baird as *Canthocamptus Strömii*. Prof. Lilljeborg described under this name a very different form, which subsequently was named by Boeck *Mesochra Lilljeborgi*, and Prof. Claus identified Baird's species with another Harpacticoid belonging to the genus *Dactylopusia*. Though the identification of Claus has been admitted by all subsequent authors, I have felt justified to reject also this identification as erroneous, and have accordingly recorded Claus's species under a new name, viz., *Dactylopusia vulgaris*. Indeed, the figures given by Baird clearly show his species to belong neither to the genus *Mesochra* nor to *Dactylopusia*, but quite certainly to the genus *Laophonte*, and, as the present form is one of the commoner littoral species and on the whole agrees in its general appearance pretty well with Baird's figure, it is very likely to believe it to be the true Bairdian species.

Occurrence.— Off the west coast of Norway this form occurs rather abundantly in the littoral region among algæ, as also occasionally in tidal pools. On the other hand, I have not met with it off the south coast or in the Christiania Fjord, where it is replaced by 2 nearly-allied species, to be described below.

Distribution.—British Isles (Baird, Brady), Franz Josef Land (Scott).

164. Laophonte curticauda, Boeck.

(Pl. CLXXIII).

Laophonte curticauda, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. 1864, p. 278 (not Brady).

Specific Characters.—Female. Very like the preceding species as to its external appearance, but of smaller size and somewhat less slender form of body. Rostral projection, as in the said species, very short and obtuse at the tip. Caudal rami of a similar form to those in *L. Strömi*, but densely cowered with small adpressed spikes, apical setæ long and slender. Anterior antennæ comparatively less elongated than in that species, 7-articulate. Posterior antennæ with the outer ramus well developed and of quite normal appearance, carrying 4 distinctly ciliated setæ. 1st pair of legs of moderate size and resembling in structure those in *L. Strömi*. Natatory legs likewise of a very similar structure, except that the

distal joint of the inner ramus in 3rd and 4th pairs has only 3 setæ, and that the terminal joint of the outer ramus in 4th pair is shorter, with only 3 spines. Last pair of legs differing more conspicuously, distal joint much smaller and oval in form, with only 5 setæ, the innermost one quite normal; inner expansion of proximal joint less broad, but rather prominent, extending as far as the distal joint; marginal setæ 4 in number, the outermost but one much longer than the others.

Male with the 2nd pair of legs scarcely at all transformed, having only the rami somewhat more elongated than in female. 3rd pair, on the other hand, very unlike those in the female, the outer ramus being exceedingly powerful and incurved, with the spines strongly developed and the setæ of the inner edge spiniform; inner ramus distinctly 3-articulate, with the middle joint produced outside to a mucroniform process. 4th pair of legs likewise somewhat transformed, having the outer ramus considerably more strongly built than in female. Last pair of legs very small, though having the distal joint well defined and edged with 4 slender setæ.

Colour yellowish.

Length of adult female 0.72 mm.

Remarks.—This form was very imperfectly characterised by Boeck, and it was for this reason not recognised by Prof. Brady, who described under the name of *L. curticauda* a different species, viz., that recorded above as *L. Strömi*. It is indeed closely allied to that species, but evidently specifically distinct, differing, as it does, in some of the structural details very conspicuously, for instance in the much fuller development of the outer ramus of the posterior antennæ, the rather unlike shape of the last pair of legs in both sexes, and finally in the somewhat different transformation of the natatory legs in the male.

Occurrence.—I have met with this form not unfrequently in the upper part of the Christiania Fjord in moderate depths, as also in some places of the south coast of Norway. Boeck found a single specimen at Haugesund, west coast of Norway. It is very probable that it also occurs off the British Isles, but has been confounded with the preceding species.

165. Laophonte minuta, Boeck.

(Pl. CLXXIV).

Laophonte minuta, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. 1872, p. 52.

Specific Characters.—Female. Body moderately slender, with the segments rather sharply marked off from each other. Rostral projection somewhat more

prominent than in the 2 preceding species, and obtusely acuminate at the tip. Caudal rami somewhat produced, exceeding in length the anal segment, apical setæ, on the other hand, unusually short. Anterior antennæ of moderate size and distinctly 7-articulate. Posterior antennæ, like those in *L. Strömi*, having the outer ramus quite rudimentary and of conical form, with only 2 hair-like setæ. 1st pair of legs built on the same type as in the 2 preceding species, though perhaps somewhat less strong. Natatory legs likewise of a rather similar structure, except that the 4th pair is considerably smaller than the others, with no setæ on the outer ramus inside. Last pair of legs somewhat resembling in shape those in *L. Strömi*, innermost seta of the distal joint, however, quite normal, and the 2 outermost setæ on the inner expansion of proximal joint both very small.

Male with the outer rami of 2nd and 3rd pairs of legs much stronger than in female, and having the spines, especially of the terminal joint, very large and divergent; inner ramus of 3rd pair, as in *L. Strömi* only composed of 2 joints, the distal one produced at the end outside to a short spiniform projection. 4th pair of legs scarcely different from those in female. Last pair of legs much reduced, distal joint not defined, and replaced by a very slight expansion carrying 4 setæ, inside which 2 other small setæ occur.

Colour yellowish.

Length of adult female 0.80 mm.

Remarks.—This form also is closely related to *L. Strömi*, perhaps still more so than *L. curticauda*. It is however easily recognised from any of them by the scharply defined body-segments, and more particularly by the unusually short caudal setæ, whereas the caudal rami themselves are more produced than in the said species. It seems indeed that the present form has been observed by Prof. Brady, but only regarded by him as a variety of his *L. curticauda* (= *L. Strömi*). In Pl. 78 of his Monograph 2 figures of a leg of the last pair are given, the one (fig. 7) representing the usual form, the other (fig. 8) indicated as belonging to a variety. The former figure undoubtedly refers to *L. Strömi*, whereas the latter may have been drawn from a specimen of the present species. The specific name given by Boeck to this species is somewhat inappropriate, as it does not in reality belong to the smaller but rather more to the larger species of the genus.

Occurrence.—I have hitherto only met with this form in the upper part of the Christiania Fjord; but here it occurs at times in great abundance on a muddy bottom, at a depth of 3 to 10 fathoms.

Distribution.—? British Isles (Brady).

166. Laophonte littoralis, Scott.

(Pl. CLXXV).

Laophonte littorale. Scott, On some new and rare Crustacea from Scotland. Ann. Mag. Nat. Hist. ser. 6, Vol. XII, p. 238, Pl. XI, figs. 7—14.

Specific Characters.—Female. Body somewhat robust, with the anterior division slightly depressed and broader than the posterior. Cephalic segment comparatively large, equalling in length the 4 succeeding segments combined, rostral projection short, triangular. Urosome almost as long as the anterior division, and having the anterior segments slightly expanded laterally, last segment fully as long as the preceding one. Caudal rami about twice as long as they are broad and somewhat divergent, apical setæ rather elongated. Anterior antennæ of moderate length and somewhat thickened at the base, 7-articulate. Posterior antennæ rather strongly built, outer ramus, however, extremely small, conical in form, and only provided with 2 hair-like bristles. 1st pair of legs powerfully developed, with the inner ramus very strong, outer ramus exceeding half the length of the proximal joint of the inner, and 3-articulate, middle joint much the longest. Natatory legs normal, except that the terminal joint of the outer ramus in the 4th pair wants any seta of the inner edge. Last pair of legs well developed, distal joint rather large and having the form of a regularly rounded lamella, with 6 comparatively short marginal setæ; inner expansion of proximal joint not extending to the middle of the distal joint, and provided with 5 marginal setæ, the 2 outer of which are smaller than the others. Ovisac rather large, rounded oval in form.

Male with the outer rami of 2nd and 3rd pairs of legs scarcely at all differing in structure from those in female. Inner ramus of 2nd pair with the proximal seta of the last joint transformed to a short and thickish spine; that of 3rd pair 3-articulate, with the terminal joint very short, middle joint, as usual, produced at the end outside to a spiniform process. 4th pair of legs very unlike those in female, outer ramus exceedingly powerful and incurved, with the spines very large, 3 of them issuing from the terminal joint; inner ramus much reduced in size, uniarticulate, with a single seta and 2 hair-like bristles. Last pair of legs with the distal joint not defined, it being replaced by 3 small setæ, inside which another similar seta is attached.

Colour light yellowish grey.

Length of adult female 0.67 mm.

Remarks.—Though the habitus-figure of this species given by Scott looks rather unlike that here reproduced, I cannot doubt that the present form is the same as that observed by the said author, since in all the structural details it

exhibits a very close agreement. The most prominent character of this species is undoubtedly the peculiar transformation of the 4th pair of legs in the male. Moreover the shape of the last pair of legs in the female is rather characteristic.

Occurrence.—A few specimens of this form were taken, some years ago, from a tidal pool at Haugesund, west coast of Norway.

Distribution.—Scottish coast (Scott).

167. Laophonte brevirostris (Claus).

(Pl. CLXXVI).

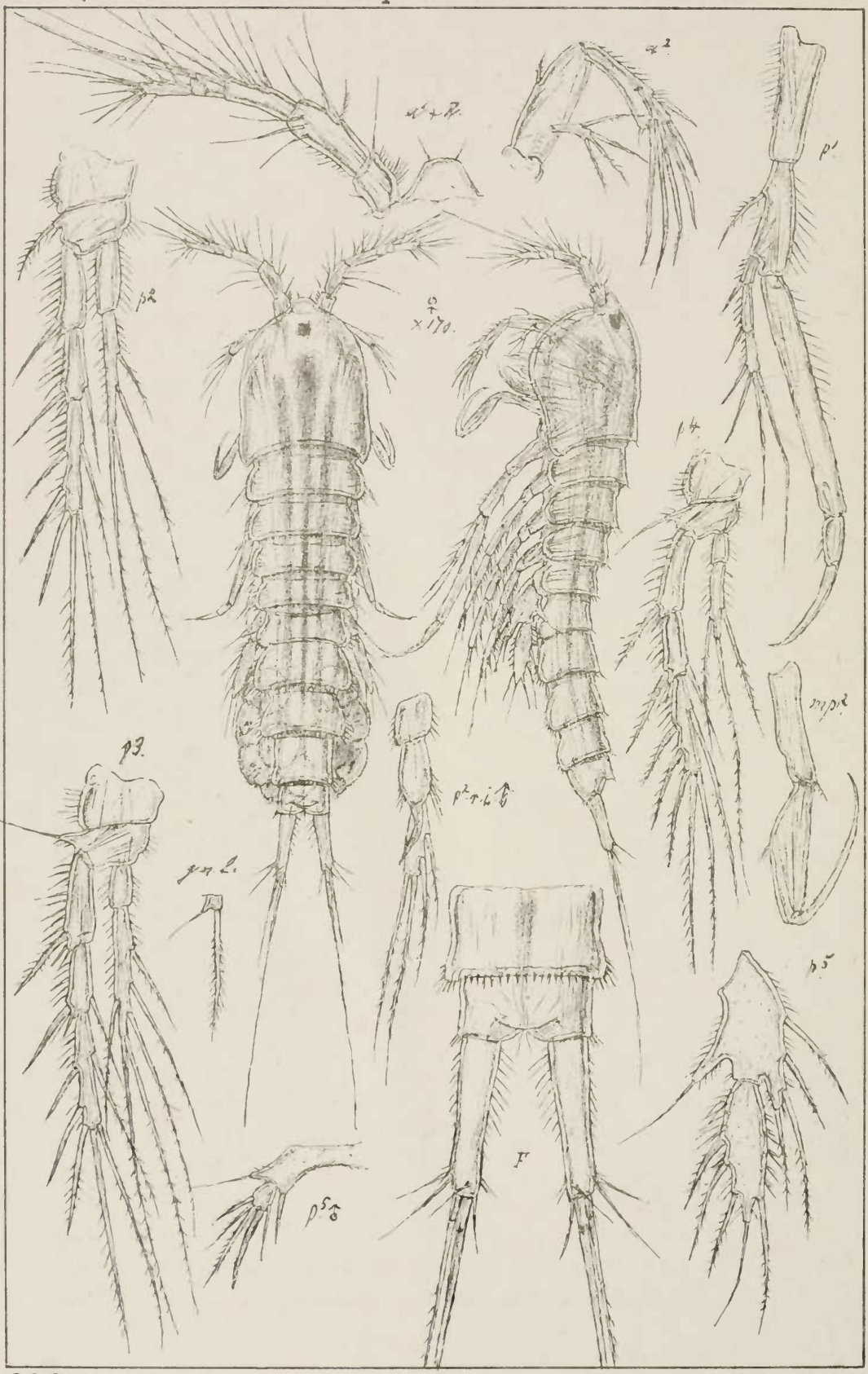
Cleta brevirostris, Claus, Die freilebenden Copepoden, p. 124.

Syn: *Laophonte Herdmani*, Scott.

Specific Characters.—Female. Body moderately slender and gradually tapering behind, with the segments well marked off from each other. Cephalic segment rather large, about the length of the 4 succeeding segments combined, rostral projection very short and slightly bilobular at the tip. Urosome shorter than the anterior division, and having the anterior segments somewhat expanded laterally. Caudal rami comparatively short, not attaining the length of the anal segment, and transversely truncated at the tip, apical setæ rather slender. Anterior antennæ much shorter than the cephalic segment, and only composed of 6 articulations, the last 2 being confluent; 2nd joint somewhat dilated and exhibiting a short nodiform projection of the hind edge in the middle. Posterior antennæ with the outer ramus normally developed. 1st pair of legs moderately strong, with the inner ramus rather elongated, outer ramus distinctly 3-articulate, but comparatively small, not attaining half the length of the proximal joint of the inner. Natatory legs well developed, with the normal number of setæ. Last pair of legs with the distal joint comparatively short and broad, spatulate in form, marginal setæ somewhat unequal and 5 in number, all issuing from the almost transversely truncated end of the joint; inner expansion of proximal joint obliquely truncated and extending almost to the end of the distal joint, marginal setæ 4 in number, the outermost but one much longer than the others.

Male with the 2nd pair of legs resembling in structure those in female, except that one of the setæ attached inside the distal joint of the inner ramus appears somewhat coarser, with the proximal part thickened and densely clothed with small spinules. 3rd pair of legs with the outer ramus somewhat more strongly built than in female, the terminal joint being more or less incurved and having the setæ of the inner edge spiniform; inner ramus transformed in the usual manner. 4th pair of legs of exactly same structure as in the female. Last pair of

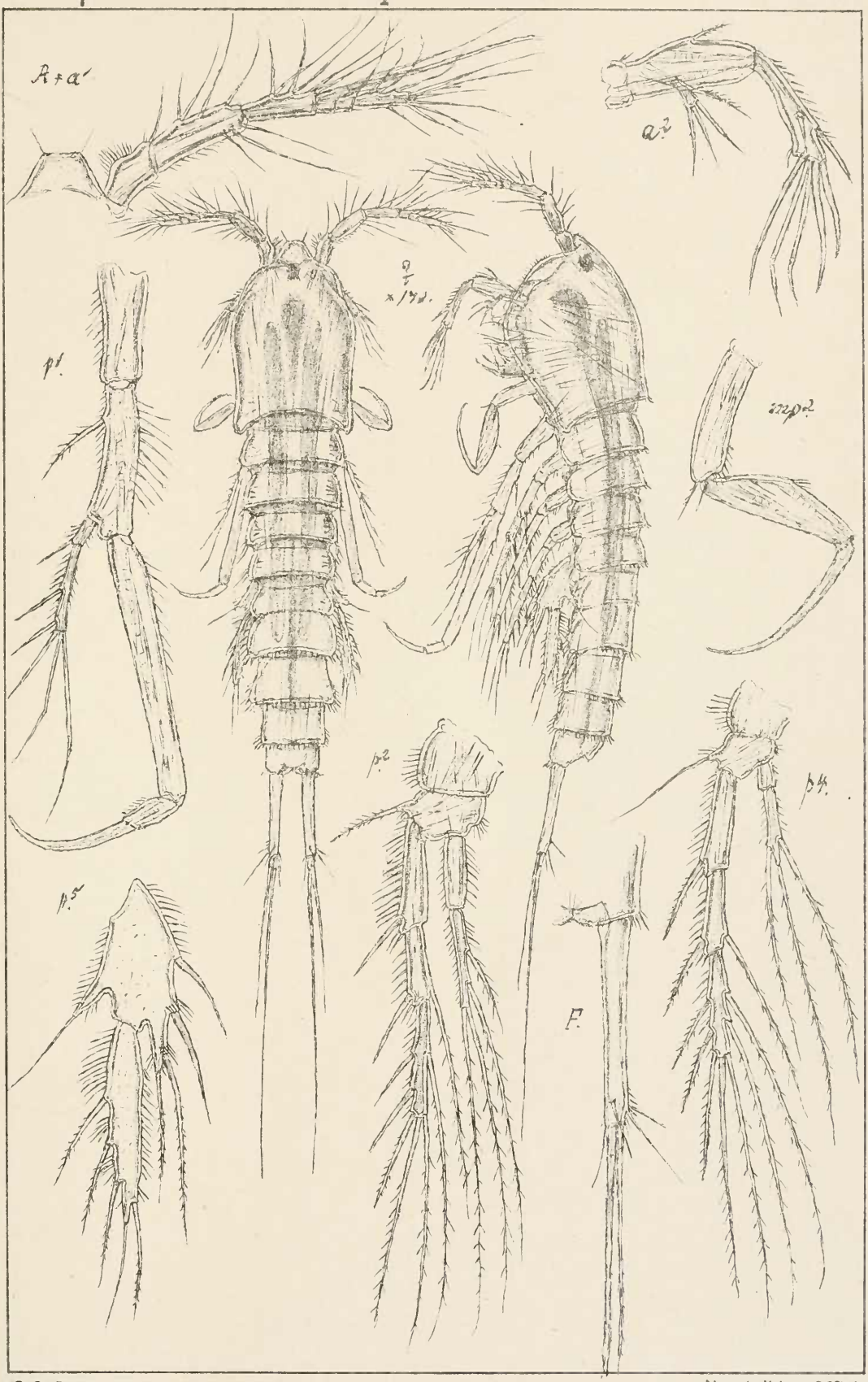
Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte thoracica, Boeck

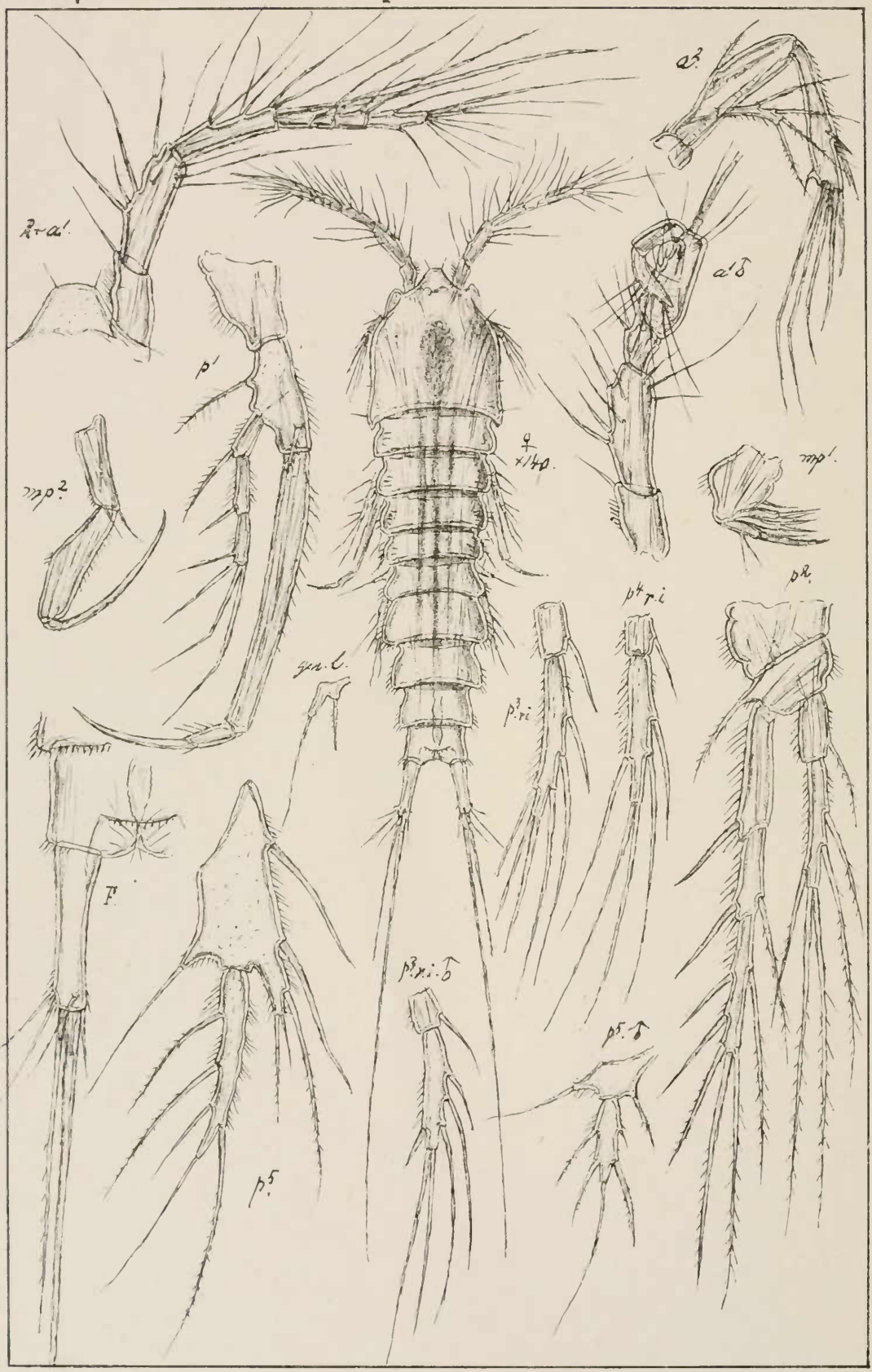
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G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte elongata, Boeck

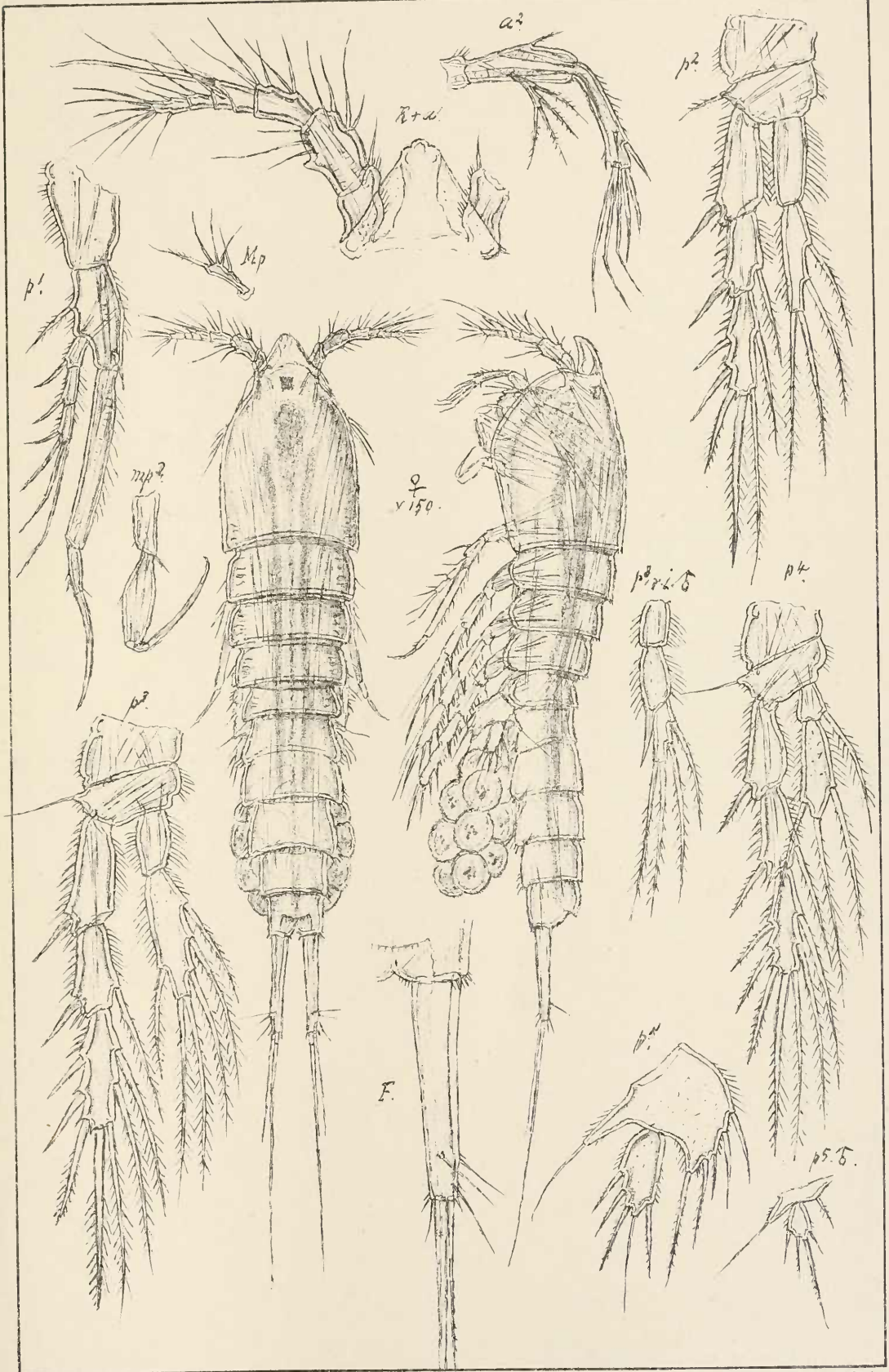
Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte typhlops, G.O. Sars

Copepoda



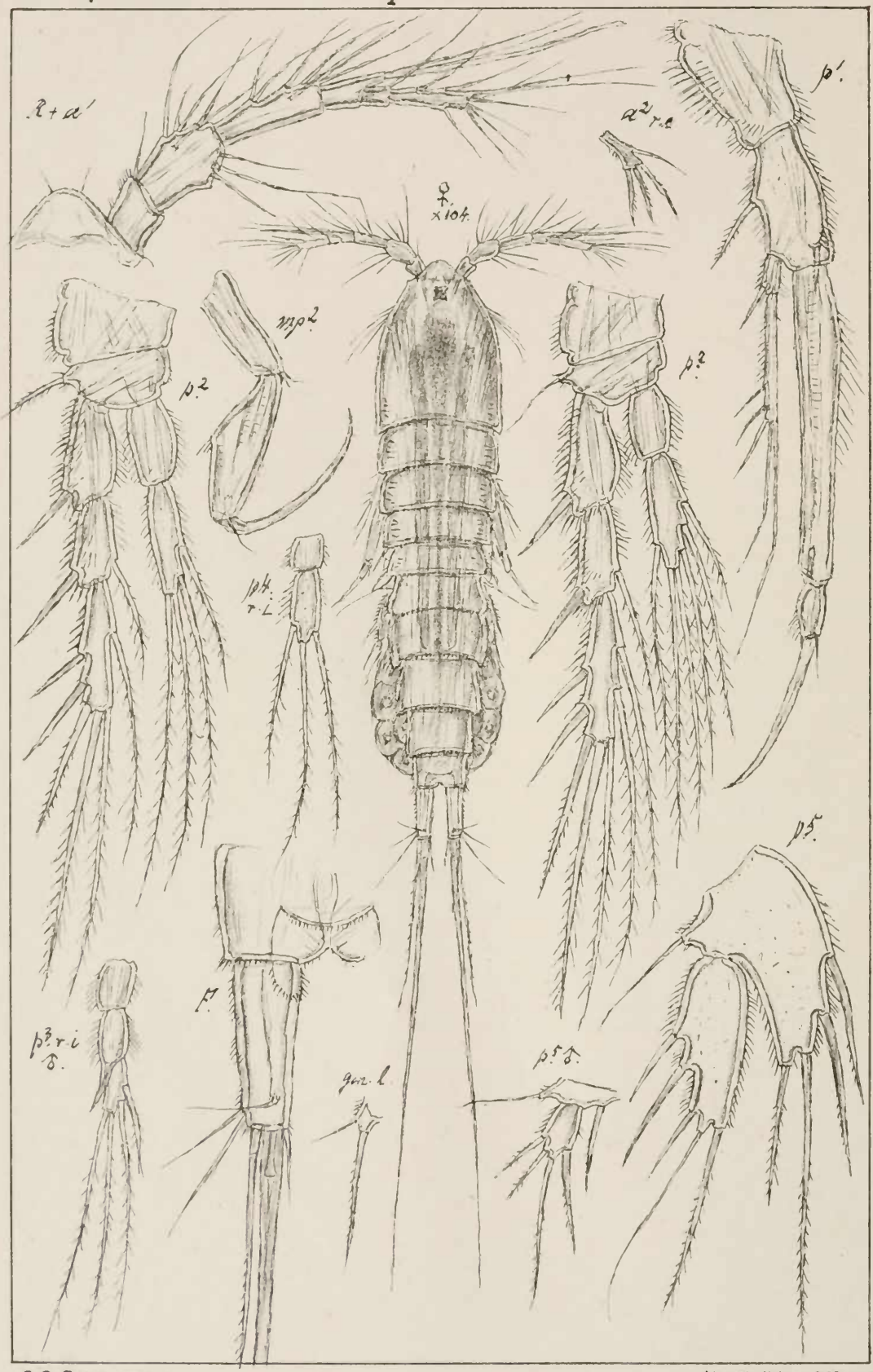
G.O.Sars autogr.

Norsk lithgr. Officin.

Laophonte longicaudata, Boeck

Copepoda

Laophontidœ — Harpacticoida — PL. CLXV

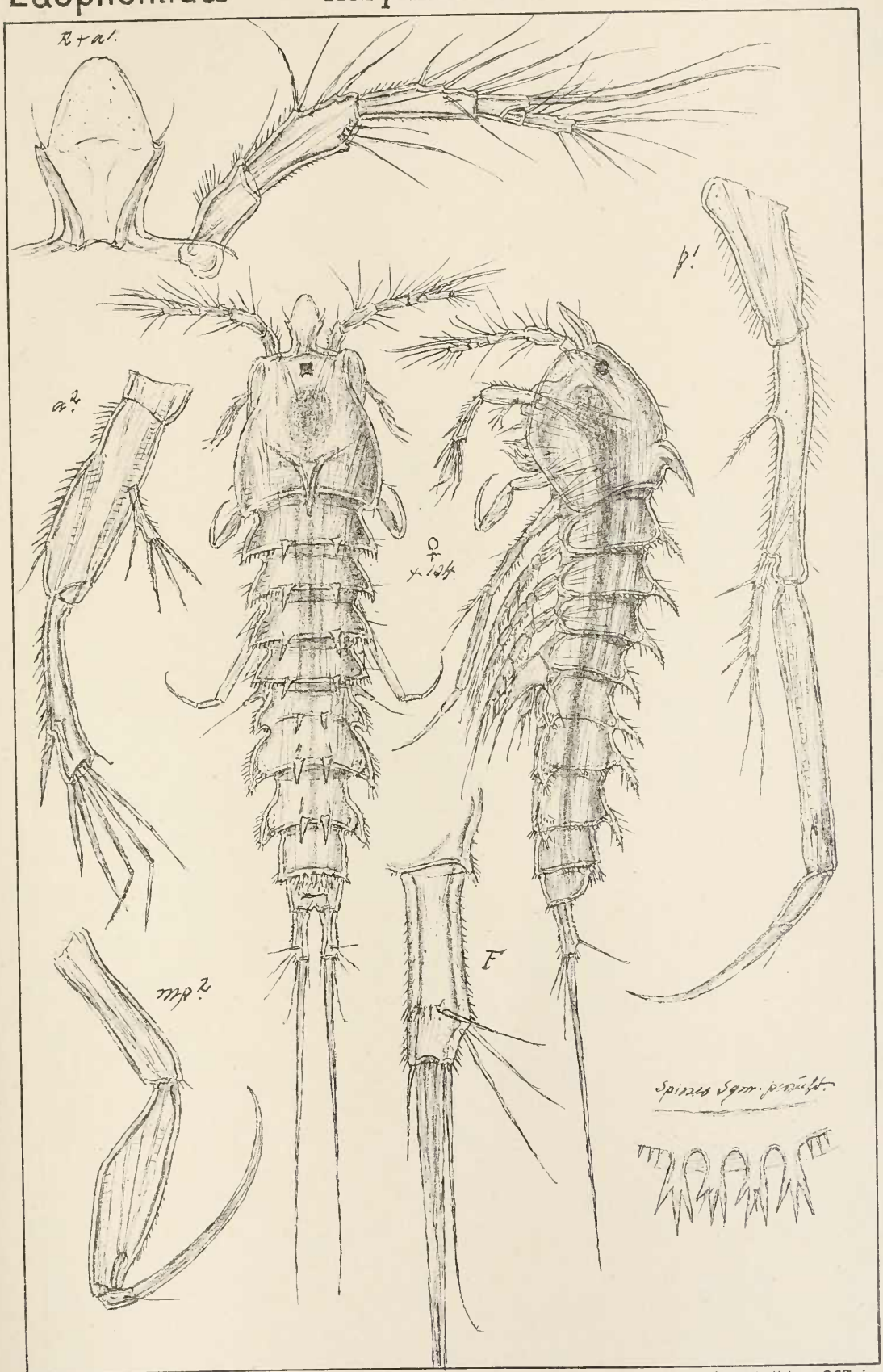


G.O. Sars autogr. — Norsk lithgr. Officin.

Laophonte similis (Claus)

Copepoda

Laophontidœ — Harpacticoida — PL. CLXVI

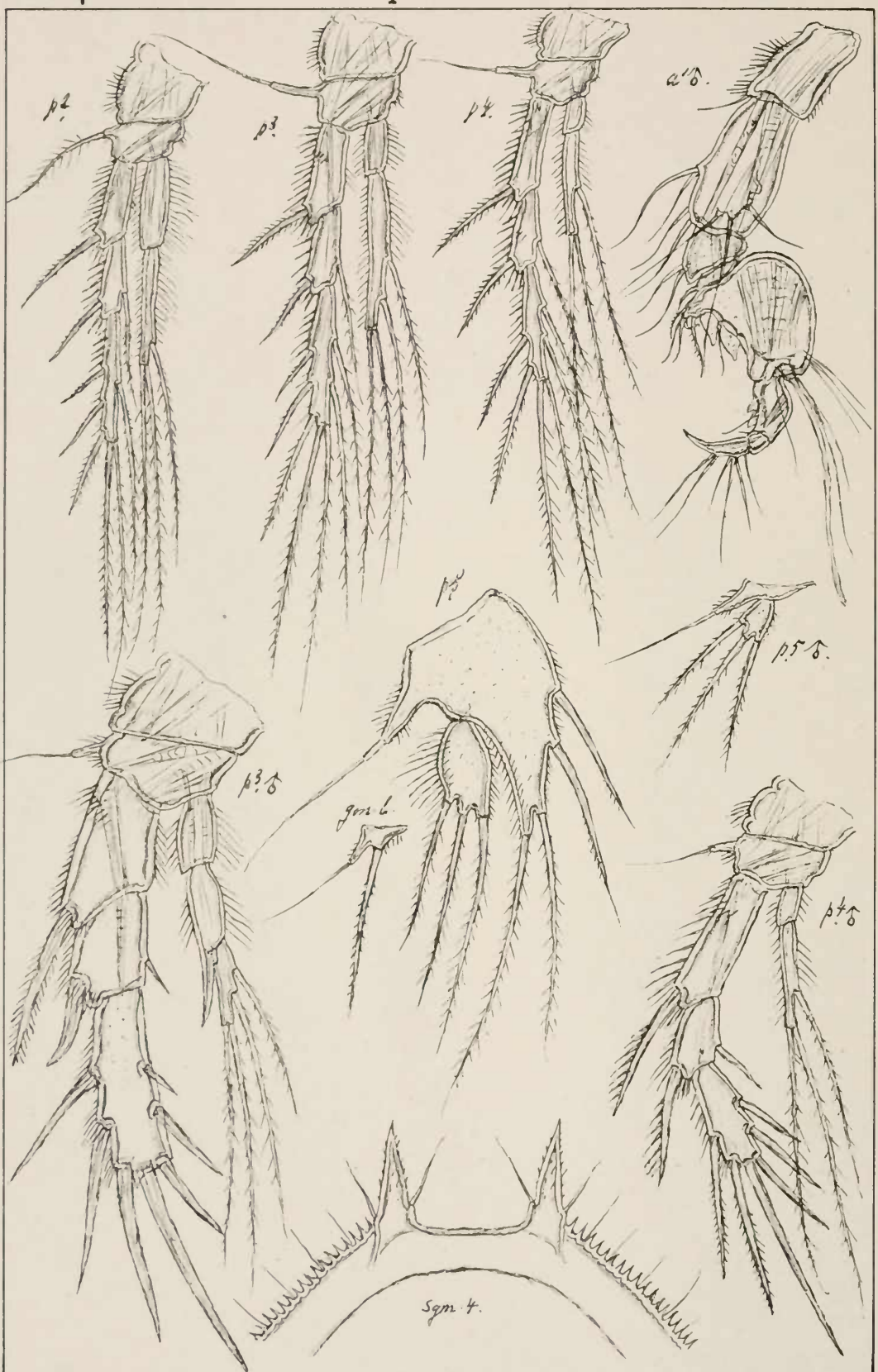


G.O.Sars autogr.

Norsk lithgr. Officin.

Laophonte horrida, Norm

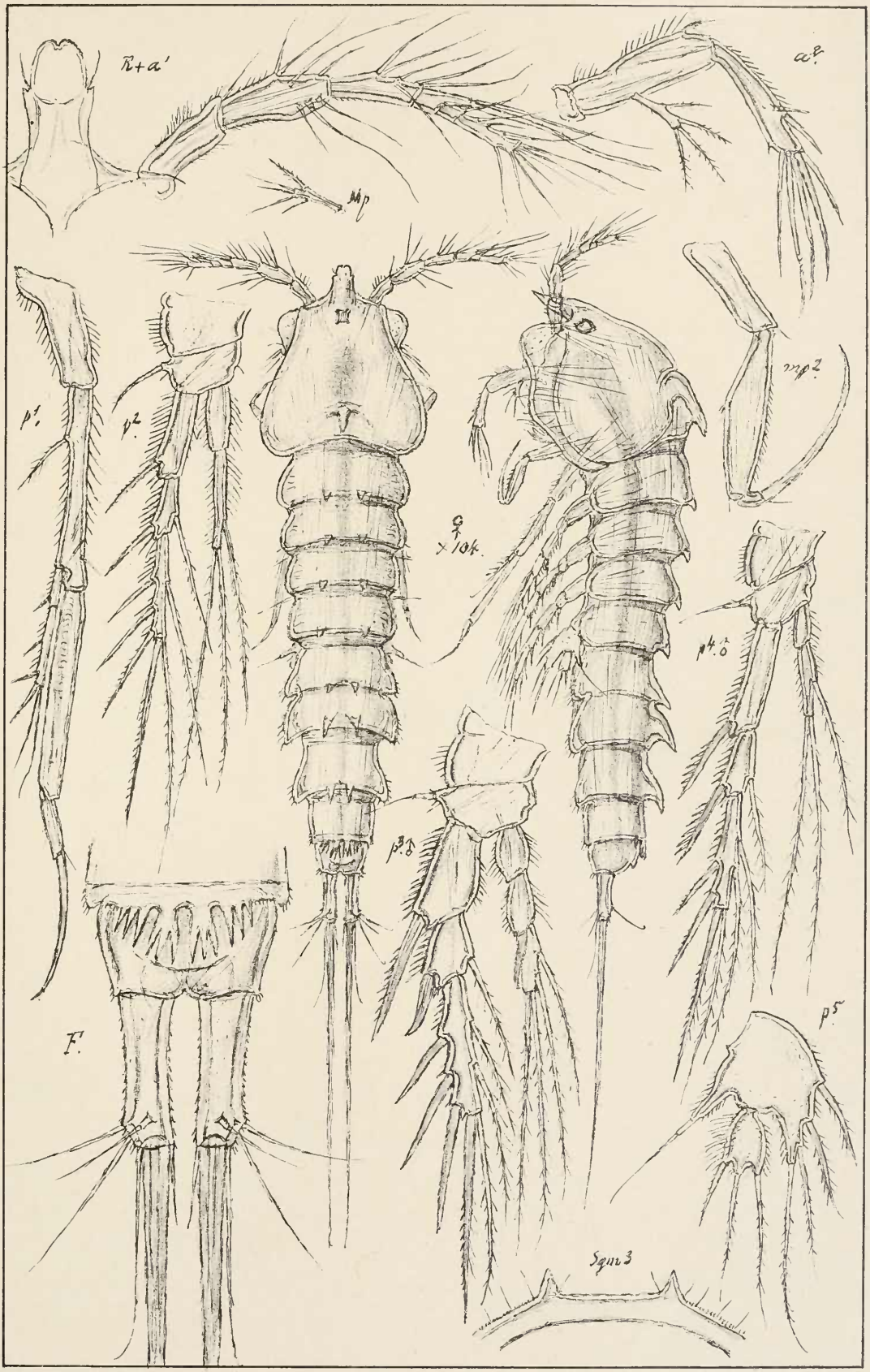
Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte horrida, Norm
(continued)

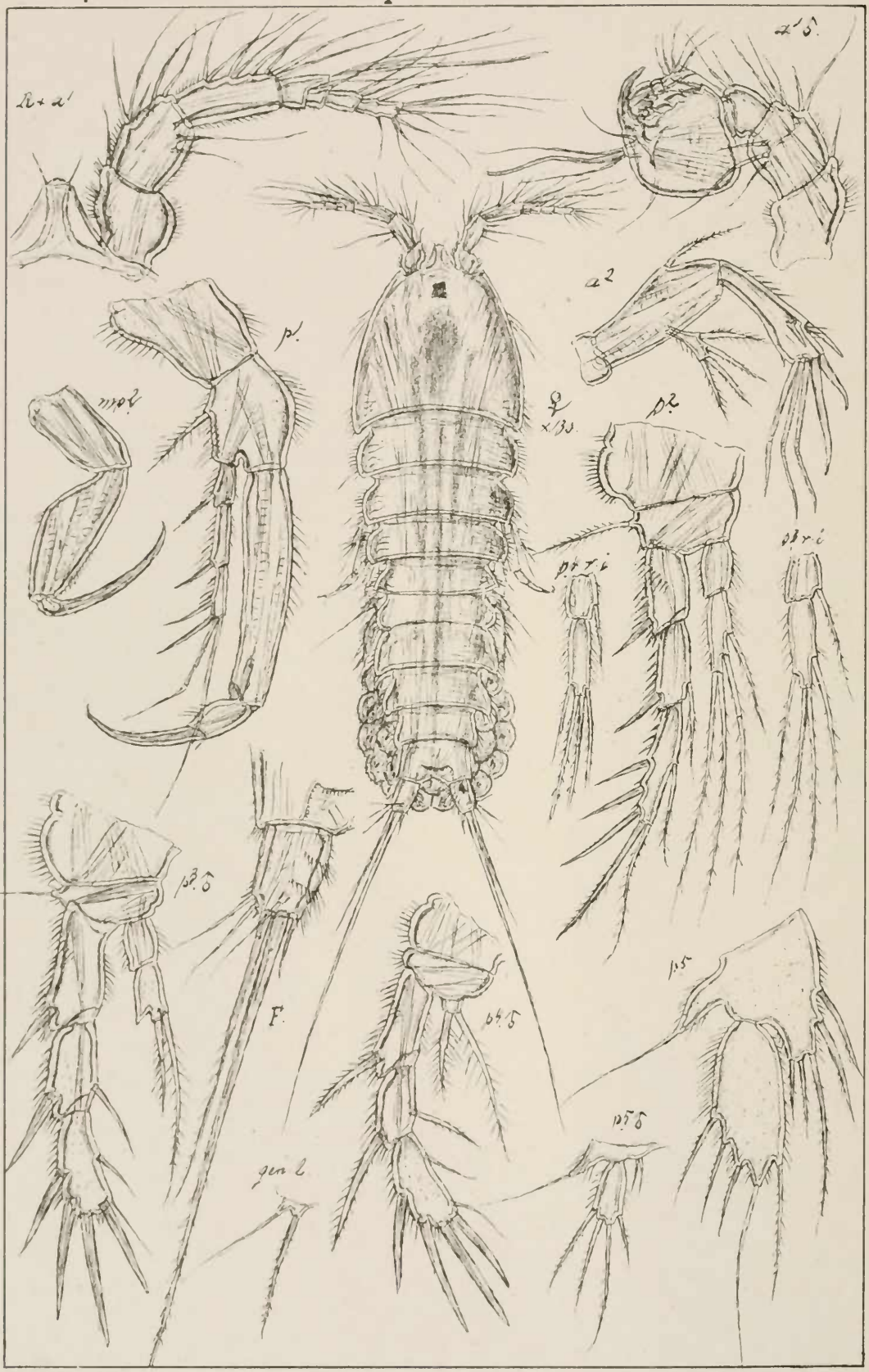
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G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte brevispinosa G.O. Sars

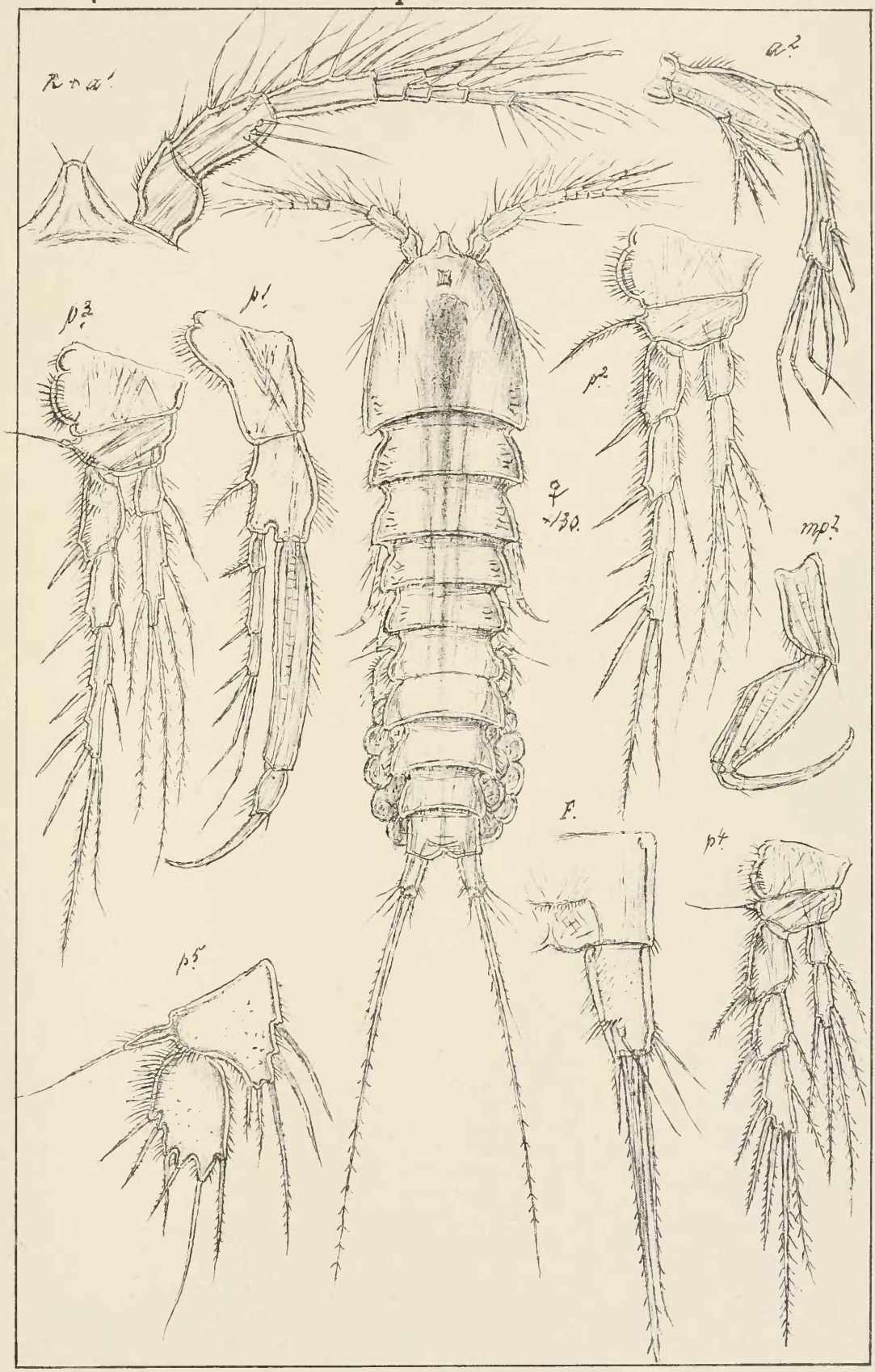
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin.

Laophonte Koreni, Boeck

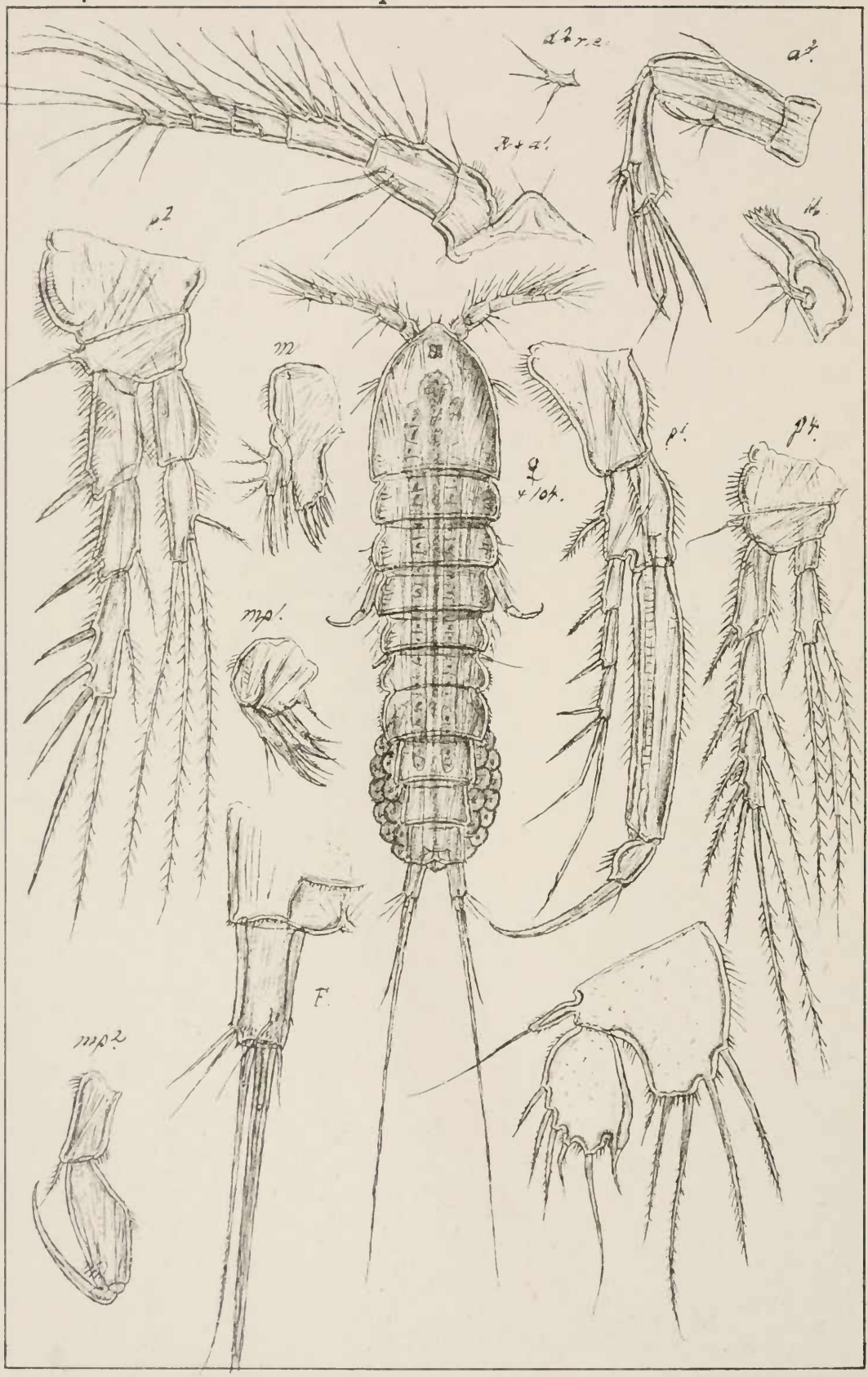
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin.

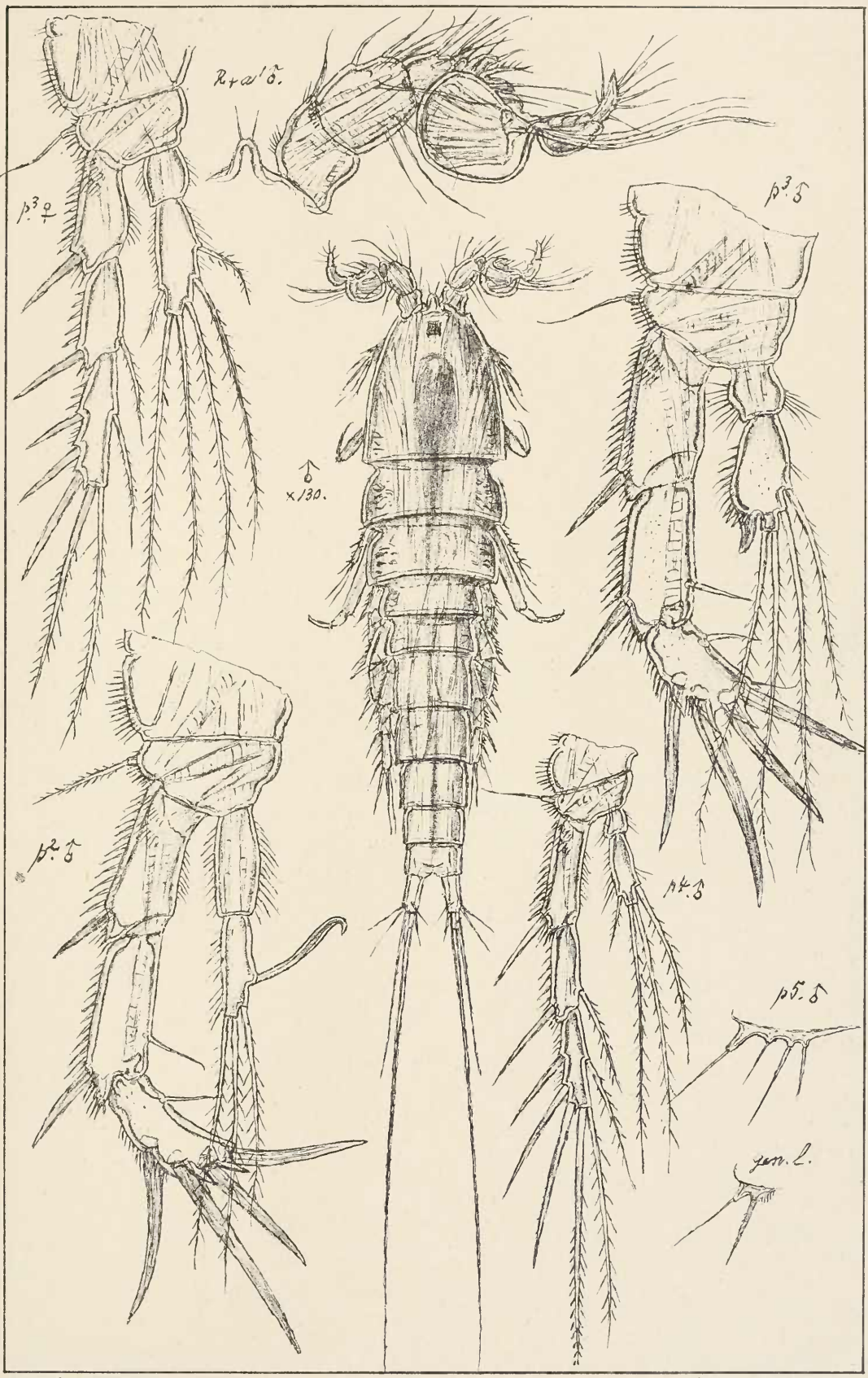
Laophonte proxima, G.O.Sars

Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

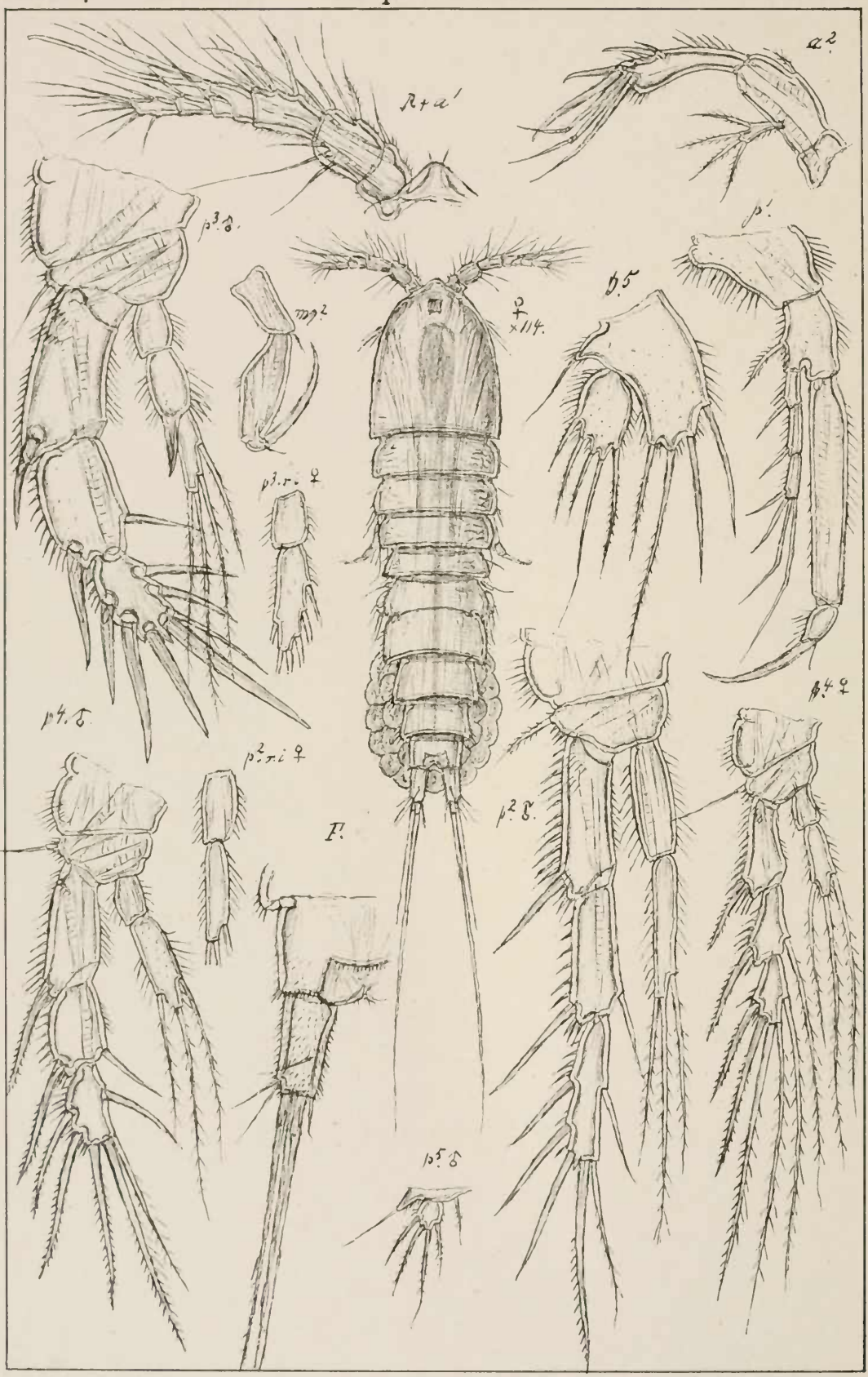
Laophonte Strömi (Baird)



G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte Strömi (Baird) (continued)

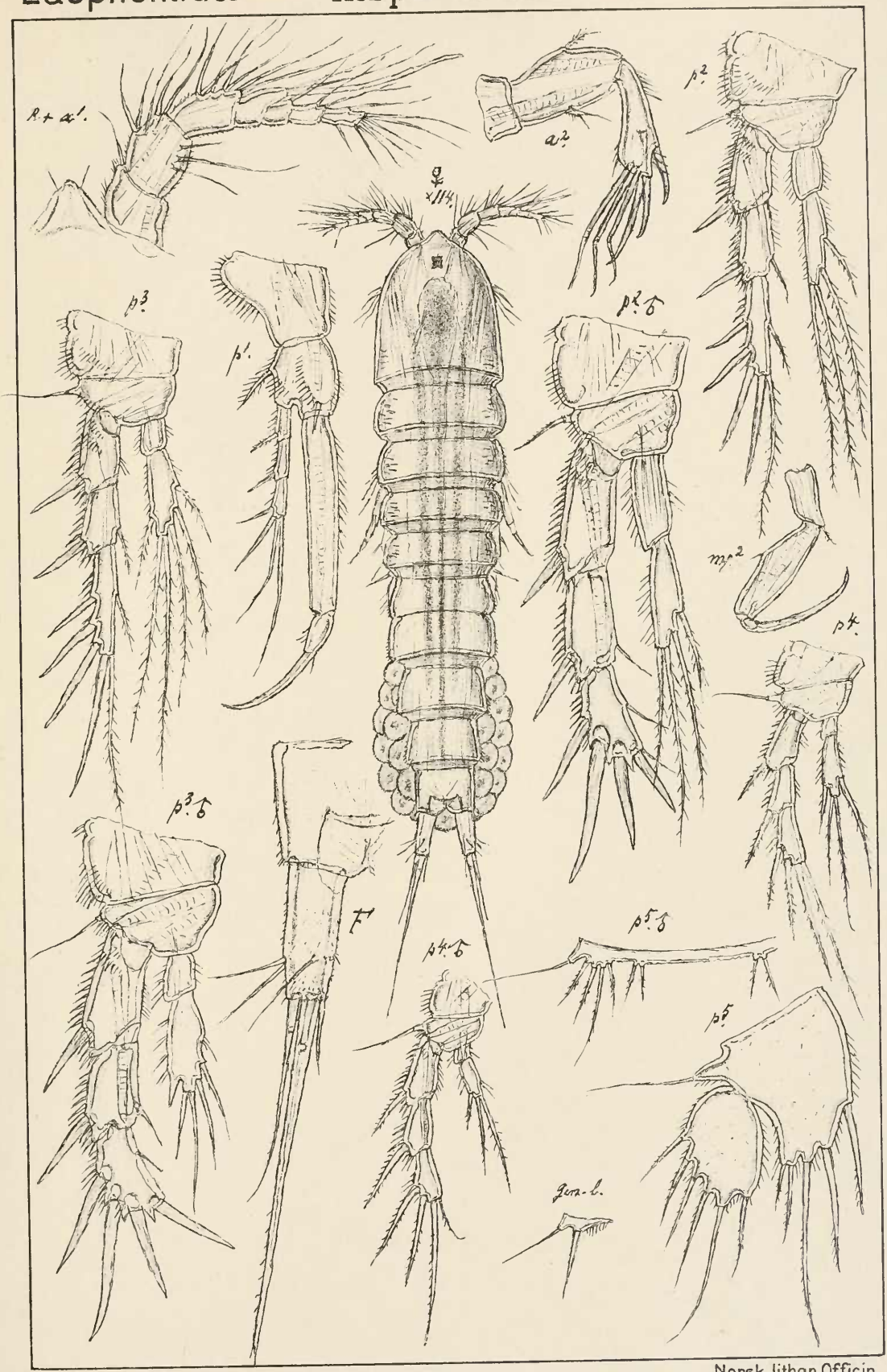
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G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte curticauda Boeck

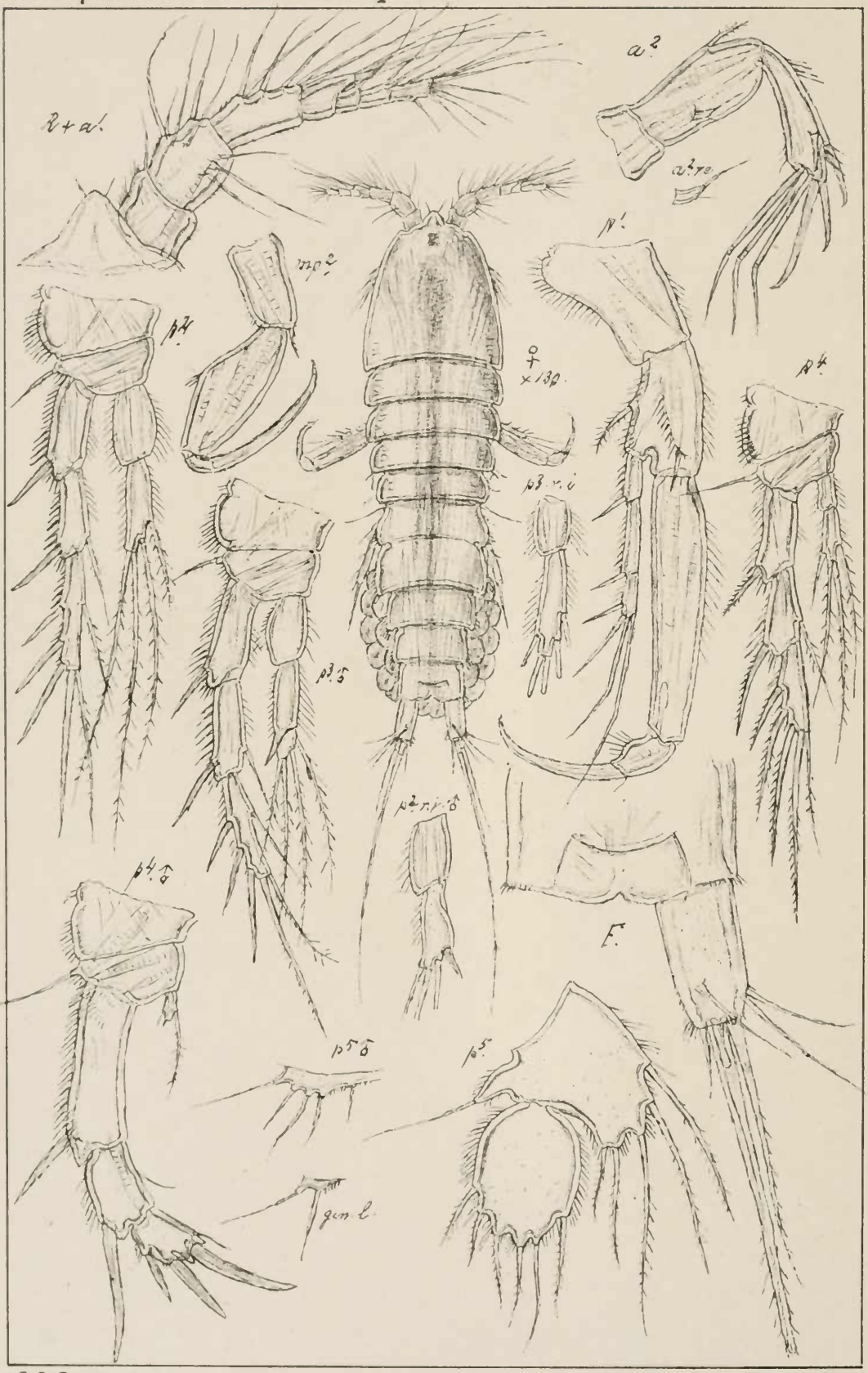
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G.O.Sars autogr. Norsk lithgr. Officin.

Laophonte minuta, Boeck

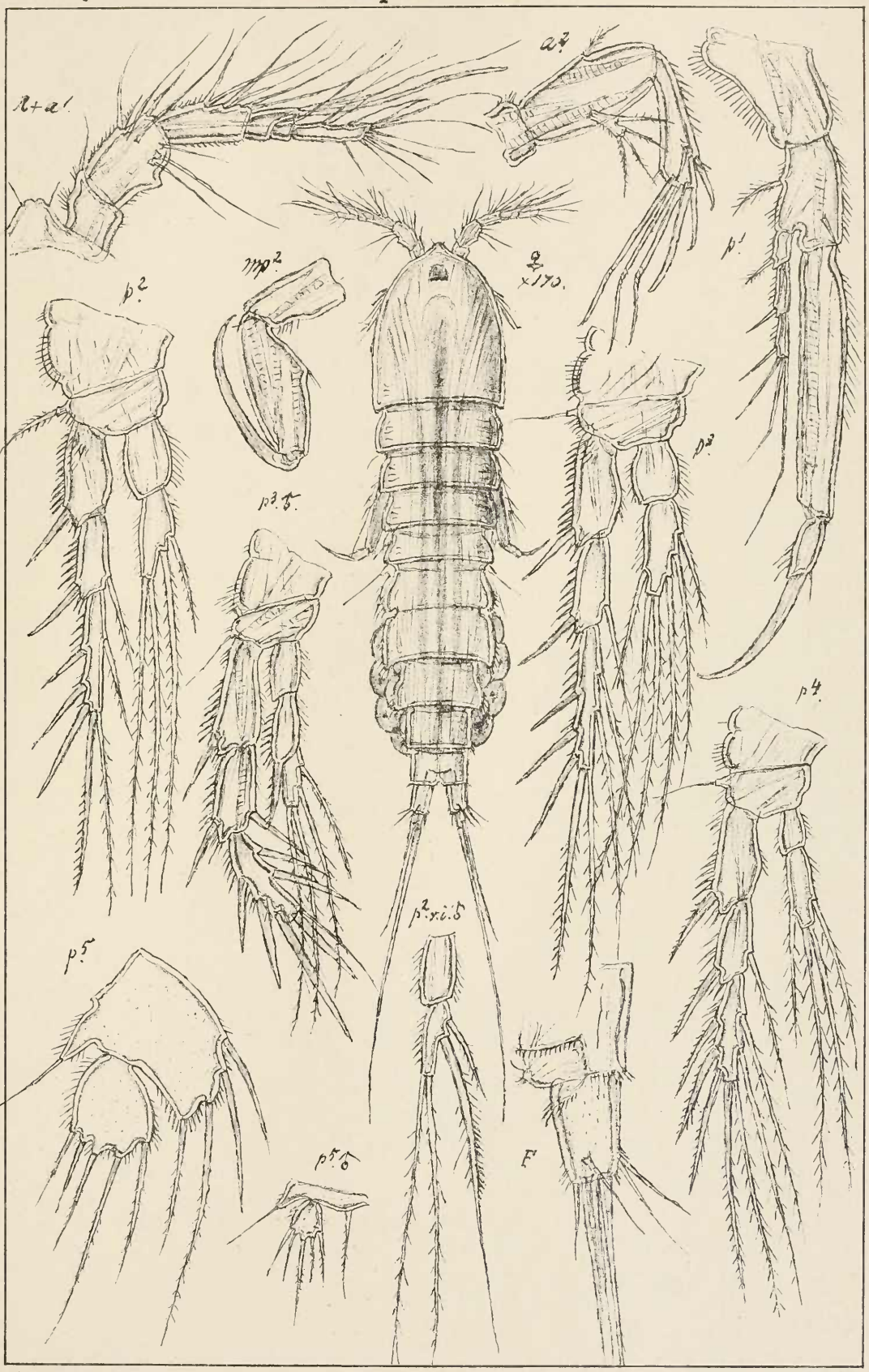
Copepoda



G.O.Sars autogr. Norsk lithgr. Officin.

Laophonte littoralis, Scott

Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte brevirostris (Claus)

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XXIII & XXIV

LAOPHONTIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM
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1908

legs, as usual, very small, but with the distal joint well defined, and having the same number of setæ as in the female; inner expansion of proximal joint very slight, with a single seta only.

Colour yellowish.

Length of adult female 0.54 mm.

Remarks.—I think I am right in identifying the present form with *Cleta brevirostris* of Claus. It was at first very imperfectly characterised by that author, and for this reason Mr. A. Scott did not recognise the species, but described it under another name, viz., *L. Herdmani*. In his account of the Copepoda of Nice, Claus gives, however, 2 detail-figures, which do not seem to leave any doubt as to the identity of his form with the present species. The peculiar short spatulate form of the distal joint of the last pair of legs in the female will suffice for distinguishing this form from any of the other species.

Occurrence.—I have met with this form not infrequently off both the south and west coasts of Norway in moderate depths among algæ.

Distribution.—British Isles (Scott), Mediterranean, at Messina and Nice (Claus), the Red Sea (A. Scott).

168. Laophonte congenera, G. O. Sars, n. sp.

(Pl. CLXXVII).

Specific Characters.—Female. Very like the preceding species *(L. brevirostris)*, but somewhat more strongly built, with rather coarse integuments. Rostral projection more prominent, with the tip distinctly bilobular. Urosome with the lateral expansions of the segments well defined and densely fringed with spinules. Caudal rami about the length of the anal segment, and of uniform width throughout, both edges fringed with short hairs. Anterior antennæ distinctly 7-articulate, the last 2 joints being well defined, 2nd joint without any projection behind, and scarcely longer than the 3rd. Posterior antennæ, oral parts and legs of a structure very similar to that in *L. brevirostris*. Last pair of legs, however, slightly different in shape, distal joint comparatively narrower, rounded oval in form (not transversely truncated at the tip); inner expansion of proximal joint shorter, scarcely extending beyond the middle of the distal joint.

Male with the inner ramus of 2nd pair of legs transformed in a manner analogous to that in *L. brevirostris*, distal seta of inner edge, however, more fully developed, with the thickened proximal part very large and coarsely spinulose in its outer half. 3rd pair of legs resembling in structure those in *L. brevirostris*.

Last pair of legs with the distal joint narrower, proximal joint with 2 unequal setæ inside.

Colour not yet ascertained.

Length of adult female 0.53 mm.

Remarks.—This form is closely allied to *L. brevirostris*, and may easily be confounded with it. On a closer examination, however, it is found to differ in its more prominent rostral projection, its distinctly 7-articulate anterior antennæ, and the shape of the last pair of legs.

Occurrence.—Some few specimens of this form were found in samples taken at Kopervik and Skutesnæs, south-west coast of Norway, from a depth of 10—20 fathoms.

169. Laophonte perplexa, Scott.

(Pl. CLXXVIII).

Laophonte perplexa, Th. Scott, Marine and fresh-water Crustacea from Franz Josef Land. Linn. Soc. Journ. Zool. Vol. XXVII, p. 103, Pl. 7, figs. 1—7.

Specific Characters.—Female. General form of body about as in *L. congenera*. Rostral projection, however, less prominent, and with the tip entire. Lateral expansions of caudal segments well developed and densely spinulose. Caudal rami about the length of the anal segment and slightly narrowed distally. Anterior antennæ distinctly 7-articulate, 2nd joint longer than 3rd, and without any projection behind. Posterior antennæ and oral parts scarcely differing in structure from those in the 2 preceding species. 1st pair of legs, however, with the outer ramus consisting of only 2 joints, the last one twice the length of the 1st. Natatory legs of a similar structure to that in the 2 preceding species. Last pair of legs with the distal joint comparatively small and obtusely truncated at the end, inner expansion of proximal joint short and broad, not extending to the middle of the distal joint. Ovisac comparatively large, rounded oval in form.

Male with the 2nd pair of legs much larger than in female, distal joint of inner ramus shorter than the proximal one, and produced inside to a narrow cylindrical process, finely ciliated on both edges and tipped with a slender bristle; seta in front of this process very small and not ciliated. 3rd pair of legs with the inner ramus not transformed, outer ramus, however, very coarse and incurved, with the spines, especially of the terminal joint, strongly developed. 4th pair of legs likewise comparatively larger than in female, with the spines of the outer ramus stronger and more coarsely denticulated. Last pair of legs much reduced in size, and without any expansion of the proximal joint inside.

Colour of female pale orange, ovisac dark bluish.

Length of adult female 0.64 mm.

Remarks.—This form was first recorded from the Arctic Ocean by Th. Scott, who considers it to be most nearly allied to the 2 species *L. curticauda* Boeck and *L. similis* Claus. It is however undoubtedly much more closely related to *L. brevirostris* Claus (= *L. Herdmani* Scott), though differing both from that species and the nearly-allied *L. congenera* G. O. Sars, in the structure of the 1st pair of legs, the outer ramus of which is only biarticulate. It is also of rather larger size than either of these 2 species. A remarkable feature in the present species is that the inner ramus of the 3rd pair of legs in the male does not exhibit any trace of the conspicuous transformation found in all other species of the genus *Laophonte*.

Occurrence.—I found this form, many years ago, not infrequently off the Finmark coast, at Hammerfest and Vadsø, and it has also been recorded by Th. Scott from that part of our country. It moreover occurs in the Trondhjem Fjord, at Selven, and occasionally also at Kopervik and Bukken on the south-west coast of Norway, in moderate depths.

Distribution.—Franz Josef Land (Scott), Polar islands north of Grinnell Land (2nd Fram-Expedition)

170. Laophonte macera, G. O. Sars, n. sp.

(Pl. CLXXIX).

Specific Characters.—Female. Body slender and narrow, with the segments sharply marked off from each other, and the integuments of very coarse consistency. Cephalic segment comparatively large and deep, with the rostral projection not very prominent, and blunted at the tip. The 4 succeeding segments much narrower and rounded laterally. Urosome almost as long as the anterior division, and having the lateral expansions of the segments rather prominent. Caudal rami considerably produced, being about 4 times as long as they are broad, and narrow linear in form; apical setæ of moderate length. Anterior antennæ 7-articulate, with the 2nd joint simple and about the length of the 3rd. Posterior antennæ with the outer ramus comparatively small, but of normal structure. Posterior maxillipeds largely developed. 1st pair of legs with the outer ramus biarticulate, and scarcely exceeding half the length of the proximal joint of the inner. Natatory legs of normal structure. Last pair of legs with the distal joint of moderate size and oval in form, inner expansion of proximal joint comparatively short, not extending to the middle of the distal joint. Ovisac small, rounded.

Male with the 2nd pair of legs scarcely larger than in female, but having one of the marginal setæ of the inner ramus remarkably transformed, consisting of a thickish and somewhat nodulose basal part and a thin apical bristle. 3rd pair of legs with the inner ramus transformed in the usual manner, outer ramus nearly as in the female. Last pair of legs very small, with no expansion inside the proximal joint.

Colour yellowish.

Length of adult female 0.50 mm.

Remarks.—This form is nearly allied to the 3 preceding species, but is of smaller size than any of them, and moreover distinguished by its very narrow body, the unusually coarse integuments, and above all by the much more produced caudal rami.

Occurrence.—I have occasionally met with this small species off the south coast of Norway, at Risør, Lillesand and Farsund, in moderate depths among algæ. A single specimen was also found in a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle.

Distribution.—Polar islands north of Grinnell Land (2nd Fram-Expedition).

171. Laophonte Nordgaardi, G. O. Sars, n. sp.

(Pl. CLXXX).

Specific Characters.—Female. Body comparatively short and stout, tapering only slightly behind. Integuments not very coarse. Cephalic segment comparatively large, exceeding in length the 4 succeeding segments combined; rostral projection rather prominent and obtusely pointed at the tip. Urosome much shorter than the anterior division and having the lateral expansions of the segments rather prominent. Caudal rami short, being scarcely twice as long as they are broad, and considerably divergent, apical setæ of moderate length. Anterior antennæ rather large, but composed of only 6 articulations, the last 2 being confluent; 2nd joint much the largest, and without any projection behind. Posterior antennæ with the outer ramus normally developed. Posterior maxillipeds very powerful. 1st pair of legs with the outer ramus distinctly 3-articulate, and somewhat exceeding half the length of the proximal joint of the inner. Natatory legs with the number of setæ on both rami somewhat reduced. Last pair of legs with the distal joint comparatively small, narrow oval in form, and provided with only 4 setæ, the apical one much the longest; inner expansion of proximal joint triangular in form, and extending to about the middle of the distal joint, marginal setæ 4 in number, all of nearly equal length.

Male with the 2nd pair of legs of exactly the same structure as in female. 3rd pair of legs with the inner ramus transformed in the usual manner, spiniform projection of middle joint sigmoid, terminal joint comparatively short, and provided with only 3 setæ. Last pair of legs much smaller than in female, distal joint gradually widening towards the end, and provided with 5 setæ.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present species is easily distinguishable from any of the 4 preceding ones, both as regards its external appearance and the structure of some of the appendages, especially that of the last pair of legs. It is one of the smallest species known.

Occurrence.—Some few specimens of this distinct form were found in a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle, and kindly sent to me for examination. I have much pleasure in naming it in honour of that distinguished naturalist, to whom I am indebted for the examination of this and many other interesting species of Copepoda.

172. Laophonte parvula, G. O. Sars, n. sp.

(Pl. CLXXXI).

Specific Characters.—Female. Body rather short and stout, gradually tapering behind, with the segments sharply marked off from each other. Rostral projection of moderate size and obtusely pointed at the tip. Urosome almost as long as the anterior division, lateral expansions of the segments not very prominent. Caudal rami short, only slightly longer than they are broad, and scarcely at all divergent, apical setæ of moderate length. Anterior antennæ distinctly 7-articulate, 2nd joint produced behind to a triangular projection. Posterior antennæ with the outer ramus normally developed. Posterior maxillipeds not very strong. 1st pair of legs with the outer ramus distinctly 3-articulate, and exceeding half the length of the proximal joint of the inner. Natatory legs of normal structure. Last pair of legs with the distal joint narrow oblong in form, and provided with 7 marginal setæ, the 2 proximal ones of the outer edge closely juxtaposed, one of the apical setæ very slender; inner expansion of proximal joint triangular, and extending somewhat beyond the middle of the distal joint, marginal setæ 5 in number, all of nearly equal length. Ovisac of moderate size, rounded oval in form.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present form is of about the same size as *L. Nordgaardi*, but is easily distinguished from that species by the distinctly 7-articulate anterior antennæ and the peculiar shape of the last pair of legs. The general form of the body is also somewhat different.

Occurrence.—Some few specimens of this form, all of the female sex, were picked up from samples taken at Risør and Lillesand, south coast of Norway.

173. Laophonte nana, G. O. Sars, n. sp.

(Pl. CLXXXII).

Specific Characters.—Female. Body very short and stout, somewhat depressed in front and rapidly tapering behind, almost pyriform in shape. Cephalic segment large and broad, with the rostral projection obtusely triangular in shape. Eye very large and light red. Urosome much shorter than the anterior division, and having the lateral expansions of the segments rather slight. Caudal rami short, not much longer than they are broad, and scarcely at all divergent, middle apical seta about half the length of the body. Anterior antennæ rather stout and gradually tapering distally, being only composed of 6 articulations, 2nd joint the largest and without any projection behind. Posterior antennæ with the outer ramus extremely small and rudimentary, conical in form, with a single apical seta and a minute lateral hair. 1st pair of legs less slender than usual, outer ramus biarticulate and about half the length of the proximal joint of the inner. Natatory legs well developed and of normal structure, except that the terminal joint of the outer ramus in the 4th pair is shortened and armed with only 3 spines. Last pair of legs with the distal joint small, sub-truncate at the tip, and provided with 5 setæ, the 2 outermost ones closely juxtaposed; inner expansion of proximal joint rather large and somewhat curved, extending nearly as far as the distal joint, marginal setæ 4 in number, the outermost but one the longest, digitiform process outside this joint short and broad. Ovisac large, rounded oval in form.

Male with the 2nd pair of legs considerably larger than in female, inner ramus very slender, with only 3 setæ on the distal joint, the innermost one short, spiniform. 3rd pair of legs very unlike those in female, outer ramus exceedingly strong, with the setæ of the inner edge spiniform, inner ramus distinctly 3-articulate, spiniform projection of middle joint of a rather peculiar appearance, being sigmoid in form and abruptly bent outwards. Last pair of legs extremely small, distal joint with only 3 setæ, proximal joint without any expansion inside.

Colour of female pale yellow, with dark green ovaria.

Length of adult female 0.42 mm.

Remarks.—This is perhaps the smallest of all the known species of the present genus, and is moreover easily recognised by its short pyriform body, as also by the structure of some of the appendages in both sexes.

Occurrence.—I have only met with this form in the upper part of the Christiania Fjord. It occurred there occasionally on a muddy bottom in shallow bays near the town.

174. Laophonte inopinata, Scott.

(Pl. CLXXXIII).

Laophonte inopinata, Th. Scott, Additions to the Fauna of the Firth of Forth. Tenth Annual Report of the Fishery Board for Scotland, Part III, p. 256, Pl. XI, figs. 1—12.

Specific Characters.—Female. Body slender, sub-cylindric in form, with the segments sharply marked off from each other, and clothed at the hind edge with scattered spinules with a dense fringe of small denticles between them. Rostral projection triangular. Urosome much shorter than the anterior division, and having the lateral expansions of the segments well defined and densely hairy; last segment exceeding in length the preceding one. Caudal rami comparatively short and of uniform width throughout, somewhat divergent and clothed both at the edges and on the upper face with short hairs; middle apical seta much elongated, exceeding half the length of the body, and having its distal part densely clothed with woolly cilia, tip naked and turned up in a hamiform manner. Anterior antennæ composed of only 6 articulations, the last 2 being confluent, 2nd joint simple and exceeding in length the 3rd. Posterior antennæ rather strong, with the outer ramus normally developed. 1st pair of legs not much elongated, outer ramus biarticulate, and scarcely half as long as the proximal joint of the inner. Natatory legs poorly developed, with the setæ much reduced both in size and number, inner ramus in the 2 anterior pairs biarticulate, in 4th pair quite rudimentary, uniarticulate. Last pair of legs well developed, distal joint somewhat fusiform in outline, and provided with 5 setæ arising from digitiform projections of the edge; inner expansion of proximal joint short and broad, not nearly extending to the middle of the distal joint, marginal setæ 4 in number, the outermost but one much the longest. Ovisac small, rounded.

Male not examined.

Colour light yellow.

Length of adult female 0.55 mm.

Remarks.—This form, described by Th. Scott in the above-mentioned paper, is at once distinguished from any of the other known species by the peculiar structure of the middle apical seta of the caudal rami. It also differs from most other species in the poor development of the natatory legs, which would seem to make it quite unable to move freely in the water.

Occurrence.—Only a very limited number of specimens of this form, all of the female sex, have hitherto come under my notice. Some of them were found off the south coast of Norway, at Risør and Lillesand, and some off the south-west coast, at Skutesnæs. Th. Scott also records this species from the Finmark coast.

Distribution.—Scottish coast (Scott).

175. Laophonte denticornis, Scott.

(Pl. CLXXXIV).

Laophonte denticornis, Th. Scott, Additions to the Fauna of the Firth of Forth. Twelfth Annual Report of the Fishery Board for Scotland, Part III, p. 246, Pl. VII, figs. 13—23.

Specific Characters.—Female. Body very slender, cylindric in form, with all the segments sharply marked off from each other, and more or less angular. Rostral projection broadly triangular, with the tip narrowly produced. Urosome fully as long as the anterior division, lateral expansions of the anterior segments well defined and densely spinulose, last segment about the length of the preceding one, and having the anal opercle triangularly produced. Caudal rami nearly 4 times as long as they are broad, linear in form, and somewhat divergent, each with a well-marked keel running along the dorsal face; apical setæ of moderate length and distinctly spinulose. Anterior antenna rather large, but composed of only 6 articulations, the last 2 being confluent; 2nd joint produced behind to a remarkably strong claw-like projection. Posterior antennæ and oral parts of normal structure. 1st pair of legs with the outer ramus very small, biarticulate, scarcely more than $^1/_3$ as long as the proximal joint of the inner. Natatory legs poorly developed, with the setæ much reduced, inner ramus in all pairs biarticulate and finely ciliated on both edges. Last pair of legs with the distal joint narrow oblong in form, and somewhat obliquely truncated at the end, which carries 5 somewhat unequal setæ; inner expansion of proximal joint rather large, extending about as far as the distal joint, marginal setæ 4 in number, all of nearly equal length.

Male not examined.

Colour whitish grey.

Length of adult female 0.80 mm.

Remarks.—The above-described form agrees on the whole so closely with the species recorded by Th. Scott, that I cannot doubt that it is the same. Yet there is one apparent difference to be noted as regards the structure of the 1st pair of legs, the outer ramus of which is said by that author to be 3-articulate; but I think this statement must be due to some mistake. The present form is a very distinct one, easily recognisable from any of the other known species.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were taken at Farsund, south coast of Norway, from a depth of about 30 fathoms.

Distribution.—Scottish coast (Scott).

Gen. 53. **Laophontopsis**, G. O. Sars, n.

Generic Characters.—Body slender, cylindric in form, with deep instrictions between the segments. Integuments unusually hard, and exhibiting a pitted sculpturing. Rostral projection broad, lamellar, and distinctly defined at the base by a transverse suture. Caudal rami pronouncedly lamellar, with the apical setæ very short and rudimentary. Anterior antennæ short and stout with the articulations much reduced in number. Posterior antennæ and oral parts differing only slightly in structure from those in *Laophonte*. 1st pair of legs likewise of a very similar appearance, though differing in the presence of a plumose seta inside the proximal joint of the inner ramus. Natatory legs well developed, with the outer ramus very slender and provided inside with long ciliated setæ, inner ramus biarticulate, with the number of setæ somewhat reduced. Last pair of legs in female with both the distal joint and the inner expansion of the proximal joint narrowly produced.

Remarks.—The present new genus is founded upon the anomalous species *Laophonte lamellifera* of Claus, which seems to me to be entitled to form a distinct generic type, exhibiting, as it does, some rather striking differences from the other species of *Laophonte*. The most conspicuous of these differences is shown in the peculiar structure of the caudal rami, from which the name of the species has been derived. There are however 2 other less conspicuous characters by which the present genus differs very markedly from most other *Laophontidæ*, and which are only found in one other very distinct genus referable to that family, viz., the genus *Normanella* Brady, to be described farther on. The first of those

characters refers to the rostral plate, which does not as usual form the immediate continuation of the cephalic segment, but, as in *Normanella*, is sharply defined from it at the base by a well-marked transverse suture. The second character is found in the structure of the 1st pair of legs, the inner ramus of which has attached inside the proximal joint a short, though well defined plumose seta, of which no trace is found in other *Laophontidæ*, except in the genus *Normanella*. We only know as yet a single species of the present genus.

176. Laophontopsis lamellifera (Claus).

(Pl. CLXXXV).

Cleta lamellifera, Claus, Die freilebenden Copepoden, p. 123, Pl. XV, figs. 21—24.

Specific Characters.—Female. Body narrow and elongated, slightly tapered behind, with the segments somewhat raised dorsally and fringed at the hind edge with distant spinules. Rostral plate broadly triangular in form, tip obtusely rounded. Urosome about the length of the anterior division, lateral expansions obsolete, last segment fully as long as the preceding one, anal opercle finely denticulate. Caudal rami twice the length of the anal segment and closely juxtaposed, tapering somewhat distally, outer edge with 2 distant bristles, dorsal seta issuing close to the base, middle apical seta scarcely half the length of the ramus, the other 2 still smaller. Anterior antennæ short and stout, composed of 4 joints only, the last 2 of the proximal part, and all of the terminal part, being confluent; setæ of the anterior edge comparatively short, partly spiniform. Posterior antennæ of quite normal structure. 1st pair of legs with the outer ramus 3-articulate and about half the length of the proximal joint of the inner, plumose seta of the latter very small, and attached about in the middle. Natatory legs with the terminal joint of the outer ramus very narrow, and provided in the anterior pair with one, in the other 2 pairs with 2 setæ inside; inner ramus in 2nd pair of legs with only 3 setæ, in the other 2 pairs with 4. Last pair of legs with the distal joint narrow linear in form, and provided with 6 partly spiniform setæ, 4 of which are attached to the outer edge, apical seta much the longest; inner expansion of proximal joint narrow linguiform, and extending considerably beyond the middle of the distal joint, marginal setæ 5 in number, the innermost one somewhat remote from the others. Ovisac of moderate size and oval in form.

Male not examined.

Colour whitish grey.

Length of adult female 0.88 mm

Remarks.—This form was first briefly described by Claus as *Cleta lamellifera*, and subsequently more closely examined by Prof. Brady, who referred it to the genus *Laophonte* of Philippi. It is an easily recognisable species, which cannot be confounded with any of the other *Laophontidæ*.

Occurrence.—I have only met with this form in a single locality, viz., at Hvalør, in the outer part of the Christiania Fjord, where some few female specimens were taken from a depth of about 6 fathoms, muddy bottom.

Distribution.—Mediterranean (Claus), British Isles (Brady), coast of France (Canu).

Gen. 54. **Asellopsis**, Brady, 1873.

Generic Characters.—Body pronouncedly depressed, with all the segments lamellarly expanded laterally. Rostral projection triangular, not defined behind by any suture. Caudal rami lamelliform, with the apical setæ rudimentary. Anterior antennæ in female with the number of joints reduced; those of male strongly hinged. Posterior antennæ about as in *Laophonte*. Oral parts also of a somewhat similar structure. 1st pair of legs with the outer ramus small, biarticulate, proximal joint the larger; inner ramus strong, resembling in structure that in *Laophonte*. Natatory legs well developed, with the full number of setæ, outer ramus coarsely spinulose outside; inner ramus of 3rd pair in male transformed in the usual manner. Last pair of legs in female with both joints lamellar and provided with comparatively short setæ; those in male without any expansion inside the proximal joint.

Remarks.—This genus was established in the year 1873 by Prof. Brady, to include a species, *A. hispida*, which, as regarded its external appearance, differed very markedly from the other *Laophontidæ*, as indicated by the generic name. Subsequently, however, he withdrew this genus, believing that the form upon which it was founded did not differ sufficiently in its anatomical details from *Laophonte*. As of recent years several genera closely related to that genus have been established and comprised within a particular family, *Laophontidæ*, I think that the present genus may also be acceptable, the more so as, in addition to the typical form, there is another well-defined species, which is evidently referable to that genus, viz., the form recently described by Th. Scott as *Laophonte intermedia*. In the structure of the caudal rami and the rudimentary condition of their apical setæ, the present genus agrees with *Laophontopsis;* but the form of the body is very different, and there are also several differences to be found in the structural details, which preclude a combination of these 2 genera.

177. Asellopsis hispida, Brady.

(Pl. CLXXXVII).

Asellopsis hispida, Brady & Robertson, Ann. & Mag. Nat. Hist. Vol. XII, p. 137, Pl. IX, figs. 6—10.

Specific Characters.—Female. Body comparatively broad, flattened, with the lateral expansions of the anterior segments truncated at the end. Cephalic segment very large, almost quadrangular in outline, rostral projection rather prominent, with the tip blunted. Urosome much shorter than the anterior division and having all the segments produced laterally to triangular imbricated expansions. Caudal rami short and broad, forming rounded lamellæ densely clothed with short hairs both at the edges and on the upper face, setæ of outer edge closely juxtaposed and not far from the end, dorsal seta issuing from about the middle, medial apical seta scarcely longer than the ramus, the other 2 still smaller. Eye well developed and of light red colour. Anterior antennæ of moderate size, and composed of 5 articulations, the last 2 of the proximal part being confluent; last joint transversely truncated at the tip. Posterior antennæ with the apical spines and setæ comparatively short and thick, outer ramus rather small and provided with 4 short ciliated setæ. 1st pair of legs with the outer ramus scarcely half as long as the proximal joint of the inner, distal joint of nearly the same length as the proximal one, but considerably narrower, and carrying outside a thin flexuous bristle, at the tip a single spine and 2 geniculated setæ. Natatory legs with the proximal joints of the rami somewhat dilated, especially in the anterior pairs, the 2 first joints of outer ramus armed with a double row of coarse spinules. Last pair of legs comparatively large, distal joint oblong oval in form with the outer edge minutely spinulose and carrying 5 rather short setæ arising from digitiform prominences, the penultimate one very thin, hair-like, inner edge of the joint quite smooth; inner expansion of proximal joint considerably produced and of narrow linguiform shape, extending about as far as the distal joint, marginal setæ 4 in number, the 2 innermost ones much shorter than the other 2.

Male with the anterior antennæ very strongly built and distinctly 6-articulate, last joint of proximal part globularly dilated, terminal part biarticulate, claw-like. Inner ramus of 3rd pair of legs distinctly triarticulate, middle joint produced at the end outside to a spiniform projection. Last pair of legs very small, with no trace of an inner expansion of the proximal joint.

Colour light yellow, with orange shading.

Length of adult female 0.58 mm.

Remarks.—The present form, first described by Messrs. Brady and Robertson under the above name, is easily recognisable by its flat expanded body and the

densely hispid lamelliform caudal rami. From the nearly allied species, *A. intermedia* (Scott), it may be distinguished by the somewhat different form of these rami, as also by some differences in the structure of the 1st pair of legs, as shown by the figures given by that author.

Occurrence.—I have found this form occasionally off the south coast of Norway, at Risør and Lillesand, in moderate depths, but more frequently off the south-west coast, at Skutesnæs and Haugesund. In the last-named locality it also occurred in tidal pools together with other littoral forms.

Distribution.—British Isles (Brady).

Gen. 55. **Laophontodes**, Scott, 1894.

Generic Characters.—Body more or less slender, with all the segments sharply marked off from each other by conspicuous constrictions. Cephalic segment comparatively broad and projecting in front to a triangular rostral plate not defined at the base. Urosome with the postero-lateral corners of the segments more or less produced. Caudal rami long and narrow, with one of the apical setæ rather strong. Anterior antennæ in female comparatively slender, with the 2 outer joints of the proximal part confluent; those in male hinged in the usual manner. Posterior antennæ with no trace of an outer ramus. Mandibular palp comparatively small, club-shaped. Maxillæ with the exopodal and epipodal lobes imperfectly developed. Anterior maxillipeds comparatively small, with only 2 digitiform lobes inside the claw-bearing joint. Posterior maxillipeds of normal structure. 1st pair of legs with the outer ramus much smaller than the inner, though composed of 3 well-defined joints, the last of which is rather short and obliquely truncated at the tip, spine of 1st joint of normal appearance, all the other 5 spines slender, geniculate, and gradually increasing in length distally; inner ramus, as in *Laophonte*, distinctly prehensile, biarticulate, with the proximal joint long and slender, distal joint armed at the tip with a curved claw and a slender seta. Natatory legs more or less extended laterally, the 2nd basal joint being considerably produced and bent upon the 1st in an elbow-like manner, rami very unequal and attached at rather a long distance from each other, the outer one slender, 3-articulate, with the spines rather elongated, inner ramus much smaller than the outer, narrow linear in form, and composed of only 2 joints, the 1st very small and in some cases imperfectly defined; inner ramus of 3rd pair of legs in male

slightly transformed. Last pair of legs forming each a slender curved stem extending laterally, its 2 joints imperfectly defined, the proximal one without any distinct expansion inside, but produced outside to a slender digitiform process tipped with a delicate bristle; those in male comparatively smaller than in female, with the 2 joints completely confluent, and the number of setæ reduced.

Remarks.—This genus was established by Th. Scott in the year 1894, and was at first merely regarded as a subgenus of *Laophonte*. In my opinion it is a fairly well defined genus, differing very markedly from the other genera comprised within the present family in several of the structural details, for instance, in the total absence of an outer ramus on the posterior antennæ, and in the rather peculiar structure of the legs. Off the coasts of Norway, there occur 3 well defined species belonging to this genus.

178. Laophontodes typicus, Scott.

(Pl. CLXXXVII).

Laophontodes typicus, Th. Scott, Additions to the Fauna of the Firth of Forth. Twelfth Annual Report of the Fishery Board for Scotland, Part III, p. 249, Pl. VIII, figs. 2—8.

Specific Characters.—Female. Body narrow, elongate, tapering behind, with the segments more or less angular in form. Cephalic segment sub-quadrangular in outline, postero-lateral corners only slightly produced. Rostral projection not very prominent, and obtuse at the tip. Urosome very narrow and (including the caudal rami) almost as long as the anterior division, lateral expansions of the segments well defined and minutely spinulose at the edges; last segment almost as long as the preceding one, and having the anal opercle finely denticulate, caudal rami narrow linear in form and rather divergent, being nearly twice as long as the anal segment, setæ of outer edge somewhat distant, dorsal seta well developed and issuing near the end of the ramus; middle apical seta rather strong, the other 2 very small, the outermost one being the longer, and connected at the base with the middle one. Anterior antennæ rather slender, almost attaining the length of the cephalic segment, and composed of 5 articulations, 2nd joint about the length of the 3rd, and exhibiting behind a slight ciliated expansion; terminal part fully as long as the 3rd joint. Posterior antennæ with the distal joint long and narrow, exhibiting the usual armature. Posterior maxillipeds not very strong, hand narrow fusiform in shape. 1st pair of legs with the outer ramus about half as long as the proximal joint of the inner, geniculate spines of the last joint rapidly increasing in length, the innermost one being 3 times as long as the whole ramus, apical claw of inner ramus of moderate size and much curved at the end,

accompanying seta rather longer than the claw. Natatory legs without any setæ inside the outer ramus. Last pair of legs with the proximal part shorter than the distal one, and provided inside with 2 closely juxtaposed setæ, distal part carrying 5 strong setæ, 2 outside and 3 at the tip, inner edge smooth. Ovisac small, rounded, with a very limited number of ova.

Male with the anterior antennæ rather strongly built, proximal part consisting of 4 well-defined joints, the last globularly dilated, terminal part uniarticulate, claw-like. Inner ramus of 3rd pair of legs 3-articulate, with the middle joint much the longest and produced at the end outside to a spiniform projection. Last pair of legs with only a single strong seta opposite the outer digitiform process, terminal part with one lateral and 2 somewhat unequal apical setæ.

Colour not yet ascertained.

Length of adult female 0.45 mm.

Remarks.—This is the first species described, and thus deserves its specific name as the type of the present genus. It is easily distinguished from the other 2 species by its long and narrow body, the form of the cephalic segment, and the angular shape of the succeeding segments.

Occurrence.—A solitary female specimen of this interesting form was taken some years ago, at Bukken, south-west coast of Norway, from a depth of about 20 fathoms. Some few specimens of both sexes were moreover picked up from a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle, and kindly sent to me for examination.

Distribution.—Scottish coast (Scott), Franz Josef Land (Scott).

179. Laophontodes bicornis, A. Scott.

(Pl. CLXXXVIII).

Laophontodes bicornis, A. Scott, Description and Notes of some new and rare Copepoda from Liverpool Bay. Report for 1985 on the Lancashire Sea Fisheries Laboratory, p. 14, Pl. III, figs. 24 & 25, Pl. IV, figs. 1—7.

Specific Characters.—Female. Body of a narrow and elongated form somewhat similar to that of the preceding species. Cephalic segment, however, very different in shape, exhibiting behind the middle a conspicuous constriction, anterior part triangularly expanded laterally, posterior part sending off to each side a remarkable horn-like process pointing obliquely backwards; rostral projection broadly triangular, with the tip slightly produced and obtusely pointed. The 3 succeeding segments very narrow and rounded laterally; last pedigerous segment somewhat broader. Urosome slender, though somewhat shorter than the anterior division,

lateral expansions of the segments only slightly produced and obtuse at the tip; last segment rather small, scarcely half as long as the preceding one, and having the anal opercle considerably prominent. Caudal rami narrow linear in form and slightly divergent, about equalling in length the last 2 segments combined, setæ of outer edge small and attached near the end, dorsal seta well developed, middle apical seta about twice the length of the ramus. Eye very conspicuous in the living animal. Anterior antennæ resembling in structure those in *L. typicus;* 3rd joint however comparatively longer. Posterior antennæ and oral parts almost exactly as in that species. 1st pair of legs likewise of a very similar structure. Natatory legs differing in the presence of well-developed setæ inside the outer ramus. Last pair of legs with the proximal part considerably longer than the distal one, and finely ciliated on both edges, carrying inside at the end 2 closely juxtaposed setæ, distal part with 5 marginal setæ, 3 at the tip and one on each side. Ovisac rounded.

Male with the anterior antennæ somewhat less strongly hinged than in the preceding species. Inner ramus of 3rd pair of legs with the projection of the middle joint very small. Last pair of legs comparatively smaller than in female, with no boundary between the proximal and the distal parts; number of setæ as in the male of *L. typicus*.

Body of a beautiful violaceous colour, with the ova in the ovisac light green.

Length of adult female 0.44 mm.

Remarks.—This form, first described by Mr. A. Scott from a solitary female specimen, is at once distinguished from the type species by the peculiar shape of the cephalic segment, and still more by the very prominent lateral processes issuing from its posterior part. It moreover differs conspicuously in the presence of well-developed setæ inside the outer ramus of the natatory legs, and the shape of the last pair of legs is also somewhat different.

Occurrence.—I have met with this peculiar Copepod not infrequently in several localities both on the south and west coasts of Norway in depths ranging from 10 to 30 fathoms. It is however easily overlooked on account of its small size.

Distribution.—British Isles (Scott).

180. Laophontodes expansus, G. O. Sars, n. sp.

(Pl. CLXXXIX).

Specific Characters.—Female. Body comparatively short and stout, flattened, with the lateral parts of the segments lamellarly expanded. Cephalic segment very large, with the lateral edged evenly curved and densely clothed with long cilia; rostral projection rather prominent, terminating in a spiniform point. Lateral parts of the succeeding segments produced to narrow linguiform plates densely ciliated at the end. Urosome much shorter than the anterior division, and having all the segments, except the last, expanded laterally in a manner similar to those of the anterior division, last segment short and broad, with the anal opercle prominent and finely spinulose at the edge. Caudal rami long and slender, linear in form, and considerably divergent, inner edge ciliated in the middle, outer edge exhibiting in front of the middle two small tufts of cilia, setæ of this edge rather distant, dorsal and apical setæ about as in *L. bicornis*. Anterior antennæ comparatively slender, but composed of only 4 joints, the terminal part being uniarticulate. Posterior antennæ and oral parts about as in the 2 preceding species. 1st pair of legs also rather similar, though comparatively more strongly built, with the apical claw of the inner ramus rather strong, and the accompanying seta much elongated. Natatory legs without any setæ inside the outer ramus, apical seta of this ramus very small and rudimentary; inner ramus of 4th pair of legs likewise much reduced, and only provided with a single apical seta. Last pair of legs with the proximal part much shorter than the distal one, and without any seta inside, distal part, like the proximal one, clothed at the edges with irregular tufts of hairs, setæ 5 in number, 2 of them issuing from the upper face.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.41 mm.

Remarks.—In its external appearance this form differs considerably from the 2 preceding species. It is however undoubtedly congeneric with them, exhibiting in the structural details all the chief features of the present genus.

Occurrence.—Only 2 female specimens of this remarkable form have as yet come under my notice. They were found in a sample taken by Mr. Nordgaard in the Salten Fjord, and kindly sent to me for examination.

Gen. 56. **Platychelipus**, Brady, 1880.

Generic Characters.—Body sub-cylindrical in form, resembling that in *Laophonte*, all the segments being very sharply marked off from each other. Cephalic segment of moderate size, and projecting in front in a triangular rostral plate, not defined at the base. Urosome with the lateral expansions of the segments only slightly marked. Caudal rami of moderate size, with the apical setæ comparatively short, the middle one very coarse, spiniform. Anterior antennæ in female 6-articulate, 2 of the joints belonging to the terminal part; those in male very strongly hinged. Posterior antennæ rather powerful, with the innermost apical seta spiniform and coarsely denticulated, outer ramus very small. Oral parts nearly as in *Laophonte;* posterior maxillipeds, however, less powerful, with the dactylus very slender and clothed inside with thin spinules. 1st pair of legs with both rami biarticulate, the outer one rather coarsely built, though shorter than the inner, the latter far less fully developed than in *Laophonte* and less pronouncedly prehensile, the apical claw being very thin, almost setiform. Natatory legs with the outer ramus strongly built, having the spines very coarse, whereas the setæ are much reduced, or in some cases wholly wanting, inner ramus poorly developed; those in male much larger than in female, with the outer ramus very powerful, inner ramus of 3rd pair of legs transformed in a manner similar to that in the male of *Laophonte*. Last pair of legs with the distal joint comparatively short, lamelliform, inner expansion of proximal joint well developed; those in male very much reduced.

Remarks.—This genus was established in the year 1880 by Prof. Brady, to include a species, *P. littoralis*, found by him off the British coast. It was referred by that author to his sub-family *Nannopinæ*, though in reality it only exhibits a very remote affinity to the gen. *Nannopus*, on which this sub-family was founded. In my opinion the present genus ought unquestionably to be included in the family *Laophontidæ*, exhibiting, as it does, all the chief features of that family. Off the Norwegian coast, 2 well-defined species referable to this genus occur.

181. Platychelipus littoralis, Brady.

(Pl. CXC & CXCI).

Platychelipus littoralis, Brady, Monograph on British Copepoda, Vol. II, p. 103, Pl. LXXIX, figs. 20—23, Pl. LXXX, figs. 15—19.

Specific Characters.—Female. Body moderately slender, slightly tapering behind, with well-marked constrictions between the segments. Cephalic segment

scarcely as long as the 3 succeeding segments combined, rostral plate obtusely pointed at the tip. Urosome much shorter than the anterior division, last segment not attaining the length of the preceding one. Caudal rami comparatively short and of uniform width throughout, setæ of outer edge closely juxtaposed, and, like the dorsal seta, issuing in front of the middle, medial apical seta distinctly jointed at the base, and not attaining half the length of the urosome. Anterior antennæ rather stout, with the setæ of the anterior edge short and thick, last joint about the length of the 3rd. Posterior antennæ with the outer ramus somewhat dilated in the middle and carrying 3 comparatively short setæ, one apical and one on each side. Mandibular palp comparatively large and densely hairy, with 5 thickish setæ, the innermost arising from a digitiform process. 1st pair of legs with the outer ramus about half the length of the inner, and rather coarsely built, last joint armed with 4 spines, but without any setæ; apical claw of inner ramus almost attaining the length of the whole ramus and turned up at the tip in a hamiform manner. Natatory legs remarkably short and stout, with no setæ on the outer ramus, the latter coarsely built, with the spines exceedingly strong; inner ramus in 2nd pair of legs normally developed though only carrying a single apical seta, in the 2 succeeding pairs quite rudimentary. Last pair of legs rather small, distal joint short, with 5 thickish setæ; inner expansion of proximal joint extending beyond the distal joint, and subtruncate at the end, which carries 4 strong setæ. Ovisac of moderate size and oval in form.

Male differing considerably from the female in its external appearance, having the anterior division of the body somewhat dilated in the middle, whereas the posterior is very slender and narrow. Rostral projection rather small and conical in form. Anterior antennæ strongly built, with the last joint of the proximal part globularly dilated, and the terminal part unguiform. 1st pair of legs slightly differing from those of the female as regards the outer ramus, the distal joint of which is comparatively larger, with an additional short seta inside the tip. Natatory legs remarkably strong, with the outer ramus much larger than in female, inner ramus in all of them well developed, though much smaller than the outer. Last pair of legs each reduced to a narrow rim carrying 4 setæ, inside which is another very small bristle.

Colour dark reddish brown.

Length of adult female 0.97 mm , of male 0.84 mm.

Remarks.—The present species is the type of the genus *Platychelipus*. and in some characters seems, indeed, to differ conspicuously from the typical species of *Laophonte*, especially as regards the female. The male, however, ex-

hibits sexual characters quite analogous to those found in some species of that genus, for instance *L. Strømi* and allied forms.

Occurrence.—I have only met with this form in a single locality, viz., in a shallow bay near Christiania. It occurred here not infrequently close to the shore, on a muddy bottom, males and females being present in about equal number and often seen tied together in copulation. Th. Scott also records this form from the Finmark coast. The movements of the animal consist chiefly in a slow creeping through the loose mud in which it dwells, and with which the surface of the body is often thickly covered. During these movements the very flexible body is twisted in various ways, and both the antennæ and the legs swing to and fro. At times the animal is seen slowly climbing up the walls of the vessel in which it is observed; but I have never seen it make even the slightest attempt to swim, and, indeed, the structure of the natatory legs, at any rate in the female, seems to render the animal quite unfit for such a movement.

Distribution.—British Isles (Brady), Novaja Zemlja (Scott).

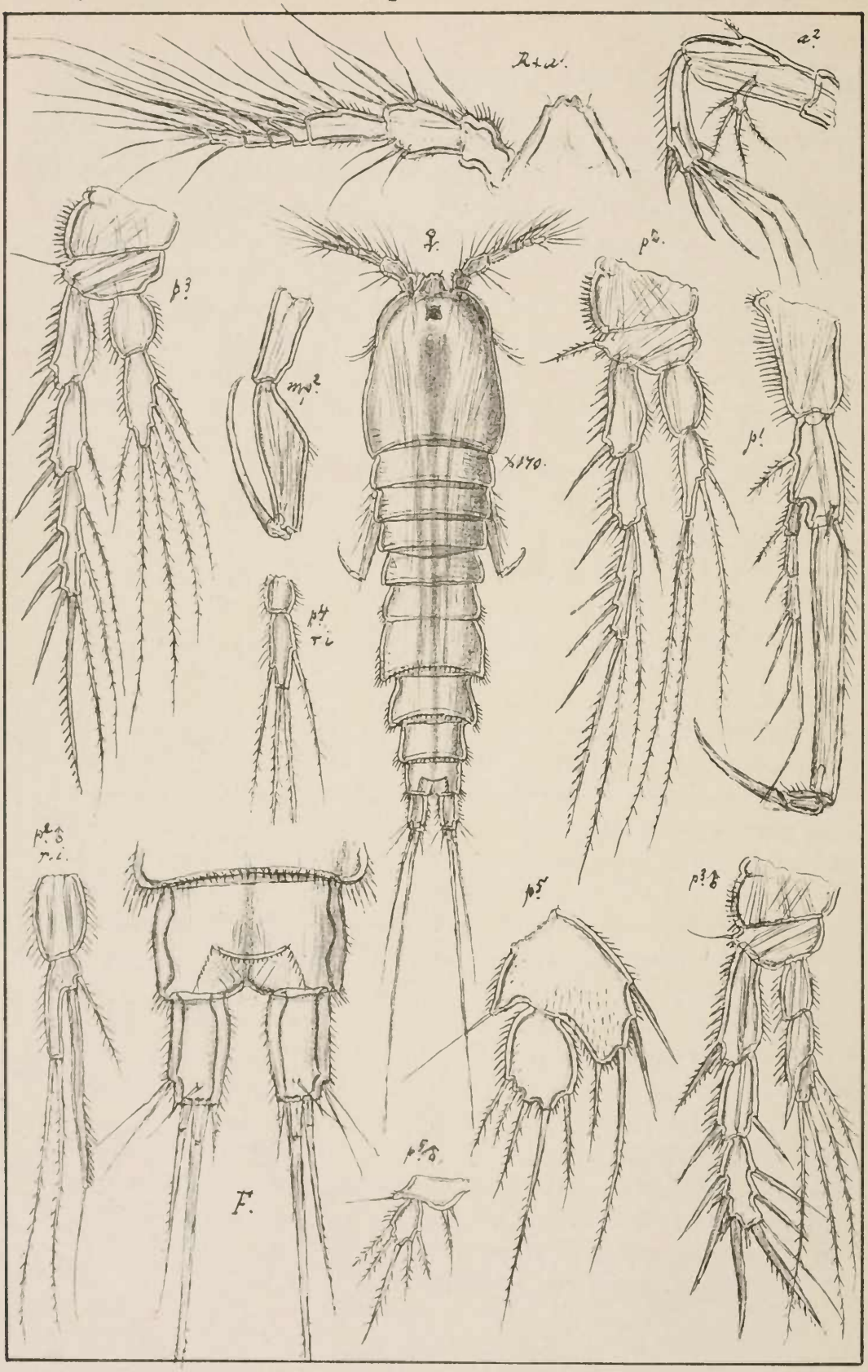
182. Platychelipus laophontoides, G. O. Sars, n. sp.

(Pl. CXCII).

Specific Characters.—Female. Body somewhat less robust than in the preceding species, though otherwise of rather a similar appearance, tapering gradually behind. Cephalic segment exceeding in length the 3 succeeding ones combined, rostral projection minutely bilobular at the tip. Urosome comparatively more elongated, with the last segment fully as large as the preceding one. Caudal rami about twice as long as they are broad, and somewhat tapered distally; setæ of outer edge, like the dorsal one, issuing a little behind the middle, medial apical seta somewhat exceeding half the length of the urosome, and not jointed at the base. Anterior antennæ comparatively more slender than in the type species, with the setæ of the anterior edge less strong, terminal joint considerably longer than the 3rd. Posterior antennæ with the outer ramus extremely small, and having one of the setæ much longer than the others. Mandibular palp comparatively smaller than in *P. littoralis*, though of a very similar structure. 1st pair of legs likewise exhibiting the structure characteristic of the genus, outer ramus, however, comparatively narrower than in the type species, with the last joint longer than the 1st, and carrying 3 spines and 2 minutely ciliated setæ; apical claw of inner ramus very slender, and evenly curved at the tip. Natatory legs with the outer ramus less strongly built than in *P. littoralis*, and provided inside with a few

Copepoda

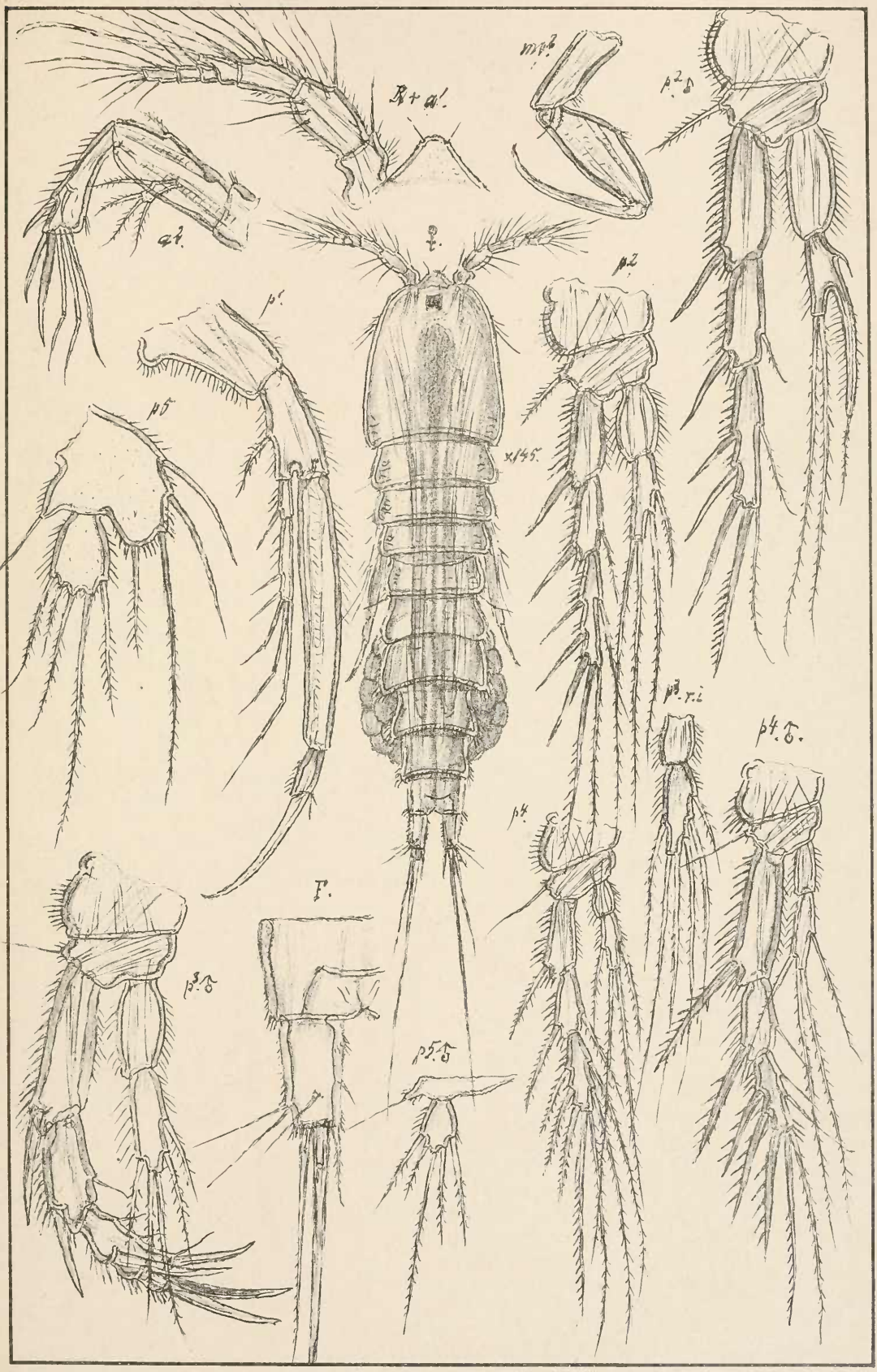
Laophontidœ Harpacticoida PL.CLXXVII



G.O.Sars autogr. Norsk lithgr. Officin.

Laophonte congenera, G.O.Sars

Copepoda

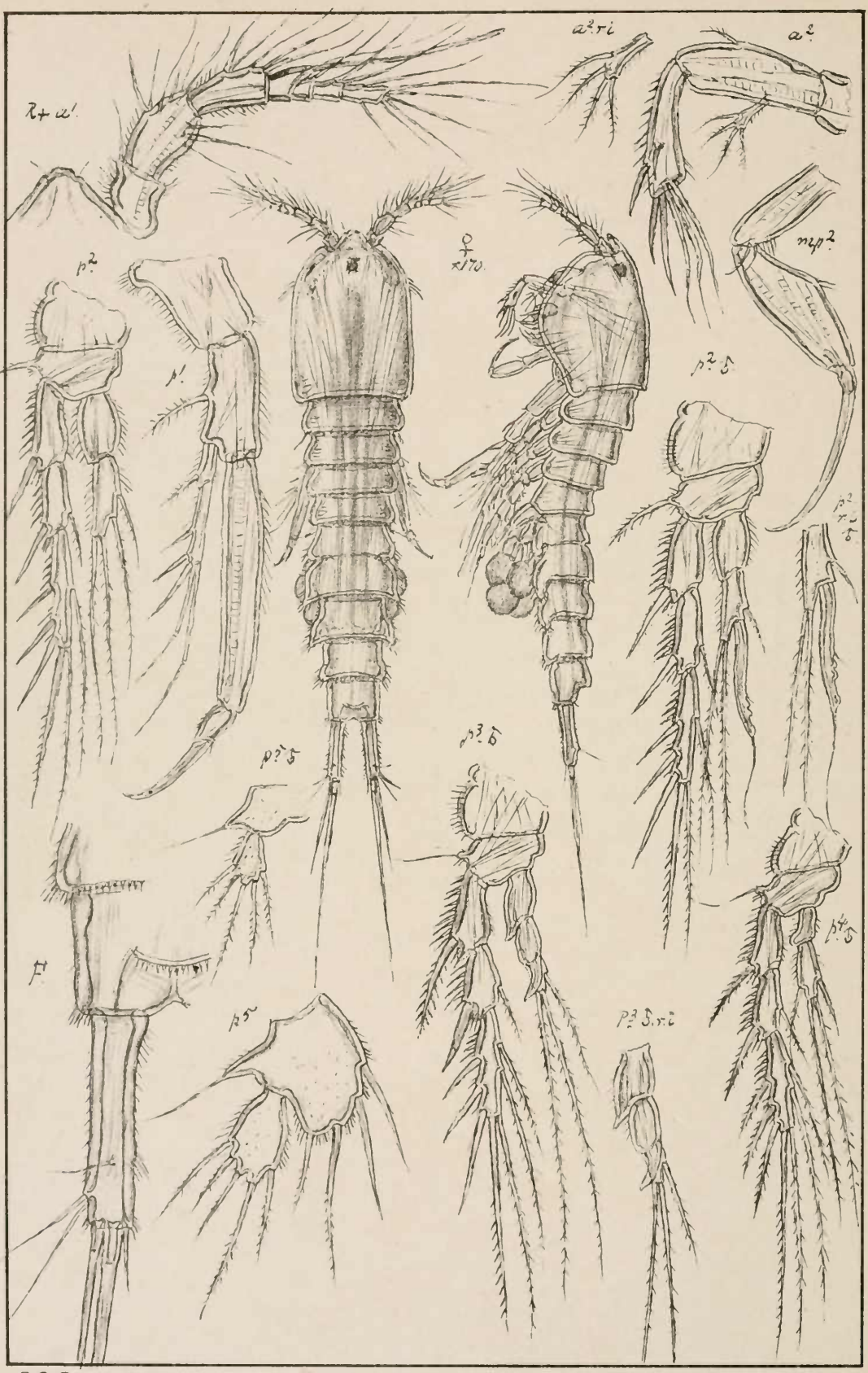


G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte perplexa, Scott

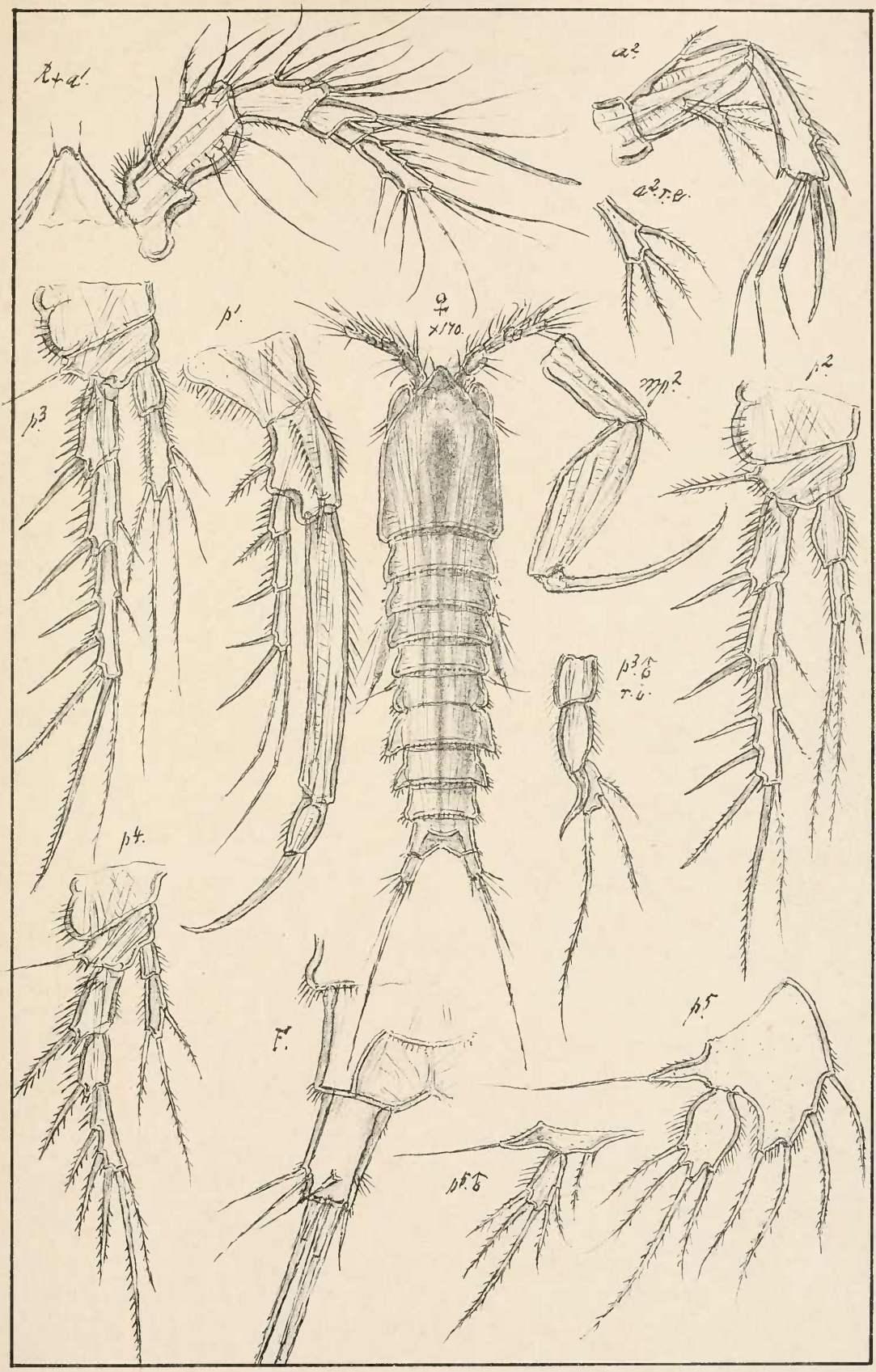
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Laophontidæ Harpacticoida PL. CLXXIX



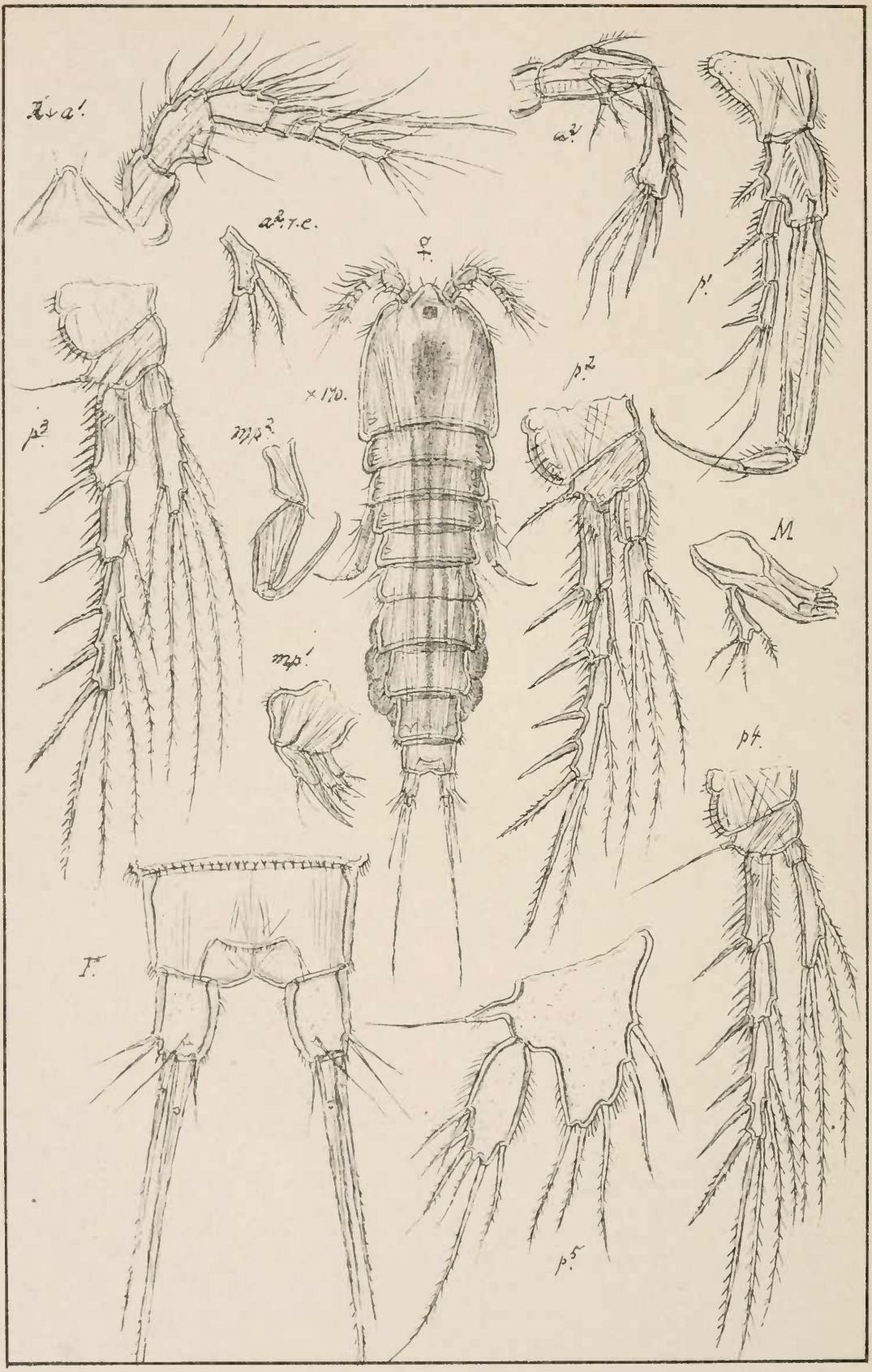
G.O. Sars autogr. Norsk lithgr. Officin.

Laophonte macera, G.O. Sars



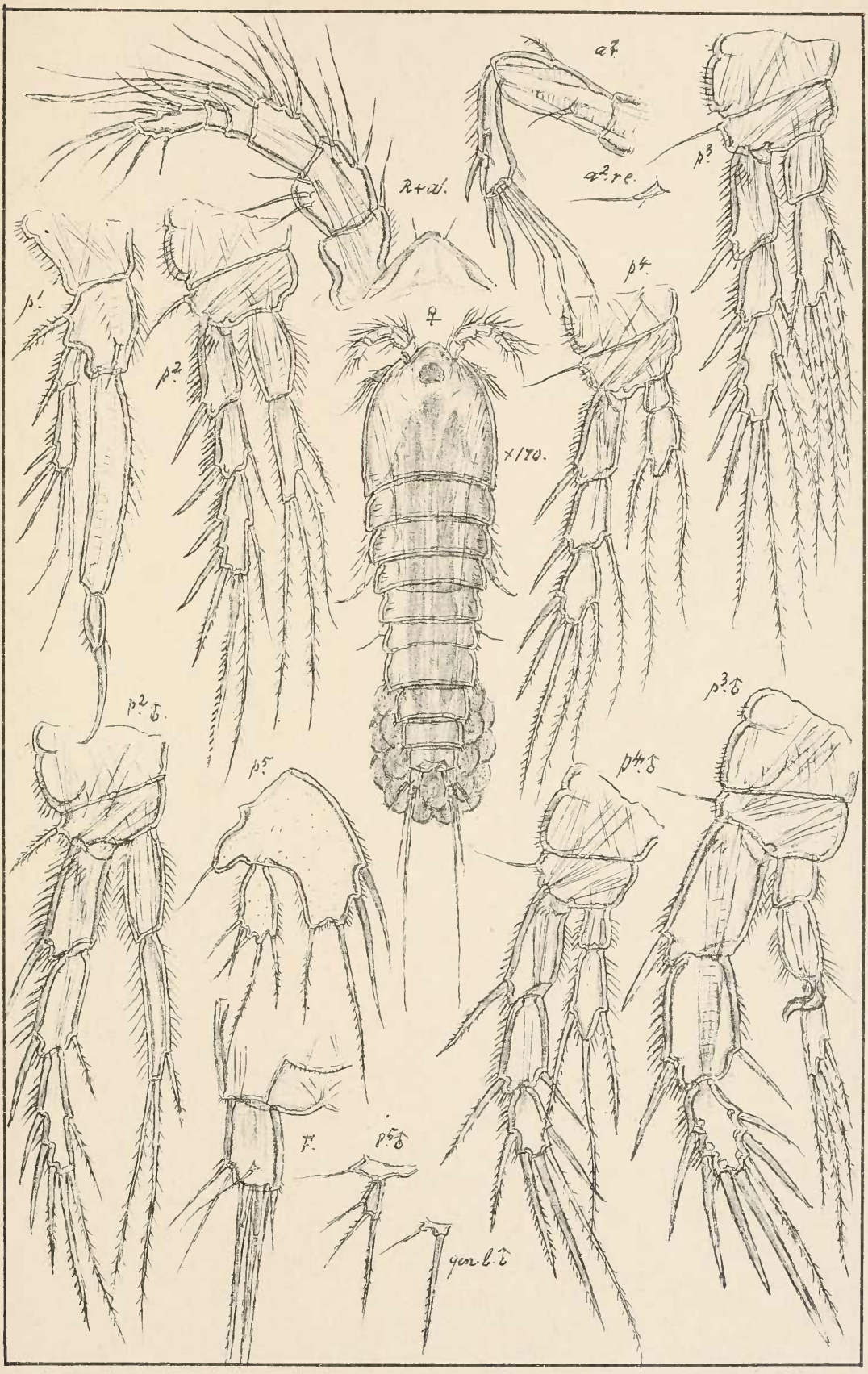
G.O.Sars autogr. Norsk lithgr. Officin.

Laophonte Nordgaardi, G.O.Sars



G.O. Sars autogr. Norsk lithgr. Officin.

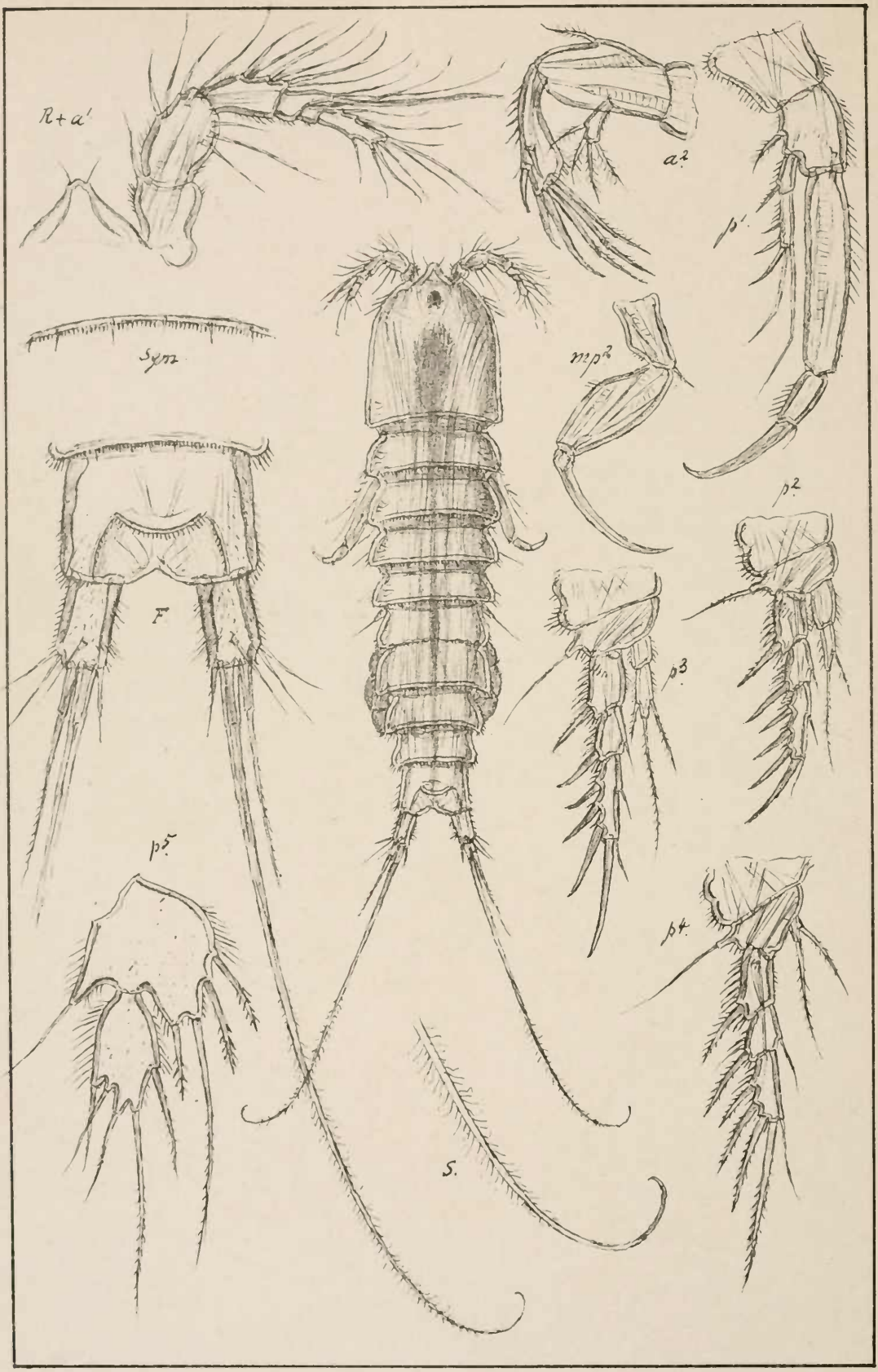
Laophonte parvula, G.O. Sars



G.O.Sars autogr. Norsk. lithgr. Officin.

Laophonte nana, G.O.Sars

Copepoda

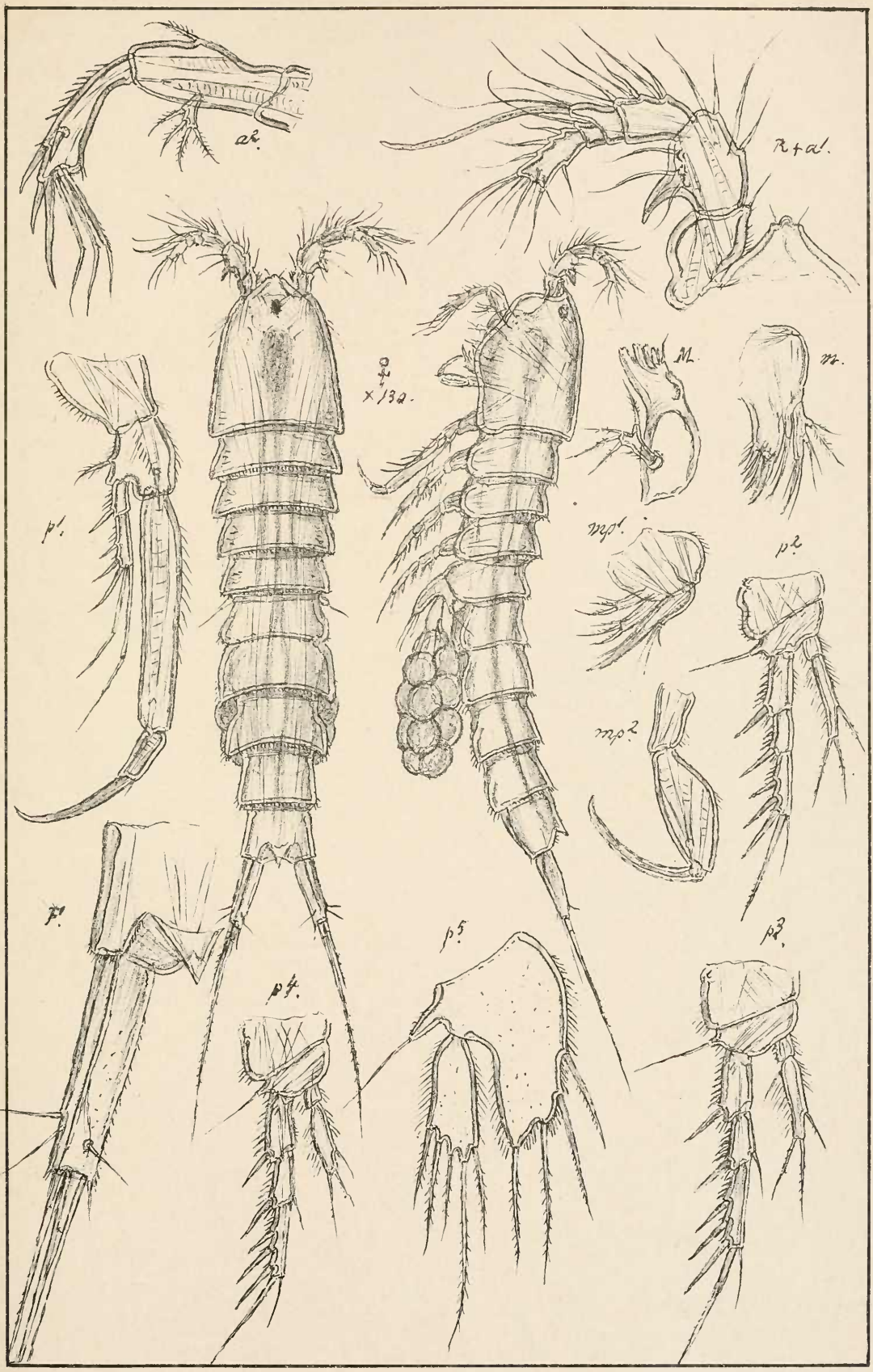


G.O.Sars autogr

Norsk lithgr. Officin.

Laophonte inopinata, Scott

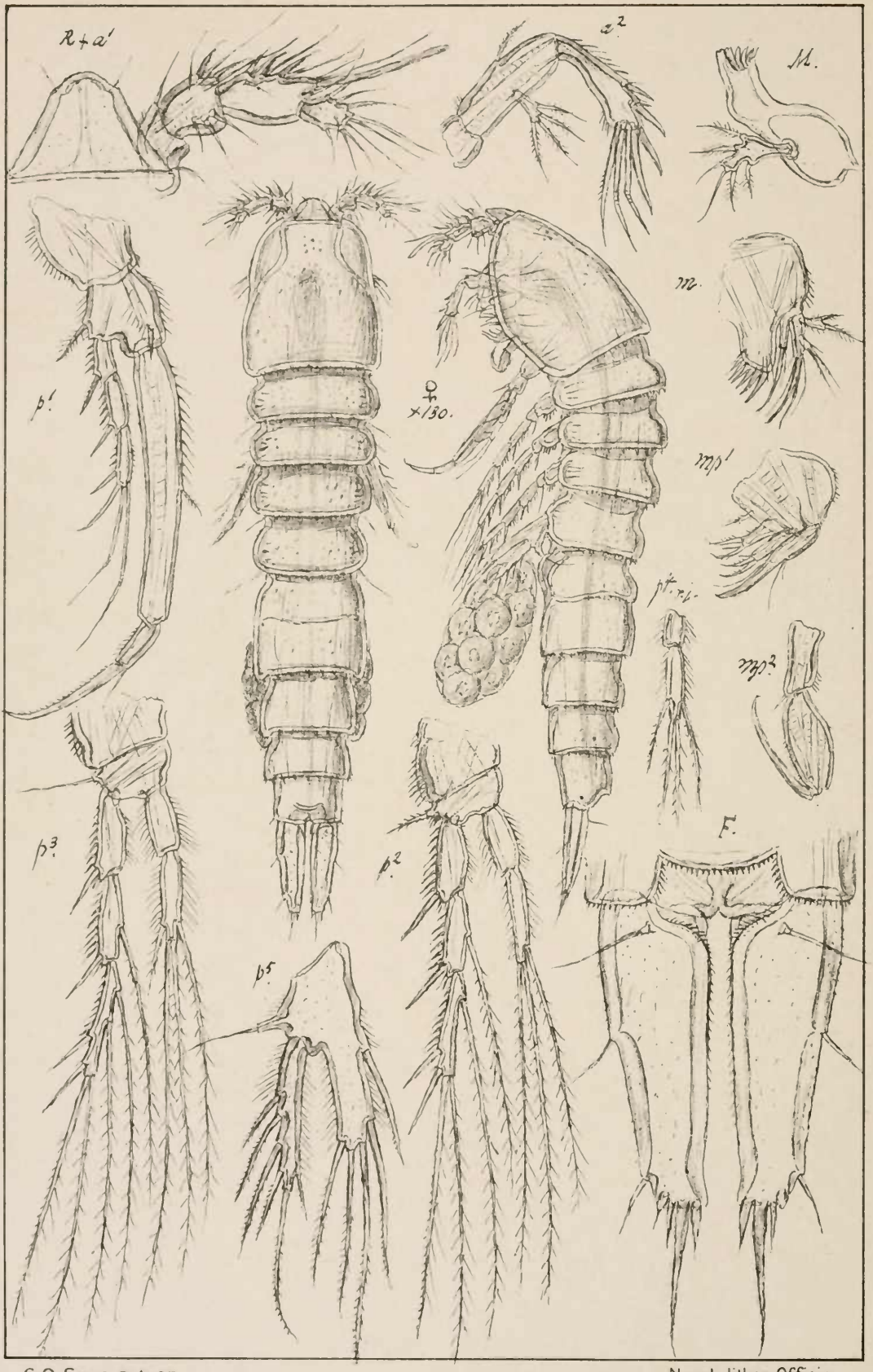
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G.O.Sars autogr. Norsk lithgr Officin.

Laophonte denticornis, Scott

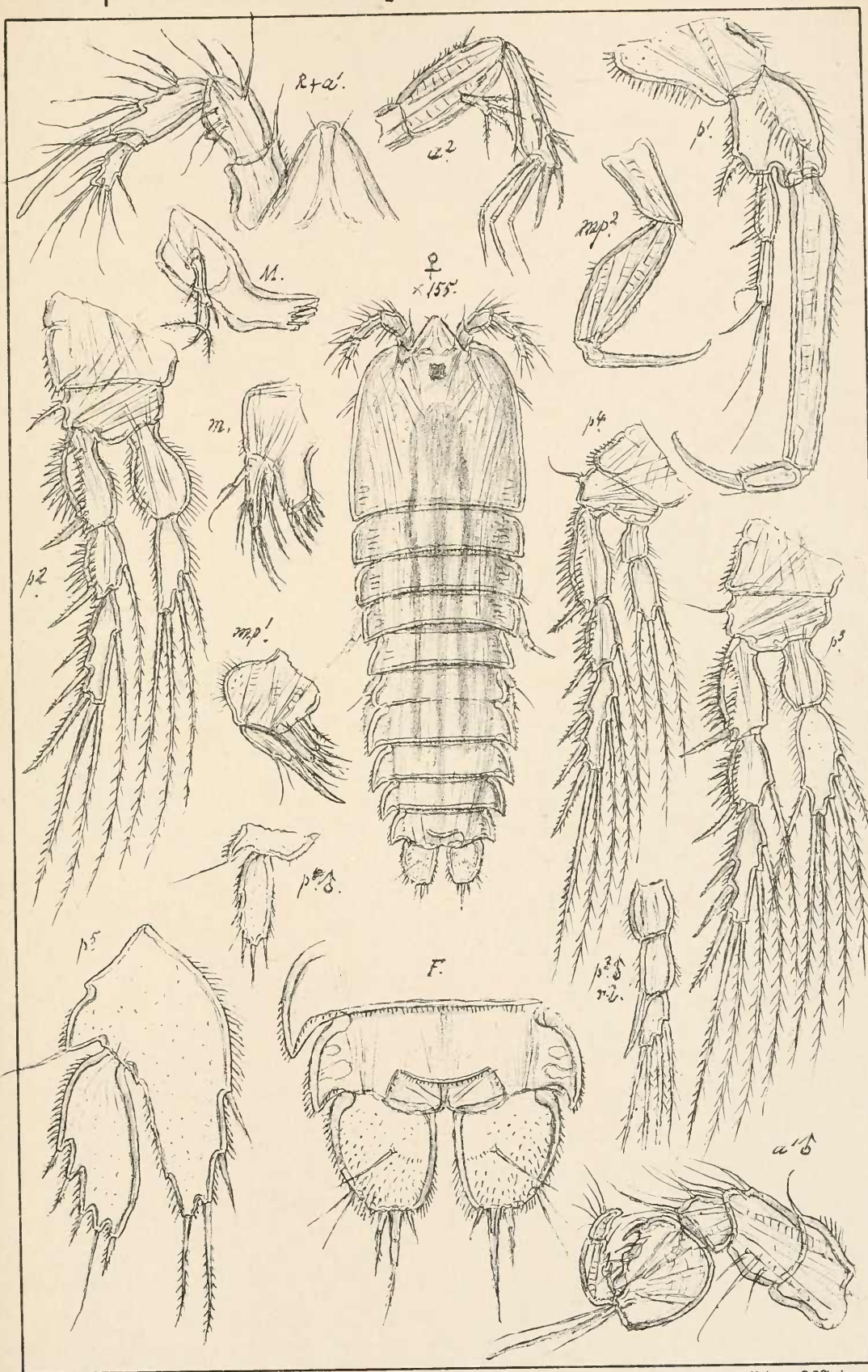
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G.O. Sars autogr. Norsk lithgr. Officin.

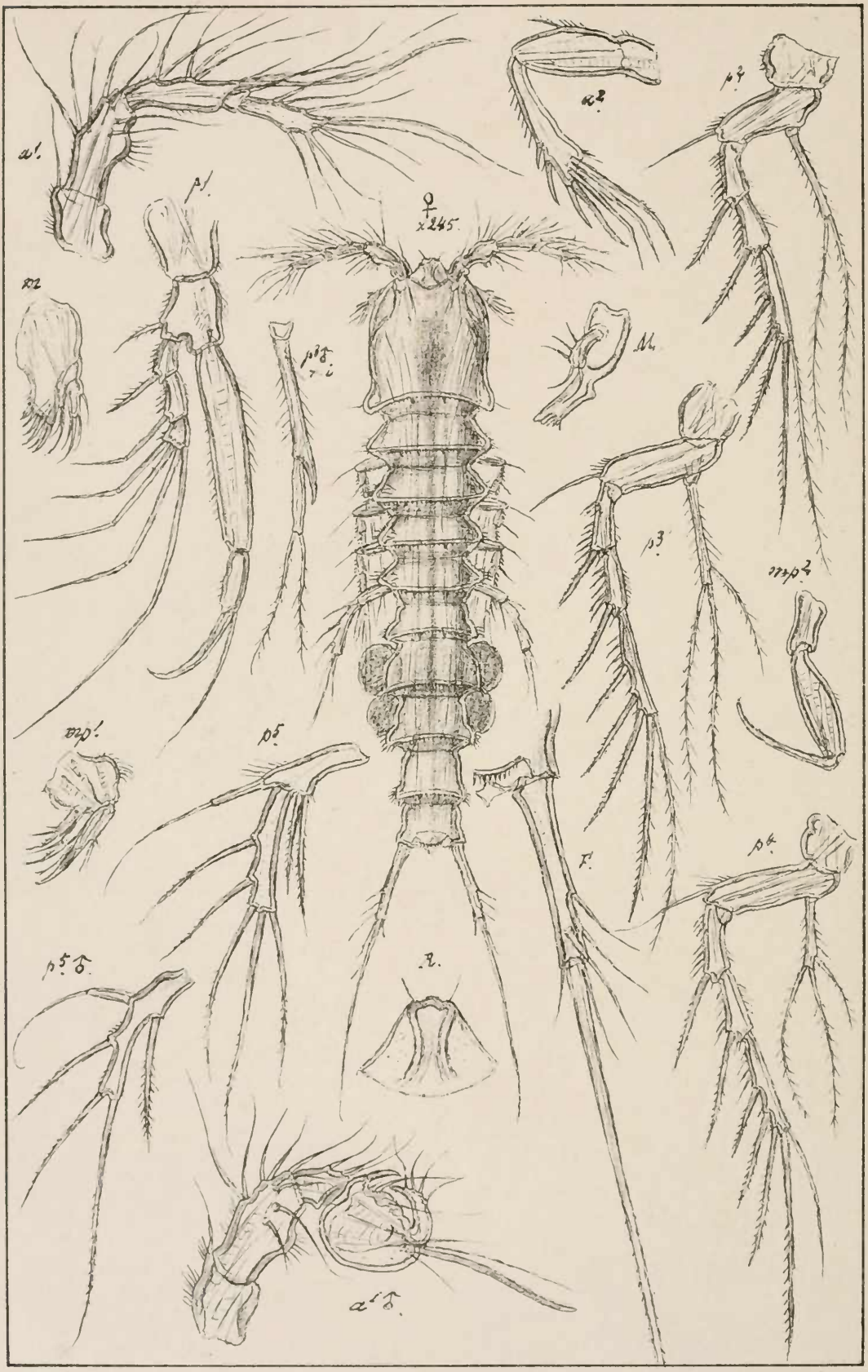
Laophontopsis lamellifera, (Claus)

Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

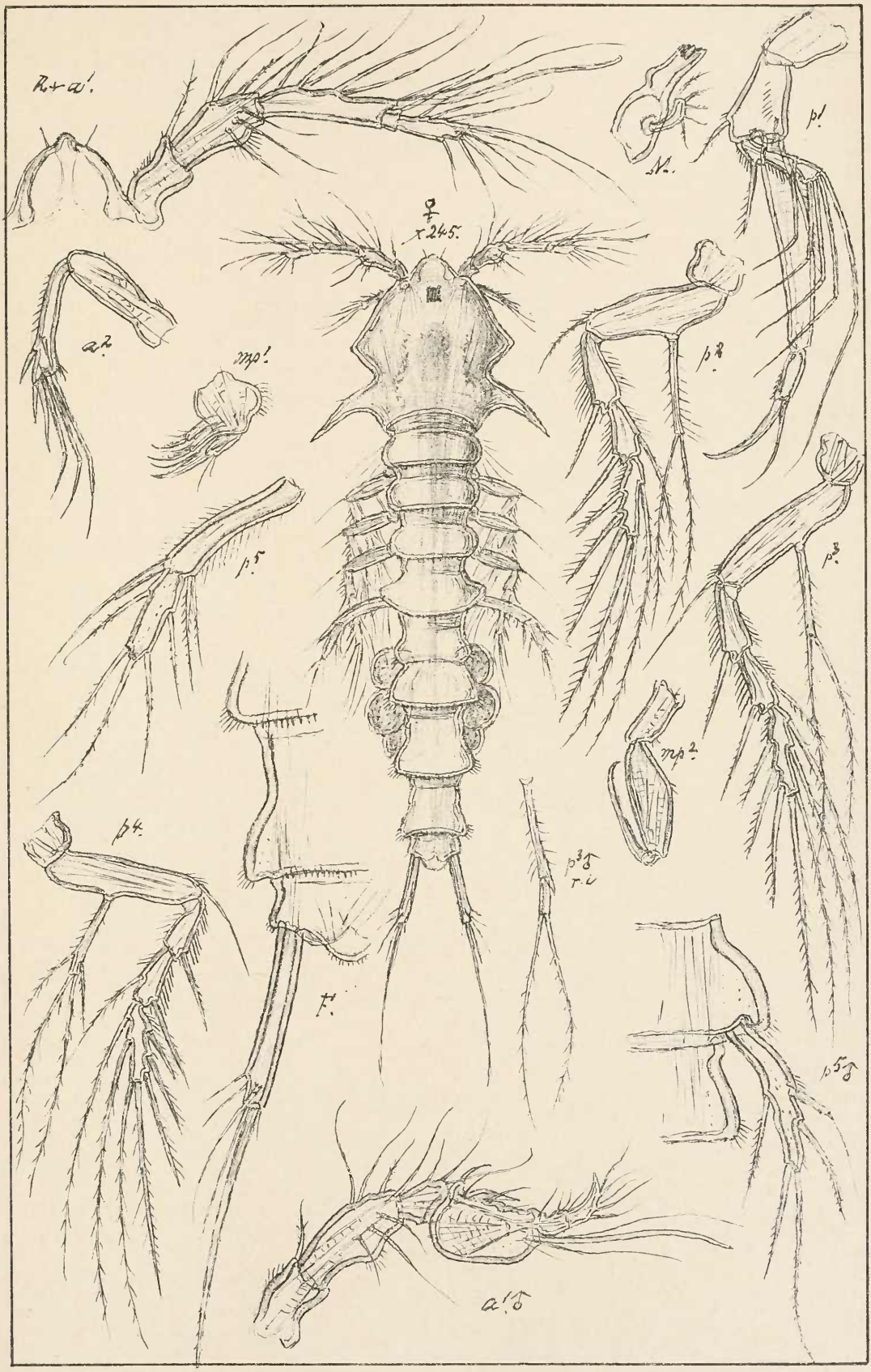
Asellopsis hispida, Brady.



G.O. Sars autogr. Norsk lithgr. Officin.

Laophontodes typicus, Scott.

Copepoda



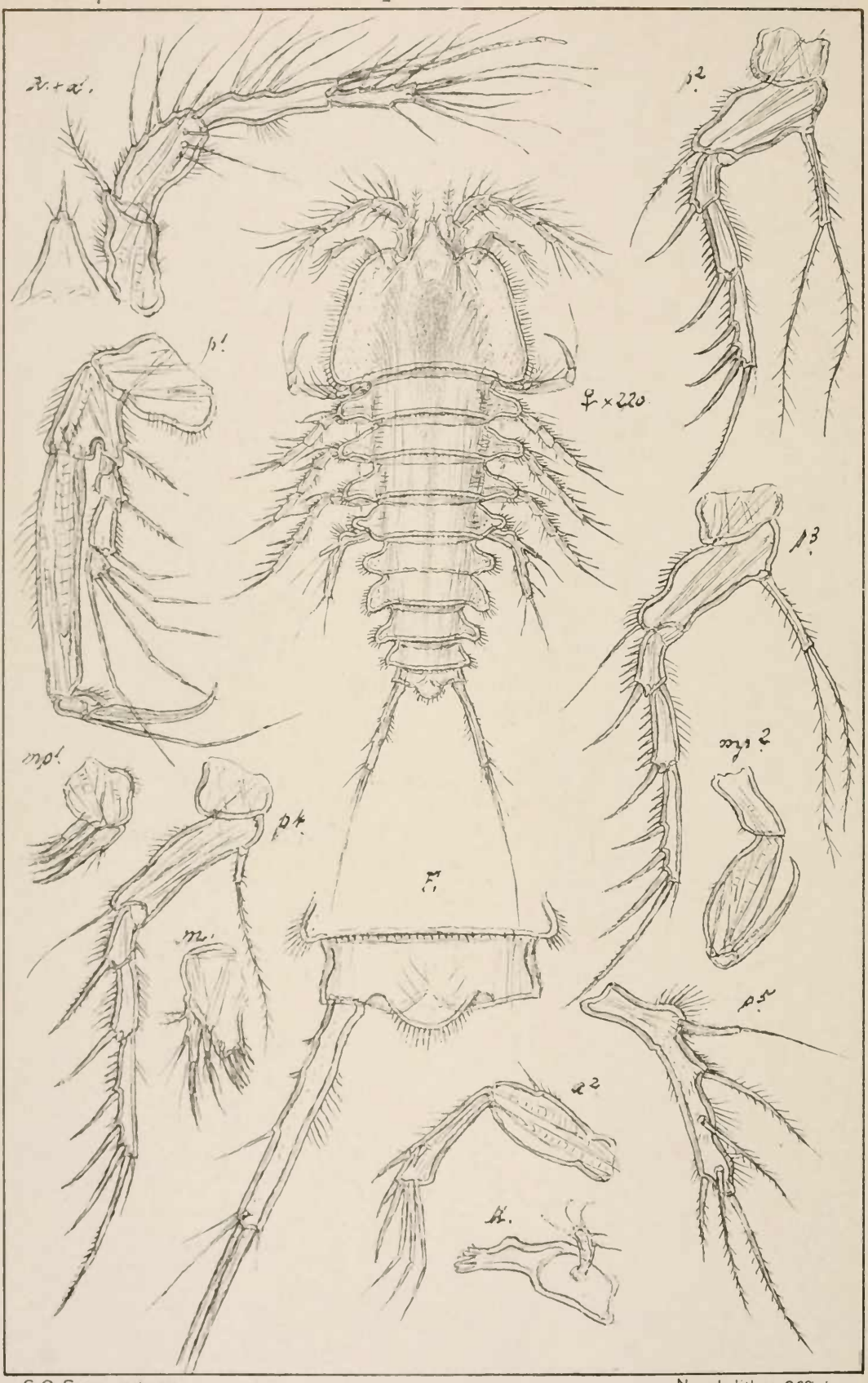
G.O. Sars autogr.

Norsk lithgr. Officin.

Laophontodes bicornis, Scott.

Copepoda

Laophontidæ Harpacticoida Pl. CLXXXIX.

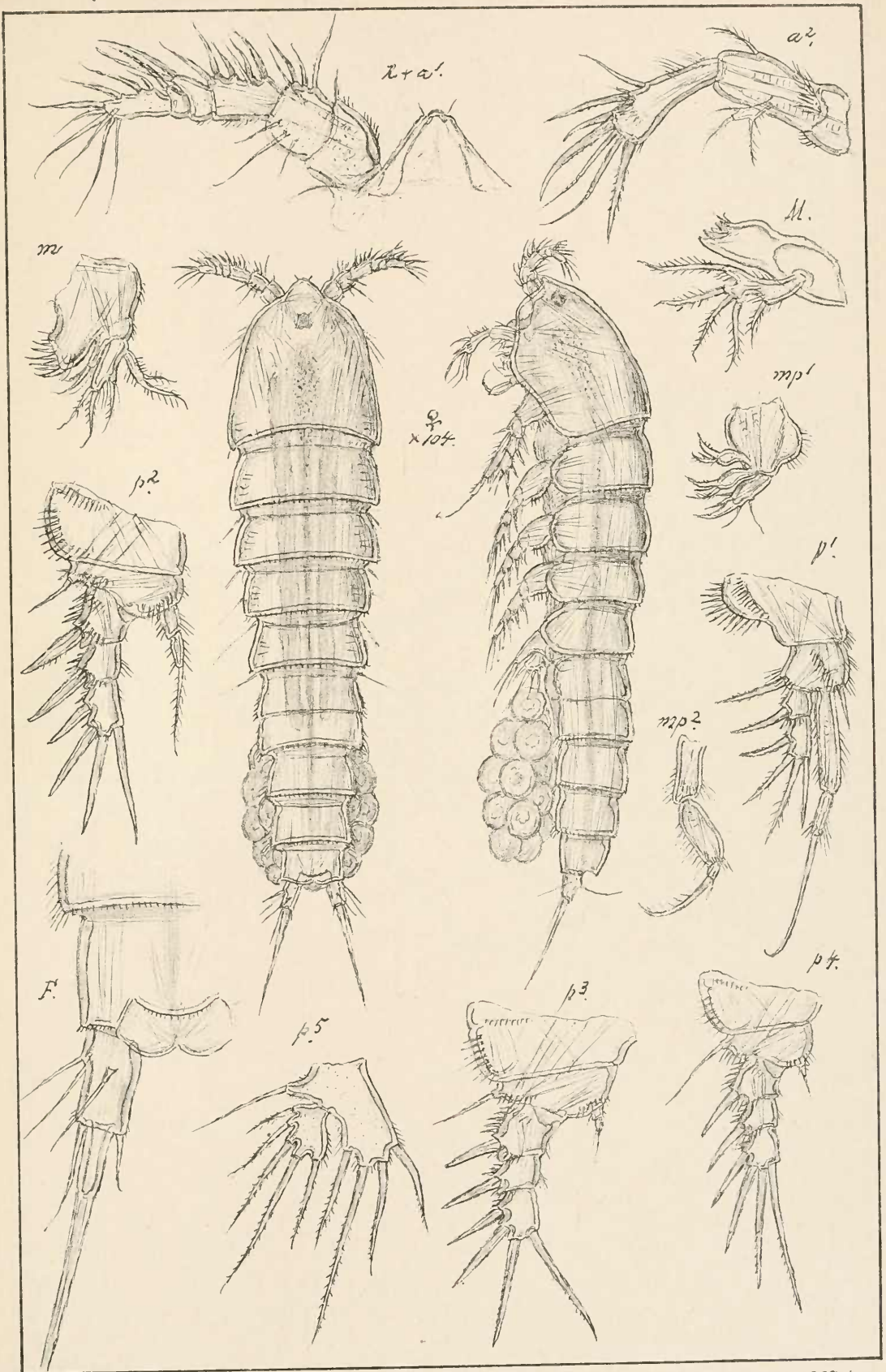


G.O. Sars autogr. Norsk lithgr. Officin.

Laophontodes expansus, G.O. Sars.

Copepoda

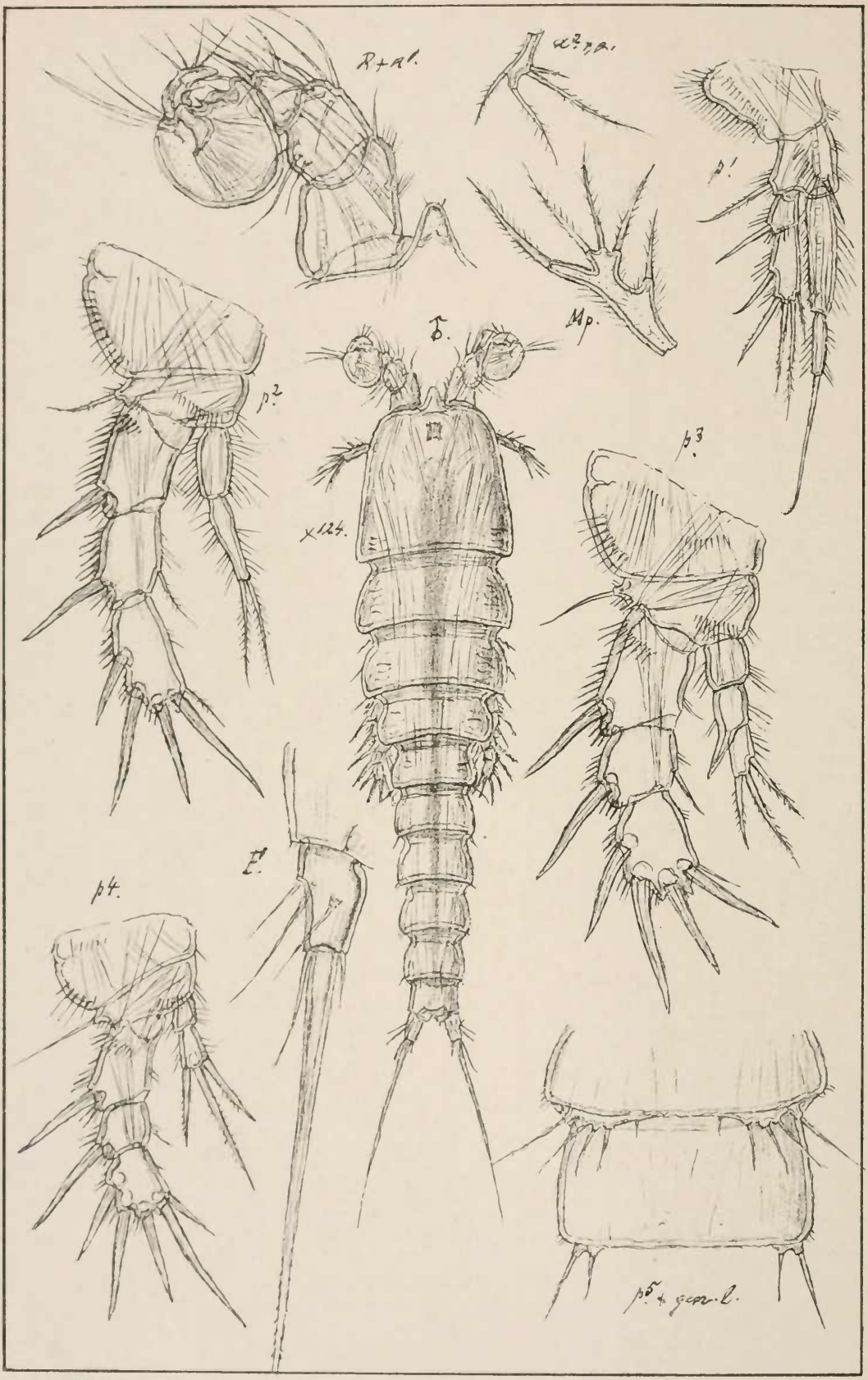
Laophontidæ Harpacticoida Pl. CXC.



G.O. Sars autogr. Norsk lithgr. Officin.

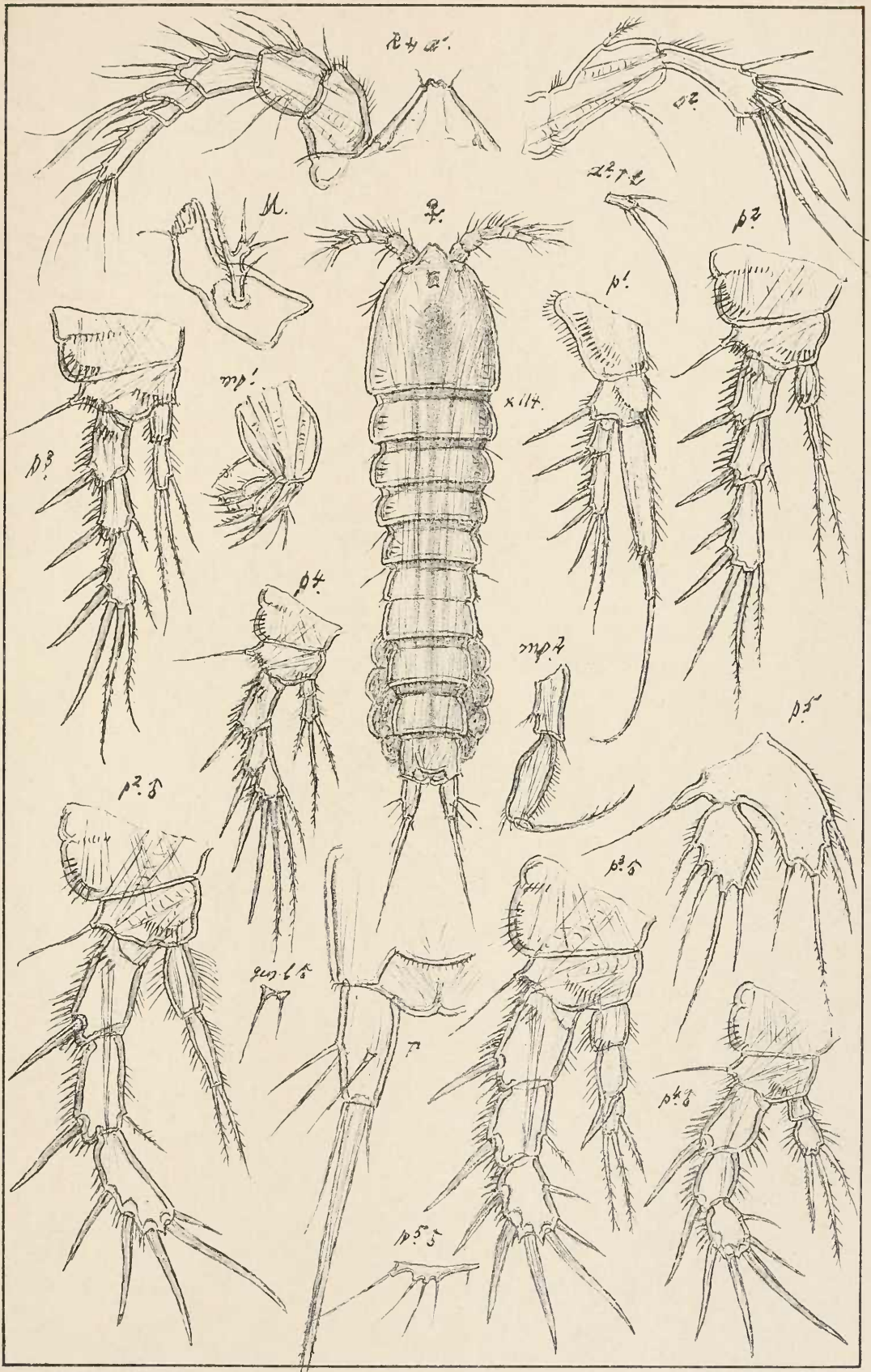
Platycholipus littoralis, Brady.

Copepoda



G.O. Sars autogr. Norsk lithgr. Officin.

Platycholipus littoralis, Brady.
male



G.O.Sars autogr. Norsk lithgr Officin.

Platychelipus laophontoides G.O.Sars.

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XXV & XXVI

LAOPHONTIDÆ (concluded), CLETODIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
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ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1909

small setæ in addition to the spines; inner ramus in all pairs distinctly developed, biarticulate, that of the anterior pair having 2, and that of the other 2 pairs 3 apical setæ. Last pair of legs somewhat more fully developed than in *P. littoralis*, distal joint comparatively larger and rounded oval in form, inner expansion of proximal joint triangularly produced at the end, and not extending quite as far as the distal joint, number of setæ in both joints as in the type species. Ovisac oval in form

Male differing from female very much as in the type species.

Colour pale yellow.

Length of adult female 0.80 mm.

Remarks.—In its external appearance this form exhibits a perplexing resemblance to certain species of *Laophonte*, especially that described above as *Laophonte minuta* Boeck, and may, indeed, at first sight be easily confounded with that species. The anatomical examination proves it, however, to be unquestionably referable to the present genus and not to *Laophonte*, though clearly showing the near relationship of these two genera. The specific name here proposed is intended to indicate this relationship as regards the present species.

Occurrence.—I have found this form not infrequently in the upper part of the Christiania Fjord in a depth of 3—10 fathoms, muddy bottom. It occurred here in company with the above-mentioned species of *Laophonte*, to which it bears so close a resemblance as regards its external appearance.

Gen. 57. **Normanella** Brady, 1880.

Generic Characters.—Body comparatively short and stout, somewhat resembling in shape that in *Laophonte*, all the segments being sharply marked off from each other, and bordered behind with delicate spinules. Cephalic segment large, with the rostral plate triangular and defined at the base by a well-marked transversal suture, as in the genus *Laophontopsis*. Genital segment in female distinctly divided in the middle. Caudal rami somewhat distant and sub-linear in form. Anterior antennæ comparatively short, and composed of only 5 articulations, the 1st joint of the terminal part being coalesced at the base with the preceding joint, which is produced at the end anteriorly and provided with the usual sensory filament. These antennæ are strongly hinged in the male. Posterior antennæ with the outer ramus uniarticulate, carrying 2 lateral and 2 apical setæ. Mandibles well developed, with the palp distinctly biramous, being composed of

a broad basal part and 2 small uniarticulate rami. Maxillæ with the exopodal and epipodal lobes distinctly defined. Anterior maxillipeds with 2 setiferous lobes inside the claw-bearing joint. Posterior maxillipeds moderately strong and of usual structure. 1st pair of legs somewhat resembling those in *Laophonte*, but less strongly built, outer ramus very small, 3-articulate, and abruptly bent at the base, inner ramus biarticulate and distinctly prehensile, proximal joint long and slender with a well-developed seta inside at some distance from the end, distal joint incurved and armed at the tip with a slender claw and a still more slender seta, its outer edge carrying moreover a small bristle. Natatory legs with the inner ramus more fully developed than in *Laophonte*, though consisting of only 2 joints, the proximal one somewhat expanded, the distal one narrow, with 5 or 6 slender setæ. None of these legs are transformed in male. Last pair of legs with the distal joint long and narrow, proximal joint narrowly produced inside; those in male, as usual, much smaller than those in female.

Remarks.—Though the systematic position of this genus appears somewhat doubtful, I think that it should more properly be placed in the family *Laophontidæ*, with which it agrees both in the external appearance of the body and in most of the anatomical details. The most conspicuous difference is found in the structure of the mandibular palp, which, unlike that in the other genera, is distinctly biramous. The separation of the rostral plate from the cephalic segment by a transversal suture, and the presence of a ciliated seta inside the proximal joint of the inner ramus in the 1st pair of legs, are both characters which it shares with another genus evidently belonging to the present family, viz., *Laophontopsis*. The form recorded by Th. Scott as *Normanella attenuata* cannot by any means be referred to the present genus. In addition to the type species, 2 new, nearly-allied species will be described below.

183. Normanella minuta (Boeck).

(Pl. CXCIII).

Mesochra minuta, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 50.

Syn: *Normanella dubia*, Brady.

Specific Characters.—Female. Body sub-cylindrical in shape, though not very slender, and slightly constricted in the middle. Cephalic segment about the length of the 3 succeeding segments combined, and somewhat contracted in front, rostral plate triangular, with the tip obtusely acuminate. Urosome nearly as long

as the anterior division, and having the lateral parts of the segments slightly projecting; last segment about the length of the preceding one, anal opercle somewhat prominent and finely denticulate. Caudal rami comparatively short, not attaining the length of the anal segment, being about twice as long as they are broad; middle apical seta normal and distinctly jointed at the base. Anterior antennæ scarcely half as long as the cephalic segment, and clothed with partly ciliated setæ, 3rd joint the largest, terminal part about the length of this joint. Posterior antennæ with the outer ramus rather small, scarcely half as long as the basal joint. 1st pair of legs with the outer ramus about half as long as the inner, its last joint longer than the middle one, and armed with 3 spines and 2 geniculate setæ; inner ramus very slender, with the distal joint about $^1/_4$ the length of the proximal one. Natatory legs of moderate size, with the outer ramus rather narrow, inner ramus of 2nd pair extending almost to the middle of the terminal joint of the outer, that of 4th pair much shorter. Last pair of legs with the distal joint very narrow, sub-linear in form and densely ciliated on both edges, marginal setæ 6 in number, some of them rather slender and elongated; inner expansion of proximal joint extending considerably beyond the middle of the distal joint, and carrying 5 setæ, 3 of them very long and issuing from the tip. Ovisac of moderate size and oval in form.

Male with the anterior antennæ very strong, sub-clavate in form, 4th joint globularly dilated, terminal part claw-like, incurved. Last pair of legs much smaller than in female, distal joint rather small and provided with only 4 setæ; inner expansion of proximal joint tipped with 2 subequal setæ.

Colour light reddish yellow.

Length of adult female 0.55 mm.

Remarks.—This form was very imperfectly characterised by Boeck and erroneously referred by him to the genus *Mesochra*, apparently owing to a certain similarity in the structure of the inner rami of the natatory legs. Prof. Brady did not recognise the Boeckian species, and described it as the type of a new genus under the name of *Normanella dubia*, placing it next to the genus *Laophonte*.

Occurrence.—I have met with this form occasionally in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths among algæ. Boeck records it also from the Christiania Fjord.

Distribution.—British Isles (Brady).

184. Normanella tenuifurca, G. O. Sars, n. sp.

(Pl. CXCIV, fig. 1).

Specific Characters.—Female. Body comparatively more slender than in the type species and more evenly attenuated behind. Cephalic segment large, attaining about the length of the 4 succeeding segments combined, rostral plate, however, smaller than in *N. minuta*, and obtuse at the tip. Caudal rami much narrower and more produced than in that species, exceeding in length the anal segment, and more than 3 times as long as they are broad, outer edge finely ciliated in its proximal half, apical setæ normal. Antennæ and oral parts about as in *N. minuta*. 1st pair of legs likewise of a very similar structure, though having the terminal joint of the outer ramus comparatively shorter, scarcely longer than the middle joint. Natatory legs scarcely different from those in the type species. Last pair of legs, however, comparatively smaller, with the distal joint less produced and somewhat tapering towards the end.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present form is closely allied to *N. minuta*, but is of smaller size, and moreover differs conspicuously in the shape of the rostral plate and in the much narrower and more produced caudal rami.

Occurrence.—Some few specimens of this form were picked up from a sample taken at Bukken, south-west coast of Norway, from a depth of about 20 fathoms.

185. Normanella mucronata, G. O. Sars, n. sp.

(Pl. CXCIV, fig. 2).

Specific Characters.—Female. Body on the whole more strongly built than in the 2 preceding species, though of a very similar appearance. Rostral plate very prominent, terminating in a sharp mucroniform point. Last caudal segment much shorter than the preceding one, anal opercle prominent, semilunar, and coarsely denticulate. Caudal rami about twice as long as they are broad, and exhibiting dorsally a well-marked longitudinal keel, middle apical seta exceedingly strong, spiniform, not jointed at the base. Antennæ, oral parts and 1st pair of legs very similar to those appendages in the 2 preceding species. Natatory legs comparatively larger. Last pair of legs likewise more fully developed, with the inner expansion of proximal joint more produced, extending almost as far as the distal joint.

Colour not yet ascertained.

Length of adult female 0.56 mm.

Remarks.—This species, though closely allied to the 2 preceding ones, is at once distinguished by its more robust body, the acutely produced rostral plate, the structure of the caudal rami, and more particularly by the unusually strong development of the middle apical seta.

Occurrence.—A few female specimens of this form were found in samples taken off the south coast of Norway, some at Flekkerø, some at Farsund, from moderate depths.

Fam. 14. Cletodidæ.

Characters.—General habitus somewhat resembling that in the *Laophontidæ*, the segments being, as a rule, sharply marked off from each other, giving the body a more or less scalariform appearance. Cephalic segment generally produced in front to a lamellar projection, which however is not defined at the base by any suture. Genital segment in female distinctly subdivided in the middle. Anterior antennæ with the number of articulations reduced; those in male strongly hinged. Posterior antennæ with the outer ramus small or quite rudimentary. Oral parts on the whole resembling in structure those in the *Laophontidæ*. Posterior maxillipeds, however, less powerfully developed. 1st pair of legs scarcely larger than the succeeding ones, and not prehensile, outer ramus 3-articulate, inner generally biarticulate and shorter than the outer. The 3 succeeding pairs of legs with the number of natatory setæ generally much reduced, inner ramus always much shorter than the outer, and never composed of more than 2 joints. Last pair of legs, as a rule, less conspicuously foliaceous than in the *Laophontidæ*. Ovisac single, or in some cases double.

Remarks.—In this family I propose to include a number of genera, which show, as regards both the outward appearance of the species and their habits, an evident resemblance to the *Laophontidæ*, and yet differ materially in the structure of the 1st pair of legs. These are not prehensile, and are generally smaller than the succeeding pairs, from which they do not in most cases differ materially, thus deserving, like those pairs, the name of natatory legs. In this respect this family was more properly entitled to be referred to the sub-section of the *Chirognata* proposed in the Introduction to this works with the name *C. pleopoda*, as opposed

to the sub-section *C. dactylopoda*, which has already been treated of. I am now of opinion, however, that the structure of the 1st pair of legs, being subjected to great variation even in nearly-related forms, cannot properly be taken as a more general systematic character.

Gen. 58. Cletodes, Brady, 1872.

Generic Characters.—Body more or less slender, cylindrical or tapering behind, with the segments sharply marked off from each other and armed at the hind edge with scattered, somewhat scale-like denticles. Integuments rather coarse. Cephalic segment produced in front to a broadly triangular rostral plate. Caudal rami more or less produced, each carrying outside, in front of the middle, 2 closely juxtaposed bristles, apical setæ comparatively short. Eye distinct. Anterior antennæ (in female) 5-articulate, and clothed with strong, partly ciliated setæ, terminal part biarticulate, with the last joint much the larger. Posterior antennæ rather strongly built, but with the outer ramus rudimentary, being replaced by a single ciliated seta. Mandibles well developed, palp uniarticulate, resembling that in *Laophonte*. Maxillæ with the masticatory part divided into 3 very coarse teeth, exopodal and epipodal lobes generally distinct. Anterior maxillipeds very strongly built; the posterior ones, on the other hand, rather feeble. 1st pair of legs only slightly differing in structure from the succeeding ones, inner ramus shorter than the outer, and biarticulate, distal joint much the longer. Last pair of legs with the distal joint long and narrow, inner expansion of proximal joint, however, as a rule quite short, setæ of both joints generally long and plumose. Ovisac single.

Remarks.—This genus was established by Prof. Brady in the year 1872, to include a species, *C. limicola*, found by him off the British coast. In recent time several new species have been added, but some of these in my opinion ought to be discarded and referred to other nearly-allied genera. In the restriction here adopted, the genus is chiefly characterised by the rudimentary condition of the outer ramus of the posterior antennæ, by the strong development of the oral parts, and partly also by the structure of the legs. 5 distinct species referable to this genus will be described below.

186. Cletodes limicola, Brady.

(Pl. CXCV).

Cletodes limicola, Brady, Monogr. of British Copepoda, Vol. II, p. 90, Pl. LXXIX, figs. 1—12.

Specific Characters.—Female. Body not very slender, but gradually tapering behind, with the segments somewhat raised dorsally. Cephalic segment rather large and deep, with the lower edges abruptly curved in the middle; rostral plate broadly triangular, with the tip slightly bilobed. Urosome nearly as long as the anterior division, and having the anterior segments acutely produced at the lateral corners; last segment about the length of the preceding one, anal opercle distinctly denticulate. Caudal rami scarcely longer than the anal segment, and exhibiting a somewhat peculiar shape, being considerably thickened at the base, with a rounded dorsal elevation, extremity narrowly exserted, middle apical seta only slightly exceeding the length of the ramus itself, dorsal seta issuing from about the middle. Anterior antennæ of moderate size, with the 3rd joint about the length of the 2nd, terminal part half as long as the proximal. Posterior antennæ of the structure characteristic of the genus. Anterior maxillipeds exceedingly strong, and armed with 3 claw-like spines in addition to the bristles. Posterior maxillipeds feeble in structure, with the hand narrow oblong in form, and clothed inside with delicate cilia, dactylus thin and likewise ciliated inside. 1st pair of legs only differing from the succeeding ones in the presence of a slender spine inside the 2nd basal joint, and in the absence of a seta inside the middle joint of the outer ramus. Inner ramus of 2nd pair of legs with only 2 setæ on the tip, in the 2 succeeding pairs with an additional spine outside. Last pair of legs rather fully developed, distal joint narrow, sub-linear in shape, and densely ciliated on both edges, with 5 slender plumose setæ, 2 issuing from the tip, 2 from the outer edge, and 1 from the inner edge; inner expansion of proximal joint rather short, with 5 similar setæ. Ovisac comparatively small, rounded, with a very limited number of ova.

Colour whitish grey.

Length of adult female 0.62 mm.

Remarks.—This is the type of the present genus, having already been recorded by Prof. Brady under the above name in the year 1872. The comparatively stout form of the body and the peculiar shape of the caudal rami will serve for easily recognising this species.

Occurrence.—I have met with this form occasionally at Grimstad and Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy bottom. Only female specimens were found.

Distribution.—British Isles (Brady).

187. Cletodes tenuipes, Scott.

(Pl. CXCVI, fig. 1).

Cletodes tenuipes, Th. Scott, Marine Invertebrata of Loch Fyne. 15th Ann. Report of the Fishery Board for Scotland, Appendix, p. 170, Pl. I, figs. 19—27.

Specific Characters.—Female. Body considerably more slender than in the type species, and slightly tapering behind. Cephalic segment scarcely as long as the 3 succeeding segments combined, rostral projection narrowly truncated at the tip. Urosome shorter than the anterior division, and having the segments less produced at the lateral corners; last segment somewhat widening distally, and about the length of the preceding one. Caudal rami narrow and produced, considerably exceeding in length the anal segment, and slightly bent near the base, dorsal seta issuing far in front of the middle, apical seta longer than in the preceding species. Anterior antennæ with the 3rd joint much smaller than the 2nd. Posterior antennæ resembling in structure those in the type species. Posterior maxillipeds comparatively more strongly built, with the hand oblong oval in form. 1st pair of legs apparently wanting the spine at the inner corner of the 2nd basal joint, otherwise resembling those in *C. limicola*. The 3 succeeding pairs without any seta inside the middle joint of the outer ramus; inner ramus with the distal joint very narrow and produced, carrying only a single apical seta. Last pair of legs much smaller than in the type species, distal joint narrow oblong in form, with the outer apical seta somewhat removed from the tip and rather small; inner expansion of proximal joint nodiform, with only a single seta.

Colour not yet ascertained.

Length of adult female 0.61 mm.

Remarks.—This form, described by Th. Scott in the above-mentioned paper, is nearly allied to *C. limicola*, but is easily distinguishable by its more slender body and the narrower and more produced caudal rami. The very narrow form of the inner ramus in the 2nd to 4th pairs of legs is another character by which this species is distinguished, and which indeed has given rise to the specific name proposed by Th. Scott.

Occurrence.—Some few female specimens of this form were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms. A variety of this species is also recorded by Th. Scott from the Finmark coast.

Distribution.—Scottish coast (Scott), Franz Josef Land (Scott).

188. Cletodes curvirostris, Scott.

(Pl. CXCVI, fig. 2).

Cletodes curvirostris, Th. Scott, Additions to the Fauna of the Firth of Forth. 12th Ann. Rep. of the Fishery Board for Scotland, p. 250, Pl. VIII, figs. 18—26.

Specific Characters.—Female. Body slender, cylindrical in form, being only very slightly tapered behind. Cephalic segment fully as long as the 3 succeeding segments combined, rostral projection rather prominent and terminating in an acute recurved point. Urosome much shorter than the anterior division, and having the 3 anterior segments slightly produced at the lateral corners, penultimate segment very short. Caudal rami rather produced, being almost twice as long as the anal segment, dorsal seta issuing far in front of the middle, apical seta of moderate length. Anterior antennæ comparatively short, with the 3rd joint scarcely more than half as long as the 2nd. Posterior antennæ with the outer ramus, as in the other species, rudimentary, being replaced by a single ciliated seta. Mandibular palp comparatively small, with 2 lateral and 3 apical setæ. Posterior maxillipeds likewise smaller than usual, hand oval in form, seta of basal joint much elongated. Natatory legs shorter and stouter than in the other species, with no setæ inside the outer ramus; inner ramus with the distal joint less produced. Last pair of legs with the distal joint narrow oblong in form, carrying 5 setæ, the apical one very strong and elongated, the other 4 comparatively small; inner expansion of proximal joint conically produced, and extending almost to the middle of the distal joint, marginal setæ 3 in number, one at the tip and 2 on the inner edge, the distal one very thick, spiniform.

Male with the anterior antenna very strongly built, terminal part claw-like. Inner ramus of 3rd pair of legs conspicuously transformed, 3-articulate, middle joint produced at the end inside to a long, somewhat curved spiniform projection, terminal joint small, with a single slender seta at the tip. Last pair of legs smaller than in female, with the inner expansion of proximal joint less produced and provided with only 2 apical setæ.

Colour not yet ascertained.

Length of adult female 0.68 mm.

Remarks.—This is a somewhat anomalous species, exhibiting in some characters a certain approximation to the genus *Enhydrosoma* Boeck. The structure of the antennæ, however, is that characteristic of the present genus.

Occurrence.—Two specimens only of this form, a female and a male, have hitherto come under my notice. They were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand. Th. Scott records this form also from the Finmark coast.

Distribution.—Scottish coast (Scott).

189. Cletodes longicaudatus (Boeck).

(Pl. CXCVII).

Enhydrosoma longicaudata, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 54.

Syn: *Cletodes neglecta*, Scott.

Specific Characters.—Female. Body slender, cylindric in form, or very slightly tapering behind. Cephalic segment comparatively short and broad, scarcely attaining the length of the 3 succeeding segments combined, rostral projection triangular, narrowly blunted at the tip. Urosome (including the caudal rami) fully as long as the anterior division, the 3 anterior segments acutely produced at the lateral corners, last segment about the length of the preceding one. Caudal rami very narrow and produced, linear in form and slightly diverging, nearly attaining the length of the last 2 segments combined; dorsal seta issuing about in the middle, apical seta scarcely longer than the ramus itself. Anterior antennæ of moderate size, with the 3rd joint about the length of the 2nd, but narrower. Posterior antennæ of exactly the same structure as in the other species. Oral parts and legs likewise agreeing closely with those in the type species. Last pair of legs only differing from those in *C. limicola* in the distal joint being somewhat less produced.

Male, as usual, smaller than female, and having the anterior antennæ strongly hinged. Inner ramus of 3rd pair of legs not transformed. Last pair of legs much smaller than in female, distal joint with only 2 comparatively short apical setæ; inner expansion of proximal joint obsolete, without any setæ.

Colour whitish grey, with a slightly yellow tinge.

Length of adult female 0·78 mm.

Remarks.—This form has been erroneously referred by Boeck to his genus *Enhydrosoma*. It is in reality a genuine *Cletodes*, and closely allied to the type species, *Cletodes limicola* Brady, from which it is readily distinguished, however, by its more slender body and especially by the narrow and produced caudal rami. Prof. Brady has described under the name of *Cletodes longicaudata* a very different form, which perhaps does not belong to the present genus at all. The form recorded by Th. Scott as *Cletodes neglecta* is unquestionably identical with Boeck's species.

Occurrence.—I have found this form in considerable abundance at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand. It also occurs occasionally in the upper part of the Christiania Fjord.

Distribution.—Scottish coast (Scott).

190. Cletodes Buchholtzi, Boeck.

(Pl. CXCVIII).

Cletodes Buchholtzi, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 53.

Specific Characters.—Female. Body moderately slender and gradually tapering behind. Cephalic segment about the length of the 3 succeeding segments combined and having the lower edges evenly curved, rostral projection rather broad, lamellar, with a distinct longitudinal keel on each side terminating in a well-defined notch, tip broadly rounded and clothed with a dense fringe of delicate cilia. Urosome shorter than the anterior division, all the segments (also the last) acutely produced at the lateral corners. Caudal rami about the length of the last segment and extending straight behind, outer edge exhibiting near the base a well-marked notch carrying 2 somewhat unequal setæ, and having near the end another stronger seta, dorsal seta issuing close to the base, middle apical seta rather strong, being more than 3 times as long as the ramus itself; innermost seta longer than the outermost. Eye very large and conspicuous in the living animal. Anterior antennæ very short and stout, though composed of the normal number of joints, 3rd joint scarcely half as large as the 2nd, terminal part about the length of the latter joint. Posterior antennæ very strongly built, with the basal joint somewhat flexuous, distal joint of about the same length, and armed with 6 claw-like spines; outer ramus, as in the other species, replaced by a single ciliated seta. Oral parts of normal structure. Natatory legs comparatively more fully developed than in the other species, and better adapted for swimming, both rami coarsely spinulose and carrying at the tip long plumose setæ; 1st pair resembling in structure the 3 succeeding ones, though having the usual spine at the inner corner of the 2nd basal joint. Last pair of legs with the distal joint comparatively small, narrow oblong in form, and provided with only 3 marginal setæ, the apical one much elongated; inner expansion of proximal joint linguiform in shape, and extending far beyond the middle of the distal joint, being provided at the end with 3 strong, somewhat curved setæ increasing in length outwards. Ovisac rather large, rounded oval in form.

Body of a yellow colour, with dark translucent intestine.

Length of adult female 0.71 mm.

Remarks.—This is a very distinct and easily recognisable form, being especially distinguished by the peculiar shape of the rostral projection, the short and thick anterior antennæ, the form of the caudal rami, and the structure of the last pair of legs.

Occurrence.—This form was observed, many years ago, by both Boeck and

myself in a single place near Christiania. It occurred here rather plentifully in a depth of about 10 fathoms, on a muddy bottom covered with decaying algæ. On revisiting this place, I found the bottom quite altered and almost devoid of animal life; nor did I succeed in finding this form in any neighbouring place. A single female specimen taken recently at Risør, south coast of Norway, has however enabled me to subject the species to a renewed examination. Out of Norway this form has not been recorded.

Gen. 59. **Orthopsyllus**, Brady, 1873.

Syn: *Lilljeborgia*, Claus (not Sp. Bate).

Generic Characters.—Body elongated, sub-cylindric in form, and almost straight, with the segments sharply marked off from each other and coarsely denticulated behind. Rostral projection very prominent. Caudal rami comparatively short and thick. Anterior antennæ with the number of joints much reduced, terminal part (in female) consisting of only a single joint; those of male strongly hinged. Posterior antennæ with the outer ramus distinctly defined and resembling in structure that in *Laophonte*. Mandibles well developed, with the palp imperfectly biarticulate. Maxillæ and maxillipeds of normal structure. 1st pair of legs differing conspicuously from the succeeding pairs, both rami having the apical appendages remarkably dilated in their proximal part, inner ramus exceeding in length the outer, and biarticulate. The 3 succeeding pairs of legs comparatively short, with no natatory setæ on the outer ramus, inner ramus small, biarticulate, that of 3rd pair conspicuously transformed in the male. Last pair of legs with both joints produced in lamellar setiferous lappets. Ovisac single.

Remarks.—This genus was established as early as the year 1860 by Claus, to include a species found by him in the Mediterranean, at Nice. As however the generic name *Lilljeborgia* proposed by that author had been previously given by Sp. Bate to an Amphipod, Prof. Brady substituted for it in the year 1873 that of *Orthopsyllus*. He subsequently withdrew this name, believing that Claus's species was referable to the genus *Cletodes* established by him in the preceding year. I think however that the genus *Orthopsyllus* ought to be retained for Claus's species, because this form differs very materially in several characters both from the species of *Cletodes* and from those of the other genera included in the present family. We do not at present know more than a single species, to be described below.

191. Orthopsyllus linearis (Claus).

(Pl. CXCIX).

Lilljeborgia linearis, Claus, Die Copepoden-Fauna von Nizza, p. 22, Pl. II, figs. 1—8.

Syn: *Cletodes linearis*, Brady.

Specific Characters.—Female. Body slender, linear in form, being almost of equal width throughout, all segments, except the last two, bordered behind with a regular row of strong denticles. Cephalic segment comparatively large, about equalling in length the 4 succeeding segments combined, rostral projection considerably produced and somewhat lamellar, with a very distinct notch on each side of the blunted tip. Urosome about the length of the anterior division, none of the segments produced at the lateral corners, penultimate segment very small and imperfectly defined from the last, which is about twice as large; anal opercle distinctly denticulate. Caudal rami somewhat divergent and rapidly tapering distally, with 2 somewhat distant setæ on the outer edge, dorsal seta issuing at a short distance from the end, middle apical seta rather strong and not jointed at the base. Anterior antennæ very coarsely built, and composed of only 4 joints, the 2nd produced behind to a strong claw-like projection, 3rd joint longer than 2nd, terminal joint considerably smaller; none of the setæ on these antennæ ciliated. Posterior antennæ likewise strong, with the terminal joint fully as long as the basal one, outer ramus carrying 4 sub-equal ciliated setæ, 2 apical and 2 lateral. Mandibular palp with the terminal joint very small and imperfectly defined from the basal one. Posterior maxillipeds moderately strong. 1st pair of legs with the outer ramus about the length of the proximal joint of the inner, 1st joint fully as long as the other 2 combined, last joint with 4 apical appendages, the outer 2 spiniform, the inner 2 terminating in a thin seta carrying at the end delicate cilia; inner ramus with a well-defined seta inside the proximal joint, distal joint scarcely more than half as long as the latter, and carrying at the tip 2 unequal appendages, the outer one somewhat claw-like, the inner much longer and of a similar structure to that of the 2 inner apical appendages of the outer ramus. The 3 succeeding pairs of legs with the outer ramus rather stout, and having at the inner corner of the terminal joint a slight rudiment of a seta, inner ramus very short, with 3 partly spiniform setæ at the tip. Last pair of legs with the distal joint confluent at the base with the proximal one, and carrying 6 comparatively short ciliated setæ; inner expansion of proximal joint extending almost as far as the distal one, and provided with 5 marginal setæ.

Male with the anterior antennæ exceedingly strong, and composed of 6 well-defined joints, the 4th greatly inflated, terminal part distinctly biarticulate,

with both joints terminating in a claw-like projection. Inner ramus of 2nd pair of legs somewhat more produced than in female, and having the setæ more elongated; that of 3rd pair distinctly triarticulate, with the middle joint produced at the end outside to a long deflexed spiniform process. Last pair of legs much smaller than in female, with the distal joint more distinctly defined; inner expansion of proximal joint very slight, with only 2 setæ.

Colour not yet ascertained.

Length of adult female 0.89 mm.

Remarks.—This form, as stated above, was first described by Claus under the name of *Lilljeborgia linearis*, and was subsequently redescribed by Prof. Brady. It is an easily recognisable species, which cannot be confounded with any other form belonging to the present family.

Occurrence.—Only 2 specimens of this form, a female and a male, have hitherto come under my notice. They were both found in a sample kindly sent to me by Mr. Nordgaard, who took it in the Skjærstad Fjord, just within the polar circle.

Distribution.—Mediterranean, at Nice (Claus), British Isles (Brady), Gulf of Guinea (Scott).

Gen. 60. **Mesocletodes**, G. O. Sars, n.

Generic Characters.—Body sub-cylindric in form, with the segments densely spinulose at the hind edge. Integuments rather thin and flexible. Cephalic segment comparatively short, with the rostral projection almost obsolete. Urosome scarcely attenuated behind, and having the last segment rather large. Caudal rami slender and narrow. Anterior antennæ with the number of joints less reduced than in the 2 preceding genera. Posterior antennæ less strongly built, with the basal joint distinctly divided in the middle, outer ramus small but well defined. Mandibular palp distinctly biarticulate. Maxillæ without any distinct exopodal and epipodal lobes. Maxillipeds comparatively small. Natatory legs with the inner ramus of essentially the same structure in all pairs and rather small, biarticulate, outer ramus in 1st pair of moderate size, in the 3 succeeding pairs very slender, with the setæ of the inner edge rudimentary. Last pair of legs with the distal joint well defined and very narrow; inner expansion of proximal joint short and broad. Ovisac single.

Remarks.—This new genus is based upon the form recorded by Th. Scott under the name of *Cletodes irrasa*. A closer examination of this form has proved it to differ in some points very materially from the other Cletodidæ, and it should thus more properly be regarded as the type of a particular genus. The general outward appearance somewhat resembles that in the species of the succeeding genus, *Eurycletodes;* but the structure of the appendages is rather different. Only a single species of this genus is as yet known.

192. Mesocletodes irrasus (Scott).

(Pl. CC).

Cletodes irrasa,[1]) Th. Scott, On some new and rare Crustacea from Scotland. Ann. Mag. Nat. Hist., ser. 6, Vol. XIII, p. 141, Pl. VIII, figs. 13—17.

Specific Characters.—Female. Body moderately slender and rather flexible, with the segments well marked off from each other and edged behind with dense rows of delicate spinules, giving it a somewhat hirsute appearance. Cephalic segment sub-triangular in form, and scarcely longer than the 3 succeeding segments combined, rostral projection very small, almost obsolete. Urosome (including the caudal rami) fully as long as the anterior division, last segment large and thick, with 2 interrupted transversal rows of spinules on each side, anal opercle broad, semilunar and perfectly smooth. Caudal rami rather distant and narrow linear in form, being about as long as the anal segment, and extending straight behind, each with a whorl of 4 diverging setæ in the middle, apical setæ rather slender. Anterior antennæ nearly as long as the cephalic segment, and composed of 7 well defined joints, clothed with strong, but not ciliated setæ, 3 of them belonging to the terminal part. Posterior antennæ with the terminal joint scarcely dilated distally, apical spines comparatively short, outer ramus consisting of a narrow linear joint carrying at the end 2 unequal setæ. 1st pair of legs smaller than the succeeding ones, and having the usual spine inside the 2nd basal joint, outer ramus about twice as long as the inner; that of the 3 succeeding pairs almost twice as long as that of the 1st pair. Last pair of legs with the distal joint comparatively small and very narrow, though widening slightly at the end, marginal setæ rather unequal and 5 in number, one of them issuing from the proximal part of the outer edge, the others from the end; inner expansion of proximal joint confluent with that of the other side, both forming together a broad plate slightly incised in the middle, and carrying on each side of the incision 2 long ciliated setæ, outside which is another much shorter seta. Ovisac comparatively small.

[1]) *Cletodes* is apparently not a feminine, but a masculine name, like *Laophontodes*.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.60 mm.

Remarks.—This form, as stated above, was described by Th. Scott as a species of the genus *Cletodes*, the specific name alluding to the somewhat hirsute appearance of the body, caused by the dense rows of spinules fringing the segments behind.

Occurrence.—Only 2 female specimens of this form have as yet come under my notice. They were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand.

Distribution.—Scottish coast (Scott).

Gen. 61. **Eurycletodes,** G. O. Sars, n.

Generic Characters.—Body short and stout, scarcely attenuated behind, with the segments well marked off from each other. Integuments remarkably soft and flexible. Cephalic segment comparatively short and more or less produced in front. Urosome scarcely narrower than the anterior division, and having the last segment remarkably large and thick, with the anal opercle broad and semilunar in form. Caudal rami rather distant and, as a rule, not much produced, dorsal seta arising from a thick bulbous base. Eye wholly absent. Anterior antennæ moderately slender, and composed of 6 joints clothed with strong non-ciliated setæ, 3 of the joints belonging to the terminal part; those in male less strongly hinged than in the preceding genera. Posterior antennæ comparatively small and of feeble structure, outer ramus absent or only replaced by a small bristle. Oral parts poorly developed. Mandibles with the masticatory part narrowly exserted and only divided into a few small teeth, palp extremely small, bisetose. Maxillæ and anterior maxillipeds more or less imperfectly developed. Posterior maxillipeds of more normal appearance. 1st pair of legs smaller than the succeeding ones, and of a structure similar to that in the genus *Cletodes*. The 3 succeeding pairs, however, more fully developed, with the setæ of the outer ramus long and densely ciliated; inner ramus much shorter than the outer, and biarticulate, or in some cases rudimentary in the 2 posterior pairs. None of these legs transformed in male. Last pair of legs more or less foliaceous. Two closely juxtaposed ovisacs present in female.

Remarks.—In this new genus I propose to include some species formerly referred to the genus *Cletodes*, but differing very materially from the type of that genus, both as regards the outward appearance and several of the structural details, thus forming together a very natural generic group. Among the distinguishing characters may be noted: the total absence of eye, as proved by the examination of living specimens, the feeble structure of the posterior antennæ and oral parts, and finally the presence in the female of 2 ovisacs. 4 Norwegian species will be described below.

193. Eurycletodes laticaudatus (Boeck).

(Pl. CCI).

Cletodes laticauda, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 52.

Specific Characters.—Female. Body short and compact, with the segments scarcely denticulate at the hind edge. Cephalic segment about the length of the 3 succeeding segments combined, and produced in front to a rather prominent conical rostrum acutely pointed at the tip. Urosome remarkably broad, even broader than the anterior division, with none of the segments produced at the lateral corners, last segment exceeding in length the 2 preceding ones combined; anal opercle, as also the ridges leading to it from behind, armed with very coarse obtuse denticles. Caudal rami rather narrow, tapering somewhat distally, and more than twice as long as they are broad at the base, dorsal seta issuing at a short distance from the end, middle apical seta scarcely more than twice as long as the ramus itself. Anterior antennæ about the length of the cephalic segment, and having the 2nd joint fully as long as the 3rd, terminal part about the length of those joints combined. Posterior antennæ with no trace of an outer ramus, terminal joint considerably shorter than the basal one, and scarcely widening distally. Posterior maxillipeds with the dactylus very slender and elongated. 1st pair of legs with the terminal joint of the outer ramus larger than the middle one, and armed with 3 spines and 2 curved setæ; inner ramus almost as long as the outer and biarticulate, distal joint with a small seta inside and carrying at the tip a short spine and 2 unequal setæ. The 3 succeeding pairs with the inner ramus distinctly biarticulate and of a structure similar to that of the 1st pair. Last pair of legs with the distal joint obovate in form, tapering gradually towards the end, and provided with 5 rather slender sub-equal setæ; inner expansion of proximal joint very short, with 3 slender setæ. Ovisacs well defined,

though so closely juxtaposed as scarcely to extend beyond the lateral edges of the urosome.

Colour whitish grey.

Length of adult female 0.75 mm.

Remarks.—This species, being the first recorded, may be regarded as the type of the present genus. It is easily recognised from the other species by the conically produced rostrum, and the unusually broad urosome, thus fully deserving the specific name given to it by Boeck.

Occurrence.—I have only met with this form in the upper part of the Christiania Fjord, at Nordstrand, east of the town. It occurred here occasionally in a depth of 30—40 fathoms, muddy bottom. Out of Norway this form has not yet been recorded.

194. Eurycletodes latus (Scott).

(Pl. CCII).

Cletodes lata, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Report of the Fishery Board for Scotland, p. 257, Pl. X, figs. 10—18.

Specific Characters.— Female. Body of a short, stout form similar to that in the preceding species, though somewhat constricted in the middle, posterior edge of the segments fringed with delicate spinules. Cephalic segment gradually contracted in front, and somewhat exceeding in length the 3 succeeding segments combined, rostral projection broadly triangular in form, with the tip slightly exserted. Urosome about the length of the anterior division and rather thick, all the segments, except the last, produced laterally to short, but well defined, somewhat recurved acute projections; last segment very large, with the anal opercle broad and prominent, coarsely denticulated at the edge. Caudal rami comparatively short, not nearly twice as long as they are broad, and only slightly tapering distally, dorsal seta issuing in front of the middle, apical setæ rather slender, the middle one nearly attaining the length of the urosome. Anterior antennæ with the 2nd joint much shorter than the 3rd. Posterior antennæ very small, with the terminal joint nearly as long as the basal one, outer ramus replaced by a minute simple bristle. Posterior maxillipeds with the dactylus comparatively shorter than in the type species, about equalling the hand in length. 1st pair of legs with the terminal joint of the outer ramus scarcely larger than the middle one, and armed with only 2 spines and 2 slender setæ; inner ramus comparatively small, though distinctly biarticulate, distal joint without any seta inside, middle apical seta very small, hair-like. Inner ramus of 2nd pair of legs, as in 1st pair, biarticulate;

that of the 2 posterior pairs, however, much reduced in size, and consisting of only a single joint tipped with 2 subequal setæ. Last pair of legs more pronouncedly foliaceous than in the type species, distal joint regularly oblong oval in form, and provided with 5 rather small setæ, the 2 apical ones very unequal in length; inner expansion of proximal joint conically produced, and extending about to the middle of the distal joint, tip narrowly truncated and carrying 2 slender subequal setæ. Ovisacs well defined, but as in the preceding species, closely juxtaposed.

Colour dark grey.

Length of adult female 0.60 mm.

Remarks.—This form, first described by Th. Scott as a species of the genus *Cletodes*, is easily distinguished from the preceding species by the broader rostral projection, the acutely produced lateral parts of the caudal segments, and the shorter and broader caudal rami. In the structure of the appendages also, some well-marked differences are found, as indicated in the above diagnosis.

Occurrence.—I have found this form occasionally at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand; and Th. Scott also records it from the Finmark coast.

Distribution.—Scottish coast (Scott).

195. Eurycletodes similis (Scott).

(Pl. CCIII).

Cletodes similis, Th. Scott, Additions to the Fauna of the Firth of Forth. 13th Ann. Rep. of the Fishery Board for Scotland, p. 168, Pl. III, figs. 22—26, Pl. IV, figs. 1—3.

Specific Characters.—Female. Body somewhat more slender than in the 2 preceding species, with the posterior division less broad. Cephalic segment about the length of the 3 succeeding segments combined, rostral projection short and broad, blunted at the tip. Urosome with the anterior segments densely spinulose at the hind edge, their lateral parts however not acutely produced; last segment, as usual very large, with the anal opercle minutely denticulate. Caudal rami narrower and more produced than in *E. latus*, tapering considerably distally, dorsal seta issuing close to the base, middle apical seta slender and almost as long as the urosome. Anterior antennæ resembling in structure those in *E. latus*. Posterior antennæ likewise rather similar, though comparatively larger. Posterior maxillipeds rather stout, with the hand oval in form and densely ciliated inside. 1st pair of legs comparatively larger than in *E. latus*, and having the terminal joint of the outer ramus armed with 3 curved spines and 2 setæ; inner ramus extending to the end of the middle joint of the outer, and having the middle

apical seta very slender and elongated. Inner rami of the 3 succeeding pairs well developed and, like that of the 1st pair, distinctly biarticulate. Last pair of legs with the distal joint narrowly produced and carrying 4 strong marginal setæ, 3 on the outer edge and one at the tip; inner expansion of proximal joint very short, with 2 slender ciliated setæ.

Male with the anterior antennæ distinctly hinged, though having the last joint of the proximal part only slightly dilated. Natatory legs of exactly the same structure as in the female. Last pair of legs, however, smaller, with only 3 setæ on the distal joint, and a single one inside the proximal joint.

Colour dark yellowish grey.

Length of adult female 0.65 mm.

Remarks.—This form, first described by Th. Scott, looks very like *E. latus*, but on a closer examination may be readily distinguished by the non-produced lateral parts of the caudal segments, and by the longer and narrower caudal rami. It also differs, as shown by the above diagnosis, in some of the structural details.

Occurrence.—I have found this form not unfrequently in several localities of the south coast of Norway, for instance at Risør, Lillesand and Farsund, in moderate depths, and Th. Scott also records it from the Lofoten Islands.

Distribution.—Scottish coast (Scott), Spitsbergen and Franz Josef Land (Scott).

196. Eurycletodes major, G. O. Sars, n. sp.

(Pl. CCIV).

Specific Characters.—Female. Body more slender than in any of the 3 preceding species, sublinear in form, being of about equal width throughout; all the segments sharply marked off from each other, and without any visible armature. Cephalic segment rather short, scarcely longer than the 2 succeeding segments combined, and produced in front to a moderately prominent triangular rostral projection. Urosome somewhat shorter than the anterior division, and having none of the segments produced laterally; last segment very large, exceeding in length the 2 preceding segments combined, anal opercle very minutely denticulate. Caudal rami comparatively small and far apart, gradually tapered distally, dorsal seta issuing near their base; middle apical seta scarcely exceeding in length the last segment. Anterior antennæ of a structure similar to that in the 2 preceding species. Posterior antennæ resembling those in the type species, and without any trace of an outer ramus. Posterior maxillipeds of moderate size,

with the hand oblong in form, dactylus slender and finely ciliated inside. 1st pair of legs with the terminal joint of outer ramus about as large as the middle one, and armed with 2 spines and 2 somewhat unequal setæ; inner ramus scarcely longer than the 1st joint of the outer, and consisting of only a single joint carrying 3 comparatively short apical setæ and a minute lateral bristle. Inner ramus of 2nd pair of a structure similar to that of 1st pair; that of the 2 succeeding pairs extremely small and rudimentary, knob-like, with a very long ciliated seta accompanied by a small bristle. Last pair of legs with the distal joint long and narrow, linear in form, and carrying 4 moderately long setæ, 2 apical and 2 lateral; inner expansion of proximal joint somewhat produced, though not extending to the middle of the distal joint, and provided at the narrowly truncated end with 2 subequal ciliated setæ.

Colour dark grey.

Length of adult female 0.95 mm.

Remarks.—This form is of considerably larger size than any of the other species, and is moreover easily recognised by its more slender, almost linear body and the short caudal rami. It also differs rather conspicuously in some of the structural details, especially as regards the imperfect development of the inner rami of the natatory legs.

Occurrence.—I have only met with this form in a single locality, viz., at Hvalør, outside the Christiania Fjord. It occurred here not unfrequently in a depth of about 6 fathoms, on a muddy bottom covered with decaying algæ.

Gen. 62. **Enhydrosoma,** Boeck, 1872 (not Brady).

Generic Characters.—Body somewhat resembling in shape that in the species of *Cletodes,* being more or less slender and attenuated behind, with the segments sharply marked off from each other, and connected in such a manner that the body is capable of rolling up into an almost perfect ball by a strong ventral flexure. Integuments very coarse. Cephalic segment comparatively large, with a short somewhat deflexed rostral projection. Caudal rami of different shape in the different species. Eye distinct, though of small size. Anterior antennæ (in female) composed of only 5 joints clothed with partly ciliated setæ, 2 of the joints belonging to the terminal part; those of male very strongly hinged. Posterior antennæ well developed, with a small, but distinctly defined outer ramus

carrying one apical and one lateral seta. Mandibles with the masticatory part divided into a number of delicate flattened teeth, palp uniarticulate, but exhibiting one or 2 small lateral lobes. Maxillæ and maxillipeds of normal structure. Natatory legs comparatively short, with both rami densely spinulose at the edges, and more or less incurved, carrying at the tip long and slender setæ, outer ramus with the spines of the outer edge very long, but without any setæ inside, inner ramus biarticulate; 1st pair only slightly differing from the 3 succeeding ones. Last pair of legs with the distal joint rather coarse and, like the inner expansion of proximal joint, armed with strong spiniform setæ; those of male not much reduced in size. Ovisac single.

Remarks.—This genus was rather insufficiently characterised by Boeck, and for this reason was not recognised by succeeding authors. Boeck himself referred to this genus 2 species which are evidently not congeneric, the one, *E. longicaudata*, having indeed turned out to be a true *Cletodes*, described above as *Cletodes longicaudatus*. The other species, *E. curticauda*, which of course must be regarded as the type of the present genus, has recently been redescribed by Th. Scott under another name as a species of the same genus. On the other hand, Prof. Brady describes, under the name of *Cletodes propinqva*, a species which is evidently congeneric with the type of Boeck's genus *Enhydrosoma*. Finally, the form referred by the same author to the latter genus, *E. curvatum*, is very different from both these genera, constituting the type of a particular genus. It appears from this, that great confusion prevails among authors as regards the present genus, the exact characters of which I have tried to draw up in the above diagnosis. 3 well-defined species referable to this genus will be described below.

197. Enhydrosoma curticaudatum, Boeck.

(Pl. CCV).

Enhydrosoma curticauda,[1]) Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 54.

Syn: *Cletodes hirsutipes*, Scott.

Specific Characters.—Female. Body somewhat robust, rapidly tapering from front to back, with the segments somewhat raised dorsally, and, viewed dorsally, quadrangular in form. Cephalic segment large and tumid, equalling in length the 3 succeeding segments combined, rostral projection terminating in 2 recurved points. Urosome much shorter than the anterior division, last segment

[1]) *Enhydrosoma* being a neuter, the specific name must be spelt as above.

about the length of the preceding one, and widening somewhat distally, with the lateral corners conically produced, anal opercle smooth. Caudal rami of a somewhat unusual shape, being sub-lamellar and, as it were, distorted, with the inner edge boldly curved, and the tip pointing obliquely outwards, lateral setæ closely juxtaposed and rather small, dorsal seta issuing from behind the middle, apical setæ short. Anterior antennæ not very strong, and scarcely more than half as long as the cephalic segment, 3rd joint about the length of the 2nd, terminal part half as long as the proximal one. Posterior antennæ with the terminal joint shorter than the basal one, and widening considerably distally, outer ramus small, but well defined. Mandibular palp with 2 small lateral lobules, each tipped with a short ciliated seta, the tip itself carrying 2 somewhat larger setæ. Posterior maxillipeds not very strong, hand oblong oval in form and finely ciliated inside, dactylus very thin, with a slender bristle issuing from the base outside. Natatory legs with the rami somewhat robust, the inner one in the 3 anterior pairs being about $^2/_3$ as long as the outer, in the 4th pair considerably shorter. Last pair of legs with the distal joint rather large, oblong in form, and clothed on the outer edge with a very dense fringe of stiff hairs, marginal setæ 4 in number and rather strong, spiniform, 3 of them issuing from the transversely truncated end, the 4th at some distance from the tip outside; inner expansion of proximal joint conically produced, and extending to the middle of the distal joint, carrying 3 spiniform setæ, one at the tip, the other 2 at the inner edge, near the base.

Male of about same size as female, and having the caudal rami of a somewhat different shape, being narrower and less distorted. Anterior antennæ very strongly built, 7-articulate, with the 4th joint greatly dilated at the base, terminal part slender, 3-articulate. Inner ramus of 3rd pair of legs with the apical spine much coarser than in female, and not defined at the base. Last pair of legs scarcely smaller than in female, but differing somewhat in the shape of the inner expansion of the proximal joint, and in the absence of one of the spines on the distal joint.

Colour dark yellowish brown.

Length of adult female 0.62 mm.

Remarks.—This form, as stated above, ought to be considered as the type of the present genus. It is easily distinguished from the other 2 species here recorded by its more robust body and by the peculiar shape of the rostral projection and of the caudal rami. The densely hairy clothing of the distal joint of the last pair of legs is another character by which the present species is distinguished, and which has given rise to the specific name *hirsutipes* given to this form by Th. Scott. In the living state it is also at once recognised by its yel-

lowish brown colour. The swimming movements of the animal are rather clumsy, and are effected in an abrupt jerking manner. When disturbed, it immediately sinks to the bottom, and rolls its body up almost into a ball by a strong ventral flexure, remaining in this attitude for some time. Exactly the same behaviour may also be observed in the succeeding species.

Occurrence.—I have met with this form not unfrequently in the upper part of the Christiania Fjord in a depth of about 6 fathoms, muddy bottom. It also occurs occasionally at Skutesnæs, south-west coast of Norway, and is moreover recorded by Th. Scott from the Finmark coast.

Distribution.—Scottish coast (Scott).

198. Enhydrosoma propinqvum (Brady).

(Pl. CCVI).

Cletodes propinqva, Brady, Monogr. Brit. Copepoda, Vol. III, p. 94, Pl. LXXVII, figs. 9—17.

Specific Characters.—Female. Body considerably more slender than in the type species and tapering more gradually behind. Cephalic segment less tumid, with the rostral projection broader and terminating in a blunt, somewhat recurved point. Urosome much shorter than the anterior division, last segment larger than the preceding one and scarcely widening distally. Caudal rami comparatively small, blade-like, with the lateral setæ rather distant, dorsal seta issuing close to the base, middle apical seta scarcely longer than the ramus itself. Anterior antennæ short and stout, with the 2nd joint much larger than the 3rd, terminal part scarcely half as long as the proximal one. Posterior antennæ with the terminal joint fully as long as the basal one, and less dilated distally than in the type species; outer ramus somewhat larger than in that species, but of a very similar structure. Mandibular palp comparatively smaller, with only a single lateral lobule. Natatory legs resembling in structure those in *E. curticaudatum*, though having the rami somewhat less robust. Last pair of legs likewise built upon the same type, distal joint however wanting the dense clothing of hairs on the outer edge, which is only finely ciliated in its proximal half, marginal setæ 4 in number, one very strong at the tip, and 3 much shorter ones on the outer edge; inner expansion of proximal joint not extending to the middle of the distal joint, and carrying on the tip a strong lancet-shaped spine, inside 2 more slender setæ.

Male with the caudal rami somewhat narrower than in female. Anterior antennæ hinged in the same manner as in the preceding species. None of the

natatory legs transformed. Last pair of legs differing somewhat from those in female, distal joint comparatively shorter, and only provided with one apical and one small lateral seta; inner expansion of proximal joint scarcely at all produced, and carrying 2 unequal setæ.

Colour whitish grey.

Length of adult female 0.64 mm.

Remarks.—This form, in spite of its external resemblance to certain species of the genus *Cletodes,* ought evidently to be referred to the present genus, agreeing, as it does, in all essential anatomical details with the type of that genus, *E. curticaudatum,* from which it chiefly differs in the more slender form of the body and in the shape of the caudal rami and the last pair of legs.

Occurrence.—I have found this form rather abundantly at Skutesnæs, south-west coast of Norway in a few fathoms' depth, muddy bottom. It also occurs occasionally off the south coast, as also in the upper part of the Christiania Fjord.

Distribution.—British Isles (Brady).

199. Enhydrosoma longifurcatum, G. O. Sars, n. sp.

(Pl. CCVII).

Specific Characters.—Female. Body somewhat less slender than in *E. propinquum.* Cephalic segment rather large, about equalling in length the 3 succeeding segments combined, rostral projection broadly triangular and slightly recurved at the tip. Urosome (including the caudal rami) almost as long as the anterior division, last segment a little larger than the preceding one, and broadly emarginated behind, lateral edges convex and exhibiting at a short distance from the end a knob-like projection tipped with a delicate bristle. Caudal rami remarkably produced, being about twice as long as the anal segment, very narrow linear in form and somewhat divergent, lateral setæ far apart, the one attached to a distinct ledge close to the base, the other nearer the end, dorsal seta issuing in front of the middle, apical seta rather slender, considerably exceeding in length the ramus itself. Anterior antennæ short and stout resembling those in *E. propinquum.* Posterior antennæ and oral parts likewise of a very similar structure. Natatory legs comparatively less fully developed, though on the whole exhibiting the structure characteristic of the genus. Last pair of legs with the distal joint comparatively short, conical in form, with the marginal setæ less strong than in the 2 preceding species; inner expansion of proximal joint rather small, but armed

with 3 strong spiniform setæ. Ovisac oblong in form and rather large, extending beyond the caudal rami, number of ova, however, rather limited.

Male with the anterior antennæ transformed in exactly the same manner as in the 2 preceding species. Last pair of legs somewhat imperfectly developed, the distal joint not being defined at the base, and being only provided with 2 unequal setæ; inner expansion of proximal joint very small, knob-like, with a spine and a slender seta.

Colour not yet ascertained.

Length of adult female 0.52 mm.

Remarks.—This form is undoubtedly congeneric with the 2 preceding species, from which it is at once distinguished, however, by the very long and narrow caudal rami. It is also rather inferior in size.

Occurrence.—Only 2 specimens of this form, a female and a male, have hitherto come under my notice. They were both found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand.

Gen. 63. **Rhizothrix,** Brady & Robertson, 1875.

Syn: *Enhydrosoma*, Brady (not Boeck).

Generic Characters.—Body sub-cylindrical, smooth, with the segments less sharply marked off from each other than in the preceding genera. Cephalic segment comparatively large, with the rostral projection obsolete. Caudal rami short and broad. Anterior antennæ with the number of joints much reduced and clothed with partly ciliated setæ. Posterior antennæ with the outer ramus small, though well defined. Mandibles strongly developed, with the masticatory part very coarse and the palp distinctly biarticulate. Maxillæ and maxillipeds of normal structure. Natatory legs very small, but with long apical setæ, inner ramus in all of them biarticulate; 1st pair differing conspicuously from the others, apical setæ of both rami terminating in a tuft of delicate hairs. Last pair of legs with the inner parts of the proximal joints coalesced. Ovisac single.

Remarks.—This genus was established in the year 1875 by Messrs. Brady and Robertson, to include a species, *R. curvata,* found by them off the British coast. In his Monograph, Prof. Brady withdrew this genus, believing it to be identical with *Enhydrosoma* Boeck. On a closer examination, I have however felt justified in restoring this genus, as the species upon which it was originally founded,

in reality differs very materially both from *Enhydrosoma* and from the other genera included in the present family.

200. Rhizothrix curvata, Brady & Robertson.

(Pl. CCVIII).

Rhizothrix curvata, Brady & Robertson in Brit. Assoc. Report 1875, p. 197.

Syn: *Enhydrosoma curvatum*, Brady.

Specific Characters.—Female. Body comparatively robust, more or less curved, maggot-shaped, slightly attenuated behind, with the segments rounded off laterally and crowded closely together. Cephalic segment large and tumid, exceeding in length the 3 succeeding segments combined, rostrum replaced by 2 small juxtaposed nodiform prominences. Last pedigerous segment fully as large as the preceding one. Urosome a little narrower than the anterior division, and much shorter, last segment very small, with the anal opercle almost obsolete. Caudal rami arising close together from a broad base, being rounded oval in outline and somewhat divergent, lateral and dorsal setæ issuing near the end, middle apical seta about half the length of the urosome. Anterior antennæ short and stout, scarcely more than half as long as the cephalic segment, and consisting of only 4 joints gradually diminishing in size, 2 or 3 of the setæ attached to the 2nd joint remarkably strong and edged with long cilia. Posterior antennæ moderately strong, terminal joint not attaining the length of the basal one, and having the apical appendages unusually short, outer ramus armed at the tip with a stout curved seta, coarsely spinulose on the one edge, and with a thin lateral bristle. 1st pair of legs very small, with both rami narrow and not very unequal in length, each carrying on the tip 2 slender setæ terminating in a tuft of fine spreading cilia, outer ramus a little longer than the inner, with the 1st joint equalling in length the other 2 combined, and armed at the end outside with a long deflexed spine coarsely ciliated on the outer edge; middle and terminal joints without any spines. The 3 succeeding pairs of equal structure, outer ramus without any setæ inside, spines of outer edge gradually increasing in length and coarsely spinulose outside; inner ramus very short, with 3 unequal setæ at the tip. Last pair of legs with the distal joint comparatively small and obovate in form, marginal setæ 5 in number, some of them very small; inner expansion of proximal joint forming together with that of the other side a broad plate, slightly incised in the middle, and carrying on each side of the incision a dense row of 5 ciliated setæ, the 3 innermost ones somewhat longer than the 2 outermost. Ovisac comparatively small, rounded oval in form.

Colour not yet ascertained.

Length of adult female 0.57 mm.

Remarks.—This is the only as yet known species of the genus, and is easily recognised from any of the other *Cletodidæ*, both as regards its outward appearance and the structure of the several appendages.

Occurrence. – I have found this form in 3 different localities of the south coast of Norway, viz., at Grimstad, Lillesand and Farsund. In all 3 places it occurred very sparingly in a depth of 10—20 fathoms, muddy bottom. Only female specimens were found.

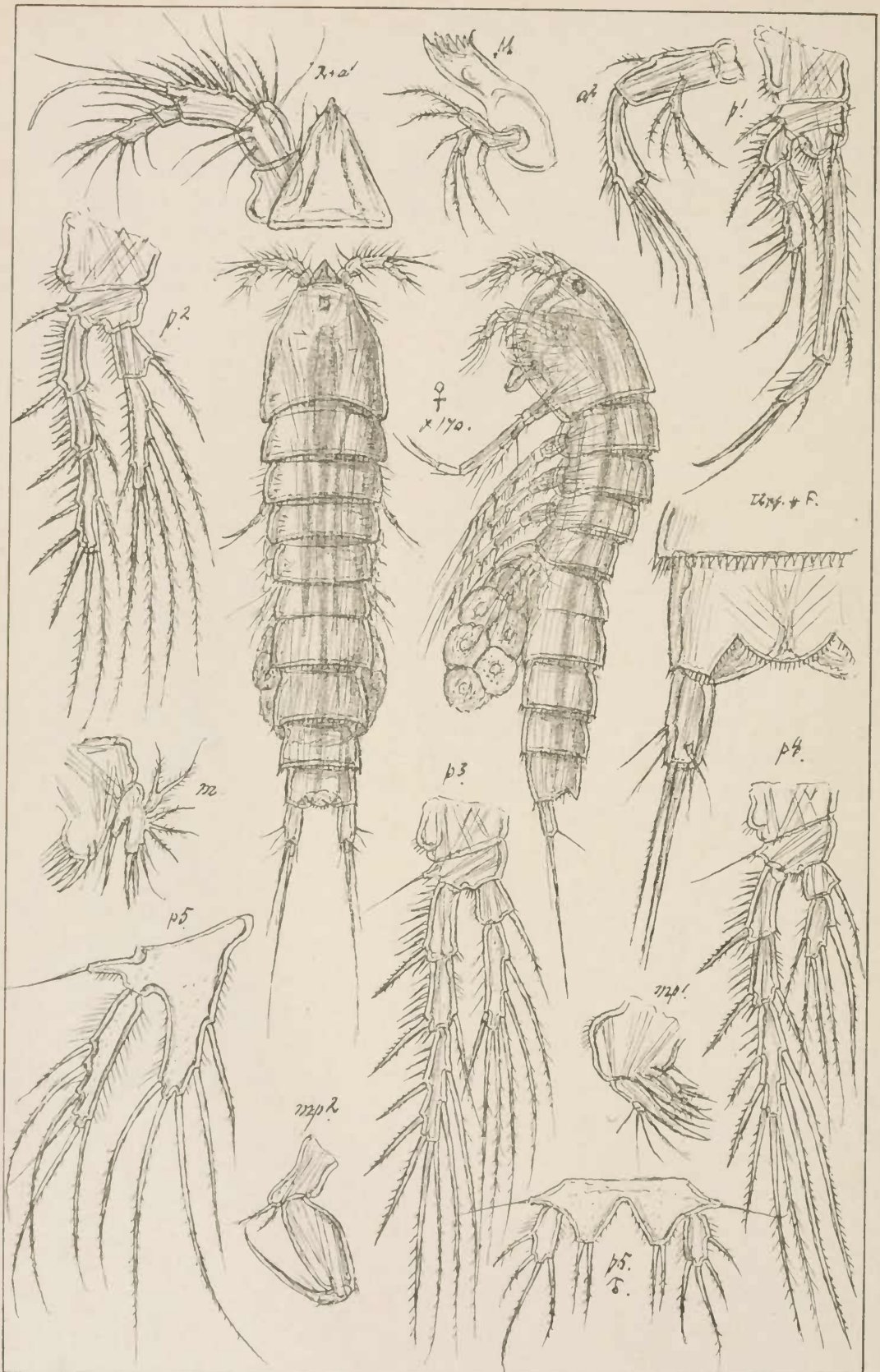
Distribution.—British Isles (Brady), Franz Josef Land (Scott).

Gen. 64. **Huntemannia,** Poppe, 1885.

Generic Characters.—Body stout, attenuated behind, with the segments crowded closely together and rounded laterally. Cephalic segment large and produced in front to a strongly prominent rostrum. Urosome comparatively short, with the caudal rami each terminating in a strong flattened spine. Anterior antennæ short and stout, with the number of joints reduced, and clothed with short, spiniform setæ; those in male strongly hinged. Posterior antennæ coarsely built, with the spines of the terminal joint short and stout, outer ramus small, lamelliform. Mandibles strong, with the palp well developed, though uniarticulate. Maxillæ and maxillipeds on the whole of normal structure. Legs, however, of a rather anomalous appearance; 1st pair differing conspicuously from the succeeding ones and very coarsely built, outer ramus 3-articulate, inner uniarticulate. The 3 succeeding pairs with the outer ramus consisting of only 2 joints, inner ramus rudimentary, knob-like. Last pair of legs well separated in the middle, and rather small. 2 well-defined divergent ovisacs present in female.

Remarks.—This genus, established in the year 1885 by Poppe, is a very distinct one, exhibiting some rather perplexing features that deviate from the usual Harpacticoid type. Yet in the more general anatomical characters it presents an evident affinity to some genera comprised within the present family, especially to the genus *Nannopus* of Brady. It is as yet only represented by a single species, to be described below.

Copepoda

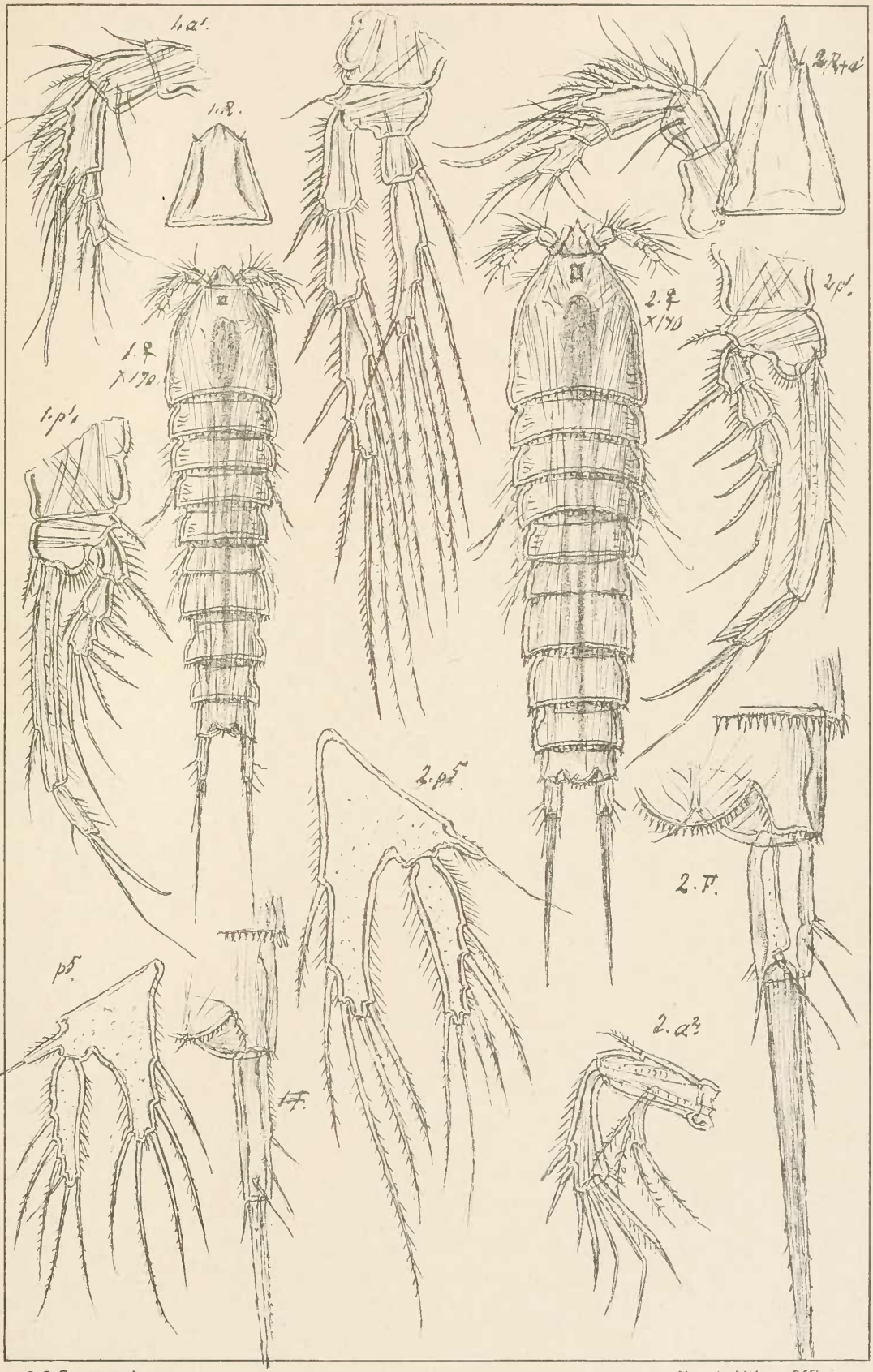


G.O.Sars, autogr. Norsk Lithgr. Officin

Normanella minuta (Boeck).

Copepoda

Laophontidæ. Harpacticoida Pl.CXCIV.

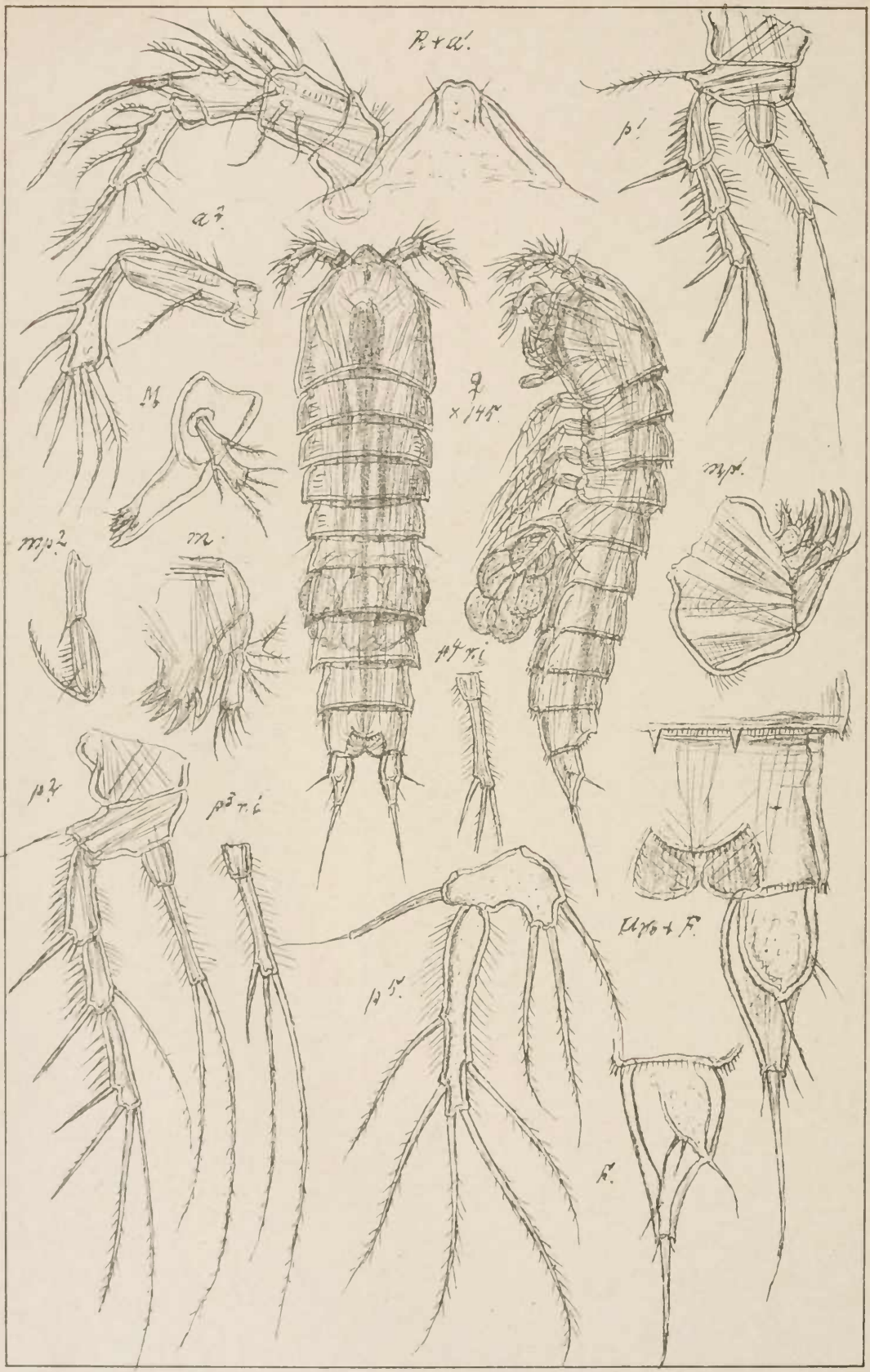


G.O.Sars, autogr. Norsk Lithgr. Officin

1. Normanella tenuifurca, G.O.Sars.
2. " mucronata, G.O.Sars.

Copepoda

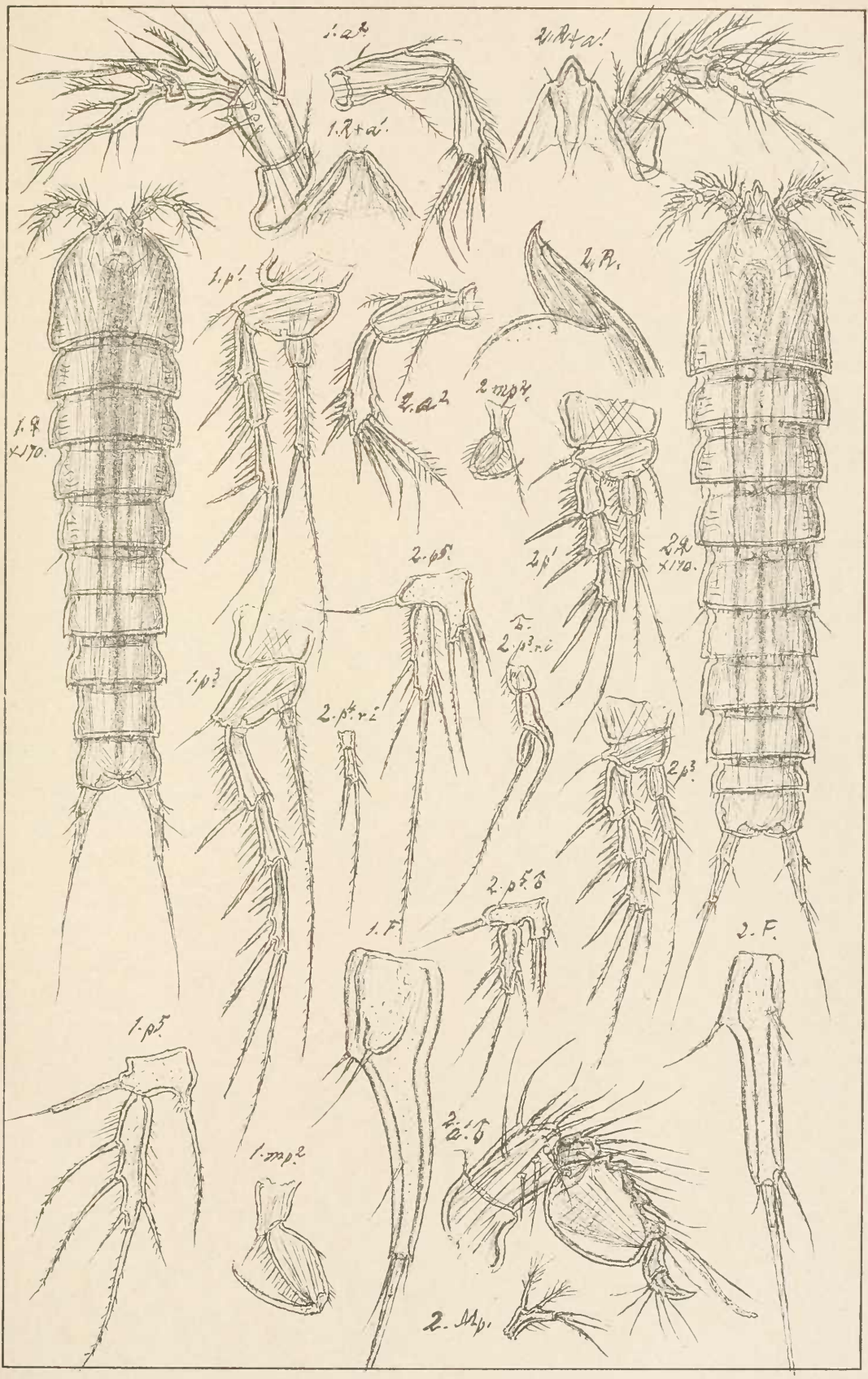
Cletodidæ. Harpacticoida Pl.CXCV



G.O. Sars, autogr. Norsk Lithgr. Officin

Cletodes limicola, Brady.

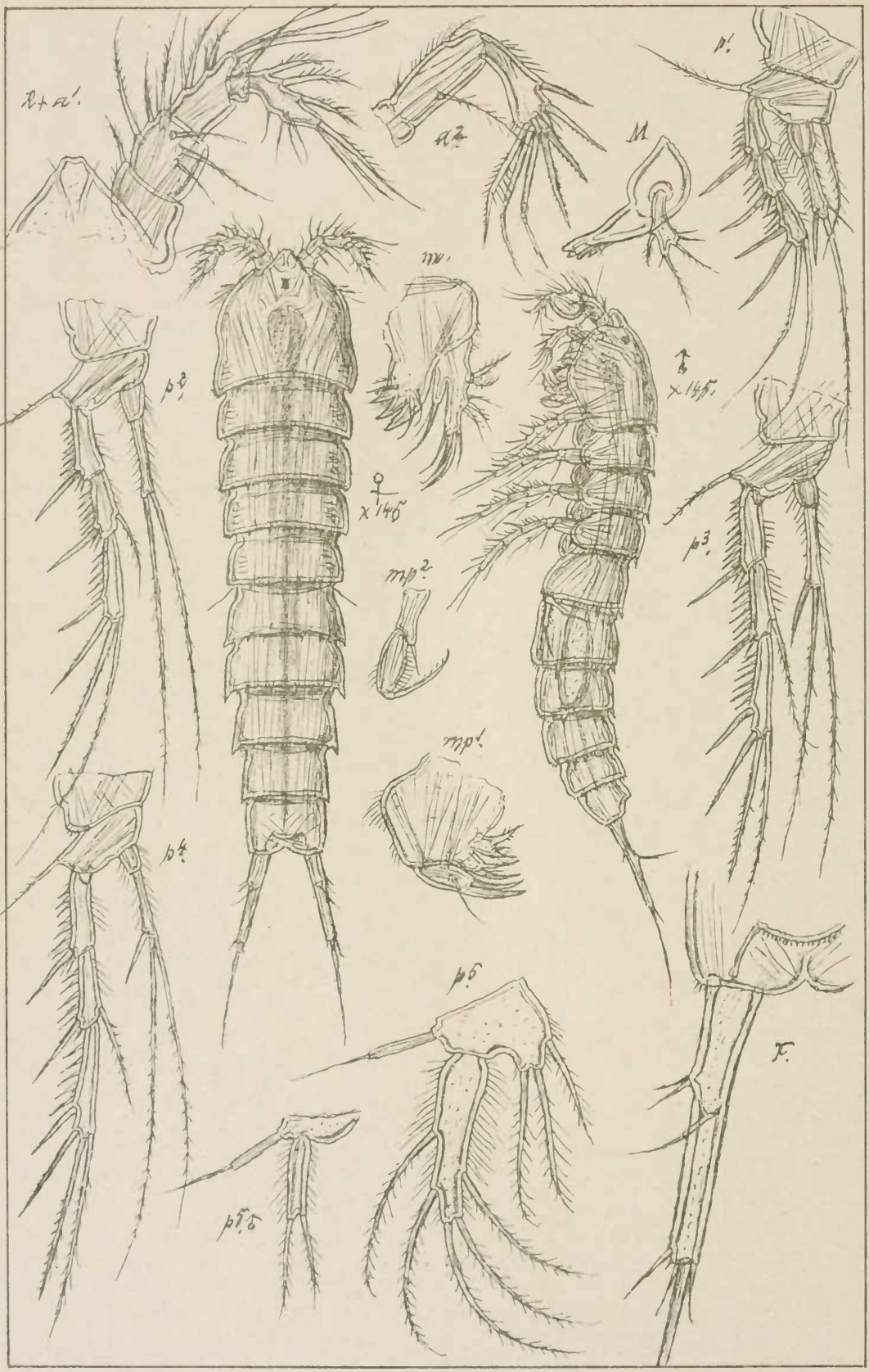
Copepoda



G.O Sars, autogr

Norsk Lithgr. Officin

1. Cletodes tenuipes, Scott
2. " curvirostris, Scott

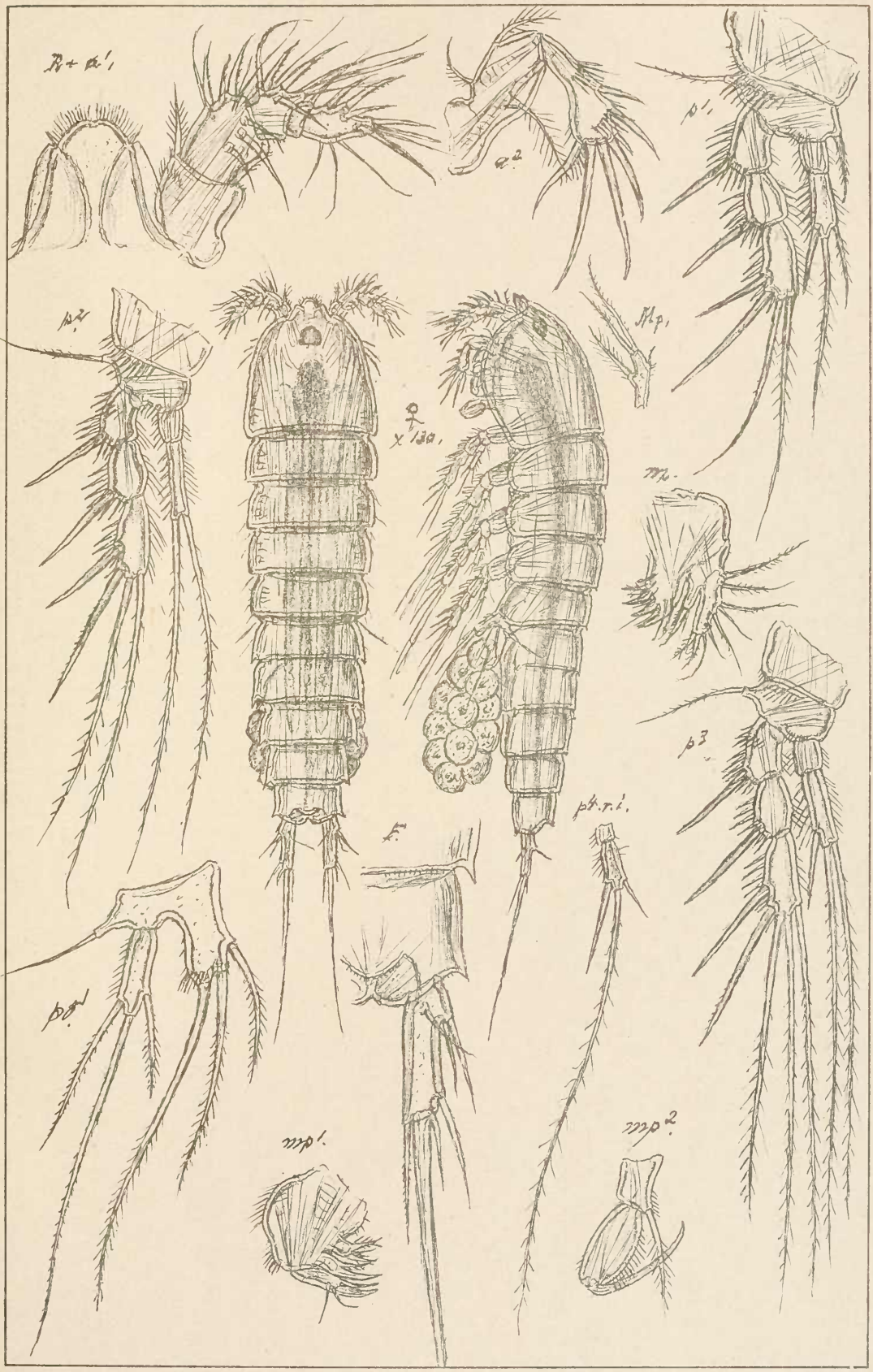


G.O.Sars, autogr. Norsk Lithgr. Officin

Cletodes longicaudatus (Boeck)

Copepoda

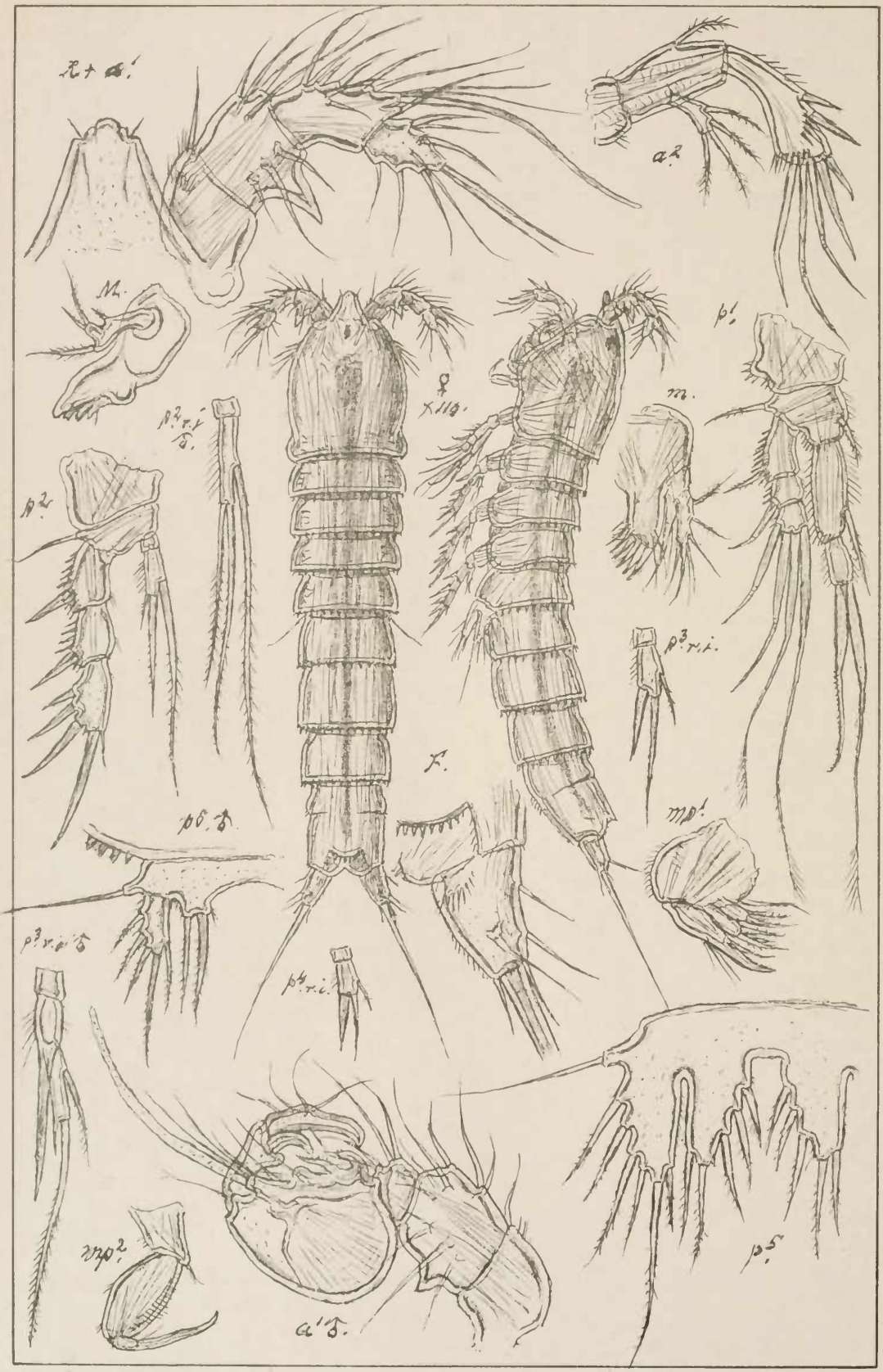
Cletodidæ. Harpacticoida Pl.CXCVIII.



G.O.Sars, autogr. Norsk Lithgr. Officin

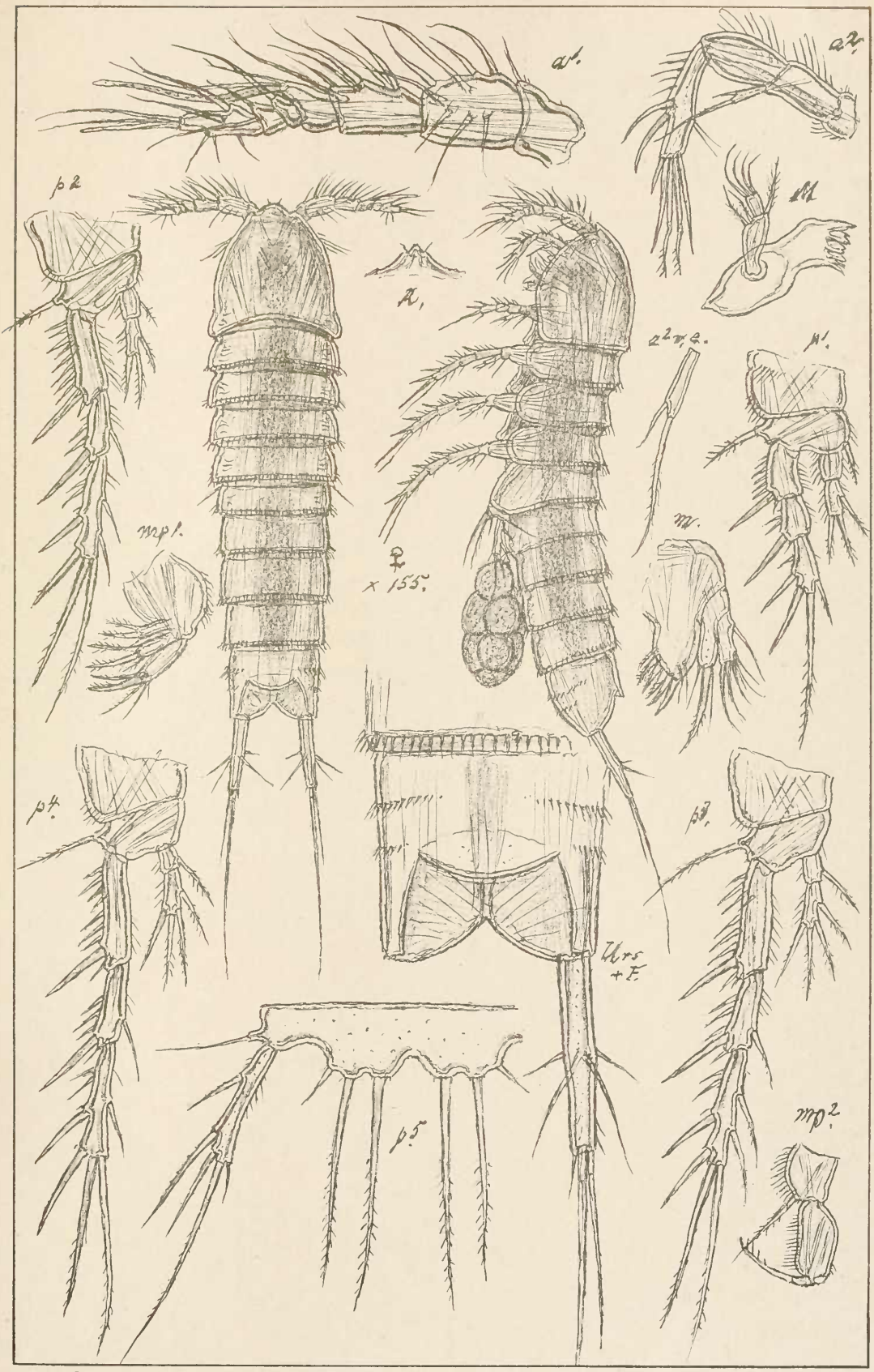
Cletodes Buchholtzi, Boeck.

Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Orthopsyllus linearis (Claus)

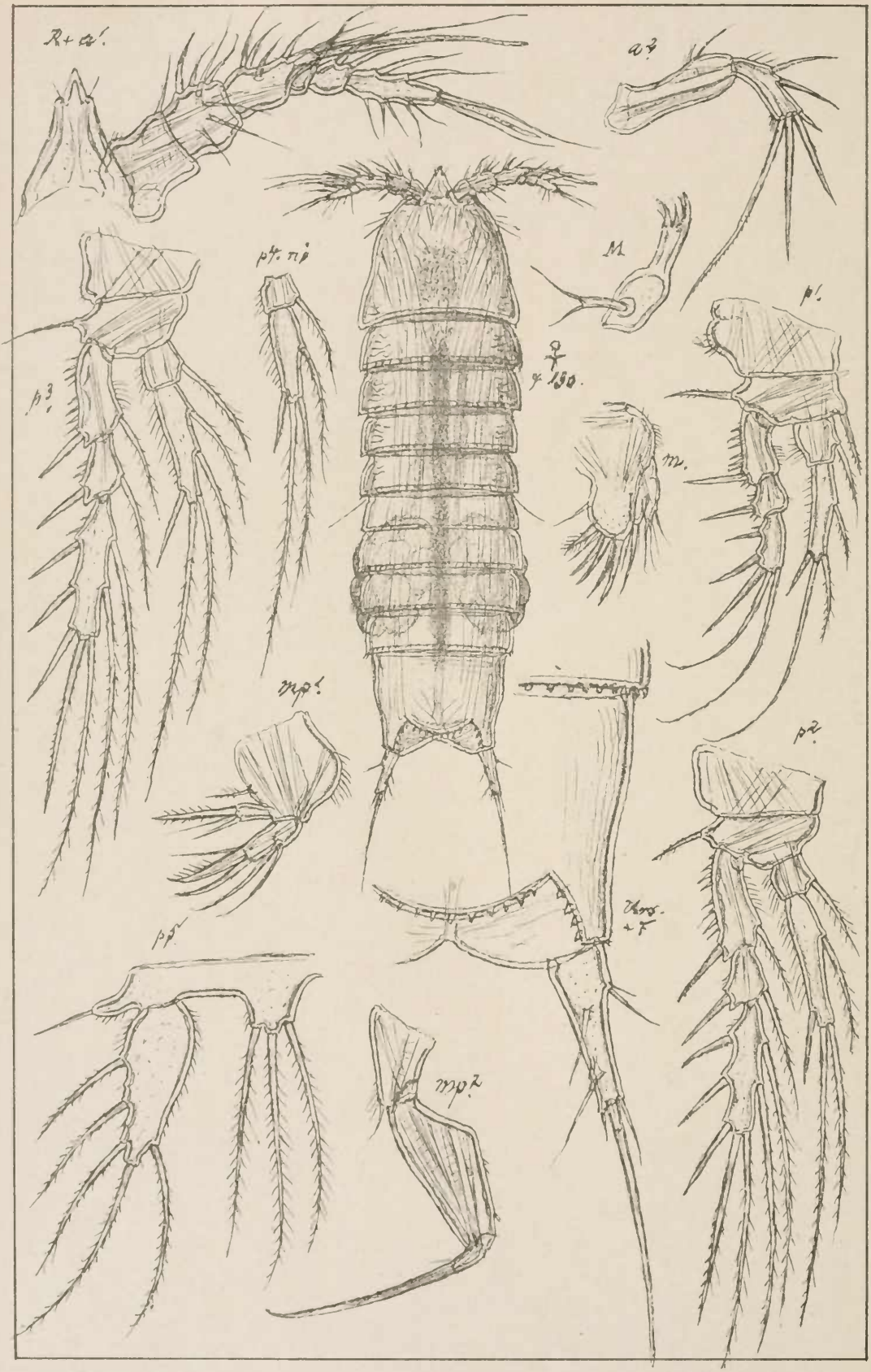


G.O.Sars, autogr

Norsk Lithgr. Officin

Mesocletodes irrasus (Scott)

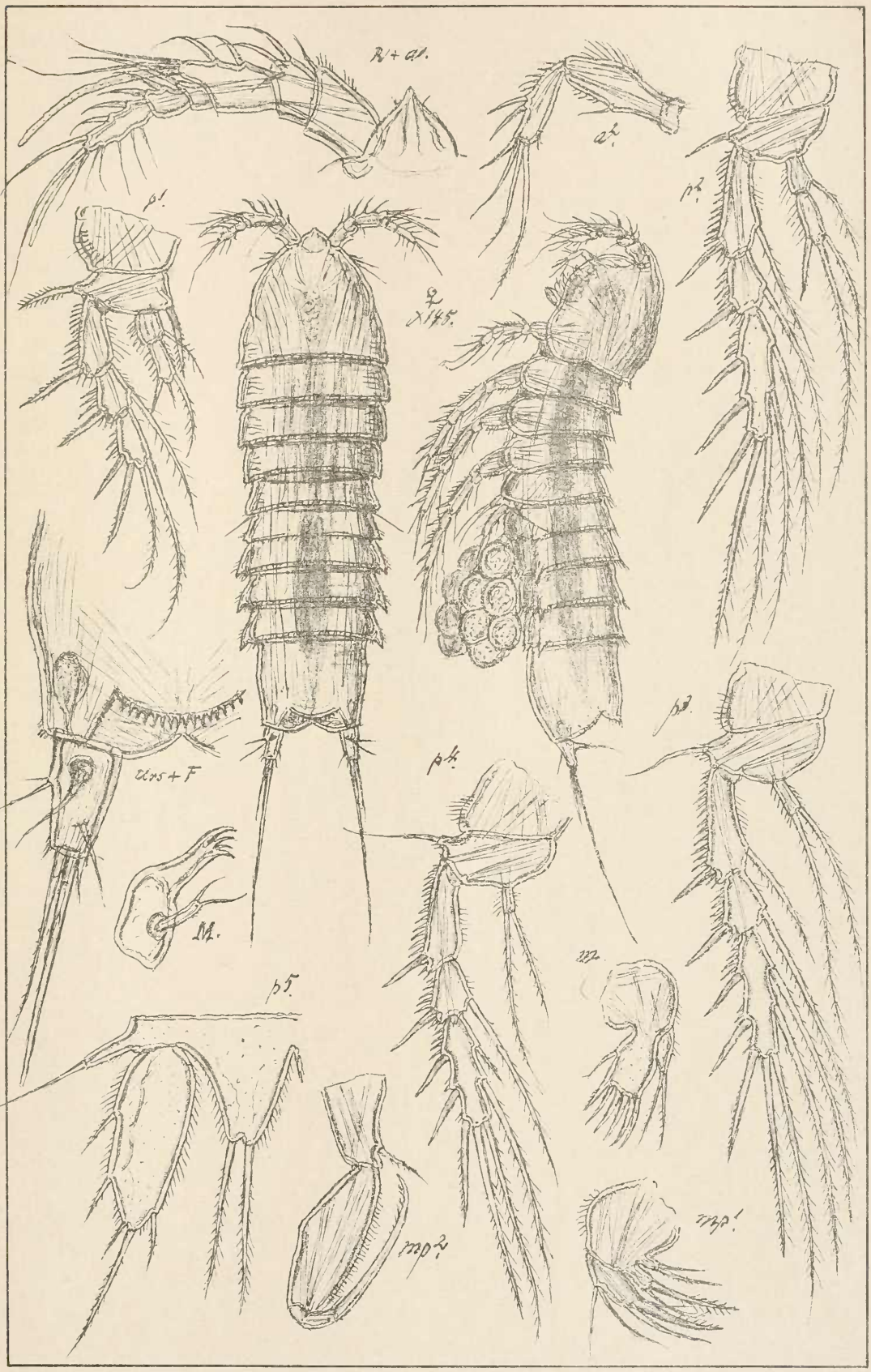
Copepoda



G.O. Sars, autogr.

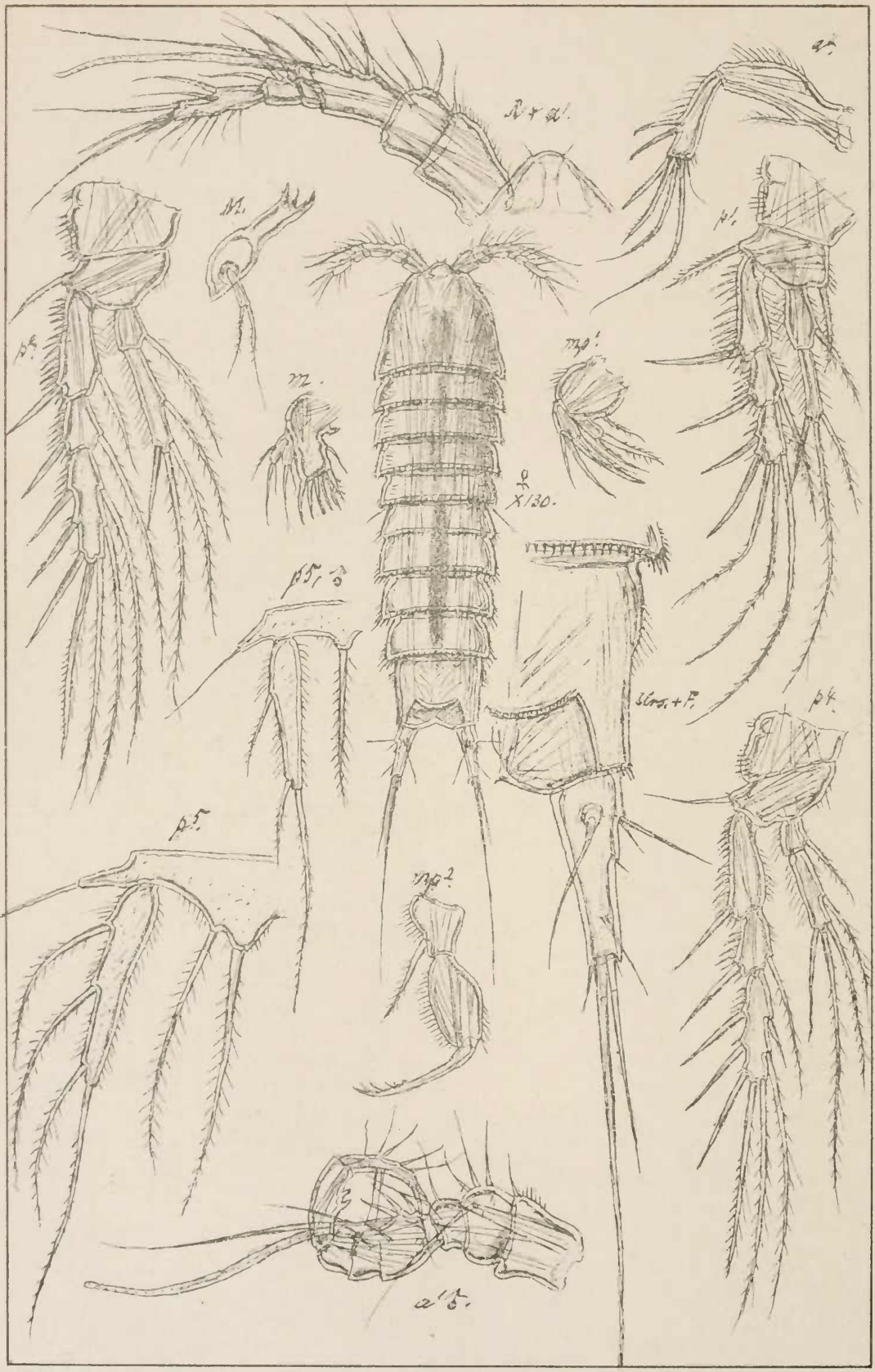
Norsk Lithgr. Officin.

Eurycletodes laticaudatus (Boeck)



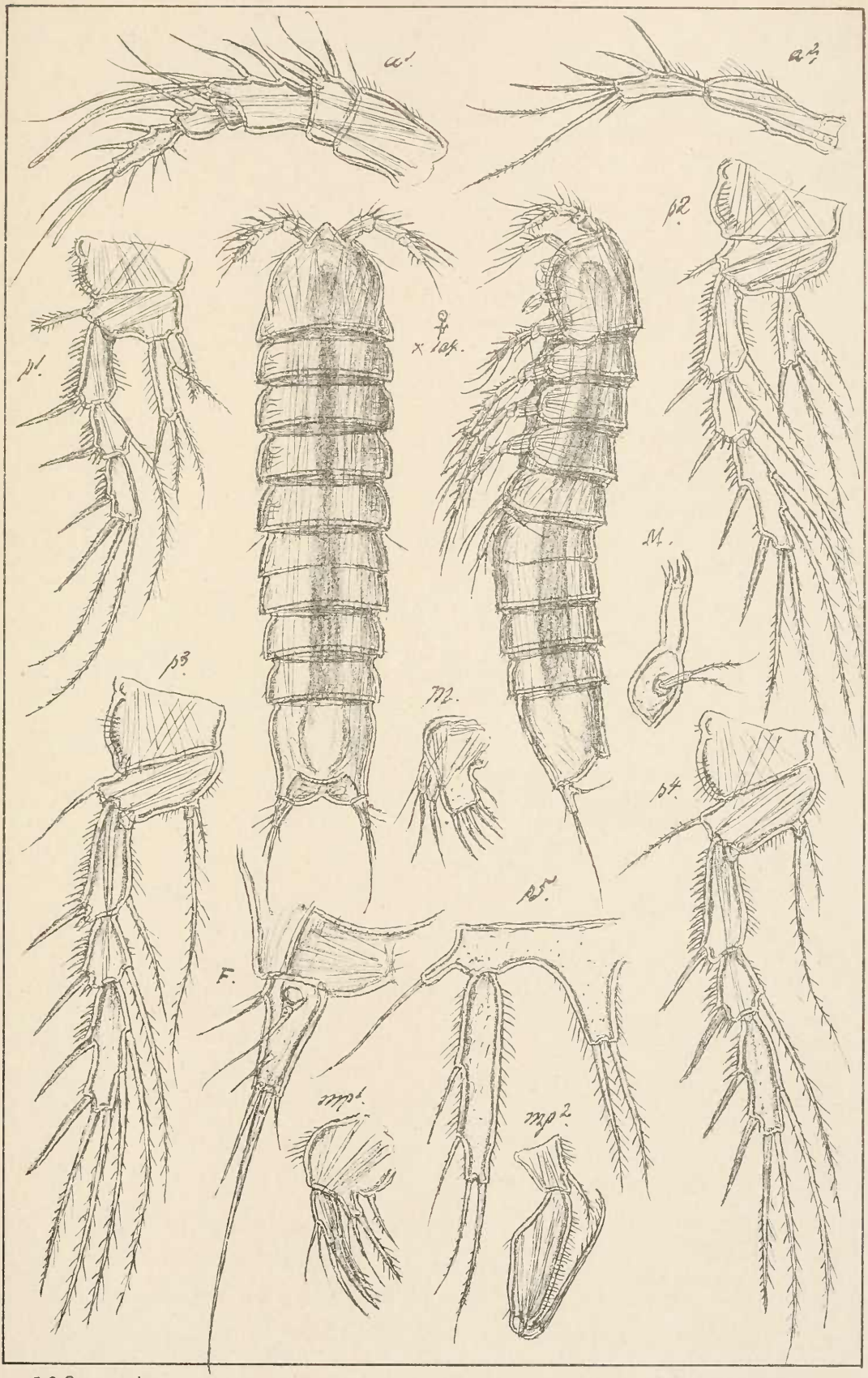
G.O. Sars, autogr. Norsk Lithgr. Officin

Eurycletodes latus (Scott)



G.O. Sars, autogr. Norsk Lithgr. Officin

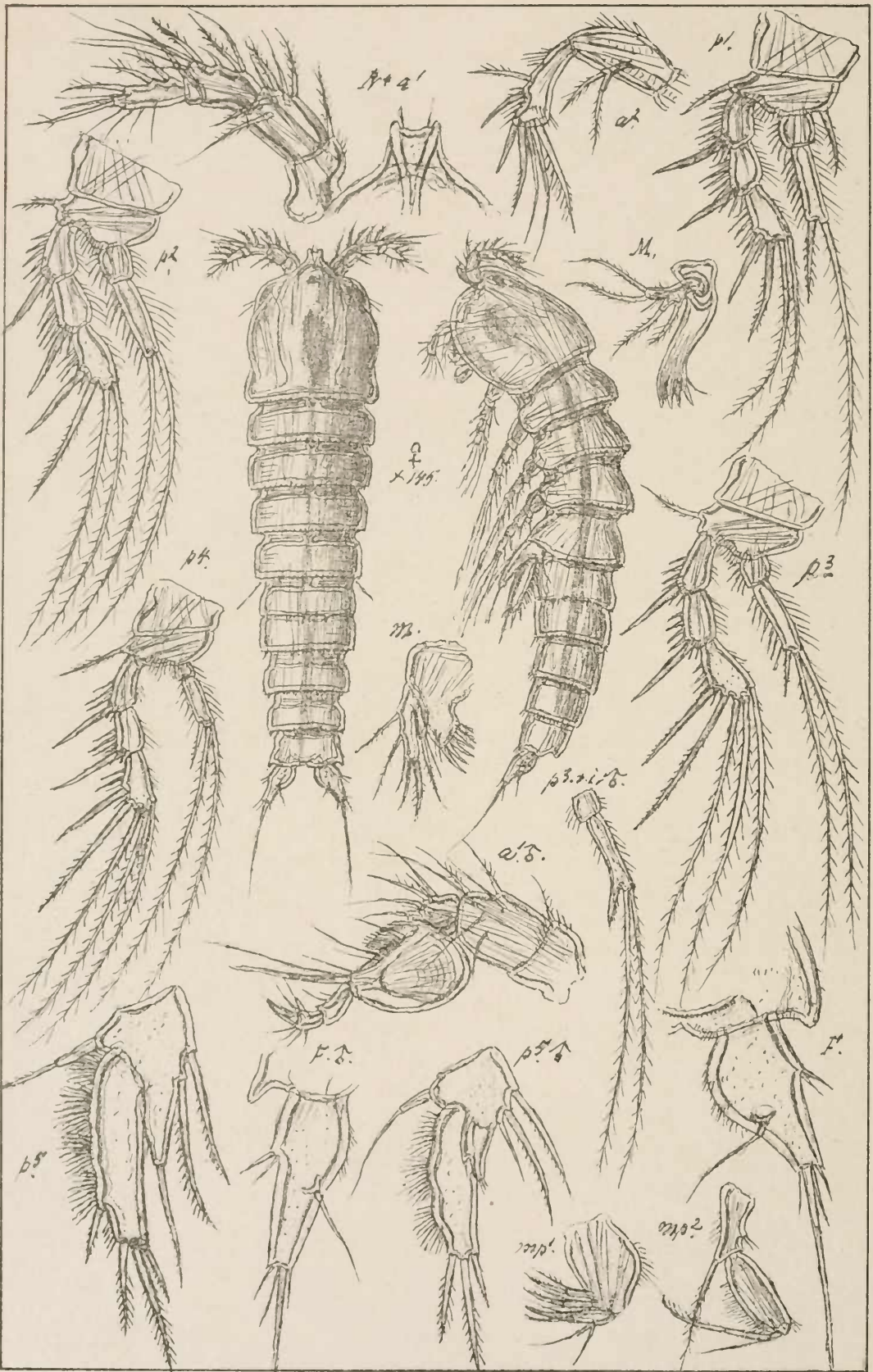
Eurycletodes similis (Scott)



G.O.Sars, autogr. Norsk Lithgr. Officin.

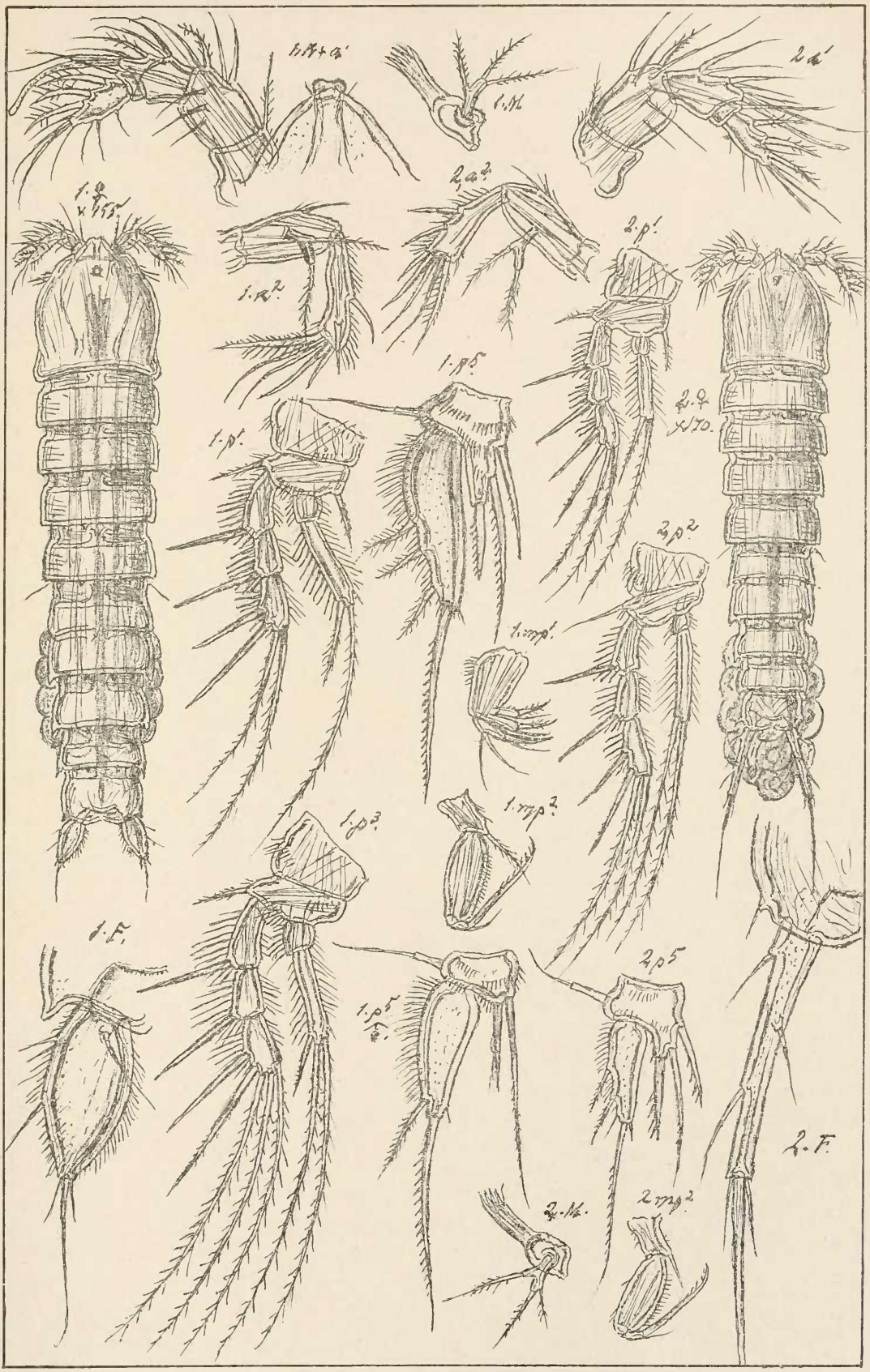
Eurycletodes major, G.O.Sars

Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin

Enhydrosoma curticaudatum Boeck

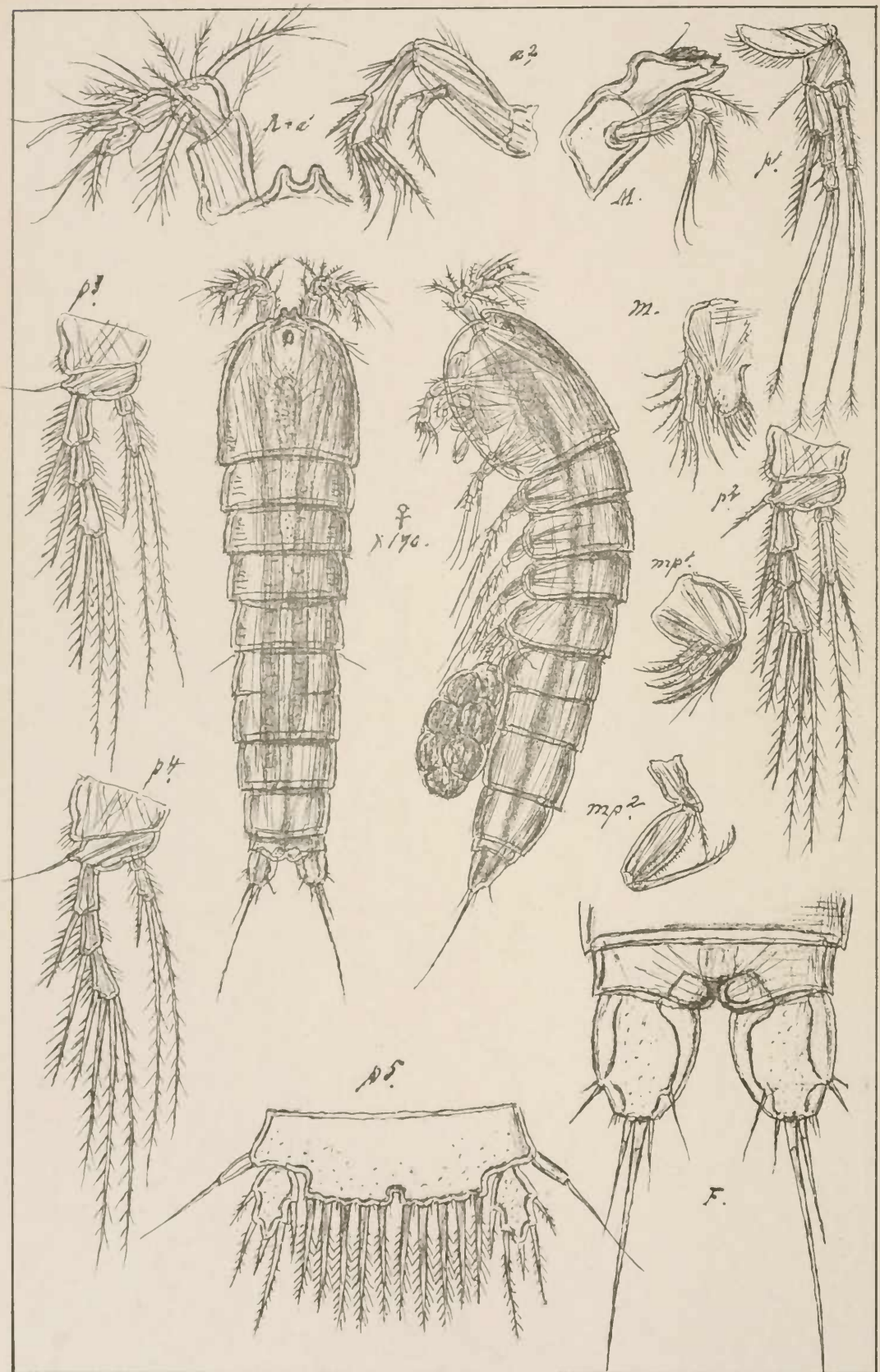


G.O.Sars, autogr. Norsk Lithgr. Officin

1 Enhydrosoma propinqvum Brady
2 " longifurcatum, G.O.Sars

Copepoda

Cletodidæ — Harpacticoida — Pl. CCVII.

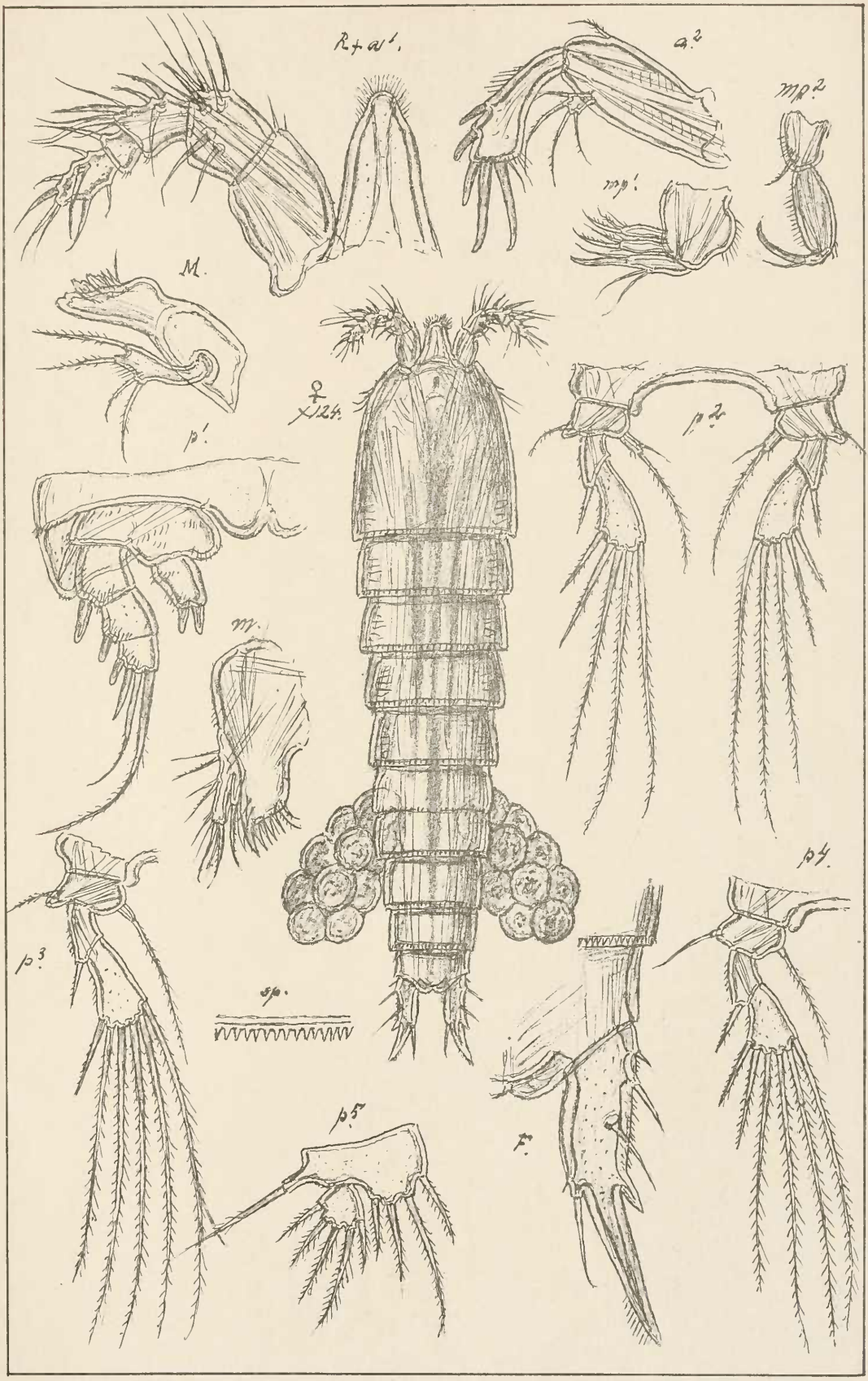


G.O. Sars, autogr. — Norsk Lithgr. Officin

Rhizothrix curvata, Brady & Roberts

Copepoda

Cletodidæ — Harpacticoida — Pl. CCVIII.



G.O.Sars, autogr. — Norsk Lithgr. Officin

Huntemannia jadensis, Poppe

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA

HARPACTICOIDA

PARTS XXVII & XXVIII

CLETODIDÆ (concluded), ANCHORABOLIDÆ, GYLINDROPSYLLIDÆ, TACHIDIIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1909

201. Huntemannia jadensis, Poppe.

(Pl. CCIX).

Huntemannia jadensis, S. A. Poppe, Die freilebenden Copepoden des Jadebusens. Abhandl. d. naturw. Vereins zu Bremen, Bd. IX, p. 201, Pl. VII, figs. 10—23.

Specific Characters.—Female. Body not very slender, but gradually tapering from front to back, without any sharp demarcation between the two divisions, hind edges of the segments finely denticulate. Cephalic segment nearly as long as the 4 succeeding segments combined, and produced in front to a narrow conical rostral projection clothed at the somewhat blunt tip with fine hairs. Last pedigerous segment scarcely smaller than the preceding one. Urosome much shorter than the anterior division, and tapering rapidly behind, last segment somewhat bulging at the end, with the anal opercle perfectly smooth. Caudal rami about the length of the anal segment, and of nearly equal width throughout, extending straight backwards, each produced at the end to a strong flattened spine of about the same length as the ramus itself, and slightly bent outwards at the tip, being accompanied outside by a short denticle, inside by a spiniform seta arising from a knob-like prominence; outer edge of the ramus with 2 short setæ near the base, dorsal face with another seta issuing from about the middle. Anterior antennæ much shorter than the cephalic segment, 5-articulate, 1st joint very large and broad, about the length of the 2 succeeding joints combined, terminal part scarcely longer than 3rd joint, though composed of 2 well-defined joints. Posterior antennæ with the terminal joint shorter than the basal one, and gradually widening distally, being armed with 5 strong blunt spines, inside which is a short seta accompanied by a number of small spinules, outer ramus attached near the end of the basal joint in the form of a small lamella carrying 4 setæ. 1st pair of legs remarkably short and stout, with the 1st basal joint dilated in a peculiar manner, forming a lamellar expansion covering over the succeeding joint in front, outer ramus distinctly 3-articulate, with the joints successively diminishing in size, last joint very short and armed at the end outside with 2 somewhat unequal spines accompanied by 2 setæ, the inner of which is much the longer; inner ramus consisting of a single rather coarse joint tipped with 2 short, blunt spines. The 3 succeeding pairs of legs comparatively small, outer ramus composed of only 2 joints defined by an oblique suture, the distal one spatulate in form and carrying at the end from 5 to 6 long setæ assuming outside gradually the character of slender spines; inner ramus much reduced, especially on the posterior pairs, forming a small nodiform joint tipped with a slender seta. Last pair of legs comparatively small, distal joint short, lamelliform, edged with 5 short setæ; inner expansion of proximal joint rounded,

with 5 similar setæ. Ovisacs oval pyriform in shape, and projecting on each side beyond the lateral edges of the urosome.

Colour not yet ascertained.

Length of adult female 0.96 mm.

Remarks.—This form was described by Poppe in the above-quoted paper as the type of a new Copepod-genus, but its systematic place within the group Harpacticoida was not discussed by that author. Th. Scott, in his List of Crustacea of the Clyde area, places it next to *Platychelipus littoralis* Brady. It is an easily recognisable form, which cannot be confounded with any of the other Harpacticoida.

Occurrence.—The only place where I have met with this peculiar Copepod, is in the immediate neighbourhood of Trondhjem, 2 or 3 female specimens having been taken there, many years ago, from shallow tidal pools on the flat, sandy beach east of the town. Canon A. M. Norman has kindly sent me some specimens taken by him, apparently in the very same place.

Distribution.—Jade Bay, on the North Sea coast of Germany (Poppe), Scottish coast (Scott).

Gen. 65. **Nannopus**, Brady, 1880.

Syn: *Ilyophilus*, Lilljeborg.

Generic Characters.—Body comparatively stout, with no sharply marked boundary between the anterior and posterior divisions, all the segments sharply marked off from each other. Cephalic segment large, and produced in front to a lamellar rostral projection not defined behind. Urosome tapered behind, with the genital segment in female distinctly subdivided. Caudal rami comparatively narrow, with one of the apical setæ very strong, spiniform. Anterior antennæ short and thick, 5-articulate and thickly clothed with coarse diverging setæ. Posterior antennæ strongly built and armed at the tip with strong claw-like spines, outer ramus short, uniarticular, attached near the end of the proximal joint. Oral parts somewhat resembling in structure those in the genus *Huntemannia*. Natatory legs short and stout, with the outer ramus distinctly triarticulate, inner ramus much shorter than the outer, and in the 3 anterior pairs biarticulate, in the 4th pair very small, uniarticulate; 1st pair only slightly differing in structure from the 2 succeeding pairs. Last pair of legs, with the distal joint small, in some

cases confluent with the proximal one, inner expansion of the latter not produced. A single ovisac present in female.

Remarks.—This genus was established in the year 1880 by Prof. Brady, to include a peculiar Copepod, *N. palustris*, found by him off the British coast. It was described and figured, but very imperfectly, in his well-known Monograph, and was considered the type of a separate sub-family *Nannopinæ*, to which he also referred a 2nd genus, viz. *Platychelipus*. As stated above, the latter genus ought to be included in the family, *Laophontidæ*, and I find no reason for excluding the present genus from the family *Cletodidæ*, exhibiting, as it does, all the essential features of that family. Its nearest ally seems to be the genus *Huntemannia*, from which however it differs pronouncedly in the structure of the legs and in the presence of only a single ovisac in the female. The genus *Ilyophilus* of Lilljeborg is identical with Brady's genus. It contains as yet 2 well defined species, one of which belongs to the fauna of Norway, the other, *N. perplexus* G. O. Sars, being found in the great lake Tanganyika of Central Africa.

202. Nannopus palustris, Brady.

(Pl. CCIX).

Nannopus palustris, Brady, Monograph of British Copepoda, Vol. II, p. 101, Pl. LXXVII, figs. 18—20.

Syn: *Ilyophilus flexibilis*. Lilljeborg.

Specific Characters.—Female. Body very flexible with rather thin integuments, and gradually tapering behind, all segments marked off from each other by deep constrictions, and fringed at the posterior edge with fine spinules. Cephalic segment rather expanded and occupying nearly half the length of the anterior division, rostral plate broadly rounded at the end and densely fringed with delicate cilia; lower edges of the segment likewise finely ciliated. Epimeral plates of the 3 succeeding segments rounded off. Last pedigerous segment, as usual, without distinct epimeral plates. Urosome somewhat exceeding half the length of the anterior division, last segment longer than the preceding one, and slightly produced at the end between the caudal rami, anal opercle small and perfectly smooth. Caudal rami about twice as long as they are broad, and scarcely divergent, each with a slender bristle at about the middle of the outer edge, middle apical seta about half the length of the urosome, and somewhat dilated in its proximal part, which is produced outside to a dentiform projection. Eye rather large and conspicuous in the living animal, and of light red colour. Anterior antennæ about half the length of the cephalic segment, and gradually tapering

distally, 1st joint much the largest and very thick, 3rd joint shorter than 2nd, terminal part about half the length of the proximal one, with its 1st joint very small. Posterior antennæ with the terminal joint shorter than the proximal one and spatulate in form, being armed at the tip with 4 strong, claw-like spines; outer ramus somewhat lamellar and carrying on the tip 4 subequal setæ. Mandibular palp comparatively large, with 4 coarse plumose setæ. Anterior maxillipeds with the digitiform lobes rather short and thick. Posterior maxillipeds of moderate size, hand narrow oblong in form and densely ciliated inside, dactylus armed at the inner edge with a row of slender spinules. Natatory legs coarsely spinulose, with the setæ much reduced; spines of outer ramus however very coarse. Last pair of legs with the distal joint well defined and short spatulate in form, carrying 5 marginal setæ, 2 of which are very thin, the other 3 strong and densely plumose; proximal joint with a transverse row of 4 coarse spinules at the junction with the distal joint, its inner expansion not at all produced, the hind edge being almost straight and provided with 4 coarse plumose setæ. Ovisac of moderate size, rounded oval in form.

Colour reddish brown.

Length of adult female 0.70 mm.

Remarks.—The above-described form is undoubtedly identical with that recorded by Lilljeborg as *Ilyophilus flexibilis*. This author considered it to be both specifically and generically different from *Nannopus palustris* of Brady, and I was at first of the same opinion myself. Seing however that Dr. Canu, in his work on the Copepoda of Boulonnais, has described the very same form under the name of *Nannopus palustris* Brady, I have again carefully compared the imperfect description and figures given in Brady's Monograph, and have thereby been induced to believe that in all probability the identification of the species by Dr. Canu will prove to be correct. The habitus-figure given by Brady (dorsal view of the animal) has apparently been made from a mounted specimen in which, by the pressure of the cover-glass, the form of the body has been somewhat injured. The 2 detail-figures (a leg of the 1st and 4th[1]) pairs) do not, on the other hand, exhibit any essential difference from the structure found in the present form.

Occurrence.—I have only met with this form in a single locality near Christiania. It occurred there occasionally in a shallow creek of the Fjord, on a muddy bottom close to the shore. As observed by Prof. Lilljeborg, the movements of the animal are very slow, and it seems to be quite devoid of

[1]) Not the 3rd pair, as indicated both in the text and in the explanation of the plate.

swimming power, as might also be guessed from the imperfect development of the natatory setæ on the legs.

Distribution.—British Isles (Brady), coast of France (Canu), shores of the Baltic near Stockholm, and occasionally in fresh water (Lilljeborg).

Gen. 66. **Pontopolites,** Scott 1894.

Generic Characters.—Body short and stout, sub-cylindrical in form, with the segments less sharply marked off from each other than in most other Cletodidæ. Cephalic segment of moderate size, and produced in front to a comparatively small rostral projection. Urosome scarcely at all attenuated behind, genital segment in female imperfectly subdivided; caudal rami short and thick. Anterior antennæ short, 5-articulate, and clothed with slender setæ, some of which are ciliated; those in male strongly hinged. Posterior antennæ moderately strong, outer ramus biarticulate and attached near the base of the proximal joint. Mandibular palp slender, biarticulate, with a slight rudiment of an outer ramus. Maxillæ and maxillipeds normal. 1st pair of legs differing conspicuously from the 3 succeeding pairs, inner ramus well developed, extending beyond the outer, and biarticulate. Inner ramus of the 3 succeeding pairs very small, uniarticulate. Last pair of legs with the distal joint quite confluent with the proximal one, both forming together a broad transverse lamella fringed behind with long setæ. A single ovisac present in female.

Remarks.—This genus, established by Th. Scott, differs somewhat, it is true, from the other Cletodidæ, both as regards the outward appearance of the body and the structure of some of the appendages. I think, however, that it will more properly find its place in the present family, as the antennæ and legs are built essentially upon the same type as in the other members of this family. It contains as yet only a single species, to be described below.

203. Pontopolites typicus, Scott.

(Pl. CCX).

Pontopolites typicus, Th. Scott, Additions to the Fauna of the Firth of Forth. Twelfth Ann. Rep. of the Fishery Board for Scotland. Part III, p. 251, Pl. VIII, figs. 9—17.

Specific Characters.—Female. Body very short and compact, of nearly uniform width throughout, all the segments quite smooth. Cephalic segment

nearly as long as the 4 succeeding segments combined, rostral projection triangular, acute at the tip. Epimeral plates of the 3 succeeding segments rounded off. Last pedigerous segment rather short, but scarcely narrower than the preceding segment. Urosome a little shorter than the anterior division, genital segment about the length of the 2 succeeding segments combined, and somewhat protuberant below, last segment much larger than the preceding one, and having the anal opercle rather small and perfectly smooth. Caudal rami very thick at the base and tapering somewhat distally, each with 2 successive bristles on the outer edge, the distal one unusually long and slender, extending generally straight outwards; middle apical seta of normal structure, and scarcely longer than the urosome. Anterior antennæ about half the length of the cephalic segment, the 3 joints of the proximal part of about equal size, terminal part scarcely longer than the last joint of the proximal, and having some of the setæ rather strong and distinctly ciliated. Posterior antennæ with the distal joint a little shorter than the proximal, and gradually widening towards the end; outer ramus comparatively small, with the distal joint quite short. 1st pair of legs with the joints of the outer ramus of nearly equal size, the last one armed with 2 spines and 2 slender geniculate setæ; inner ramus fully as long as the outer, proximal joint rather broad, with a slender seta inside, distal joint a little longer and much narrower, carrying on the tip a strong claw-like spine and a slender seta. The 3 succeeding pairs of legs with the terminal joint of the outer ramus much produced, being about as long as the 2 preceding joints combined, and armed with 3 strong spines and a small apical seta, inner edge of the joint in the 2nd and 3rd pairs carrying a single seta near the base, in the 4th pair 2 setæ, middle joint in this pair with another seta inside, which is wanting in the other pairs. Inner ramus in 2nd to 4th pairs very small, with a single apical spine; that of 4th pair quite rudimentary. Last pair of legs forming each an obliquely transverse plate fringed with 10 slender setæ, the outermost one attached to a knob-like prominence.

Male, as usual, smaller than female, and having the anterior antennæ very strongly hinged, 6-articulate. Inner ramus of 2nd and 3rd pairs with the apical spine comparatively longer than in female. Last pair of legs of somewhat smaller size, but otherwise of much the same structure as in the female.

Colour whitish grey.

Length of adult female 0.53 mm.

Remarks.—This form may be easily recognized by its short, stout, cylindrical body, and by the thick caudal rami, with the very slender bristle springing from their outer edge.

Occurrence.— I have met with this small Copepod occasionally at Farsund, and more frequently at Korshavn, near Lindesnæs, the southernmost point of Norway. It occurs in moderate depths, ranging from 6 to 20 fathoms.

Distribution.—Scottish coast (Scott).

Fam. 15. Anchorabolidæ.

Characters.—Body slender, tapering behind, with no sharply marked boundary between the anterior and posterior divisions. All the segments very sharply defined and, excepting the last 2 or 3, produced to peculiar horn-like projections, either dorsal or lateral, or both dorsal and lateral, cephalic segment somewhat flattened in front, with the antero-lateral corners generally produced, rostral projection of varying shape in the different genera, in some cases wanting. Genital segment imperfectly subdivided in female. Caudal rami long and slender, with one of the apical setæ much elongated. Eye wholly absent. Anterior antennæ with the number of joints much reduced, terminal part (in female) uniarticulate. Posterior antennæ without any trace of an outer ramus. Oral parts poorly developed, but on the whole of normal structure. Natatory legs slender and projecting more or less laterally, 2nd basal joint obliquely produced; 1st pair generally differing in structure from the others, but never prehensile. Last pair of legs with the distal joint long and slender, proximal joint generally produced outside to a long narrow process tipped with a slender bristle. A single ovisac present in female.

Remarks.—The present new family, the type of which is the remarkable Copepod, *Anchorabolus mirabilis*, described by Norman, in some respects strongly resembles the genus *Laophontodes* among the *Laophontidæ*. The structure of the 1st pair of legs, however, is very different, and agrees better with that in the *Cletodidæ*, where they are not prehensile at all. The remarkable armature of the body is another character distinguishing the present family very conspicuously from most other Harpacticoida. In addition to the typical species described by Norman, 3 other forms will be described below, each of them exhibiting a very characteristic armature of the body, and also differing so much in other particulars from each other and from the type, that I have felt justified in regarding them as types of as many separate genera.

Gen. 67. **Anchorabolus**, Norman, 1903.

Generic Characters.—Body armed with numerous horn-like, partly branched processes curving backwards, and forming several rows, dorsal, sub-dorsal and lateral. Rostral projection well defined, narrow linear. Anterior antennæ in female composed of only 3 joints, in male 5-articulate and distinctly hinged. Posterior antennæ with the distal joint very slender, linear. Mandibular palp small, uniarticulate. Posterior maxillipeds very slender. 1st pair of legs differing conspicuously in structure from the succeeding ones, both rami biarticulate, the inner one being the longer. Inner ramus of the 3 succeeding pairs much smaller than the outer, but distinctly biarticulate, 1st joint very short, 2nd narrow linear; outer ramus slender, 3-articulate. Inner ramus of 2nd pairs of legs in male slightly transformed. Last pair of legs with a well-defined setiferous expansion inside the proximal joint, wanting, however, in male.

Remarks.— This is the typical genus from which the present family has been named. It differs conspicuously from the 3 other genera treated of below, in the armature of the body, as also in the structure of some of the appendages. Only a single species is known to me, but Mr. Norman mentions having also observed a second species of the present genus.

204. Anchorabolus mirabilis, Norman.

(Pl. CCXI).

Anchorabolus mirabilis, Norman. Notes on the Nat. Hist. of East Finmark. Ann. & Mag. Nat. Hist. Ser. 7, Vol. XI, pag. 2.

Specific Characters.—Female. Body comparatively slender, sub-linear in form, though at first sight appearing rather broad, on account of the numerous processes flanking it both dorsally and laterally. Cephalic segment scarcely longer than the 2 succeeding segments combined, and slightly contracted in front, anterior edge almost transversely truncated, though projecting in the middle in a narrow horizontal rostrum minutely bifid at the tip, and provided on each side with a knob-like projection tipped with a small hair; antero-lateral corners of the segment produced to a short spine pointing straight outwards; dorsal face carrying 2 pairs of horn-like, posteriorly-curving processes, the anterior one simple, the posterior trifid. On each side of this segment, moreover, 3 successive processes are seen, the 2 anterior ones lateral and bifurcate, the posterior one sub-dorsal and tripartite. Each of the 4 succeeding segments provided with one pair of dorsal processes, one pair of sub-dorsal, and one pair of lateral, the dorsal

and lateral processes being simple, the sub-dorsal bifurcate, except in the last segment. Urosome, including the caudal rami, almost as long as the anterior division and without any dorsal processes, but with 3 successive pairs of simple lateral and sub-dorsal processes of considerable length and curving abruptly backwards. All the processes minutely denticulate in their outer part. Last caudal segment rather small, with the anal opercle smooth. Caudal rami considerably produced, exceeding half the length of the urosome, and very narrow, each exhibiting at about the middle of the outer edge a slender bristle, middle apical seta exceeding half the length of the body. Anterior antennæ rather slender, being fully as long as the cephalic segment, 2nd joint slightly exceeding the 1st in length, but much narrower and (in some specimens) provided near the base posteriorly with a short incurved dentiform projection; terminal joint shorter than the 2nd, and linear in form. Posterior antennæ with the distal joint longer than the proximal one, the latter carrying 2 small setæ anteriorly. Posterior maxillipeds very slender, hand sublinear in form, dactylus long and setiform. 1st pair of legs with the inner ramus nearly twice as long as the outer, distal joint scarcely more than $^1/_3$ as long as the proximal one, and carrying on the tip 2 slender setæ, and inside them a small spine; distal joint of outer ramus armed with 3 slender spines and 2 geniculate setæ. Inner ramus of the 3 succeeding pairs scarcely half as long as the outer, and narrow linear in form, carrying on the tip 2 or 3 slender setæ; outer ramus with the spines of the outer edge very long and slender, terminal joint without any setæ inside. Last pair of legs with the distal joint linear in form, and edged with 5 setæ, 2 on the outer edge, 2 on the tip, and 1 on the inner edge, inner apical seta much the longest; proximal joint with the digitiform process exceedingly long and slender, inner expansion about half the length of the distal joint and rather narrow, carrying 4 setæ of moderate length. Ovisac broadly rounded and somewhat flattened.

Male, as usual, smaller than female, and with the anterior antennæ distinctly hinged, 5-articulate, 3rd joint slightly dilated, last joint claw-like. Inner ramus of 2nd pair of legs armed at the tip, with a somewhat flexuous claw-like spine in addition to the setæ. Last pair of legs much smaller than in female, one of the setæ wanting on the outer edge of the distal joint, proximal joint without any expansion inside.

Colour whitish grey.

Length of adult female 0.78 mm.

Remarks.—This form was described, but not figured, by Norman, from specimens collected off the Finmark coast, and its resemblance to the species

of the genus *Laophontodes* was noted, as also its material difference from those species as regards the structure of the 1st pair of legs.

Occurrence.—I have been long acquainted with this remarkable form, which I have come across in many different places on the Norwegian coast, though always quite by chance. It is found in depths ranging from 16 to 30 fathoms and, as noted by Norman, generally in places where otherwise animal life proves to be very scanty. The specimens are generally so thickly covered with muddy particles adhering to the numerous curved processes of the body, that it is rather difficult at first sight to obtain a correct idea of their true forms and wonderful armature. They move through the water in a somewhat jerky manner, and never for long together.

Distribution.—Scottish coast, at Cumbrae (Norman).

Gen. 68. Echinopsyllus, G. O. Sars, n.

Generic Characters.—Body provided with dorsal and lateral projections, but wanting a sub-dorsal series. Rostrum very small, but well defined. Anterior antennæ in female distinctly 4-articulate; posterior antennæ about as in *Anchorabolus*. Oral parts resembling in structure those ist the said genus; posterior maxillipeds, however, less slender. 1st pair of legs of nearly the same structure as the 3 succeeding ones, inner ramus in all pairs very small and rudimentary, uniarticulate. Last pair of legs without any inner expansion of the proximal joint, digitiform process of this joint very slender and elongated.

Remarks.—This new genus differs very conspicuously from *Anchorabolus*, both as regards the armature of the body and the structure of some of the appendages; yet it exhibits an unmistakable general affinity to that genus, so that it ought undoubtedly to be included in the same family.

205. Echinopsyllus Normani, G. O. Sars, n. sp.

(Pl. CCXII).

Specific Characters.—Female. Body comparatively slender, rapidly tapering behind, with the segments sharply defined. Cephalic segment rather large, fully as long as the 3 succeeding segments combined, and produced on each side in 2 successive acuminate processes of considerable size and pointing straight outwards, antero-lateral corners conically produced, as in *Anchorabolus;* dorsal face exhibiting

in the middle a deep transverse depression partly covered by 2 peculiar horn-like hairy processes arising from the anterior part of the segment and curving abruptly backwards; posterior part of the dorsal face armed with 2 small juxtaposed prominences. Rostrum very small, terminating in 2 juxtaposed knob-like prominences, each tipped with a delicate hair. The 4 succeeding segments without any lateral projections, but each armed with a pair of simple erect dorsal processes. Urosome rather narrow and shorter than the anterior division, anterior part of genital segment unarmed, posterior part, as also the succeeding segment, armed with 2 rather large and closely juxtaposed dorsal processes curving gently backwards. Last caudal segment about the size of the preceding one, anal opercle smooth. Caudal rami rather produced, exceeding in length the last 3 segments combined, and somewhat bent in the middle, where each carries outside a thin bristle, and somewhat dorsally another much larger bristle arising from a knob-like prominence; middle apical seta scarcely longer than the ramus itself. Anterior antennæ rather slender, being about the length of the cephalic segment, 1st and 3rd joints of nearly equal length, 2nd joint much shorter, terminal joint very narrow and not quite the length of the preceding joint. Posterior antennæ with the distal joint shorter than the proximal one. Posterior maxillipeds with the hand oblong oval in form, dactylus of moderate length and slightly curved in its outer part. 1st pair of legs resembling in structure the 3 succeeding pairs, but of somewhat smaller size, outer ramus triarticulate, though the boundary between the 2 last joints appears somewhat less sharply marked, middle joint without any seta inside, terminal joint with a slender spine and 3 still more slender geniculate setæ; inner ramus, as in the 3 succeeding pairs, quite rudimentary, with a single small seta on the tip. Outer ramus in these pairs well developed, with a seta inside the middle joint, terminal joint in all pairs smooth inside. Last pair of legs comparatively small, distal joint narrow linear, with 4 unequal setæ, inner edge smooth; proximal joint with a small bristle inside, but not forming any distinct expansion, digitiform process exceedingly long and narrow.

Male unknown.

Body of whitish colour, with a yellowish tinge.

Length of adult female 0.76 mm.

Remarks.—This is the only species of the genus as yet known, and it may be easily recognised by the peculiar and very conspicuous armature of the body. I have much pleasure in dedicating this extraordinary form to the well known distinguished naturalist, Canon A. M. Norman, to whom we are indebted for so many important contributions in nearly all branches of Zoology.

Occurrence.—I have as yet seen only 2 female specimens of this interesting form, the one taken at Farsund, the other at Korshavn, both localities on the south coast of Norway. It occurred in both places in a depth of about 20 fathoms, on a muddy bottom covered with decaying algæ.

Gen. 69. Ceratonotus, G. O. Sars, n.

Generic Characters.—Body armed with a double series of peculiar, highly chitinized dorsal processes, lateral and sub-dorsal processes wanting. Rostrum wholly absent. Anterior antennæ slender, 4-articulate, 1st joint much the largest. Posterior antennæ and oral parts about as in the preceding genus. 1st pair of legs differing conspicuously in structure from the 3 succeeding ones, both rami biarticulate and subequal in size. Inner ramus of the 4 succeeding pairs very small, uniarticulate. Last pair of legs comparatively simple, biarticulate, resembling in structure those in the genus *Laophontodes*.

Remarks.—This genus also is characterised by a most peculiar armature of the body, and moreover differs from the 2 preceding ones in the total absence of a rostrum, and also somewhat in the structure of the anterior antennæ and legs.

206. Ceratonotus pectinatus, G. O. Sars, n. sp.

(Pl. CCXIII).

Specific Characters.—Female. Body very narrow and slightly attenuated behind, with the segments somewhat less sharply defined than in the other species of the present family. Cephalic segment nearly as long as the 3 succeeding segments combined, and abruptly constricted anteriorly, frontal margin without any trace of a rostrum, being even slightly concave in the middle; antero-lateral corners produced each to a strong, minutely spinulose process, turned somewhat upwards; dorsal face armed behind the middle with a pair of very strong, horn-like processes diverging somewhat to each side, and exhibiting along the anterior edge a regular comb-like series of about 8 spinules gradually diminishing in size distally. Each of the 4 succeeding segments provided with a pair of similar dorsal processes. Urosome much shorter than the anterior division, and of nearly uniform width throughout, posterior part of genital segment armed with a pair

of dorsal processes similar to those on the anterior division, though a little smaller, the other segments unarmed; last segment shorter than the preceding one. Caudal rami slender and narrow, though not attaining the length of the 3 preceding segments combined, each with 2 successive bristles on the outer edge, middle apical seta rather strong, about the length of the urosome, including the caudal rami. Anterior antennæ comparatively slender, attaining the length of the cephalic segment, 1st joint much produced, occupying half the length of the whole antenna, 2nd joint small and imperfectly defined from the 3rd, terminal joint about the length of these joints combined. Posterior antennæ very slender, distal joint fully as long as the proximal one, and exhibiting near the end posteriorly 2 successive dentiform projections, spines of anterior edge unusually slender. Mandibular palp somewhat more fully developed than in the other species of this family, though uniarticulate. Posterior maxillipeds of moderate size, hand narrow oblong in form, dactylus slender and gently curved. 1st pair of legs with the inner ramus about the length of the outer, distal joint the longer and tipped with 2 very slender setæ, outer ramus with the spine of the proximal joint very long and narrow, distal joint armed with 2 slender spines and 3 still more slender curved setæ. Inner ramus of the 2 succeeding pairs consisting of a single very small joint tipped with a long seta and a small hair-like bristle; that of 4th pair quite rudimentary; outer ramus in these pairs with the spines unusually long and slender, middle joint with a seta inside, terminal joint in 2nd and 4th pairs with a similar seta, in 3rd pair with 2 such setæ. Last pair of legs forming each a simple, slightly curved, biarticulate stem projecting from each side of the last segment of the anterior division, and tipped with 3 subequal setæ, proximal joint shorter than the distal one, and provided on either side with a slender bristle.

Male unknown.

Colour not yet ascertained.

Length of the specimen examined 0.54 mm.

Remarks.—This form also exhibits a most extraordinary appearance, owing to the peculiar pectinate processes arising from the dorsal face of the body, a character which indeed has given rise both to the generic and specific names here proposed.

Occurrence.—A single female specimen of this remarkable form was found in a sample taken at Flekkerö, south coast of Norway, from a depth of about 12 fathoms, muddy bottom.

Gen. 70. Arthropsyllus, G. O. Sars, n.

Generic Characters.—Body without any dorsal or sub-dorsal processes, but flanked on each side by a uniform series of acutely produced lappets arising from the lateral parts of all the segments except the last 2. Cephalic segment rather broad, and produced in front to a broadly triangular rostral projection, antero-lateral corners rounded off. Anterior antennæ less slender than in the preceding genera, and in female composed of only 3 joints; those in male strongly hinged. Posterior antennæ likewise rather robust. Oral parts exhibiting the structure characteristic of the family. Natatory legs with the 2nd basal joint less produced than in the 3 preceding genera, 1st pair with both rami biarticulate and subequal in size. Inner ramus of the 3 succeeding pairs well developed, biarticulate, though shorter than the outer; that of 2nd pair slightly transformed in the male. Last pair of legs of normal appearance, with the distal joint slender and narrow, proximal joint with a well-defined setiferous expansion inside, wanting however in male.

Remarks.—This genus, like the 3 preceding ones, is based upon a single species, which in spite of the rather different external appearance of the body, in all anatomical details exhibits a near relationship to those genera, and more particularly to the typical genus, *Anchorabolus*. The generic name here proposed refers to the sharp demarcation of the segments, due to the acutely produced lateral parts.

207. Arthropsyllus serratus, G. O. Sars, n. sp.

(Pl. CCXIV).

Specific Characters.—Female. Body moderately slender and somewhat depressed, tapering gradually behind, with all the segments very sharply defined. Cephalic segment consparatively broad, and about the length of the 3 succeeding segments combined, rostral projection triangular, broad at the base and terminating in 2 small prominences, dorsal face of the segment smooth and slightly vaulted, antero-lateral corners evenly rounded, lateral edges each exhibiting beyond the middle a small notch, and behind it produced to an acute lappet pointing obliquely backwards. Each of the 4 succeeding segments produced on each side to a similar, though somewhat larger lappet. Urosome somewhat shorter than the anterior division, and provided with 3 pairs of lateral lappets similar to those on the anterior part of the body, though somewhat diminishing successively in size, the 2 posterior segments being

unarmed. Last segment a little shorter than the preceding one, and slightly constricted in the middle. Caudal rami slender, exceeding in length the last 3 segments combined, and somewhat attenuated distally, outer edge minutely spinulose and carrying, somewhat in front of the middle, a small bristle, dorsal seta issuing much nearer the end of the ramus, middle apical seta very long and slender, attaining half the length of the body. Anterior antennæ comparatively stout, much shorter than the cephalic segment, and clothed with rather strong setæ, the 3 joints of about equal length, but diminishing successively in width. Posterior antennæ with the distal joint a little shorter than the proximal one. Posterior maxillipeds of moderate size, hand oblong oval in form, dactylus exceedingly long and slender. 1st pair of legs, with the inner ramus of about the same length as the outer, but somewhat narrower, distal joint a little shorter than the proximal one, and tipped with 2 slender setæ, distal joint of outer ramus armed with 3 spines and 2 geniculate setæ. Inner ramus of the 3 succeeding pairs about the length of the first 2 joints of the outer ramus combined, its distal joint much the longest and carrying inside a comparatively short seta, at the tip 2 very long setæ, and outside them again, in the 3rd and 4th pairs, another smaller seta; terminal joint of outer ramus without any setæ inside. Last pair of legs with the distal joint long and narrow, though a little dilated at the end, marginal setæ 5 in number, 2 rather small on the outer edge and 3 much coarser on the tip, the middle one rather elongated; proximal joint with the digitiform process rather produced, inner expansion narrow and about half the length of the distal joint, marginal setæ of moderate length and 4 in number.

Male with the anterior antennæ rather strongly built and apparently composed of 6 joints, the 4th rather dilated, terminal part claw-like. Inner ramus of 2nd pair of legs armed at the tip with a strong claw-like spine in addition to the 2 apical setæ. Last pair of legs much smaller than in female, distal joint without any setæ on the outer edge, inner expansion of proximal joint obsolete.

Body of whitish colour, with dark bluish green intestine.

Length of adult female 0.80 mm.

Remarks.—The present form is at once distinguished from any of the other species included in this family, by the total absence of dorsal and subdorsal processes; whereas the lateral parts of the body are divided into a regular series of acute lappets giving them a pronouncedly jagged appearance, hence the specific name here proposed. In the structural details, as above stated, this form exhibits a close relationship to the type of the present family, *Anchorabolus mirabilis* Norman.

Occurrence.—I have met with this form not unfrequently in one locality, namely Bejan in the outer part of the Trondhjem Fjord, and occasionally also in

some other places on the south and west coasts of Norway, in depths ranging from 12 to 30 fathoms, muddy bottom. A single male specimen was moreover found in a sample taken by Mr. Nordgaard at Repvaag, East Finmark.

Fam. 16. Cylindropsyllidæ.

Characters.—Body narrow, vermiform, with no distinct boundary between the anterior and posterior divisions, the former not being at all dilated. All segments smooth, without any armature whatever. Rostral projection comparatively small. Anterior antennæ with the proximal part composed of 4 well-defined joints. Posterior antennæ with a very small, but well-defined uniarticulate outer ramus. Oral parts on the whole normal, except the posterior maxillipeds, which in some cases are very anomalous or quite rudimentary. Natatory legs of comparatively feeble structure; 1st pair not prehensile, and more or less resembling the 3 succeeding pairs. Last pair of legs imperfectly developed, with no visible subdivision. 2 ovisacs generally present in female.

Remarks.—This new family is established to comprise the peculiar genus *Cylindropsyllus* of Brady and some allied genera, all of them conspicuously distinguished by the extremely narrow, vermiform shape of the body. In the structural details some resemblance may be found to exist to certain genera of the family *Canthocamptidæ*, especially to the genus *Tetragoniceps* Brady; but the 1st pair of legs are never prehensile as in that family, and there are also some other features which would seem to preclude a union of these 2 families. In addition to the 3 genera treated of below, the genus *Leptocaris* of Scott is undoubtedly referable to the present family.

Gen. 71. Cylindropsyllus, Brady, 1880.

Syn: *Cylindrosoma* Brady (name already appropriated).

Generic Characters.—Body slender, cylindrical in form, with rather coarse integuments exhibiting a minutely pitted structure. Rostral projection well defined

at the base. Genital segment in female scarcely subdivided at all. Caudal rami comparatively short. Anterior antennæ slender, 7-articulate, with the 2nd joint much the largest, and the terminal part distinctly 3-articulate; those in male slightly hinged. Posterior antennæ with the outer ramus very small and rudimentary. Mandibular palp small, uniarticulate. Maxillæ and anterior maxillipeds normal. Posterior maxillipeds quite rudimentary, being replaced by 2 small immobile lamellæ intercalated between the bases of the anterior maxillipeds. Natatory legs with the inner ramus distinctly bi-articulate, that of 1st pair larger than that of the 3 succeeding pairs; 4th pair exceeding the other pairs in size, the outer ramus being considerably elongated. Outer ramus of 2nd pair and inner ramus of 3rd pair conspicuously transformed in male. Last pair of legs very small lamelliform. 2 ovisacs present in female.

Remarks.—This genus was removed by Prof. Brady from the *Harpacticoida*, and described under the head of the group *Poecilostoma* Thorel. There cannot be any doubt that such an arrangement is quite untenable, and the genus has subsequently been placed by Th. Scott among the Harpacticoida. The structure of the mouth-organs was not made out by Prof. Brady, and Th. Scott, who carefully examined these organs, has fallen into a strange error, as regards the interpretation of these parts. What he describes, though with some hesitation, as the maxillæ, are evidently the lateral lobes of the posterior lip, and the parts described as the anterior and posterior maxillipeds are in reality respectively the maxillæ and the anterior maxillipeds, the slight rudiments of the posterior maxillipeds having apparently escaped his attention, or being perhaps wrongly represented as parts of the so-called "labium" (fig. 8).

208. Cylindropsyllus lævis, Brady.

(Pl. CCXV).

Cylindropsyllus lævis, Brady, Monograph of British Copepoda, Vol. III, p. 30, Pl. LXXXIV, figs 1—8.

Specific Characters.—Female. Body exceedingly slender and elongated, and perfectly cylindrical, being of the very same width throughout. Cephalic segment somewhat exceeding in length the 2 succeeding segments combined, rostrum small, triangular in form. The 3 succeeding segments without any distinct epimeral plates; last pedigerous segment somewhat larger than the preceding one. Urosome slightly exceeding in length the anterior division, genital segment not much larger than the others, and without any visible subdivision; last segment a little longer than the preceding one, and having the anal opercle rather prominent, and

semilunar in form. Caudal rami about twice as long as they are broad, and slightly divergent, outer edge with a slender bristle near the tip, middle apical seta of moderate length, with the proximal part somewhat thickened and sharply marked off from the thin setiform terminal part, dorsal seta issuing near the inner edge of the ramus, which here forms a slight bulging. Eye inconspicuous. Anterior antennæ nearly as long as the cephalic segment, and clothed in their outer part with slender bristles, 1st joint scarcely more than half as long as the 2nd, both together exceeding in length the remaining part of the antenna, sensory filament, as usual, issuing from the 4th joint. Posterior antennæ with the distal joint much shorter than the proximal one, outer ramus very small, issuing near the base of the proximal joint, and tipped with a single slender seta. 1st pair of legs with the inner ramus nearly as long as the outer, proximal joint with a slender seta inside, distal joint a little longer, linear in form, and carrying on the tip 2 unequal geniculate setæ accompanied inside by a small bristle, outer ramus with its 3 joints of about equal size, the terminal one armed at the end with 2 spines and 2 geniculate setæ. The 2 succeeding pairs of essentially the same structure and size, both with the inner ramus scarcely more than half the length of the outer. 4th pair of legs conspicuously larger than the preceding ones, the outer ramus being almost twice as long, with its first 2 joints considerably produced, terminal joint somewhat incurved and armed at the end with 4 coarsely spinulose setæ of unequal length; inner ramus shorter than the 1st joint of the outer, and tipped with a single spiniform seta finely ciliated in its outermost part. Last pair of legs extremely small, each forming a subtriangular lamella edged with 8 unequal setæ. Ovisacs narrow oblong in form, each containing only 3 large ova arranged in a single row.

Male somewhat smaller than female, and having the genital segment distinctly subdivided. Anterior antennæ more strongly built and slightly hinged, 4th joint a little dilated and subdivided near the end. Outer ramus of 2nd pair of legs carrying at the tip a very large, incurved, falciform claw, exceeding in length the whole ramus, and clothed inside with slender spinules. Inner ramus of 3rd pair of legs peculiarly transformed, exhibiting 2 unequal appendages issuing from a short basal part, the outer one forming a thin plate exserted into 2 finely ciliated setæ, the inner one a straight spine with 2 hook-like ledges inside near the end. Last pair of legs still smaller than in female, with the marginal setæ less developed.

Colour yellowish grey.

Length of adult female 1.20 mm.

Remarks.—This is the only species as yet known of the present genus. 2 other forms have certainly been referred to the same genus; but one of these, *C. fairliensis* Scott, has recently been raised by that author to the type of a new genus, *D'Arcythompsonia*, and the other *C. minor* Scott, is undoubtedly referable to the next genus to be treated of below.

Occurrence.—Some few specimens of this peculiar Copepod were taken last summer at Korshavn, near Lindesnæs, the southernmost point of Norway. The specimens occurred in a depth of about 20 fathoms on a bottom covered with muddy sand.

Distribution.—British Isles (Brady).

Gen. 72. **Stenocaris**, G. O. Sars, n.

Generic Characters.—Body of a slender narrow form similar to that in the preceding genus, but with the integuments rather thin and without any visible sculpturing. Rostrum well defined at the base. Genital segment in female scarcely subdivided. Caudal rami comparatively larger than in *Cylindropsyllus*. Anterior antennæ resembling in structure those in that genus. Posterior antennæ, however, with the outer ramus less rudimentary. Mandibular palp distinctly biarticulate. Posterior maxillipeds normally developed, terminating in a clawed hand. Inner ramus of 1st and 4th pairs of legs biarticulate, that of 2nd and 3rd pairs (in female) uniarticulate; 4th pair, as in *Cylindropsyllus*, larger than the others. 2nd pair of legs in male with both rami conspicuously transformed, 3rd pair with the inner ramus of comparatively simple structure. Last pair of legs more fully developed than in *Cylindropsyllus*, each armed inside with a strong spine, wanting, however, in male. 2 ovisacs present in female.

Remarks.—This new genus is closely allied to *Cylindropsyllus*, though differing rather materially in some particulars, and more especially in the altogether normal development of the posterior maxillipeds. The *Cylindropsyllus minor* of Scott is undoubtedly referable to the present genus.

209. Stenocaris gracilis, G. O. Sars, n. sp.

(Pl. CCXVI).

Specific Characters.—Female. Body very slender and narrow, cylindrical in form, though a little thickened in the genital region. Rostrum small, trian-

gular in form. Urosome about the length of the anterior division, genital segment scarcely larger than the preceding one, last segment with the anal opercle less prominent than in *Cylindropsyllus*. Caudal rami somewhat fusiform in shape and rather divergent, each with a slender bristle outside near the tip, middle apical seta of normal structure. Eye inconspicuous. Anterior antennæ rather slender, about equalling in length the cephalic segment, and 6-articulate, 1st joint short and thick, 2nd joint 3 times as long and somewhat tapering distally, terminal part composed of only 2 joints. Posterior antennæ with the proximal joint imperfectly subdivided in the middle, outer ramus narrow linear in form, with 2 slender setæ on the tip. Mandibular palp with the distal joint short but well defined from the proximal one. Posterior maxillipeds comparatively small, but exhibiting all the parts well defined. 1st pair of legs with the inner ramus shorter than the outer, and having its 2 joints of about equal length. 2nd and 3rd pairs with the inner ramus very small and tipped with a slender spine accompanied by a small bristle, its inner edge in 3rd pair smooth, in 2nd pair carrying a moderately long seta. 4th pair of legs much larger than the others, and resembling in structure those in *Cylindropsyllus;* inner ramus, however, considerably exceeding in length the 1st joint of the outer and carrying on the tip a strong spine with a broad fringe of cilia at the extremity. Last pair of legs forming each an oval lamella produced inside to a strong spiniform process, outer part of the lamella fringed with 6 slender setæ, within them being an elongated spine.

Male still more slender than female, and having the genital segment distinctly subdivided. Anterior antennæ transformed in much the same manner as in *Cylindropsyllus*. 2nd pair of legs much larger than in female, and having the 2nd basal joint produced between the 2 rami to an acute lobe curving outwards, terminal joint of outer ramus very large, nearly twice as long as the other 2 combined, and slightly incurved in its distal part, inner edge exhibiting in front of the middle 2 successive nodiform prominences, outer edge armed distally with 3 slender spines, tip carrying a moderately long straight spine terminating in a hook-like point; inner ramus distinctly biarticulate, with a short seta at the tip, and another inside the proximal joint. 3rd pair of legs much less transformed, inner ramus, however, as in 2nd pair, biarticulate, with the proximal joint very short, distal joint acutely produced at the tip, and carrying inside a small bristle. Last pair of legs smaller than in female, and without the spiniform process inside.

Colour whitish.

Length of adult female 1.75 mm.

Remarks.—This form, in all essential anatomical details, agrees very closely with the species described by Th. Scott as *Cylindropsyllus minor*. It is, how-

ever, of much larger size and more slender form of body, differing moreover very conspicuously in the structure of the caudal setæ, the middle of which, in Scott's species, has the form of a comparatively short and stout lancet-shaped lamella.

Occurrence.—Several specimens of this form, males and females, were found last summer at Korshavn in the same places where *Cylindropsyllus laevis* occurred.

Gen. 73. D'Arcythompsonia, Scott. 1906.

Generic Characters.—Body, as in the 2 preceding genera, slender cylindrical in form, with rather soft, thin integuments. Rostral projection small, not defined behind. Genital segment in female distinctly subdivided. Caudal rami small, but with one of the apical setæ much elongated. Anterior antennæ comparatively short, but composed of 7 well-defined joints, the 2nd not much prolonged. Posterior antennæ likewise more robust than in the preceding genera, with the outer ramus very small. Mandibular palp small, uni-articulate. Maxillæ with an oval setiferous lamella outside, masticatory lobe rather coarse, intermediate lobe apparently wanting. Anterior maxillipeds strongly built, with 2 short digitiform lobes inside the claw-shaped terminal joint. Posterior maxillipeds peculiarly transformed and very small, each forming a vertical immobile lamella armed with 2 claw-like recurved spines, and having a small nodiform appendage outside, tipped with a minute bristle. Natatory legs comparatively small, but with very long apical setæ, 1st pair only slightly differing from the others, inner ramus in all pairs distinctly biarticulate. Last pair of legs very small and rudimentary.

Remarks.—This genus has recently been established by Th. Scott, to include the form previously described by him as *Cylindropsyllus fairliensis*. This form, indeed, exhibits several well marked differences in its structural details, both from *Cylindropsyllus* and *Stenocaris*, though its right to a place in the same family with them is evident. The peculiar structure of the posterior maxillipeds has quite escaped the attention of Th. Scott, who erroneously describes the anterior maxillipeds as the posterior ones.

210. D'Arcythompsonia fairliensis, Scott.

(Pl. CCXVII).

Cylindropsyllus fairliensis, Th. Scott, in the Seventeenth Ann. Rep. of the Fishery Board for Scotland, Part. III, p. 258, Pl. X, figs 11—14, Pl. XI, figs 1—4.

Specific Characters.—Female. Body very slender and flexible, cylindrical in form, though a little wider posteriorly than anteriorly (the reverse of what is

generally found in Copepoda). Cephalic segment of moderate size and projecting in front to a very small rostral prominence. The 4 succeeding segments gradually increase in size, and are without distinct epimeral plates. Urosome considerably exceeding in length the anterior division, and composed of 5 well-defined segments, the genital segment being distinctly subdivided in the middle; last segment about the size of the preceding one, and having the anal opercle only slightly indicated. Caudal rami comparatively short and rather broad in their proximal part, but abruptly contracted distally, the outer edge forming in the middle a nearly rectangular bend, inner edge straight; middle apical seta very long, attaining nearly half the length of the body, and extended straight backwards. Eye inconspicuous. Anterior antennæ rather small, scarcely more than half as long as the cephalic segment, and clothed with comparatively short setæ, the 4 joints of the proximal part rather thick and of nearly equal length, terminal part narrowing abruptly, with the last joint longer than the other 2 combined. Posterior antennæ short and robust, with the distal joint scarcely as long as the proximal one, and armed with 7 claw-like spines, 2 on the outer edge and 5 on the blunted end; outer ramus very small, and tipped with a single spiniform seta. Mandibular palp likewise very small, and provided with only 2 apical setæ. 1st pair of legs with the inner ramus somewhat shorter than the outer, distal joint about the length of the proximal one, and armed at the tip with a strong claw-like spine and 2 very unequal setæ; terminal joint of outer ramus shorter than either of the 2 preceding joints, and armed at the end with 2 spines and 2 curved setæ. The 3 succeeding pairs of essentially the same appearance, inner ramus about the length of the first 2 joints of the outer combined, and provided at the end with a spine and 2 exceedingly long setæ, carrying moreover inside near the end a short seta, and in the 3rd pair another similar seta inside the proximal joint; terminal joint of outer ramus in 2nd pair with 1, in the 2 succeeding pairs with 2, comparatively small setæ inside. Last pair of legs extremely small, with 3 unequal setæ at the end, and another very slender seta attached to a knob-like projection outside.

Colour not yet ascertained.

Length of adult female 1.50 mm.

Remarks.—This form, as stated above, was at first referred by Th. Scott, though with some hesitation, to the genus *Cylindropsyllus* of Brady, to which it certainly bears a general external resemblance. Having, however, subsequently renewed his examination of both sexes, he became fully convinced of the generic distinctness of this form.

Occurrence.—I have seen only 2 female specimens of this remarkable form, taken many years ago off the west coast of Norway, the exact locality not being noted. One of these specimens, the one here figured, was provided with greatly developed ovarial tubes, the structure of which seemed to differ conspicuously from that generally found in this group of Copepoda. As seen from the 2 habitus-figures here given, in which these organs are represented as exactly as possible, the posterior parts of the tubes extending through the urosome are greatly dilated and contain each 4 large ovarial cells lying end to end, and exactly corresponding in the 2 tubes. At the junction of the anterior and posterior divisions of the body, or more correctly in the anterior part of the genital segment, the tubes become abruptly contracted, lying also somewhat more dorsally, and the enclosed cells rapidly diminish in size anteriorly. It is very probable that the large ovarial cells in the caudal part were ready to be discharged from the genital openings, to form 2 separate ovisacs, each with 4 ova arranged in a single row. Ovigerous specimens of this form have not, however, as yet been observed.

Distribution.—Scottish coast (Scott).

Fam. 17. Tachidiidæ.

Characters.—Body of somewhat varying shape, in some cases depressed, in other cases more cylindrical or fusiform. Anterior antennæ comparatively short, with the number of joints in some cases much reduced; those in male strongly hinged. Posterior antennæ with the outer ramus generally well developed. Oral parts on the whole more fully developed than in the 4 preceding families, the mandibular palp being always distinctly biramous. 1st pair of legs not prehensile, but generally resembling in structure the 3 succeeding ones; inner ramus of the latter well developed and 3-articulate, like the outer. Last pair of legs in some cases simple, lamelliform, but more generally of normal structure, with both joints well defined. Only a single ovisac present in female.

Remarks.—In this family I comprise a number of genera, which more or less distinctly group themselves around the well-known genus *Tachidius* of Lilljeborg, and which agree with those belonging to the 3 preceding families in the non-prehensile nature of the 1st pair of legs, but differ materially in the much fuller development of the oral parts and of the natatory legs. In addition to

the genera referred by Prof. Brady to his sub-family *Tachidiinæ*, the genus *Danielssenia* Boeck (= Jonesiella Brady) and *Fultonia* Scott are included in this family, and moreover 3 new genera, to be treated of further on.

Gen. 74. **Tachidius**, Lilljeborg, 1853.

Generic Characters.—Body short, sub-depressed, with the anterior division broader than the posterior. Rostral projection not defined behind. Genital segment in female imperfectly subdivided in the middle. Caudal rami of moderate size. Anterior antennæ comparatively short and thick, though composed of 6 or 7 well defined joints; those in male very strong, subcheliform. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus comparatively small, bi-articulate. Oral parts comparatively less fully developed than in most other Tachidiidæ, though of normal structure. Natatory legs very powerful and somewhat resembling in structure those in the *Cylopoida*, 1st pair differing only slightly from the succeeding pairs, and having the inner ramus distinctly 3-articulate; 2nd and 3rd pairs somewhat transformed in male. Last pair of legs simple, lamelliform, with no boundary between the distal and proximal joints.

Remarks.—This genus was established as early as the year 1853 by Prof. Lilljeborg, and is the type of the present family. In addition to the species originally described by Lilljeborg, 2 other species have been recorded in recent times, viz., *T. littoralis* Poppe, and *T. crassicornis* Scott. I am acquainted with only the type species.

211. Tachidius brevicornis, Lilljeb.

(Pl. CCXVIII & CCXIX).

Tachidius brevicornis, Lilljeborg, De crustaceis ex ordinibus tribus in Scania occurrentibus, p. 196, Pl. XXII, figs. 12—16, Pl. XXIII, figs. 112, 9, Pl. XXVI, figs. 17 & 18.

Syn: *Tachidius discipes*, Giessbrecht.

Specific Characters.—Female. Body comparatively short and stout, rapidly tapering behind, with the anterior division oblong oval in outline, and distinctly depressed in front. Cephalic segment large, exceeding in length the 3 succeeding segments combined, rostral projection obtusely conical in form. Last pedigerous segment considerably narrower than the preceding one. Urosome short, not attaining even half the length of the anterior division, and gradually tapering behind,

all the segments fringed at the posterior edge with delicate spinules; last segment about the length of the preceding one, and having the anal opercle finely spinulose at the edge. Caudal rami about as long as they are broad, and transversely truncated at the end, outer corner armed with a slender spine, middle apical seta exceeding half the length of the body. Eye large and very conspicuous in the living animal. Anterior antennæ much less than half the length of the cephalic segment, and distinctly 7-articulate, tapering gradually towards the end, and densely clothed with setæ, some of which are coarsely ciliated, 1st joint much the largest, terminal part exceeding half the length of the proximal one. Posterior antennæ with the outer ramus much shorter than the distal joint, and carrying 3 setæ, one lateral and 2 apical. Natatory legs with the basal part very broad and flattened; inner ramus of 1st pair slightly longer than the outer, that of the 3 succeeding pairs a little shorter, middle joint of this ramus rather large and expanded, in the 2nd and 3rd pairs carrying 2 setæ inside. Last pair of legs forming each a broad, rounded, quadrangular lamella edged with 9 comparatively short setæ. Ovisac large, oval in form, and projecting far beyond the caudal rami.

Male somewhat smaller than female, and having the urosome narrower and more elongated. Anterior antennæ very powerful, subcheliform, 4th joint of considerable size and globularly inflated, terminal part short, unguiform. 2nd and 3rd pairs of legs comparatively more strongly built than in female, inner ramus of 2nd pair with a conical deflexed process issuing from the end of the middle joint inside, outer ramus of 3rd pair of very coarse structure, with the setæ of the inner edge much reduced in size. Last pair of legs smaller than in female, with only 7 marginal setæ.

Body of whitish colour, with a slight yellow or orange tinge.

Length of adult female 0.60 mm.

Remarks.—I do not find it necessary to reject the specific name *brevicornis* under which the present form was first described. It may be that Lilljeborg's identification of this species with *Cyclops brevicornis* of O. Fr. Müller is untenable, but any difficulty in this respect will be avoided by simply annexing to the species the author-name of Lilljeborg instead of that of Müller.

Occurrence.—I have met with this form very abundantly in the neighbourhood of Christiania in shallow creeks of the Fjord, sometimes in brackish water. It also occurs under similar circumstances in many other places both on the south and west coasts of Norway, and Th. Scott also records it from East Finmark. It is a very active little animal, being almost constantly in motion, and running about with considerable speed. Males and young females are often found tied

together in copula, the female being firmly grasped in the middle by the powerful anterior antennæ of the male.

Distribution.—Baltic (Lilljeborg), British Isles (Brady), coast of France (Canu).

Gen. 75. **Pseudotachidius**, Scott, 1898.

Generic Characters.—Body robust, with the anterior division considerably expanded and rather sharply marked off from the posterior. Rostral projection conically produced, genital segment in female distinctly subdivided. Caudal rami very short. Anterior antennæ short and stout, 6-articulate, and clothed with strong ciliated setæ; those in male less strongly hinged than in *Tachidius*. Posterior antennæ with the proximal joint not subdivided, outer ramus rather large 3-articulate. Oral parts on the whole more fully developed than in *Tachidius*. Natatory legs densely spinulose; 1st pair with the inner ramus distinctly 3-articulate and much larger than the outer, being rather dilated at the base and angularly bent in the middle; inner ramus of 2nd and 3rd pair in male slightly transformed. Last pair of legs very small, but with the distal joint well defined.

Remarks.—This genus, established by Th. Scott, differs conspicuously in some respects from *Tachidius*, though exhibiting a general resemblance to that genus as regards outward appearance and the structure of the natatory legs. Only a single species is as yet known.

212. Pseudotachidius coronatus, Scott.

(Pl. CCXX).

Pseudotachidius coronatus, Th. Scott, Additions to the Fauna of Loch Fyne; Sixteenth Annual Report of the Fishery Board for Scotland, Part III, p. 267, Pl. XIII, figs. 22—26, Pl. XV, figs. 1—4.

Specific Characters.—Female. Body short and stout, with the anterior division oblong quadrangular in outline and much broader than the posterior. Cephalic segment large, almost equalling in length the 4 succeeding segments combined; rostral projection rather prominent and obtusely acuminate at the tip, which carries 2 delicate hair-like bristles. Last pedigerous segment much narrower than the preceding ones, and slightly produced on either side. Urosome about half the length of the anterior division, and of almost uniform width throughout, posterior edge of the segments minutely spinulose; last segment

shorter than the preceding one, and having the anal opercle smooth. Caudal rami very short, being scarcely half as long as they are broad, outer corner armed with a short spine, the 2 middle apical setæ very slender and coarsely ciliated in the middle, the inner one fully twice as long as the urosome. Eye wholly absent. Anterior antennæ scarcely attaining half the length of the cephalic segment, and only slightly tapering distally, 2nd joint the largest, terminal part biarticulate and very short, blunt at the tip. Posterior antennæ rather short and stout, with a strong seta issuing from the proximal joint in front; outer ramus very fully developed, and attached near the end of the proximal joint, extending considerably beyond the distal joint, and provided with 6 plumose setæ, 2 apical and 4 lateral. Basal part of mandibular palp forming a rather large expansion inside, carrying 4 densely plumose setæ. Maxillæ with the epipodal lobe comparatively large, lamelliform, and edged with 4 setæ. Anterior maxillipeds having the basal part unusually broad, but with the digitiform lobes small and wide apart. Posterior maxillipeds of moderate size, hand oval in form and densely spinulose inside, dactylus shorter than the hand. 1st pair of legs with the inner ramus almost twice as long as the outer, 1st joint considerably dilated, and carrying inside a comparatively short plumose seta, 2nd joint somewhat obliquely truncated at the end, and provided inside with a strong spiniform seta, terminal joint somewhat longer than the preceding one, with 2 unequal spiniform setæ on the tip, and another inside; all the joints clothed outside with slender spinules. The 3 succeeding pairs resembling in structure those in *Tachidius*, but more coarsely spinulose. Last pair of legs, however, very different, distal joint well defined but rather small, obliquely truncated at the tip, and fringed with 4 comparatively short setæ, proximal joint provided outside with the usual digitiform process, innermost part of the joint forming a narrow linguiform expansion carrying on the tip a slender bristle accompanied by 2 or 3 small spines. Ovisac very small, only containing 2 juxtaposed ova.

Male with the anterior antennæ, as usual, hinged, but not nearly so strongly built as in *Tachidius*, the 4th joint being of much smaller size. Inner ramus of 2nd pair of legs with the terminal joint more tapered than in female, and carrying on the tip 2 unequal spines, spine of outer edge wanting; inner ramus of 3rd pair of legs having the outer corner of the middle joint produced to a short, somewhat hamiform process. Last pair of legs of a similar structure to that in female, but of smaller size.

Colour whitish grey.

Length of adult female 0.97 mm.

Remarks.—This form was described by Th. Scott in the year 1898 as the type of the present genus. It may easily be recognized by its short, stout form and the abrupt contraction of the posterior division of the body, as also by the stout and densely hirsute anterior antennæ.

Occurrence.—I have taken this form rather abundantly in 2 places on the Norwegian coast, viz., at Bukken and in the Lyngdal Fjord, near Farsund. It is a true deep-water form, only occurring in greater depths ranging from 40 to 100 fathoms, muddy bottom.

Distribution.—Scottish coast (Scott).

Gen. 76. **Tachidiella**, G. O. Sars, n.

Generic Characters.—Body short, sub-depressed, with the anterior division very much broader than the posterior. Rostral projection not defined behind. Genital segment in female imperfectly subdivided. Caudal rami very short, but with the apical setæ rather coarse. Anterior antennæ short, 8-articulate, and densely clothed with partly ciliated setæ. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus comparatively small, bi-articulate. Mandibles, maxillæ and anterior maxillipeds of normal structure. Posterior maxillipeds, however, distinguished by the substitution of a short joint carrying 4 subequal spines, for the dactylus. 1st pair of legs somewhat similar to those in *Pseudotachidius*, the inner ramus being much larger than the outer, and distinctly 3-articulate. The 3 succeeding pairs of legs powerfully developed, with the rami subequal in size. Last pair of legs with the distal joint well defined, proximal joint forming inside a rather prominent setiferous expansion.

Remarks.—This new genus in some respects combines characters of both the 2 preceding genera. The peculiar structure of the posterior maxillipeds is very characteristic of the genus, recalling that in the genus *Bradya* among the *Ectinosomidæ*. I am as yet acquainted with only a single species.

213. Tachidiella minuta, G. O. Sars, n. sp.

(Pl. CCXXI).

Specific Characters.—*Female.* Body comparatively short and stout, with the anterior division regularly oval in form, and sharply marked off from the posterior. Cephalic segment large, exceeding in length the 4 succeeding segments combined; rostral projection rather prominent and narrowly rounded at the tip.

Last pedigerous segment very small. Urosome about $^2/_3$ the length of the anterior division, with the posterior edges of the segments minutely spinulose ventrally and laterally, genital segment rather large and expanded, last segment much shorter than the preceding one, and having the anal opercle very small and smooth. Caudal rami scarcely half as long as they are broad, and transversely truncated at the tip, innermost apical seta twice as long as the outermost, inner medial seta remarkably strong and considerably thickened in its proximal part, being about half the length of the body. Eye apparently present, but very small. Anterior antennæ not nearly half the length of the cephalic segment, and gradually tapering distally, 1st and 2nd joints the largest, terminal part exceeding half the length of the proximal one. Posterior antennæ with the outer ramus scarcely more than half as long as the distal joint, and carrying 5 setæ, 2 on the 1st and 3 on the very small last joint. 1st pair of legs with the outer ramus widening very considerably distally, its last joint being much larger than either of the 2 preceding ones and armed with 4 spines and 2 setæ, the spines being fringed, like those on the 2 preceding joints, with slender spinules along the outer edge; inner ramus nearly twice as long as the outer, and straight, 1st joint much the largest, 2nd joint obliquely produced outside, last joint sub-linear and carrying at the end 2 slender setæ and an intermediate ciliated spine. Inner ramus of the 3 succeeding pairs with the middle joint acutely produced at the outer corner, terminal joint carrying on the tip a long spine and 2 comparatively small setæ, its inner edge being provided in the 2nd pair with one, in the 3rd pair with 3, and in the 4th pair with 2 setæ. Last pair of legs with the distal joint of rounded oval form, and edged with 4 comparatively short setæ; inner expansion of proximal joint extending considerably beyond the distal joint and carrying on the narrowly truncated end 2 unequal setæ and inside them a short spine.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.43 mm.

Remarks.—This small Copepod has at first sight a certain resemblance to the species of the genus *Idyæa*, Philippi, the anterior division being distinctly depressed and sharply marked off from the posterior. The structure of the several appendages, however, is very different, and proves it to belong in reality to the present family.

Occurrence.—Some specimens of this form, all of the female sex, were picked up from a sample taken at Skutesnæs, south-west coast of Norway, from a depth of about 12 fathoms.

Gen. 77. **Robertsonia**, Brady, 1880.

Generic Characters.—Body not depressed, almost cylindric in form, though tapering behind, with no very sharp demarcation of the 2 divisions. Rostrum prominent, well defined behind. Genital segment imperfectly subdivided in female. Caudal rami short. Anterior antennæ comparatively short and stout, with the number of joints somewhat reduced; those in male distinctly hinged. Posterior antennæ with the proximal joint not subdivided, outer ramus well developed, though composed of only 2 joints. Oral parts normal. 1st pair of legs only slightly differing in structure from the 3 succeeding ones, inner ramus 3-articulate and about the length of the outer; inner ramus of 2nd pair of legs in male conspicuously transformed. Last pair of legs of normal appearance, with both joints well defined.

Remarks.—This genus was established in the year 1880 by Prof. Brady, and was referred by that author to his sub-family *Tachidiinæ*. I am also of opinion, that this genus is more properly referable to the present family, although the general form of the body is rather unlike that in the typical genus *Tachidius*. Only one species has as yet been observed.

214. Robertsonia tenuis, Brady.

(Pl. CCXXII).

Robertsonia tenuis, Brady, Monogr. of Brit. Copepoda, Vol. II, p. 25, Pl. XLI, figs. 1—14.

Specific Characters.—Female. Body moderately robust, somewhat dilated in front, and rapidly tapering behind. Cephalic segment large and deep, fully equalling in length the 4 succeeding segments combined; rostrum rather prominent and narrow triangular in form, tip obtusely acuminate. Epimeral plates of the 3 succeeding segments well developed and acutely produced at the posterior corner. Last pedigerous segment almost as broad as the preceding segment. Urosome somewhat exceeding half the length of the anterior division, and gradually tapering distally, posterior edge of the segments coarsely spinulose, genital segment, fully as long, as the remaining segments combined. Caudal rami broader than they are long and obtusely truncated at the end, edges partly spinulose, apical setæ of moderate length and normal structure. Eye distinct though rather small. Anterior antennæ much less than half the length of the cephalic segment, and rather densely clothed with comparatively short, partly ciliated setæ, being composed of 5 joints only, 3 of them belonging to the proximal part, terminal part about half the length of the latter, with the 1st joint very small. Posterior

antennæ short and stout, with the proximal joint scarcely longer than the distal one, and carrying in front a strong ciliated seta; outer ramus about the length of the distal joint, and provided with 4 setæ, 2 apical and 2 lateral. Posterior maxillipeds of moderate size, with a long seta issuing from the basal joint in front, hand finely ciliated inside, dactylus scarcely longer, and clothed inside with slender spinules. 1st pair of legs with the inner ramus projecting a little beyond the outer, both coarsely spinulose outside. The 3 succeeding pairs rather strongly built, with the inner ramus a little shorter than the outer. Last pair of legs with the distal joint comparatively small, cordiform in shape, with 5 marginal setæ; inner expansion of proximal joint well developed, broadly triangular in form, and extending considerably beyond the distal joint, marginal setæ 5 in number, and rather strong, spiniform, the outermost the smallest.

Male with the anterior antennæ moderately strong and composed of 7 well defined joints, the 4th being somewhat dilated. 1st pair of legs with a highly chitinized plug-like prominence inside the 2nd basal joint. Inner ramus of 2nd pair of legs transformed in much the same manner as in the *Thalestridæ*, middle joint carrying at the end outside 2 closely juxtaposed spiniform appendages, the outer of which is very coarse. Last pair of legs smaller than in female, with the inner expansion of the proximal joint much reduced in size, and provided with only 2 spiniform setæ.

Colour more or less reddish.

Length of adult female 0.80 mm.

Remarks.—In its outward appearance the present form somewhat recalls certain species of the genus *Amphiascus*. The structure of the 1st pair of legs, however, is very different, and the female is only provided with a single ovisac. Also the other structural details prove it to be much more nearly allied to the genus *Tachidius*, as was also suggested by Prof. Brady.

Occurrence.—I have taken this form rather abundantly in one place, near Farsund, on a muddy bottom at a depth of about 20 fathoms. It also occurs occasionally in some other localities of the south coast of Norway (Lillesand, Risör), as also in the upper part of the Christiania Fjord.

Distribution.—British Isles (Brady), Arctic Ocean, off Spitsbergen and Franz Josef Land (Scott).

Gen. 78. **Danielssenia**, Boeck. 1873.

Syn: *Jonesiella*, Brady. 1880.

Generic Characters.—Body more or less fusiform in shape, with no sharp demarcation between the 2 divisions. Rostrum well defined behind, forming a very thin and hyaline plate. Genital segment in female imperfectly subdivided. Caudal rami, as a rule, rather short. Eye well developed. Anterior antennæ very small, with the number of joints much reduced, some of the setæ very strong and coarsely spinulose; those in male strongly hinged, sub-cheliform. Posterior antennæ with the proximal joint not subdivided; outer ramus well developed, 3-articulate. Oral parts on the whole built on the same type as in the other genera of the present family. Natatory legs coarsely spinulose, with the rami comparatively narrow and provided at the tip with coarse spiniform setæ; 1st pair differing from the others in the fact that the inner ramus is composed of only 2 joints. Inner ramus of 2nd pair of legs in male conspicuously transformed. Last pair of legs with the distal joint well defined, inner expansion of proximal joint in female linguiformly produced.

Remarks.—This genus was established by Boeck as early as the year 1873, but was rather imperfectly characterised. The genus *Jonesiella* of Brady is undoubtedly identical with Boeck's genus, and this name ought of course to be replaced by that proposed by Boeck. Prof. Brady placed this genus within his sub-family *Stenheliinæ*; but I think that such an arrangement cannot properly be defended, as its affinity to the 3 other genera included by Brady in that sub-family is in reality a very remote one. On the other hand, the several appendages are built, upon the whole, upon the type characteristic of the present family. In addition to the 2 species described below, a 3rd well-defined species *(D. sibirica)* has been characterised and figured by the present author, and a 4th species *(D. Braccei)* has been recorded by Th. Scott from the coast of Novaja Sembla. The form at first described by Th. Scott as *Jonesiella hyænæ* has, on the other hand, recently been raised by that author to the type of a distinct genus *Thompsonula*.

215. Danielssenia typica, Boeck.

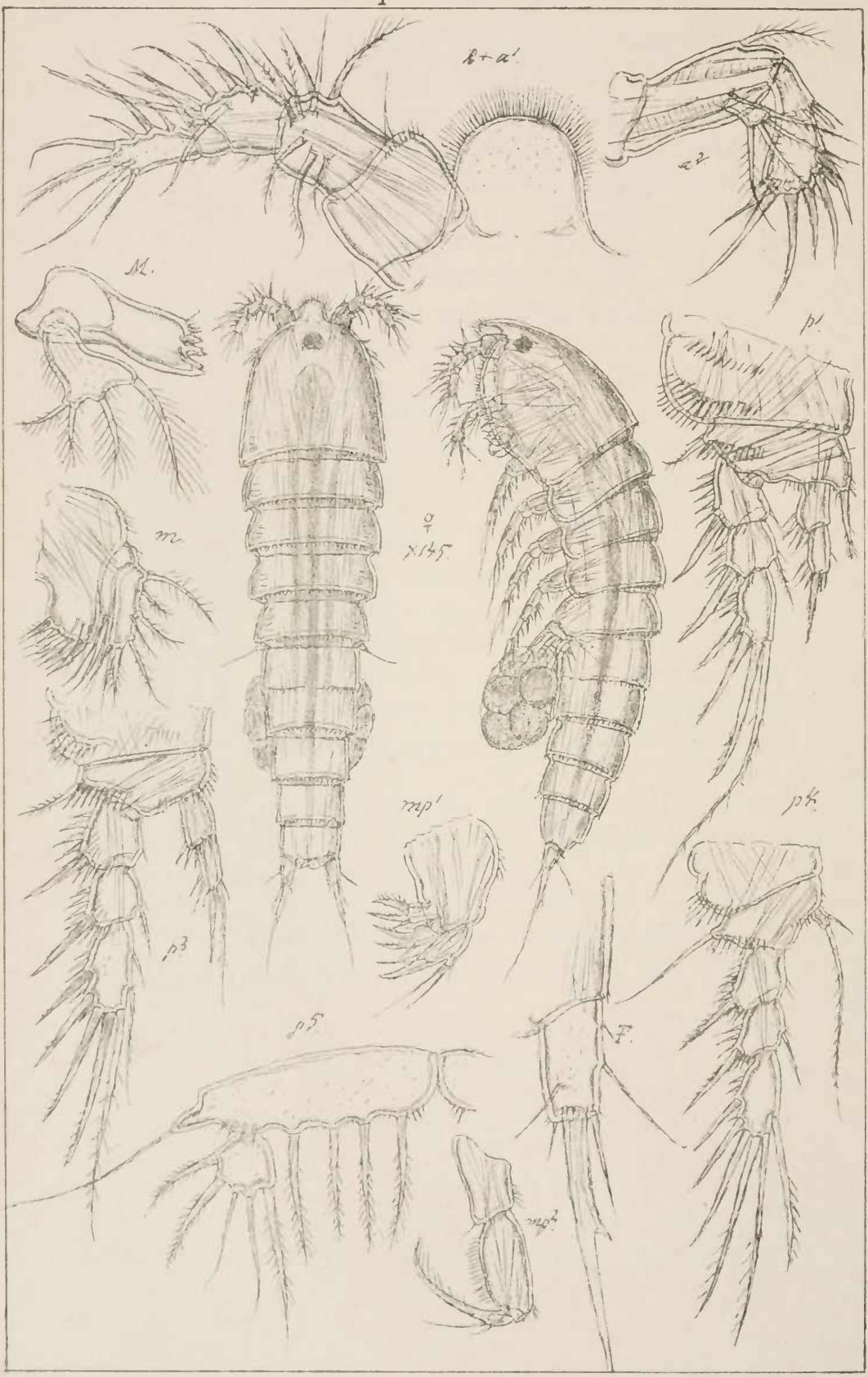
(Pl. CCXXIII).

Danielssenia typica, Boeck, Nye slægter og Arter of Saltvandscopepoder. Chr. Vid. Selsk. Forh. f. 1872, p. 55.

Syn: *Jonesiella spinulosa*, Brady.

Specific Characters.—Female. Body comparatively short, slightly depressed in its anterior part, and evenly contracted both in front and behind. Cephalic

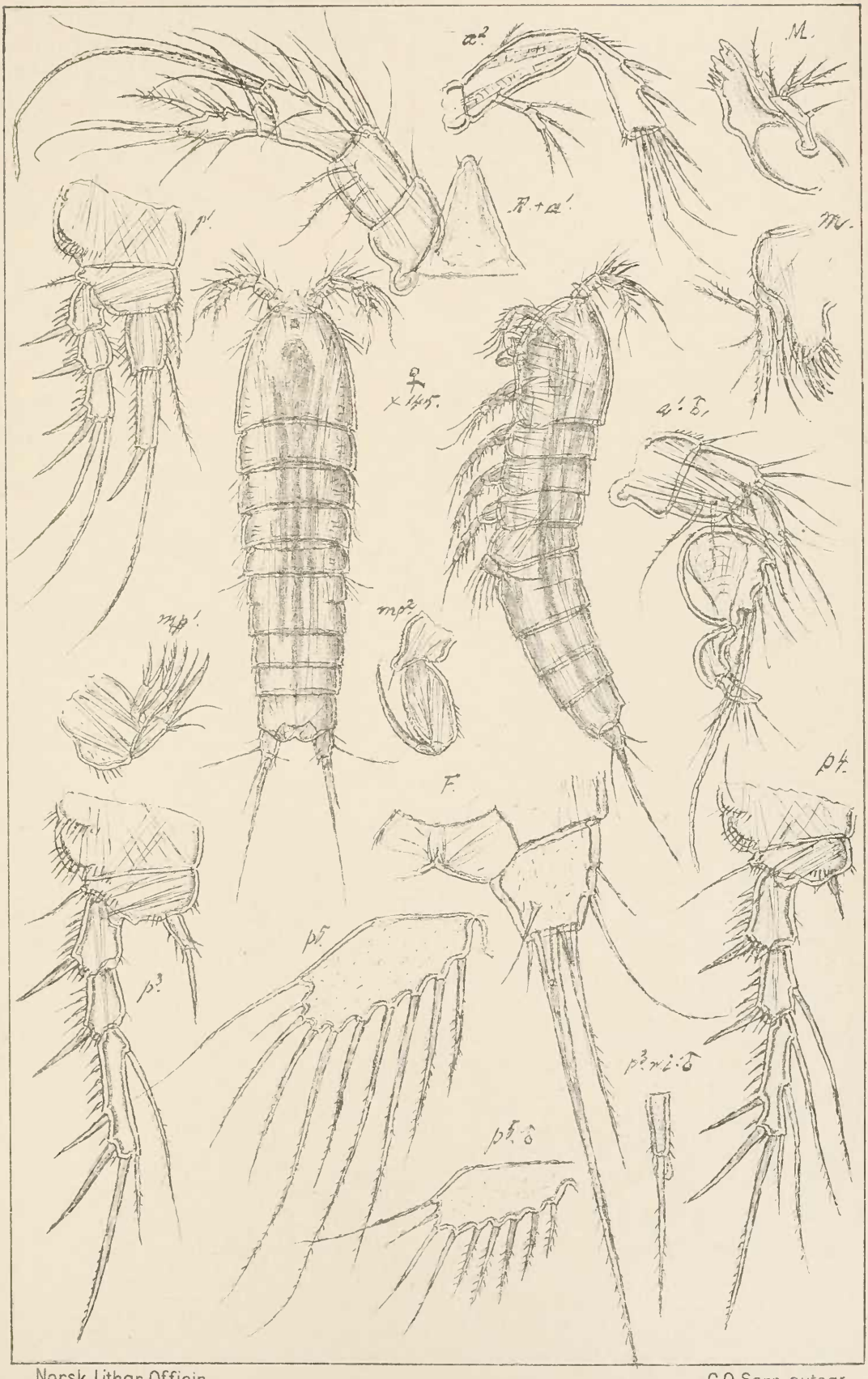
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Nannopus palustris, Brady

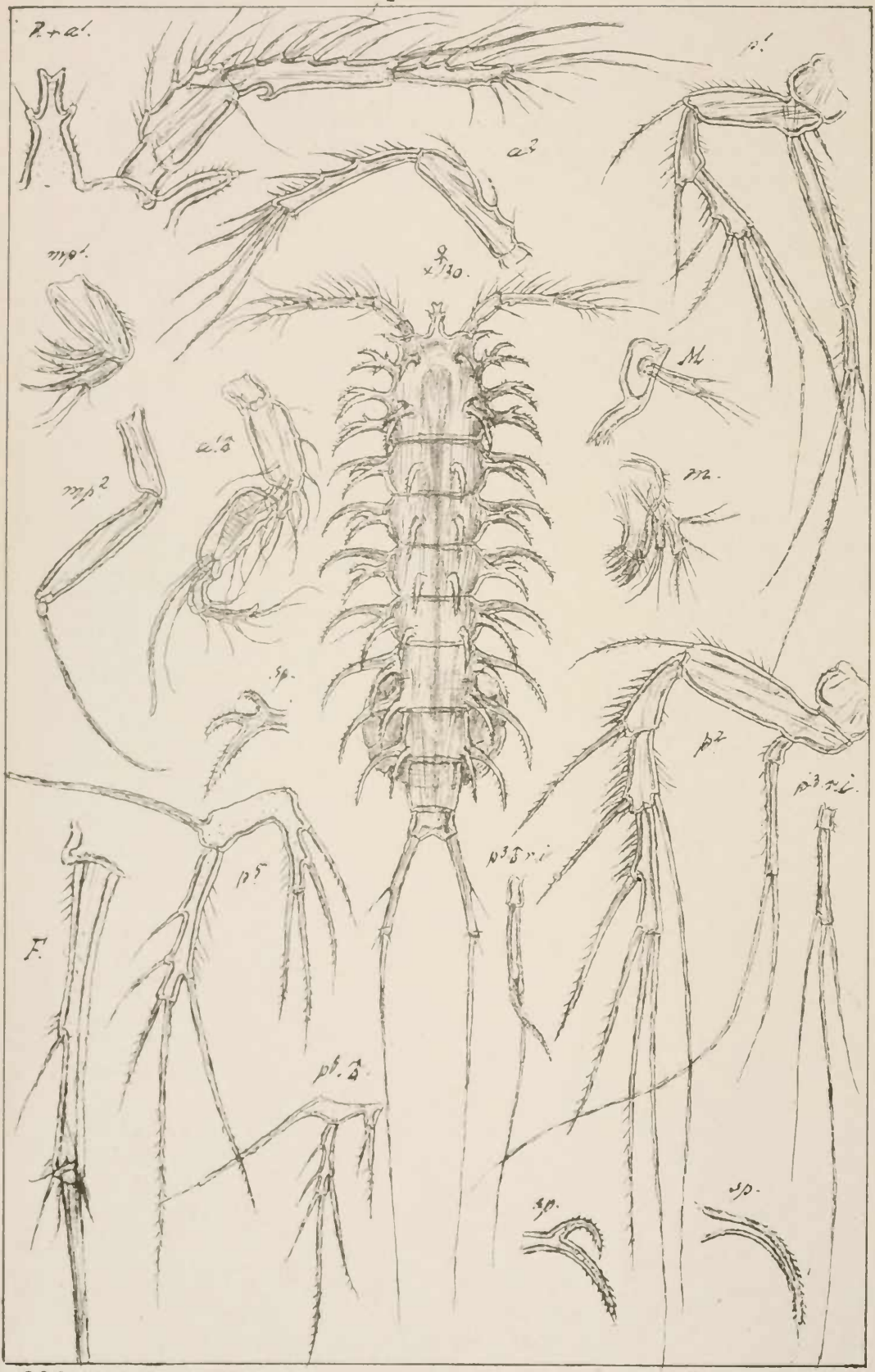
Copepoda



Norsk Lithgr. Officin. G.O. Sars, autogr.

Pontopolites typicus, Scott

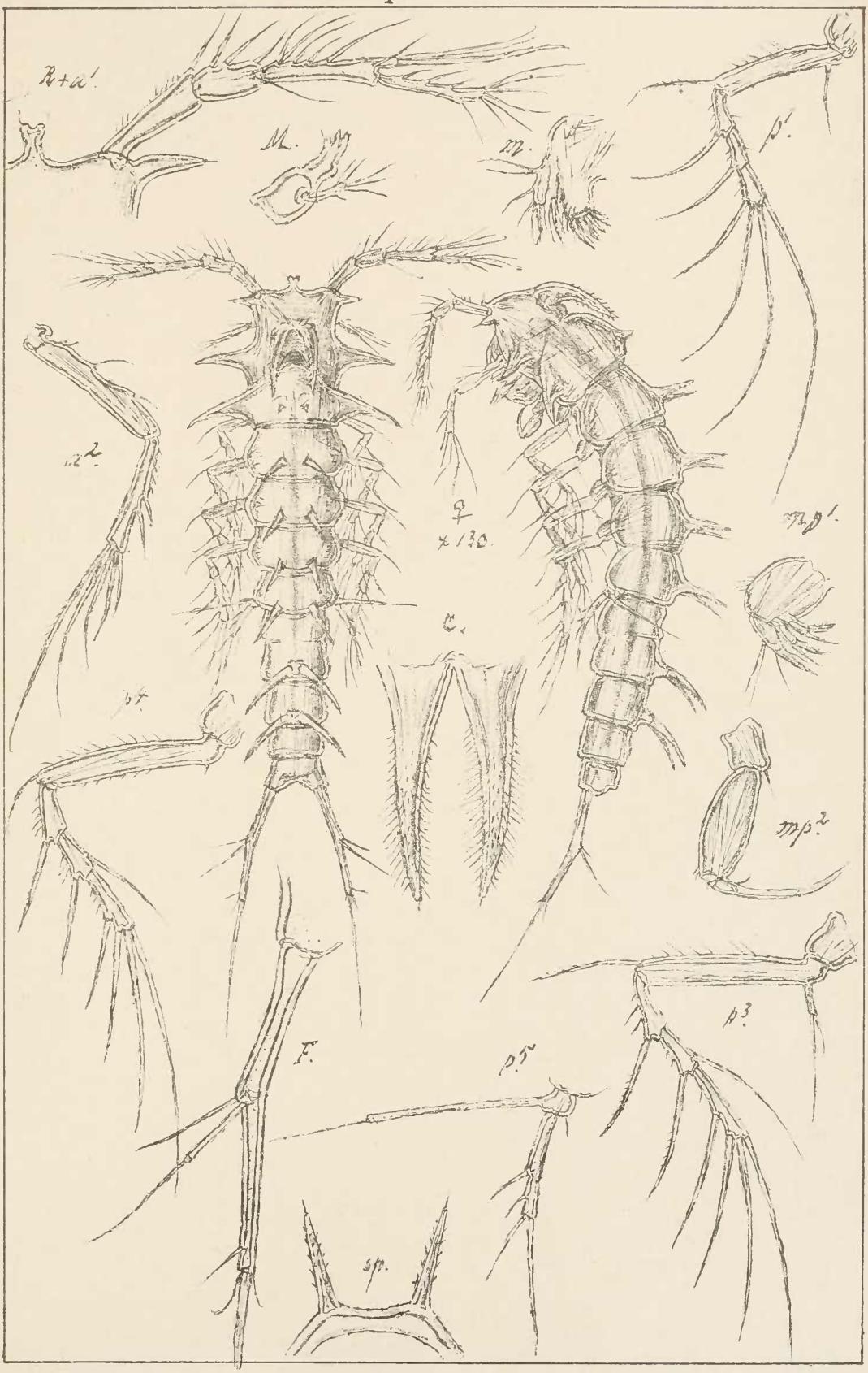
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Anchorabolus mirabilis, Norm.

Copepoda

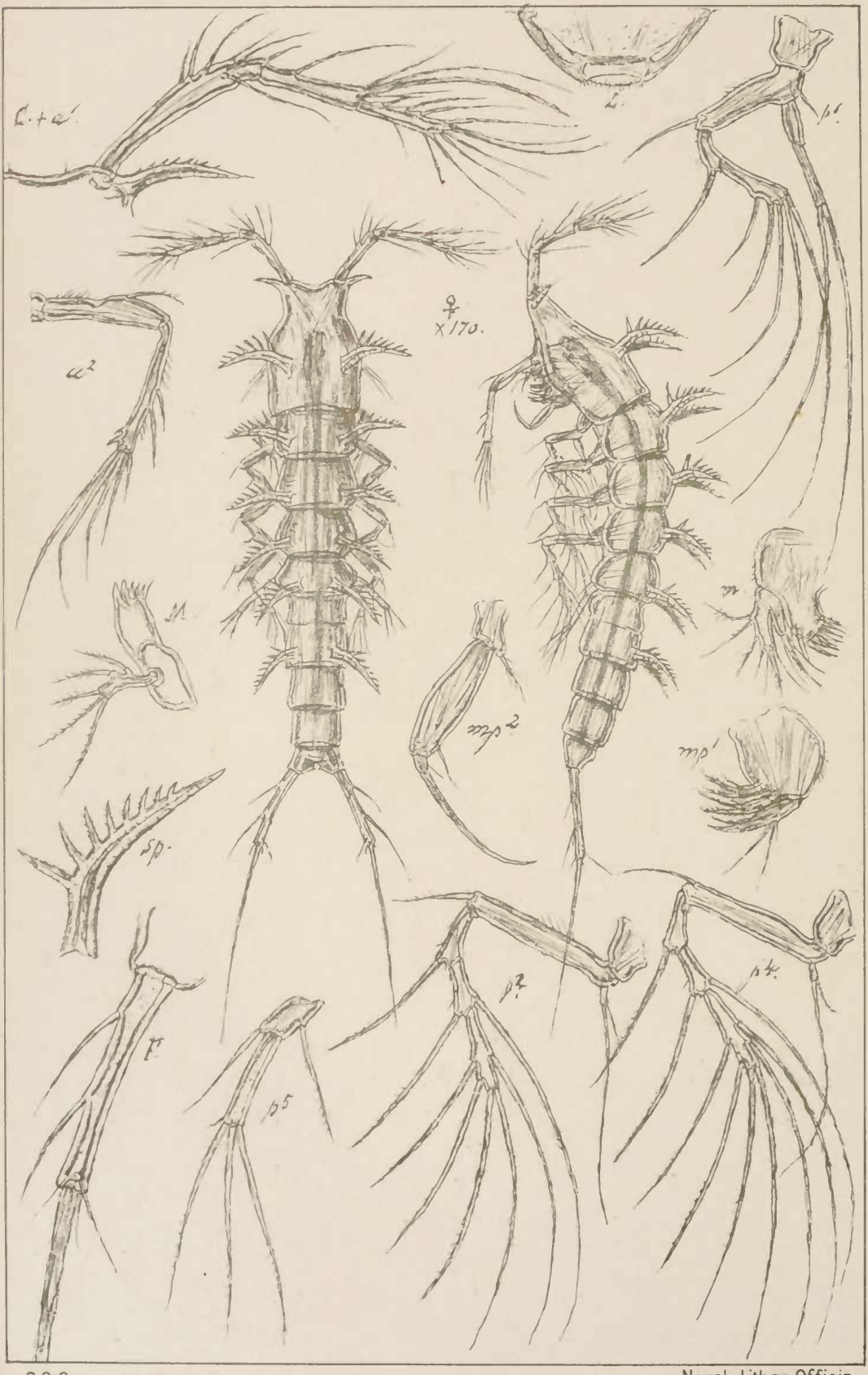


G.O.Sars, autogr. Norsk Lithgr. Officin

Echinopsyllus Normani, G.O.Sars

Copepoda

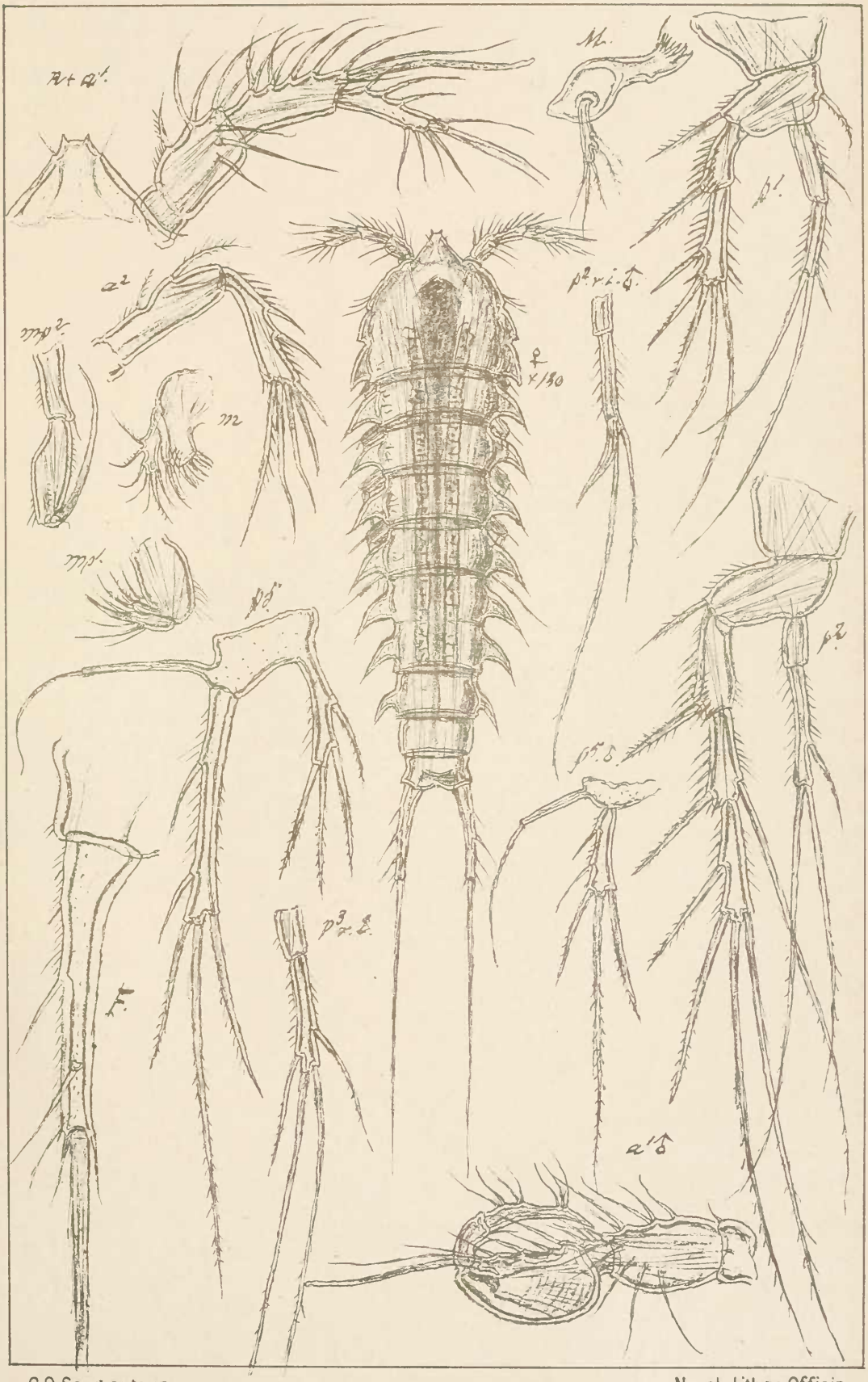
Anchorabolidæ — Harpacticoida — Pl. CCXIII.



G.O.Sars, autogr. — Norsk Lithgr. Officin.

Ceratonotus pectinatus, G.O.Sars

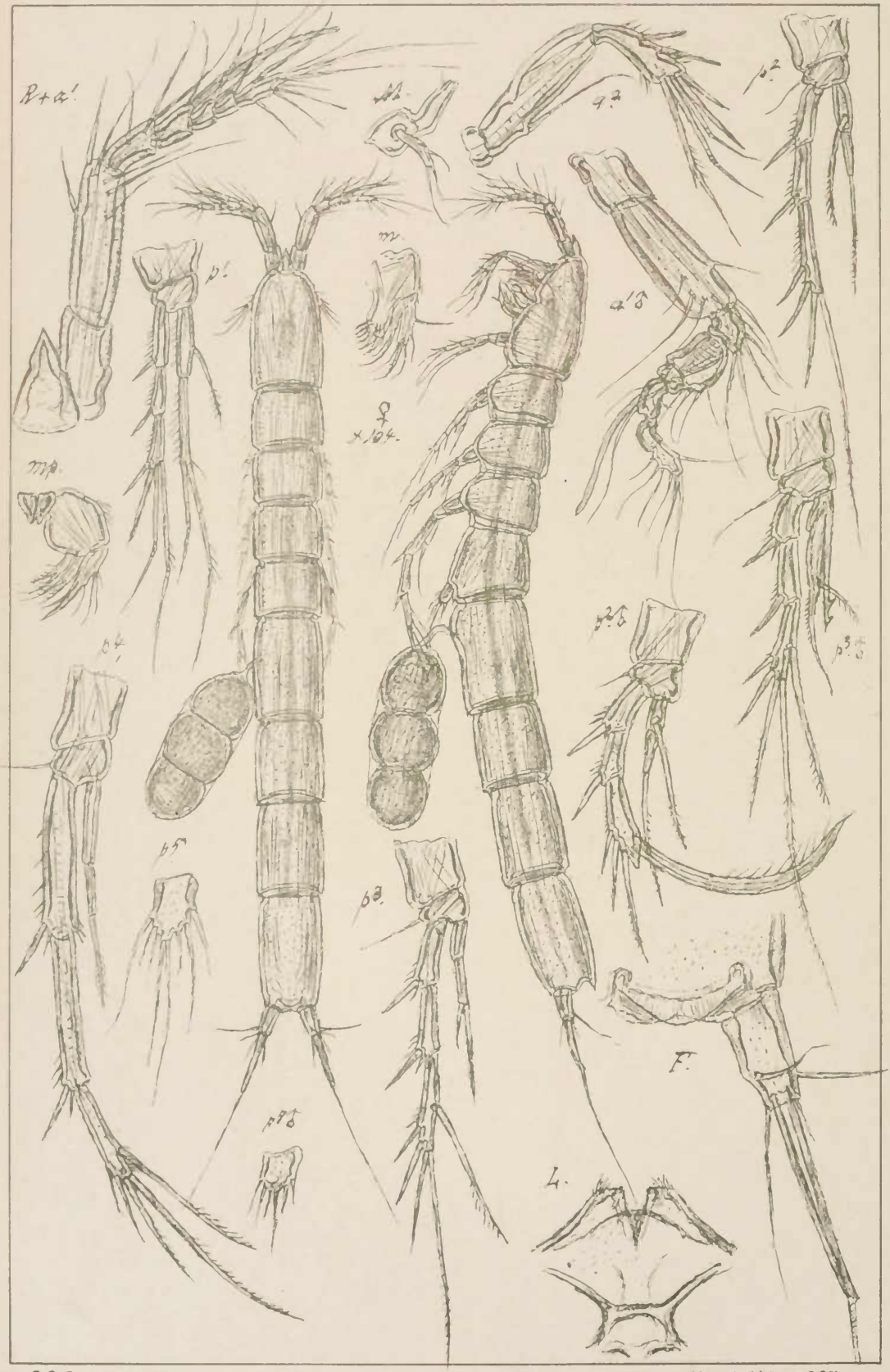
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Arthropsyllus serratus, G.O.Sars

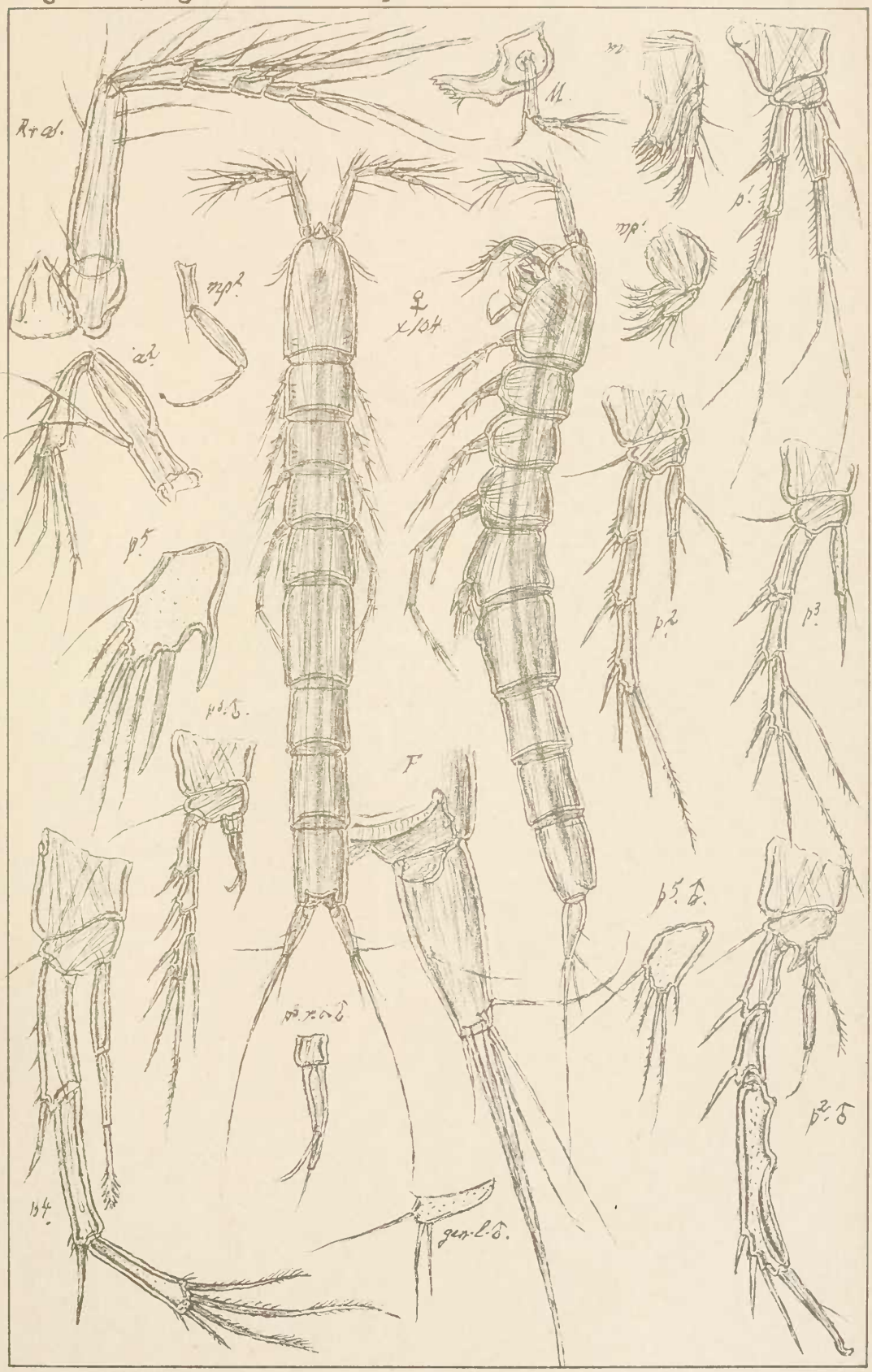
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin

Cylindropsyllus lævis, Brady

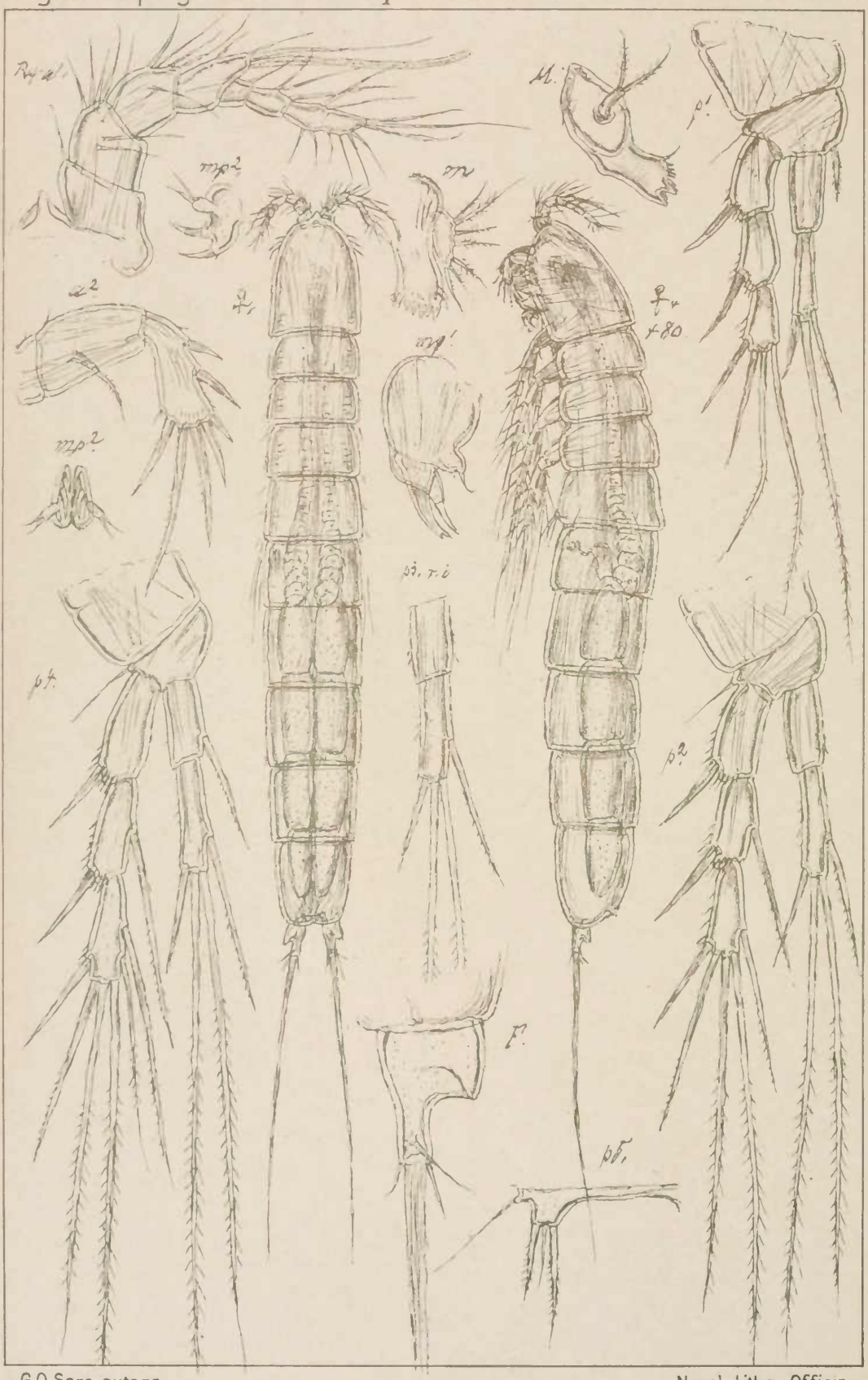
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Stenocaris gracilis, G.O.Sars

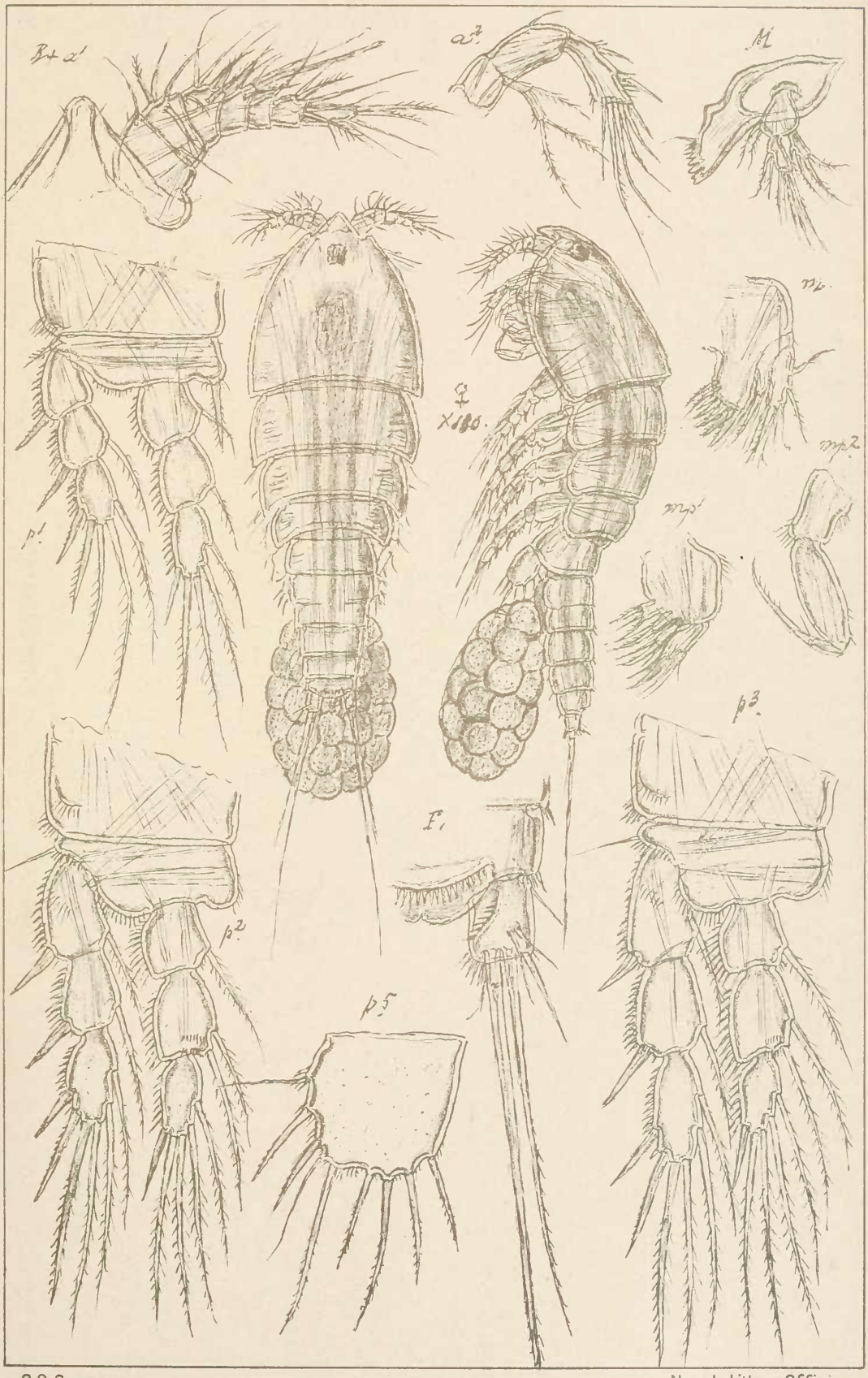
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

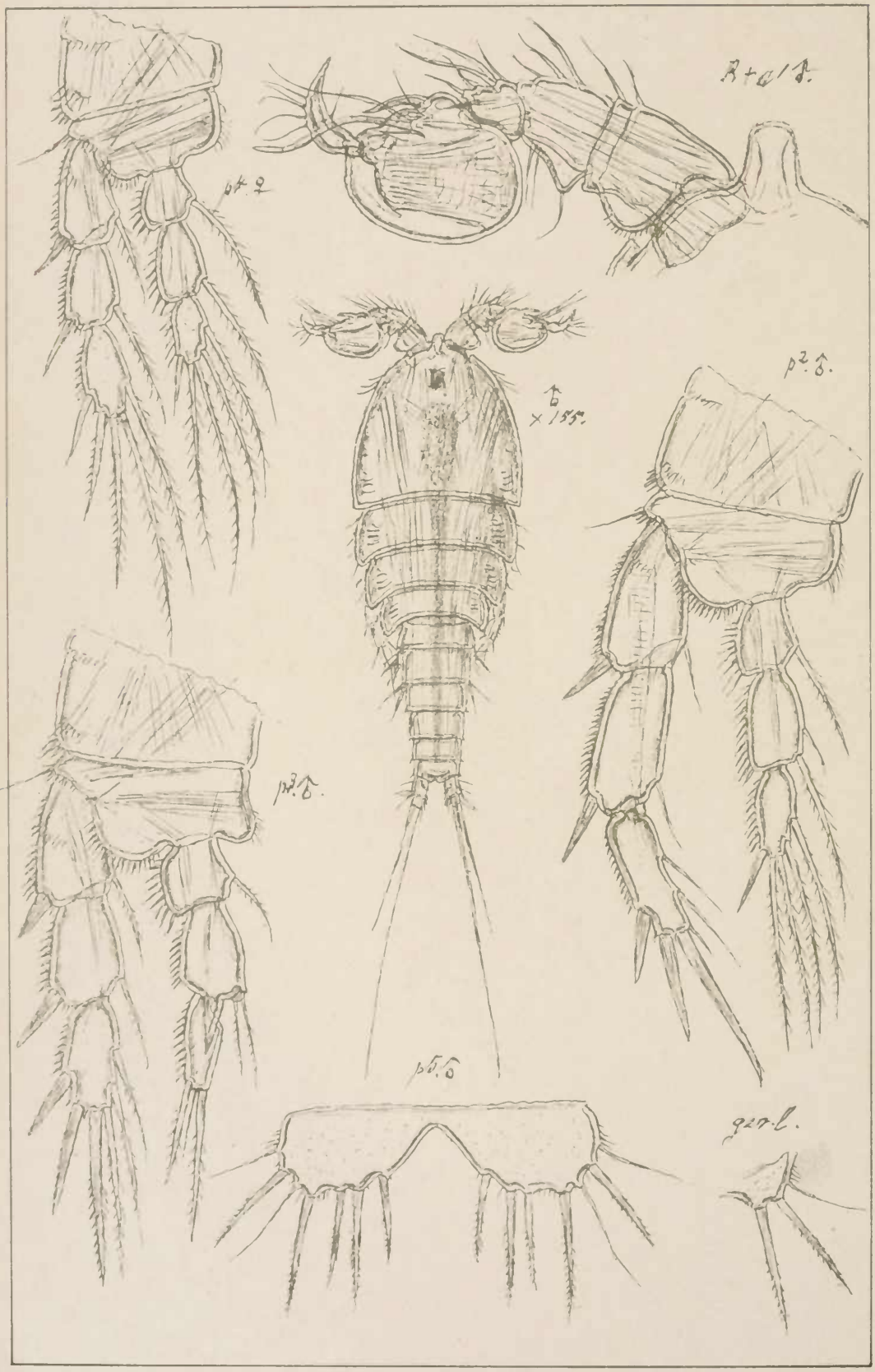
D'Arcythompsonia fairliensis, Scott

Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

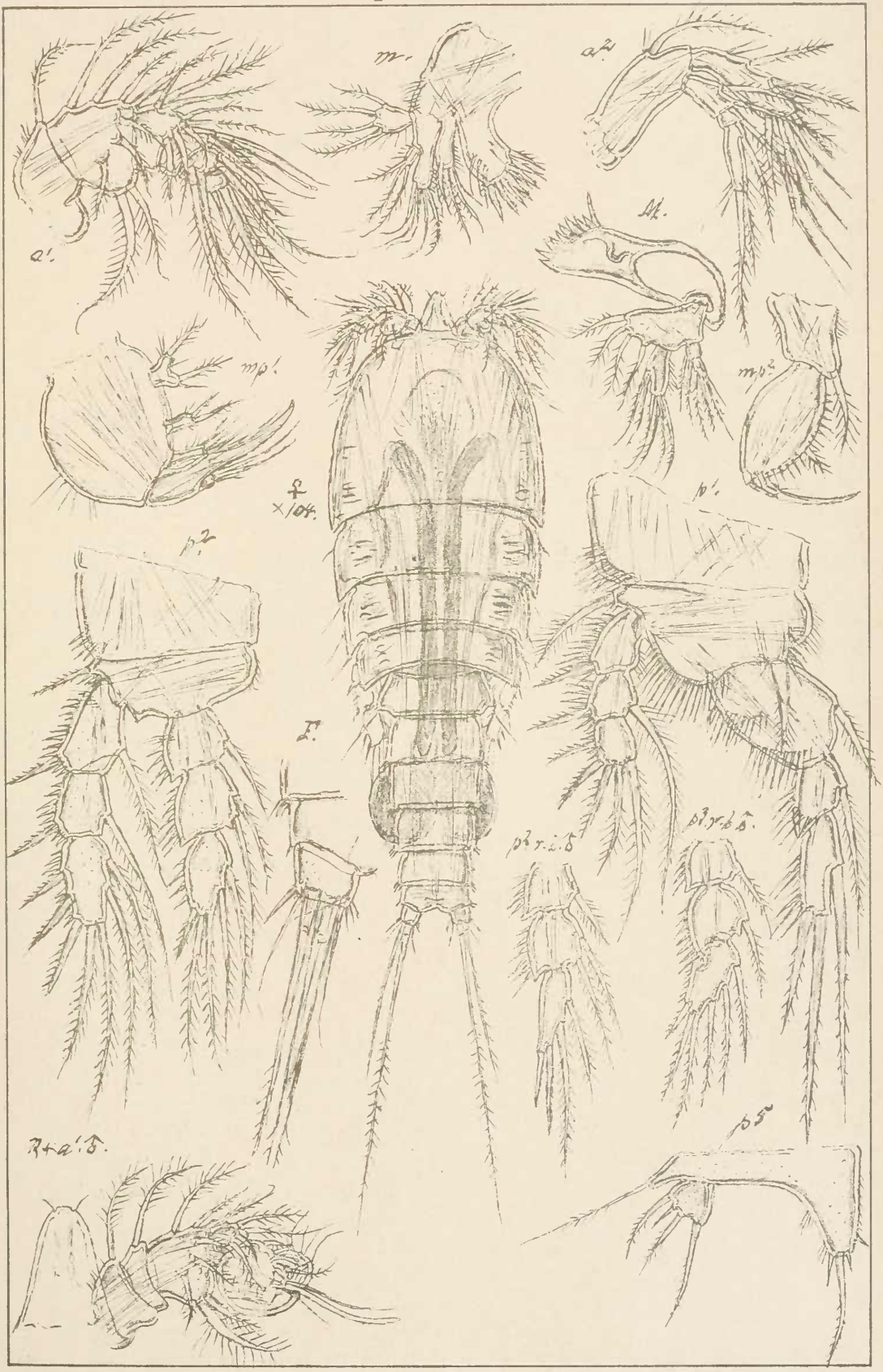
Tachidius brevicornis, Lilljeb.



G.O.Sars, autogr. Norsk Lithgr. Officin.

Tachidius brevicornis, Lilljeb. (continued)

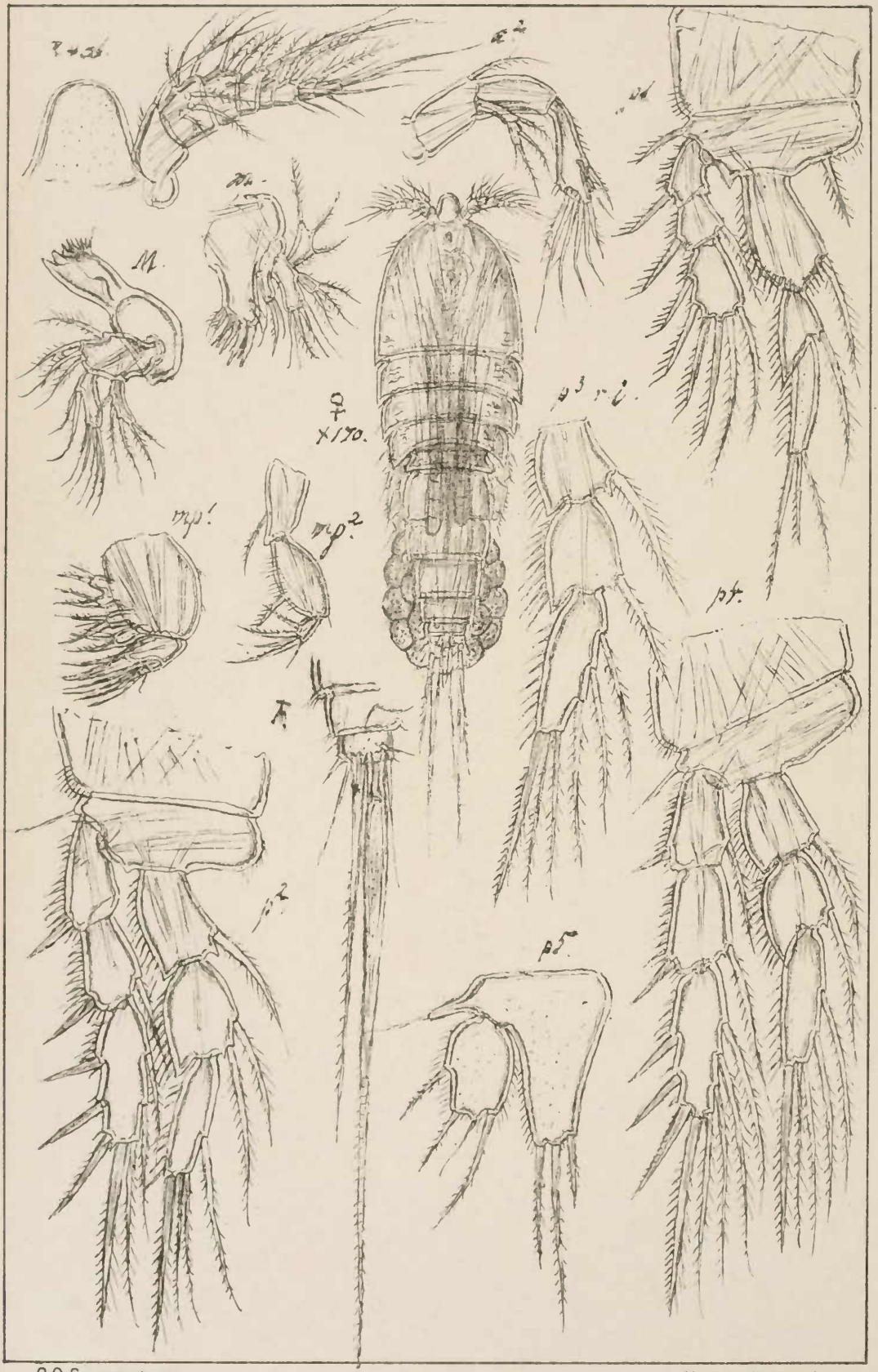
Copepoda



G.O.Sars, autogr. Norsk Lithgr. Officin.

Pseudotachidius coronatus, Scott

Copepoda

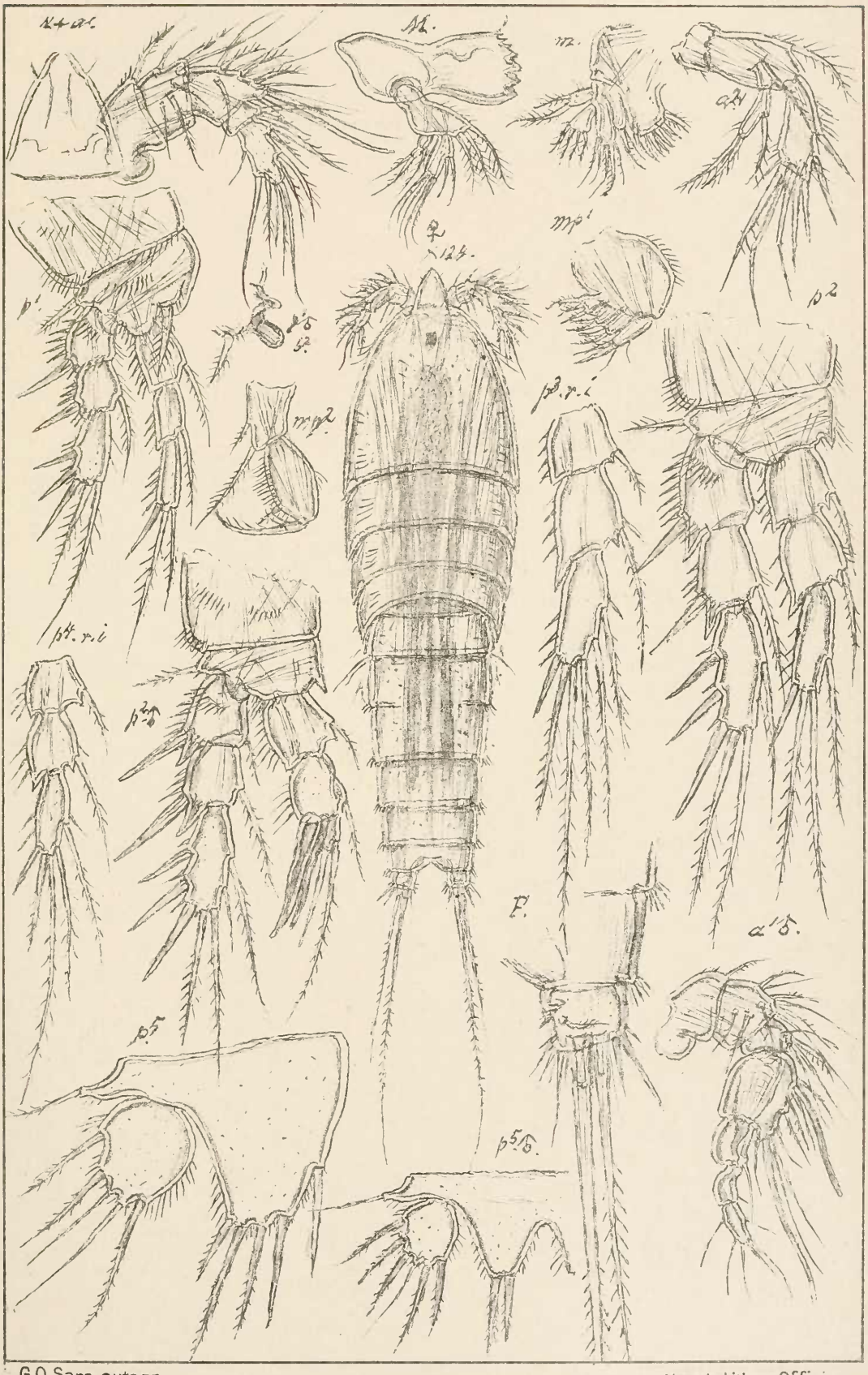


G.O.Sars, autogr. Norsk Lithgr. Officin.

Tachidiella minuta, G.O.Sars

Copepoda

Tachidiidœ — Harpacticoida — Pl. CCXXII.

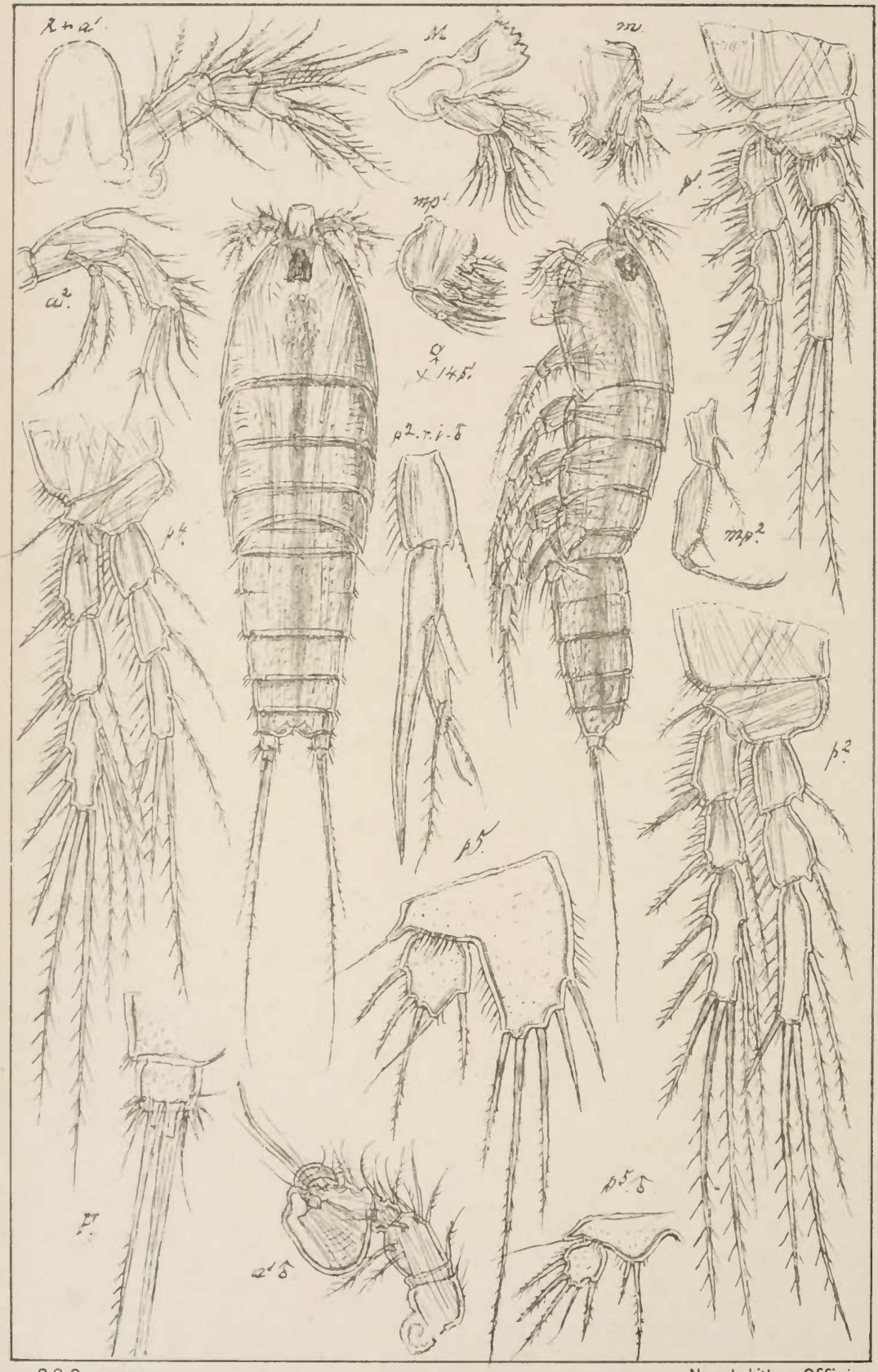


G.O.Sars, autogr. — Norsk Lithgr. Officin.

Robertsonia tenuis, Brady

Copepoda

Tachidiidæ — Harpacticoida — Pl. CCVIII

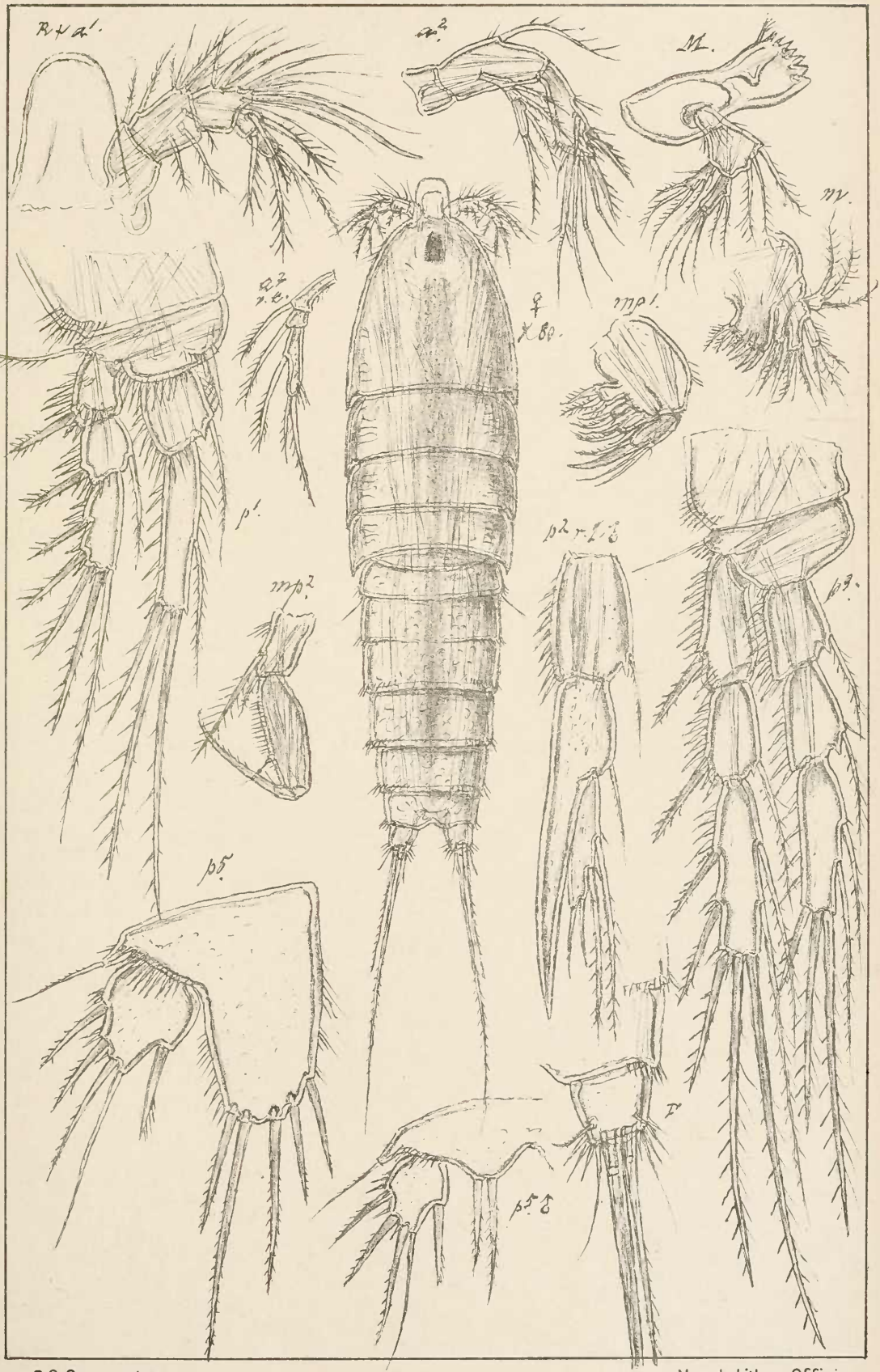


G.O.Sars, autogr. — Norsk Lithgr. Officin.

Danielssenia typica, Boeck

Copepoda

Tachidiidœ — Harpacticoida — PI.CCXXIV.



G.O.Sars, autogr. — Norsk Lithgr.Officin.

Danielssenia fusiformis (Brady)

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA

HARPACTICOIDA

PARTS XXIX & XXX

TACHIDIIDÆ (concluded), METIDÆ, BALÆNOPHILIDÆ,
SUPPLEMENT (part)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
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ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1910

segment (exclusive of the rostrum) about equal in length to the 3 succeeding segments combined; rostral plate rather prominent, narrow quadrangular in shape, and obtusely truncated at the end. Epimeral plates of the 3 succeeding segments acutely produced at the hind corner. Last pedigerous segment very short. Urosome a little exceeding half the length of the anterior divison, and having the hind edge of the segments coarsely spinulose, genital segment about the length of the 2 succeeding segments combined. Caudal rami scarcely as long as they are broad at the base, and partly spinulose at the edges, middle apical setæ rather slender, the inner one exceeding half the length of the body. Eye of quite unusual size, and very conspicuous in the living animal. Anterior antennæ rather small and feeble, being of nearly equal width throughout, and composed of only 4 joints, the last one, representing the terminal part, carrying several strong spinulose setæ pointing in different directions. Posterior antennæ with a coarse curved seta issuing from the middle of the proximal joint in front; outer ramus a little shorter than the distal joint, and carrying 5 setæ, one of the 2 apical ones rather elongated. Posterior maxillipeds with the hand rather narrow and very finely ciliated inside. 1st pair of legs with the inner ramus projecting somewhat beyond the outer, distal joint linear in form, and more than twice the length of the proximal one, carrying on the tip 3 coarse spiniform setæ; inner ramus of 2nd pair likewise extending a little beyond the outer, that of the 2 succeeding pairs successively somewhat shorter, tip of the ramus in these pairs armed in a manner similar to that in the 1st pair. Last pair of legs with the distal joint comparatively small and cordiform in shape, carrying 5 rather short setæ, that issuing from the tip very thin, hair-like; proximal joint exhibiting at the junction with the distal joint a transverse row of slender spinules, inner expansion comparatively large, linguiform in shape, and extending far beyond the distal joint, marginal setæ 5 in number, the outermost but one considerably elongated.

Male considerably smaller than female and of somewhat more slender form of body. Anterior antennæ much more strongly built and 5-articulate, 4th joint globularly inflated, terminal joint unguiform. Inner ramus of 2nd pair of legs with the middle joint produced at the end outside to an exceedingly strong deflexed mucroniform process of about the length of the whole ramus, the terminal joint being [illegible]

expansion of proximal joint [illegible]

Body of a light bluish grey colour, with a faint rosy tinge.

Length of adult female 0.58 mm.

Remarks.—This is the form originally recorded by Boeck as the type of his genus *Danielssenia*. The *Jonesiella spinulosa* is unquestionably identical with Boeck's species.

Occurrence.—I have met with this form occasionally in several places on the Norwegian coast up to the Lofoten Islands, and Th. Scott also records it from East Finmark. It occurs in depths ranging from 12 to 30 fathoms, muddy bottom.

Distribution.—British Isles (Brady), Arctic Ocean off Novaja Semlja and Franz Josef Land (Scott).

216. Danielssenia fusiformis (Brady).

(Pl. CCXXIV).

Jonesiella fusiformis, Brady, Monogr. Brit. Copepoda, Vol. II, p. 39, Pl. XLVIII, figs. 1—13.

Specific Characters.—Female. Very like the preceding species, but of much larger size and somewhat more slender form of body. Anterior antennæ distinctly 5-articulate, the terminal part being divided into 2 well-defined joints. Posterior antennæ scarcely differing in structure from those in the type species. Posterior maxillipeds with the hand coarsely ciliated inside, one of the setæ issuing from the basal joint very strong and coarsely ciliated. Natatory legs differing only very little in structure from those in the type species, though on the whole more strongly built. Last pair of legs likewise of a very similar shape and armature, inner expansion of proximal joint, however, comparatively larger and more rounded at the extremity.

Male with the anterior antennæ comparatively more strongly built than in *D. typica*. Inner ramus of 2nd pair of legs transformed in a manner very similar to that in the type species, the mucroniform process, however, being comparatively shorter and stouter.

Colour about as in the preceding species.

Length of adult female 0.90 mm.

Remarks.—The present form is very closely allied to the preceding species, and it is rather difficult to derive from the structural details a sufficient number of good distinctive characters; but the difference in size is so pronounced that this alone must prove the present form to be specifically distinct, the more so as both species in some cases are found living together in the very same places and under altogether similar conditions.

Occurrence.—I have found this form in considerable abundance in one locality, at Skutesnæs, in a depth of about 12 fathoms, muddy bottom. It also occurs occasionally in other places on the west coast of Norway.

Distribution.—British Isles (Brady).

Gen. 79. **Psammis,**[1]) G. O. Sars, n.

Body sub-cylindric in form, with no sharp demarcation between the anterior and posterior divisions, and with all the segments closely crowded together, being not separated by any conspicuous constrictions. Cephalic segment produced in front to a prominent rostral projection. Genital segment in female imperfectly subdivided. Caudal rami of moderate size, with the apical setæ unusually prolonged. Anterior antennæ short and thick, hirsute, with the number of articulations much reduced. Posterior antennæ with the proximal joint not subdivided, outer ramus well developed, tri-articulate. Mandibles strong, with the basal part of the palp broad and expanded, rami, however, imperfectly developed. Maxillæ and maxillipeds about as in *Danielssenia*. Natatory legs powerfully developed, with some of the setæ unusually long and slender; inner ramus of 1st pair bi-articulate. Last pair of legs with the distal joint confluent with the proximal one.

Remarks.—This new genus is allied to *Danielssenia*, though the external appearance of the body more resembles that in the genus *Robertsonia*. It differs conspicuously from both these genera in the structure of the mandibular palp and of the last pair of legs. Moreover the extraordinary length of the caudal setæ and of the apical setæ of the natatory legs is rather characteristic. The genus only comprises as yet a single species, to be described below.

217. Psammis longisetosa, G. O. Sars, n. sp.

(Pl. CCXXV).

Specific Characters.—Female. Body comparatively short and compact, slightly tapering behind. Cephalic segment large, exceeding in length the 4 succeeding segments combined, and scarcely contracted in front, rostral projection well defined behind and somewhat lamellar, tip obtusely rounded. Epimeral plates of the succeeding segments well defined and obtusangular behind. Last pedigerous segment scarcely narrower than the preceding one. Urosome considerably exceeding half the length of the anterior division, and having the segments finely spinulose at the hind edge. Caudal rami about the length of the last segment and slightly divergent, apical setæ very strong and dark-coloured, the inner medial one almost attaining the length of the whole body. Eye inconspicuous in preserved specimens. Anterior antennæ of almost uniform width throughout and somewhat curved, being composed of 4 joints only, the last one representing the terminal part and carrying a number of strong plumose setæ.

[1]) Nomen proprium.

Posterior antennæ with the distal joint fully as long as the proximal one, apical spines comparatively short; outer ramus extending nearly to the end of the distal joint. Mandibular palp with the basal part obliquely expanded and provided with 3 strong plumose setæ, both rami very small and imperfectly defined at the base, each with only 3 short, thick setæ. Posterior maxillipeds comparatively short and stout, basal joint thick, with a strong plumose seta at the end anteriorly, hand oblong oval in form, with a similar though shorter seta beyond the middle of the palmar edge, dactylus thin and slender. 1st pair of legs with the inner ramus about the length of the outer, distal joint a little longer than the proximal one. Inner ramus in 2nd pair of legs extending considerably beyond the outer, in 3rd pair of about same length as this ramus, in 4th pair much shorter. Last pair of legs each forming an irregular lamella divided at the end by an angular incision into 2 unequal setiferous lappets, the outer one, representing the distal joint, short [illegible] length, the inner one much more prominent, linguiform in shape, and carrying likewise 5 setæ, 2 on the tip and 3 on the inner edge, inner apical seta much longer than the others.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.55 mm.

Remarks.—In the compact appearance of the body, the prominent rostrum, the short, curved, densely hirsute anterior antennæ, and the very long, dark-coloured caudal setæ, this form somewhat reminds of the species of the genus *Longipedia* Claus. A closer examination proves it, however, to be in reality very different, and to be unquestionably referable to the present family as here defined.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were found in a sample taken at Farsund, south coast of Norway, from a depth of about 30 fathoms, sandy mud.

Gen. 80. **Fultonia,** Scott, 1902.

Generic Characters.—Body subcylindrical in form, with all the segments sharply marked off from each other and edged with slender spinules. Rostrum almost obsolete. Genital segment in female distinctly subdivided; last segment comparatively large. Caudal rami of moderate size. Anterior antennæ rather fully developed, 7-articulate, and edged with short, thick ciliated setæ. Posterior antennæ comparatively small, with the proximal joint imperfectly subdivided; outer ramus

rudimentary. Mandibles with the cutting edge armed outside with a prominent tooth cleft at the tip, its inner part forming an undivided plate; palp comparatively small, but distinctly biramous. Maxillæ with the epipodal and exopodal lobes imperfectly developed. Anterior maxillipeds with 2 well-developed setiferous lobes, and a rudiment of a 3rd inside the claw-bearing joint. Posterior maxillipeds rather large, with the dactylus long and slender. 1st pair of legs with the inner ramus biarticulate and shorter than the outer. Inner ramus of the 3 succeeding pairs distinctly 3-articulate, but much smaller than the outer. Last pair of legs with the distal joint well defined and oblong in form; inner expansion of proximal joint obsolete.

Remarks.—This and the succeeding genus should perhaps more properly have been referred to the *Cletodidæ*, with which they agree both in general appearance and in the structure of most of the appendages. Yet they both differ very materially in the much fuller development of the inner ramus of the natatory legs, this ramus not being rudimentary, as in the *Cletodidæ*, but distinctly 3-articulate, like the outer. In the present genus, however, this ramus in the 1st pair of legs is composed of only 2 joints, as is also the case in several other genera of the present family. The genus comprises as yet only a single species, to be described below.

218. Fultonia hirsuta, Scott.

(Pl. CCXXVI).

Fultonia hirsuta, Th. Scott, Notes on gatherings of Crustacea, etc. 20th Annual Report of the Fishery Board for Scotland. Part. III, p. 466. Pl. XXIII, figs. 5—12.

Specific Characters.—Female. Body moderately slender, with the anterior division somewhat depressed and wider than the posterior. Cephalic segment rather large and slightly contracted in front; rostral projection extremely small. Urosome about the length of the anterior division and cylindric in form, all the segments densely fringed behind with slender spinules; last segment about as large as the 2 preceding ones combined, and provided below in the middle with a transverse row of spinules, anal opercle semilunar, smooth. Caudal rami longer than they are broad, sub-quadrangular in form and somewhat divergent, inner medial seta exceeding half the length of the body. Eye inconspicuous. Anterior antennæ attaining the length of the cephalic segment, 2nd joint the largest, terminal part about the length of the 3 preceding joints combined. Posterior antennæ with the distal joint shorter than the proximal one, outer ramus replaced by a simple seta. Posterior maxillipeds rather strong, hand oblong in form, with the inner edge straight, the outer angularly bent in the middle, dactylus exceeding

the hand in length. 1st pair of legs with the inner ramus much shorter than the outer, its proximal joint short, unarmed, the distal one oblong in form and carrying 3 setæ, and at the outer corner a strong spine. Inner ramus of the 3 succeeding pairs only slightly exceeding half the length of the outer. Last pair of legs with the distal joint narrow oblong in form and carrying 7 unequal setæ, proximal joint with a long setiferous process outside, inner part not expanded, and provided with only a single plumose seta.

Male unknown.

Colour whitish grey.

Length of adult female 0.49 mm.

Remarks.—This form was described in the year 1902 by Th. Scott as the type of a new genus, the external resemblance of which to some of the *Cletodidæ* (Mesocletodes irrasus) was also noted.

Occurrence.—Some specimens of this form, all of the female sex, were found at Farsund and Korshavn, south coast of Norway, in depths ranging from 20 to 50 fathoms.

Distribution.—Scottish coast (Scott).

Gen. 81. **Argestes,**[1]) G. O. Sars, n.

Generic Characters.—General form of body resembling that in the preceding genus. All integuments remarkably thin and soft. Genital segment in female imperfectly subdivided; anal segment rather large. Caudal rami very small. Anterior antennæ of a structure similar to that in *Fultonia*, but rather shorter. Posterior antennæ with the proximal joint distinctly subdivided; outer ramus small, but well defined. Mandibles with several teeth outside the inner lamella of the cutting edge, palp distinctly biramous. Maxillæ and posterior maxillipeds nearly as in *Fultonia;* anterior maxillipeds, however, less fully developed, with only a single setiferous lobe and a slight rudiment of a 2nd inside the claw-bearing joint. 1st pair of legs with both rami distinctly 3-articulate and subequal in size. The 3 succeeding pairs resembling in structure those in *Fultonia*, inner ramus, however, comparatively larger. Last pair of legs likewise built after the same type as in that genus.

[1]) Nomen proprium.

Remarks.—This new genus is closely allied to *Fultonia*, differing, however, rather materially in the structure of the anterior maxillipeds and the 1st pair of legs. It contains as yet only a single species, to be described below.

219. Argestes mollis, G. O. Sars, n. sp.

Specific Characters.—Female. Body of a remarkably soft consistency and in form rather like that in *Fultonia hirsuta*, the anterior division being conspicuously wider than the posterior, and somewhat depressed. Cephalic segment scarcely exceeding in length the 2 succeeding segments combined, and evenly rounded in front; rostral projection extremely small, nearly obsolete. Urosome about equalling in length the 4 preceding segments combined, and slightly tapering distally, its segments edged behind with delicate spinules; last segment rather large with the anal opercle semilunar in form and perfectly smooth. Caudal rami extremely small and scarcely at all divergent, apical setæ rather slender. Eye wholly absent. Anterior antennæ much shorter than the cephalic segment, and, as in *Fultonia*, distinctly 7-articulate, with comparatively short and thick setæ. Posterior antennæ with the outer ramus very small, but well defined at the base, and carrying one apical seta and a few small lateral bristles. Mandibular palp with both rami well developed and setiferous, the inner one the larger. 1st pair of legs with the inner ramus fully as large as the outer, its joints gradually diminishing in size distally. Inner ramus of the 3 succeeding pairs exceeding half the length of the outer. Last pair of legs rather small, distal joint narrow oblong in form, with both edges densely hairy, tip provided with 4 comparatively short setæ; inner part of proximal joint very slightly expanded, and carrying 3 short setæ.

Male unknown.

Body of a whitish grey colour, with dark intestine.

Length of adult female 1.40 mm.

Remarks.—This form, as noted above, strongly resembles *Fultonia hirsuta* in the general form of the body, but is very much (nearly 3 times) larger, and exhibits moreover a peculiar softness of body, this character, indeed, having given rise to the specific name here proposed.

Occurrence.—I have only met with this form in a single locality, viz., at Bukken, south-west coast of Norway. It occurred here in a depth of about 60 fathoms on a soft muddy bottom, together with *Cervinia* and *Eucanuella*. Only female specimens were found.

Fam. 18. Metidæ.

Characters.—Body compact, tapering behind, with the segments closely crowded together, the 1st one of very large size. Both pairs of antennæ coarsely built, the anterior ones with the basal joint very large, the posterior ones without any outer ramus. Oral parts very small and closely crowded together, exhibiting a rather anomalous structure. 1st pair of legs differing conspicuously in structure from the 3 succeeding ones and very coarsely built. Last pair of legs in both sexes imperfectly developed. A single ovisac present in female.

Remarks.—This family is established to include the peculiar genus *Metis* of Philippi (= Ilyopsyllus Brady), which differs in several respects materially from all other known Harpacticoida.

Gen. 82. **Metis**, Philippi, 1843.

Syn: *Ilyopsyllus*, Brady.

Generic Characters.—Body short and stout, gibbous, somewhat resembling that in the genus *Westwoodia*. Cephalic segment very large and tumid, produced in front to a deflexed rostral projection. Urosome short, tapered, with the genital segment in female imperfectly subdivided. Caudal rami short, truncated at the tip, with the apical setæ rather strong. Eye well developed. Anterior antennæ 6-articulate, 2nd joint firmly connected with the 1st, and produced at the end anteriorly to a hood-like projection; those in male distinctly hinged. Posterior antennæ with the proximal joint subdivided, distal joint armed with strong claw-like spines. Oral parts densely crowded and together forming an obtuse cone carrying on each side a bisetose appendage (mandibular palp) and behind a narrow median piece bifurcate at the end (posterior maxillipeds). 1st pair of legs very strongly built and armed with claw-like spines, outer ramus 3-articulate, inner shorter and biarticulate. The 3 succeeding pairs of normal structure, with both rami 3-articulate. Last pair of legs extremely small and rudimentary, of different shape in the two sexes.

Remarks.—This genus was established by Philippi as early as in the year 1843, but was not recognised by Brady, who describes it under another name, viz., *Ilyopsyllus*. Brady refers the genus to his sub-family *Harpacticina*

and records it next to *Westwoodia*, to which genus it certainly bears some resemblance as regards the external appearance of the body. The structural details, however, are very different, and forbid the union of these two genera into the same family. In addition to the typical form, another closely related species has been described by Th. Scott from the Gulf of Guinea.

220. Metis ignea, Philippi.

(Pl. CCXXVIII).

Metis ignea, Philippi, Fernere Beobachtungen über die Copepoden des Mittelmeeres; Archiv für Naturgeschichte 1843, s. 61, Pl. IV, fig. 7.

Syn: *Ilyopsyllus coriaceus*, Brady.

Specific Characters.—Female. Body sub-pyriform in shape, with the back more or less curved and with no sharply marked demarcation between the anterior and posterior divisions. Cephalic segment exceedingly large and vaulted, occupying almost half the length of the body; rostral projection not distinctly defined behind, linguiform, deflexed. The 4 succeeding segments densely crowded, with the epimeral plates small, but acutangular behind. Urosome scarcely exceeding $^1/_3$ of the length of the anterior division and rapidly tapered behind. Caudal rami quadrangular, being about as long as they are broad, inner apical seta nearly as long as the whole body, outer one much shorter. Eye large and conspicuous in the living animal. Anterior antennæ comparatively short and stout, hood-like projection of 2nd joint finely crenulated along the anterior edge; 3rd joint abruptly much narrower than the 2 preceding joints, and carrying at the end the usual sensory filament, joints of terminal part subequal in size. Posterior antennæ with the proximal part very strong, distal joint comparatively short, and armed with 6 unequal claw-like spines. 1st pair of legs with the basal part very thick and massive, carrying at the end on each side a strong spine, outer ramus somewhat incurved at the base, and without any setæ inside, last joint shorter than the preceding one, and armed at the tip with 2 strong unequal spines, and inside them with 2 slender setæ; inner ramus scarcely more than half as long as the outer, proximal joint short, unarmed, distal joint carrying on the tip 2 strong spines of unequal length. The 3 succeeding pairs of legs with the outer ramus a little longer than the inner, and having the spines of the outer edge rather slender; apical setæ of both rami much elongated. Last pair of legs represented by 2 extremely small juxtaposed lamellæ of triangular form and with only slight traces of marginal setæ.

Male somewhat smaller than female, but otherwise of a rather similar appearance. Anterior antennæ, however, distinctly prehensile and composed of 8

well-defined articulations, the penultimate one produced at the end anteriorly to a dentiform projection. Inner ramus of 1st pair of legs with the 2 apical spines sligtly transformed, the outer one claw-like and curved outwards, the inner setiform. The 3 succeeding pairs of exactly the same structure as in female. Last pair of legs each produced at the end into 2 small digitiform lappets.

Colour fiery red.

Length of adult female 0.55 mm.

Remarks.—There cannot, in my opinion, be any doubt that the above-described form is that originally recorded by Philippi as *Metis ignea*. The *Ilyopsyllus coriaceus* of Brady is the same species, and this is in all probability also the case with the form recently recorded from the east coast of North America.

Occurrence.—I have met with this peculiar Copepod occasionally in several places on the west coast of Norway. It generally occurs in moderate depths on a muddy bottom covered with decaying algæ, and may at once be recognised by its vivid fiery red colour.

Distribution.—Mediterranean (Philippi), British Isles (Brady), Atlantic coast of North America.

Fam. 19. Balænophilidæ.

Characters.—Body slender, sub-linear in form, with no sharp demarcation between the anterior and posterior divisions. Anterior antennæ of moderate size, and the number of joints not reduced. Posterior antennæ with the outer ramus rudimentary. Oral parts small and to some extent imperfectly developed, except the posterior maxillipeds, which are rather powerful and strongly clawed. 1st pair of legs much larger than the others, and of rather different structure, being pronouncedly prehensile, with both rami strongly clawed at the end. The 3 succeeding pairs with the inner ramus imperfectly developed. Last pair of legs very small, lamellar.

Remarks.—This family, like the preceding one, contains as yet only a single genus, viz., *Balænophilus* Aurivillius, which in my opinion cannot be referred to any of the other Harpacticoid families, though in some respects it bears a remote resemblance to the genus *Harpacticus*.

Gen. 83. **Balænophilus,** Aurivillius, 1879.

Generic Characters.—Body narrow and elongated, with the segments sharply marked off from each other by distinct constrictions. Cephalic segment produced in front to a conical rostrum. The 3 succeeding segments without any distinct epimeral plates. Genital segment in female not subdivided. Caudal rami of moderate size, each with only a single apical seta. Anterior antennæ slender, 9-articulate, tapering distally, and only sparingly setous, 5th joint with a short sensory appendage; those in male comparatively larger and slightly prehensile. Posterior antennæ with the proximal joint undivided, outer ramus small, uniarticulate. Mandibles with the palp quite rudimentary, knob-like. Maxillæ without any distinct exopodal or epipodal lobes. Anterior maxillipeds comparatively small, with only 2 setiferous processes inside the claw-bearing joint. Posterior maxillipeds well developed, terminating in a strong clawed hand. 1st pair of legs with the basal part much prolonged, both rami 3-articulate, but rather unequal, the inner one being much the longer, each ramus armed at the tip with 2 curved claws of unequal size. The 3 succeeding pairs with the outer ramus well developed, 3-articulate, inner ramus much shorter and composed in the 2nd pair of 2 joints, in the 2 other pairs of a single joint only. Last pair of legs with the distal joint imperfectly defined from the proximal one. 2 ovisacs present in female.

Remarks.—This genus was established in the year 1879 by Dr. Aurivillius, to include a peculiar Copepod found by him on the baleen of the great blue whale (Balænoptera sibbaldi). Only the type species is as yet known.

221. Balænophilus unisetis, Auriv.

(Pl. CCXXIX & CCXXX).

Balænophilus unisetus, Aurivillius, Academical treatise with 3 plates.

Specific Characters.—Female. Body very slender and slightly constricted in the middle, with the anterior division scarcely wider than the posterior. Cephalic segment about the length of the 3 succeeding segments combined, and considerably vaulted dorsally, rostral projection of moderate size and obtusely pointed at the end. Urosome nearly as long as the anterior division and without any spinules at the posterior edge of the segments, genital segment comparatively large and somewhat tumid, last segment scarcely shorter than the preceding one, anal opercle small. Caudal rami about the length of the anal segment, and sub-linear in form, being about 3 times as long as they are broad, each carrying outside, near the end, 2 short spiniform bristles, and another more slender one

dorsally, apical seta exceeding half the length of the body, and distinctly jointed at the base. Anterior antennæ not nearly attaining the length of the cephalic segment, and gradually tapering, 1st joint much the largest and subdivided in the middle, terminal part shorter than the proximal one, and having its 4 joints nearly equal in size. Posterior antennæ with the distal joint much shorter than the proximal one, and armed with 4 claw-like spines and 3 slender geniculated setæ, outer ramus extremely small and attached close to the end of the proximal joint, carrying on the tip 3 minute bristles. Posterior maxillipeds with the hand oval in form, outer edge much curved, inner straight, dactylus strong and curved. 1st pair of legs with the 2 basal joints of about equal size, outer ramus scarcely more than half as long as the inner, middle joint much the largest and, like the 1st, armed outside with a short spine; inner ramus not attaining the length of the basal part, the outer 2 joints quite short, apical claws of both rami of same appearance, the inner one much larger than the outer. Natatory legs with the 1st joint of the outer ramus the largest, and without any seta inside, spines of outer edge of this and the 2 succeeding joints smooth. Inner ramus of 2nd pair of legs about the length of the 1st joint of the outer, and distinctly biarticulate, carrying on the tip 3 somewhat unequal setæ; that of the 2 succeeding pairs shorter and uniarticulate, with 2 slender setæ on the tip. Last pair of legs forming each a rather small plate divided at the end by a narrow incision into 2 setiferous lobes, the outer of which, answering to the distal joint, is rounded in shape and provided with 3 slender curved setæ, inner lobe a little more prominent and edged with 5 setæ, the 2 innermost of which are shorter than the others and spiniform. Ovisacs oval in form and only slightly divergent, each containing rather a large number of ova.

Male somewhat smaller than female, and of still more slender shape, the urosome being much narrower and, as usual, composed of 5 well-defined segments. Anterior antennæ comparatively larger, almost attaining the length of the cephalic segment, terminal part consisting of only 3 joints, the middle one somewhat tumefied and movably articulated to the 1st. Posterior maxillipeds somewhat more strongly built than in female. 2nd pair of legs with the setæ of the inner ramus shortened and spiniform. The 2 succeeding pairs with the spines outside the last 2 joints of the outer ramus coarsely denticulated. Last pair of legs very small, with the inner lobe less developed than in female and provided with only 2 unequal setæ. Genital lobes closely juxtaposed, each with a single spiniform seta.

Colour yellowish.

Length of adult female 2.40 mm.

Remarks.—This remarkable form was made the subject of a separate dissertation by Mr. Aurivillius for his doctor's degree, and in this dissertation not only the structure of the adult animal of both sexes, but also the development, was treated of. Dr. Aurivillius recognised in it the type of a very distinct genus, the systematic relation of which to the other known Harpacticoid genera was discussed in detail.

Occurrence.—As mentioned above, Dr. Aurivillius found this peculiar Copepod on the baleen of a blue-whale recently killed at the whaling-establishment of Mr. Foyn at Vadsö, east Finmark. On examining the baleen, his attention was directed to some yellowish patches scattered over their surface, and on a closer inspection he found these patches to be made up of innumerable specimens of this Copepod in all stages of development and densely crowded together. As justly remarked by that author, the present Copepod can scarcely be regarded as a true parasite, but is more properly speaking a commensal of the whale, subsisting on the remains of food adhering to the baleen after being sifted through it. In orders to kepp its place on the baleen and resist the strong current of water streaming through it, powerful grasping organs are needed, and such are indeed found not only in the adult animal, but, as shown by Dr. Aurivillius, even in the newly-hatched Nauplius, which of course, unlike what is generally the case, leads a rather sedentary existence. I have not myself come across this form, nor has it as yet been observed by any other naturalist. The figures here given are drawn from specimens kindly sent to me by Dr. Aurivillius.

Supplement.

Remarks.—During the progress of this work I have paid constant attention to the Norwegian Harpacticoida, spending some time every summer on the coast in suitable places for continued investigation of this group. I have in this way come across a number of additional forms, which make it necessary to annex to the work a supplement treating of these forms, and also giving some additional remarks and corrections as regards the species already described. The number of additional species observed in the last 2 or 3 years is rather large, and seems to prove that we are still far from having attained to a full knowledge of the existing forms. It is very probable that all the species described by Dr. Th. Scott from the Scottish coast will also prove to occur off the Norwegian coast, and moreover that a closer investigation of the greater deeps with suitable catching apparatus, will bring to light many interesting new forms of this extensive group.

Page 6.

Misophria pallida, Boeck.

Distribution.—Franz Josef Land (Scott), Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 12.

Longipedia minor, Scott.

Distribution.—Gulf of Guinea (Th. Scott), Ceylon (A. Scott).

Page 15.

Sunaristes paguri, Hesse.

Distribution.—Ceylon (A. Scott).

Page 17.

Canuella perplexa, Scott.

Distribution.—Ceylon (A. Scott).

Page 20.

For Cervinia Bradyi Norman read:

Cervinia synarthra, G. O. Sars, n. sp.

(see below).

Cervinia Bradyi, Norman.

(Suppl. Pl. 1)

Specific Characters.—Female. Very similar in its external appearance to *C. synarthra*, but of somewhat smaller size, and having the caudal rami comparatively shorter and more divergent; apical setæ curving abruptly outwards and densely ciliated in their outer part. Antennæ and oral parts almost exactly as in the said species. 1st pair of legs likewise very similar, though having the inner ramus fully as long as the outer. The 3 succeeding pairs of legs, however, differing conspicuously in the structure of the inner ramus, which is distinctly 3-articulate, with the last 2 joints not, as in *C. synarthra*, fused together, but well defined. Last pair of legs very small and of a structure similar to that in the said species.

Male differing very conspicuously from female in its external appearance, being on the whole of a more slender form, with the anterior division regularly oval in outline and marked off from the posterior by a distinct constriction. Cephalic segment much narrower than in female and produced in front to a very large and prominent rostral plate of triangular form. Epimeral plates of the 3 succeeding segments not, as in female, laterally expanded, but deflexed, each terminating behind in an angular corner. Urosome (including the caudal rami) about the length of the anterior division, and somewhat tumid in its anterior part, and being thickly covered with small spikes. Caudal rami much more prolonged than in female, attaining the length of the 3 last segments combined, apical setæ straight and very minutely ciliated. Anterior antennæ imperfectly hinged, but more strongly built than in female, with the joints more sharply marked off from each other, and also of a somewhat different shape, 2nd, 3rd and 4th joints each carrying an exceedingly large recurved sausage-shaped sensory appendage of a very delicate hyaline appearance. Posterior antennæ comparatively more feeble in structure than in female. Oral parts likewise considerably reduced in size. Natatory legs of essentially the same structure as in female, the inner ramus in all of them being distinctly 3-articulate. Last pair of legs, as in female, biarticulate and scarcely smaller in size. Genital lobes each with 2 spiniform setæ.

Body (in female) of a clear yellowish colour, variegated in front with light orange; urosome of a more or less vivid brimstone-yellow.

Length of adult female 1.40 mm., of male 1.20 mm.

Remarks.—The above-described species is unquestionably that originally recorded in Prof. Brady's Monograph under the name of *Cervinia Bradyi*, Norman, and is specifically distinct from the form described under that name on page 20 of the present work. For the latter I propose the name of *C. synarthra*, owing to the peculiar fusion of the outer 2 joints of the inner ramus in the 3 posterior pairs of natatory legs. In the present species this ramus is distinctly 3-articulate, as indicated in the figures given by Prof. Brady. The male is very remarkable for its prominent external dissimilarity from the female, and also for the peculiar structure of the anterior antennæ and the very large rostral projection.

Occurrence.—I have met with this species in 2 different places, viz., at Bukken, S W coast of Norway, and in the Lyngdal Fjord near Farsund. In both places it occurred on a muddy bottom in depths ranging from 30 to 60 fathoms, and in company with the other species, which in both localities was much the commoner. The specimens of the present species, though very much resembling the other in shape, could, when in a fresh state, at once be distinguished by the very different colour. In *C. synarthra* the colour is a uniform whitish grey, whereas in the present species the body exhibits a distinct yellowish hue, being moreover variegated with orange and brimstone-yellow. Only 2 male specimens have come under my notice. They both agree fairly well with the solitary specimen described by Dr. Giesbrecht from the Gulf of Naples. According to Dr. Th. Scott, this species also occurs off the Finmark coast.

Page 25.

Eucanuella spinifera, Scott.

(Suppl. Pl. 2, fig. 1).

Male.—Body considerably more slender than in female, with the cephalic segment more regularly contracted in front. Epimeral plates of 2nd segment each produced behind to a rather long mucroniform projection, those of 3rd segment only slightly produced; those of 4th segment about as in female. Urosome (including the caudal rami) fully as long as the anterior division, genital segment, as in female, armed on each side with a recurved spiniform projection. Caudal rami very narrow and much more prolonged than in female, being also more conspicuously asymmetrical, right ramus projecting considerably beyond the left, and about half the length of the urosome, apical setæ very slender. Anterior antennæ much larger than in female and distinctly prehensile, being composed of 8 well-defined joints, 4th, 5th and 6th joints forming together a dilated section, which contains a strong muscle acting upon the succeeding part, this last oc-

cupying about half the length of the antenna and being composed of 2 joints only, the 1st somewhat dilated and armed anteriorly with 3 successive short tuberculiform spines and at the end with a strong plumose seta, the second very narrow and terminating in a somewhat claw-like point. 2nd, 3rd and 4th joints of the antennæ, as in the male of *Cervinia*, provided with large recurved, sausage-shaped sensory appendages. Posterior antennæ and oral parts somewhat reduced in size. Natatory legs of exactly the same structure as in the female. Last pair of legs, however, rather different, and of quite an unusual appearance, each forming a slender 4-articulate stem, the 1st joint of which is produced outside to a digitiform process tipped with a thin bristle, the remaining 3 joints well defined and each armed outside with a slender spine, last joint carrying moreover at the end 3 denticulated spines, and the middle joint a single similar spine inside. Genital lobes each with a slender seta outside, followed inside by 2 shorter unequal spines.

Length of adult male 1.20 mm.

Remarks.—The female of this form has been described and figured in detail in the 1st part of this work, and I here only give on the annexed plate a new habitus-figure of a female specimen for comparison with the hitherto unknown male, of which a description has been given above. The sexual differences are also in this case very conspicuous, as regards both the external appearance and some of the structural details. The structure of the last pair of legs in the male in particular is highly remarkable, and the anterior antennæ also exhibit some peculiarities in their structure.

Occurrence.—This form, like the species of the genus *Cervinia*, is a true deep-water Copepod, scarcely occurring in depths of less than 40 fathoms. I have found it rather plentifully of late years in the 2 above-mentioned localities in which *Cervinia* occurred; but among the numerous specimens collected only 2 or 3 males were found.

Page 27.

Zosime typica, Boeck.

(Suppl. Pl. 2, fig. 2).

Male.—Body of much smaller size than in female and also rather different in shape, the anterior division being much broader than the posterior, which is narrow cylindrical in form, with none of the segments expanded laterally. Caudal rami comparatively more coarsely built than in female, with the apical setæ more prolonged. 3 dark pigmentary patches, arranged in a curved transversal row, constantly present in the ocular region. Anterior antennæ much larger than in female, and distinctly hinged, 8-articulate, 3rd joint the largest, 5th joint somewhat

dilated and carrying in front an extremely long and slender sensory filament, terminal part short, 3-articulate, last joint projecting at the end in a hook-like point. Posterior antennæ, oral parts and natatory legs of essentially the same structure as in female; inner ramus of 2nd pair of legs, however, slightly transformed, its terminal joint being oval in form and without any seta inside, but carrying on the tip a curved, clawlike spine and inside it a single seta. Last pair of legs very small, distal joint, as in female, not defined at the base, and provided with 4 setæ only, inner expansion of proximal joint very slight, and carrying 2 small diverging bristles.

Length of adult male 0.45 mm.

Remarks.—The male of this form has not yet been observed, for which reason the above short description of it has been given. On the annexed plate a figure of an adult female specimen is also given for comparison with the male.

Occurrence.—I have of late years met with this form, not only in the Christiania Fjord, but occasionally on the south coast of Norway, at Risør, Lillesand and Farsund. In samples from the last-named locality, some few male specimens were also found. Th. Scott records this form also from the Finmark coast.

Distribution.—Additional localities: Arctic Sea off Franz Josef Land and Novaja Semlja (Scott).

Page 28.

Add another species:

Zosime incrassata, G. O. Sars, n. sp.

(Suppl. Pl. 3).

Specific Characters.—Female. Body short and stout, with the anterior division strongly incrassated and much broader than the posterior. Cephalic segment large and deep, produced in front to a short rostral prominence, obtuse at the tip. Epimeral plates of the 3 succeeding segments sub-imbricate, and each terminating in an obtuse corner. Last pedigerous segment much narrower than the preceding ones, and without any epimeral plates. Urosome scarcely more than half as long as the anterior division, genital segment imperfectly subdivided, though exhibiting on each side in the middle a well-marked angular ledge. Caudal rami comparatively short, being scarcely longer than they are broad, apical setæ rather slender. Eye absent. Anterior antennæ short and thick, 7-articulate and densely clothed with bristles, some of which are spiniform, 3rd joint the largest, the 4 outer joints very short. Posterior antennæ resembling in structure those in the type species. Mandibular palp very small, with the rami imperfectly developed, the inner one lamelliform with only 2 small diverging bristles, the outer

one replaced by a simple short seta. Maxillæ and maxillipeds about as in *Z. typica*. Natatory legs, however, more strongly built, with the rami broader. Inner ramus of 1st pair, as in the type species, composed of only 2 joints, and about the length of the outer. Last pair of legs small, but with the distal joint well defined, rounded quadrangular in form, and provided with 4 comparatively short marginal setæ, proximal joint with the digitiform process short and stout, inner expansion only slightly produced and carrying 3 slender ciliated setæ, 2 on the tip and one inside.

Colour whitish grey.

Length of adult female 0.55 mm.

Remarks.—The above-described form is evidently referable to the genus *Zosime*, as defined by Boeck, though differing from the type species conspicuously both in its external appearance and in some of the structural details, especially the mandibular palp and the last pair of legs.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was found last summer in the Lyngdal Fjord, near Farsund, in a depth of about 40 fathoms.

Page 31.

Ectinosoma neglectum, G. O. Sars.

Distribution.—Polar islands north of Grinnell Land (2nd Fram Expedition).

Page 32.

Ectinosoma propinquum, Scott.

Distribution.—Franz Josef Land (Scott).

Page 34.

Ectinosoma melaniceps, Boeck.

Distribution.—Polar-islands north of Grinnell Land (2nd Fram Exp.).

Pag. 35.

Ectinosoma Normani, Scott.

Distribution.—Franz Josef Land (Scott).

Pag. 36.

Ectinosoma curticorne, Boeck.

Distribution.—Franz Josef Land and Novaja Semlja (Scott); mouth of Jana river, Siberia (the present author).

Page 37.

Ectinosoma gothiceps, Giesbrecht.

Distribution.—Franz Josef Land (Scott).

Page 41.

Pseudobradya minor (Scott).

Distribution.—Franz Josef Land (Scott).

Page 43.

Add the 4 following species:

Pseudobradya hirsuta (Scott).

(Suppl. Pl. 4, fig. 1).

Bradya hirsuta, Th. Scott, Revision of the species of *Bradya* and *Ectinosoma*, Transact. Linn. Soc. Vol. VI, Part. 5, p. 423, Pl. 35, figs. 2, 8, 17, 19, 23, 28, 34, 40, 47; Pl. 36, figs. 2 & 7.

Specific Characters.—Female. Body rather slender and of nearly equal width throughout. Cephalic segment scarcely longer than the 3 succeeding segments combined, and only slightly contracted in front, rostral projection comparatively short and broad, obtuse at the tip. Urosome about the length of the anterior division and very slightly tapering behind, surface of the segments more or less densely covered with small spikes; last segment scarcely more than half the size of the preceding one. Caudal rami considerably produced, being nearly 3 times as long as they are broad, and somewhat divergent, each projecting at the end into an acute lappet covering the bases of the apical setæ; the latter comparatively short. Anterior antennæ very small, 5-articulate, the 2nd and 3rd joints being fused together, and clothed with slender setæ, the first 2 joints much the largest and somewhat expanded anteriorly. Posterior antennæ with the outer ramus comparatively small, biarticulate, 1st joint very short, last narrow linear, with 2 apical bristles. Anterior maxillipeds small and feeble in structure, 1st basal joint somewhat expanded, 2nd of about same length, but much narrower. Posterior maxillipeds with the inner apical spine rather coarse. Natatory legs of the usual structure, the inner ramus being a little broader than the outer, but scarcely longer. Last pair of legs of moderate size, and exhibiting on the lower surface several transverse rows of spinules, marginal setæ not much elongated, distal joint oval in shape and somewhat unequally trilobate at the end, innermost seta transformed to a strong denticulated spine, the other 2 slightly unequal in length; inner expansion of proximal joint narrow linear in form and extending somewhat beyond the middle of the distal joint, outer apical seta rather short, inner of about same length as the middle apical seta of the distal joint;

appendicular bristle rather slender and issuing at the junction of the proximal with the distal joints.

Colour not yet ascertained.

Length of adult female 0.89 mm.

Remarks.—I have no doubt that the above-described form is that recorded by Th. Scott as *Bradya hirsuta*, though in the specimen examined by me the urosome did not exhibit nearly such a densely hirsute surface as indicated in the figure given by that author. In all structural details, however, a perfect agreement seems to exist. This species, like several others referred by Th. Scott to the genus *Bradya* of Boeck, ought to be included in the nearly-allied genus *Pseudobradya*, as defined by the present author.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was found in a sample taken at Farsund, south coast of Norway in a depth of about 30 fathoms.

Distribution.—Scottish coast (Scott).

Pseudobradya fusca (Scott).

(Suppl. Pl. 4, fig. 2).

Bradya fusca, Th. Scott, l.c. p. 424, Pl. 35, figs. 6, 12, 18, 20, 30, 37, 43, 45; Pl. 36, figs. 6 & 8.

Specific Characters.—Female. Body somewhat less slender than in the preceding species, and fusiform in shape. Cephalic segment gradually contracted in front, rostral projection of moderate size and narrowly rounded at the tip. Urosome shorter than the anterior division, with the segments spinulose only at the hind edge; last segment, as in the preceding species, rather short. Caudal rami of moderate size, being scarcely twice as long as they are broad, tip obtusely truncated, apical setæ of moderate length. Anterior antennæ small, 6-articulate. Posterior antennæ with the outer ramus narrow, 3-articulate, the first 2 joints very small. Posterior maxillipeds with none of the apical setæ spiniform. Natatory legs of normal structure. Last pair of legs somewhat resembling in shape those in the preceding species, but with the marginal setæ differing slightly in their mutual relation; innermost seta of distal joint scarcely spiniform and much shorter than the outermost, middle seta very much elongated; inner expansion of proximal joint extending almost as far as the distal joint, and having the 2 apical setæ less unequal, the inner one not nearly attaining the length of the middle apical seta of the distal joint; appendicular bristle issuing from the proximal joint at some distance from its junction with the distal one.

Colour, according to Scott, brown.

Length of adult female 0.69 mm.

Remarks.—This is another of the species referred by Th. Scott to the genus *Bradya* of Boeck, though scarcely corresponding to the diagnosis given by Boeck of that genus. In its external appearance the present form looks very like a true *Ectinosoma;* but the structure of the antennæ and oral parts proves it in reality to be a member of the intermediate genus *Pseudobradya.*

Occurrence.—Some few specimens of this form, all of the female sex, were found in samples taken at Farsund from moderate depths.

Distribution.—Scottish coast (Scott).

Pseudobradya robusta, G. O. Sars, n. sp.

(Supplm. Pl. 5).

Specific Characters.—Female. Body considerably more robust than in any of the other species, and somewhat fusiform in shape. Cephalic segment comparatively large, exceeding in length the 4 succeeding segments combined, and gradually contracted in front, rostral projection of moderate size and obtuse at the tip. Urosome not nearly attaining the length of the anterior division, and having the last segment not much shorter than the preceding one. Caudal rami comparatively short, being scarcely longer than they are broad, and each produced at the end above to a short triangular lappet, from which a distinct carina extends along the dorsal face of the ramus inside the middle; apical setæ rather slender, the inner medial one exceeding half the length of the body. Anterior antennæ very small, 6-articulate. Posterior antennæ with the distal joint comparatively short and stout, outer ramus of moderate size and 3-articulate, with the first 2 joints very small. Mandibles and maxillæ of normal structure. Anterior maxillipeds more fully developed than in the 2 preceding species, 2nd basal joint considerably prolonged, spines of terminal part claw-like. Posterior maxillipeds with the middle joint somewhat dilated, terminal joint, as usual, short and armed with 3 unequal spiniform setæ, the innermost of which is the shortest. Natatory legs on the whole of normal structure, inner ramus in 1st pair a little longer than outer, in the other pairs conspicuously shorter, terminal joint of outer ramus in the first 2 pairs with 3 spines outside, in the 2 posterior pairs with only 2 such spines. Last pair of legs very large, with all the marginal setæ long and slender, distal joint comparatively broad and somewhat spatulate in form, its end rather regularly trilobate, with the middle seta the longest, the other 2 of about equal length, inner expansion of proximal joint less narrow than in the 2 preceding species, and extending somewhat beyond the middle of the distal joint, its base crossed by an obliquely transverse row of spinules, apical setæ

slightly unequal in length; appendicular bristle issuing from the base of the distal joint.

Colour not yet ascertained.

Length of adult female 0.79.

Remarks.—This form, which, according to the structure of the antennæ and oral parts, is evidently referable to the genus *Pseudobradya*, as defined by the present author, may be easily distinguished from the other species by its comparatively robust body and the short and stout caudal rami, as also by the structure of some of the appendages, especially that of the last pair of legs.

Occurrence.—Only a single female specimen of this form has hitherto come under my notice. It was found in a sample taken last summer at Farsund from a moderate depth.

Pseudobradya elegans (Scott).

(Suppl. Pl. 6, fig. 1).

Bradya elegans, Th. Scott, l.c. p. 422, Pl. 35, figs. 4, 10, 15, 25, 28, 36, 38, 40; Pl. 36, figs. 4 & 11.

Specific Characters.—Female. Body narrow fusiform in shape, with the 2 chief divisions of nearly equal size. Cephalic segment conically tapered in front, rostral projection rather prominent and obtusely pointed at the tip. Epimeral plates of the 3 succeeding segments rather broad, sub-imbricate, those of 4th segment densely spinulose behind. Last pedigerous segment scarcely smaller than the preceding one, and likewise fringed behind with slender spinules. Urosome (including the caudal rami) scarcely shorter than the anterior division, genital segment rather large and, like the succeeding segment, fringed behind with unusually long and delicate spinules; last segment very short. Caudal rami of unusually large size, and somewhat resembling in shape those in *P. hirsuta*, each ramus being produced at the end to an acute lanceolate lappet; apical setæ comparatively short. Anterior antennæ small, 5-articulate. Posterior antennæ rather stout, with the spines of the terminal joint strong and clothed with unusually long lateral spikes, outer ramus biarticulate and of a somewhat unusual appearance, the distal joint being conspicuously dilated, with the apical setæ strong and densely plumose. Oral parts extremely small and difficult to examine, though on the whole, it would seem, built upon the type characteristic of the present genus. Natatory legs of normal structure. Last pair of legs, however, rather unlike those in the other species, distal joint very broad, spatulate in shape and irregularly indented along the terminal edge, the 3 marginal setæ comparatively short and spiniform, proximal joint with the digitiform process at the

outer corner apparently quite absent, or perhaps more properly forming an integrant part of the distal joint, a thin bristle, exactly resembling that usually issuing from the said process, being present at the outer corner of the distal joint itself; inner expansion rather large, extending considerably beyond the distal joint, and, like that joint, clothed on the lower face with an obliquely transverse row of small spinules, apical setæ resembling those on the distal joint and slightly unequal in length.

Colour not yet ascertained.

Length of the specimen examined 0.81 mm.

Remarks.—This is a rather anomalous species, and should perhaps more properly be regarded as the type of a separate genus, differing, as it does, rather conspicuously from the other species in some of the structural details. The antennæ and oral parts seem, however, on the whole to be built upon the type characteristic of the present genus.

Occurrence.—Of this form also only a solitary female specimen has come under my notice. It was found in a sample taken at Kopervik, SW coast of Norway, from a depth of about 30 fathoms.

Distribution.—Scottish coast (Scott).

Page 46.

Bradya typica, Boeck.

Distribution.—Polar islands north of Grinnel Land (2nd Fram Exp.).

Page 47.

Add the following species.

Bradya armifera (Scott).

(Suppl. Pl. 6, fig. 2).

Ectinosoma armiferum, Th. Scott, l.c. p. 434, Pl. 36, figs. 20, 43; Pl. 37, figs. 4, 17, 31, 53; Pl. 38, figs. 14, 19, 37, 43.

Specific Characters.—Female. Body moderately slender, with the anterior division less sharply marked off from the posterior than in the type species, though exceeding it somewhat in width. Cephalic segment comparatively large, being fully as long as the 4 succeeding segments combined, and gradually contracted in front, rostral projection of moderate size, and evenly rounded at the tip. Urosome scarcely more than half as long as the anterior division, and having the segments apparently quite smooth; last segment shorter than the preceding one. Caudal rami very small and far apart, being scarcely as long as they are broad, apical setæ very slender, the inner medial one almost attaining the length of the

whole body. Anterior antennæ short and thick, 6-articulate, and densely clothed with slender bristles, 2nd joint the largest, terminal part scarcely longer than the preceding joint. Posterior antennæ with the spines of the terminal joint very strong and fringed along one of their edges with unusually long spikes, outer ramus comparatively smaller than in the type species, but otherwise of a very similar structure. Oral parts well developed and on the whole agreeing in structure with those in the type species; 2nd basal joint of the anterior maxillipeds, however, rather shorter, and middle joint of the posterior maxillipeds narrower. Natatory legs with the inner ramus considerably longer than the outer, being in the 1st pair almost twice as long, and having the middle joint incised at the end in a peculiar manner. Last pair of legs rather small and resembling in structure those in the type species, distal joint short, quadrangular in form, with the middle seta much longer than the other 2, which are rather unequal in size; inner expansion of proximal joint somewhat curved, and scarcely extending beyond the distal joint, apical setæ rather strong, the inner one much the longer and equalling in size the middle seta of the distal joint; appendicular bristle quite short, and issuing from the lower face of the distal joint.

Colour not yet ascertained.

Length of adult female 0.90 mm.

Remarks.—This form ought in my opinion unquestionably to be referred to the genus *Bradya*, and not, as suggested by Th. Scott, to the genus *Ectinosoma*. With the former genus it agrees pretty well in most of the anatomical characters, the structure of the last pair of legs in particular being very like that in *Bradya typica*. The specific name proposed by Th. Scott is probably derived from the coarse armature of the apical spines of the posterior antennæ.

Occurrence.—Some few female specimens of this form were found in samples taken last summer at Farsund from moderate depth.

Distribution.—Scottish coast (Scott).

Page 47.

Add the following new genus:

Ectinosomella, G. O. Sars, n. gen.

Generic Characters.—General form of body resembling that in *Ectinosoma*. Rostral projection forming a very thin, hyaline plate. Anterior antennæ small, 6-articulate, basal joint much the largest. Posterior antennæ with a spreading fascicle of strong unequal setæ issuing from the apex, no lateral spines being present; outer ramus comparatively short, but distinctly 3-articulate.

Mandibles with the masticatory part quite rudimentary, palp, however, rather large, with the basal part narrow and prolonged, both rami sub-terminal and having the appearance of long falciform setæ. Maxillæ with the masticatory lobe imperfectly developed, palp lamellar and edged with numerous slender plumose setæ. Anterior maxillipeds somewhat resembling in structure those in the genus *Pseudobradya*. Posterior maxillipeds very small, with the terminal joint imperfectly defined. Natatory legs of normal structure. Last pair of legs comparatively small, but with very long and slender marginal setæ.

Remarks.—This new genus is chiefly characterised by the very prominent hyaline rostral plate, and by the structure of the antennæ and oral parts, the latter especially being rather peculiar. It comprises as yet only a single species to be described below.

Ectinosomella nitidula, G. O. Sars, n. sp.

(Suppl. Pl. 7).

Specific Characters.—Female. Body moderately slender and somewhat compressed in its anterior parts, being of nearly equal width throughout. Surface of body remarkably smooth and shining. Cephalic segment large and deep, considerably exceeding in length the 4 succeeding segments combined, rostral plate prominent, very thin, narrow linguiform in shape, and slightly curved at the end. Epimeral plates of this and the 3 succeeding segments thin and pellucid, including between them the oral parts and the bases of the natatory legs. Urosome much shorter than the anterior division, and without any spinules at the hind edges of the segments. Caudal rami rather far apart and only slightly longer than they are broad, tip transversely truncated, apical setæ very slender. Anterior antennæ comparatively narrow and densely clothed with bristles in their outer part, basal joint occupying half the length of the antenna, terminal part short, 3-articulate. Posterior antennæ with 7 rather unequal spiniform setæ issuing from the truncated end of the terminal joint, outer ramus scarcely exceeding the middle joint in length, and carrying 5 comparatively short setæ. Mandibular palp with the basal part long and narrow, carrying in front 3 curved setæ, both rami of a similar appearance, though a little unequal in length, and issuing close together from the end of the basal part, each consisting of a narrow cylindrical scape split up at the end into 2 or 3 slender setæ. Posterior maxillipeds with 3 slender apical setæ gradually increasing in length inwards. Natatory legs with the rami subequal in length, middle joint of inner ramus in the 2nd and 3rd pairs provided inside with 2 setæ Last pair of legs with the

distal joint oval in form and regularly trilobate at the end, setæ increasing in length inwards; inner expansion of proximal joint rather narrow and scarcely extending as far as the distal joint, apical setæ rather unequal, the inner one being much the longer; appendicular bristle of moderate length, and issuing at the junction between the proximal and distal joints. Ovisac oblong oval in form, enclosing comparatively large ova.

Colour yellowish grey.

Length of adult female 0.63 mm.

Remarks.—This form may be easily distinguished from the other members of the present family by the very prominent hyaline rostral plate, the remarkably smooth and shining surface of the body, and the structure of the several appendages.

Occurrence.—Some few specimens of this peculiar form, all of the female sex, were taken last summer at Farsund in depths ranging from 30 to 50 fathoms.

Page 49.

Harpacticus chelifer, (Müller).

Distribution.—West coast of Greenland (2nd Fram Exped.).

Page 51.

Harpacticus uniremis, (Krøyer)

Distribution.—Scottish coast (Scott), Polar island north of Grinnell Land (2nd Fram Exped.).

Page 54.

Add the following species:

Harpacticus littoralis, G. O. Sars, (new name).

(Suppl. Pl. 8).

Harpacticus chelifer, Brady, Monograph of British Copepoda, Vol. II, p. 146, Pl. LXV, figs. 1—15; Pl. LXIV, figs. 19 & 20 (not Müller).

Specific Characters.—Female. Body moderately slender, with the anterior division oblong oval in form and somewhat depressed. Cephalic segment about the length of the 3 succeeding segments combined, rostrum not very prominent, and obtusely rounded at the end. Urosome scarcely more than half as long as the anterior division and much narrower, hind edges of the segments finely spinulose ventrally and laterally; last segment rather small. Caudal rami very short, being broader than they are long, apical setæ slender and elongated, the inner

medial one almost attaining the length of the body. Anterior antennæ rather slender and attenuated, 9-articulate, 4th joint exceeding in length the 3rd, terminal part not attaining half the length of the proximal one. Posterior antennæ of the usual structure. Posterior maxillipeds not nearly so powerful as in *H. chelifer*, hand oval in form, with the palmar edge obtusely angular in front of the middle, dactylus rather slender. 1st pair of legs with the rami narrower than in *H. chelifer* and the apical claws less strong, distal joint of outer ramus shorter than the proximal one, inner ramus extending considerably beyond the latter. Natatory legs of the usual structure. Last pair of legs with the distal joint rounded oval in form, and somewhat constricted at the base, marginal setæ comparatively slender; inner expansion of proximal joint rather broad, extending somewhat beyond the middle of the distal joint, and almost tranversely truncated at the end, which carries 4 unequal setæ similar to those in *H. gracilis*. Ovisac comparatively small.

Male exhibiting the usual sexual differences from the female. Anterior antennæ distinctly hinged, though having the last joint of the proximal part far less tumefied than in the male of *H. chelifer*. Inner ramus of 2nd pair of legs with the mucronate process of the middle joint comparatively shorter than in that species. Outer ramus of 3rd pair less powerful and scarcely incurved, more resembling that in the male of *H. uniremis*. Last pair of legs with the distal joint oval in form, carrying 5 moderately slender setæ; inner expansion of proximal joint obsolete.

Colour yellowish brown.

Length of adult female 0·97 mm.

Remarks.—The above-described form is unquestionably that recorded in Prof. Brady's Monograph at *H. chelifer*. It is, however, not identical with Müller's species, which is described in the present work on page 49; but more nearly related to *H. gracilis* Claus, from which it is, however, at once distinguished by its much larger size.

Occurrence.—I have met with this form in several places, both on the south and west coasts of Norway. It is a pronouncedly littoral species, being generally found in very shallow water, especially in flat sandy creeks; and it is not seldom left in tidal pools together with other littoral species.

Distribution.—British Isles (Brady).

Page 57.

Zaus spinatus, Goodsir.

Distribution.—Polar islands north of Grinnell Land (2nd Fram Exp.).

Page 64.

For Alteutha depressa, Baird,
read: *Alteutha purpurocincta*, Norman.

Remarks.—According to the opinion of both Norman and Th. Scott, *Alteutha depressa* Baird is not the same as *A. purpurocincta* of Norman, but identical with the form described in Prof. Brady's Monograph as *Peltidium crenulatum*, a species not yet found off the Norwegian coast. For the species described in the present work as *Alteutha depressa* Baird, therefore, the specific name *purpurocincta*, proposed by Norman, should be retained.

Page 70.

For Tegastes longimanus (Claus),
read: *Tegastes Clausi*, G. O. Sars, n. sp.
(see below).

Page 72.

Add the 3 following species:

Tegastes harpacticoides (Claus).

(Suppl. Pl. 9, fig. 1).

Amymone harpactoides, Claus, Die freilebenden Copepoden, p. 114, Pl. 20, figs. 10 & 11.

Specific Characters.—Female. Cephalic segment without any chitinous stripe across the back, postero-lateral corners rather prominent and acuminate, rostral prominence very slight, almost obsolete. Genital segment very slightly protuberant below and without any armature. Distal part of urosome in some specimens distinctly prominent and exhibiting 3 well-defined segments, in others almost wholly retracted. Caudal rami of the usual appearance. Anterior antennæ rather slender, 8-articulate, with the first 2 joints much the largest and combined occupying almost half the length of the antenna. Posterior antennæ likewise unusually slender, with the outer ramus extremely small, uniarticulate. Posterior maxillipeds of comparatively feeble structure, hand very narrow, nearly linear in form, dactylus thin and slender. Natatory legs of the usual structure. Last pair of legs, however, less fully developed than in the other species, inner expansion of proximal joint rather narrow and of nearly uniform width throughout, carrying along the anterior edge 3 short setæ and at the obtusely truncated apex 2 minute bristles; distal joint very small, narrow linear in form, and extending only slightly beyond the middle of the inner expansion of the proximal joint.

Male of somewhat smaller size than female, and having the genital segment provided below with a roomy spermatophore-reservoir produced behind on each side to a mucroniform posteriorly-pointing process. Anterior antennæ, as usual, geniculate between the 5th and 6th joints. Last pair of legs with the proximal joint simple, not expanded inside.

Colour light yellowish red.

Length of adult female 0.28 mm.

Remarks.—I think I am right in identifying the above-described form with *Amymone harpactoides* of Claus, as it on the whole agrees rather well with the short description and figures given by that author. It is a very distinct species, easily recognisable by the non-produced genital segment in the female, and the poor development of the posterior maxillipeds and of the last pair of legs.

Occurrence.—Several specimens of this small Copepod were found some years ago at Skutesnæs, SW coast of Norway, in a depth of about 20 fathoms.

Distribution.—Mediterranean at Messina (Claus).

Tegastes calcaratus, G. O. Sars, n. sp.

(Suppl. Pl. 9, fig. 2).

Specific Characters.—*Female.* Cephalic segment with a well-marked chitinous stripe across the back, postero-lateral corners acutely produced; rostral prominence distinct, angular. Genital segment forming below 2 thin juxtaposed lamellæ, rectangular in front, and each produced behind into a narrow spur-like deflexed process. Distal part of urosome scarcely projecting. Anterior antennæ rather slender and distinctly 8-articulate. Posterior maxillipeds of moderate size, with the hand oblong oval in form, palmar edge slightly arched in front, dactylus moderately strong. Last pair of legs with the inner expansion of proximal joint normally developed, anterior edge curved and finely ciliated in its proximal half, carrying moreover the usual 3 short setæ, distal joint extending beyond the said expansion.

Colour not yet ascertained.

Length of adult female 0.30 mm.

Remarks.—This new species is easily distinguishable from the other known species by the peculiar spur-like processes issuing from the genital segment below, a character, which has given rise to the specific name here proposed.

Occurrence.—Only a single female specimen of this form has hitherto come under my notice. It was found in a sample taken at Bukken, SW coast of Norway, from a depth of about 20 fathoms.

Tegastes longimanus (Claus).

(Suppl. Pl. 9, fig. 3).

Amymone longimana, Claus, l.c. p. 115, Pl. 20, figs. 13 & 14.

Specific Characters.—Female. Cephalic segment without any chitinous stripe across the back, postero-lateral corners rather produced, though somewhat less acute than in the 2 preceding species; rostral prominence well marked. Genital segment slightly protuberant below and produced into 2 successive recurved blunt dentiform projections. Distal part of urosome scarcely prominent. Anterior antennæ unusually short and apparently composed only of 7 articulations. Posterior maxillipeds of a very characteristic appearance, being much elongated, with the basal part composed of 2 slender joints forming together an elbow-shaped bend, hand comparatively short, but much dilated at the base, almost triangular in shape, palmar edge concave behind, and forming in front a strong arcuate bulge armed with 4 slender spines, dactylus rather strong and curved. Legs apparently of normal structure.

Colour not yet ascertained.

Length of adult female 0.27 mm.

Remarks.—This is unquestionally the species originally recorded by Claus under the name of *Amymone longimana*. It is specifically distinct from the form described on page 70 of the present work as Claus's species, and I propose to name that species *Tegastes Clausi*. The very peculiar shape of the posterior maxillipeds will at once make the present species recognisable from any of the others.

Occurrence.—Of this form also only a single female specimen has come to my notice. It was found in a sample taken at Kopervik, SW coast of Norway, from a depth of about 15 fathoms.

Distribution.—Heligoland (Claus), ? British Isles (Brady).

Page 87.

For Idya, Philippi,

read: *Idyæa*, Philippi.

Remarks.—The above slight change of the Philippian name was proposed by the present author last year (Report on the Crustacea of the 2nd Fram Expedition), in order to keep it apart from *Idya* Fréminville (a genus of Acalephæ).

Page 90.

Idyæa ensifera (Fischer).

Distribution.—Polar islands north of Grinnell Land (2nd Fram Exp.).

Page 94.

Idyæa gracilis, Scott.

Distribution.—Polar islands north of Grinnell Land (2nd Fram Exp.).

Page 96.

Idyæa finmarchica, G. O. Sars.

Distribution.—Polar island north of Grinnell Land (2nd Fram Exp.).

Page 97.

Add the following species:

Idyæa tenella, G. O. Sars, n. sp.

(Suppl. Pl. 10).

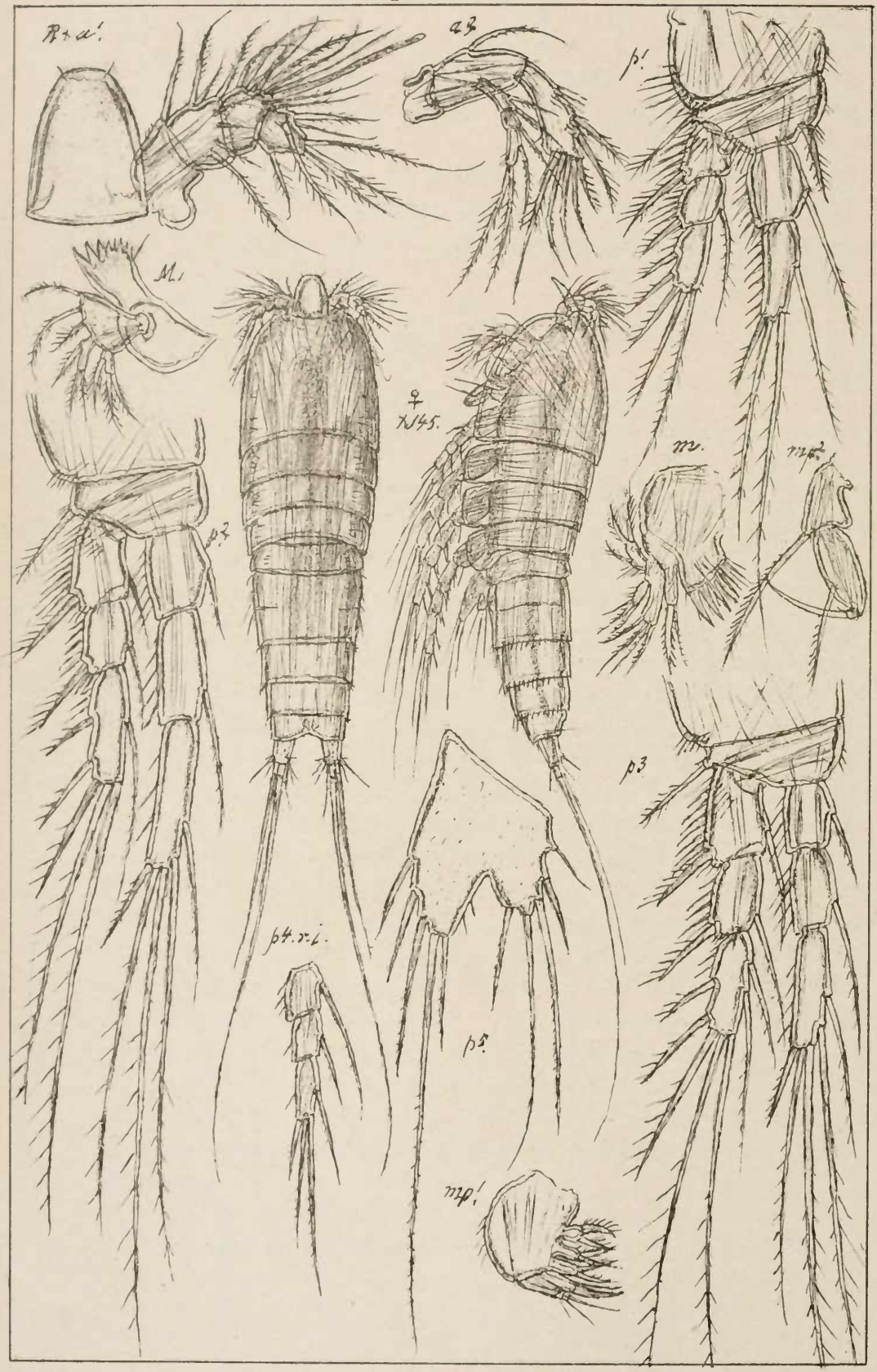
Specific Characters.—Female. Body very slender, though, as in the other species of this genus, having the anterior division somewhat expanded and much broader than the posterior. Cephalic segment about the length of the 3 succeeding segments combined, and produced in front to a rather small rostral prominence. Lateral parts of the 3 succeeding segments somewhat expanded and separated by narrow incisions. Last pedigerous segment considerably narrower than the preceding ones, and obtusely produced on each side. Urosome very slender and elongated, exceeding $^2/_3$ of the length of the anterior division, genital segment imperfectly subdivided in the middle, last segment very small. Caudal rami short and closely juxtaposed, being scarcely more than half as long as they are broad, apical setæ of rather peculiar appearance, the 2 middle ones having their proximal part remarkably dilated, the inner one attaining about half the length of the body. Anterior antennæ not very slender, scarcely attaining the length of the cephalic segment, and, as usual, composed of 8 articulations, 3rd joint the largest, 4th joint comparatively short, terminal part about half the length of those joints combined. Posterior antennæ and oral parts exhibiting on the whole the structure characteristic of the genus. 1st pair of legs with the outer ramus extending a little beyond the 1st joint of the inner, 2nd joint of the latter ramus scarcely longer than the 1st, and not much attenuated. The 3 succeeding pairs of legs powerfully developed, with the rami rather broad, the outer one being the longer. Last pair of legs with the distal joint lamelliform and broadly oval in outline.

Colour not yet ascertained.

Length of adult female 0.69 mm.

Copepoda

Tachidiidæ — Harpacticoida — Pl. CCXXV.

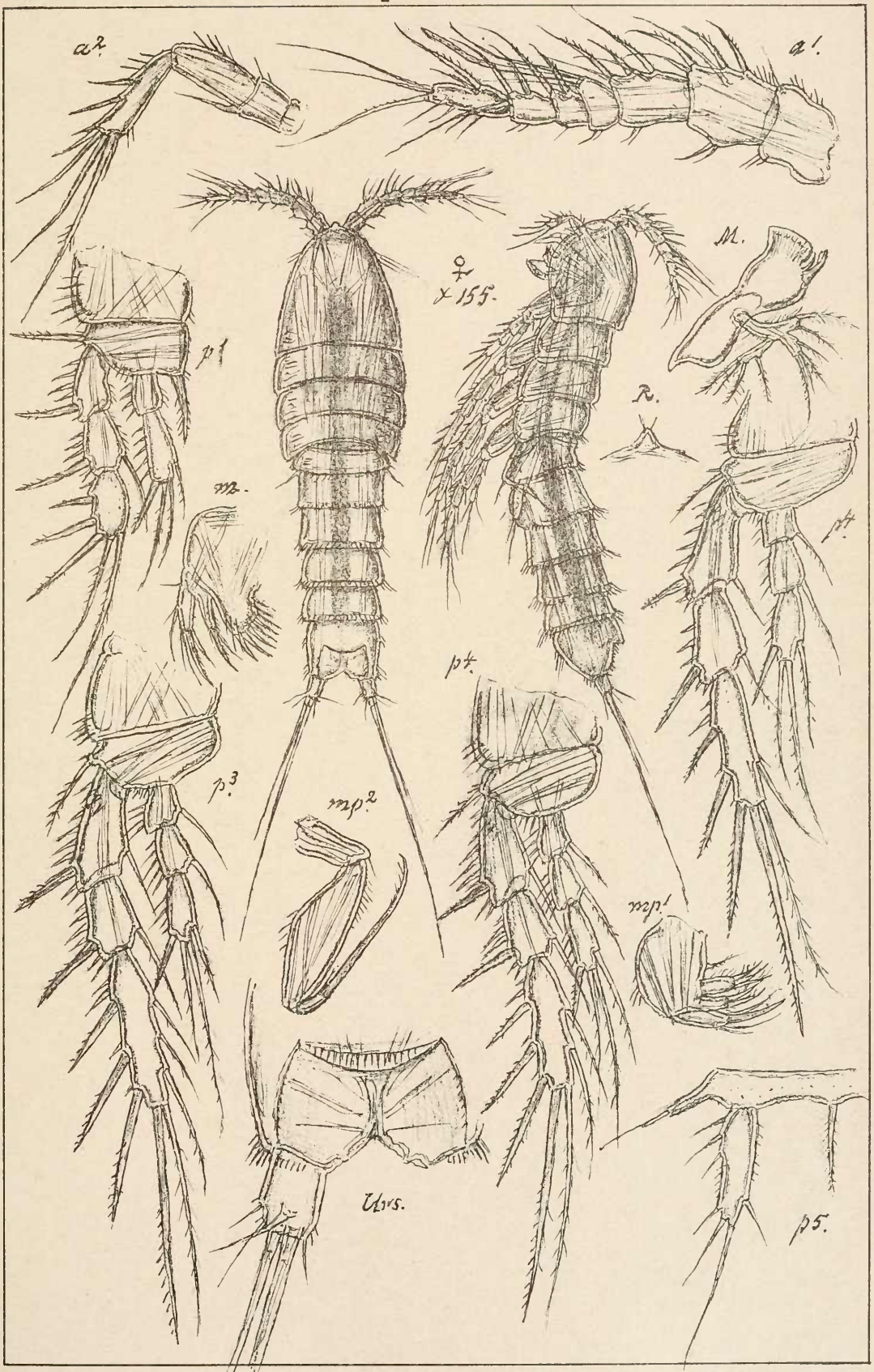


G.O.Sars autogr.

Norsk Lithgr. Officin

Psammis longisetosa, G.O.Sars.

Copepoda



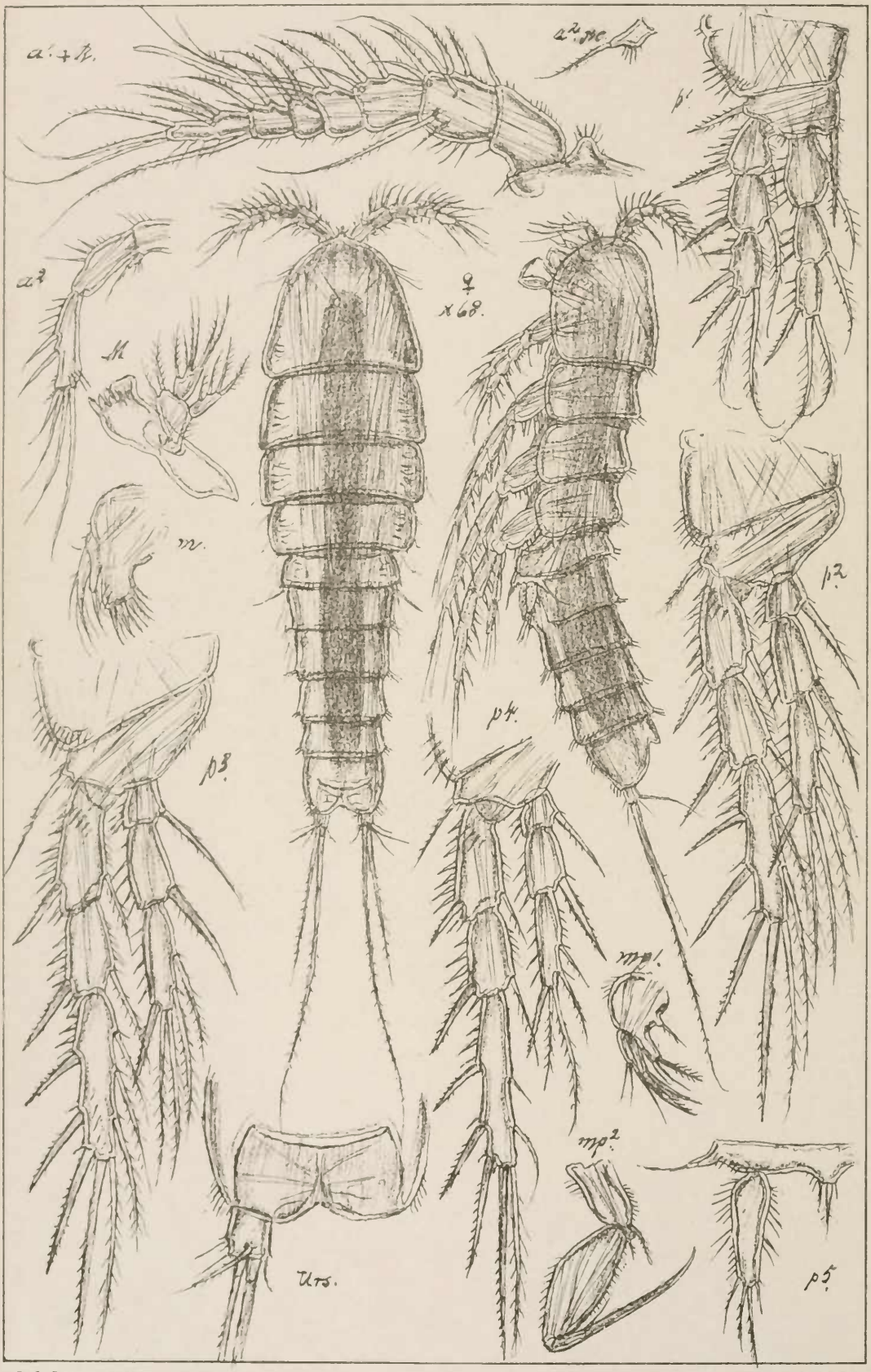
G.O. Sars, autopr

Norsk Lithgr. Officin

Fultonia hirsuta, Scott.

Copepoda

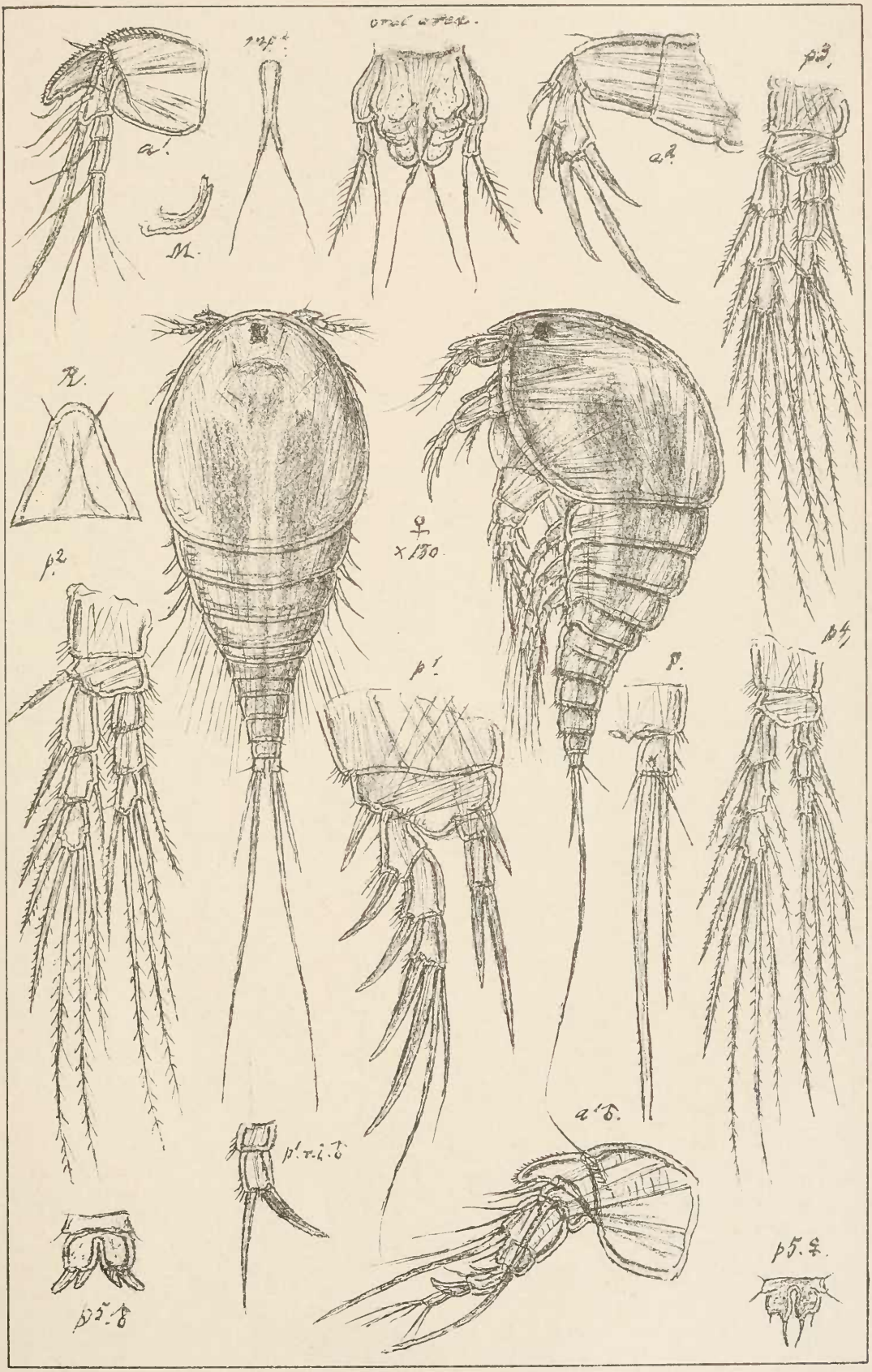
Tachidiidæ | Harpacticoida | Pl. CCXXVII.



G.O.Sars, autogr. Norsk Lithgr. Officin.

Argestes mollis, G.O.Sars.

Copepoda

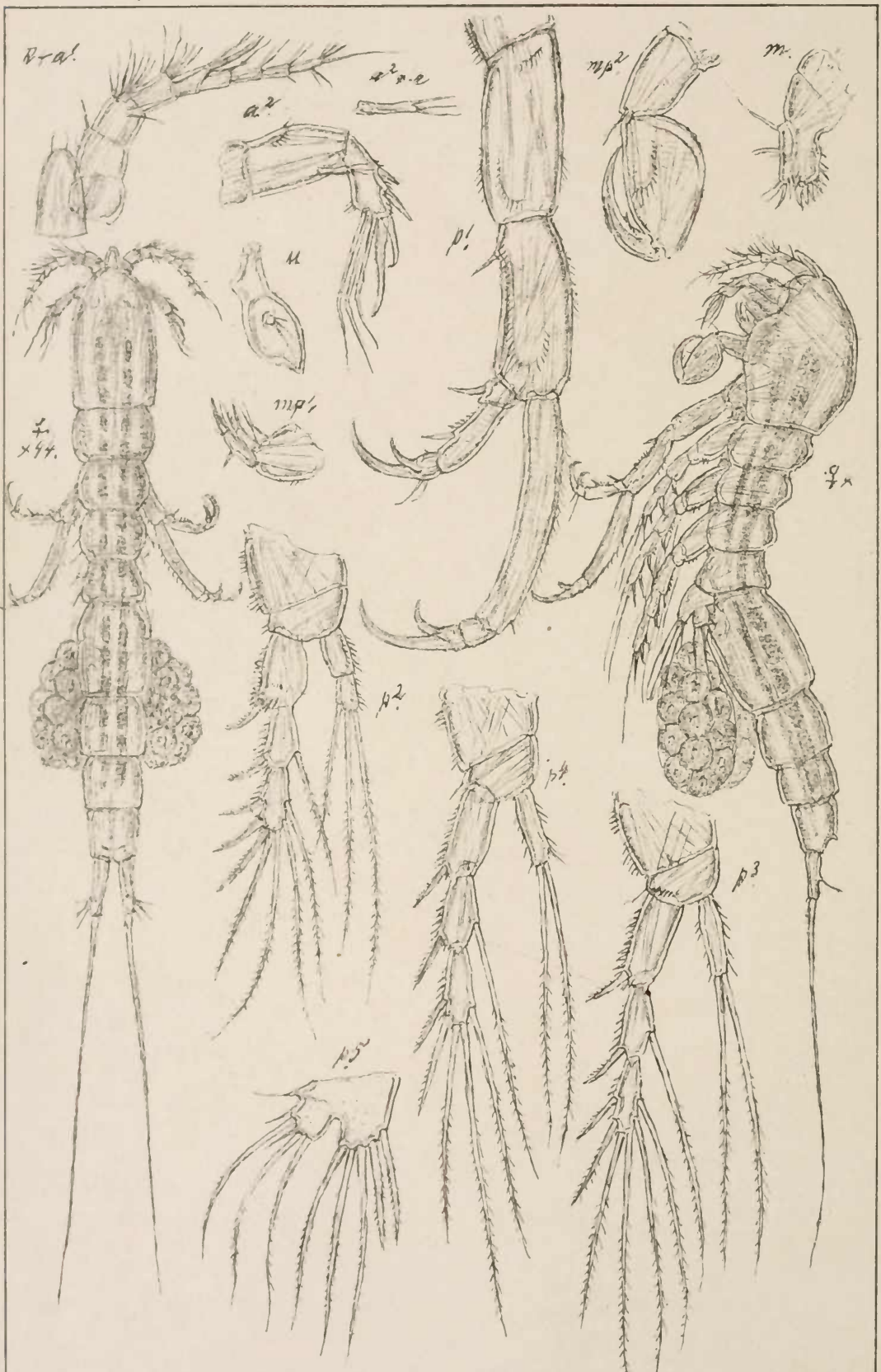


G.O.Sars, autogr. Norsk Lithgr. Officin

Metis ignea, Philippi.

Copepoda

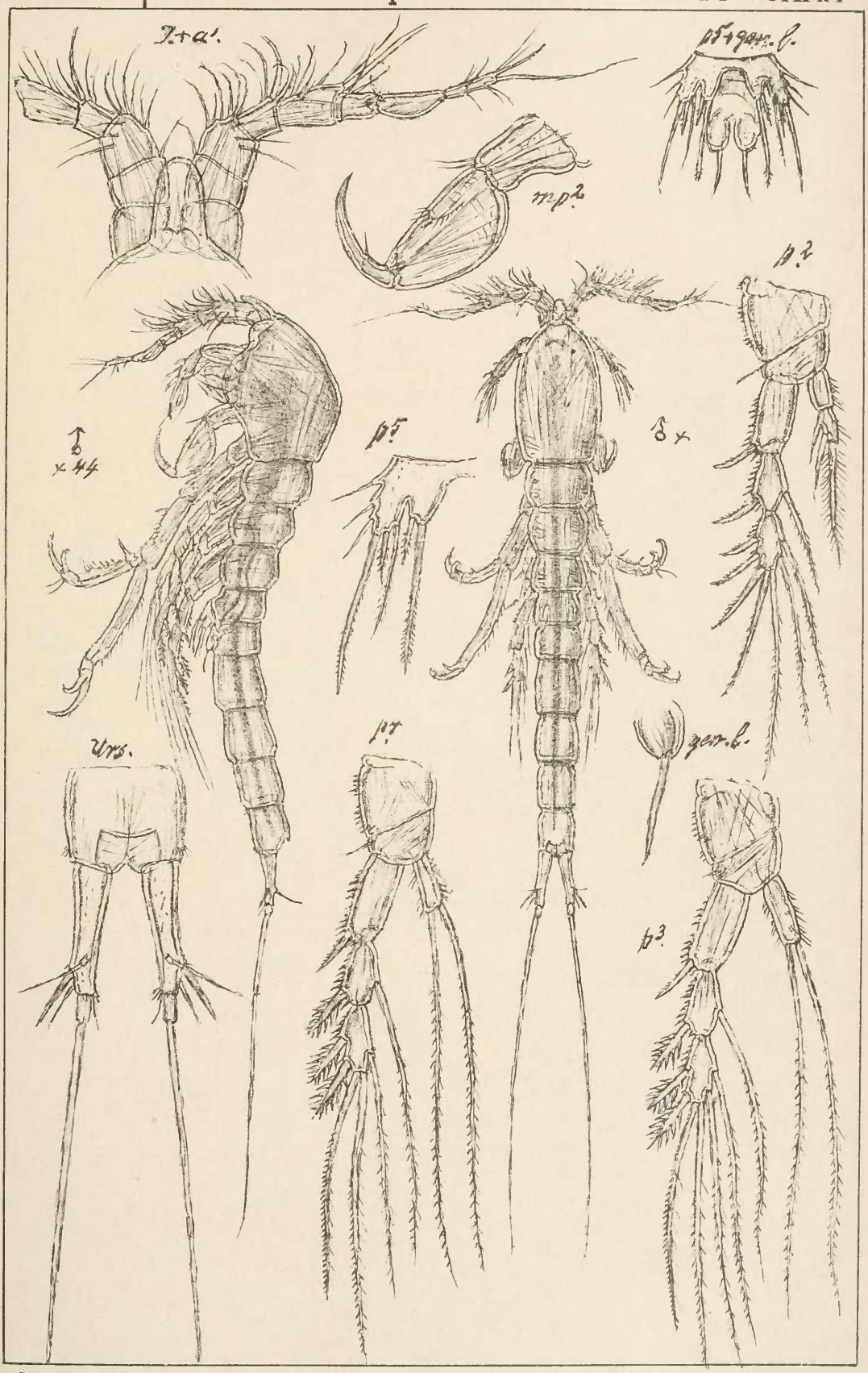
Balænophilidæ Harpacticoida Pl. CCXXIX.



G.O.Sars, autogr. Norsk Lithgr. Officin

Balænophilus unisetis, Auriv.

Copepoda



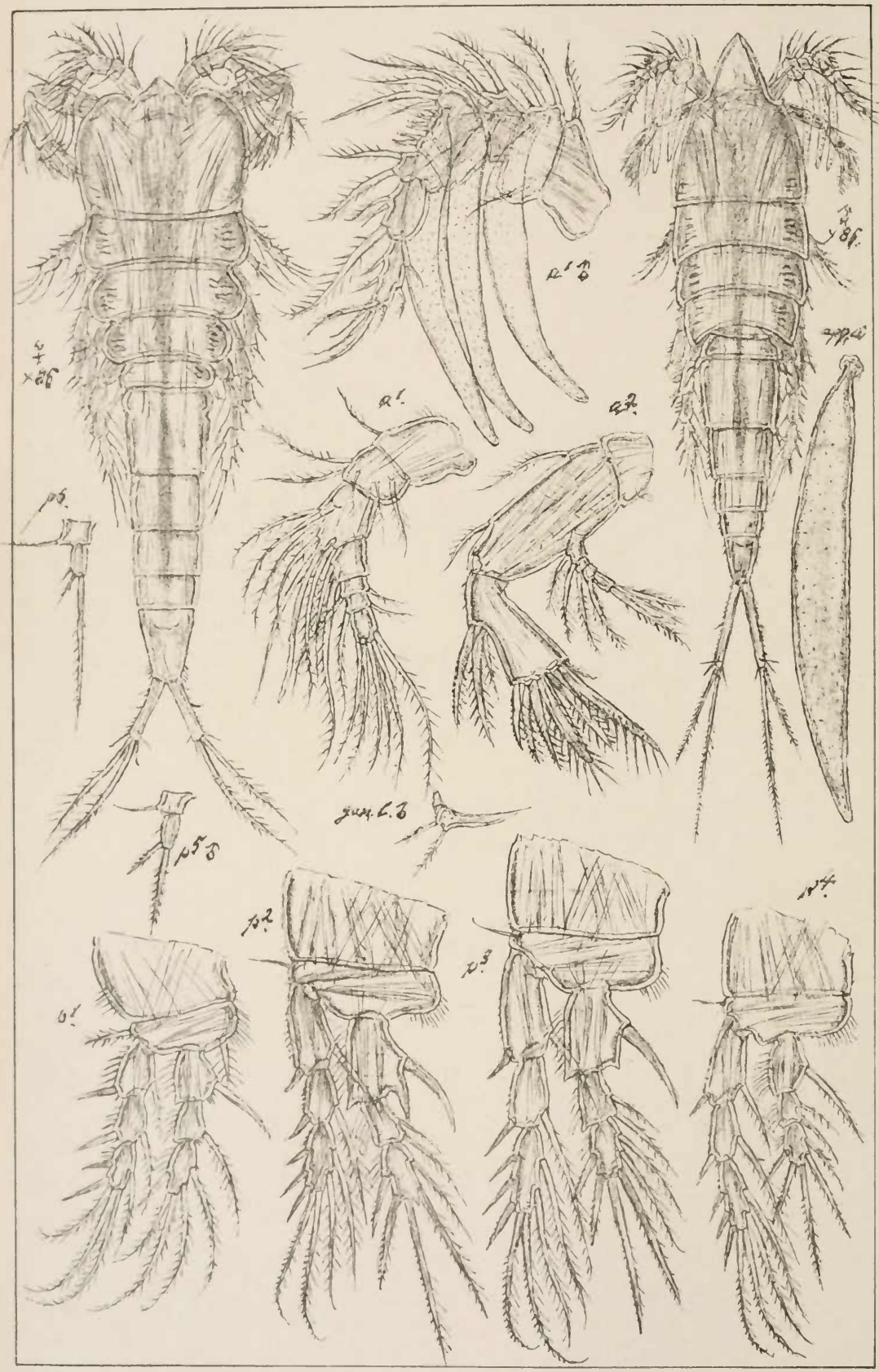
G.O. Sars, autogr

Norsk Lithgr. Officin

Balænophilus unisetis, Auriv.
(male)

Copepoda

Cerviniidæ — Harpacticoida — Supplm. Pl. 1

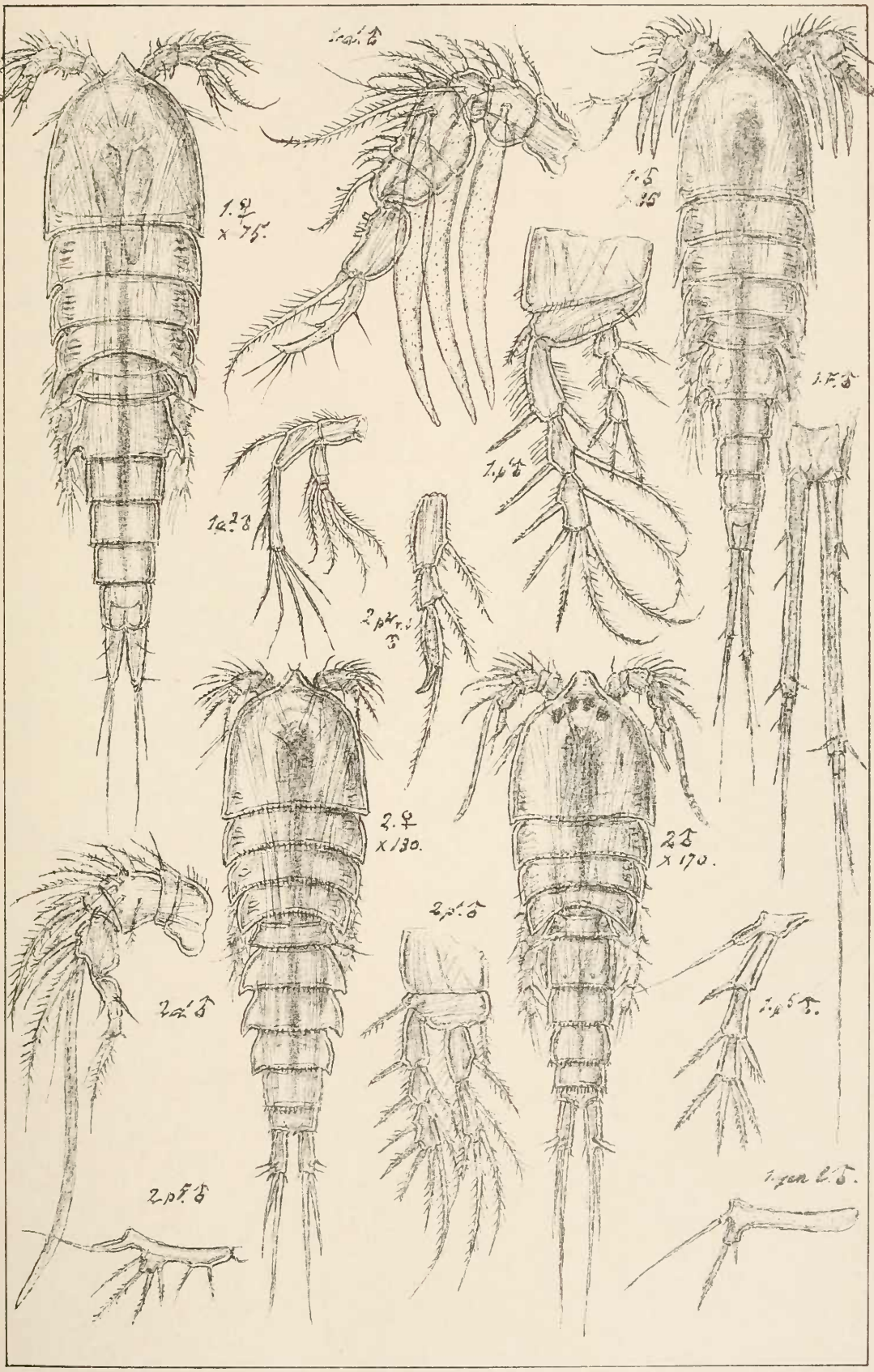


G.O. Sars, autogr. — Norsk Lithgr Officin.

Cervinia Bradyi, Norm.

Copepoda

Cerviniidæ — Harpacticoida — Supplm. Pl. 2

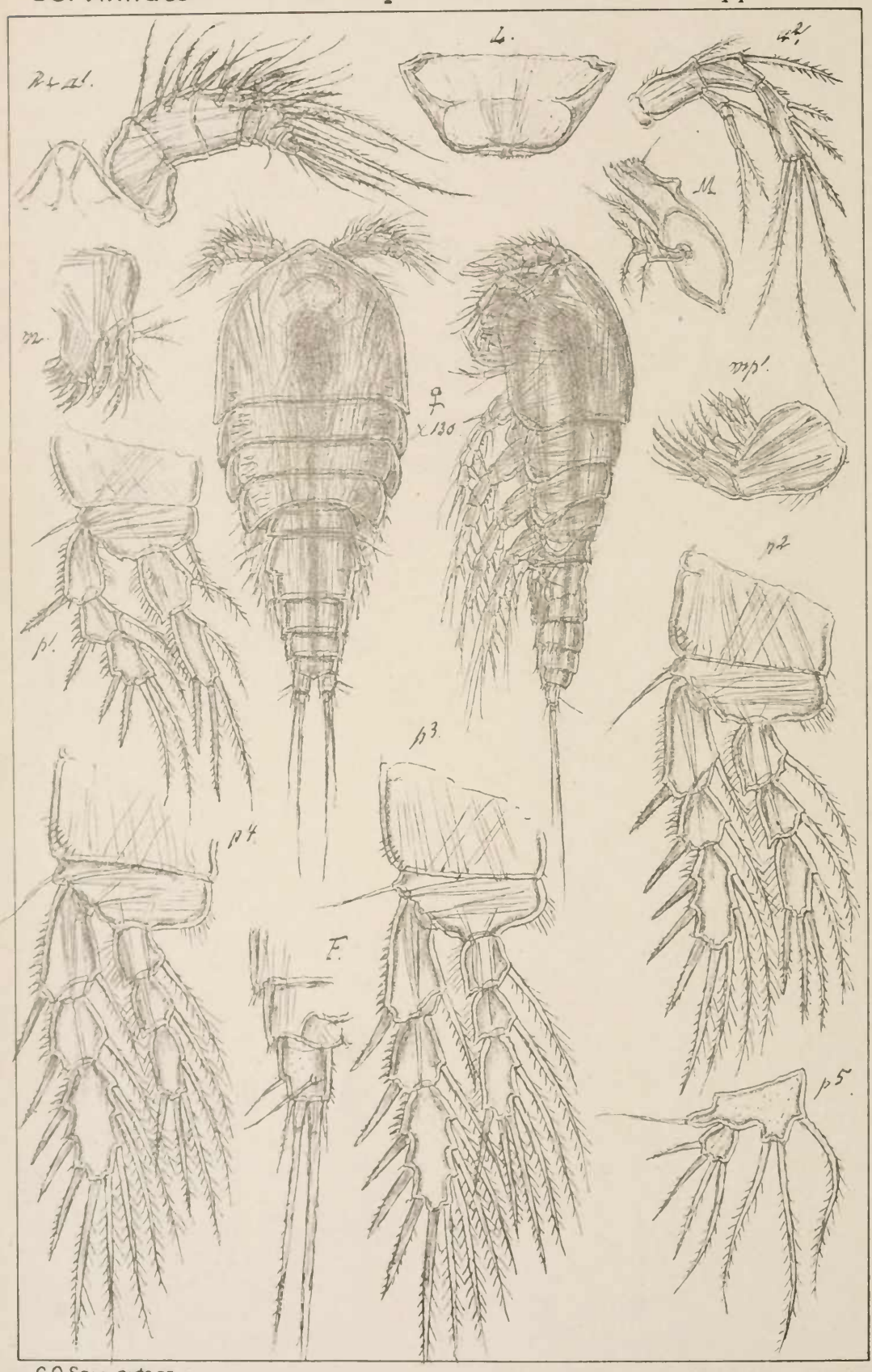


G.O. Sars, autogr. — Norsk Lithgr. Officin

1. Eucanuella spinifera, Scott.
2. Zosime typica, Boeck.

Copepoda

Cerviniidœ | Harpacticoida | Supplm. Pl. 3



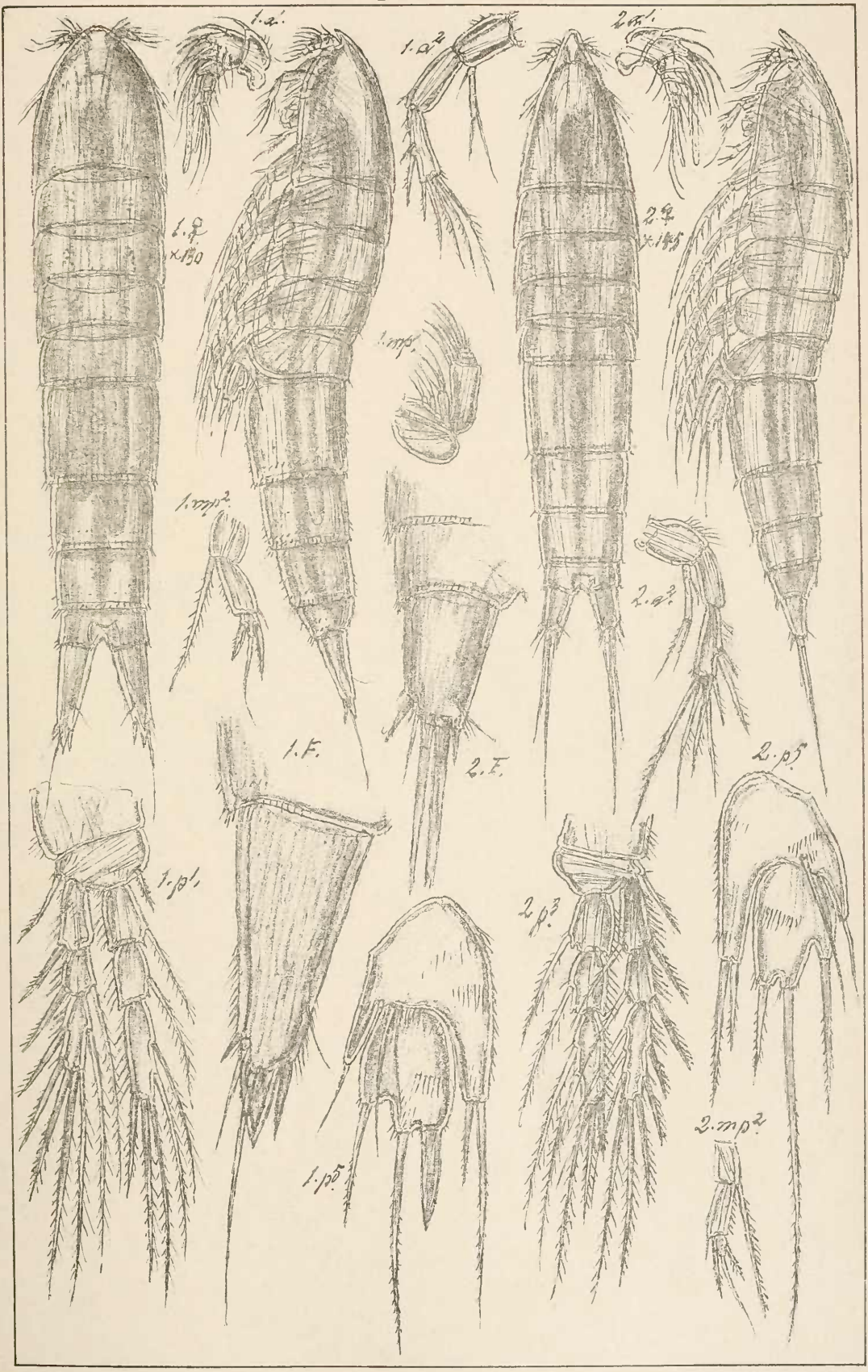
G.O.Sars, autogr.

Norsk Lithgr. Officin.

Zosime incrassata, G.O.Sars.

Copepoda

Ectinosomidæ Harpacticoida Supplm. Pl. 4

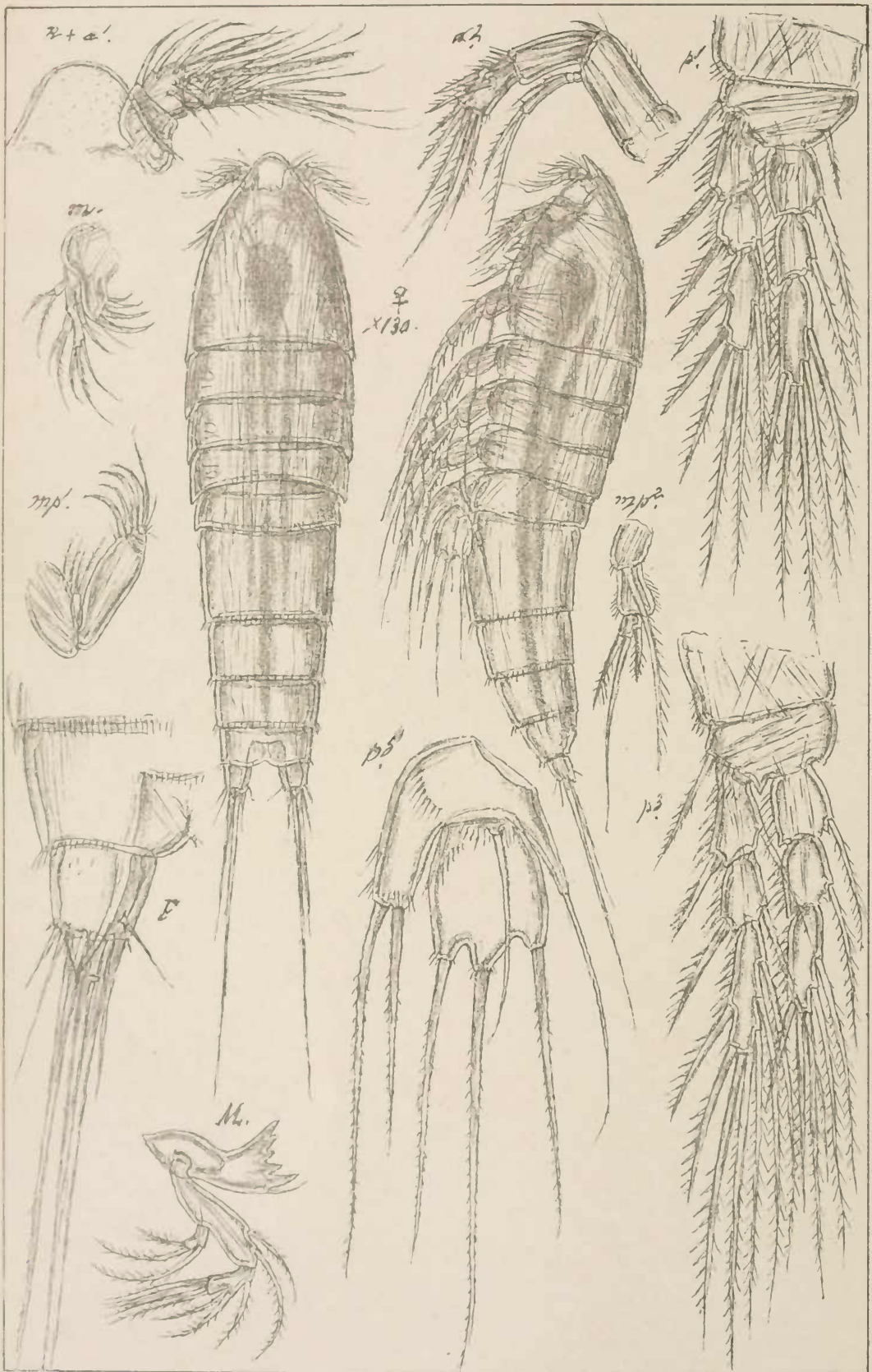


G.O.Sars, autogr. Norsk Lithgr. Officin.

1. Pseudobradya hirsuta (Scott)

Copepoda

Ectinosomidæ Harpacticoida Supplm. Pl. 5

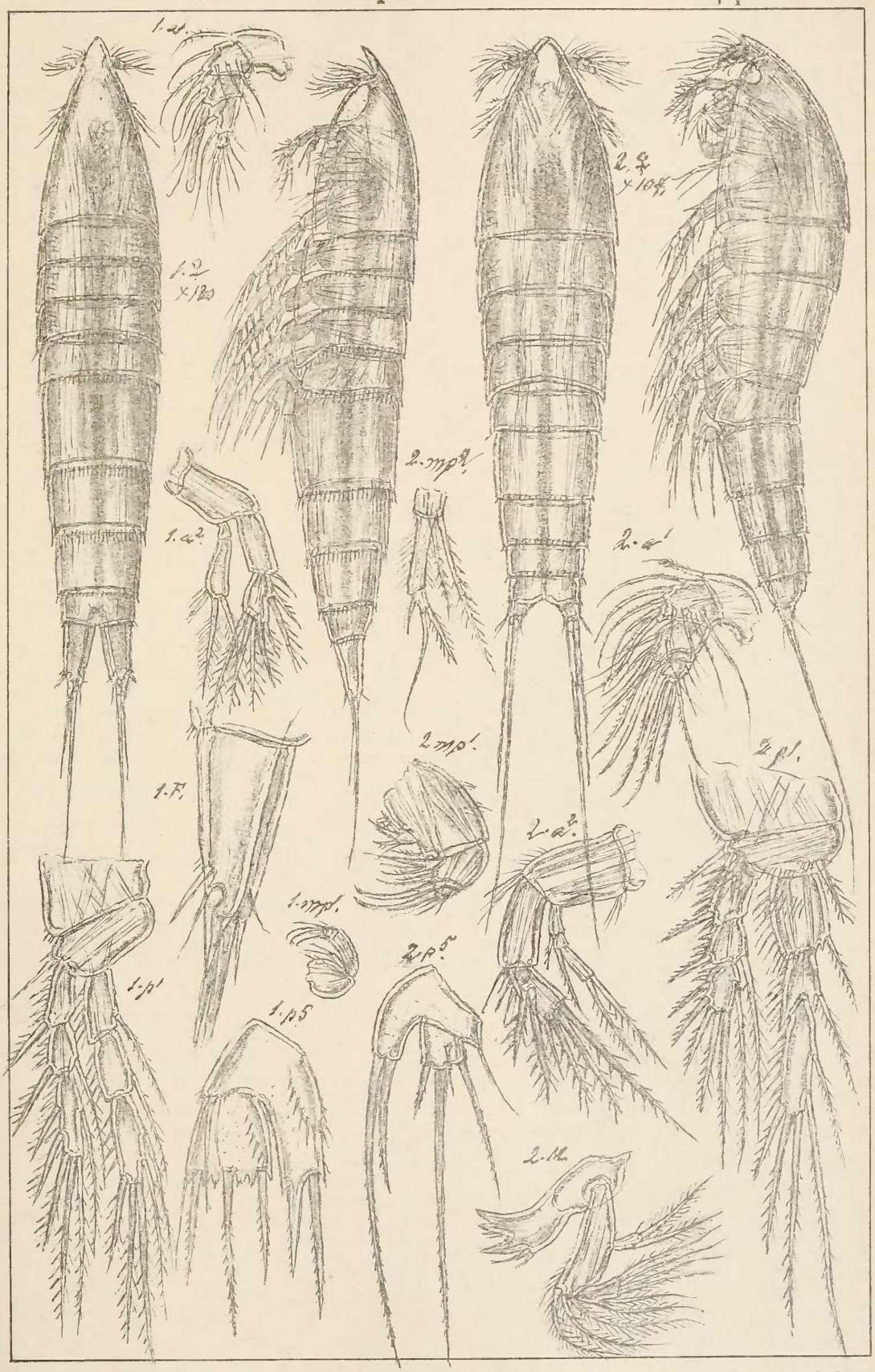


G.O.Sars, autogr. Norsk Lithgr. Officin.

Pseudobradya robusta, G.O.Sars.

Copepoda

Ectinosomidæ Harpacticoida Supplm. Pl. 6

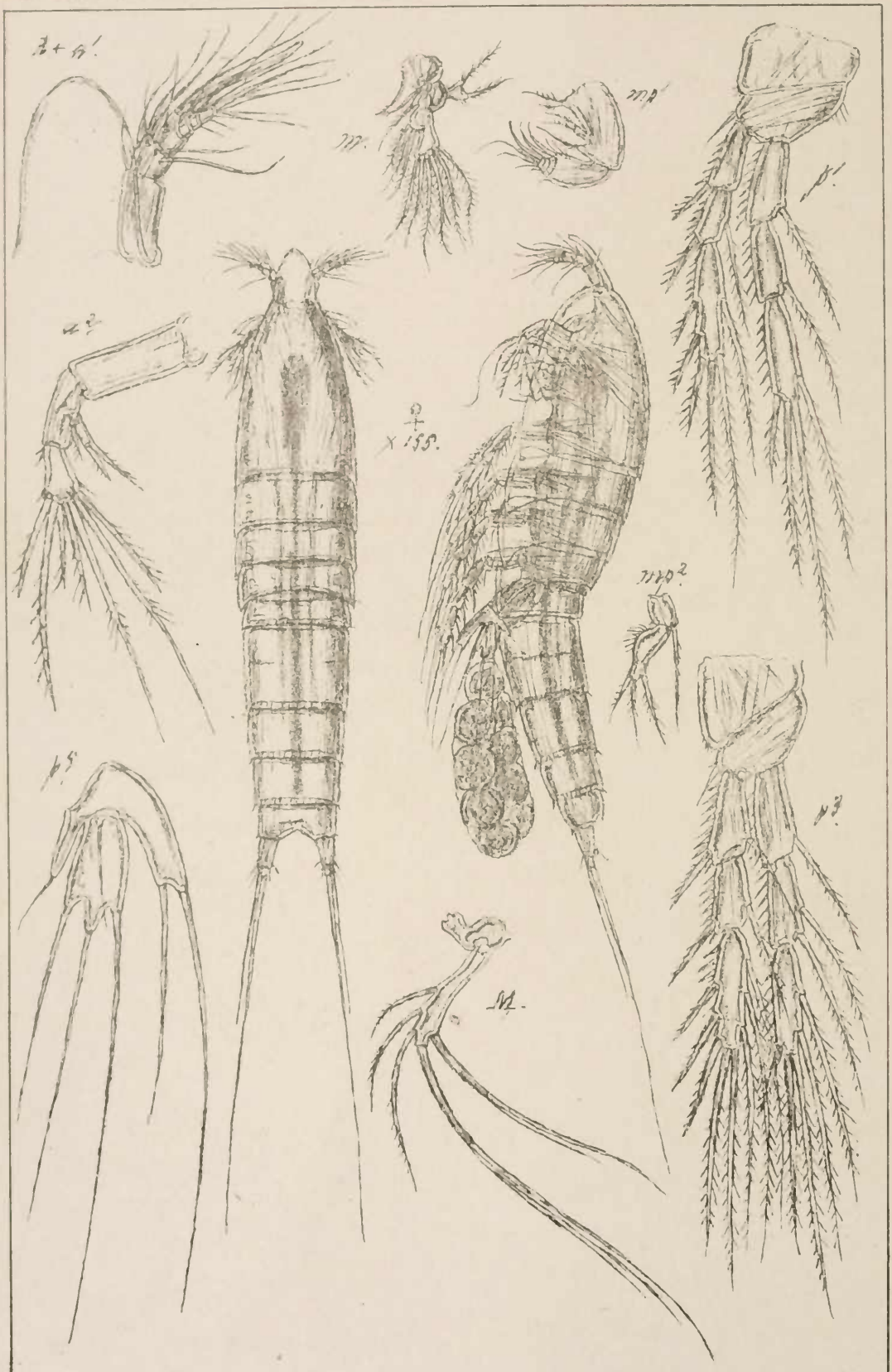


G.O.Sars, autogr. Norsk Lithgr. Officin.

1. Pseudobradya elegans (Scott)

Copepoda

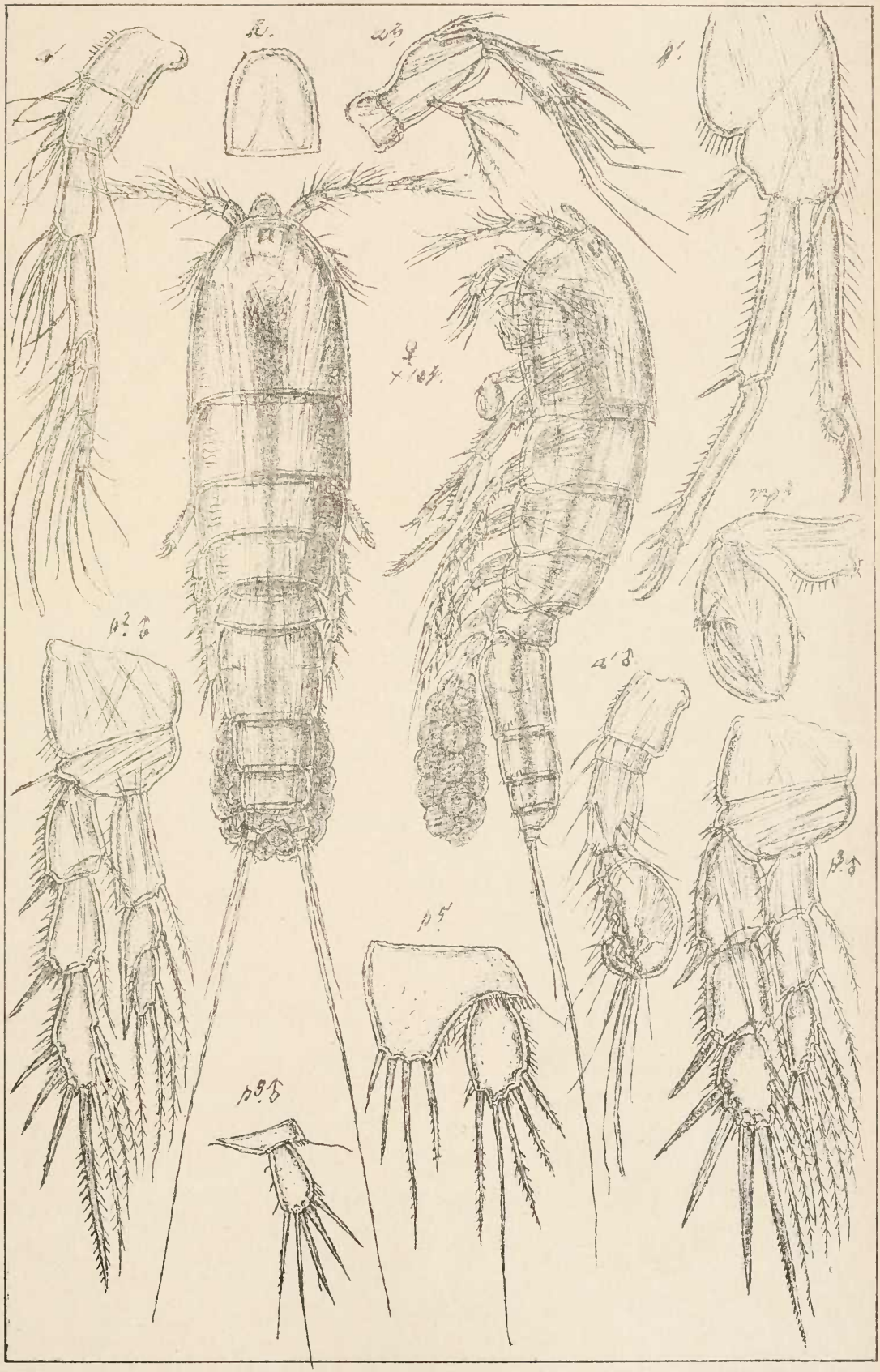
Ectinosomidæ Harpacticoida Supplm. Pl. 7



G.O.Sars, autogr. Norsk Lithgr. Officin.

Ectinosomella nitidula G.O.Sars

Copepoda

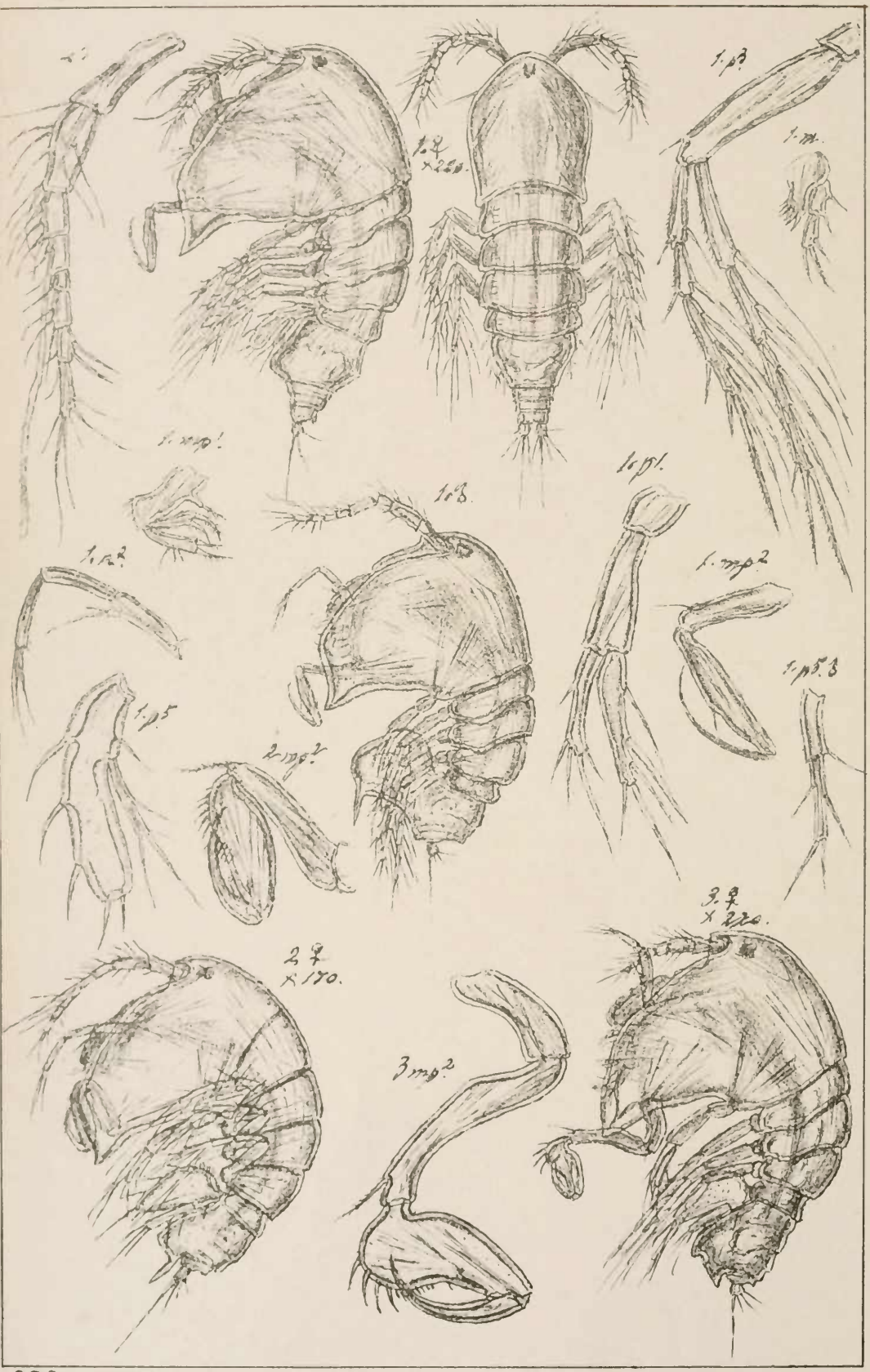


G.O.Sars, autogr. Norsk Lithgr. Officin.

Harpacticus littoralis, G.O.Sars

Copepoda

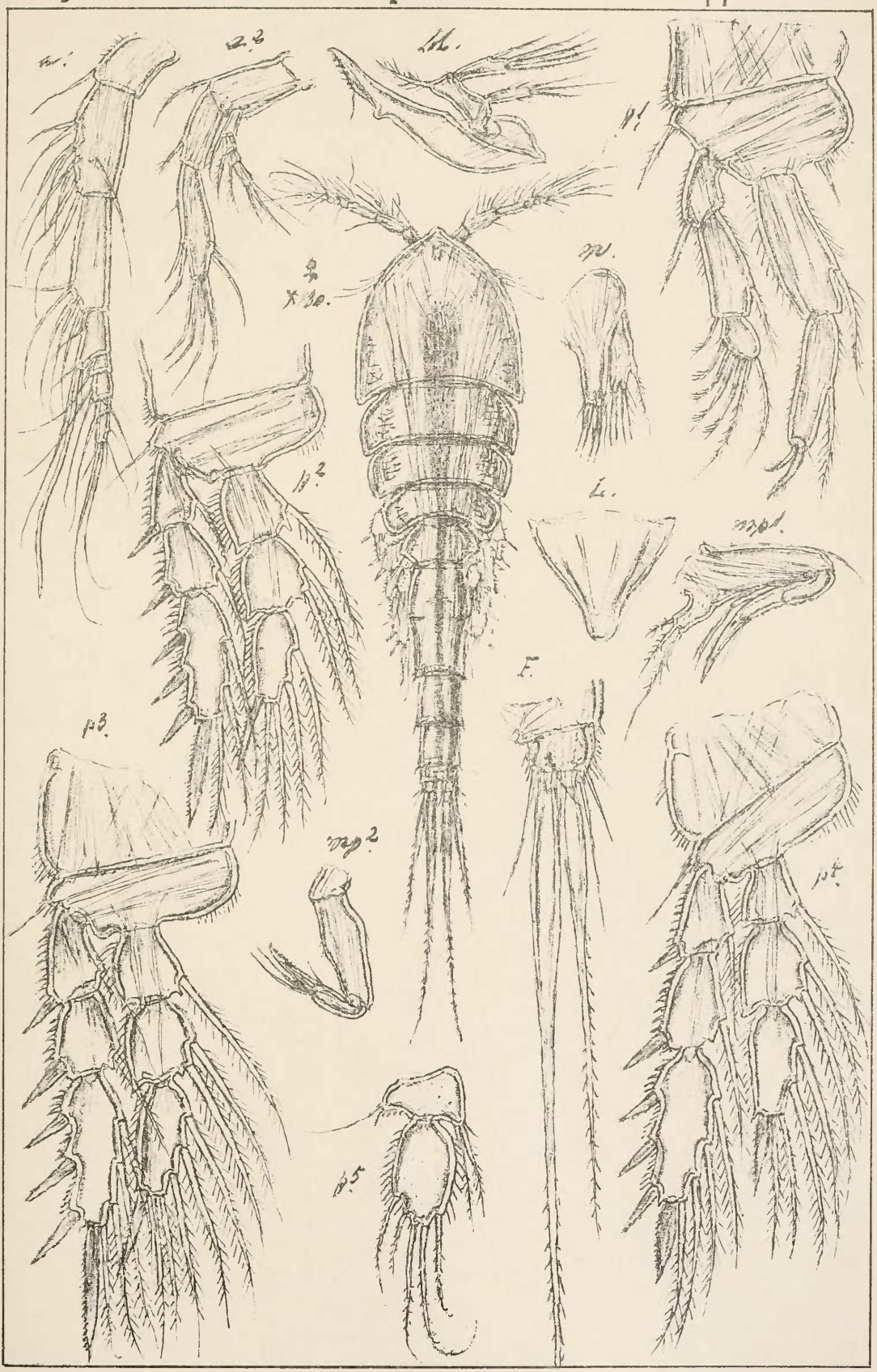
Tegastidœ — Harpacticoida — Supplm. Pl. 9



G.O.Sars, autogr. — Norsk Lithgr. Officin.

1. Tegastes harpacticoides (Claus)
2. Tegastes calcaratus G.O.Sars

Copepoda



G.O.Sars, autogr.

Norsk Lithgr. Officin.

Idyœa tenella, G.O.Sars

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HAPACTICOIDA

PARTS XXXI & XXXII

SUPPLEMENT (continued)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
PUBLISHED BY THE BERGEN MUSEUM
SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1911

Remarks.—This new species somewhat resembles in its outward appearance *I. angusta*, G. O. Sars, exhibiting a similar very slender form of body. It is, however, easily distinguished by the less slender anterior antennæ, and still more by the peculiar dilatation of the 2 middle caudal setæ.

Occurrence.—Of this form at first only a single female specimen was found at Lillesand. Last summer, however, I observed this species not unfrequently in another locality of the south coast, viz., at Korshavn.

Pages 97.
For Idyopsis, G. O. Sars.
Read: *Idyanthe*, G. O. Sars.

Remarks.—As the generic name *Idyopsis* has been previously appropriated in zoology, I have in my account of the Crustacea of the 2nd Fram Expedition proposed the above change of name.

Page 121.
Rhynchothalestris helgolandica, (Claus).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Expedition).

Page 124.

Add the following species:

Microthalestris littoralis, G. O. Sars, n. sp.
(Suppl. Pl. 11, fig. 1).

Specific Characters.—Female. Very like the type species both in size and general appearance, though perhaps a little less slender in form. Caudal setæ simple, none of them conspicuously dilated at the base. Anterior antennæ comparatively shorter than in the type species, but of a very similar structure. Posterior antennæ and oral parts almost exactly as in that species. 1st pair of legs exhibiting the structure characteristic of the genus, the rami being even still more slender than in the type species. Last pair of legs resembling in their general shape those in *M. forficula*, but differing conspicuously as to the number of marginal setæ on the distal joint, the inner edge of this joint having only a single seta, whereas in the type species 3 such setæ are constantly present.

Colour whitish, with a faint yellow tinge.

Length of adult female 0.60 mm.

Remarks.--The present form is closely allied to *M. forficula* (Claus), and indeed I have long been in doubt about its real specific difference. Having however met with this form in many different localities and always found the above mentioned characteristic difference in the structure of the last pair of legs perfectly constant, I prefer to describe it here as a new species. The forms recorded by Boeck as *Thalestris karmensis* and by Th. Scott as *T. forficuloides*, belong both to the type species, as proved by the structure of the last pair of legs.

Occurrence.—I have met with this form in many places, both of the south and west coasts of Norway and northwards to the Trondhjem Fjord (Bejan). It is a pronouncedly littoral form, being only found in the uppermost part of the littoral zone, and very often in shallow pools left by the tide.

Page 128.

Dactylopusia vulgaris, G. O. Sars.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Expedition).

Page 129.

Dactylopusia micronyx, G. O. Sars.

Remarks.—This form seems to be the same as that recorded by Messrs. Normann and Scott as *D. valida*. I do not however know, which of these 2 names should be retained for the species, as they were proposed about simultanously.

Page 131.

Add the following species:

Dactylopusia latipes, Boeck.

(Suppl. Pl. 11, fig. 2).

Dactylopus latipes, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. f. 1864, p. 270.

Syn. Dactylopus brevicornis, Scott (not Claus).

Specific Characters.—Female. Body very robust, with the anterior division considerably dilated and of rounded oval form. Urosome much narrower and about half the length of the anterior division. Caudal rami very short, being nearly twice as broad as they are long; innermost but one of the apical setæ exhibiting at the base inside a very conspicuous dilatation. Anterior antennæ short and thick, consisting, as in *D. brevicornis*, of 5 joints only, with a slight

trace of a subdivision of the 3rd joint. Posterior antennæ and oral parts scarcely different in structure from those parts in *D. brevicornis*. 1st pair of legs very powerfully built, with the rami still shorter and stouter than in that species, the outer one scarcely extending to the end of the 1st joint of the inner, and having the apical claws shorter and less curved than in *D. brevicornis;* inner, ramus with the 2 outer joints very short and less perfectly separated, apical claws strong. Last pair of legs with the distal joint short, cordiform in shape, being only slightly longer than it is broad at the base; inner expansion of proximal joint extending nearly as far as the distal joint. Ovisac of moderate size and rounded oval in form.

Colour light yellow.

Length of adult female 0.75 mm.

Remarks.—This form, which I believe is that recorded by Boeck under the above name, is closely allied to *D. brevicornis* Claus, agreeing with that species in most of the structural details. It is, however, of larger size and considerably more robust form of body, and may moreover at once be recognised by the peculiar and very conspicuous dilatation which the innermost but one of the caudal setæ exhibits at the base inside, and of which no trace is found in *D. brevicornis*. The form described and figured by Th. Scott as *D. brevicornis* in the 24th Annual Report of the Fishery Board for Scotland seems to be referable to the present species.

Occurence.—I have met with this form not rarely in several places both of the south and west coasts of Norway in depths ranging from 20 to 40 fathoms.

Distribution.—Scottish coast (Scott).

Add also the following new genus and species:

Gen. **Dactylopodopsis,** G. O. Sars, n.

Generic Characters.—General form of body resembling that in *Dactylopusia*. Rostral projection well developed, lamellar. Anterior antennæ short and stout, with the number of joints considerably reduced. Posterior antennæ with the outer ramus small, but distinctly 3-articulate. Mandibles very strong, palp, however, comparatively narrow, with both rami imperfectly developed. 1st pair of legs rather small, outer ramus scarcely prehensile, inner unusually short and only composed of 2 joints. Natatory legs well developed, with the rami subequal in length. Last pair of legs with the distal joint small; inner expansion of proximal joint triangularly produced.

Remarks.—This new genus is chiefly characterised by the peculiar structure of the 1st pair of legs, which differs conspicuously from that in any of the other genera belonging to the present family. In the other structural details, as also in the external appearance, it exhibit a general ressemblance to some species of the genus *Dactylopusia* (D. brevicornis and latipes). Only a single species is known to me.

Dactylopodopsis dilatata, G. O. Sars, n. sp.

(Suppl. Pl. 12).

Specific Characters.—*Female.* Body short and stout, with the anterior division considerably dilated and somewhat depressed, the posterior much narrower. Cephalic segment exceedingly large and having the posterior edge minutely denticulated; rostral projection large and prominent, linguiform in shape. Last pedigerous segment abruptly much narrower than the preceeding ones. Urosome about half the length of the anterior division and very slightly tapered behind. Caudal rami short, quadrangular in form, apical setæ normal and rather slender. Anterior antennæ short and stout, 5-articulate, resembling in structure those in *Dactylopusia brevicornis*, 3rd joint having a slight trace of a subdivision in the middle. 1st pair of legs much smaller than the 3 succeeding ones, outer ramus with the last joint scarcely shorter than the middle one and rather narrow, oblong in form, being armed outside with 3 simple spines successively increasing in length distally and at the tip with 2 slender setæ; inner ramus scarcely as long as the outer, proximal joint somewhat dilated and carrying inside below the middle a plumose seta, distal joint small, incurved, with 2 unequal apical spines. Natatory legs with both rami strongly built, middle joint of the inner one acutely produced at the outer corner. Last pair of legs comparatively small, distal joint of rounded form, and provided with 5 rather unequal marginal setæ; inner expansion of proximal joint extending beyond the distal one and carrying 5 setæ.

Colour not yet ascertained.

Length of adult female 0.85 mm.

Remarks.—As above stated, this form in several respects has a general resemblance to *Dactylopusia brevicornis* and its ally *D. latipes*, and indeed I was at first inclined to combine these 3 species in a particular genus. The anomalous structure of the 1st pair of legs in the present species, however, would seem to forbid such a combination, and I prefer therefore to leave the 2 said species in the old genus *Dactylopusia*, restricting the new genus to the present form.

Occurrence.—A solitary female specimen of this form was found in a sample taken at Bukken, south west coast of Norway from a depth of about 60 fathoms. Another specimen was taken, many years ago, off the Lofoten islands, from a dept of 100 fathoms, muddy bottom.

Page 133.

Add the following species:

Dactylopodella clypeata, G. O. Sars, n. sp.

(Suppl. Pl. 13, fig. 1).

Specific Characters.—Female Body very short and compact, clypeiform, with the dorsal face strongly vaulted. Cephalic segment exceedingly large, occupying almost half the length of the body, rostral prominence short and deflexed. Epimeral plates of the 3 succeeding segments laterally expanded, subimbricate, hind corner acutely produced, 4th segment deeply emarginated, encompassing laterally the small last segment. Urosome very short, not even attaining $^1/_3$ of the length of the anterior division. Caudal rami small, apical setæ, however, rather slender and elongated. Antennæ and oral parts of a structure nearly agreeing with that in the type species. 1st pair of legs likewise rather similar, though having the outer ramus comparatively shorter and the apical claws of the inner less slender. 2nd pair of legs, as in the type species, with the outer 2 joints of the inner ramus confluent. Last pair of legs with the distal joint comparatively larger than in that species, inner expansion of proximal joint broader and less produced.

Colour brownish yellow.

Length of adult female 0.41 mm.

Remarks.—This form may at once be distinguished from *D. flava* (Claus) by its very short and compact, clypeiform body. In the structural details, however, it very closely agrees with that species.

Occurrence.—Several specimens of this form were found at Farsund and Korshavn, south coast of Norway, in depths ranging from 20 to 50 fathoms, sandy bottom.

Page 135.

Add the following species:

Idomene borealis, G. O. Sars, n. sp.

(Suppl. Pl. 13, fig. 2).

Specific Characters.—Female. General form of body resembling that in the type species, though perhaps a little shorter and stouter. Cephalic segment large and evenly rounded in front, with a very small deflexed rostral expansion. Epimeral parts of this and the 3 succeeding segments sub-imbricate and acutely produced at the hind corner. Last pedigerous segment much narrower than the preceding ones, but provided with well defined acute epimeral plates. Urosome not nearly attaining half the length of the anterior division; last segment short and scarcely cleft behind. Caudal rami rather short, being scarcely longer than they are broad, apical setæ comparatively short, the innermost one not spiniform. Anterior antennæ rather small, and resembling in structure those in the type species. Posterior antennæ with the outer ramus comparatively smaller, but distinctly 3-articulate. Mandibular palp with the rami much smaller than in the type species, none of the setæ spiniform. Maxillæ and maxillipeds about as in that species. 1st pair of legs with the outer ramus much shorter than the 1st joint of the inner, this joint less dilated than in the type species and having the seta of the inner edge attached in front of the middle, last joint of same ramus rather small, scarcely longer than the preceding one, apical claws more slender than in the type species. Setæ of this and the preceding joint small and not plumose. Last pair of legs with the distal joint narrowly exserted at the tip, with only the 2 outermost setæ spiniform, seta of inner edge attached in front of the middle; inner expansion of proximal joint angularly incurved at the base outside and comparatively narrower than in the type species, marginal setæ 6 in number and of rather unequal size, the innermost but one reduced to a very short denticulated spine.

Colour, when alive, not yet ascertained.

Length of adult female 0.42 mm.

Remarks.—This form at first sight looks very like *I. forcipata* Phil. On a closer examination, however, it may at once be distinguished by the comparatively shorter caudal rami, and more particularly by the innermost apical seta not being spiniform. As mentioned in the above diagnosis, moreover, several other well marked differences in the structural details are found to exist.

Occurrence.—Some few specimens of this form, all of the female sex, were found in a sample kindly send to me from Mr. Nordgaard, who procured it in the Trold Fjord, inside the Lofoten islands.

Add also the following genus and species:

Gen. **Idomenella**, Scott.

Generic Characters.—Body somewhat resembling in shape that in *Dactylopusia*, but more depressed. Anterior antennæ comparatively short and stout, with the number of joints reduced, and carrying, in addition to the usual setæ a number of slender, densely pectinate spines. Posterior antennæ and oral parts on the whole built upon the same type as in *Idomene*. 1st pair of legs, as in that genus, having the inner ramus distinctly 3-articulate, with the 1st joint lamellarly dilated. Natatory legs normal. Last pair of legs, however, imperfectly developed, with no distinct boundary between the distal and proximal joints.

Remarks.—This genus has recently been established by Th. Scott, to include the form described by him at an earlier date as *Dactylopus coronatus*. As indicated by the generic name proposed, it is nearest allied to the genus *Idomene* Philippi, from which it chiefly differs in the structure of the anterior antennæ and of the last pair of legs. The diminutive end-syllable of the name *Idomenella* is somewhat unappropriate, in so far as the type species is in reality of considerably larger size than either of the 2 known species belonging to the genus *Idomene*.

Idomenella coronata, Scott.

(Suppl. Pl. 14).

Dactylopus coronatus, Scott, Additions to the Fauna of the Firth of Forth. Twelfth Ann. Rep. of the Fishery Board for Scotland, p. 255, Pl. IX, figs 12—20.

Syn: *Idomene coronata*, G. O. Sars.

Specific Characters.—Female. Body moderately robust and pronouncedly depressed, tapering gradually behind. Cephalic segment rather large and produced in front into an obtuse rostral projection. Urosome comparatively short, not attaining half the length of the anterior division, its segments coarsely spinulose at the hind edge ventrally and laterally. Caudal rami scarcely longer than they are broad, apical setæ normal and of moderate length. Anterior antennæ comparatively short and stout, 6-articulate, gradually tapered and densely setiferous, carrying besides a number of slender spines edged with long spinules

in a comb-like manner. Posterior antennæ with the distal joint comparatively short, outer ramus attached near the end of the proximal joint, and fully as long as the distal joint. Mandibular palp with the rami of moderate size and simply setiferous. Posterior maxillipeds rather powerful, hand oval fusiform in shape, with an oblique row of delicate spinules crossing its base. 1st pair of legs with the outer ramus much shorter than the inner, middle joint with a rather strong plumose seta inside, last joint much smaller and armed with 3 curved spines and 2 somewhat longer setæ; inner ramus with the 1st joint rather dilated and carrying inside, somewhat beyond the middle, a strong plumose seta, the outer 2 joints well developed and combined nearly attaining the length of the 1st, each with a well-marked seta inside, last joint armed moreover at the tip with 2 unequal claw-like spines and a slender plumose seta. Natatory legs of usual structure, and having both rami coarsely spinulose outside. Last pair of legs each forming an irregular lamella divided in the middle by a deep incision into two rounded setiferous lobes, the outer one provided near the base with a small hair-like bristle and carrying moreover 5 marginal setæ, the outer 2 of which are falciform curved and clothed along the outer edge with coarse spinules; inner lobe a little more prominent and likewise edged with 5 setæ, the outer 2 of which are much the longest, whereas the innermost but one is rather short.

Colour pale yellowish grey.

Length of adult female 0.74 mm.

Remarks.—This form, as above mentioned, was at first described by Th. Scott as a species of the genus *Dactylopusia,* and was subsequently by the present author referred to the genus *Idomene* Philippi, to which it undoubtedly bears a near relation. Quite recently, however, Th. Scott has proposed for its reception the new genus *Idomenella,* which I believe ought to be supported.

Occurrence.—A solitary female specimen of this form was taken, some years ago, at Risør, south coast of Norway, from a depth of about 20 fathoms. Another specimen I found in a sample taken at Aalesund on the west coast.

Distribution.—Scottish coast (Scott), Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 136.

Amenophia peltata, Boeck.

Distribution.—Polar Island north of Grinnell Land (2nd Fram Exp.).

Page 141.

Westwoodia assimilis, G. O. Sars.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 144.

Add the following species:

Westwoodia monensis (Brady).

(Suppl. Pl. 15).

Pseudothalestris monensis, Brady. On Copepoda and other Crustacea taken in Ireland and the North east coast of England. Trans. Nat. Hist. Soc. N. D. & N. C., Vol. XIV, p. 59, Pl. I, figs. 15, 16. Pl. III, figs. 11—16.

Specific Characters.—Female. Body of the usual short pyriform shape, with the anterior division much dilated, the posterior short and tapered. Cephalic segment large, but not nearly so deep as in *W. minuta;* the 3 succeeding segments less conspicuously imbricate. Eye of quite normal structure. Anterior antennæ very slender, tapering, and composed of 8 well defined joints, 4 of which belong to the terminal part. Posterior antennæ and oral parts scarcely different in structure from those in the said species. 1st pair of legs likewise very similar, the outer ramus being distinctly biarticulate and about half as long as the 1st joint of the inner, seta attached inside this joint comparatively small and more remote from the base; apical claws of same ramus comparatively shorter than in *W. minuta* and still more unequal in size. Natatory legs scarcely different in structure from those in *W. minuta.* Last pair of legs with the distal joint rather small, oblong oval in form, outermost marginal seta somewhat remote from the base, middle one very thin, hair-like; inner expansion of proximal joint comparatively broader than in *W. minuta* and scarecly extending beyond the distal joint.

Male differing from the female in a manner similar to that found in the other species of the present genus. Inner ramus of 2nd pair of legs biarticulate, with 2 subequal spines at the tip, both slightly curved outwards. Last pair of legs not much different in shape from those in female; inner expansion of proximal joint however comparatively smaller and only provided with 3 marginal setæ.

Colour yellowish grey.

Length of adult female 0.55 mm.

Remarks.—The above—described form is unquestionably that recorded by Prof. Brady as *Pseudothalestris monensis.* It is closely allied to the species

described in the present work as *W. minuta* Claus, but differs in some particulars, especially as regards the structure of the anterior antennæ, so that it evidently ought to be regarded as specifically distinct. As to the genus *Pseudothulestris* of Brady, I am still of opinion, that it cannot be supported, since the only character on which it is based, the biarticulate condition of the outer ramus of the 1st pair of legs, is also found in a species, *W. assimilis* G. O. Sars, which so closely resembles the type species, *W. nobilis*, Baird, as hardly to be distinguished without dissection.

Occurrence.—Several specimens of this form were taken, some years ago, from tidal pools at Haugesund, west coast of Norway. Prof. Brady also found this species in tidal pools, and it would thus seem to be a pronouncedly littoral form.

Distribution.—British Isles (Brady).

Page 154.

Amphiascus minutus (Claus).

Distribution.—Polar Island north of Grinnell Land (2nd Fram Exp.).

Page 156.

For Amphiascus imus (Brady)

Read: *Amphiascus varians* (Norm. & Scott).

Stenhelia varians, Norman & Scott, Copepoda new to science from Devon and Cornwall. Ann. Mag. Nat. Hisc. Ser. 1 Vol. XV, p. 284.

Remarks.—I find that the form decribed in the present account on page 156 as *Amphiascus imus* Brady is unquestionally identical with that recorded in the year 1905 by Messrs. Normann and Scott under the name of *Stenhelia varians* and subsequently more fully described and figured in their beautiful work „Crustacea of Devon and Cornwall". As these gentlemen also record the true *Stenhelia ima* of Brady, these 2 forms must in reality be specifically distinct. In describing the present species I have also pointed out some apparent differences, especially in the structure of the last pair of legs.

Page 166.

Amphiascus hispidus (Brady).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 168.

Amphiascus affinis, G. O. Sars.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 169.

Amphiascus intermedius (Scott).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 170.

Amphiascus typhlops, G. O. Sars.

Remarks.—It may be that this form is in reality identical with that recorded in 1893 by I. C. Thompson as *Stenhelia hirsuta*. Some doubt about the identity is however left, as the figures given by that author do not by far agree exactly with those here reproduced, and as there are 3 other closely allied species, to be described in the sequel, which with almost the same right might be adduced to Thompson's species. A re-eximation of the type specimens will be necessary, to settle this question.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 175.

For Amphiascus productus, G. O. Sars

Read: *Amphiascus Blanchardi* (Scott).

Stenhelia Blanchardi, Scott, on some new and rare British Copepoda. Anz. & Mag. Nat. Hist. Ser. 6. Vol. XVI, p. 353, Pl. XV, figs. 1—10.

Remarks.—Though the habitus-figure (lateral view) given by Th. Scott scarcely display with sufficient clearnes the extremely slender and elegant form of the body in this species, the detail-figures reproduced do not leave any doubt on the identity of these 2 forms. The description of Th. Scott was published in 1905, that of the present author the next year.

Page 179.

Add the following 12 species:

Amphiascus latifolius, G. O. Sars.

(Suppl. Pl. 16).

Amphiascus latifolius, G. O. Sars, Crustacea of the 2nd Fram Exp., p. 28, Pl. III.

Specific Characters.—Female. Body somewhat robust and only slightly tapered behind. Cephalic segment of moderate size, rostrum conically produced.

Ursome considerably shorter than the anterior devision, with the segments well marked off from each other and densely spinulose at the hind edge ventrally and laterally. Caudal rami short quadrangular, broader than they are long, inner medial seta conspicuously dilated in its proximal part and exceeding half the length of the body. Anterior antennæ of moderate lenght, gradually tapering distally, and composed of 9 well defined joints, the 4 first successively diminishing in size, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus distinctly 3-articulate, middle joint setiferous. Oral parts of the usual structure. 1st pair of legs with both rami pronouncedly prehensile, the outer one about equalling in length the 1st joint of the inner, its middle joint long and slender, somewhat curved in its proximal part, last joint very short, lamelliform, and armed with 3 strong curved claws, successively increasing in length distally, and accompanied outside by a small bristle, inside by a well developed curved seta; inner ramus with the 1st joint linear in form and carrying near the end a comparatively short seta, the outer 2 joints very small and connected by an oblique suture, the last one armed at the tip with 2 strong claws of unequal length. Natatory legs well developed, with the full number of setæ. Last pair of legs large and pronouncedly foliaceous, distal joint of unusual size and very thin, obliquely rounded in form, and edged with 6 setæ, one of them, issuing from the tip, very thin and hair-like; inner expansion of proximal joint obtusely rounded at the tip and scarcely extending beyond the middle of the distal joint, marginal setæ 5 in number, the 2 outermost closely juxtaposed.

Colour not yet ascertained.

Length of adult female 0.70 mm.

Remarks.—This species was described and figured by the present author in the year 1909 from specimens procured during the 2nd Fram Expedition. The arctic specimens were of larger size than those found off the Norwegian coast, but otherwise agreed in all essential structural details. It is a very distinct and easily recognisable species.

Occurrence.—Some few specimens of this form, all of the female sex, were found in a sample taken by Mr. Nordgaard in the Trold Fjord, inside the Lofoten islands. Another female specimen was derived from a sample taken, many years ago, at Christiansund, west coast of Norway.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exped.).

Amphiascus thalestroides, G. O. Sars, n. sp.

(Suppl. Pl. 17).

Specific Characters.—Female. Body comparatively slender and gradually tapered behind, resembling in shape somewhat that in certain species of the genus *Parathalastris*. Rostrum not much prominent, triangular in form, with the tip somewhat blunted. Urosome almost as long as the anterior division, and having the segments very sharply marked off from each other, the last one rather small. Caudal rami quadrangular, broader than they are long and spinulose inside, apical setæ unusually strong and dark-coloured, the inner medial one, as usual the longest and gradually thickened in its proximal part. Anterior antennæ of moderate length and composed of 8 joints, the first 2 much the largest, the 2 succeeding ones about equal-sized, terminal part rather slender, considerably exceeding half the length of the proximal one. Posterior antennæ with the middle joint of the outer ramus imperfectly developed and without any setæ. Maxillæ with the masticatory lobe unusually strong and armed with a limited number of coarse claw-like spines. Oral parts otherwise normal. 1st pair of legs with both rami distinctly prehensile, the outer one rather short, not nearly attaining the length of the 1st joint of the inner, its middle joint somewhat dilated and oval in form, last joint lamellar, rounded, and armed with 4 curved claws successively increasing in length distally, and at the inner corner with a slender seta; inner ramus with the 1st joint linear in shape and carrying near the end inside a well-developed plumose setæ, the 2 outer joints of larger size than in the preceding species, and each provided inside with a small seta, last joint being larger than the preceding one and carrying on the tip 2 strong unequal claws accompanied inside with a thin seta. Natatory legs well developed, with the full number of setæ, middle joint of inner ramus acutely produced at the outer corner. Last pair of legs rather large, distal joint broadly cordiform and edged with 6 rather strong, dark-coloured setæ, one of then, however, attached to the conically produced tip of the joint, thinner than the others; inner expansion of proximal joint comparatively short, triangular, not nearly extending to the middle of the distal joint, marginal setæ 5 in number, the middle one the longest.

Colour not yet ascertained.

Lenght of adult female about 1 mm.

Remarks.—This is one of the larger species of the genus, and, like the preceding one, belongs to the section in which both rami of the 1st pair of legs are pronouncedly prehensile. It may easily be recognised both by the general form of the body and by the structure of the 1st and last pairs of legs.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was found in a sample taken at Farsund, south coast of Norway, from moderate depth.

Amphiascus denticulatus (Thompson).

(Suppl. Pl. 18).

Stenhelia denticulata, I. C. Thompson, Revised Report on the Copepoda of Liverpool Bay. Trans. Liverp. Biol. Soc. Vol. VII, p. 194, Pl. XXX.

Specific Characters.—Female. Body very slender, sub-linear in form, with the anterior division scarcely at all broader than the posterior. Rostrum prominent, conically produced. Urosome nearly as long as the anterior division, its segments less sharply marked off from each other than in the 2 preceding species and less coarsely spinulose at the hind edge, last segment well developed, though somewhat shorter than the preceding one. Caudal rami small, broader than they are long and scarcely spinulose at the edges; apical setæ quite normal and of moderate length. Anterior antennæ rather slender, 8-articulate, 2nd joint the largest, gradually widening distally, and produced at the end outside to an acute spiniform lappet curving anteriorly, 4th joint longer than 3rd, terminal part not attaining the length of those joints combined. Posterior antennæ with the middle joint of the outer ramus well defined and setiferous. Oral parts normal. 1st pair of legs slender, with the outer ramus scarcely prehensile, and exceeding somewhat the length of the 1st joint of the inner, its last joint longer than either of the other 2 and narrow oblong in form, being armed with 3 simple spines and 2 slender geniculate setæ; inner ramus with the 1st joint linear in form and somewhat exceeding in length the other 2 combined, last joint very narrow and about 3 times as long as the middle one, carrying on the tip a slender claw-like spine, a somewhat longer seta and, inside the latter, a small bristle. Natatory legs with the rami very slender, number of setæ somewhat reduced. Last pair of legs with the distal joint rather narrow, conical in form, and edged with 5 rather unequal setæ, having moreover, just outside the end, a peculiar knob-like appendage tipped by a small hair; inner expansion of proximal joint narrow triangular and scarcely extending beyond the middle of the distal joint, marginal setæ 5 in number, none of them of any considerable length. Ovisacs comparatively small, narrow oblong in form and only containing a limited number of ova.

Male considerably smaller than female and exhibiting the usual sexual differences. Anterior antennæ distinctly hinged and exhibiting the spiniform projection of the 2nd joint characteristic of the species. Inner ramus of 2nd pair of legs biarticulate, with the 2 usual juxtaposed spines outside the distal joint.

Last pair of legs much smaller than in female, with only 2 spines on the inner expansion of the proximal joint, distal joint of a form similar to that in female and exhibiting also the characteristic appendage inside the tip.

Colour light yellowish grey.

Length of adult female about 1 mm.

Remarks.—The above described form is unquestionably that recorded by I. C. Thompson as *Stenhelia denticulata*. The characteristic spiniform expansion of the 2nd joint of the anterior antennæ is alone sufficient for recognising the present form from any of the other known species.

Occurrence.—I have only met with this elegant and comparatively large species in a single locality, viz., at Kroshavn, south coast of Norway. It occurred here not rarely on a coarse sandy bottom at a depth of about 20 fathoms.

Distribution.—British Isles (Thompson).

Amphiascus Normani, G. O. Sars (new name).

(Suppl. Pl. 19, fig. 1).

Stenhelia longirostris, Norman & Scott, Copepoda new to Science from Devon and Cornwall. Ann. Mag. Nat. Hist. ser. 7. Vol. XV, p. 288 (not Amphiascus longirostris Claus).

Specific Characters.—Female. Very like the preceding species, but of smaller size and somewat less slender form of body. Anterior antennæ comparatively shorter and less attenuated, 2nd joint simple, without any trace of the spiniform lappet found in *A. denticulatus*, 4th joint only slightly longer than 3rd, terminal part exceeding in length those joints combined. 1st pair of legs with the outer ramus scarcely longer than the 1st joint of the inner, otherwise resembling in structure those in *A. denticulatus*. Last pair of legs likewise very similar in shape, the distal joint having outside the tip an appendage of the same peculiar appearance as in that species.

Colour not yet ascertained.

Length of adult female 0.95 mm.

Remarks.—This form was at first briefly characterised by Messrs. Norman and Scott in a preliminary paper published in the year 1905, and was subsequently more fully described and figured in "The Crustacea of Devon and Cornwall" by the same authors. The specific name *longirostris* proposed by those authors cannot be accepted, since there is another species of the present genus having this name given to it already by Claus. I have therefore changed it in honour to the one of the above-named authors. This species is very closely allied to *A. denticulatus*, so closely indeed, that I have been in some doubt about its real specific difference. Having, however, found several specimens and in none

of them detected even the slightest trace of the spiniform lappet on the 2nd joint of the anterior antennæ so characteristic of *A. denticulatus*, I think that it must be kept apart from that species.

Occurrence.—Some specimens of this form, all of the female sex, were found in a sample taken last summer at Korshavn from moderate depth. It also occurred occasionally in another locality, viz., at Agnefest, uppermost part of the Ros Fjord.

Distribution.—British Isles (Norman & Scott).

Amphiascus amblyops, G. O. Sars, n. sp.

(Suppl. Pl. 19, fig. 2).

Specific Characters.—Female. Body rather slender and only slightly attenuated behind, with very thin and pelluid integuments. Rostrum prominent, conically produced. Urosome not nearly attaining the length of the anterior division, last segment scarcely shorter than the preceding one. Caudal rami short, broader than they are long; apical setæ normal. Eye replaced by a diffuse branching pigment of a light yellow colour. Anterior antennæ moderately slender, 8-articulate, the first 2 joints much the largest and subequal in size, 4th joint a little longer than 3rd, terminal part scarcely exceeding in length those joints combined. Posterior antennæ with the middle joint of the outer ramus well defined and setiferous. 1st pair of legs with the outer ramus considerably shorter than the 1st joint of the inner, middle joint without any seta inside, last joint of about same size and armed with 3 spines and 2 geniculate setæ; inner ramus with the 1st joint narrow linear in form carrying near the end inside a slender seta, last joint 3 times as long as the middle one and armed in the usual manner, both joints combined scarcely more than half as long as the 1st. Natatory legs with the rami very slender, but having the full number of setæ. Last pair of legs with the distal joint oval in form, tip slightly bilobular, marginal setæ comparatively short and 6 in number, the 2 apical ones very thin, hair-like; inner expansion of proximal joint narrow triangular and extending somewhat beyond the middle of the distal joint, marginal setæ 5 in number.

Colour whitish.

Length of adult female 0.72 mm.

Remarks.—This form may, in the fresh state, at once be recognised by its highly pellucid body and the imperfectly developed visual organ. In the structural details also some well marked differences are found to exist, distinguishing it from the other known species.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was taken in the Lyngen Fjord inside Farsund, from a depth of about 50 fathoms, muddy sand.

Amphiascus lagenirostris, G. O. Sars, n. sp.

(Suppl. Pl. 20).

Specific Characters.—Female. Body moderately slender and nearly cylindrical in form, being only very slightly tapered behind. Rostrum of a very peculiar appearance, being considerably expanded at the base and narrowly exserted at the tip, thus assuming a lageniform shape. Urosome much shorter than the anterior division, last segment comparatively short. Caudal rami small, scarcely longer than they are broad; apical setæ normal and rather slender. Anterior antennæ almost attaining the length of the cephalic segment, and 8-articulate, 2nd joint much the largest and narrower than the first, exhibiting in the middle indside a well-marked setiferous ledge and produced at the tip to a sharp somewhat incurved dentiform projection, 4th joint about twice as long as 3rd, terminal part slightly exceeding in length those joints combined. Posterior antennæ likewise rather slender, outer ramus distinctly 3-articulate, with the 1st joint longer than the other 2 combined. Posterior maxillipeds with the hand comparatively narrow and clothed inside with slender spinules. 1st pair of legs rather slender, outer ramus much shorter than the 1st joint of the inner, middle joint with a well-marked seta inside, last joint of about same size, and armed with 3 spines and 2 geniculate setæ, inner ramus with the 1st joint very narrow, linear, and carrying near the end indside a well-developed seta, last joint about twice as long as the middle one and armed in the usual manner, both joints combined scarcely exceeding in length $^1/_3$ of the 1st. Natatory legs with the rami narrow and the number of setæ somewhat reduced, the last joint of the outer ramus having in the 2 anterior pairs only a single seta inside. Last pair of legs with the distal joint narrow oblong in form, marginal setæ 6 in number, the 2 apical ones much more slender than the others; inner expansion of proximal joint narrow triangular in form and extending about to the middle of the distal joint, marginal setæ 5 in number, 2 of them rather slender.

Male much smaller than female, but exhibiting the very same characteristic form of the rostrum. Anterior antennæ hinged in the usual manner, their 2nd joint agreeing in shape with that in female. Inner ramus of 2nd pair of legs transformed in a similar manner to that in most other species of the present genus. Last pair of legs with the distal joint much shorter than in female and

having only 5 rather unequal marginal setæ; inner expansion of proximal joint with 2 apical setæ accompanied outside by a small spinule.

Colour not yet ascertained.

Length of adult female 0.77 mm., of male 0.57 mm.

Remarks.—This is a very distinct and easily recognisable species, being especially characterised by the peculiar form of the rostrum and the structure of the anterior antennæ.

Occurrence.—Only 2 specimens of this form, a female and a male, have hitherto come under my notice. They were found in a sample taken last summer at Korshavn, south coast of Norway, from a depth of 20 to 30 fathoms, coarse sandy bottom.

Amphiascus nanoides, G. O. Sars, n. sp.

(Suppl. Pl. 21, fig. 1).

Specific Characters.—Female. Body comparatively slender, sublinear in form. Rostrum narrow conical in shape. Urosome almost as long as the anterior division, last segment well developed. Caudal rami short, quadrangular; middle apical setæ rather strong and somewhat thickened in their proximal part, exhibiting moreover a peculiar flexure, seta of outer corner unusually long. Anterior antennæ rather slender, 8-articulate, first 2 joints the largest, 4th joint only slightly longer than 3rd, terminal part about the length of those joints combined. Posterior antennæ with the middle joint of the outer ramus very small and without any seta. Posterior maxillipeds well developed, with the hand oval fusiform in shape. 1st pair of legs with the outer ramus about the length of the 1st joint of the inner, middle joint without any seta inside, last joint a little longer and armed with 2 spines only and 2 geniculate setæ, distal spine coarsely denticulated along the outer edge; inner ramus very slender, its last joint more than 3 times as long as the middle one and armed in the usual manner, both joints conbined nearly as long as the 1st. Natatory legs slender, with the number of setæ considerably reduced. Last pair of legs with the distal joint narrow oblong in shape and carrying 5 marginal setæ, the 2 apical ones very slender; inner expansion of proximal joint triangularly produced and extending considerably beyond the middle of the distal joint, marginal setæ 5 in number.

Colour not yet ascertained.

Length of adult female 0.56 mm.

Remarks.—This form belongs to the smaller species of the genus, and may easily be recognised by the thickened caudal setæ and their peculiar flexure.

In the structural details also several well-marked differences from the other known species are found to exist.

Occurrence.—Some specimens of this form, all of the female sex, were found in samples taken last summer at Korshavn, south coast of Norway, from depths ranging from 20 to 40 fathoms, coarse sandy bottom.

Amphiascus bulbifer, G. O. Sars, n. sp.

(Suppl Pl. 21, fig. 2).

Specific Characters.—Female. Body somewhat less slender than in the last species and slightly tapered behind. Rostrum not much produced and somewhat obtuse at the tip. Urosome almost as long as the anterior division and having the segments sharply marked off from each other, last segment well developed and only slightly shorter than the preceding one. Caudal rami comparatively large and broad, quadrangular in form, apical setæ exhibiting rather an anomalous appearance, the outer medial one being comparatively short, but forming at the base a large bulbous dilatation coarsely ciliated in its outer part on both sides and abruptly narrowed to a thin hair-like bristle, inner medial seta very slender and not at all thickened at the base, nor exhibiting any trace of the usual joint, seta of inner corner small, that of outer corner coarse, spiniform. Anterior antennæ unusually short and stout, and only composed of 6 joints, the 2nd being much the largest and together with the 1st occupying half the length of the antenna, 4th joint scarcely longer than 3rd but considerably expanded in front, terminal part only consisting of 2 joints, the distal one much the longer. Posterior antennæ with the middle joint of the outer ramus well defined and setiferous. Mandibular palp with the outer ramus very small, nodiform. Posterior maxillipeds less strongly built than in the last species. 1st pair of legs with the outer ramus about the length of the first 2 joints of the inner combined, middle joint without any seta inside, last joint somewhat longer and armed with 2 simple spines and 2 geniculate setæ; inner ramus with the 1st joint somewhat dilated and shorter than usual, carrying, like the middle one, near the end inside a well developed ciliated seta, last joint nearly twice as long as the middle one and armed on the tip with a rather strong claw-like spine, a slender seta, and inside the latter with a small bristle; both joints combined considerably exceeding the length of the 1st joint. Natatory legs slender, with the number of setæ considerably reduced. Last pair of legs comparatively small, distal joint of inconsiderable size and rounded form, carrying 5 rather unequal setæ; inner expansion

of proximal joint extending beyond the distal joint, and carrying only 4 comparatively short spiniform setæ.

Colour not yet ascertained.

Length of adult female 0.44 mm.

Remarks.—This is a very small form and in some respects differs considerably from the other known species. It may at once be recognised from any of them by the anomalous structure of the caudal setæ, especially that of the outer medial one. The structure of the anterior antennæ also is rather peculiar, and the 1st and last pair of legs likewise differ somewhat in shape from that usually met with.

Occurrence.—2 female specimens of this peculiar form were found in a sample taken last summer at Korshavn from a depth of 20—30 fathoms, sandy bottom.

Amphiascus spinulosus, G. O. Sars, n. sp.

(Suppl. Pl. 22).

Specific Characters.—Female. Body comparatively shorter and stouter than in the preceding species and somewhat tapering behind. Rostrum of usual shape, conically produced. Urosome considerably shorter than the anterior division, and having the segments well marked off from each other, the anterior ones exhibiting each laterally 2 oblique rows of spinules somewhat remote from the hind edge, last segment shorter than the preceding one. Caudal rami comparatively small, apical setæ of moderate length and normal structure. Anterior antennæ not much elongated, but rather slender, 8-articulate, the first 2 joints of about equal size, 4th joint considerably longer than 3rd, terminal part about the length of those joints combined. Posterior antennæ with the outer ramus normally developed. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, middle joint without any seta inside, last joint of about same size and, as in the 2 preceding species, armed with 2 spines and 2 geniculate setæ; inner ramus with the 1st joint long and slender carrying near the end inside the usual seta, last joint scarcely twice as long as the middle one and armed on the tip with a claw-like spine, a thickish seta and a small bristle; both joints combined not attaining half the length of the 1st. Natatory legs with the rami less narrow than in the preceding species; number of setæ somewhat reduced. Last pair of legs with the distal joint oblong in form, slightly bilobular at the end, marginal setæ 6 in number, the 2 apical ones longer and thinner than the others; inner expansion of proximal joint broadly triangular and narrowly truncated at the end, scarcely extending beyond the middle of the distal joint, marginal setæ 5 in number.

Male rather smaller than female, but exhibiting a very similar armature at the caudal segments. Anterior antennæ hinged in the usual manner. Inner ramus of 2nd pair of legs distinctly 3-articulate, last joint comparatively small and armed outside with 2 coarse juxtaposed spines. Last pair of legs with the distal joint very small, rounded oval in form, and only provided with 5 marginal setæ, inner expansion of proximal joint carrying 3 subequal spines.

Colour light yellowish grey.

Length of adult female 0.55 mm.

Remarks.—This form somewhat resembles, as to the outward appearance, *A. longiremis* (Brady). It is however of much smaller size, and may moreover at once be distinguished by the peculiar armature of the caudal segments, a character from which the specific name here proposed has been derived. In the structure of the legs also some well-marked differences are found to exist.

Occurrence.—Several specimens of this form were found last summer at Korshavn, south coast of Norway, in a depth of 30—40 fathoms, sandy bottom.

Amphiascus confusus, (Scott).

(Suppl. Pl. 23).

Stenhelia confusa, Th. Scott, Twentieth Ann. Rep. of the Fishery Board for Scotland, p. 458, Pl. XXII, figs. 17—25.

Syn: *Stenhelia Meeki* Brady.

Specific Characters.—Female. Body slender, cylindrical in form, being only very slightly tapered behind. Rostrum rather prominent, conically produced and acutely pointed at the tip. Urosome not much shorter than the anterior division, and having the last segment smaller than the preceding one. Caudal rami considerably produced, exceeding in length the anal segment and sublinear in form, being slightly incurved, with the outer edge sharpened, the inner thickened and somewhat concaved, tip transversely truncated; apical setæ of normal structure and rather slender, the inner medial one about equalling in length the urosome. Eye wanting. Anterior antennæ resembling in structure those in *A. typhlops*, being composed of 8 well-defined joints densely clothed with strong curved setæ, the first 2 joints much the largest and combined about occupying half the length of the antenna. Posterior antennæ and oral parts scarcely differing in their structure from those parts in *A. typhlops*. 1st pair of legs likewise very similar, having the inner ramus rather slender, with the outer 2 joints combined about the length of the 1st; apical claw-like spine of this ramus very long and slender. Natatory legs of almost exactly same structure as in *A. typhlops*. Last pair of legs, however, differing in the shape of the distal joint, which is narrow conical

in form, with one of the setæ of the outer edge removed from the others and attached in front of the middle; inner expansion of proximal joint narrowly produced and extending considerably beyond the middle of the distal joint; marginal setæ 5 in number, the 2 innermost ones distinctly bifid at the tip. Ovisacs of moderate size and sligthly divergent, each containing only a very limited number of ova.

Male exhibiting the usual sexual differences. Inner ramus of 2nd pair of legs biarticulate, distal joint the larger and armed outside with an unusually strong spiniform appendage blunted at the tip and accompanied by a much thinner spine of about same length. Last pair of legs with the distal joint narrow sublinear in form; inner expansion of proximal joint armed with 2 subequal apical spines, both bifid at the tip.

Colour whitish.

Length of adult female 0.98 mm.

Remarks.—The identity of the above-described form with that recorded by Th. Scott as *Stenhelia confusa* would seem to be somewhat doubtful, as the figures given by that author, especially those of 1st and last pairs of legs, do not fully agree with those here reproduced. In every case it is closely allied to that species, as also to *A. typhlops*, G. O. Sars. From the latter it is chiefly distinguished by the more prominent rostrum, the shape of the caudal rami and that of the last pair of legs. The form recorded by Prof. Brady as *Stenhelia Meeki* seems to me to be referable to the same species.

Occurence.– I found this form last summer rather abundantly in one place, at Korshavn, south coast of Norway. It occurred here on a coarse sandy bottom, at a depth of 40—50 fathoms, together with many other interesting forms to be described in the following pages.

Distribution.—British Isles (Scott, Brady).

Amphiascus typhloides, G. O. Sars, n. s.

(Suppl. Pl. 24, fig. 1).

Specific Characters.—*Female.* Body comparatively slender, sub-cylindrical in form, and only slightly tapered behind. Rostrum less prominent than in the preceding species, but of a very similar form. Urosome about the length of the anterior division, and having the last segment well developed. Caudal rami about the length of the anal segment and of almost uniform width throughout, inner egde straight; apical setæ slender, the inner medial one thickened in its proximal part and exhibiting at some distance from the base inside a peculiar nodi-

form excrescence unequally bilobed at the end, inner edge of the seta immediately behind the excrescence coarsely ciliated. Eye wanting. Anterior antennæ somewhat more slender than in the last species, but otherwise of a very similar structure, the first 2 joints combined, however, not fully occupying half the length of the antenna. Posterior antennæ, oral parts and the 4 anterior pairs of legs very little different from those in *A. confusus*. Last pair of legs with the distal joint comparatively shorter and broader, oblong oval in form, setæ of outer edge very small, hair-like; inner expansion of proximal joint less produced, though extending a little beyond the middle of the distal joint. Ovisacs comparatively small, each containing a very limited number of ova.

Colour whitish grey.

Length of adult female 0.73 mm.

Remarks.—This form is perhaps still more closely allied to *A. typhlops* than the preceding species, but is of smaller size than either of them, and moreover at once recognised by the peculiar structure of the inner medial caudal seta, which character seems to be pretty constant. Slight differences may also be found in the structure of the anterior antennæ and the last pair of legs.

Occurrence.—Some specimens of this form were found at Farsund and Korshavn in depths ranging from 10 to 28 fathoms. In all of them the inner medial caudal seta exhibited exactly the same peculiar excrescence inside the base.

Amphiascus lamellifer, G. O. Sars, n. sp.

(Suppl. Pl. 24, fig. 2),

Specific Characters.—Female. Body somewhat more strongly built than in the 2 preceding species, though nearly cylindrical in form. Rostrum rather prominent and very acute at the tip. Urosome rather shorter than the anterior division, and having the last segment well developed. Caudal rami about the length of the anal segment, and of a comparatively broad, lamelliform shape, with the inner edge conspicuously convex; apical setæ of normal structure and comparatively shorter than in the 2 preceding species. Eye absent. Anterior antennæ built in the same manner as in the said species, though somewhat shorter and stouter. 1st pair of legs with the outer ramus fully as long as the first 2 joints of the inner combined; inner ramus with the outer 2 joints rather slender and combined exceeding in length the 1st. Last pair of legs with the distal joint comparatively large, oblong oval in form and having the setæ of the outer edge well developed; inner expansion of proximal joint scarcely extending beyond the middle of the distal joint.

Colour whitish.

Length of adult female 0. 97 mm.

Remarks.—This is another form closely allied to the 2 preceding species, as also to *A. typhlops*. There are, however, some minor differences both as to the external appearance and the structural details, which make it convenable to keep it apart as a distinct species. The specific name here proposed is derived from the broad lamelliform shape of the caudal rami, in which respect this form is at once recognised from any of the 3 said species.

Occurrence.—Some specimens of this form, all of the female sex, were found in the same place in which *A. confusus* occurred.

Page 181.

Stenhelia gibba, Boeck.

Remarks.—The form described by Prof. Brady[1]) as *Ameira brevirems* is in my opinion undistinguishable from the present species.

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 185.

Stenhelia palustris (Brady).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 191.

Gen. *Stenheliopsis*, G. O. Sars.

Remarks.—The characters of this genus must be slightly changed, in order to comprise the 2 new species described below, which both differ from the type species in the distinctly triarticulate inner ramus of the natatory legs.

Stenheliopsis latifurca, G. O. Sars, n. sp.

(Suppl. Pl. 25, fig. 1).

Specific Characters.—*Female.* Body comparatively short and stout, with the anterior division considerably dilated and of rounded oval form; epimeral plates of the segments laterally expanded and sub-imbricate. Rostral plate large and prominent, with the tip broadly rounded. Urosome almost equalling in length the anterior division, but much narrower, genital segment large and imperfectly divided in the middle, last segment but little shorter than the preceding one and not cleft at the end. Caudal rami comparatively large and broad, equalling in length the last 2 segments combined, and scarcely at all divergent, apical setæ

[1]) Trans. Nat. Hist. Soc. N. D. & N. C. 1905.

rather short and abruptly curved outwards. Eye absent. Anterior antennæ comparatively small, but densely setiferous, 6-articulate, joints of proximal part successively diminishing in size, the 4th being very short but considerably expanded in front, terminal part distinctly biarticulate and about equalling in length the 3 preceding joints combined. Posterior antennæ with the outer ramus well developed, about equalling in length the distal joint, and composed of 2 well-defined joints, the distal one the larger and carrying 4 setæ, 2 lateral and 2 apical. Mandibles, maxillæ and anterior maxillipeds of a similar structure to that in the type species. Posterior maxillipeds, however, much smaller, with the basal part rather narrow and exhibiting a well-marked angular ledge inside, hand rounded oval in form. 1st pair of legs with the outer ramus shorter and narrower than the inner, middle joint with a distinct, though small seta inside, last joint of about same size and, as in the type species, armed with 3 spines and a slender geniculate seta; inner ramus with the proximal joint considerably dilated and ciliated on both edges, but without any seta inside, distal joint longer and much narrower than the proximal one, carrying indside about in the middle a small seta, tip somewhat obliquely truncated and armed with 3 spines successively increasing in length inwards. Natatory legs very powerfully built, with both rami distinctly 3-articulate and armed with unusually strong spines, last joint of outer ramus carrying 5 such spines and a single very small seta inside; inner ramus in the 2 anterior pairs of about same length as the outer and having the last joint spatulate in form, with 3 strong spines at the end and a small seta inside; inner ramus of 4th pair of legs shorter than the outer, with the last joint comparatively small and only provided with 3 diverging apical spines. Last pair of legs imperfectly developed, each forming a thin lamella, sub-quandrangular in form, and edged with 6 setæ, the outermost of which is hair-like and attached at some distance from the others.

Colour yellowish white.

Length of adult female 0.57 mm.

Remarks.—The above-described form, it is true, in some particulars differs rather markedly from the type of the genus *Stenheliopsis*. Yet I think that it more properly ought to be referred to that genus than to the genus *Stenhelia*, as it agrees with the former in the structure of the mandibles and in the imperfect development of the last pair of legs.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was taken in the Lyngen Fjord, near Farsund, from a depth of about 60 fathoms, muddy sand.

Stenheliopsis media, G. O. Sars, n. sp.

(Suppl. Pl. 25, fig. 2).

Specific Characters.—Female Body comparatively less robust than in the preceding species, more resembling that in the type one. Rostral plate of a similar shape to that in *S. latifurca*, though perhaps a little less broad. Urosome shorter than the anterior division and slightly tapered behind, last segment comparatively small and deeply cleft at the end. Caudal rami much narrower than in the preceding species, though not nearly so extremely slender as in the type, and considerably divergent, apical setæ, as in the 2 other species abruptly curved outwards. Anterior antennæ resembling those in *S. latifurca*, though only composed of 5 distinctly defined joints, the penultimate one being wholly coalesced with the preceding joint, so that the terminal part only consists of a single joint. Posterior antennæ and oral parts nearly as in *S. latifurca*. 1st pair of legs likewise of a very similar structure, though having the 1st joint of the inner ramus still broader in proportion to its length and provided inside with a well developed seta. Natatory legs, as in the preceding species with both rami distinctly 3-articulate, but of far less robust form, last joint of both rami much narrower and exhibiting a quite normal armature. Last pair of legs resembling those in *S. latifurca*, each forming a simple quadrangular lamella edged with 6 setæ. Ovisacs very small, each only containing a single ovum.

Colour pale yellow.

Length of adult female 0.46 mm.

Remarks.—As to the external appearance, the present form more resembles the type species than does the preceding form. It is however undoubtedly more nearly allied to the latter than to the former, as proved by the structure of the several appendages. In the shape of the caudal rami it occupies, as it were, an intermediate position between both, a feature which has given rise to the specific name here proposed.

Occurrence.—Some specimens of this small Copepod, all of the female sex, were taken in the harbour of Farsund, from a depth of about 20 fathoms, muddy bottom.

Page 209.

Mesochra pygmæa (Claus).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 211.

Add the following species:

Mesochra exigua, G. O. Sars, n. sp.

(Suppl. Pl. 26, fig. 1).

Specific Characters.—Female. Body comparatively short and stout, slightly depressed in front, with the anterior division somewhat broader than the posterior. Rostral prominence well marked, subtriangular in form, with the tip obtusely rounded. Urosome nearly as long as the anterior division and only very slightly tapered behind, last segment well developed, though a little shorter than the preceding one. Caudal rami very small and placed rather far apart; apical setæ normal and of moderate length. Anterior antennæ comparatively short and only composed of 5 joints densely clothed with rather strong setæ, the 3 first joints belonging to the proximal part, the last 2 to the terminal part, the latter occupying not fully half the length of the antenna and having the 1st joint short, the 2nd elongate fusiform. Posterior antennæ with the outer ramus small, but distincly biarticulate. Mandibular palp with a slight rudiment of an outer ramus. Posterior maxillipeds of moderate size and normal structure. 1st pair of legs with both rami distinctly 3-articulate, the outer one a little shorter than the inner, with no seta inside the middle joint, its last joint the largest and armed with 3 spines and 2 curved setæ; inner ramus imperfectly prehensile, 1st joint somewhat dilated and, like the 2 succeeding joints, provided inside with a ciliated seta, last joint longer than the midle one and armed on the tip with a claw-like spine and a slender curved seta; both these joints combined considerably exceeding the length of the 1st. Natatory legs with the outer ramus long and slender, inner much shorter and only composed of 2 joints. Last pair of legs with the distal joint oblong conical in form and edged with 5 rather unequal setæ; inner expansion of proximal joint triangular and extending about to the middle of the distal joint, marginal setæ 5 in number, the outermost but one the longest.

Colour not yet ascertained.

Length of adult female 0.45 mm.

Remarks.—This form in some respects differs rather conspicuously from the other known species comprised within the genus *Mesochra* of Boeck. As however the structure of the natatory legs is that caracteristic of the said genus, I find it appropriate to describe it as a member of that generic group.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were found in a sample taken some years ago at Farsund from moderate depth.

Page 214.

Add the following species:

Nitocra pusilla, G. O. Sars, n. sp.

(Suppl. Pl. 26, fig. 2).

Specific Characters.—Female. Body less slender than in the other known species, gradually tapering behind. Rostral projection very small, nodiform. Urosome much shorter than the anterior division, last segment comparatively small and wanting the spinulose armature found in the other species, the anal opercle being quite smooth. Caudal rami of moderate size and quadrangular in form, with the setæ of the outer corner unusually long and pointing straight outwards, apical setæ rather slender and divergent. Anterior antennæ nearly as long as the cephalic segment, and composed of 8 sharply defined joint densely clothed with slender curved setæ and successively diminishing in size, terminal part exceeding half the length of the proximal one. Posterior antennæ with the outer ramus very small uniarticulate, carrying 3 ciliated setæ. Oral parts of normal structure. 1st pair of legs agreeing in structure with those in the other species, the inner ramus being distinctly prehensile, with the outer 2 joints incurved and combined scarcely more than half as long as the 1st; apical claw and setæ rather strong. Natatory legs with the inner ramus much shorter than the outer but distinctly 3-articulate. Last pair of legs with the distal joint rounded in form and edged with 6 setæ, the outermost of which is unusually long and slender; inner expansion of proximal joint narrow linguiform and extending somewhat beyond the middle of the distal joint, marginal setæ 5 in number, the outermost but one the longest. Ovisac of moderate size oval in form.

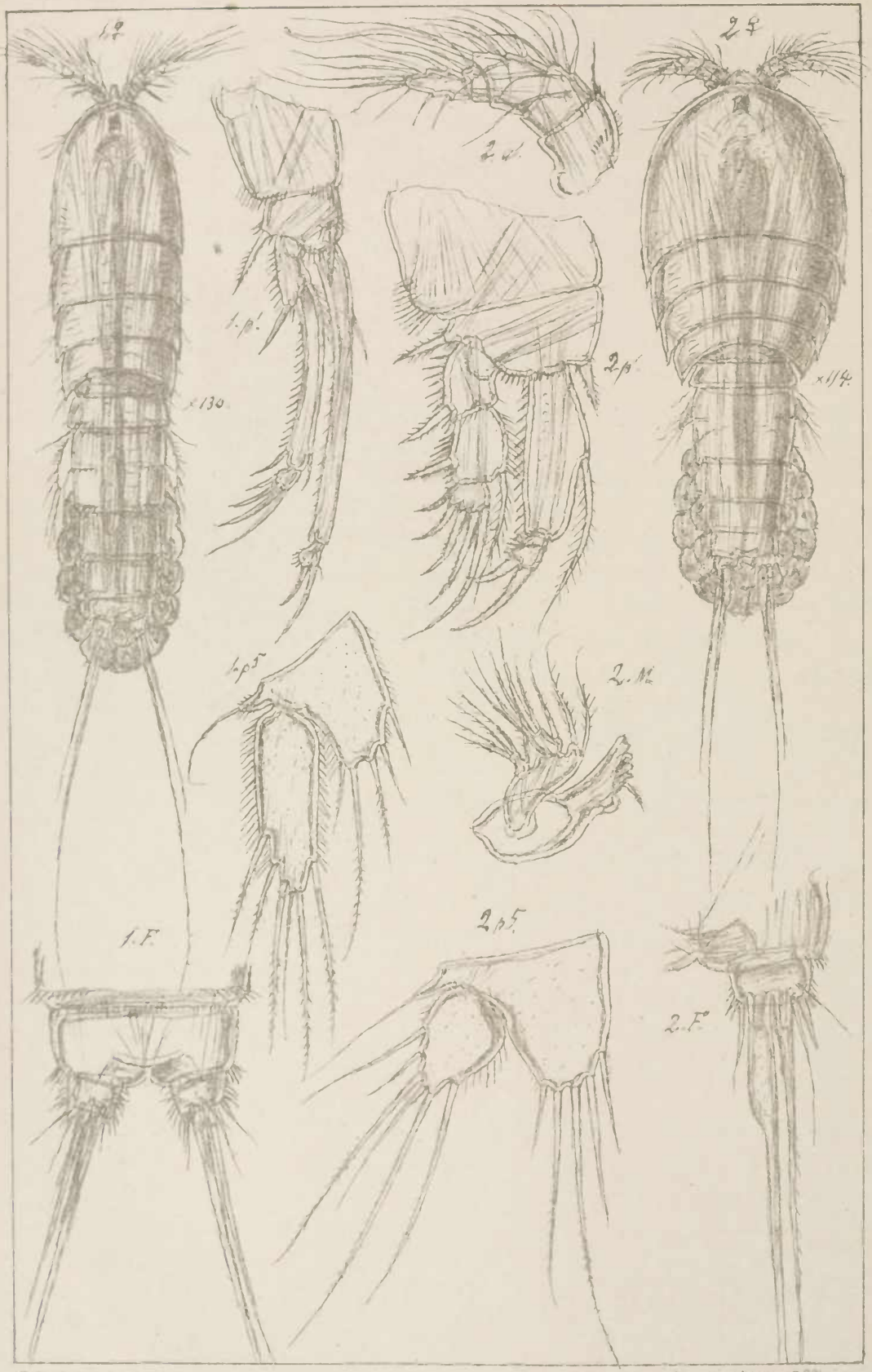
Colour not yet ascertained.

Length of adult female 0.50 mm.

Remarks.—This form differs from the other known species in the less slender form of the body and in the absolute want of the usual spinulous armature of the last caudal segment. Otherwise it agres pretty well in all essential characters assigned to the present genus. It is of smaller size than any of the hitherto known species.

Copepoda

Thalestridæ | Harpacticoida | Suppl. Pl. 11

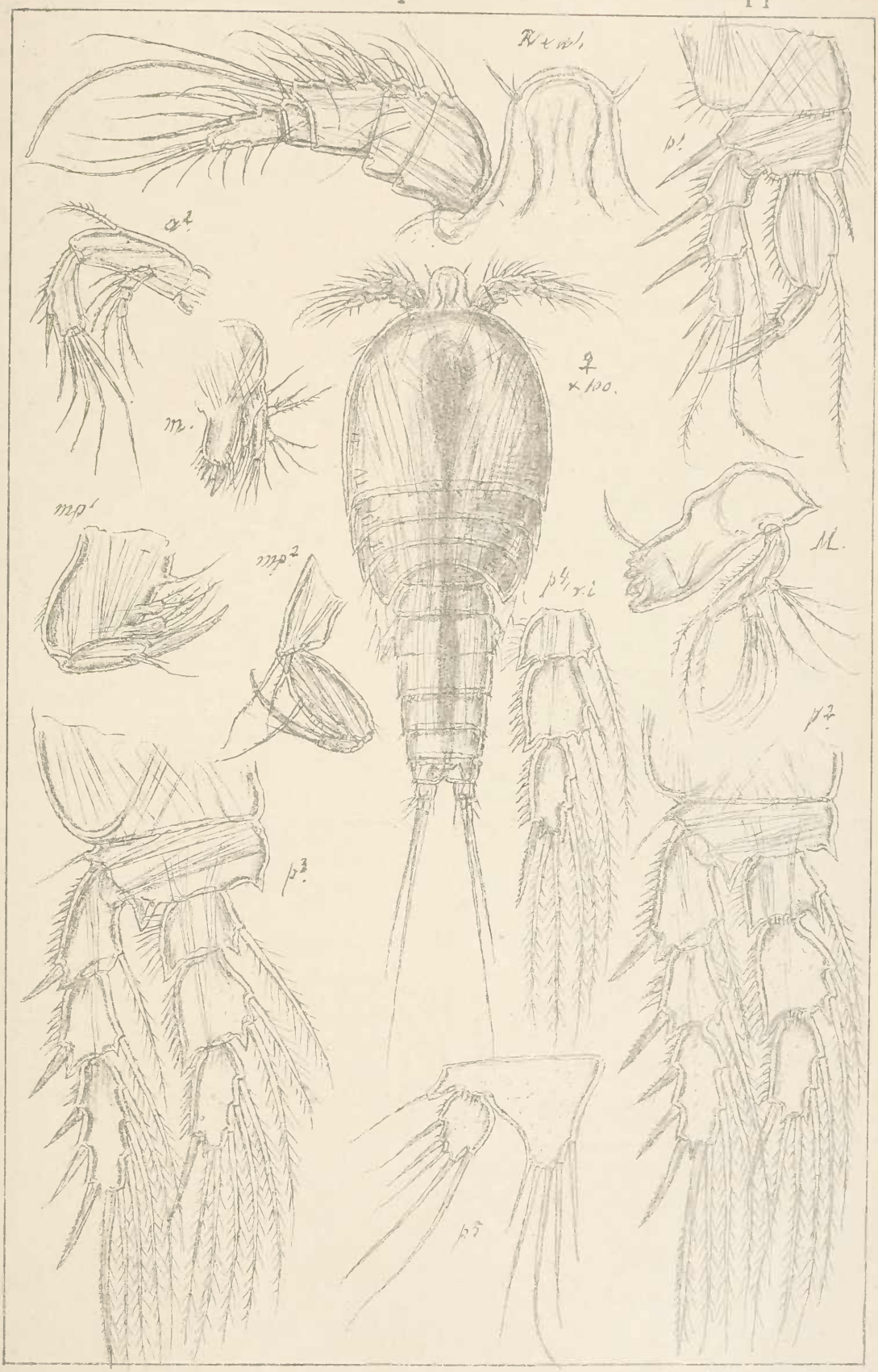


G.O. Sars, autogr. Norsk Lithgr. Officin.

1. Microthalestris litoralis, G.O. Sars.
2. Dactylopusia latipes, Boeck.

Copepoda

Thalestridæ — Harpacticoida — Suppl. Pl. 12

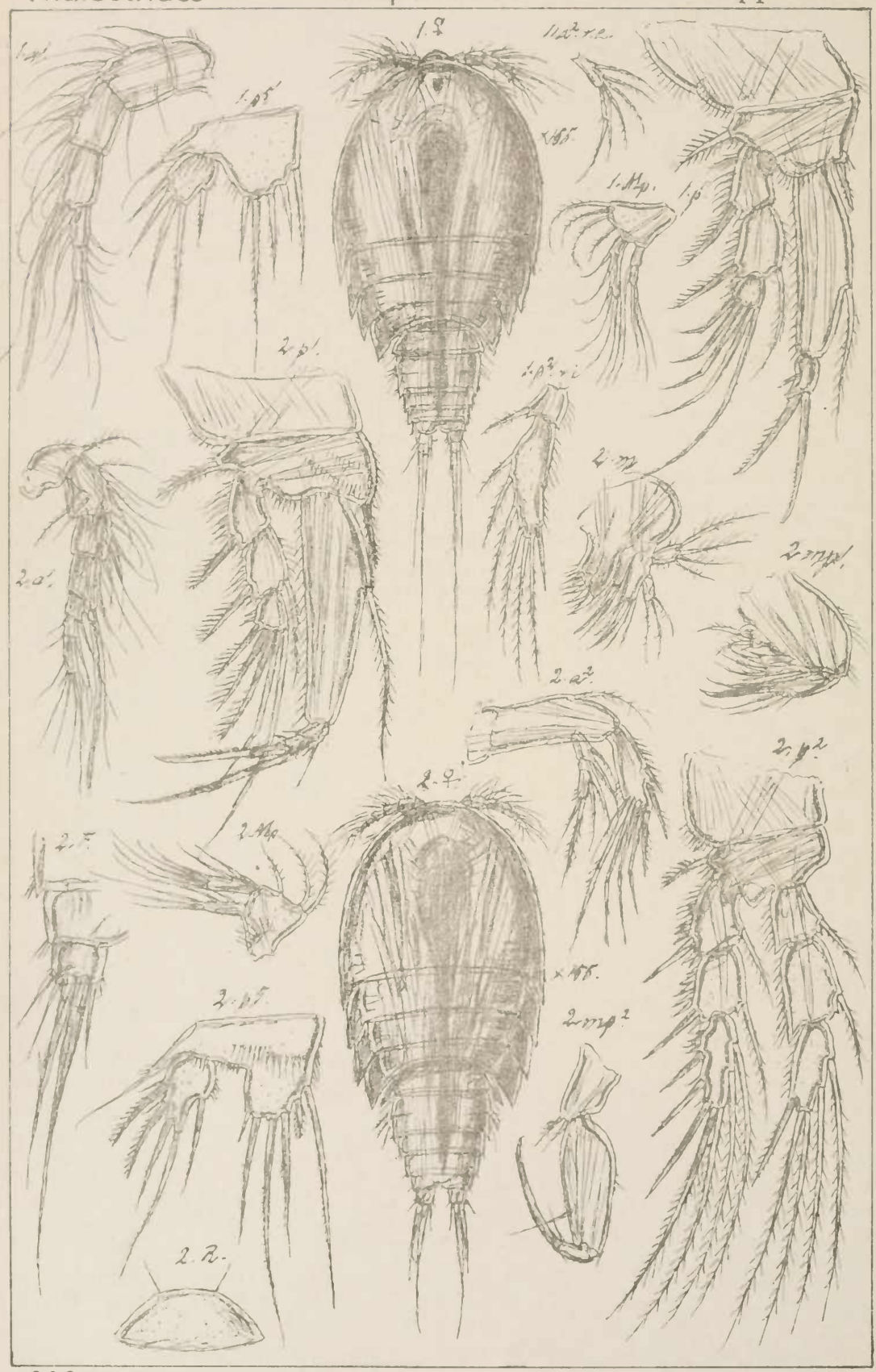


G.O.Sars, autogr. — Norsk. Litogr. Officin.

Dactylopodopsis dilatata, G.O.Sars.

Copepoda

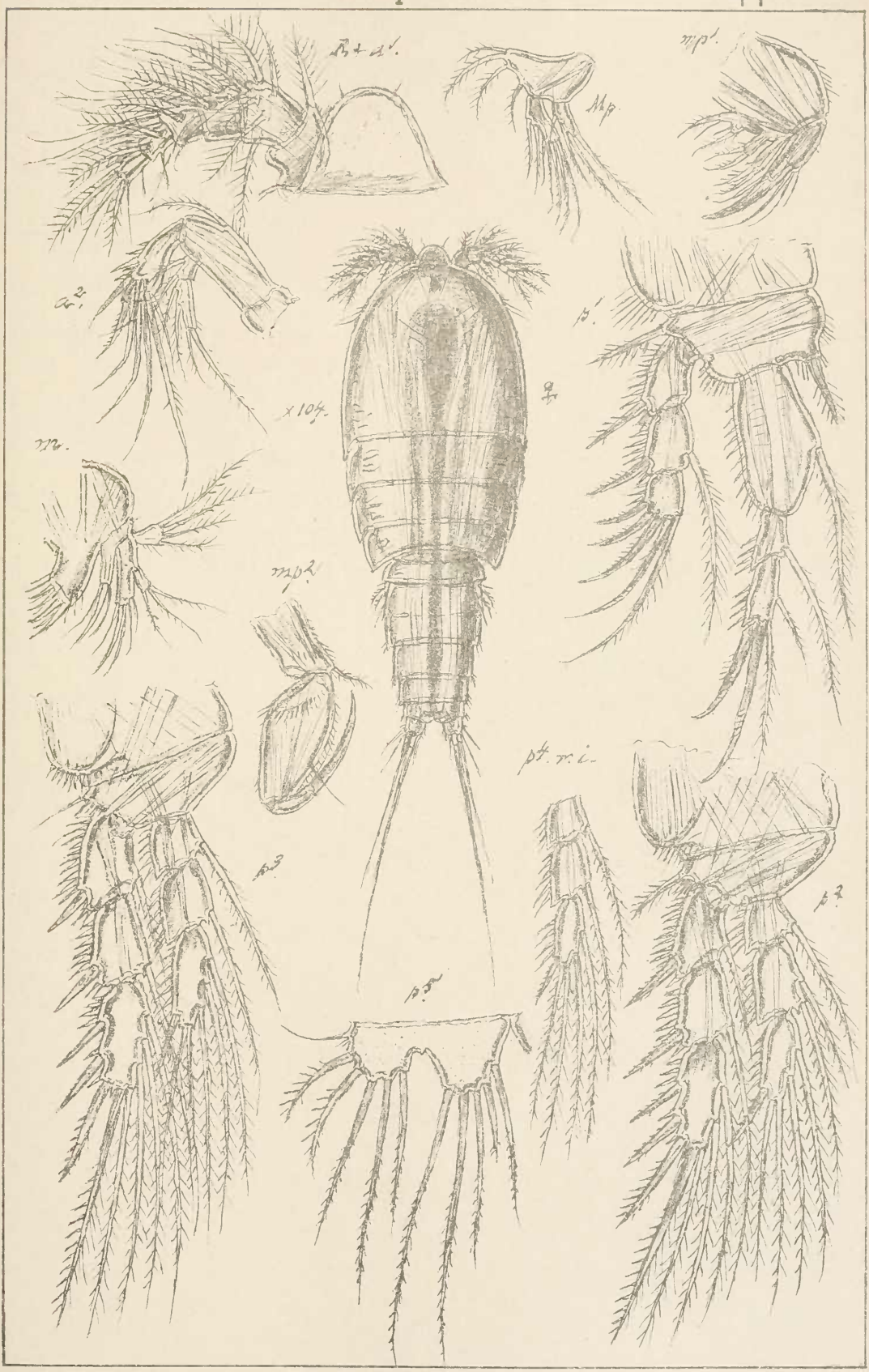
Thalestridæ | Harpacticoida | Suppl. Pl. 13



G.O.Sars, autogr. Norsk Lithgr. Officin.

1. Dactylopodella clypeata, G.O.Sars.
2. Idomene borealis, G.O.Sars.

Copepoda

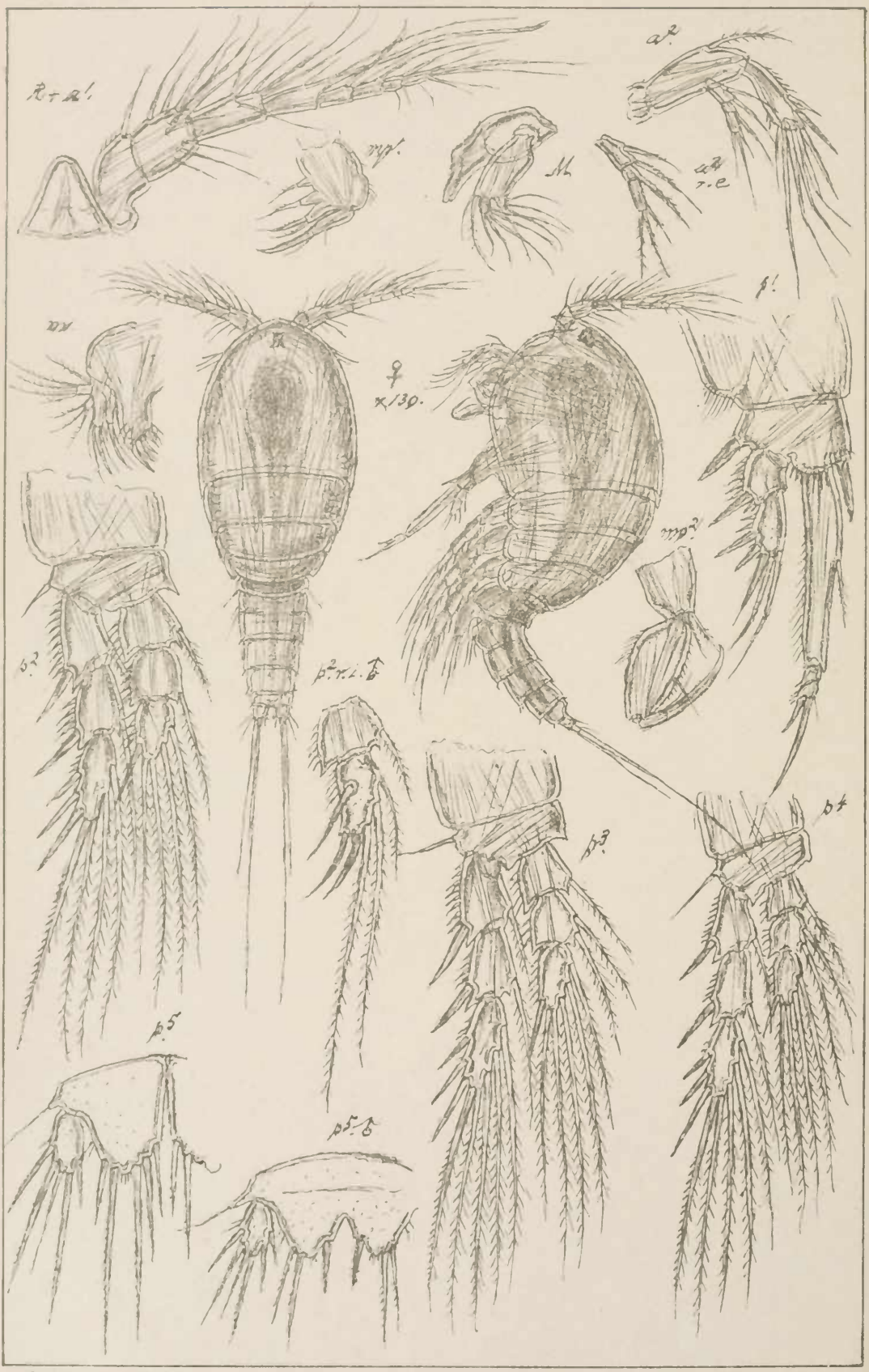


G.O. Sars, autogr. Norsk Lithgr. Officin.

Idomenella coronata, Scott.

Copepoda

Thalestridæ — Harpacticoida — Suppl. Pl. 15

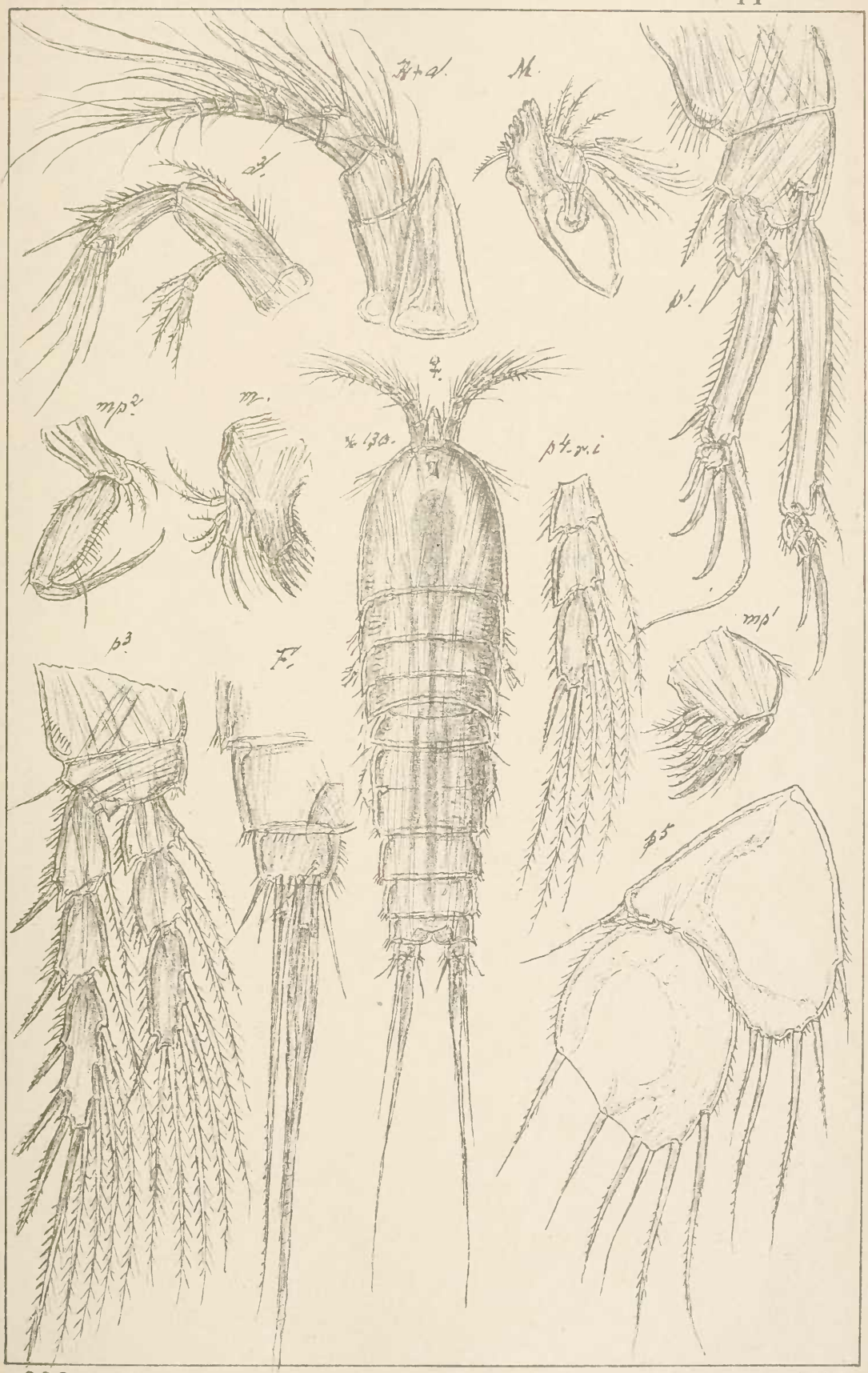


G.O. Sars, autogr. — Norsk Lithgr. Officin.

Westwoodia monensis, (Brady).

Copepoda

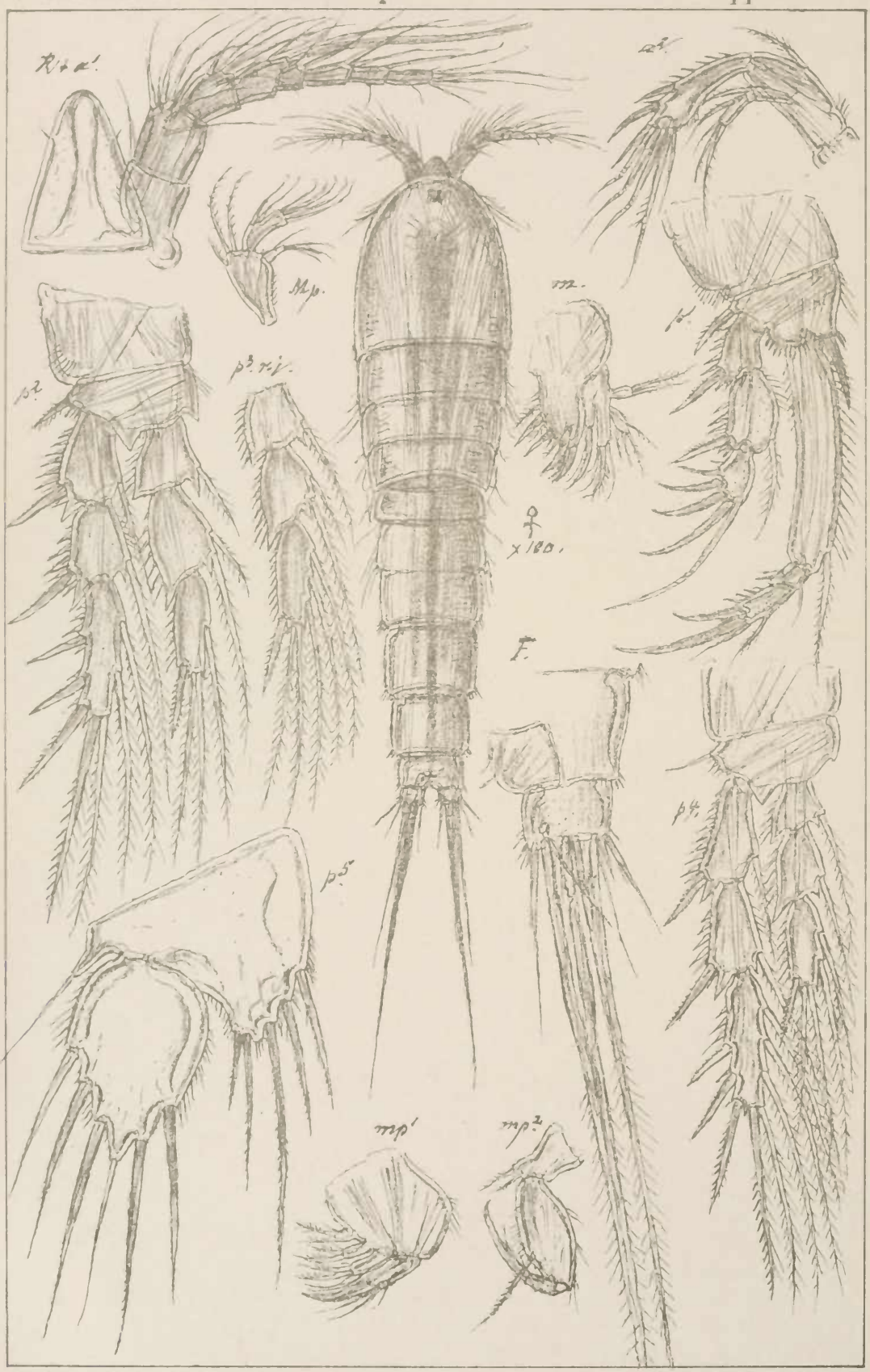
Diosaccidæ — Harpacticoida — Suppl. Pl. 16



G.O.Sars, autogr. — Norsk Lithgr. Officin.

Amphiascus latifolius, G.O.Sars.

Copepoda

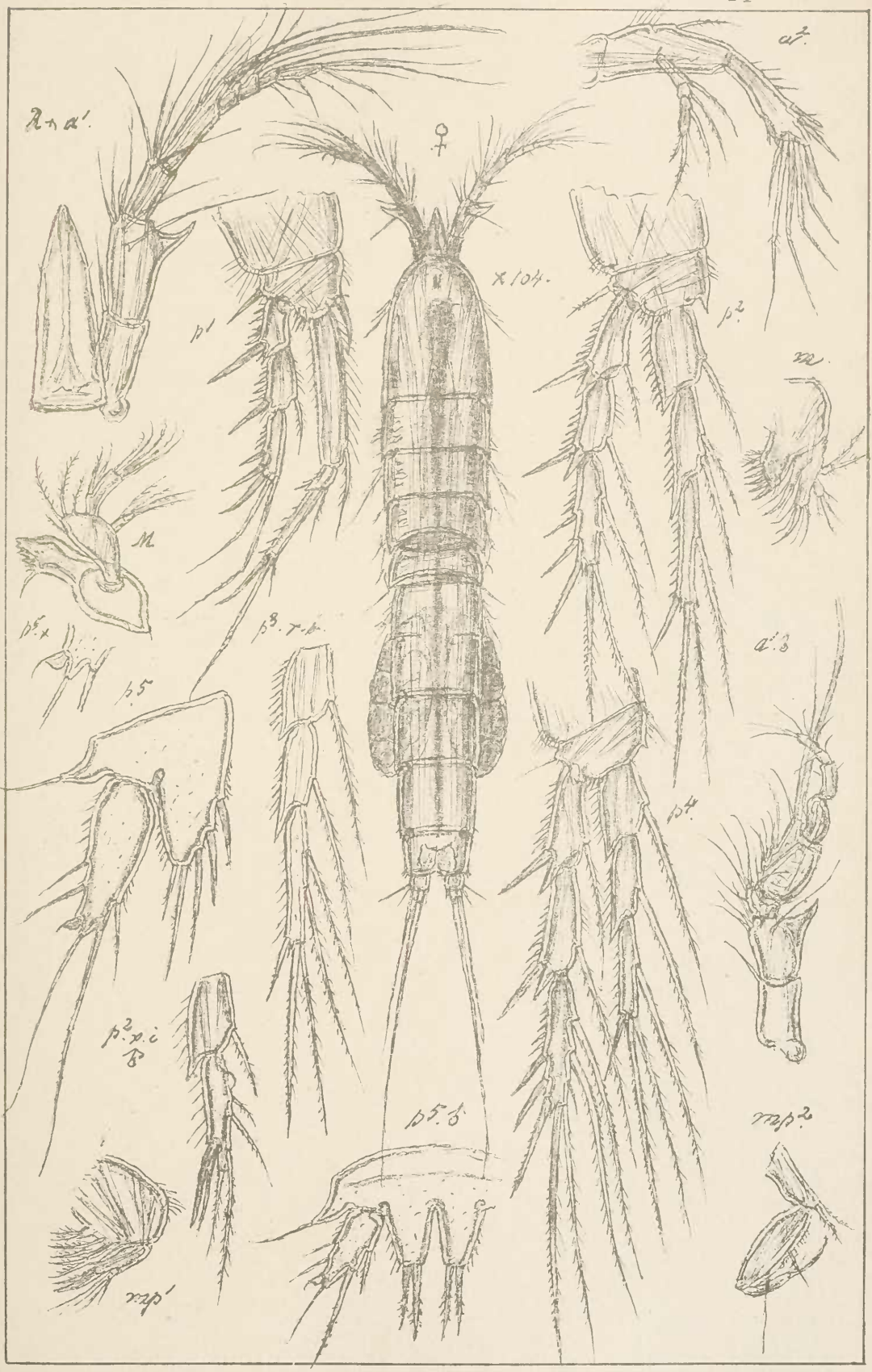


G.O.Sars, autogr. Norsk Lithgr. Officin.

Amphiascus thalestroides, G.O.Sars.

Copepoda

Diosaccidæ Harpacticoida Suppl. Pl. 18

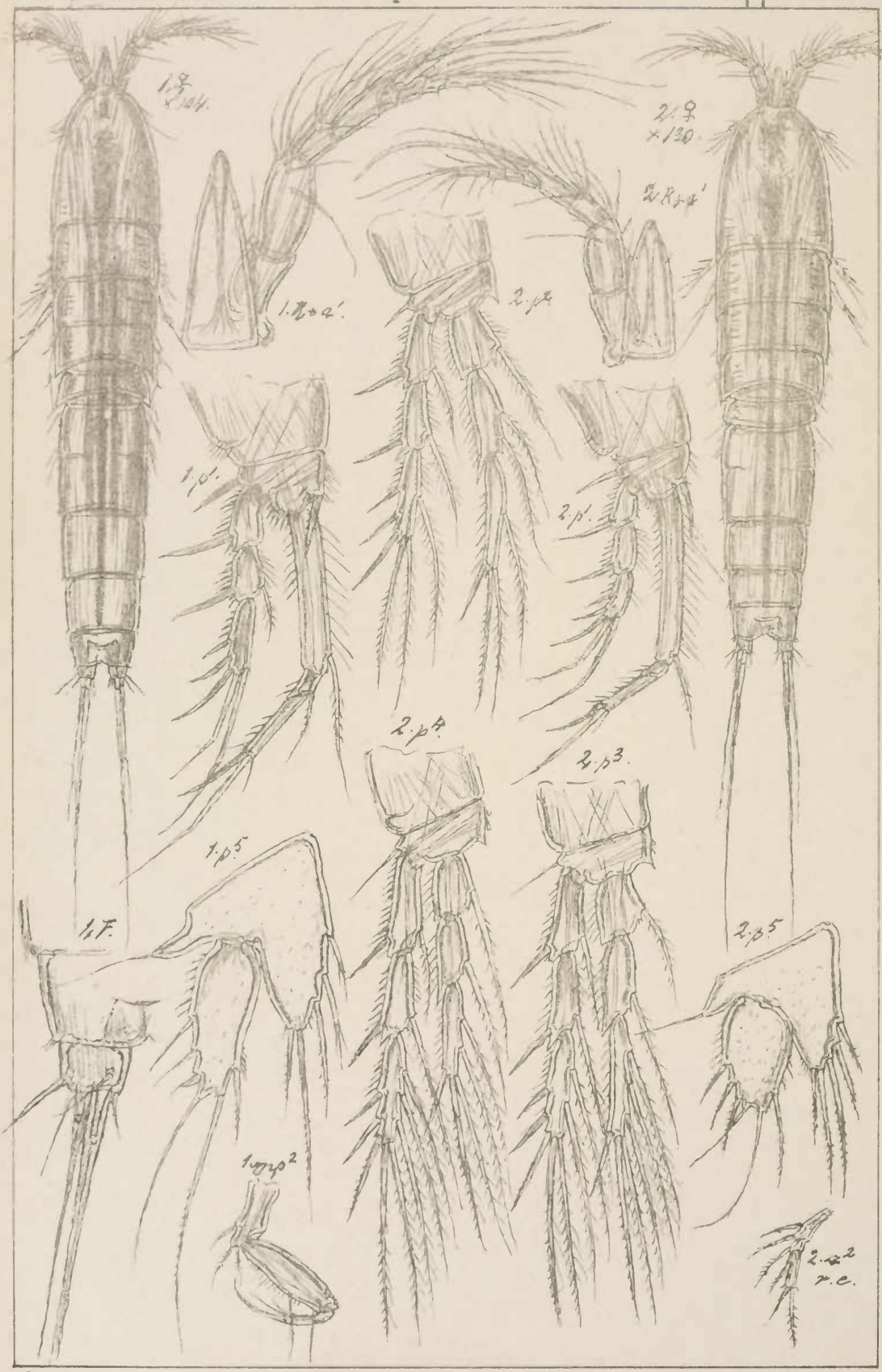


G.O. Sars, autogr. Norsk Lithgr. Officin.

Amphiascus denticulatus, (Thomps.)

Copepoda

Diosaccidæ — Harpacticoida — Suppl. Pl. 19.

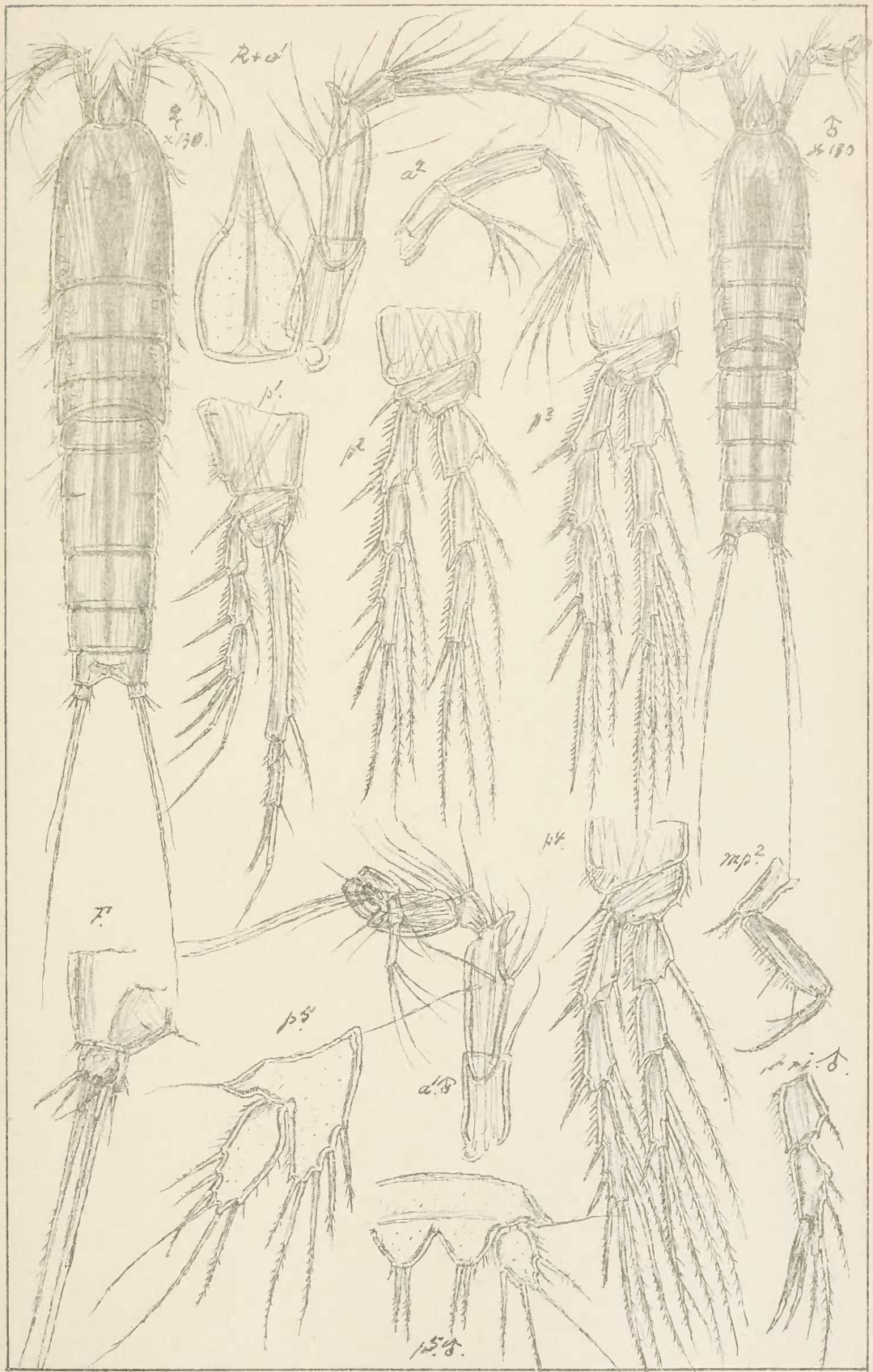


G.O. Sars, autogr. — Norsk Lithgr. Officin.

1. Amphiascus Normani, G.O. Sars.

2. " amblyops, G.O. Sars

Copepoda

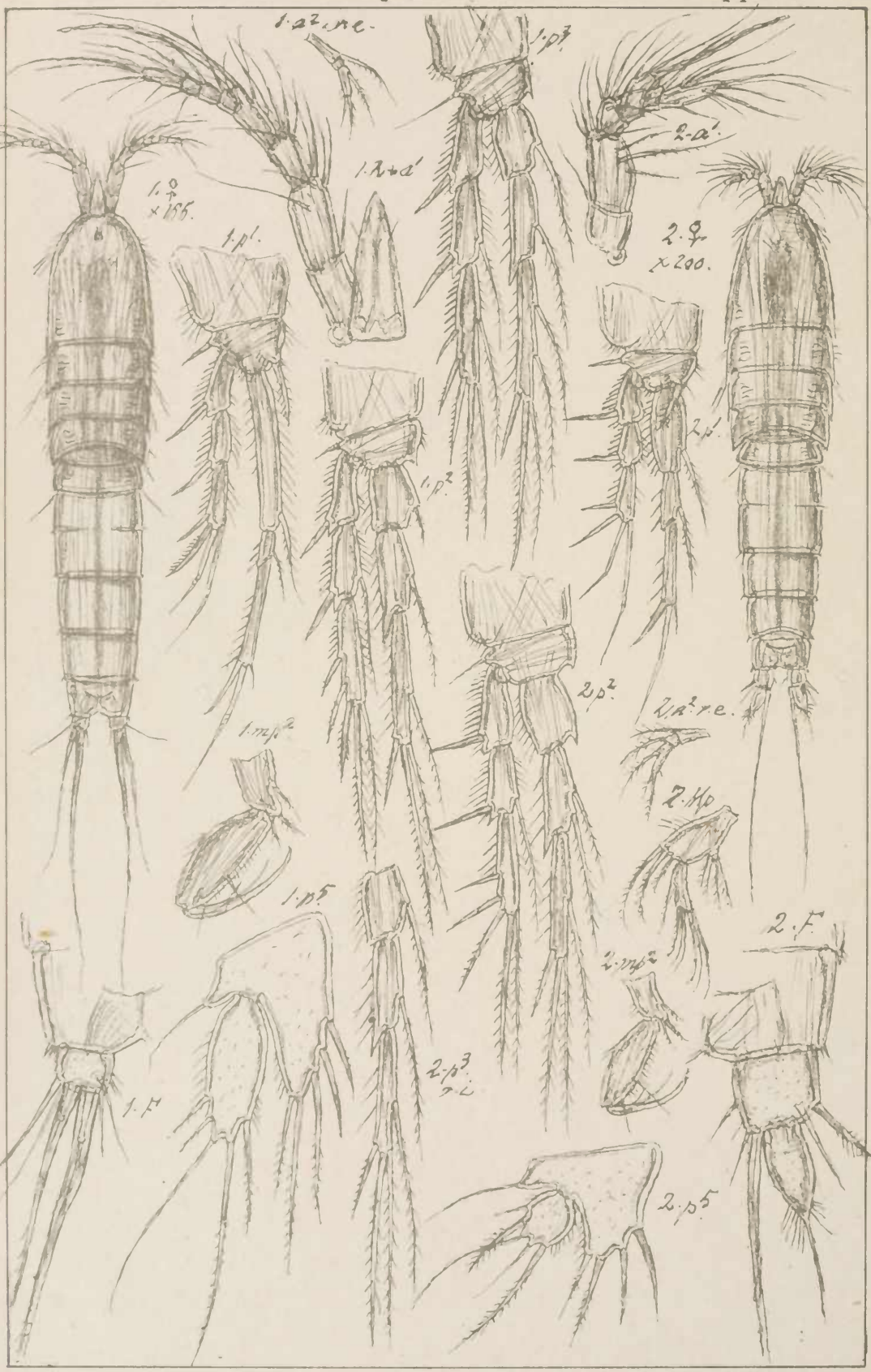


G.O.Sars, autogr.

Norsk Lithgr. Officin.

Amphiascus lagenirostris, G.O.Sars.

Copepoda



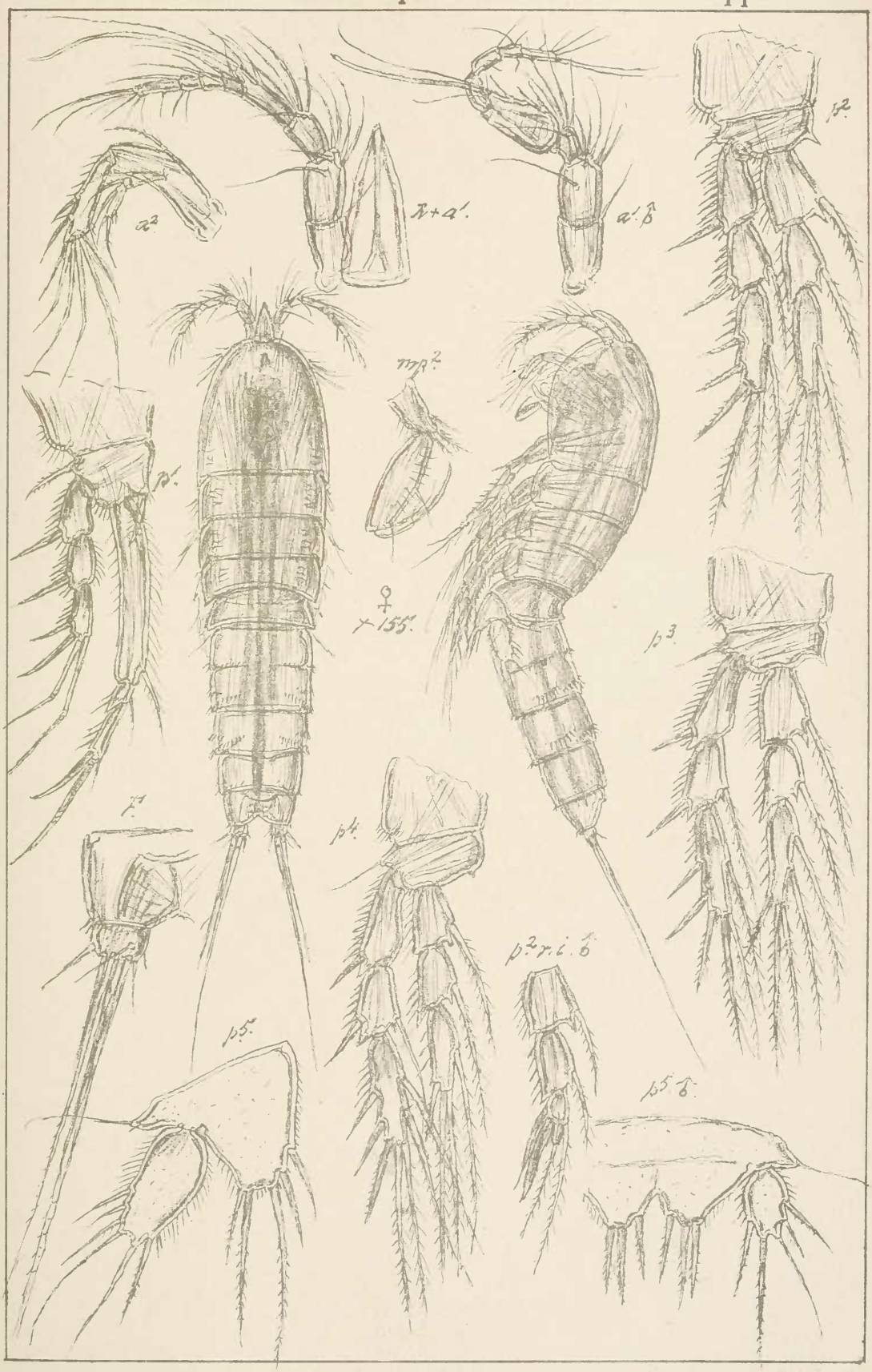
G.O.Sars, autogr. Norsk Lithgr. Officin.

1. Amphiascus nanoides, G.O.Sars.

2. " " bulbifer, G.O.Sars.

Copepoda

Diosaccidæ — Harpacticoida — Suppl. Pl. 22

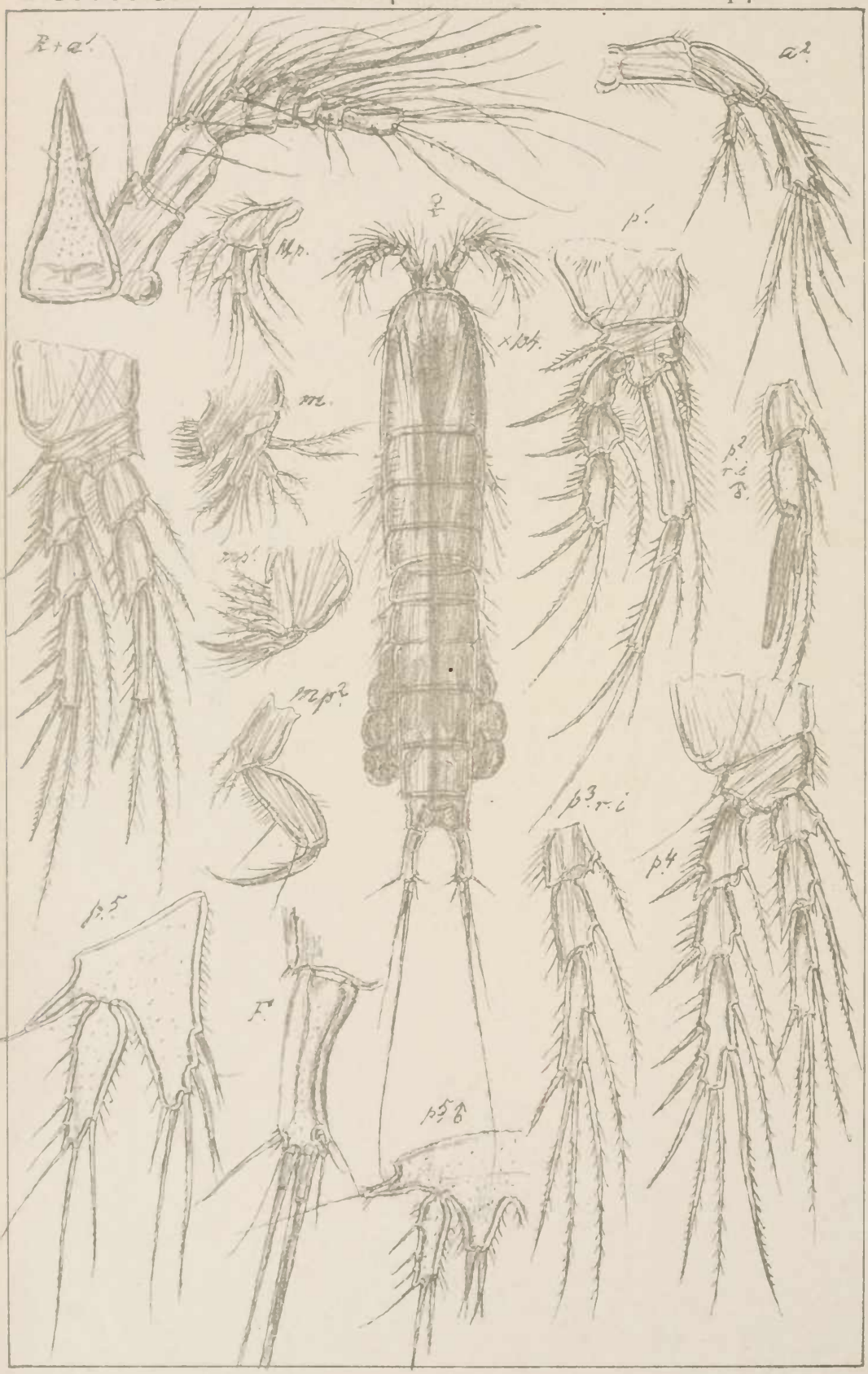


G.O.Sars, autogr. — Norsk Lithgr. Officin.

Amphiascus spinulosus, G.O.Sars.

Copepoda

Diosaccidæ — Harpacticoida — Suppl. Pl. 23

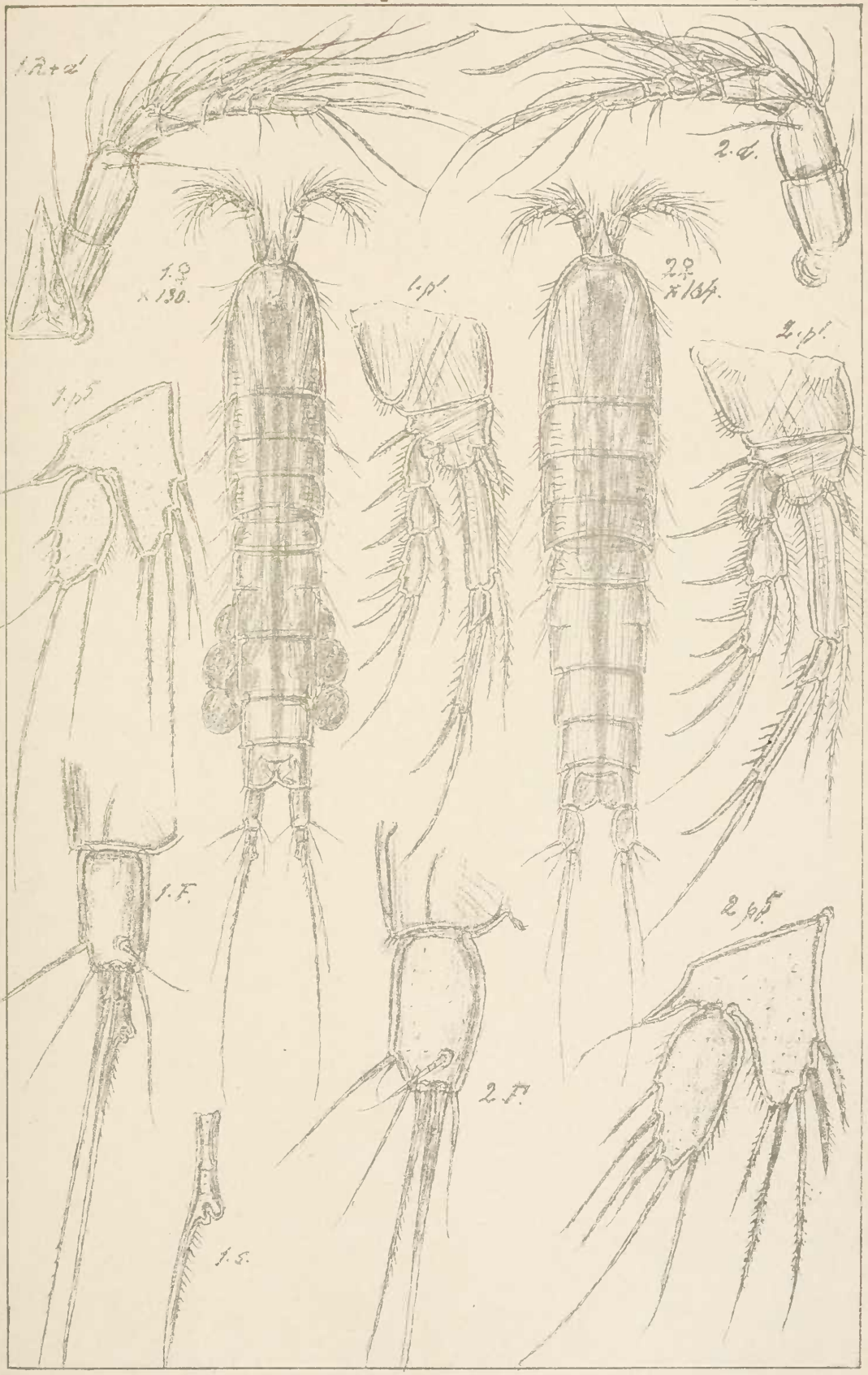


G.O. Sars, autogr. — Norsk Lithgr. Officin.

Amphiascus confusus, (Scott)

Copepoda

Diosaccidæ — Harpacticoida — Suppl. Pl. 24



G.O.Sars, autogr. — Norsk Lithgr. Officin.

1. Amphiascus typhloides, G.O.Sars.

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XXXIII & XXXIV

SUPPLEMENT (continued)

WITH 16 AUTOGRAPHIC PLATES

BERGEN
PUBLISHED BY THE BERGEN MUSEUM
— SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1911

Occurrence.—Only a solitary specimen of this form, a fully grown ovigerous female, has hitherto come under my notice. It was found in the same sample as the last-named species.

Page 217.

For Ameira tenuicornis, Scott,

read: *Ameira Scotti,* G. O. Sars, n. sp.

Remarks.—Having now examined the true *Ameira tenuicornis* of Scott, which will be described below, I propose to name the present species as above.

Page 218.

Ameira tau, (Giesbrecht).

Distribution.—Polar Islands north of Grinnell Land (2nd Fram Exp.).

Page 220.

For Ameira tenella, G. O. Sars,

read: *Ameira attenuata,* Thomps.

Ameira attenuata, I. C. Thompson, Revised Report on the Copepoda of Liverpool Bay. Trans. Liv. Biol. Soc.. Vol. VII, p. 195, Pl. XXXII.

Remarks.—I think I am right in identifying the form described in the present account on page 220 as *Ameira tenella* with *A. attenuata* of I. Thompson. The figures given by that author are certainly far from being accurate, but there are so many points of agreement that, on a closer comparison, I am led to the conclusion that these 2 forms are in all probability identical.

Page 221.

Add the following species:

Ameira tenuicornis, Scott.

(Suppl. Pl. 27).

Ameira tenuicornis, Th. Scott, in 20th Ann. Report of the Fishery Board for Scotland, Part III, p. 549, Pl. XXIV, figs. 1—9.

Specific Characters.—Female. Body extremely slender and narrow, sublinear in form, with the anterior division only slightly broader than the posterior, the two being of about equal length. Rostral prominence very small. Last caudal segment a little shorter than the preceding one. Caudal rami shorter than the anal segment and only slightly longer than they are broad, apical setæ however of quite unusual length, the inner medial one being even longer than the whole

body. Anterior antennæ long and slender, fully twice as long as the cephalic segment, and clothed in their outer part with unusually long and slender setæ, 2nd joint the largest, 3rd joint longer than 4th, terminal part scarcely attaining the length of those two joints combined. Posterior antennæ likewise more slender than usual, outer ramus distinctly biarticulate, terminal joint very small. Mandibular palp, as in the other species, simple, biarticulate, basal joint however carrying inside, in place of the usual setæ, a single remarkably strong spiniform appendage minutely denticulated at the end[1]), distal joint comparatively small. 1st pair of legs rather slender, outer ramus a little shorter than the 1st joint of the inner, and having its 3 joints of about equal length, last joint of inner ramus fully twice as long as the middle one, both together about half the length of the 1st. The 3 succeeding pairs of legs with the rami slender and narrow, setæ present in the normal number. Last pair of legs with the distal joint comparatively small, oblong oval in form, slightly tapered, and carrying 5 rather unequal setæ, that issuing from the tip very long and slender; inner expansion of proximal joint obtusely rounded at the end, and extending beyond the middle of the distal joint, marginal setæ 4 in number and rather strong, the outermost but one the longest.

Colour whitish, pellucid.

Length of adult female 0.70 mm.

Remarks. —The above-described form is undoubtedly that originally recorded by Th. Scott as *A. tenuicornis*, and is very different from the species so named in the principal part of this account. On the other hand, it has a general resemblance to *A. attenuata* Thompson, exhibiting a similar very slender form of body. It is however of considerably larger size, and moreover easily distinguished by the comparatively shorter caudal rami and the very different form of the last pair of legs. The extraordinary length of the caudal setæ in the present species has quite escaped the attention of Th. Scott, probably because those setæ had accidentally been broken off in the specimen examined by him.

Occurrence.—Several specimens of this form were found last summer at Korshavn in a single locality, which also yielded many other interesting Copepoda, most of them of a remarkably slender form of body. Some of these have already been described in the preceding pages, and several others will be treated of below. The locality was a submarine bank with coarse sandy bottom and located at some distance outside the village at a depth of 30 to 40 fathoms.

Distribution.—Scottish coast (Scott).

[1]) This appendage was erroneously considered by Th. Scott to be a particular ramus, and the palp of course described as biramous.

Page 223.

Add the following species:

Parameira propinqva (Scott).

(Suppl. Pl. 28).

Ameira propinqva, Th. Scott, in 20th Ann. Report of The Fishery Board for Scotland, Part III, p. 460, Pl. XXIV, figs. 10—18.

Specific Characters.—Female. Body comparatively more slender than in the other species of the genus, with the anterior division scarcely longer than the posterior. Cephalic segment rather deep, with the rostral projection very small. Last caudal segment about the size of the preceding one, anal opercle somewhat prominent and, like the lateral ridges leading to it, finely denticulate. Caudal rami wide apart and rather narrow, being nearly twice as long as they are broad, apical setæ rather slender, the inner medial one exceeding half the length of the body. Anterior antennæ much more slender than in the other species, exceeding in length the cephalic segment, none of the setæ plumose, 2nd joint much the largest, 3rd joint more than twice as long as the 4th, terminal part not attaining the length of those two joints combined. Posterior antennæ likewise more slender than usual, and having the proximal joint distinctly subdivided, outer ramus uniarticulate, bisetose. Oral parts of the structure characteristic of the genus. 1st pair of legs with the inner ramus considerably longer than the outer, its 1st joint comparatively narrow and about the length of the other 2 combined. The 3 succeeding pairs of legs agreeing in structure with those in the type species. Last pair of legs with the distal joint long and narrow, sublinear in form, with both edges densely ciliated, tip somewhat obliquely truncated and carrying 5 rather unequal setæ; inner expansion of proximal joint short and somewhat narrowed at the end, which carries 4 spiniform setæ.

Colour whitish.

Length of adult female 0.64 mm.

Remarks.—This is a genuine *Parameira,* agreeing in all essential characters with the other species included in that genus. It is, however, easily distinguished from any of them by its comparatively more slender body and the considerably produced anterior antennæ.

Occurrence.—Some specimens of this form were taken last summer at Korshavn, in the place where *Ameira tenuicornis* occurred.

Distribution.—Scottish coast (Scott).

Add also the following new genus:

Gen. **Pseudameira**, G. O. Sars, n.

Generic Characters.—Body comparatively robust, resembling somewhat that in *Parameira*, though having the posterior division conspicuously narrower than the anterior. Rostral prominence extremely small. Caudal rami more or less produced, with the apical setæ rather strong and conspicuously spinulose. Anterior antennæ short and thick, with the number of joints reduced, and with some of the setæ very strong and spinulose at the edges. Posterior antennæ with the basal joint not subdivided, outer ramus small, uniarticulate. Oral parts resembling in structure those in the genus *Parameira*. 1st pair of legs imperfectly prehensile, inner ramus only slightly longer than the outer and 3-articulate, with the 1st joint comparatively short. The 3 succeeding pairs of legs rather large, with both rami 3-articulate and the number of setæ more or less reduced. Last pair of legs resembling in structure those in the genus *Ameira*.

Remarks.—This new genus is nearly related to *Parameira*, differing, however, conspicuously in the structure of the anterior antennæ and that of the natatory legs. Two species referable to this genus will be described below.

Pseudameira crassicornis, G. O. Sars (new name).

(Suppl. Pl. 29).

Ameira reflexa, var., Th. Scott, in 20th Ann. Rep. of the Fishery Board for Scotland, Part III Pl. XXIII, figs. 34—42 (without description).

Specific Characters.—Female. Body comparatively short and stout, with the anterior division oval in outline and conspicuously broader than the posterior. Cephalic segment of moderate size and narrowly rounded in front; rostral projection almost obsolete. Urosome about the length of the anterior division, and having the hind edges of the segments coarsely spinulose ventrally and laterally; genital segment of moderate size and imperfectly subdivided, last segment about the length of the preceding one, and having the anal opercle comparatively small. Caudal rami scarcely exceeding in length the anal segment, and of somewhat conical shape, apical setæ of moderate length. Anterior antennæ about half the length of the cephalic segment, and composed of only 6 distinctly defined joints, 2 of which belong to the terminal part, the 1st of them very small, the 2nd large and tumid, oblong oval in form, and carrying several strong spinulose setæ in addition to the usual ones. Posterior antennæ with the distal joint about the length of the proximal one, outer ramus somewhat curved and carrying one

rather strong apical seta and 2 lateral ones, the distal of which is very small. Posterior maxillipeds of moderate size. 1st pair of legs with the inner ramus extending somewhat beyond the outer, its joints successively diminishing in length, the 1st one oblong in form and, like the other 2, carrying inside near the end a ciliated seta, last joint moreover armed at the tip with a claw-like spine and a slender seta. The 3 succeeding pairs of legs with the inner ramus scarcely more than half as long as the outer, its 1st joint of normal appearance, and the last shorter than the middle one and only provided with a single seta inside, terminal joint of outer ramus in 2nd and 3rd pairs likewise with a single seta on the inner edge, in 4th pair with 2 setæ, the distal one very strong and denticulated along the edge. Last pair of legs with the distal joint obliquely oval in form and less perfectly defined at the base, marginal setæ only 4 in number, the outer 2 rather strong, inner edge of the joint straight and quite smooth; inner expansion of proximal joint linguiform in shape, and extending as far as the distal joint, marginal setæ 4 in number, all issuing from the obtusely rounded extremity, the outermost but one much elongated.

Colour not yet ascertained.

Length of adult female 0.52 mm.

Remarks.—The above-described form is evidently identical with that figured (but not described) by Th. Scott in the above-quoted journal as *Ameira reflexa var.* It is however quite certainly specifically distinct from the form previously discribed by that author as *Ameira reflexa*, which seems more properly to be referable to the genus *Parameira*. The specific name here proposed refers to the peculiar inflated shape of the last joint of the anterior antennæ.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. It was found in a sample taken last summer at Korshavn from a depth of about 20 fathoms, sandy bottom.

Distribution.—Scottish coast (Scott).

Pseudameira furcata, G. O. Sars, n sp.

(Suppl. Pl. 30).

Specific Characters.—Female. General form of body resembling that in the preceding species, though perhaps still shorter and stouter. Rostral projection a little more prominent than in that species and acutely pointed. Urosome about the length of the anterior division and distinctly narrower; genital segment very large, fully equalling in length the other 3 segments combined. Caudal rami considerably produced, being about as long as the last 2 segments combined, and narrow linear in form, apical setæ rather strong and conspicu-

ously annulated in their outer part. Anterior antennæ short and stout, 7-articulate, 2nd joint the largest and clothed along the hind curved edge with thin spinules, terminal part short, 3-articulate, with all 3 joints of about equal size. Posterior antennæ almost exactly as in the preceding species. Posterior maxillipeds comparatively smaller than in that species. 1st pair of legs with the inner ramus very slightly longer than the outer, 1st joint comparatively short and broad, scarcely exceeding in length the middle one, last joint considerably longer and linear in form. The 3 succeeding pairs of legs with the inner ramus more fully developed than in the preceding species, being in 2nd pair considerably longer than the outer, and in the 2 other pairs almost of equal length; 1st joint of this ramus in all these pairs rather tumid and carrying inside, near the base, a remarkably stout spiniform seta, terminal joint in 2nd pair very slender, equalling in length the other 2 combined, and having a single seta inside, that of the other 2 pairs of moderate length and, like the terminal joint of the outer, provided inside with 2 setæ. Last pair of legs comparatively small, distal joint well defined and conically oval in form, with 5 moderately long marginal setæ; inner expansion of proximal joint not extending as far as the distal joint, and carrying 5 setæ, 4 issuing from the transversely truncated extremity, the 5th from the inner edge; outermost but one of the setæ, as usual, the longest, the inner 2 rather short and spiniform.

Colour not yet ascertained.

Length of adult female 0.58 mm.

Remarks.—The above-described form is evidently congeneric with the preceding one, though specifically well defined, differing conspicuously in the more produced caudal rami, as also in the structure of the anterior antennæ and legs. It is also of somewhat larger size.

Occurrence.—Two female specimens of this form were found in another sample from Korshavn, taken at a depth of about 12 fathoms, muddy bottom.

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Add the 3 following species:

Ameiropsis nobilis, G. O. Sars, n. sp.

(Suppl. Pl. 31).

Specific Characters.—Female. Body slender and graceful in form, with the anterior division only slightly broader than the posterior. Cephalic segment scarcely as long as the 3 succeeding segments combined and not very deep; rostral projection very small, narrow linguiform in shape. Urosome about the

length of the anterior division, and having the hind edges of the segments clothed with delicate spinules. Caudal rami nearly twice as long as they are broad, and slightly divergent; apical setæ exceedingly long and slender, the inner medial one attaining the length of the whole body Anterior antennæ unusually long and slender, being almost twice as long as the cephalic segment, and composed of 9 joints, the last of which however is so very small as easily to escape attention, 2nd joint the largest, 3rd joint twice as long as the 4th, terminal part about the length of those two joints combined, and clothed with unusually long and slender setæ. Posterior antennæ likewise more slender than usual, outer ramus well developed, with the proximal joint fusiform in shape, its inner edge bulging considerably in the middle, but quite smooth. Mandibles with the masticatory part narrowly exserted, palp distinctly biramous, as in the other species of this genus. Anterior maxillipeds with 3 somewhat unequal setiferous lobes inside the basal joint. 1st pair of legs with the outer ramus about the length of the 1st joint of the inner, its last joint a little longer than the middle one; 1st joint of inner ramus about twice as long as the other 2 combined, and having the seta of the inner edge not far from the end, last joint larger than the middle one. The 3 succeeding pairs of legs exhibiting the structure characteristic of the genus. Last pair of legs comparatively small, distal joint oblong conical in form and densely ciliated on both edges, marginal setæ 6 in number, 2 of them, however, very small, hair-like; inner expansion of proximal joint linguiform in shape, and extending about to the middle of the distal joint, its extremity provided with 4 spiniform setæ increasing successively in length outwards, and at the outer corner with a very small spinule. Ovisac rather small, rounded oval in form.

Colour whitish, pellucid.

Length of adult female 0.94 mm.

Remarks.—This form is at once distinguished from any of the 3 species described in the main part of this work by its slender and graceful body and the much produced anterior antennæ and caudal setæ. It is the largest of the known species.

Occurrence.—Several specimens of this handsome species were found last summer at Korshavn in the same locality as that from which Ameira tenuicornis was derived.

Ameiropsis angulifera, G. O. Sars, n. sp.

(Suppl. Pl. 32).

Specific Characters.—Female. Body of a similar slender form to that in the preceding species. Urosome, however, somewhat shorter than the anterior

division, and having the last segment smaller than the preceding one. Caudal rami comparatively short, being scarcely longer than they are broad, and of a somewhat unusual form, each exhibiting dorsally a rectangular prominence, best seen in the lateral aspect of the animal; apical setæ slender, though scarcely as long as in the preceding species. Anterior antennæ slender and narrow, exceeding in length the cephalic segment, and, as in the preceding species, composed of 9 well-defined joints, 2nd joint much the largest and subfusiform in shape, 3rd joint considerably longer than 4th, terminal part exceeding in length those two joints combined. Outer ramus of posterior antennæ resembling in shape that in the preceding species, being distinctly biarticulate, with the proximal joint conspicuously dilated in the middle. Oral parts scarcely differing in structure from those in that species. 1st pair of legs with the outer ramus a little shorter than the 1st joint of the inner, the latter joint not quite twice as long as the other 2 combined. The 3 succeeding pairs of legs of same structure as in the other species of this genus. Last pair of legs with the distal joint oval conical in form, inner edge bulging considerably at the base, tip somewhat obliquely truncated and, as in the preceding species, provided with 6 setæ, 2 of which are hair-like; inner expansion of proximal joint not extending to the middle of the distal joint, and carrying on the obtusely truncated extremity 5 spiniform setæ, the outermost one very short, that succeeding it much the longest.

Colour whitish, pellucid.

Length of adult female 0.70 mm.

Remarks.—On account of a certain resemblance in the shape of the caudal rami, I was at first inclined to identify this form with *Ameira exilis* of Scott. On a closer comparison, I find however that such an identification is untenable. *Ameira exilis* is of much larger size, attaining, according to Scott, a length of 1.40 mm.; and the structure of both pairs of antennæ, mandibles and last pair of legs seems also, according to the figures given by Th. Scott, to differ conspicuously in these 2 forms. The specific name here proposed refers to the peculiar shape of the caudal rami, whereby the present species is at once recognised from any of the others.

Occurrence.—Some few specimens of this form were found in the same place in which the preceding species occurred.

Ameiropsis abbreviata, G. O. Sars, n. sp.

(Suppl. Pl. 33).

Specific Characters.—Female. Body unusually short and stout, subdepressed, with all the segments sharply marked off from each other. Cephalic

segment rather large and expanded, equalling in length the 4 succeeding segments combined; rostral projection broadly triangular in form. Urosome somewhat shorter than the anterior division and having the segments coarsely spinulose at the hind edge ventrally and laterally, last segment fully as large as the preceding one. Caudal rami about the length of the anal segment and slightly tapered distally, apical setæ of moderate length. Anterior antennæ comparatively slender, exceeding in length the cephalic segment, and composed of 8 joints, 2nd joint, as usual, the largest, 3rd joint scarcely longer than 4th, terminal part much longer than those two joints combined. Outer ramus of posterior antennæ uniarticulate, ciliated on the edges and carrying on the tip 3 setæ, the middle one the longest. Mandibular palp comparatively small, but distinctly biramous. Anterior maxillipeds with only 2 setiferous lobes inside the basal joint. Posterior maxillipeds with the hand rather narrow, oblong in form. 1st pair of legs comparatively large, outer ramus shorter than the 1st joint of the inner and having the middle joint the largest; 1st joint of inner ramus more than twice as long as the other 2 combined, apical spine of this ramus rather slender. The 3 succeeding pairs of legs scarcely differing in structure from those in the other species of the genus. Last pair of legs with the distal joint comparatively large, oblong fusiform in shape, and very finely ciliated on the edges, marginal setæ 5 in number, one of them attached at some distance from the others to the outer edge in front of the middle; inner expansion of proximal joint only very slightly produced, and carrying 4 unequal setæ.

Colour not yet ascertained.

Length of adult female 0.52 mm.

Remarks.—This is a somewhat anomalous species, though apparently referable to the genus *Ameiropsis*, according to the structure of the mandibles and legs. It may at once be recognized from any of the other species by the short and stout form of the body.

Occurrence.—Only a solitary female specimen of this form has as yet come under my notice. It was found in a sample taken last summer at Korshavn from a depth of about 20 fathoms, sandy bottom.

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Add the following species:

Stenocopia spinosa, (Scott).

(Suppl. Pl. 34).

Ameira longicaudata, var. spinosa, Th. Scott, Additions to the Fauna of the Firth of Forth, Part IV. 10th Ann. Rep. of the Fishery Board for Scotland, p. 251, Pl. IX, figs 17 & 18.

Specific Characters.—Female. Rather like *S. longicaudata*, but of somewhat smaller size and, when viewed dorsally, at once distinguished by the epimeral plates of the 4 anterior segments being expanded laterally, forming together a broad hyaline rim surrounding the anterior part of the body, edges of the plates very finely spinulose. Urosome with the segments very sharply marked off from each other, the lateral parts forming in all of them, except the last, lamellar expansions densely spinulose at the edges. Posterior edges of all the segments of the body somewhat raised dorsally, and clothed with very coarse spinules. Caudal rami, as in the type species, narrow linear in form and exceeding half the length of the urosome, apical setæ long and slender. Anterior antennæ resembling in structure those in *S. longicaudata*, though differing somewhat in the mutual relation of the joints in the proximal part, the 1st joint being only slightly longer than the 2nd, which is fully as long as the 2 succeeding joints combined. Posterior antennæ with the outer ramus comparatively smaller than in that species, though of a very similar structure. 1st pair of legs with the outer ramus much shorter than the 1st joint of the inner, the latter very narrow and somewhat sigmoid in shape. The 3 succeeding pairs of legs comparatively smaller than in the type species, and having the basal part bent in an elbow-like manner, as in *S. setosa;* both rami very narrow. Last pair of legs comparatively small, with the distal joint narrowly exserted at the tip; inner expansion of proximal joint considerably smaller than in *S. longicaudata* and defined outside by an angular sinus.

Colour whitish grey.

Length of adult female 0.80 mm.

Remarks.—This form is closely allied to *S. longicaudata*, and was indeed considered by Th. Scott to be only a variety of that species. Having, however, on a closer comparison of both forms, found several perfectly constant differences, both as regards the external appearance and some of the structural details, I am led to the conclusion that the present form should more properly be separated as a distinct though closely-allied species.

Occurrence.—This form was found last summer rather abundantly at Korshavn in a depth of 30—50 fathoms, coarse sandy bottom. In the same locality *S. longicaudata* also occurred; but it was fairly easy to pick out the present form, on account of its coarsely spinulose body and the laterally expanded epimeral plates of the anterior segments, which, in the dorsal aspect of the animal, give it a rather peculiar appearance.

Distribution.—Scottish coast (Scott).

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Add the following new genus:

Gen. **Malacopsyllus**, G. O. Sars, n.

Generic Characters.—Body slender cylindrical in form, with no sharp demarcation between the anterior and posterior divisions. All integuments remarkably thin and soft, partly clothed with delicate hairs. Rostral prominence wholly obsolete. Caudal rami comparatively short. Anterior antennæ slender and narrow, 8-articulate, in male slightly hinged. Posterior antennæ likewise remarkably slender, with the basal joint not subdivided, outer ramus quite rudimentary. Oral parts on the whole resembling in structure those in the genus *Stenocopia*. 1st pair of legs very slender, with the inner ramus the longer and only composed of 2 joints. The 3 succeeding pairs of legs likewise unusually slender, with the 2nd basal joint produced outwards and forming with the 1st an elbow-like bend; inner ramus much smaller than the outer, and composed of only 2 joints, the proximal one very short; natatory setæ of both rami considerably reduced in number. Last pair of legs small, with the distal joint narrowly exserted; proximal joint having outside a long and narrow process tipped with a delicate bristle, its inner expansion very small.

Remarks.—This new genus differs from *Stenocopia*, to which it exhibits a certain affinity, chiefly in the rudimentary condition of the outer ramus of the posterior antennæ, and in the rather different structure of the legs. The generic name here proposed refers to the extremely thin and delicate integuments, which give to the body a peculiarly soft and fragile consistency. Only a single species of this genus has as yet come to my notice.

Malacopsyllus fragilis, G. O. Sars, n. sp.

(Suppl. Pl. 35).

Specific Characters.—Female. Body rather narrow, with the anterior division slightly depressed, the posterior perfectly cylindrical. Cephalic segment comparatively small, rounded quadrangular in outline, frontal margin perfectly straight, without any trace of a rostral projection, lateral edges slightly curved, and each exhibiting behind a knob-like prominence clothed with delicate hairs. Lateral parts of the 4 succeeding segments rounded and likewise clothed with delicate diverging hair-like bristles. Urosome about the length of the anterior division and slightly narrower, with the posterior edges of the segments clothed with delicate hairs; last segment fully as large as the preceding one, and having

the anal opercle rather prominent and perfectly smooth. Caudal rami much shorter than the anal segment and conspicuously constricted at the base, each provided dorsally, near the end, with a remarkably large bulbous prominence tipped with a delicate seta, extremity of the ramus somewhat dilated and transversely truncated, carrying at the outer somewhat projecting corner 2 short juxtaposed bristles and at the inner another similar bristle, the 2 median setæ rather slender, the inner one exceeding half the length of the body. Eye wholly absent. Anterior antennæ of rather feeble structure, about half the length of the anterior division, and clothed with comparatively short setæ, joints of the proximal part successively diminishing in length, the 1st scarcely thicker than the others, and densely ciliated along the anterior edge, terminal part exceeding half the length of the proximal, and having the 2nd joint the longest. Posterior antennæ with the distal joint narrow linear in form, outer ramus replaced by a small seta. Mandibular palp comparatively small, basal part only slightly dilated, and carrying inside a single thickish seta, outer ramus smaller than inner and imperfectly defined at the base, with only 2 apical setæ. Posterior maxillipeds rather slender, with the propodos narrow oblong in form, dactylus much elongated. 1st pair of legs with the basal part conspicuously constricted in the middle and carrying at the end on each side a remarkably slender curved seta; outer ramus with the middle joint much longer than the others, last joint armed at the end with 4 somewhat geniculate setæ gradually increasing in length inwards; inner ramus with the proximal joint longer than the outer ramus and very narrow, carrying inside, at some distance from the end, the usual seta; distal joint scarcely exceeding $^1/_3$ of the length of the proximal one, and provided inside, at about the middle, with a short seta, tip armed with a slender claw-like spine and a still longer seta accompanied inside by a small bristle. The 3 succeeding pairs of legs with the outer ramus long and slender, 1st joint small and without any seta inside, terminal joint exceeding in length the other 2 combined, and having inside in the 2nd pair 2 setæ, in the 2 succeeding pairs only a single seta, spines of outer edge remarkably long and slender; inner ramus narrow linear in form and in the 2 posterior pairs scarcely half as long as the outer, with only a single seta inside the distal joint, in 2nd pair somewhat longer and having 2 setæ inside the distal joint. Last pair of legs with the distal joint long and slender, somewhat fusiform in shape, and exserted at the end to a very narrow process tipped with a hair-like bristle, its outer edge clothed with scattered hair and moreover carrying 3 curved setæ, inner edge with a single somewhat longer seta; outer process of proximal joint remarkably long and slender,

inner expansion of same joint only represented by a small conical projection tipped with 2 setæ. Ovisac comparatively small, rounded.

Male, as usual, considerably smaller than female and having the anterior antennæ slightly transformed and adapted for prehension. Last pair of legs resembling in shape those in female, but still smaller and having only a single seta inside the proximal joint.

Colour whitish, pellucid, with a few irregular patches of a clear orange hue.

Length of adult female 0.93 mm., of male 0.70 mm.

Remarks.—In its outward appearance this form has a general resemblance to *Stenocopia setosa* described in the main part of this work, and at first, therefore, I was inclined to refer it to the same genus. A closer examination has however proved it to differ so materially in some of the structural details, that it can scarcely be included in that genus.

Occurrence.—This peculiar Copepod occurred not unfrequently in the same locality as that in which *Stenocopia spinosa* and many other interesting forms were found. It could at once be distinguished from *Stenocopia setosa*, which also occurred in the same locality, by its comparatively short and peculiarly formed caudal rami.

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Phyllopodopsyllus Bradyi, Scott

(Suppl. Pl. 37, fig. 2).

Male.—Rather unlike the female in its outward appearance, the body being more rapidly attenuated behind, with the segments of the urosome simple cylindrical in form. Caudal rami much more produced than in female, equalling in length the last 2 segments combined, and very slender, gradually tapered distally, apical seta not, as in female, bulbously dilated at the base. Anterior antennæ very strongly built and composed of only 7 joints, those belonging to the proximal part considerably dilated. Legs comparatively less slender than in female, especially those of 4th pair. Last pair of legs very unlike those in female and of much smaller size, each composed of 2 well defined joints, the proximal one somewhat lamellar, conically produced outside, and forming inside a well defined, though short expansion carrying 3 spiniform setæ, distal joint rather narrow and projecting at the end outside to an acute point, outer edge straight and carrying 2 small bristles, inner edge armed at about the middle with a strong spiniform seta and at the end, inside the apical point, with 2 somewhat smaller setæ. Genital lobes each with a strong spine and 2 unequal setæ.

Length of adult male 0.60 mm.

Remarks.—The female of this form has been described and figured in the main part of this work, and I have therefore here confined myself to an indication of the sexual differences exhibited by the adult male. These differences are, as shown above, rather striking.

Occurrence.—The present form, of which previously only 3 female specimens had come under my notice, occurred rather frequently in one locality near Korshavn, at a depth of about 20 fathoms, sandy bottom.

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Add the following genera and species belonging to the family *Canthocamptidæ*:

Gen. **Tetragoniceps**, Brady, 1880.

Generic Characters.—Body of narrow cylindrical form, with the posterior division unusually slender. Cephalic segment comparatively large and deep projecting in front in an obtuse rostral prominence. Caudal rami conically tapered. Anterior antennæ well developed, with the 1st joint much the largest and produced at the end outside to a claw-shaped process. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus small, uniarticulate. Anterior lip securiformly produced. Mandibles strongly built, with the palp well developed, biramous. Maxillæ with the epipodal lobe obsolete. Anterior maxillipeds with 3 setiferous lobes inside the basal joint, apical part distinct, biarticulate. 1st pair of legs with the inner ramus much longer than the outer and biarticulate. The 3 succeeding pairs of legs with the inner ramus likewise biarticulate, but shorter than the outer, the latter in 4th pair much elongated; natatory setæ in all 3 pairs much reduced in number. Last pair of legs not very large, distal joint conically produced and in some cases confluent with the proximal one.

Remarks.—This genus was established by Prof. Brady in the year 1880, to include a single species, *T. malleolatus*. The generic name refers to the quadrangular form of the head, as seen laterally, chiefly caused by the very prominent anterior lip. In latter years several additional species of this genus have been described by Th. Scott; but most of these have recently been removed by that author, to constitute the types of separate genera. The form described below ought, I think, to be referred to the original genus.

Tetragoniceps Scotti, G. O. Sars (new name)

(Suppl. Pl. 36 & 37, fig. 1).

Tetragoniceps malleolata, Th. Scott, Additions to the Fauna of the Firth of Forth, Part IV. 10th Ann. Rep. of the Fishery Board for Scotland, p. 252, Pl. VIII, figs. 11 & 12 (not Brady).

Specific Characters.—Female. Body very slender and slightly tapered behind, with the anterior and posterior divisions of about equal length. Cephalic segment about as long as the 3 succeeding segments combined, and having the lower edges angularly curved in the middle, rostral prominence short, evenly rounded at the tip. Epimeral plates of the 3 succeeding segments small, rounded; last segment scarcely shorter than the preceding one. Urosome rather narrow, with the segments unarmed at the hind edges; last segment fully as large as the preceding one, and having the anal opercle somewhat prominent and finely denticulated at the edge. Caudal rami about the length of the anal segment and slightly dilated at the base, outer edge with 2 successive slender bristles, dorsal bristle issuing in front of the middle; apical seta simple and not very elongated. Anterior antennæ about the length of the cephalic segment, and composed of 9 well-defined joints, 1st joint attaining almost half the length of the antenna, terminal part scarcely exceeding $^1/_3$ of the length of the proximal part. Posterior antennæ rather slender, but having the distal joint comparatively short, outer ramus very small, with 3 setæ, 2 apical and one lateral. 1st pair of legs comparatively slender, outer ramus shorter than the proximal joint of the inner, and having the last joint much smaller than the others and armed at the tip with 2 spines and 2 geniculate setæ; proximal joint of inner ramus narrow linear in form, ciliated on both edges and carrying inside, behind the middle, a plumose seta, distal joint not attaining half the length of the proximal one, and armed at the tip with a slender claw-like spine and a still longer seta accompanied inside by a small bristle. The 2 succeeding pairs of legs with the inner ramus a little shorter than the outer, and having the distal joint slender linear in form, with no seta inside, but with a slender spine and one or 2 bristles at the tip. 4th pair of legs with the outer ramus more than twice as long as the inner, and provided at the end with a bunch of setæ, 2 of which are remarkably strong and minutely spinulose at the edges. Last pair of legs with the distal joint well defined and very slender, gradually tapered towards the end and edged with a number of very small hair-like bristles, one of which issues from the narrowly exserted tip; proximal joint somewhat lamellar and forming inside a triangular expansion extending about to the middle of the distal joint and carrying 4 short setæ, 3 inside and one at the tip.

Male much smaller than female, and having the anterior antennæ transformed in the usual manner. Last pair of legs, as in the female, with the distal

joint well defined, but of a rather different shape, being produced immediately inside the tip to a strong spiniform process, inner expansion of proximal joint with only 3 marginal setæ, the innermost one spiniform.

Colour not yet ascertained.

Length of adult female 0.90 mm.

Remarks.—The above-described form is evidently that briefly recorded by Th. Scott as *T. malleolata* Brady. It cannot, however, be referred to that species at all, as the structure of the last pair of legs is very unlike that in the type species, and Th. Scott has also called attention to this essential difference. I propose to name the species in honour of that distinguished naturalist.

Occurrence. -Only a few specimens of this form have come under my notice. They were found in samples taken last summer at Korshavn from depths of about 20 fathoms, sandy bottom.

Distribution.—Scottish coast (Scott).

Gen. **Pteropsyllus,** Scott 1906.

Generic Characters.—General form of body resembling that in *Phyllopodopsyllus*. Rostral projection, however, very prominent and acutely produced at the tip. Genital segment in female very large and somewhat depressed. Caudal rami narrow linear in form. Anterior antennæ with the 1st joint much elongated, but without any unguiform projection outside. Posterior antennæ very slender, with the outer ramus rudimentary. Oral parts resembling on the whole in structure those in the genus *Phyllopodopsyllus*. 1st pair of legs with the inner ramus much longer than the outer, and distinctly 3-articulate. The 3 succeeding pairs of legs all of essentially same structure, being rather small, with the inner ramus somewhat shorter than the outer and biarticulate; natatory setæ much reduced in number. Last pair of legs in female very large, forming together, as in the genus *Phyllopodopsyllus*, beneath the urosome a roomy incubatory chamber, each, however, composed of 2 well-defined lamellar joints; those in male very small, uniarticulate.

Remarks.- This genus, established by Th. Scott, is nearly allied to *Phyllopodopsyllus*, but differs conspicuously in the shape of the rostrum and the caudal rami, as also in the structure of the antennæ and legs. Only a single species is as yet known.

Pteropsyllus consimilis, Scott.

(Suppl. Pl. 38).

Tetragoniceps consimilis, Th. Scott, Additions to the Fauna of the Firth of Forth, Part. VI. 12th Ann. Rep. of the Fishery Board for Scotland, p. 244, Pl. VII, figs. 4—12.

Specific Characters.—Female. Body moderately slender, with the anterior division somewhat compressed and about the length of the posterior. Cephalic segment rather large, exceeding in length the 4 succeeding segments combined; rostrum resembling in shape that in the genus *Amphiascus*, being well defined at the base, slightly curved, and terminating in an acute point. Urosome somewhat depressed in its anterior part, with the genital segment fully as long as the other 3 combined, 2nd segment with a small appressed spine on each side, last segment rather narrower than the preceding one, but scarcely shorter, anal opercle comparatively small. Caudal rami narrow linear in form and exceeding in length the anal segment, tip slightly dilated and armed at the outer corner with a strong spine, apical setæ rather slender and of normal structure. Anterior antennæ about equalling in length the cephalic segment, and 8-articulate, 1st joint much elongated and somewhat tapered distally, with the inner edge finely serrate, 2nd joint scarcely half as long and having the inner distal corner conically produced, terminal part only slightly longer than the 2 preceding joints combined. Posterior antennæ with the distal joint very narrow and having the apical setæ unusually short, outer ramus forming a very small knob-like prominence tipped with a delicate seta. 1st pair of legs with the outer ramus shorter and much narrower than the 1st joint of the inner, resembling in structure that in *Tetragoniceps;* 1st joint of inner ramus slightly dilated, and carrying inside near the end a slender seta, last joint longer than the middle one, and both combined not attaining half the length of the 1st, apical spine and seta rather slender. The 3 succeeding pairs of legs with the outer ramus comparatively narrow and without any setæ inside, inner ramus with the proximal joint somewhat dilated and carrying inside a well-developed seta, distal joint scarcely longer and linear in form. Last pair of legs very large, extending to the end of the 2nd caudal segment, proximal joint short, forming inside a conical expansion furnished with 3 or 4 short setæ, distal joint foliaceous, oblong quadrangular in form and somewhat obliquely truncated at the end, which carries 3 short, thick setæ, and in the middle 2 juxtaposed small hair-like bristles, outer edge of the joint having a single small seta about the middle.

Male smaller than female and more regularly attenuated behind. Anterior antennæ hinged in the usual manner. 1st pair of legs with the spine inside the 2nd basal joint remarkably produced, sabre-like; inner ramus apparently composed of only 2 joints. Last pair of legs very small, each forming an undivided

lamella armed with 3 spines, the apical one very strong and denticulated in its outer part.

Colour not yet ascertained.

Length of adult female 0.75 mm.

Remarks.—This form was first described by Th. Scott as a species of the genus *Tetragoniceps*, but has recently been removed by the same author, to constitute the type of a separate genus. In outward appearance it bears a great resemblance to *Phyllopodopsyllus Bradyi*, and it is indeed to this resemblance that the specific name proposed by Th. Scott refers. On a closer examination it may, however, be at once distinguished by the prominent rostrum and the narrow linear caudal rami.

Occurrence.—Some few specimens of this form were found in samples taken last summer at Korshavn from a depth of about 30 fathoms, coarse sandy bottom.

Distribution.—Scottish coast (Scott).

Gen. **Evansia**, Scott, 1906.

Generic Characters.—Body narrow and elongated, with comparatively thin integuments. Rostrum well defined, though less prominent than in *Pteropsyllus*. Caudal rami produced, tapered, with the apical seta distinctly geniculate. Anterior antennæ in female simple, without any armature, in male strongly hinged. Posterior antennæ with the outer ramus small, uniarticulate. Mandibular palp simple, biarticulate. Maxillæ with the exopodal and epipodal lobes obsolete. Anterior maxillipeds short and stout, with only 2 setiferous lobes inside the basal joint. 1st pair of legs slender, with the inner ramus much longer than the outer and biarticulate. Inner ramus of the 3 succeeding pairs of legs very small, uniarticulate; that of 3rd pair in male transformed. Last pair of legs small, uniarticulate.

Remarks.—This genus was established by Th. Scott, to include the form previously described by him as *Tetragoniceps incerta*. Another species *T. pygmæa* is also referred by Th. Scott to this genus. The chief differences from the 3 preceding genera are the unarmed condition of the female anterior antennæ, the simple biarticulate mandibular palp, and the very small uniarticulate inner rami of the 2nd to 4th pairs of legs. Only one of the 2 species is known to me.

Evansia incerta, Scott.

(Suppl. Pl. 39).

Tetragonicceps incerta, Th. Scott, Additions to the Fauna of the Firth of Forth, Part I., 10th Ann. Rep. of the Fishery Board for Scotland, p. 254, Pl. XII, figs. 1—17.

Specific Characters.—Female. Body slender, cylindric in form, with the anterior division scarcely broader than the posterior. Cephalic segment comparatively short, but rather deep, with the lower edges angularly curved in the middle; rostrum rather small, but well defined, and acutely produced at the tip. Urosome nearly as long as the anterior division and having the segments quite smooth, the genital one of moderate size and not subdivided, last segment about the length of the preceding one. Caudal rami almost as long as the anal segment and gradually tapered distally, each exhibiting dorsally in front of the middle a short dentiform prominence accompanied by a delicate bristle, outer edge with 2 successive slender setæ, apical seta having the proximal part remarkably strong, spiniform, and sharply defined from the thin hair-like terminal part. Anterior antennæ slender, considerably exceeding in length the cephalic segment, and composed of only 7 joints, the first 2 of which are much larger than the others and of about equal length, terminal part about the length of the 2 preceding joints combined. Posterior antennæ moderately strong, with the distal joint widening somewhat distally, outer ramus very small, with 2 bristles at the tip. Mandibular palp with the proximal joint narrow linear in form, with a small seta at the inner distal corner, distal joint short curved. 1st pair of legs with the outer ramus very narrow and much shorter than the proximal joint of the inner, the latter linear in form and carrying inside, near the base, a delicate seta, distal joint of this ramus quite short and armed at the tip with a claw-like spine and a somewhat longer seta. The 3 succeeding pairs of legs with the outer ramus comparatively narrow and without any setæ inside, inner ramus very small, with 2 setæ at the tip, and in 4th pair with 2 additional setæ on the inner edge. Last pair of legs forming each a small triangular lamella terminating in a strong spine and having outside 3, inside 4, slender bristles.

Male with the anterior antennæ strongly hinged, 4th joint considerably dilated and projecting angularly in front. Inner ramus of 3rd pair of legs conspicuously transformed, biarticulate, proximal joint imperfectly defined from the basal part and produced at the end inside to a strong deflexed spiniform process. Last pair of legs with the apical spine not defined at the base, inner

edge armed with a single rather strong spine, outer with a much smaller spine in addition to the marginal bristles.

Colour not yet ascertained.

Length of adult female 0.84 mm.

Remarks.—This form was also at first described by Th. Scott as a species of the genus *Tetragoniceps,* though the specific name proposed would seem to indicate the doubt he had felt in referring it to that genus. In its external appearance the present form more resembles the type species of *Tetragoniceps* than do the other 2 forms treated of in the preceding pages.

Occurrence.—Only very few specimens of this form have as yet come under my notice. One of these, a fully developed male, was found in a sample kindly sent to me by Mr. Nordgaard, who procured it from the Trold Fjord, inside the Lofoten islands. The other specimens were derived from samples taken last summer at Korshavn from depths of from 30 to 50 fathoms.

Distribution.—Scottish coast (Scott).

Gen. **Leptastacus,** Scott, 1906.

Generic Characters.—Body very narrow, but with rather hard integuments. Rostrum small, but well defined. Caudal rami more or less produced. Anterior antennæ slender, unarmed. Posterior antennæ with the proximal joint not subdivided, outer ramus very small, uniarticulate. Anterior lip very prominent. Mandibles with the masticatory part securiformly dilated and coarsely dentate, palp small, simple. Maxillæ with the palp unusually prolonged and without any traces of exopodal and epipodal lobes. Anterior maxillipeds more slender than usual, and having the apical part well defined. Posterior maxillipeds powerfully developed, with the basal joint short and unarmed, propodos exceedingly large and tumid, dactylus thin and accompanied at the base outside by a slender bristle. 1st pair of legs very small and imperfectly prehensile, inner ramus shorter than usual, and biarticulate. The 3 succeeding pairs of legs very slender, with the inner ramus of moderate size and biarticulate; outer ramus of 4th pair much more elongated than in the other pairs. Natatory setæ in all pairs much reduced in number. Last pair of legs comparatively small and acutely produced inside, distal joint very small or quite wanting.

Remarks.—This genus established by Th. Scott is especially distinguished by the powerful and peculiar development of the posterior maxillipeds. It also differs conspicuously in the structure of the other oral parts and in that of the

legs, though otherwise exhibiting a general relationship to the 3 preceding genera. In addition to the typical species described below, the form recorded by Th. Scott as *Mesochra spinicauda* is evidently referable to the present genus.

Leptastacus macronyx, Scott

(Suppl. Pl. 40).

Tetragoniceps macronyx, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Rep. of the Fishery Board for Scotland, Part. IV, p. 253, Pl. X. figs. 19—28.

Specific Characters.—Female. Body slender and narrow, sub-linear in form. Cephalic segment of moderate size and rather deep; rostrum comparatively short and obtuse at the tip. Urosome about the length of the anterior division and slightly attenuated behind, genital segment of moderate size and not subdivided, last segment smaller than the preceding one. Caudal rami considerably longer than the anal segment and somewhat divergent, tapering slightly distally, outer edge armed close to the end with a slender spine tipped with a thin bristle, apical setæ very unequal, the inner medial one much the strongest and having the proximal part thickened, spiniform; dorsal seta issuing close to the end of the ramus. Anterior antennæ very slender, equalling in length the 3 first segments combined, and composed of 7 joints, the first 3 nearly of equal length, the 4th much smaller, terminal part about $^1/_3$ as long as the proximal. Posterior antennæ with the distal joint scarcely dilated at the end and having the apical setæ comparatively short, outer ramus represented only by a small knob-like prominence tipped with a delicate bristle. Mandibular palp distinctly biarticulate. Posterior maxillipeds of quite unusual size, propodos somewhat fusiform in shape and perfectly smooth, dactylus exceedingly slender and somewhat flexuous, being clothed in the outer part with thin spinules, accompanying bristle about half the length of the dactylus. 1st pair of legs with the inner ramus only slightly longer than the outer, its proximal joint slightly dilated and carrying inside, a little in front of the middle, a slender seta, distal joint narrow linear and exceeding half the length of the proximal one, apical spine and seta very slender. The 2 succeeding pairs of legs of essentially equal structure, both rami very slender, the inner one the shorter and having its 2 joints of about equal length, tip armed with only a single spine accompanied outside by a small dentiform projection. 4th pair of legs with the outer ramus much elongated, being fully twice as long as the inner, middle joint the largest and provided inside near the base with a well-developed seta, terminal joint carrying inside 2 rather strong setæ and at the tip 3 unequal spines. Last pair of legs without the slightest trace of a distal joint, each forming a somewhat triangular piece, produced outside at

the base to a conical prominence tipped with a delicate bristle, inner portion exserted to a strong spiniform projection flanked inside by 2 slender bristles and outside by a single smaller one.

Colour not yet ascertained.

Length of adult female 0.70 mm.

Remarks.—This is another form at first described by Th. Scott as a species of the genus *Tetragoniceps*, but recently removed from that genus. Indeed, the present form exhibits several very striking peculiarities, which seem fully to justify its separation from any of the 4 preceding genera. It may here be noted, that the 5 genera treated of in the preceding pages, though apparently well defined, exhibit a certain relationship to each other distinguishing them from the other genera included in the family *Canthocamptidæ*. It therefore appears not improbable that in future it will be found appropriate to combine these genera into a separate family, which in some respects would seem to approach that of the *Cylindropsyllidæ*.

Occurrence.—Only 2 female specimens of this form have as yet come under my notice. They were found in the same samples as those from which the 3 preceding forms were derived.

Distribution.—Scottish coast (Scott).

Gen. **Leptomesochra**, G. O. Sars, n.

Generic Characters.—Body narrow and elongated, with rather thin integuments. Rostrum obsolete. Genital segment in female not subdivided. Caudal rami comparatively short, with the apical setæ of normal structure. Anterior antennæ very slender and quite unarmed; those in male slightly hinged. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus small, bi- or uniarticulate. Mandibles with the masticatory part narrowly exserted, palp well developed, biarticulate, with the basal joint more or less expanded and in some cases carrying a rudiment of an outer ramus. Maxillæ small, with the exopodal and epipodal lobes imperfectly developed. Anterior maxillipeds short and stout, with the distal joint produced inside to a very long claw-like spine, basal setiferous lobes imperfectly developed, apical part inconspicuous. Posterior maxillipeds normal. 1st pair of legs of comparatively feeble structure, though distinctly prehensile, inner ramus longer than the outer and in most cases biarticulate. The 3 succeeding pairs of legs well developed, with the outer ramus rather large, inner much shorter and biarticulate, except in the 4th pair, where it is more generally composed of 3 well-defined joints; natatory setæ in both

rami considerably reduced in number. Last pair of legs comparatively small, foliaceous, distal joint well defined or in some cases confluent with the proximal one.

Remarks.—In this new genus I propose to include 4 species, 2 of which have been previously described, but erroneously referred to as many known genera. One of these, not yet examined by myself, is *Mesochra Macintoshi*, Th. Scott, the other *Normanella attenuata*, A. Scott. These 2 species are undoubtedly congeneric, but certainly cannot be referred either to the genus *Mesochra* or to *Normanella*, differing, as they do very materially, from both these genera. A new genus is therefore required to include these 2 species as also 2 new ones to be described below. The generic name here proposed refers to the extremely slender form of the body and the delicate structure of the several appendages.

Leptomesochra attenuata, (A. Scott).

(Suppl. Pl. 41).

Normanella attenuata, A. Scott, Description of some new and rare Copepoda from Liverpool Bay. Report on the Lancashire See-Fisheries Laboratory f. 1895, p. 16, Pl. IV, figs. 8—20.

Specific Characters.—Female. Body very slender and elongated, cylindrical in form, with the anterior division scarcely broader than the posterior. Cephalic segment about the length of the 2 succeeding segments combined, and not very deep; rostral prominence very small, knob-like. Urosome unusually elongated, being even longer than the anterior division, and having the segments perfectly smooth, genital segment rather large, last segment exceeding in length the preceding one and somewhat narrowed distally, anal opercle comparatively small and perfectly smooth. Caudal rami a little longer than they are broad, and slightly tapering, apical setæ rather slender, the inner medial one equalling in length the urosome. Anterior antennæ slender and narrow, exceeding half the length of the anterior division, and composed of 8 joints, the 2nd of which is the largest, 3rd joint somewhat longer than 4th, terminal part scarcely attaining the length of those two joints combined. Posterior antennæ with the outer ramus biarticulate, distal joint however extremely small and tipped with a single seta. Mandibular palp comparatively large, with the basal joint fusiform in outline and carrying outside, close to the base, a very small knob-like outer ramus. Anterior lip conically tapered. 1st pair of legs rather small, outer ramus considerably shorter than the 1st joint of the inner, its terminal joint somewhat smaller than the middle one, and armed at the end with 2 spines and 2 geniculate setæ; inner ramus biarticulate, with the proximal joint long and slender, carrying inside, in front of the middle, a ciliated seta, distal joint comparatively small, with a claw-like spine and a moderately long seta at the tip. The 3 succeeding pairs of legs

with the outer ramus more than twice as long as the inner, and having a well-developed seta inside the middle joint, inner ramus without any seta inside the 1st joint, that of 4th pair distinctly 3-articulate. Last pair of legs with the distal joint well defined and broadly oval in form, with 5 thin setæ issuing from the somewhat obliquely truncated apex; inner expansion of proximal joint only slightly produced, and carrying 4 slender setæ. Ovisac oval, flattened, and containing only a limited number of ova.

Male differing only slightly from female, though having the anterior antennæ transformed in the usual manner.

Colour not yet ascertained.

Length of adult female 0.86 mm.

Remarks.—This form was first described by A. Scott in the above-quoted paper, and was erroneously referred by him to the genus *Normanella* of Brady, to which genus it in reality has only a very remote affinity. On the other hand, it is evidently closely allied to *Mesochra Macintoshi* of Th. Scott, though apparently specifically distinct.

Occurrence.—Several specimens of this form were found in samples taken last summer at Korshavn from a depth of from 30 to 50 fathoms, coarse sandy bottom.

Distribution.—Liverpool Bay (A. Scott), Scottish coast (T. Scott).

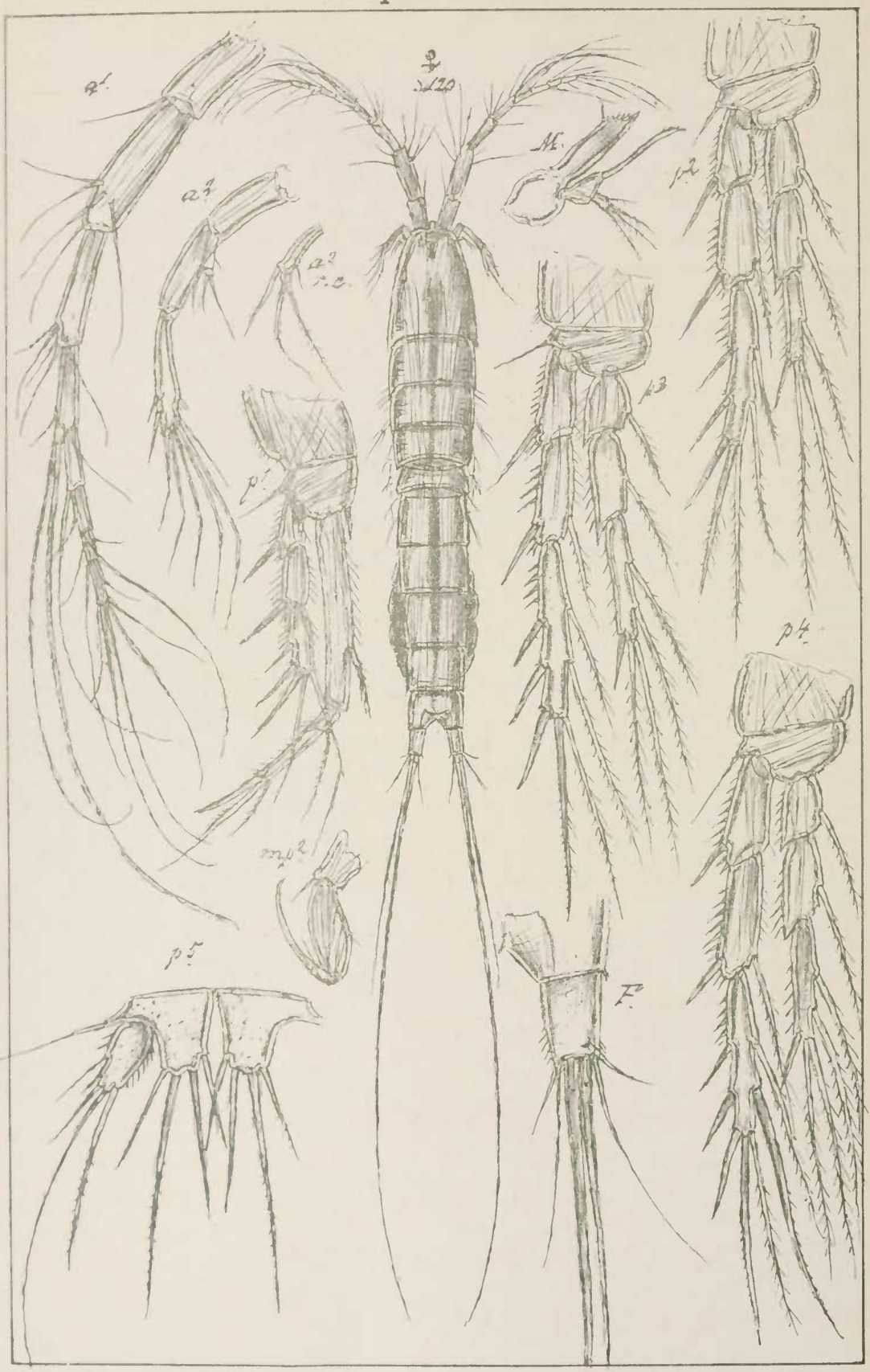
Leptomesochra tenuicornis, G. O. Sars, n. sp.

(Suppl. Pl. 42).

Specific Characters.—Female. Body somewhat less slender than in the preceding species, though of a similar narrow cylindrical form. Cephalic segment slightly exceeding in length the 2 succeeding segments combined; rostral projection almost obsolete. Urosome not attaining the length of the anterior division and slightly tapered behind, with the segments minutely spinulose at the hind edges ventrally, last segment much smaller than the preceding one. Caudal rami short, being scarcely longer than they are broad, apical setæ rather elongated, the inner medial one exceeding $^2/_3$ of the length of the body and somewhat thickened in its proximal part, outer medial seta very distinctly spinulose outside. Anterior antennæ exceedingly slender, being about twice as long as the cephalic segment, and composed of only 7 joints, 3rd joint longer than either of the 2 preceding joints and more than twice the length of the 4th, terminal part not attaining half the length of the proximal. Posterior antennæ with the outer ramus comparatively larger than in the preceding species, biarticulate, with 3 thickish setæ, 2 of them issuing from the small distal joint. Mandibular palp less fully developed than in the preceding species and without any trace of an

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 27

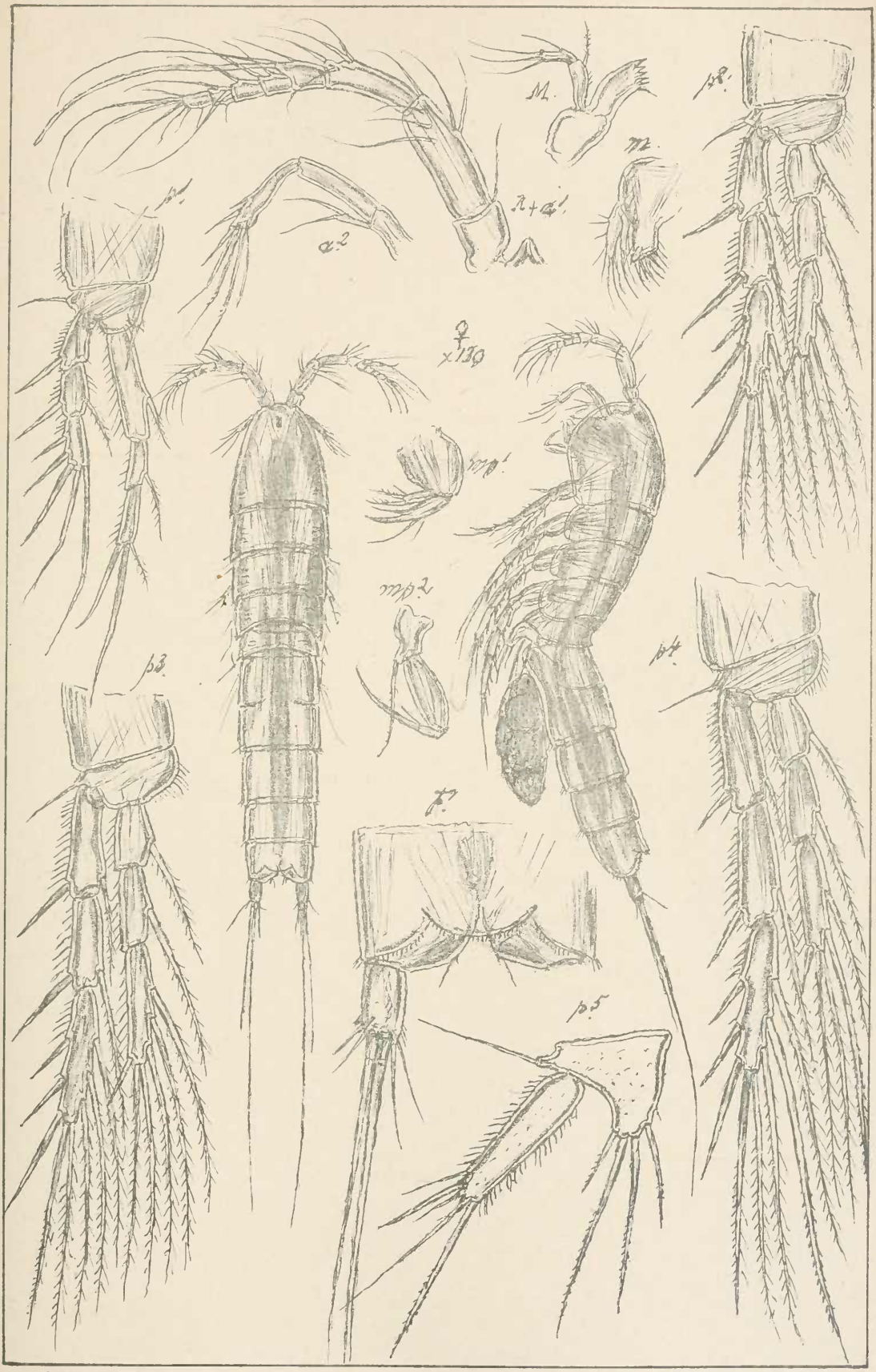


. G.O. Sars, autogr. Norsk Lithgr. Officin.

Ameira tenuicornis, Scott.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 28



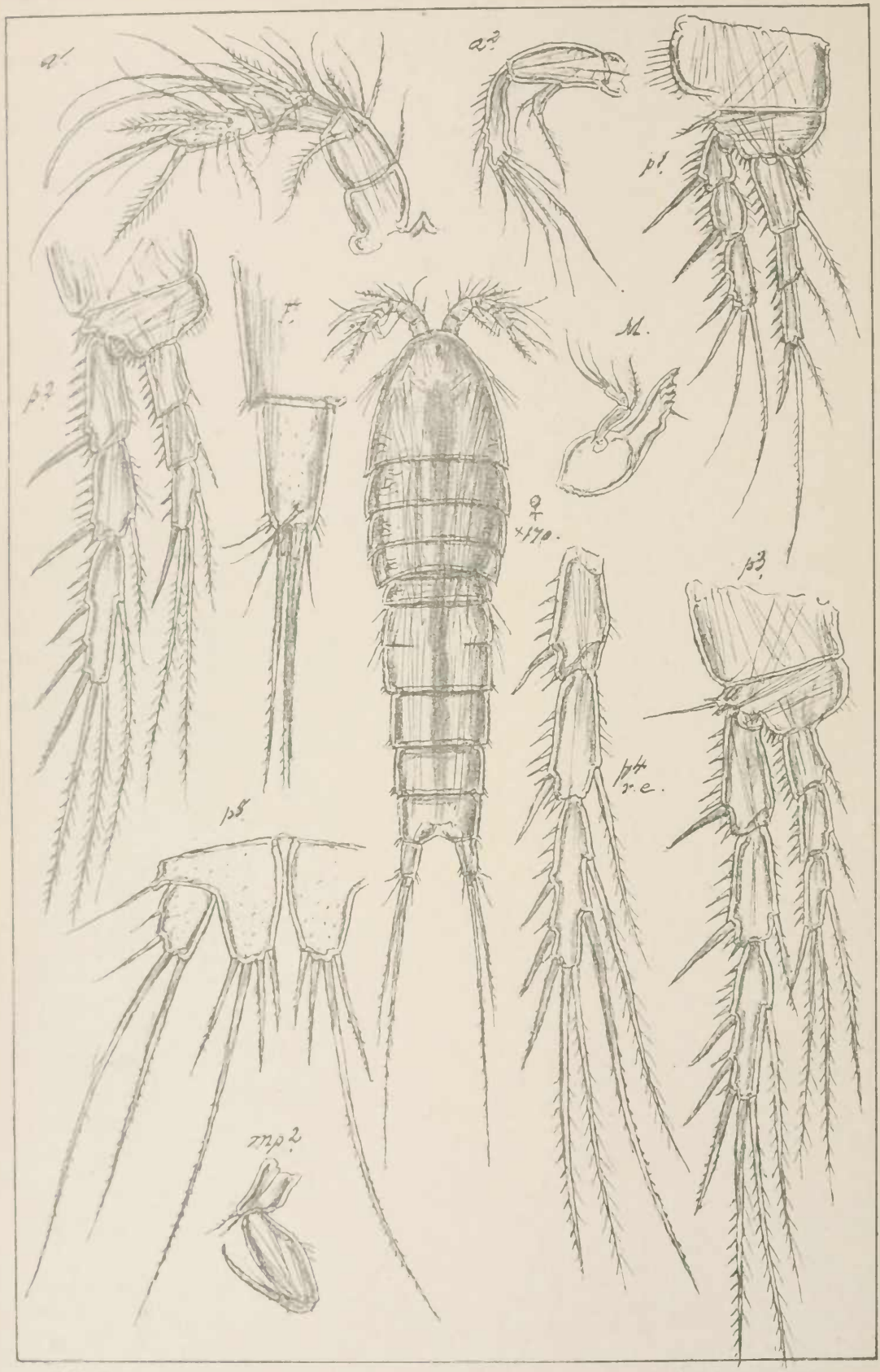
G.O.Sars, autogr. Norsk Lithgr. Officin

Parameira propinqva, (Scott)

Copepoda

Canthocamptidæ Harpacticoida

Suppl. Pl. 29



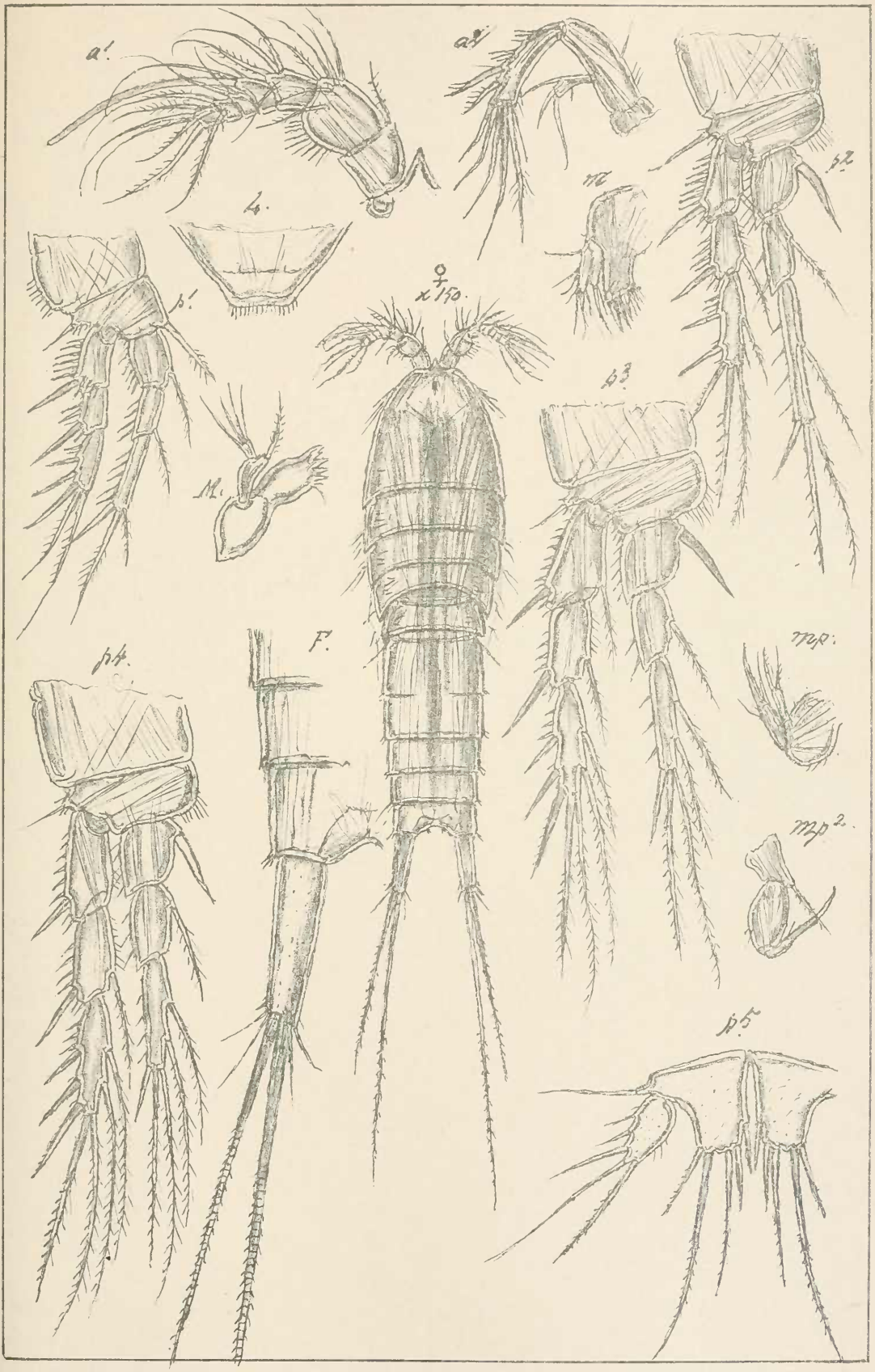
G.O. Sars, autogr.

Norsk Lithgr. Officin.

Pseudameira crassicornis, G.O. Sars.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 30

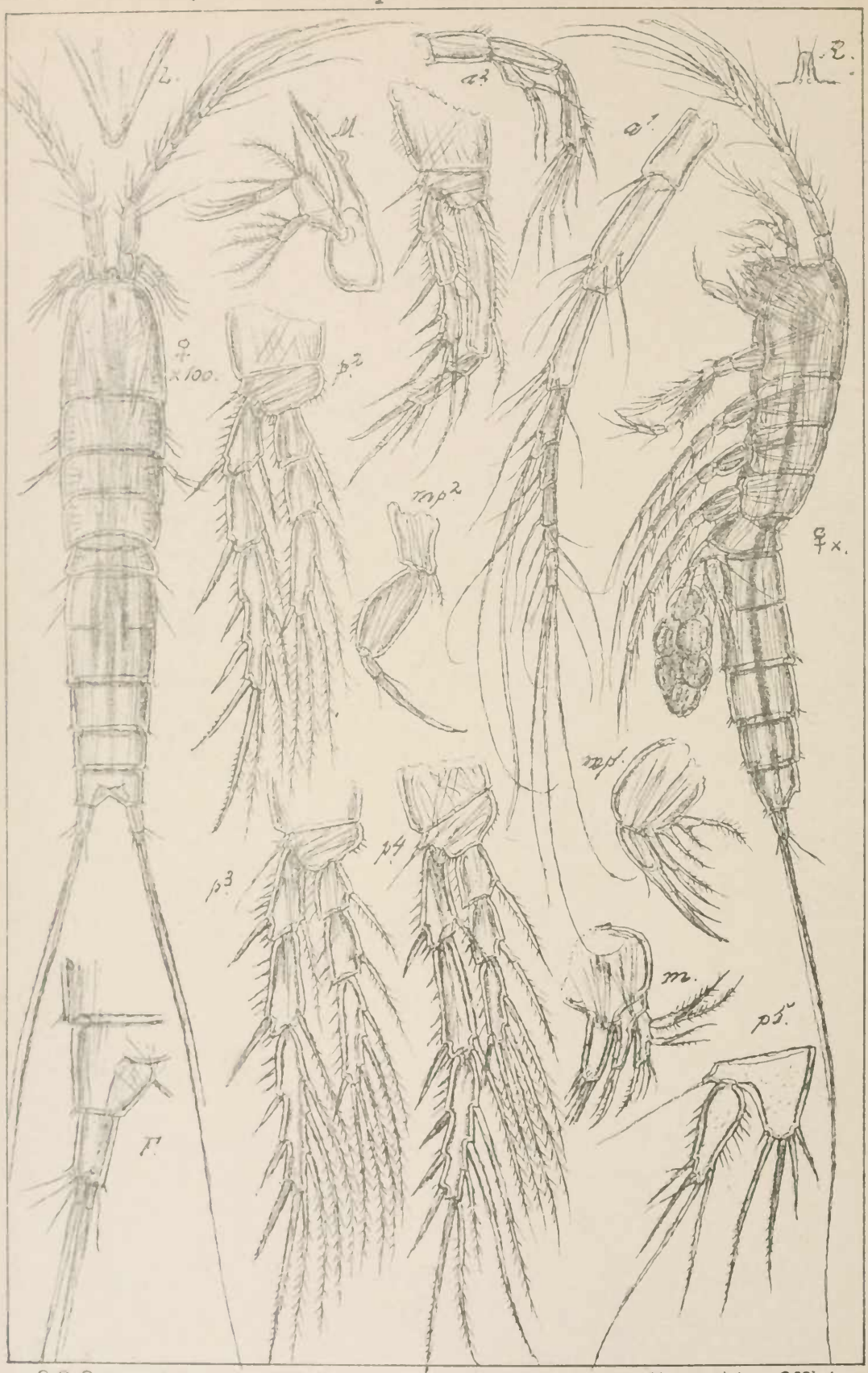


G.O. Sars, autogr. Norsk Lithgr. Officin.

Pseudameira furcata, G.O. Sars.

Copepoda

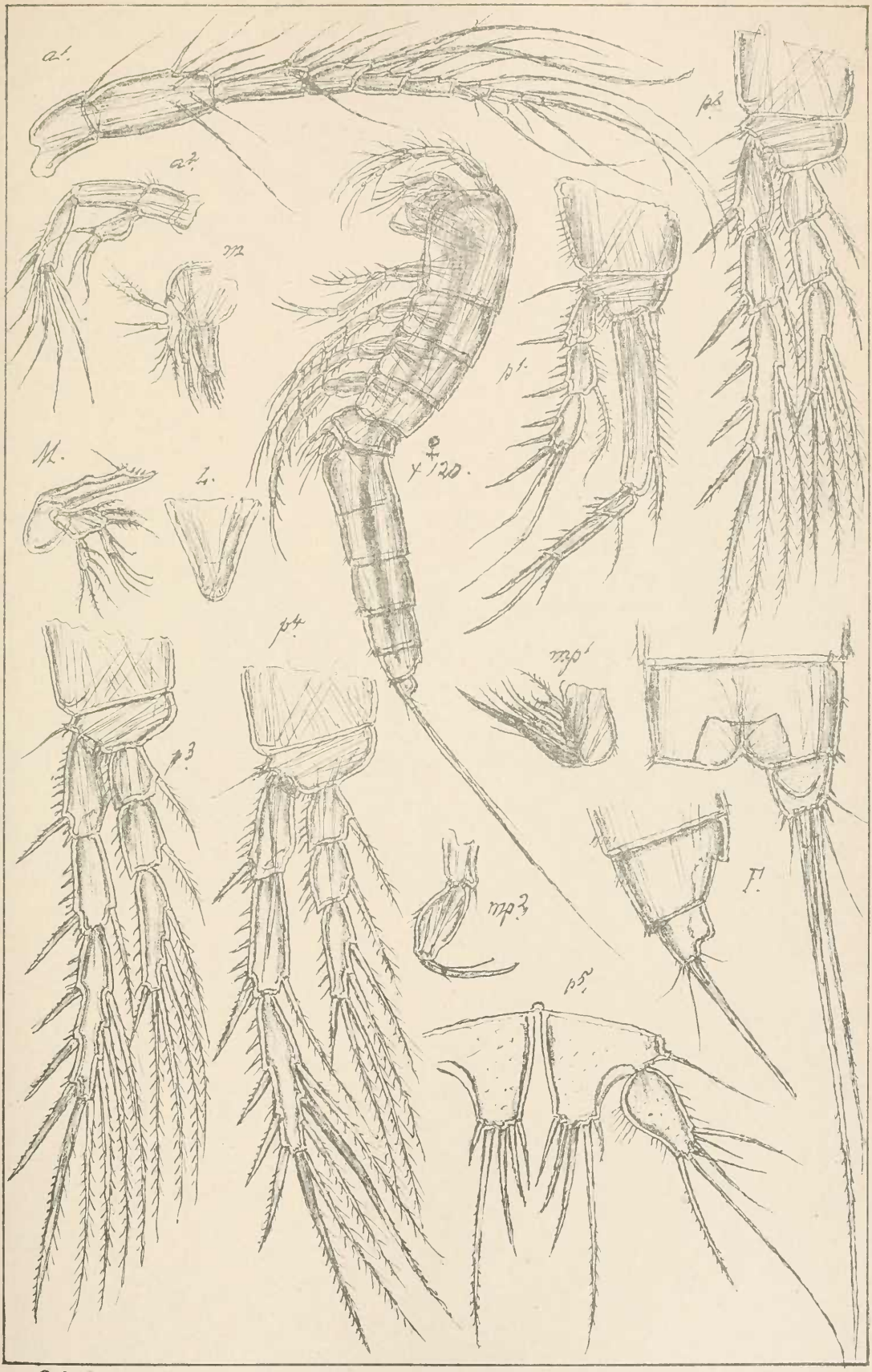
Canthocamptidæ Harpacticoida Suppl. Pl. 31



G.O. Sars, autogr. Norsk Lithgr. Officin.

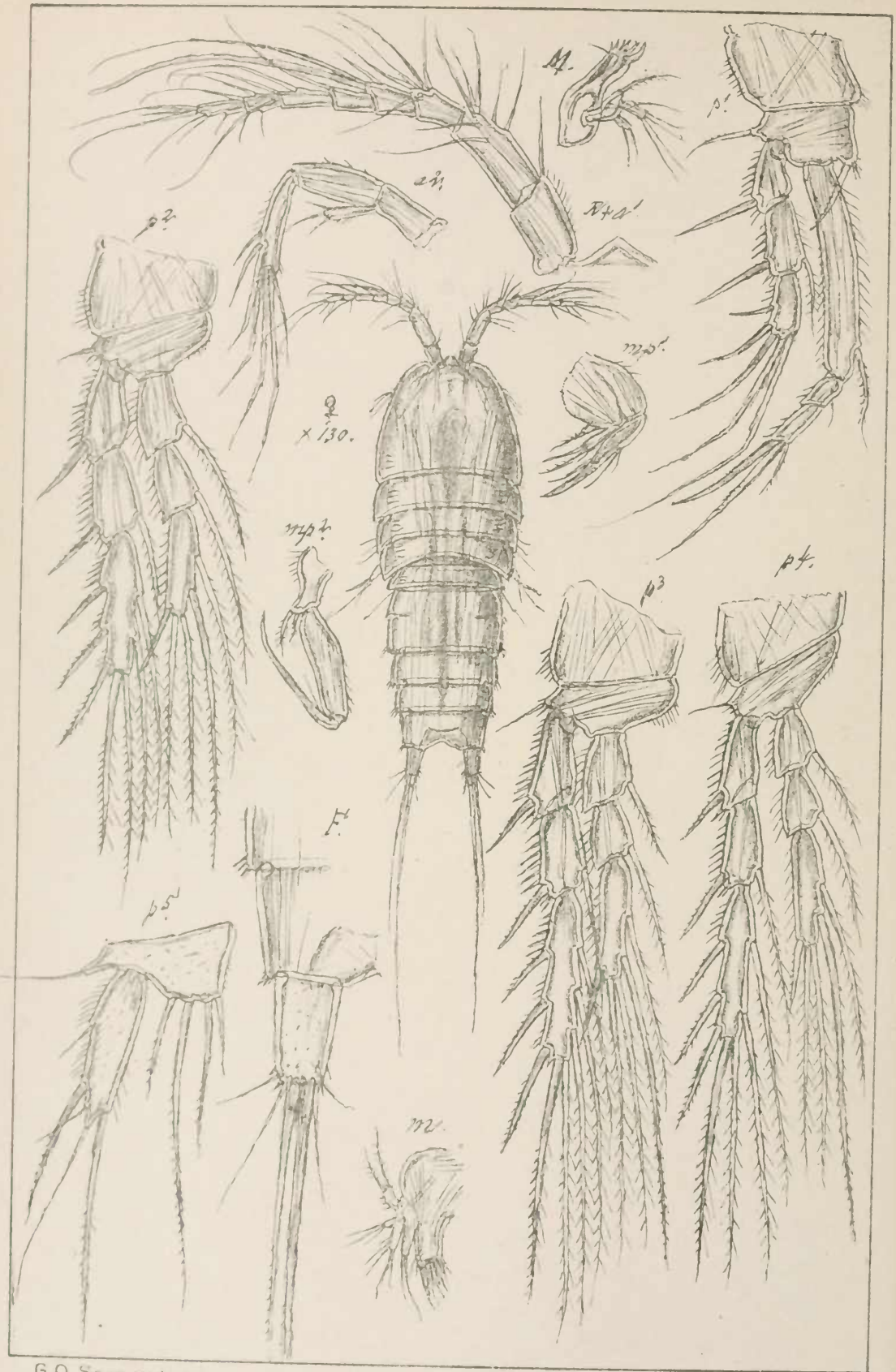
Ameiropsis nobilis, G.O. Sars.

Copepoda



G.O. Sars, autogr. Norsk Lithgr. Officin.

Ameiropsis angulifera, G.O. Sars.



G.O. Sars, autogr.

Norsk Lithgr. Officin.

Ameiropsis abbreviata, G.O. Sars.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 34



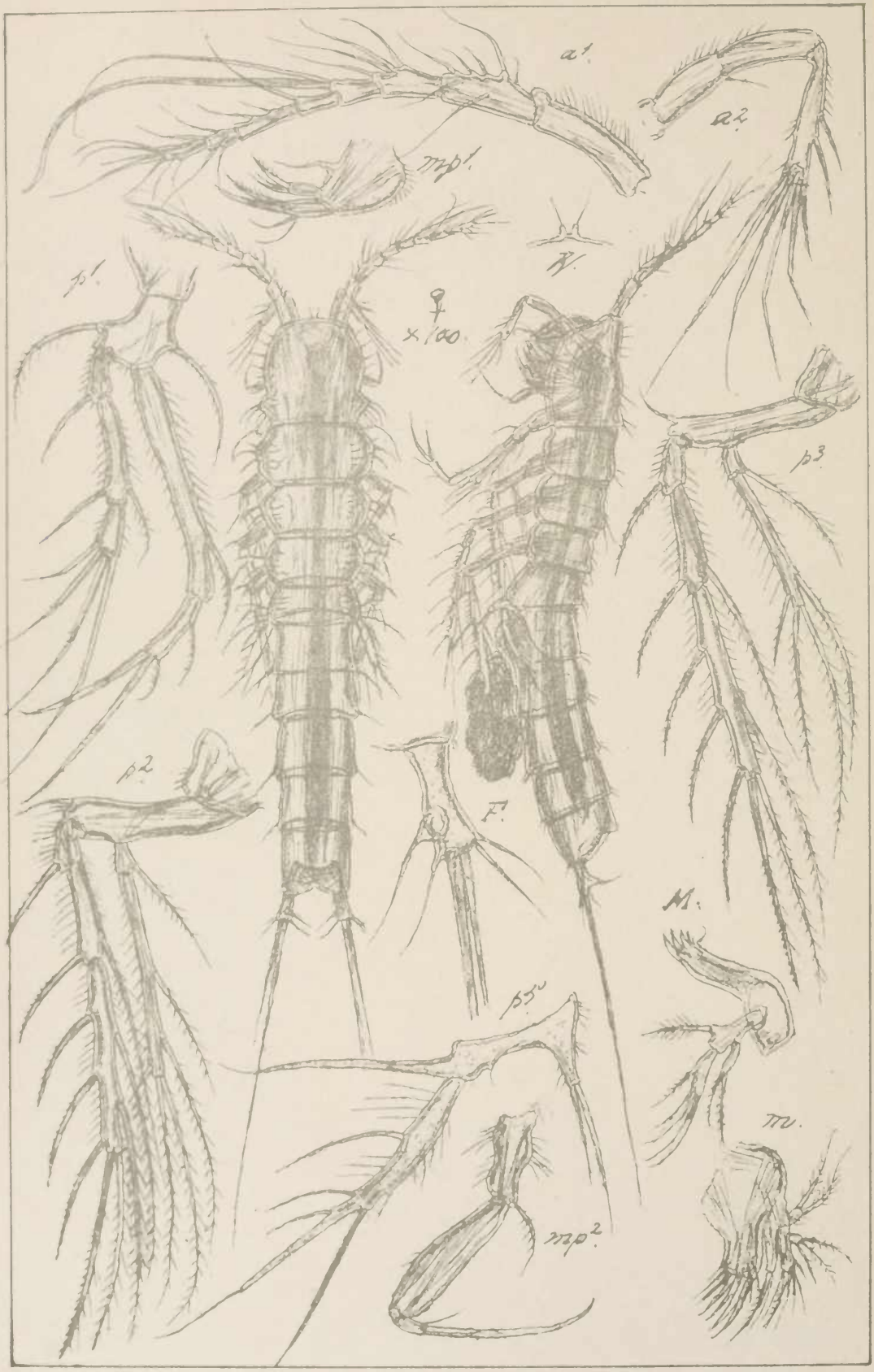
G.O. Sars, autogr. Norsk Lithgr. Officin.

Stenocopia spinosa, (Scott).

Copepoda

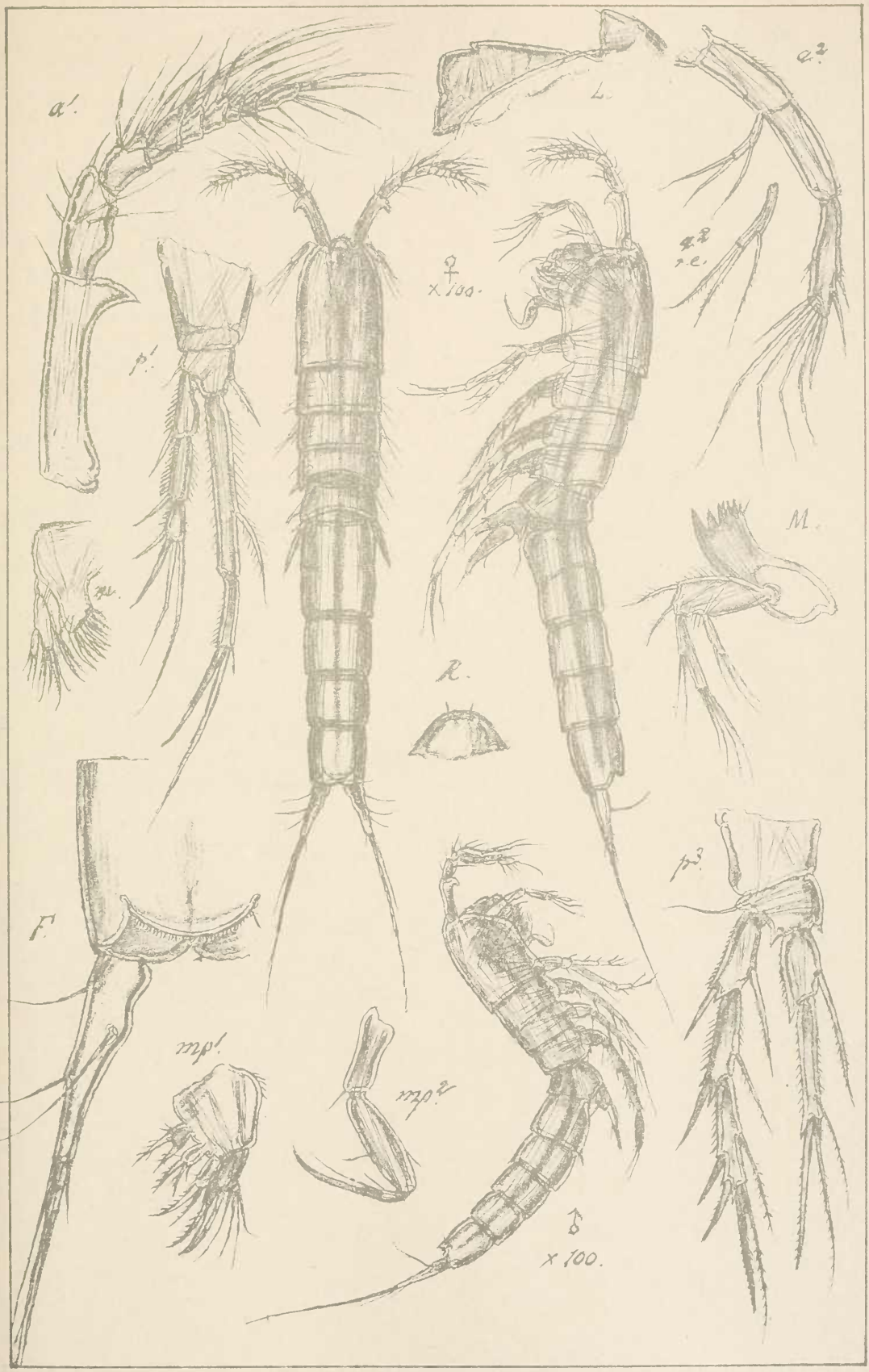
Canthocamptidæ Harpacticoida

Suppl. Pl. 35



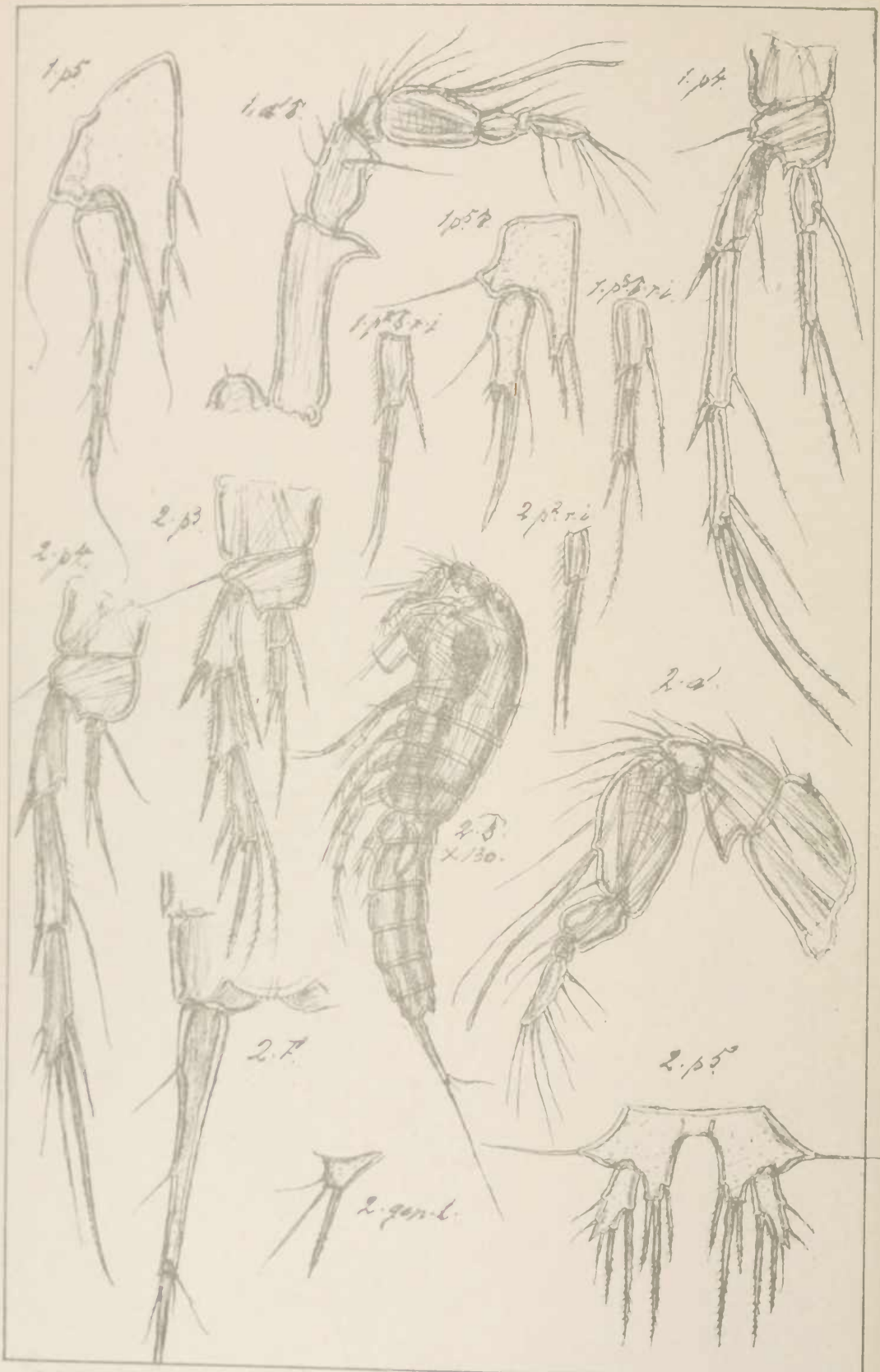
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Malacopsyllus fragilis, G.O.Sars.



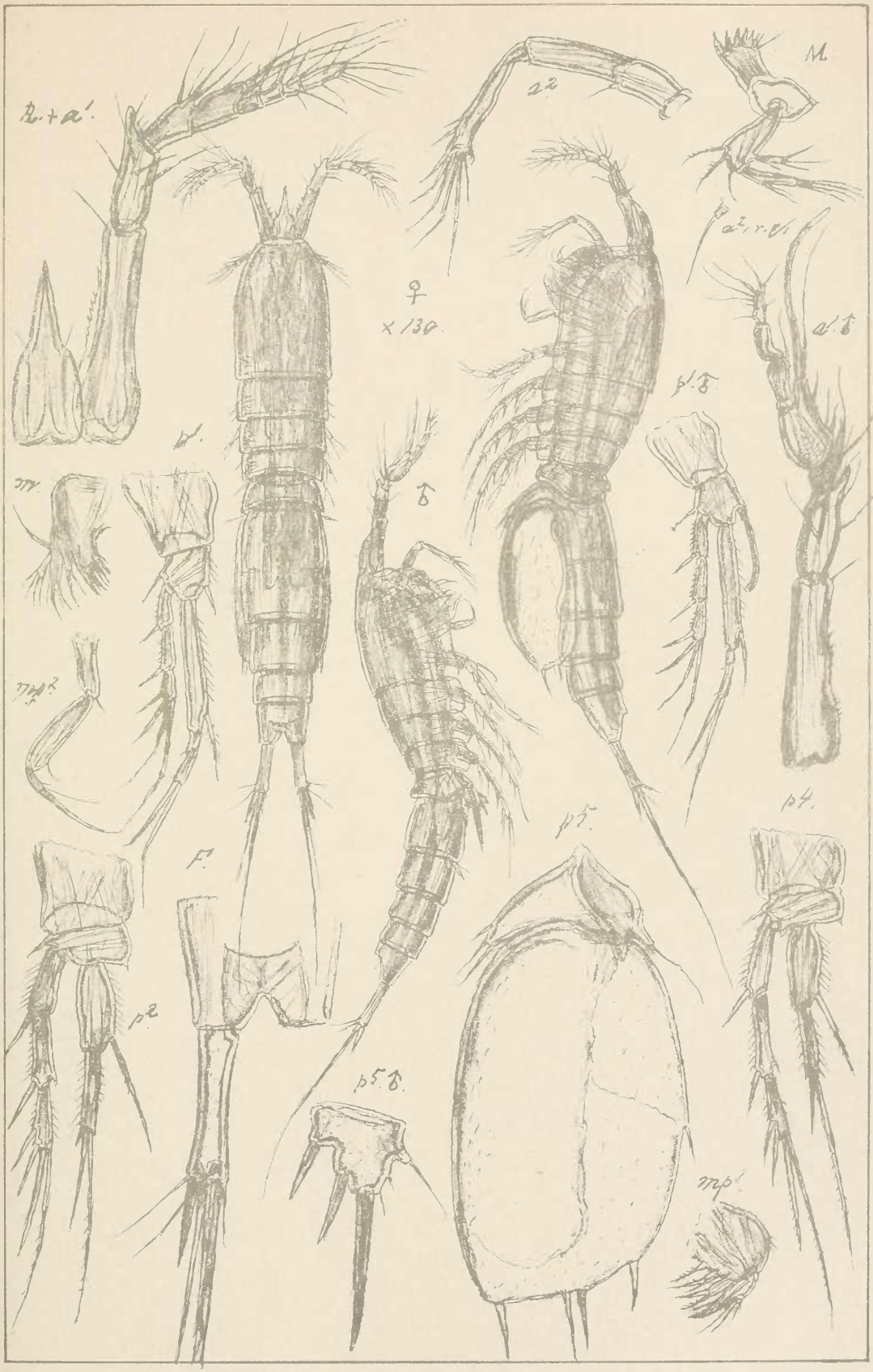
G.O.Sars, autogr. Norsk Lithgr. Officin.

Tetragoniceps Scotti, G.O.Sars.



G.O. Sars, autogr. Norsk Lithgr. Officin.

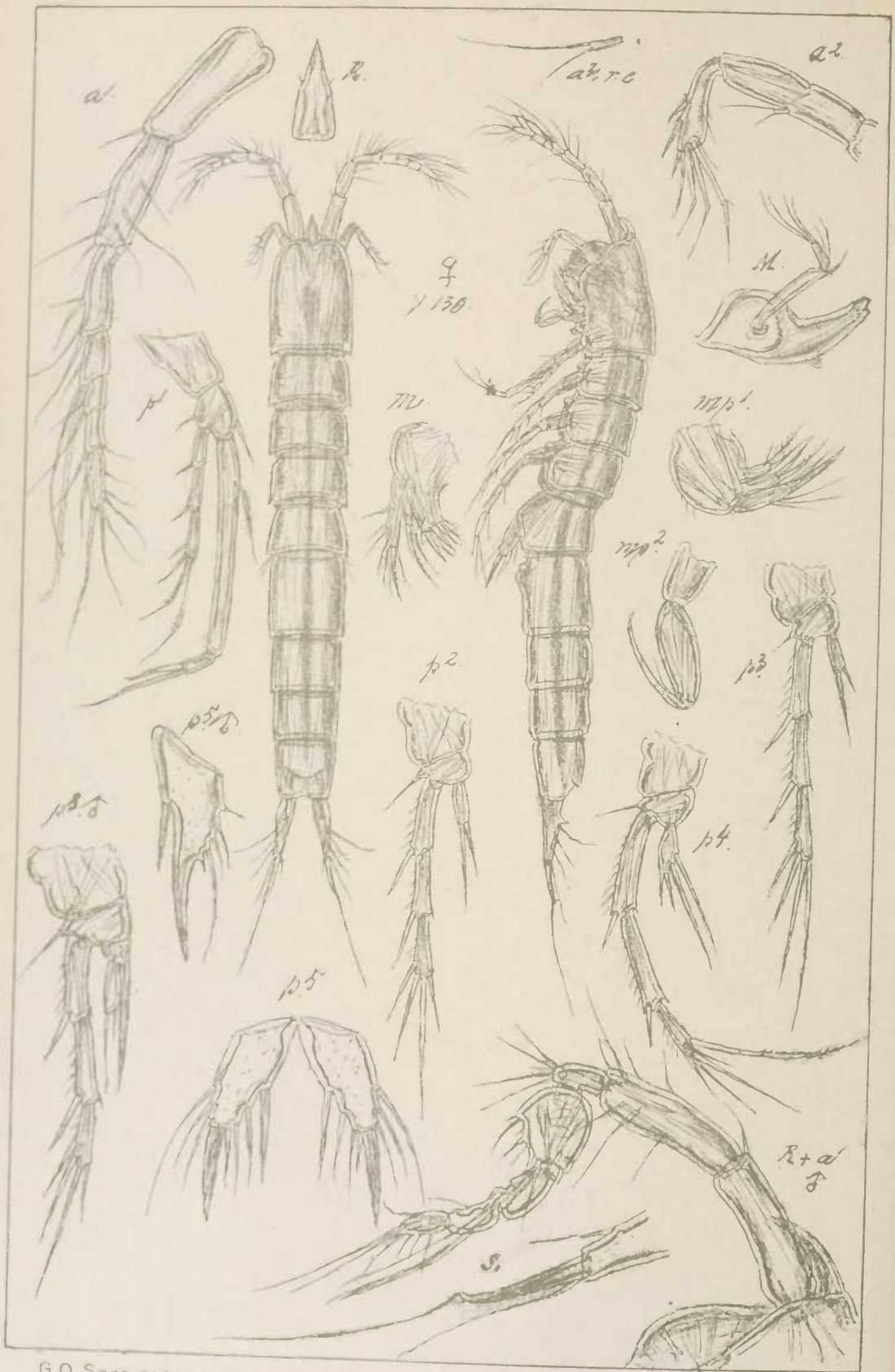
1. Tetragoniceps Scotti, G.O. Sars (continued.)
2. Phyllopodopsyllus Bradyi, Scott, male.



Pteropsyllus consimilis, Scott.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 39



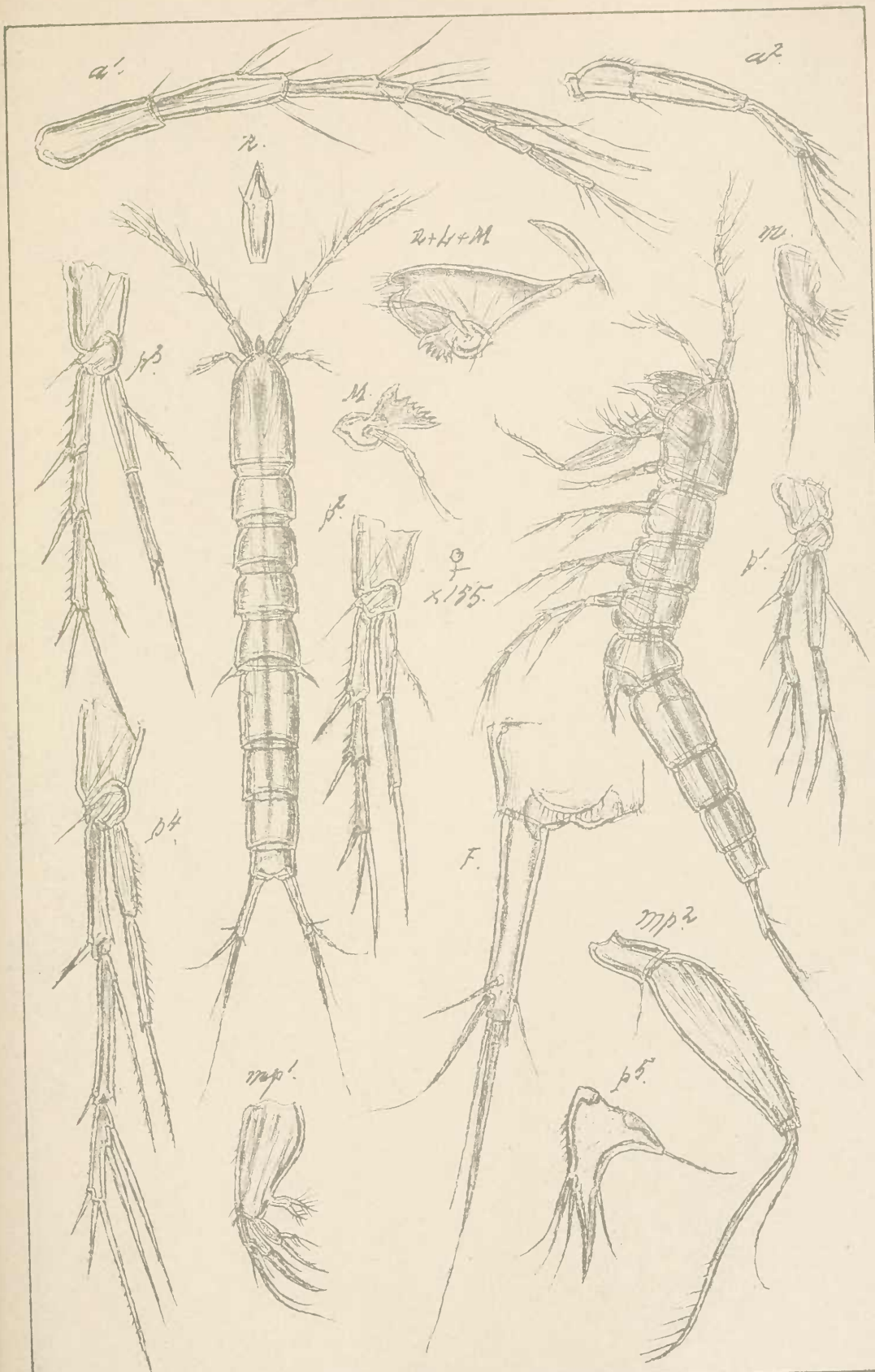
G.O.Sars, autogr. Norsk Lithgr. Officin.

Evansia incerta, Scott.

Copepoda

Canthocamptidæ Harpacticoida

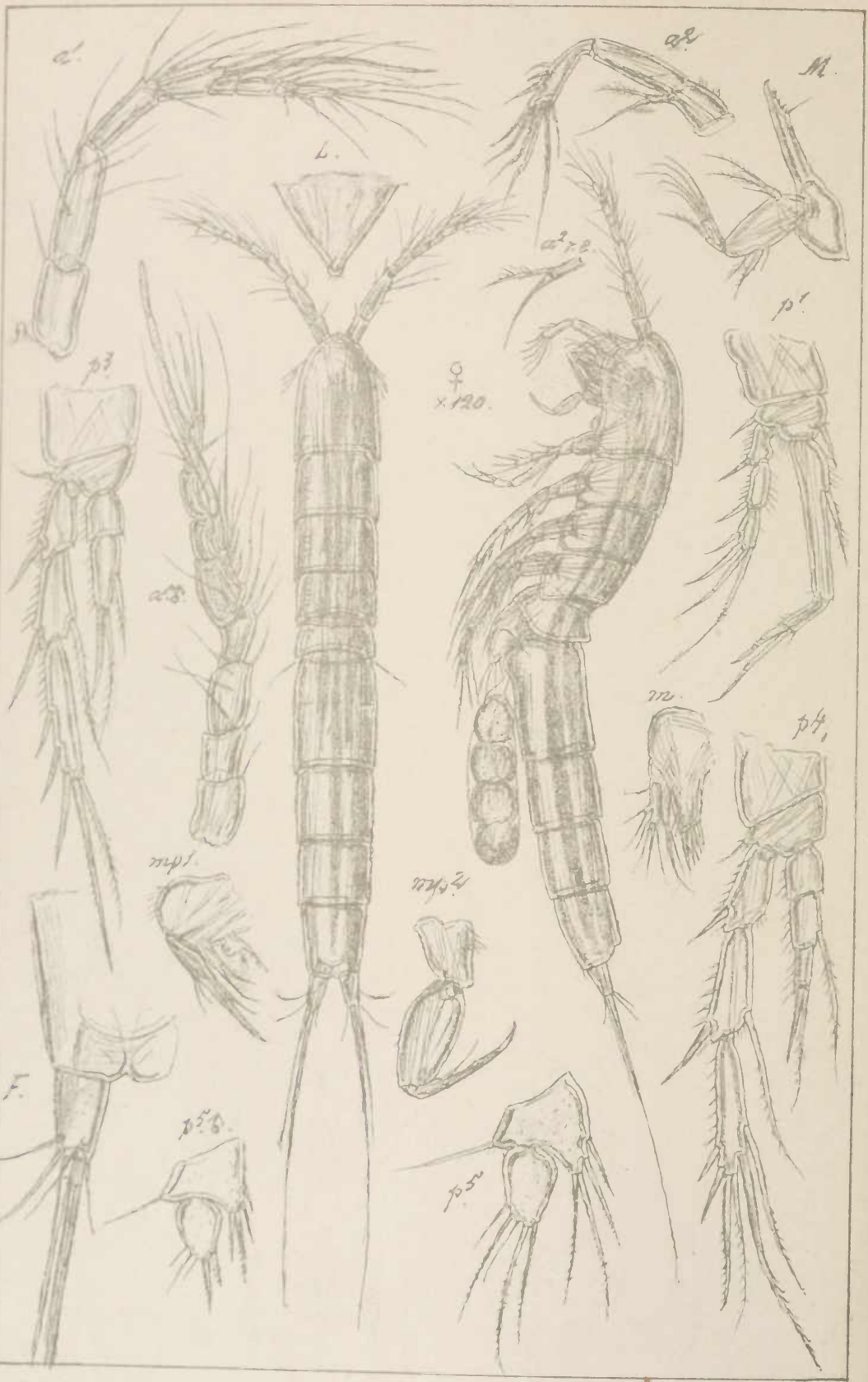
Suppl. Pl. 40



G.O. Sars, autogr.

Norsk Lithgr. Officin.

Leptastacus macronyx, Scott.

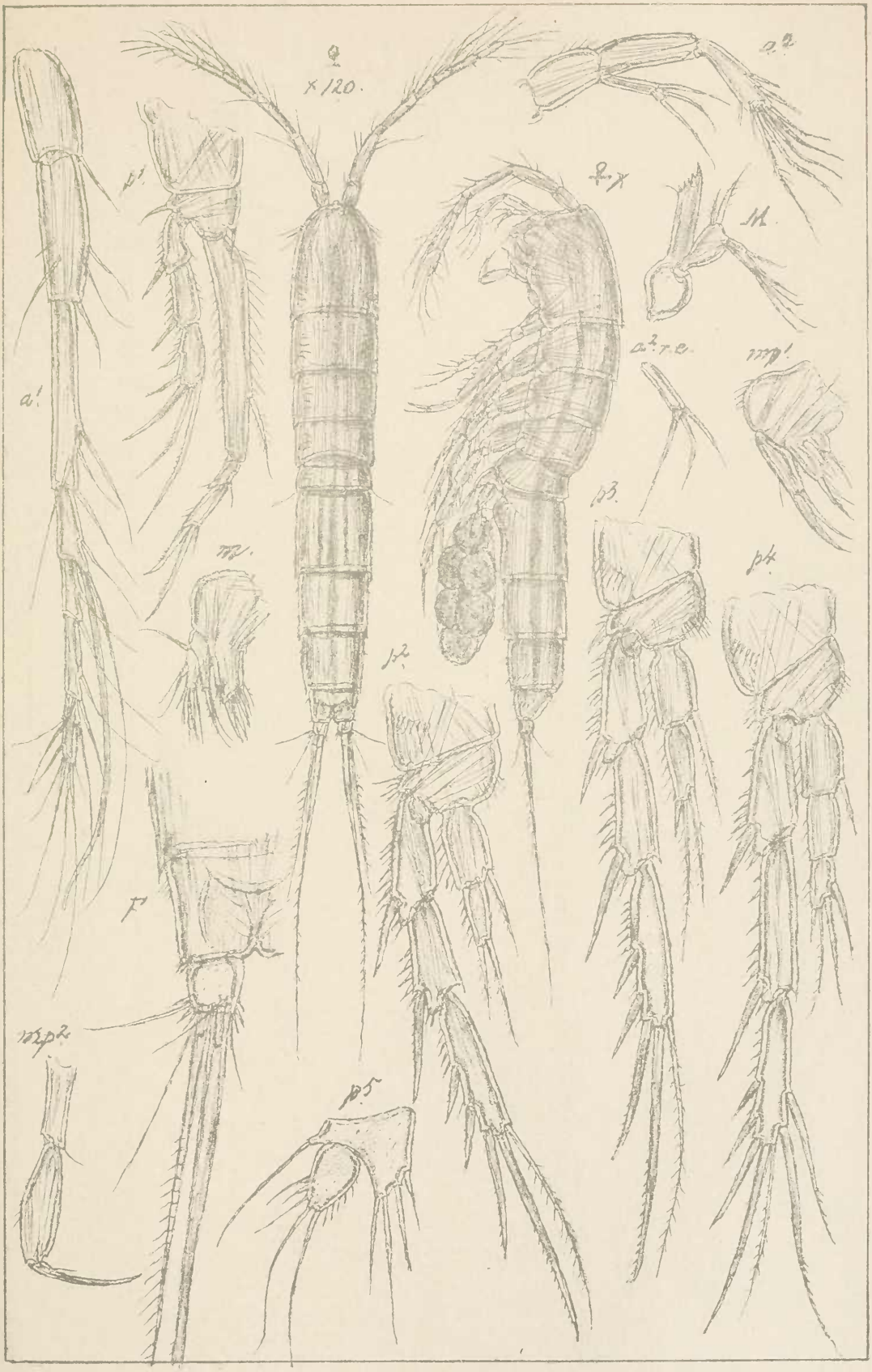


G.O.Sars, autogr. Norsk Lithgr. Officin.

Leptomesochra attenuata, (Scott.)

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 42



G.O.Sars, autogr. Norsk Lithgr. Officin.

Leptomesochra tenuicornis, G.O.Sars.

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XXXV & XXXVI

SUPPLEMENT (concluded), INDEX etc.

WITH 12 AUTOGRAPHIC PLATES

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1911

outer ramus. 1st pair of legs with the inner ramus distinctly 3-articulate, 1st joint 3 times as long as the other 2 combined, and carrying inside, at some distance from the end, a slender seta, apical claw and seta of this ramus not very slender; outer ramus much shorter than the 1st joint of the inner, its last joint fully as large as the middle one, and having an additional small spine outside. The 3 succeeding pairs of legs with no seta inside the middle joint of the outer ramus, 1st joint of inner ramus on the other hand setiferous; inner ramus of 4th pair, as in the preceding species, distinctly 3-articulate. Last pair of legs with the distal joint well defined and somewhat resembling in shape that in *L. attenuata,* but of comparatively smaller size and provided with only 4 setæ; inner expansion of proximal joint more produced, extending beyond the middle of the distal joint, and carrying 4 somewhat unequal setæ.

Colour not yet ascertained.

Length of adult female 0.68 mm.

Remarks.—In the distinctly 3-articulate inner ramus of the 1st pair of legs, this form seems, it is true, to differ essentially from the other species comprised within the present genus; but as the other legs are built upon the very same type as in the preceding species, and there is also a general resemblance in the other structural details, I consider it quite unreasonable, solely on the ground of the above-mentioned difference, to remove it from the other species of the present genus. The specific name here proposed refers to the unusually long and slender anterior antennæ.

Occurrence.—Only some few specimens of this form, most of them in a more or less mutilated condition, were picked up from samples taken in the same locality as that from which the preceding species was derived.

Leptomesochra confluens, G. O. Sars, n. sp.

(Suppl. Pl. 43).

Specific Characters.—Female. General form of body resembling that in the 2 preceding species, being very slender and narrow, sub-linear. Rostral prominence very small, knob-like. Urosome fully as long as the anterior division and scarcely tapering at all behind; genital segment rather large, last segment somewhat exceeding in length the preceding one. Caudal rami very short and thick, being scarcely as long as they are broad at the base, each having outside a thin bristle generally curved anteriorly; apical setæ of moderate length. Anterior antennæ rather slender, equalling in length the first 2 segments combined, and composed of 8 well-defined joints, the 2nd of which is the largest, 3rd and 4th

joints of about equal size, terminal part about as long as those two joints combined. Posterior antennæ with the outer ramus very small, uniarticulate, carrying 2 short setæ on the tip. Oral parts about as in *L. tenuicornis*. 1st pair of legs resembling in structure those in *L. attenuata*, the inner ramus being composed of only 2 joints, apical claw and seta comparatively slender. The 3 succeeding pairs of legs likewise of a structure very similar to that in the said species; inner ramus of 4th pair however composed of only 2 joints, like that of the 2 preceding pairs. Last pair of legs with the distal joint wholly confluent with the proximal one, each leg forming an undivided small lamella of somewhat irregular form, exhibiting in the middle of the posterior edge a slight incision, whereby 2 short lobules may be distinguished, the outer one carrying 5 thin bristles, the inner 4 spiniform setæ. Ovisac comparatively small, with a very limited number of ova.

Male rather smaller than female and having the anterior antennæ hinged in the usual manner. Last pair of legs resembling in shape those in female, but having a smaller number of marginal setæ, which also are more spiniform in appearance.

Colour not yet ascertained.

Length of adult female 0.68 mm.

Remarks.—This form also distinguishes itself by a peculiarity not found in any of the other species, viz, the complete fusion of the 2 joints of the last pair of legs. In all other structural details, however, it shows a close affinity to them, and accordingly cannot be generically removed. The specific name here proposed refers to the above-mentioned anomalous character.

Occurrence.—Only 2 or 3 specimens of this form have hitherto come under my notice. They were found in the same samples from which the 2 preceding species were derived.

Gen. **Phyllocamptus**, Scott, 1899.

Generic Characters.—Body sub-cylindrical in form, with rather thin integuments. Rostral projection very small. Genital segment in female imperfectly subdivided. Caudal rami short. Anterior antennæ less slender than in the preceding genus. Posterior antennæ likewise more strongly built, with the outer ramus broader, though composed of only a single joint. Mandibles moderately strong, palp comparatively small, biarticulate. Maxillæ and maxillipeds nearly as in the preceding genus. 1st pair of legs unusually short and stout, with the outer ramus nearly as long as the inner, the latter biarticulate. The 3 succeeding pairs of

legs well developed, with the outer ramus rather large, inner ramus much shorter and in all 3 pairs 3-articulate, 1st joint, however, very small; natatory setæ on both rami much reduced in number. Last pair of legs somewhat resembling in structure those in *Ameira*.

Remarks.—This genus was established in the year 1899 by Th. Scott, to include the species *P. fairliensis*. As observed by that author, it exhibits some affinity, partly to the genera *Canthocamptus* and *Attheyella*, partly to the genus *Mesochra*, though differing in some points materially from each of these 3 genera. In addition to the typical species, the form recorded by Th. Scott as *Mesochra propinqua* ought evidently to be referred to the present genus, as also the new species described below.

Phyllocamptus minutus, G. O. Sars, n. sp.

(Suppl. Pl. 44).

Specific Characters.—Female. Body moderately slender and slightly tapered behind. Cephalic segment about the length of the 3 succeeding segments combined, and not very deep; rostral prominence extremely small, knob-like. Urosome somewhat shorter than the anterior division, and having all the segments perfectly smooth; last segment nearly as large as the preceding one. Caudal rami scarcely longer than they are broad at the base, apical setæ normal. Anterior antennæ not attaining the length of the cephalic segment and rather thick in their proximal part, being composed of 8 joints clothed with rather slender setæ, the first 2 joints much larger than the others, 3rd and 4th joints of about equal size, terminal part considerably exceeding in length those joints combined. Posterior antennæ with the distal joint fully as long as the proximal one and slightly widening distally, outer ramus resembling somewhat that in the genus *Nitocra*, being conspicuously compressed and provided with 3 thickish setæ, the innermost of which however is very small. 1st pair of legs with the outer ramus rather strongly built and only slightly shorter than the inner; its terminal joint larger than either of the other 2, and armed with 3 strong spines and 2 slender geniculate setæ; inner ramus with the proximal joint slightly dilated and carrying inside, behind the middle, a well-developed plumose seta, distal joint almost as long as the proximal one, but much narrower, linear in form, and armed on the tip with a claw-like spine and a very long seta accompanied inside by a thin bristle. The 3 succeeding pairs of legs with the outer ramus much produced and strongly spinous outside, its first 2 joints without any setæ inside, terminal joint long and narrow, with the inner edge quite smooth in the 2 anterior pairs, in 4th

pair provided with 2 strong spinulose setæ; apical spine and seta in all pairs very long and slender; inner ramus scarcely half as long as the outer, with the 1st joint very small and simple, middle joint the largest and produced at the end inside to an acute corner, terminal joint carrying on the tip a moderately long spine and inside 2 unequal setæ, the distal one very long and slender. Last pair of legs with the distal joint well-developed, oval in form, and edged with 6 setæ of rather unequal length, the innermost but one very long and slender; inner expansion of proximal joint comparatively short, not extending to the middle of the distal joint, and carrying at the obtusely rounded extremity 2 unequal setæ and inside them 2 short spines bifid at the tip.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The above-described species is unquestionably referable to the genus *Phyllocamptus*, as defined by Th. Scott, and comes very near *P. fairliensis* Scott. It is however of much smaller size and differs moreover in the perfectly smooth caudal segments, as also slightly in the structure of the legs.

Occurrence.—Only a solitary female specimen of this form has hitherto come under my notice. Is was found in a sample taken last summer at Korshavn from a depth of about 20 fathoms.

Gen. **Paramesochra**, Scott, 1892.

Generic Characters.—Body more or less slender, with the anterior division distinctly broader than the posterior and somewhat depressed. Integuments very hard. Rostrum obsolete. Genital segment in female large, not subdivided. Caudal rami more or less produced. Anterior antennæ short and stout. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus well developed, though uniarticulate. Mandibles very strong, with the palp well developed, biramous. Maxillæ comparatively small, with the epipodal lobe imperfectly developed. Anterior maxillipeds with 4 subequal setiferous lobes inside, the outermost issuing from the distal joint, apical part well defined. Posterior maxillipeds with the dactylus composed of a small basal joint carrying 2 or 3 claw-like spines. Legs comparatively small and of simple structure; 1st pair with both rami biarticulate, the inner one distinctly prehensile; the 3 succeeding pairs with the basal part broad and flattened, outer ramus 3-articulate, inner biarticulate; natatory setæ imperfectly developed. Last pair of legs with the distal joints very small, proximal joints confluent inside to a large median plate.

Remarks.—This is a rather anomalous genus, the systematic position of which appears somewhat doubtful. Its supposed close affinity to the genus *Mesochra*, as indicated by the name proposed by Th. Scott, I am unable to admit. It is in my opinion very different from that genus, and seems to me to be much more nearly related to the genus *Leptopsyllus* Scott. Indeed one of the species of the latter genus, *L. intermedius*, ought in my opinion to be referred to the present genus. Only the type species is known to me.

Paramesochra dubia, Scott.

(Suppl. Pl. 45).

Paramesochra dubia, Th. Scott, Additions to the Fauna of the Firth of Forth. Part IV. 10th Ann. Rep. of the Fishery Board for Scotland, p. 252, Pl. XII, figs. 18—32.

Specific Characters.—Female. Body moderately slender, with the anterior division oblong oval in outline and somewhat narrowed behind. Cephalic segment comparatively large, broadly rounded anteriorly and having the postero-lateral corners produced to spiniform appressed processes extending beyond the next segment; 5th segment much narrower than the preceding one, and marked off from it by a conspicuous constriction. Urosome fully as long as the anterior division, but much narrower, and having the segments perfectly smooth, genital segment rather large and tumid, last segment very small. Caudal rami about the length of the last 2 segments combined, narrow linear in form and somewhat divergent, apical seta comparatively short, dorsal seta issuing close to the end. Anterior antennæ scarcely more than half as long as the cephalic segment and angularly curved, being composed of 7 sharply defined joints clothed with rather short setæ, 1st joint much the largest, occupying more than half the length of the antenna, and having the inner distal corner produced to a strong spiniform projection slightly curved inwards, 2nd and 3rd joints of about equal size, 4th rather smaller and carrying at the end the usual sensory filament, terminal part scarcely longer than the 2 preceding joints combined. Posterior antennæ with the distal joint comparatively large and somewhat fusiform in shape, outer ramus rather narrow, with 3 or 4 lateral setæ and 2 apical, one of them spiniform. Mandibular palp comparatively large, with the inner ramus very slender and abruptly bent upon the basal part. Posterior maxillipeds with the propodos rather narrow, tapered distally, dactylus terminating in 3 claw-shaped spines of about equal length. 1st pair of legs comparatively small, though having the basal part rather broad, outer ramus scarcely as long as the 1st joint of the inner, its distal joint armed with 4 spines successively increasing in length; inner ramus with the

proximal joint linear in form and quite unarmed, distal joint small carrying on the tip a claw-like spine and a somewhat longer seta. The 3 succeeding pairs of legs with the outer ramus distinctly 3-articulate and without any setæ inside, its terminal joint armed in the 2 anterior pairs with 3 spines and a sub-apical seta, in 4th pair with only 2 spines; inner ramus considerably shorter than the outer, with the distal joint oval in form and about the length of the proximal one, being only provided with a single imperfectly developed seta at the tip. Last pair of legs with the median plate divided at the end by a small incision into 2 short lobes, each carrying 2 unequal setæ; distal joints very small, cordate in form, each with 3 short setæ, inner edge finely ciliated.

Colour not yet ascertained.

Length of adult female 0.58 mm.

Remarks.—The above-described form agrees on the whole so closely with that recorded by Th. Scott, that I cannot but believe it to belong to the same species, though it is of somewhat smaller size and more slender form of body than indicated in the figures given by Th. Scott. I have also failed to detect in any of my specimens even the slightest trace of the peculiar prominences ("lenses") mentioned by T. Scott as occurring on each side of the cephalic segment behind, and seen both in his figure of the female and that of the male.

Occurrence.—Some few specimens of this peculiar form, all of the female sex, were picked up from samples taken last summer at Korshavn from a depth of about 20 fathoms, sandy bottom.

Distribution.—Scottish coast (Scott).

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Add the following species:

Laophonte karmensis, G. O. Sars, n. sp.

(Suppl. Pl. 46).

Specific Characters.—Female. Body moderately slender, resembling somewhat in shape that in *L. brevirostris*, though having the segments more sharply marked off from each other. Cephalic segment very large and tumid, considerably exceeding in length the succeeding 4 segments combined; rostral projection broadly triangular in form and distinctly bilobular at the tip. Urosome with the lateral expansions of the anterior segments rather prominent and minutely spinulose on the edges. Caudal rami scarcely longer than the anal segment and of nearly equal width throughout, lateral edges smooth. Anterior antennæ comparatively short, scarcely attaining half the length of the cephalic segment, and composed

of 7 well-defined joints, 2nd joint much the largest, and produced outside to a short triangular projection. Posterior antennæ and oral parts normally developed. 1st pair of legs comparatively large, with the inner ramus much produced, outer ramus however very small, scarcely exceeding in length $^1/_3$ of the proximal joint of the inner, and composed of only 2 joints. The 3 succeeding pairs of legs resembling in structure those in *L. brevirostris*, but comparatively less slender and with the setæ of the outer ramus somewhat reduced in number. Last pair of legs likewise resembling in shape those in the said species, distal joint however less broad and provided with only 4 setæ on the obtusely truncated extremity; inner expansion of proximal joint less produced, extending scarcely beyond the middle of the distal joint.

Male differing from the female in a very similar manner to that found in the male of *L. brevirostris*.

Colour yellowish.

Length of adult female 0.48 mm.

Remarks.—This form is nearly allied to *L. brevirostris* (Claus), but is of much smaller size, and moreover differs in the comparatively shorter, but distinctly 7-articulate anterior antennæ and in the very small biarticulate outer ramus of the 1st pair of legs. It also exhibits some slight differences in the structure of the other legs.

Occurrence.—I have hitherto only noted this form from a single locality, viz., Skutesnes, at the southern end of Karmø, S.W.coast of Norway. It occurred here not infrequently in a depth of about 10 fathoms, on a muddy bottom covered with decaying algæ.

Add also the following genus:

Pseudolaophonte, A. Scott.

Syn. *Laophontina* Norm. & Scott.

Generic Characters.—General form of body resembling that in *Laophonte*. Rostral plate short and broad. Caudal rami somewhat produced. Anterior antennæ strongly built, especially in the male, and having the number of joints reduced, 2nd joint produced outside to a strong recurved unguiform process. Posterior antennæ, oral parts, and 1st and last pairs of legs built on the same type as in *Laophonte*. Legs of 2nd to 4th pairs, however, rudimentary, and quite unfit for swimming.

Remarks.—The present genus, established by A. Scott, is nearly allied to *Laophonte*, differing from it chiefly in the rudimentary condition of the 2nd to 4th pairs of legs. The genus *Laophontina*, recently established by Messrs. Norman and Th. Scott, ought in my opinion to be combined with *Pseudolaophonte*, the distinguishing characters recorded being apparently only of specific, not of generic value.

Pseudolaophonte spinosa (Thomps.).

(Suppl. Pl. 47).

Laophonte spinosa, J. C. Thompson, Revised Report on the Copepoda of Liverpool Bay. Trans. Liverpool Biol. Soc. Vol. VII, p. 198, Pl. XXXIII.

Syn. *Pseudolaophonte aculeata*, A. Scott.

Specific Characters.—Female. Body comparatively slender, cylindrical in form, and very flexible, all the segments being sharply marked off from each other and clothed at the hind edge with minute spinules. Cephalic segment rather large, equalling in length the 3 succeeding segments combined, and, viewed dorsally, of oval quadrangular form; rostral plate short and broad, transversely truncated at the end, with a small conical prominence in the middle. Urosome shorter than the anterior division, and having the lateral parts of the segments slightly expanded and densely spinulose, each expansion terminating in a somewhat stronger denticle; last segment smaller than the others and not expanded laterally, anal opercle armed in the middle with a short, thick spine. Caudal rami about the length of the anal segment and slightly tapering distally, each armed dorsally somewhat in front of the middle, with an upturned spiniform projection accompanied by a delicate bristle, and at the inner distal corner with a similar but longer curved spine, outer edge carrying about in the middle 2 thin bristles, apical seta of moderate length and accompanied outside by a very short bristle. Anterior antennæ almost as long as the cephalic segment, and composed of 5 joints only, the 1st minutely serrate along the inner edge, and produced outside near the base to a knob-like prominence divided at the end into a varying number of denticles, 2nd joint a little shorter, fusiform, and produced outside in the middle to a strong recurved claw-like process, 3rd joint of about the same length as the 2nd, but much narrower, 4th joint scarcely half as long, and carrying at the end the usual sensory filament, 5th or last joint, representing the terminal part, about the length of the 4th, and produced at the hind corner to a spiniform projection. Posterior antennæ with the distal joint about the length of the proximal one, but much narrower and armed in the usual manner, outer ramus comparatively small, with 4 thickish setæ. Posterior maxillipeds very slender, with the propodos sub-

linear in form. 1st pair of legs well developed, with the outer ramus biarticulate and nearly attaining half the length of the proximal joint of the inner; apical claw of the latter ramus moderately strong. The 3 succeeding pairs of legs extremely small and difficult to isolate by dissection. 2nd pair of legs consisting each only of a biarticulate stem, the proximal joint representing the basal part, the distal joint the outer ramus. 3rd pair distinctly biramous, with both rami biarticulate. 4th pair likewise biramous, with the outer ramus 3-articulate, the inner biarticulate and scarcely more than half as long. Last pair of legs normally developed, foliaceous, distal joint oval in form and carrying on the somewhat obliquely truncated extremity 5 comparatively short setæ, each arising from a knob-like prominence at the edge; inner expansion of proximal joint rather large, triangular in form, and extending almost as far as the distal joint, marginal setæ 5 in number, 3 of them issuing from the inner edge; surface of both joints covered with curved rows of minute spikes.

Male of about same size as the female, and having the anterior antennæ very strongly hinged, with the 4th joint globularly dilated, and the terminal part claw-like. 3rd and 4th pairs of legs slightly differing from those in female, 1st joint of outer ramus in both pairs being produced at the end outside to a long deflexed spiniform process; inner ramus of 3rd pair moreover terminating in a somewhat flexuous spine. Last pair of legs very much reduced in size, distal joint with only 3 stout spines, inner expansion of proximal joint not produced, and carrying 2 unequal setæ.

Colour light grey.

Length of adult female 1.30 mm.

Remarks.—This form was first described in the above-quoted paper by J. C. Thompson as a species of the genus *Laophonte,* and was figured on a separate plate. The figures are however far from being accurate, and also in the description there are some apparent inaccuracies, which led Mr. A. Scott to believe that the form observed by him was a different species. I think however that there can be little doubt that the 2 forms are in reality identical, and the specific name *spinosa* proposed by Thompson ought accordingly, as the older one, to be substituted for that given to the species by Mr. A. Scott. In size and general appearance the present form somewhat resembles *Laophonte cornuta* Phil., but on a closer examination is easily distinguished by the peculiar armature of the caudal rami, and by the rudimentary condition of the legs of the 2nd to 4th pairs.

Occurrence.—I found this form last summer not unfrequently at Korshavn on a coarsely sandy bottom, at depths ranging from 20 to 50 fathoms. As could be inferred from the rudimentary condition of the natatory legs, the animal is

quite incapable of swimming freely in the water, and keeps constantly at the bottom, where it moves by winding its very flexible body and at the same time using its powerful antennæ and to some extent also the caudal rami as levers

Distribution. — Liverpool Bay (Thompson, A. Scott), Scottish coast (Th. Scott).

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Eurycletodes similis (Scott).

Distribution.—Polar Islands North of Grinnell Land (2nd Fram Exped.).

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Add the following species:

Rhizothrix gracilis (Scott).

(Suppl. Pl. 48).

Enhydrosoma gracile, Th. Scott, On some new and rare Crustacea, etc. 21st Ann. Rep. of the Fishery Board for Scotland, Part III, p. 122, Pl. II, figs. 16—26, Pl. III, fig. 1.

Specific Characters.—Female. Body comparatively slender, cylindric in form, or very slightly tapered behind. Cephalic segment of moderate size and not very deep, projecting in front to a broadly triangular rostral prominence. Urosome comparatively short, scarcely exceeding half the length of the anterior division, its last segment a little shorter than the preceding one. Caudal rami comparatively small and somewhat contracted in their distal part, which is produced, outside the apical setæ, to a bifid lappet, outer edge with a slender bristle behind the middle, principal apical seta about the length of the urosome. Anterior antennæ rather small, though somewhat more slender than in the type species, and, as in that species, composed of 4 joints only, the 1st of which is the largest, 2nd and 3rd joints of about equal length, last joint rather smaller. Posterior antennæ with the distal joint short and armed outside with 2 thick spines, at the end with 2 somewhat longer spines and 2 thin geniculate setæ, outer ramus very small, with 4 comparatively short bristles. Oral parts of essentially the same structure as in the type species; posterior maxillipeds however comparatively more slender. 1st pair of legs with the rami less narrow than in *R. curvata*, spine attached outside to the 1st joint of the outer ramus short, inner ramus scarcely more than half as long as the outer; each ramus, as in the type species, carrying on the tip 2 very slender setæ terminating in a tuft of spreading cilia. The 3 succeeding pairs of legs scarcely differing in structure

from those in the type species. Last pair of legs however rather different, forming simple transverse lamellæ contiguous in the middle, each lamella exhibiting a slight median incision and carrying on either side of the incision a row of 5 closely-set plumous setæ, outer corner exserted to a knob-like prominence tipped with a delicate bristle. Ovisac oval in form and attached to the genital segment by a long stalk.

Male still more slender than female, and scarcely smaller. Anterior antennæ 5-articulate and strongly hinged, with the 4th joint globularly dilated and the terminal joint claw-shaped. Last pair of legs smaller than in female with the median incision obsolete and the number of setæ much reduced.

Colour not yet ascertained.

Length of adult female 0.68 mm.

Remarks.—The above-described form is unquestionably referable to the genus *Rhizothrix*, as characterised in the main part of this work, agreeing, as it does, in all essential structural details with the type species, *R. curvata* Brady, though being specifically well defined.

Occurrence.—Several specimens of this form were picked up from samples taken last summer at Korshavn from a depth of about 20 fathoms, sandy bottom.

Distribution.—Scottish coast (Scott).

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Add the following new genus:

Gen. **Anoplosoma**, G. O. Sars, n.

Generic Characters.—Body without any armature whatever, the segments being evenly rounded both laterally and dorsally. Rostrum wholly absent. Caudal rami moderately slender, linear in form. Anterior antennæ narrow and elongated, with the terminal part distinctly biarticulate; those in male slightly hinged. Posterior antennæ very slender, outer ramus rudimentary. Mandibular palp slender, biarticulate. Maxillæ very small. Anterior maxillipeds with only a single setiferous lobe inside the basal joint. Posterior maxillipeds normal. 1st pair of legs very small and imperfectly developed, both rami being composed of only a single joint. The 3 succeeding pairs of legs extremely slender and projecting laterally; 2nd basal joint much prolonged and forming with the 1st an elbow-shaped bend, outer ramus very narrow and elongated, with the full number of natatory setæ; inner ramus exceedingly small, uniarticulate. Last pair of legs with the distal joint long and slender, proximal joint only slightly expanded inside, but having outside a very long and narrow process.

Remarks.—I have been in some doubt about the real systematic position of the present genus, but have at last arrived at the conclusion that it ought more properly to be referred to the family *Anchorabolidæ*, in spite of the absence of any obvious armature of the body. It is from this character that the generic name here proposed has been derived. Only a single species of this genus has hitherto come under my notice.

Anaplosoma sordidum, G. O. Sars, n. sp.

(Suppl. Pl. 49).

Specific Characters.—Female. Body not very slender, and somewhat depressed, sub-linear in form, being of nearly equal width throughout. Integuments very thin and fragile. Surface of body smooth, without any distinct processes, either lateral, or dorsal, but clothed with scattered stiff hairs arranged in a symmetrical manner, 2 pairs of them, attached to the 3rd and 4th segments dorsally, more being conspicuous than the others. Cephalic segment of moderate size, about equalling in length the 2 succeeding segments combined, and transversely truncated anteriorly, the frontal edge being even slightly concave in the middle. The 3 succeeding segments with the lateral parts evenly rounded off; 5th segment scarcely smaller than the preceding one. Urosome about the length of the anterior division and having all the segments simple, without lateral expansions, genital segment distinctly subdivided in the middle, last segment unusually large, being fully as long as the 2 preceding segments combined, anal opercle somewhat prominent and finely denticulated at the edge. Caudal rami about the length of the anal segment, slightly divergent and of narrow linear form, inner edge finely ciliated in its proximal part; all the setæ, 7 in number on each ramus, crowded together on its outermost part, the dorsal one arising from a bulbous base, and having its proximal part somewhat thickened and sharply defined from the distal; principal apical seta about half the length of the body. Eye wholly absent. Anterior antennæ very slender and narrow, fully twice as long as the cephalic segment, and composed of 5 well-defined joints, 1st, 3rd and 5th joints of about equal size, 2nd joint comperatively short but broader than the others, 4th joint very small. Posterior antennæ with the proximal joint very long and slender, outer ramus replaced by a small bristle arising from a knob-like prominence. Mandibular palp with the basal joint rather narrow and about the length of the distal one, exhibiting outside a small lappet tipped with a delicate bristle and apparently answering to the outer ramus. Posterior maxillipeds rather stout, with 2 remarkably strong plumose setæ issuing from the basal joint, propodus oblong in form, with a conspicuous sinus outside near the base, dactylus long and slender.

1st pair of legs very small, 2nd basal joint, as in the succeeding pairs, narrowly produced, and carrying at the end outside a slender seta, outer ramus represented by a narrow, somewhat curved joint appearing as the immediate continuation of the basal part, and provided with 6 unequal setæ, 3 on the outer edge and 3 on the tip; inner ramus scarcely more than half as long as the outer, and carrying on the tip 3 unequal setæ. The 3 succeeding pairs of legs with the 2nd basal joint much produced, outer ramus long and very narrow, with the spines of the outer edge rather slender, the first 2 joints in the 2nd and 4th pairs confluent, in the 3rd pair well defined; inner ramus in 2nd pair resembling that of 1st pair, in the 3rd pair much smaller, bisetose, in 4th pair quite rudimentary. Last pair of legs with the distal joint linear in form, and carrying 5 slender curved setæ, proximal joint with the outer process very long and narrow, inner expansion small, with 2 slender setæ of unequal length.

Male somewhat smaller than female, and having the anterior antennæ slightly hinged and composed of 7 well-defined joints, the 1st of which is much the largest. Last pair of legs smaller than in female, with only a single seta inside the proximal joint.

Colour whitish grey.

Length of adult female 0.84 mm.

Remarks.—This form is very markedly distinguished from the other members of the family *Anchorabolidæ* by its less slender body and the absolute absence of any processes similar to those found in the other species. In most cases, however, the body is found to be so thickly covered with muddy particles, that these differences only become obvious after the animal has been subjected to a very careful cleansing. The muddy particles are apparently kept in place by the peculiar stiff hairs which clothe the surface of the segments, and evidently serve as a protecting covering for the body, the integuments of which are very thin and fragile. It is to this peculiarity that the specific name here proposed refers.

Occurrence—I found this peculiar Copepod last summer not unfrequently at Korshavn in a depth of 30—50 fathoms, on a bottom covered with coarse sand intermingled with mud. It moves in a manner very similar to that observed in *Anchorabolus mirabilis*, for which it may easily be mistaken, as that form is also very often found covered by a thick crust of muddy particles.

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Add the following species:

Stenocaris minor, (Scott).

(Suppl. Pl. 50).

Cylindropsyllus minor, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Rep. of the Fishery Board for Scotland, p. 210, Pl. XI, figs. 17—24.

Specific Characters.—Female. Body slender, cylindrical in form, resembling that in *S. gracilis*. Rostrum very small and apparently not defined behind. Urosome about the length of the anterior division, genital segment the largest, last segment scarcely smaller than the preceding one. Caudal rami about the length of the anal segment, slightly divergent, and of nearly equal width throughout, outer edge carrying near the end a short bristle, principal apical seta transformed to a lancet-shaped appendage accompanied outside by a slender bristle issuing from its base. Anterior antennæ resembling in structure those in *S. gracilis*, but composed of 7 well-defined joints, the terminal part being 3-articulate instead of biarticulate. Posterior antennæ likewise rather similar, though having the outer ramus comparatively smaller. Oral parts and the 4 anterior pairs of legs very nearly agreeing in their structure with those appendages in *S. gracilis*. Last pair of legs, as in that species, very small, lamelliform, but less exserted at the end, and having only a single coarse spine inside, marginal setæ 7 in number. Ovisacs small and narrow, each containing only 3 or 4 ova arranged in a single row.

Colour whitish.

Length of adult female 0.90 mm.

Remarks.—This form, described by Th. Scott as a species of the genus *Cylindropsyllus*, is evidently referable to the genus *Stenocaris*, as defined in the main part of this work, agreeing with the type species, *S. gracilis*, in all essential characters. It differs from that species in the much smaller size, the distinctly 7-articulate anterior antennæ, the peculiar transformation of the principal caudal seta, and finally in the form and armature of the last pair of legs.

Occurrence.—Some few specimens of this form, all of the female sex, were found last summer at Korshavn in a depth of about 20 fathoms, sandy bottom.

Distribution.—Scottish coast (Scott).

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Add the following new genus:

Gen. Tachidiopsis, G. O. Sars, n.

Generic Characters.—General form of body somewhat resembling that in *Tachidius*, the anterior division being distinctly broader than the posterior.

Rostral prominence comparatively small, deflexed. Genital segment in female imperfectly subdivided. Caudal rami comparatively short. Anterior antennæ more slender than in *Tachidius*, and composed of a greater number of joints. Posterior antennæ with the proximal joint distinctly subdivided, outer ramus rather fully developed. Oral parts somewhat resembling in structure those in the genus *Tachidiella*. Posterior maxillipeds, however, clearly distinguished by the presence inside the basal joint of a complex masticatory lobe clothed with several denticulated spines. 1st pair of legs with both rami 3-articulate, the inner one the longer and bent in the middle. Inner ramus of the 2 succeeding pairs of legs biarticulate, the outer 2 joints being coalesced, that of 4th pair distinctly 3-articulate. Last pair of legs comparatively small, distal joint well defined, inner expansion of proximal joint scarcely at all produced.

Remarks.—This new genus ought evidently to be included in the family *Tachidiidæ*, as defined in the main part of this work, as it exhibits in its structural details some affinity both to the genus *Tachidiella* and to *Pseudotachidius*, though differing conspicuously from both of them in certain points. The structure of the posterior maxillipeds in particular is very peculiar and unlike that found in any other Harpacticoid known to me. Only a single species of this genus has hitherto come under my notice.

Tachidiopsis cyclopoides, G. O. Sars, n. sp.

(Suppl. Pl. 51).

Specific Characters—Female. Body moderately slender, with the 2 divisions sharply marked off from each other, whereby it assumes a pronouncedly cyclopoid appearance. Anterior division oblong oval in outline, with the cephalic segment rather large and broadly rounded in front; rostral projection triangular, deflexed. Epimeral plates of the 3 succeeding segments small and rounded off; 5th segment much narrower than the preceding one, from which it is separated by a conspicuous constriction. Urosome a little shorter than the anterior division and much narrower, tapering somewhat distally, its segments clothed with small spikes; genital segment comparatively large and somewhat depressed in its anterior part, last segment slightly shorter than the preceding one, and having the anal opercle finely denticulated. Caudal rami about the length of the anal segment and of uniform width throughout, each with a small bristle outside near the end, apical setæ normally developed. Anterior antennæ almost attaining the length of the cephalic segment and composed of 9 well-defined joints clothed with comparatively short and simple setæ, 1st joint the largest, the 3 succeeding joints of

about equal size, terminal part nearly as long as the proximal, with the 2nd joint the largest, the 2 succeeding joints very short. Posterior antennæ with the distal joint comparatively short, but with rather long apical setæ, outer ramus exceeding in length the distal joint and distinctly 4-articulate. Mandibles with the masticatory part considerably expanded, the outer 2 teeth of the cutting edge claw-like, palp with the basal part oblong oval in form, rami of about equal size, the outer one distinctly 4-articulate. Posterior maxillipeds with the masticatory lobe of the basal joint well defined and armed with 5 short denticulated spines and one or 2 simple bristles, propodus fusiform in shape, with the outer edge finely ciliated, inner edge carrying in the middle 2 strong plumose setæ, dactylus rather complex, biarticulate, proximal joint carrying at the end inside a short bristle, and outside a small lobule tipped with a minute hair, distal joint unguiform with 2 slender curved setæ outside. 1st pair of legs with the basal part broad and flattened, outer ramus shorter than the inner and having a well developed seta inside the middle joint, terminal joint larger than either of the other 2, and armed with 5 slender spines successively increasing in length distally, and with a seta on the inner edge; inner ramus with the 1st joint about the length of the other 2 combined and, like the middle one, provided at the end inside with a slender seta, terminal joint somewhat smaller than the middle one, and carrying outside a short spine, inside a small seta, and at the tip another seta and a very long spine. The 3 succeeding pairs of legs with the outer ramus normally developed, terminal joint in the 2 anterior pairs with 2 setæ inside, in 4th pair with 3 such setæ; inner ramus in 2nd pair nearly as long as the outer, and having the proximal joint rather expanded, in 3rd pair rather shorter; distal joint in both these pairs with a small dentiform projection in the middle of the outer edge, inner edge in 2nd pair with 3 setæ, the outermost one rather strong, in 3rd pair with 4 subequal setæ and a minute denticle interposed between the 2 proximal ones. 4th pair of legs with the inner ramus distinctly 3-articulate, but much shorter than the outer. Last pair of legs with the distal joint conical in form, and edged with 5 rather unequal setæ, one of them issuing from the narrowly exserted tip; inner expansion of proximal joint rather broad, but scarcely at all produced, and provided with 3 slender setæ. Ovisac of moderate size and rounded oval in form.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.65 mm.

Remarks.—In its outward appearance this form has a strong resemblance to certain species of the genus *Cyclopina*, and may easily be mistaken for one of them.

A closer examination will however at once prove it to be a genuine Harpacticoid. As in the greater number of these, only a single ventral ovisac is present, a circumstance which never occurs in any of the Cyclopoida.

Occurrence.—Some few specimens of this form, all of the female sex, were picked up from samples taken last summer at Korshavn from a depth of about 20 fathoms, sandy bottom.

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Fultonia hirsuta, Scott.

Remarks.—On a closer examination of specimens of this form taken last summer at Korshavn, I have ascertained that in the female there are 2 well-defined ovisacs present, as in the genus *Eurycletodes,* to which the present form also in other respects exhibits an unmistakable affinity. This fact has still further confirmed me in the opinion intimated on page 341, that the genus *Fultonia* and its near ally *Argestes,* should more properly be included in the family *Cletodidæ,* in spite of the distinctly 3-articulate inner rami of the natatory legs.

Additional species.

Fam. Ectinosomidæ.

Ectinosoma tenuireme, Scott.

(Suppl. Pl. 52).

Ectinosoma tenuireme, Th. & A. Scott, Revision of the British Copepoda belonging to the genera *Bradya* and *Ectinosoma*. Trans. Linn. Soc. London, 2nd ser. Vol. IV, Part 5, p. 439, Pl. 36, fig. 33; Pl. 37, figs. 8, 27, 36, 46; Pl. 38, figs. 1, 24, 40, 49.

Specific Characters.—Female. Body exceedingly slender, of narrow linear form. Rostral plate not very prominent, and narrowly rounded at the tip. Urosome considerably shorter than the anterior division and somewhat tapered distally, last segment very small. Caudal rami scarcely longer than they are broad, and slightly divergent, apical setæ exceedingly slender and elongated, the inner medial one exceeding in length $^2/_3$ of the body. Anterior antennæ unusually slender and attenuated, 7-articulate, 1st joint much the largest, last joint very small. Posterior antennæ with the outer ramus very narrow, 3-articulate, last joint nearly twice as long as the other 2 combined. Anterior lip with the usual recurved projection in front. Mandibles and maxillæ of the usual structure. Anterior maxillipeds very strongly built, with the 2nd basal joint considerably dilated and fully twice as long as the 1st, terminal claws very slender. Posterior maxillipeds long and narrow, with the terminal joint fully half as long as the middle one. Natatory legs with the outer ramus much smaller than the inner, scarcely exceeding in length the first 2 joints of that ramus combined. Last pair of legs comparatively small, distal joint twice as long as it is broad, with the middle seta exceedingly long and slender, almost 3 times as long as the other 2, which are subequal in length; inner expansion of proximal joint extending considerably beyond the middle of the distal joint, the 2 apical setæ rather unequal. Ovisac comparatively large, oblong in form.

Colour not yet ascertained.

Length of adult female 0.73 mm.

Remarks.—This species briefly described by Scott in the above-cited treatise, is most nearly related to *E. gracile* Scott, but is of somewhat larger size and still more slender form of body. It moreover differs slightly in the structure of the antennæ, the maxillipeds and the last pair of legs, as also in the very long and slender caudal setæ.

Occurrence.—Some few specimens of this form were picked up from samples taken last summer at Korshavn from a depth of 30—50 fathoms, coarse sandy bottom.

Distribution.—Scottish coast (Scott).

Gen. **Neobradya**, Scott, 1892.

Generic Characters.—Body elongate, of cylindrical form, without any sharp demarcation between the anterior and posterior divisions. Rostral prominence short, triangular. Genital segment in female not subdivided. Caudal rami small, with the principal apical seta sub-geniculate. Anterior antennæ elongate, resembling in structure those in *Cylindropsyllus* and *Stenocaris*. Posterior antennæ however rather different, the outer ramus being very fully developed. Anterior lip simple, flap-shaped. Mandibles strong, with the palp large and biramos. Maxillæ with the exopodal lobe unusually large. Maxillipeds comparatively small, the anterior ones with 4 setiferous lobes inside, and the apical part distinctly defined; the posterior ones not prehensile, 3-articulate, and armed inside with a number of stout appressed spines coarsely pectinate along the one edge. Natatory legs moderately slender, with the number of setæ much reduced; 1st pair with both rami 3-articulate, the 3 succeeding pairs with the inner ramus biarticulate. Last pair of legs very small, with the distal joint imperfectly defined at the base and the inner expansion of proximal joint poorly developed. A single ovisac present in female.

Remarks.—The systematic position of this genus appears to me somewhat doubtful. Th. Scott believes it to be nearly allied to the genus *Bradya* of Boeck, and according to that opinion it should of course be included in the family *Ectinosomidæ*. There are however several characters by which it conspicuously differs from the members of that family, and by which it shows a certain affinity to a very different family, viz., that of the *Cylindropsyllidæ*, with which the external appearance also agrees better than with the *Ectinosomidæ*. On the other hand, the structure of the posterior antennæ and the mandibles is very different from that in the first-named family and more in accordance with that found in the *Ectinosomidæ*. I think that it will be found advisable in

future to remove the present genus from both these families, and to regard it as the type of a particular family. The genus contains as yet only a single species, to be described below.

Neobradya pectinifera, Scott.

(Suppl. Pl. 53).

Neobradya pectinifer, Th. Scott, Additions to the Fauna of the Firth of Forth, Part IV. 10th Ann. Rep. of the Fishery Board for Scotland, p. 249; Pl. XIII, figs. 19—32.

Specific Characters.—Female. Body very slender and elongated, of perfectly cylindrical form. Cephalic segment nearly as long as the 3 succeeding segments combined, and forming in front a short and broad rostral prominence of triangular form. Epimeral plates of the 3 succeeding segments very small, but distinct; 5th segment fully as large as the preceding one. Urosome about the length of the anterior division and rather massive, with all the segments perfectly smooth; last segment much smaller than the other 3, and deeply incised behind in the middle. Caudal rami very small, slightly longer than they are broad, and each carrying outside, about in the middle, 2 unequal bristles, dorsal seta issuing close to the end, apical seta accompanied outside by a thin bristle and having its proximal half very coarse, almost spiniform, distal part however extremely thin, hair-like and generally extended obliquely outwards. Eye wholly absent. Anterior antennæ nearly as long as the cephalic segment, and composed of 9 well-defined joints clothed with moderately long setæ, 1st joint comparatively short and thick, 2nd much the largest and slightly attenuated distally, 3rd joint about twice the length of the 4th, which carries at the end the usual sensory filament, terminal part scarcely longer than those 2 joints combined. Posterior antennæ with the outer ramus very fully developed and composed of 4 well-defined joints, the 1st about equal in length to the other 3 combined. Mandibles with the masticatory part abruptly incurved and somewhat flattened, cutting edge divided into several strong teeth, palp large, with the outer ramus distinctly 4-articulate. 1st pair of legs with the outer ramus slightly longer than the inner, middle joint without any seta inside, terminal joint armed with 4 spines and inside the tip with a slender seta; inner ramus with the 1st joint about the length of the other 2 combined and without any seta inside, middle joint setiferous, terminal joint about the size of the middle one, and carrying on the tip 3 unequal setæ, the middle one very long. The 2 succeeding pairs of legs with the outer ramus very narrow and without any setæ inside, terminal joint only slightly longer than the middle one, and provided at the end with 3 slender spines and a still more slender seta; inner ramus a little shorter than the outer, and having

the proximal joint subfusiform in shape and much larger than the distal one, the latter provided inside near the base with a moderately long seta, and at the tip with a very long denticulated spine accompanied outside by a short spine, inside by an ordinary seta. 4th pair of legs resembling in structure the 2 preceding pairs, except that the inner ramus is comparatively shorter and has no seta inside the distal joint, whereas the terminal joint of the outer ramus is provided inside with such a seta. Last pair of legs with the distal joint obliquely rounded and carrying outside 3 short spines and at the tip a slender seta; inner expansion of proximal joint very small, with only 2 slightly unequal setæ on the transversely truncated extremity. Ovisac oblong oval in form, and attached to the genital segment by a short stalk.

Male only slightly differing from female, though having the anterior antennæ hinged in the usual manner, and the last pair of legs less perfectly developed.

Colour pure white.

Length of adult female 1.18 mm.

Remarks.—From its slender cylindrical body, this Copepod looks very like the forms included in the family *Cylindropsyllidæ*, and may at first sight easily be mistaken for one or other of them. A closer examination will however soon reveal some very essential differences in the structural details. Another obvious difference is the presence in the female of only a single ovisac, whereas in all the known *Cylindropsyllidæ*, there are 2 such ovisacs.

Occurrence.—I found this remarkable Copepod last summer rather abundantly at Korshavn in the same locality from which so many other interesting forms, treated of in the preceding pages, were derived, the depth ranging from 30 to 50 fathoms. In the same locality also *Cylindropsyllus lævis* occurred rather frequently, and the resemblance between these 2 forms in size and general appearance was very striking.

Distribution.—Scottish coast (Scott).

Fam. Diosaccidæ.

Amphiascus simulans (Scott).

(Suppl. Pl. 54).

Stenhelia simulans, Norm. & Scott, Copepoda new to Science from Devon and Cornwall. Ann. Mag. Nat. Hist. ser. 7, Vol. XV, p. 285.

Specific Characters.—Female. Body slender, sublinear in form, or slightly tapered behind. Rostrum very prominent, acuminate. Urosome somewhat shorter than the anterior division, last segment not quite attaining the length of the preceding one. Caudal rami very short, being scarcely as long as they are broad, apical setæ normal. Anterior antennæ moderately slender, about the length of the cephalic segment, and composed of 8 joints, the 2nd much the largest and exhibiting in the middle a very conspicuous constriction, 4th joint about twice as long as the 3rd, terminal part exceeding in length those joints combined. Posterior antennæ with the middle joint of the outer ramus very small and without any seta. 1st pair of legs with the outer ramus about the length of the 1st joint of the inner, middle joint without any seta inside, terminal joint slightly longer and armed with only 2 spines and 2 geniculate setæ; inner ramus with the 1st joint narrow linear in form and carrying inside, near the end, a slender seta, last joint fully twice as long as the middle one, and armed in the usual manner; both these joints combined considerably exceeding half the length of the 1st. The 3 succeeding pairs of legs with the rami moderately slender, and the natatory setæ somewhat reduced in number, terminal joint of outer ramus in the 2 anterior pairs having only a single seta inside, that of the inner ramus in 2nd and 4th pairs likewise with a single seta on the inner edge. Last pair of legs with the distal joint oblong oval in form and edged with 6 setæ; inner expansion of proximal joint triangular in form and extending considerably beyond the middle of the distal joint, marginal setæ 5 in number. Ovisacs of moderate size, oblong fusiform in shape.

Male having the anterior antennæ transformed in the usual manner. 1st pair of legs with the spine inside the 2nd basal joint remarkably produced and somewhat sigmoid. Inner ramus of 2nd pair of legs with the middle joint expanded inside to a rounded lobe, and carrying at the end outside 2 strong deflexed spines, the inner one distinctly bifid at the tip. Last pair of legs much smaller than in female, distal joint short, pyriform in shape, with only 5 marginal setæ; inner expansion of proximal joint conical in form, with 2 thickish apical setæ.

Colour not yet ascertained.

Length of adult female 0.93 mm.

Remarks.—It is only quite recently that I have become aware of this form, owing to its external resemblance to several other species of the present genus. On a closer examination I find it however to be a well-defined species, which may also without dissection be easily recognised by the characteristic form of the 2nd joint of the anterior antennæ. This character has not been sufficiently noticed by Messrs. Norman and Scott in their description of the species.

Occurrence.—Several specimens of this form were found in samples taken last summer at Korshavn from depths ranging from 20 to 40 fathoms, sandy bottom.

Distribution.—Coast of Cornwall (Norm. & Scott).

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AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

PROFESSOR OF ZOOLOGY AT THE UNIVERSITY OF CHRISTIANIA

VOL. V

COPEPODA

HARPACTICOIDA

WITH 284 AUTOGRAPHIC PLATES

(TEXT)



BERGEN

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SOLD BY

ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA

1911

PREFACE.

The elaboration of the present Volume has been connected with no small trouble and expenditure of time. Indeed, the group of Crustacea here treated of is undoubtedly one of the most difficult, both as regards the direct examination of the species, and the exact determination of the often very intricate mutual relation of the several types. The group has proved to be very richly represented in the Norwegian Fauna, as will appear from the extent of this Volume, (about 300 (291) different species, belonging to 99 genera, being treated of here); and yet I have every reason to believe that many other forms will be added in the future. As regards this statement, I will only point to the fact that during my last excursion, in the summer of 1910, no less than about 40 additional species, several new to science, were procured, and of these moreover by far the greater number were derived from a single locality at Korshavn, on the south coast of Norway.

The systematic arrangement of the genera adopted in this work can only be regarded as a quite provisional one. No doubt in the future essential improvements will be effected also in this respect. Although the present Volume cannot therefore lay any claim to being an exhaustive account of the group, I think that it will at least be found useful as a basis for further investigations.

As to the preparation of the plates accompanying this Volume, I have been anxious to give, besides analytical figures of the several appendages, also good habitus-figures of each species, drawn on a sufficiently large scale. The great advantage of such figures for an easy determination of the species is evident. In most cases it is found that earlier authors have contented themselves with giving only lateral figures of the species belonging to the present group. I find, however, that in many cases the dorsal view of the animal more clearly reveals the characteristic differences between nearly-related species than does the lateral view. In cases where only a single habitus-figure is given, I have therefore always preferred to represent the animal in a dorsal aspect. In most cases, however, the animal is

figured in both positions. The analytical figures have in all cases been associated in the same plates with the habitus-figures, an arrangement which is undoubtedly more convenient than that adopted by Th. Scott in some of his recent papers, where these figures are found scattered over many different plates.

I regret that in some few cases the figures on the plates have been less perfectly reproduced, owing to want of care on the part of the lithographer in the transfer of my drawings to the stone. In the great majority of cases, however, I hope that the plates will be found to suffice for an easy recognition of the species represented.

In concluding this Volume, I wish to express my most sincere thanks to those gentlemen who have assisted me in the work. To Canon A. M. Norman and Dr. Th. Scott I am much indebted for their kindness in sending me interesting specimens and in giving me other information useful to me. My hearty thanks are also due to Mr. O. Nordgaard, curator of the Trondhjem Museum, for his generosity in placing in my hands his whole material of *Harpacticoida*, as also for sending me several bottom-samples taken by him partly off the Finmark coast, partly off the Lofoten Islands and in the Skjærstad Fjord. Several interesting species, described and figured in the present Volume, were derived from these samples. Finally, I beg to thank the Direction of the Bergen Museum for the promptness with which it has attended to the printing and publishing of the several parts of this Volume, as soon as they left my hands.

G. O. Sars.

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SYSTEMATIC LIST

OF THE SPECIES DESCRIBED IN THIS VOLUME.

Achirota.

Misophriidæ.

Misophria, Boeck.
- *pallida*, Boeck.

Logipediidæ.

Longipedia, Claus.
- *coronata*, Claus.
- *Scotti*, G. O. Sars.
- *minor*, Scott.
- *rosea*, G. O. Sars.

Sunaristes, Hesse.
- *paguri*, Hesse.

Canuella, Scott.
- *perplexa*, Scott.
- *furcigera*, G. O. Sars.

Cerviniidæ.

Cervinia, Norman.
- *Bradyi*, Norman.
- *synarthra*, G. O. Sars.

Cerviniopsis, G. O. Sars.
- *clavicornis*, G. O. Sars.
- *longicaudata*, G. O. Sars.

Eucanuella, Scott.
- *spinifera*, Scott.

Zosime, Boeck.
- *typica*, Boeck.
- *incrassata*, G. O. Sars.

Ectinosomidæ.

Ectinosoma, Boeck.
- *Sarsi*, Boeck.
- *neglectum*, G. O. Sars.
- *propinquum*, Scott.
- *elongatum*, G. O. Sars.
- *Herdmani*, Scott.
- *melaniceps*, Boeck.
- *Normani*, Scott.
- *curticorne*, Boeck.
- *gothiceps*, Giesbr.
- *mixtum*, G. O. Sars.
- *brevirostre*, G. O. Sars.
- *gracile*, Scott.
- *tenuireme*, Scott.

Microsetella, Brady & Rob.
- *norvegica*, Boeck.

Ectinosomella, G. O. Sars.
- *nitidula*, G. O. Sars

Pseudobradya, G. O. Sars.
- *minor*, Scott.
- *acuta*, G. O. Sars.
- *similis*, Scott.
- *hirsuta*, Scott.
- *fusca*, Scott.
- *robusta*, G. O. Sars.
- *elegans*, Scott.

Bradya, Boeck.
- *typica*, Boeck.

dilatata, G. O. Sars.
armifera, Scott.
Neobradya, Scott.
petinifera, Scott.

Chirognatha.

Harpacticidæ.

Harpacticus, M. Edw.
chelifer, Müller.
uniremis, Kröyer.
gracilis, Claus.
flexus, Brady.
littoralis, G. O. Sars
Tigriopus, Norman.
fulvus, Fischer.
Zaus, Goodsir.
spinatus, Goodsir.
abbreviatus, G. O. Sars.
Goodsiri, Brady.

Peltidiidæ.

Alteutha, Baird.
interrupta, Goodsir.
purpurocincta, Norm.
Peltidium, Philippi.
purpureum, Phil.

Tegastidæ.

Tegastes, Norman.
falcatus, Norman.
flavidus, G. O. Sars.
Clausi, G. O. Sars.
grandimanus, G. O. Sars.
nanus, G. O. Sars.
harpacticoides, Claus.
calcaratus, G. O. Sars.
longimanus, Claus.
Parategastes, G. O. Sars.
sphæricus, Claus.

Porcellidiidæ.

Porcellidium, Claus.
fimbriatum, Claus.

Idyidæ.

Aspidiscus, Norman.
littoralis, G. O. Sars.
fasciatus, Norm.
Psamathe, Philippi.
longicauda, Phil.
Machairopus, Brady.
minutus, G. O. Sars.
Idyæa, Philippi.
furcata, Baird.
minor, Scott.
ensifera, Fischer.
tenera, G. O. Sars.
longicornis, Scott.
elegantula, G. O. Sars.
gracilis, Scott.
angusta, G. O. Sars.
finmarchica, G. O. Sars.
tenella, G. O. Sars.
Idyanthe, G. O. Sars.
dilatata, G. O. Sars.
pusilla, G. O. Sars.
Idyella, G. O. Sars.
pallidula, G. O. Sars.
exigua, G. O. Sars.

Thalestridæ.

Thalestris, Claus.
longimana, Claus.
gibba, Kröyer.
rufoviolacens, Claus.
brunnea, G. O. Sars.
purpurea, G. O. Sars.
Parathalestris, Brady & Rob.
Clausi, Norman.
harpacticoides, Claus.
hibernica, Brady & Rob.
Jacksoni, Scott.
Phyllothalestris, G. O. Sars.
mysis, Claus.
Halithalestris, G. O. Sars.
Croni, Kröyer.

Rhynchothalestris, G. O. Sars.
rufocincta, Norm.
helgolandica, Claus.
Microthalestris, G. O. Sars.
forficula, Claus.
littoralis, G. O. Sars.
Dactylopusia, Norman.
thisboides, Claus.
neglecta, G. O. Sars.
vulgaris, G. O. Sars.
micronyx, G. O. Sars.
brevicornis, Claus.
latipes, Boeck.
Dactylopodella, G. O. Sars.
flava, Claus.
clypeata, G. O. Sars
Dactylopodopsis, G. O. Sars.
dilatata, G. O. Sars.
Idomene, Philippi.
forficata, Phil.
borealis, G. O. Sars.
Idomenella, Scott.
coronata, Scott.
Amenophia, Boeck.
peltata, Boeck.
pulchella, G. O. Sars.
Westwoodia, Dana.
nobilis, Baird.
assimilis, G. O. Sars.
minuta, Claus.
pygmæa, Scott.
monensis, Brady.

Diosaccidæ.

Diosaccus, Boeck.
tenuicornis, Claus.
Amphiascus, G. O. Sars.
cinctus, Claus.
obscurus, G. O. Sars.
similis, Claus.
nasutus, Boeck.
phyllopus, G. O. Sars.
latifolius, G. O. Sars.
thalestroides, G. O. Sars.
minutus, Claus.
varians, Scott.
Giesbrechti, G. O. Sars.
propinquus, G. O. Sars.
longirostris, Claus.
tenuiremis, Brady.
parvus, G. O. Sars.
debilis, Giesbr.
pallidus, G. O. Sars.
abyssi, Boeck.
nanus, G. O. Sars.
exiguus, G. O. Sars.
Blanchardi, Scott.
tenellus, G. O. Sars.
linearis, G. O. Sars.
sinuatus, G. O. Sars.
denticulatus, Thomps.
Normani, G. O. Sars.
amblyops, G. O. Sars.
lagenirostris, G. O. Sars.
nanoides, G. O. Sars.
bulbifer, G. O. Sars.
spinulosus, G. O. Sars
simulans, Scott.
attenuatus, G. O. Sars.
hispidus, Norman
affinis, G. O. Sars.
intermedius, Scott.
typhlops, G. O. Sars.
typhloides, G. O. Sars.
lamellifer, G. O. Sars
confusus, Scott.

Stenhelia, Boeck.
gibba, Boeck.
proxima, G. O. Sars.
æmula, Scott.
palustris, Brady.
reflexa, Brady.
Giesbrechti, Scott.
Normani, Scott.
longicaudata, Boeck.

Stenheliopsis, G. O. Sars.
divaricata, G. O. Sars.
latifurca, G. O. Sars.
media, G. O. Sars.

Canthocamptidæ.

Canthocamptus, Westw.
staphylinus, Jurine.
minutus, Claus.
Altheyella, Brady.
crassa, G. O. Sars.
gracilis, G. O. Sars.
pygmæa, G. O. Sars.
arctica, Lilljeb.
Duthiei, Scott.
Moraria, Scott.
brevipes, G. O. Sars.
Mesochra, Boeck.
Lilljeborgi, Boeck.
pygmæa, Claus.
hirticornis, Scott.
exigua, G. O. Sars.
Nitocra, Boeck.
typica, Boeck.
spinipes, Boeck.
pusilla, G. O. Sars.
Ameira, Boeck.
longipes, Boeck.
minuta, Boeck.
Scotti, G. O. Sars.
tau, Giesbr.
simplex, Scott.
attenuata, Thomps.
tenuicornis, Scott.
Parameira, G. O. Sars.
parva, Boeck.
major, G. O. Sars.
propinqva, Scott.
Pseudameira, G. O. Sars.
crassicornis, G. O. Sars.
furcata, G. O. Sars.
Ameiropsis, G. O. Sars.
brevicornis, G. O. Sars.
longicornis, G. O. Sars.
mixta, G. O. Sars.
nobilis, G. O. Sars.
angulifera, G. O. Sars.
abbreviata, G. O. Sars.
Stenocopia, G. O. Sars.
longicaudata, Scott.
spinosa, Scott.
setosa, G. O. Sars.
Malacopsyllus, G. O. Sars.
fragilis, G. O. Sars.
Leptomesochra, G. O. Sars.
attenuata, A. Scott.
tenuicornis, G. O. Sars.
confluens, G. O. Sars.
Phyllocamptus, Scott.
minutus, G. O. Sars.
Paramesochra, Scott.
dubia, Scott.
Tetragoniceps, Brady.
Scotti, G. O. Sars.
Phyllopodopsyllus, Scott.
Bradyi, Scott.
furciger, G. O. Sars.
Pteropsyllus, Scott.
consimilis, Scott.
Evansia, Scott.
incerta, Scott.
Leptastacus, Scott.
macronyx, Scott.

Laophontidæ.

Laophonte, Philippi.
cornuta, Phil.
serrata, Claus.
depressa, Scott.
thoracica, Boeck.
elongata, Boeck.
typhlops, G. O. Sars.
longicaudata, Boeck.
similis, Claus.
horrida, Norm.
brevispinosa, G. O. Sars.
Koreni, Boeck.
proxima, G. O. Sars.
Strömi, Baird.
curticauda, Boeck.
minuta, Boeck.

littoralis, Scott.
brevirostris, Claus.
congenera, G. O. Sars.
karmensis, G. O. Sars.
perplexa, Scott.
macera, G. O. Sars.
Nordgaardi, G. O. Sars.
parvula, G. O. Sars.
nana, G. O. Sars.
inopinata, Scott.
denticornis, Scott.

Pseudolaophonte, A Scott.
spinosa, Thomps.

Laophontopsis, G. O. Sars.
lamellifera, Claus.

Asellopsis, Brady.
hispida, Brady.

Laophontodes, Scott.
typicus, Scott.
bicornis, A. Scott.
expansus, G. O. Sars.

Platychelipus, Brady.
littoralis, Brady.
laophontoides, G. O. Sars.

Normanella, Brady.
minuta, Boeck.
tenuifurca, G. O. Sars.
mucronata, G. O. Sars.

Cletodidæ.

Cletodes, Brady.
limicola, Brady.
tenuipes, Scott.
curvirostris, Scott.
longicaudatus, Boeck.
Buchholtzi, Boeck.

Orthopsyllus, Brady.
linearis, Claus.

Mesocletodes, G. O. Sars.
irrasus, Scott.

Eurycletodes, G. O. Sars.
laticaudatus, Boeck.
latus, Scott.
similis, Scott.
major, G. O. Sars.

Enhydrosoma, Boeck.
curticaudatum, Boeck.
propinquum, Brady.
longifurcatum, G. O. Sars.

Rhizothrix, Brady.
curvata, Brady.
gracilis, Scott.

Huntemannia, Poppe.
jahdensis, Poppe.

Nannopus, Brady.
palustris, Brady.

Pontopolites, Scott.
typicus, Scott.

Fultonia, Scott.
hirsuta, Scott.

Argestes, G. O. Sars.
mollis, G. O. Sars.

Anchorabolidæ.

Anchorabolus, Norman.
mirabilis, Norman.

Echinopsyllus, G. O. Sars.
Normani, G. O. Sars.

Ceratonotus, G. O. Sars.
pectinatus, G. O. Sars.

Arthropsyllus, G. O. Sars.
serratus, G. O. Sars.

Anoplosoma, G. O. Sars.
sordidum, G. O. Sars.

Cylindropsyllidæ.

Cylindropsyllus, Brady.
lævis, Brady.

Stenocaris, G. O. Sars.
gracilis, G. O. Sars.
minor, Scott.

D'Arcythompsonia, Scott.
fairliensis, Scott.

Tachidiidæ.

Tachidius, Lilljeb.
brevicornis, Lilljeb.
Pseudotachidius, Scott
coronatus, Scott.
Tachidiella, G. O. Sars.
minuta, G. O. Sars.
Tachidiopsis, G. O. Sars.
cyclopoides, G. O. Sars.
Robertsonia, Brady.
tenuis, Brady.
Danielssenia, Boeck.
typica, Boeck.
fusiformis, Brady.

Psammis, G. O. Sars.
longisetosa, G. O. Sars.

Metidæ.

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ignea, Phil.

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Balænophilus, Aurivillius.
unisetis, Auriv.

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LIST OF PLATES

(WITH CORRECTIONS).

Letterings.—♀ female; ♂ male; *C.* cephalic segment; *Urs* urosome with the caudal rami; *gen. ar.* genital area; *F.* furcal joints; *R.* rostrum; $a.^1$ anterior antenna; $a.^2$ posterior antenna; *L.* anterior lip; *M.* mandible; *Mp.* mandibular palp; *m.* maxilla; $mp.^1$ anterior maxilliped; $mp.^2$ posterior maxilliped; $p.^1$—$p.^5$ legs of 1st to 5th pairs.; *gen. l.* genital lobe of male.

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2. — propinqvum, Scott.

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4. — nanus, G. O. Sars.

Pl XLIII.
Parategastes sphæricus, (Claus).

Pl. XLIV.
Porcellidium fimbriatum, Claus.

Pl. XLV.
Porcellidium fimbriatum, Claus (continued).

Pl. XLVI.
Aspidiscus littoralis, G. O. Sars.

Pl. XLVII.
Aspidiscus littoralis, G. O. Sars (continued).

Pl. XLVIII.
Aspidiscus fasciatus, Norman.

Pl. XLIX.
Psamathe longicauda, Philippi.

Pl. L.
Machairopus minutus, G. O. Sars.

Pl. LI.
Idyæa furcata, (Baird) (see Supplmt.).

Pl. LII.
1. Idyæa furcata, (Baird) (continued).
2. — minor, Scott.

Pl. LIII.
1. Idyæa ensifera, (Fischer).
2. — tenera, G. O. Sars.

Pl. LIV.
1. Idyæa longicornis, Scott.
2. — elegantula, G. O. Sars.

Pl. LV.
1. Idyæa gracilis, Scott.
2. — angusta, G. O. Sars.

Pl. LVI.
Idyæa finmarchica, G. O. Sars.

Pl. LVII.
1. Idyanthe dilatata, G. O. Sars (see Supplmt.).
2. — pusilla, G. O. Sars.

Pl. LVIII.
1. Idyella pallidula, G. O. Sars.
2. — exigua, G. O. Sars.

Pl. LIX.
Thalestris longimana, Claus.

Pl. LX.
Thalestris longimana, Claus (continued).

Pl. LXI.
Thalestris gibba, (Kröyer).

Pl. LXII.
Thalestris rufoviolacens, Claus.

Pl. LXIII.
Thalestris brunnea, G. O. Sars.

Pl. LXIV.
Thalestris purpurea, G. O. Sars.

Pl. LXV.
Parathalestris Clausi, (Norman).

Pl. LXVI.
Parathalestris Clausi, (Norman) (continued).

Pl. LXVII.
Parathalestris harpacticoides, (Claus).

Pl. LXVIII.
Parathalestris hibernica, (Brady & Rob.).

Pl. LXIX.
Parathalestris Jacksoni, (Scott).

Pl. LXX.
Phyllothalestris mysis, (Claus).

Pl. LXXI.
Phyllothalestris mysis, (Claus) (continued).

Pl. LXXII.
Halithalestris Croni, (Kröyer).

Pl. LXXIII.
Rhynchothalestris rufocincta, (Norman).

Pl. LXXIV.
Rhynchothalestris rufocincta, (Norman) (continued).

Pl. LXXV.
Rhynchothalestris helgolandica, (Claus).

Pl. LXXVI.
Microthalestris forficula, (Claus).

Pl. LXXVII.
Dactylopusia thisboides, Claus.

Pl. LXXVIII.
1. Dactylopusia thisboides, Claus (continued).
2. — neglecta, G. O. Sars.

Pl. LXXIX.
1. Dactylopusia vulgaris, G. O. Sars.
2. — micronyx, G. O. Sars.

Pl. LXXX.
Dactylopusia brevicornis, Claus.

Pl. LXXXI.
Dactylopodella flava, Claus.

Pl. LXXXII.
Idomene forficata, Philippi.

Pl. LXXXIII.
Amenophia peltata, Boeck.

Pl. LXXXIV.
1. Amenophia peltata, Boeck (continued).
2. — pulchella, G. O. Sars.

Pl. LXXXV.
Westwoodia nobilis, (Baird).

Pl. LXXXVI.
Westwoodia nobilis, (Baird) (continued).

Pl. LXXXVII.
Westwoodia assimilis, G. O. Sars.

Pl. LXXXVIII.
1. Westwoodia minuta, Claus.
2. — pygmæa, (Scott).

Pl. LXXXIX.
Diosaccus tenuicornis, (Claus).

Pl. XC.
Diosaccus tenuicornis, (Claus) (continued).

Pl. XCI.
Amphiascus cinctus, (Claus).

Pl. XCII.
Amphiascus cinctus, (Claus) (continued).

Pl. XCIII.
Amphiascus obscurus, G. O. Sars.

Pl. XCIV.
Amphiascus similis, (Claus).

Pl. XCV.
Amphiascus nasutus, Boeck.

Pl. XCVI.
Amphiascus minutus, (Claus).

Pl. XCVII.
Amphiascus varians, (Norm. & Scott) (see Supplmt.).

Pl. XCVIII.
Amphiascus Giesbrechti, G. O. Sars.

Pl. XCIX.
Amphiascus propinqvus, G. O. Sars.

Pl. C.
Amphiascus longirostris, (Claus).

Pl. CI.
Amphiascus longirostris, (Claus) (continued).

Pl. CII.
Amphiascus tenuiremis, (Brady).

Pl. CIII.
Amphiascus parvus, G. O. Sars.

Pl. CIV.
Amphiascus debilis, (Giesbr.).

Pl. CV.
Amphiascus pallidus, G. O. Sars.

Pl. CVI.
Amphiascus abyssi, (Boeck).

Pl. CVII.
Amphiascus hispidus, (Norm).

Pl. CVIII.
Amphiascus hispidus, (Norman) (continued).

Pl. CIX.
Amphiascus affinis, G. O. Sars.

Pl. CX.
Amphiascus intermedius, (Scott).

Pl. CXI.
Amphiascus typhlops, G. O. Sars.

Pl. CXII.
Amphiascus attenuatus, G. O. Sars.

Pl. CXIII.
Amphiascus phyllopus, G. O. Sars.

Pl. CXIV.
1. Amphiascus nanus, G. O. Sars.
2. — exiguus, G. O. Sars.

Pl. CXV.
Amphiascus Blanchardi, (Scott) (see Supplmt.).

Pl. CXVI.
Amphiascus tenellus, G. O. Sars.

Pl. CXVII.
Amphiascus linearis, G. O. Sars.

Pl. CXVIII.
Amphiascus sinuatus, G. O. Sars.

Pl. CXIX.
Stenhelia gibba, Boeck.

Pl. CXX.
1. Stenhelia gibba, Boeck (continued).
2. — proxima, G. O. Sars.

Pl. CXXI.
Stenhelia æmula, (Scott).

Pl. CXXII.
Stenhelia palustris, (Brady).

Pl. CXXIII.
Stenhelia reflexa, (Brady).

Pl. CXXIV.
1. Stenhelia Giesbrechti, (Scott).
2. — Normani, (Scott).

Pl. CXXV.
1. Stenhelia longicaudata, Boeck.
2. Stenheliopsis divaricata, G. O. Sars.

Pl. CXXVI.
Canthocamptus staphylinus, (Jurine).

Pl. CXXVII.
Canthocamptus staphylinus, (Jur.) (continued).

Pl. CXXVIII.
Canthocamptus minutus, Claus.

Pl. CXXIX.
Attheyella crassa, G. O. Sars.

Pl. CXXX.
Attheyella gracilis, G. O. Sars.

Pl CXXXI.
Attheyella pygmæa, G. O. Sars.

Pl. CXXXII.
Attheyella arctica, (Lilljeb.).

Pl. CXXXIII.
Attheyella Duthiei, (Scott).

Pl. CXXXIV.
Moraria brevipes, G. O. Sars.

Pl. CXXXV.
Mesochra Lilljeborgi, Boeck.

Pl. CXXXVI.
Mesochra pygmæa, (Claus).

Pl. CXXXVII.
Mesochra hirticornis, (Scott).

Pl. CXXXVIII.
Nitocra typica, Boeck.

Pl. CXXXIX.
Nitocra spinipes, Boeck.

Pl. CXL.
Ameira longipes, Boeck.

Pl. CXLI.
Ameira minuta, Boeck.

Pl. CXLII.
Ameira Scotti, G. O. Sars (see Supplmt.).

Pl CXLIII.
Ameira tau, (Giesbrecht).

Pl. CXLIV.
Ameira simplex, Norm. & Scott.

Pl. CXLV.
Ameira attenuata, Thomps. (see Supplmt.).

Pl. CXLVI.
Parameira parva, (Boeck).

Pl. CXLVII.
Parameira major, G. O. Sars.

Pl. CXLVIII.
Ameiropsis brevicornis, G. O. Sars.

Pl. CXLIX.
Ameiropsis longicornis, G. O. Sars.

Pl. CL.
Ameiropsis mixta, G. O. Sars.

Pl. CLI.
Stenocopia longicaudata, (Scott).

Pl. CLII.
Stenocopia longicaudata, (Scott) (continued).

Pl. CLIII.
Stenocopia setosa, G. O. Sars.

Pl. CLIV.
Stenocopia setosa, G. O. Sars (continued).

Pl. CLV.
Phyllopodopsyllus Bradyi, Scott.

Pl. CLVI.
1. Phyllopodopsyllus Bradyi, Scott (contin.).
2. — furcifer, G. O. Sars.

Pl. CLVII.
Laophonte cornuta, Philippi.

Pl. CLVIII.
Laophonte cornuta, Phil. (continued).

Pl. CLIX.
Laophonte serrata, (Claus).

Pl. CLX.
Laophonte depressa, Scott.

Pl. CLXI.
Laophonte thoracica, Boeck.

Pl. CLXII.
Laophonte elongata, Boeck.

Pl. CLXIII.
Laophonte typhlops, G. O. Sars.

Pl. CLXIV.
Laophonte longicaudata, Boeck.

Pl. CLXV.
Laophonte similis, (Claus).

Pl. CLXVI.
Laophonte horrida, Norm.

Pl. CLXVII.
Laophonte horrida, Norm. (continued).

Pl. CLXVIII.
Laophonte brevispinosa, G. O. Sars.

Pl. CLXIX.
Laophonte Koreni, Boeck.

Pl. CLXX.
Laophonte proxima, G. O. Sars.

Pl. CLXXI.
Laophonte Strömi, (Baird).

Pl. CLXXII.
Laophonte Strömi, (Baird) (continued).

Pl. CLXXIII.
Laophonte curticauda, Boeck.

Pl. CLXXIV.
Laophonte minuta, Boeck.

Pl. CLXXV.
Laophonte littoralis, Scott.

Pl. CLXXVI.
Laophonte brevirostris, (Claus).

Pl. CLXXVII.
Laophonte congenera, G. O. Sars.

Pl. CLXXVIII.
Laophonte perplexa, Scott.

Pl. CLXXIX.
Laophonte macera, G. O. Sars.

Pl. CLXXX.
Laophonte Nordgaardi, G. O. Sars.

Pl. CLXXXI.
Laophonte parvula, G. O. Sars.

Pl. CLXXXII.
Laophonte nana, G. O. Sars.

Pl. CLXXXIII.
Laophonte inopinata, Scott.

Pl. CLXXXIV.
Laophonte denticornis, Scott.

Pl. CLXXXV.
Laophontopsis lamellifera, (Claus).

Pl. CLXXXVI.
Asellopsis hispida, Brady.

Pl. CLXXXVII.
Laophontodes typicus, Scott.

Pl. CLXXXVIII.
Laophontodes bicornis, A. Scott.

Pl. CLXXXIX.
Laophontodes expansus, G. O. Sars.

Pl. CXC.
Platychelipus littoralis, Brady.

Pl. CXCI.
Platychelipus littoralis, Brady (continued).

Pl. CLCII.
Platychelipus laophontoides, G. O. Sars.

Pl. CXCIII.
Normanella minuta, (Boeck).

Pl. CXCIV.
1. Normanella tenuifurca, G. O. Sars.
2. — mucronata, G. O. Sars.

Pl. CXCV.
Cletodes limicola, Brady.

Pl. CXCVI.
1. Cletodes tenuipes, Scott.
2. — curvirostris, Scott.

Pl. CXCVII.
Cletodes longicaudatus, (Boeck).

Pl. XCVIII.
Cletodes Buchholtzi, Boeck.

Pl. CXCIX.
Orthopsyllus linearis, (Claus).

Pl. CC.
Mesocletodes irrasus, (Scott).

Pl. CCI.
Eurycletodes laticaudatus, (Boeck).

Pl. CCII.
Eurycletodes latus, (Scott).

Pl. CCIII.
Eurycletodes similis, (Scott).

Pl. CCIV.
Eurycletodes major, G. O. Sars.

Pl. CCV.
Enhydrosoma curticaudatum, Boeck.

Pl. CCVI.
1. Enhydrosoma propinqvum, (Brady).
2. — longifurcatum, G. O. Sars.

Pl. CCVII.
Rhizothrix curvata, Brady & Rob.

Pl. CCVIII.
Huntemannia jahdensis, Poppe.

Pl. CCIX.
Nannopus palustris, Brady.

Pl. CCX.
Pontopolites typicus, Scott.

Pl. CCXI.
Anchorabolus mirabilis, Norman.

Pl. CCXII.
Echinopsyllus Normani, G. O. Sars.

Pl. CCXIII.
Ceratonotus pectinatus, G. O. Sars.

Pl. CCXIV.
Arthropsyllus serratus, G. O. Sars.

Pl. CCXV.
Cylindropsyllus lævis, Brady.

Pl. CCXVI.
Stenocaris gracilis, G. O. Sars.

Pl. CCXVII.
D'Arcythompsonia fairliensis, Scott.

Pl. CCXVIII.
Tachidius brevicornis, Lilljeborg.

Pl. CCXIX.
Tachidius brevicornis, Lilljeb. (continued).

Pl. CCXX.
Pseudotachidius coronatus, Scott.

Pl. CCXXI.
Tachidiella minuta, G. O. Sars.

Pl. CCXXII.
Robertsonia tenuis Brady.

Pl. CCXXIII.
Danielssenia typica, Boeck.

Pl. CCXXIV.
Danielssenia fusiformis, (Brady).

Pl. CCXXV.
Psammis longisetosa, G. O. Sars.

Pl. CCXXVI.
Fultonia hirsuta, Scott.

Pl. CCXXVII.
Argestes mollis, G. O. Sars.

Pl. CCXXVIII.
Metis ignea, Philippi.

Pl. CCXXIX.
Balænophilus unisetis, Auriv.

Pl. CCXXX.
Balænophilus unisetis, Auriv. (continued).

Supplm. Pl. 1.
Cervinia Bradyi, Norman.

Supplm. Pl. 2.
1. Eucanuella spinifera, Scott.
2. Zosime typica, Boeck.

Supplm. Pl. 3.
Zosime incrassata, G. O. Sars.

Supplm. Pl. 4.
1. Pseudobradya hirsuta, (Scott).
2. — fusca, (Scott).

Supplm. Pl. 5.
Pseudobradya robusta, G. O. Sars.

Supplm. Pl. 6.
1. Pseudobradya elegans, (Scott).
2. Bradya armifera, (Scott).

Supplm. Pl. 7.
Ectinosomella nitidula, G. O. Sars.

Supplm. Pl. 8.
Harpacticus littoralis, G. O. Sars.

Supplm. Pl. 9.
1. Tegastes harpacticoides, (Claus).
2. — calcaratus, G. O. Sars.
3. — longimanus, (Claus).

Supplm. Pl. 10.
Idyæa tenella, G. O. Sars.

Supplm. Pl. 11.
1. Microthalestris littoralis, G. O. Sars.
2. Dactylopusia latipes, Boeck.

Supplm. Pl. 12.
Dactylopodopsis dilatata, G. O. Sars.

Supplm. Pl. 13.
1. Dactylopodella clypeata, G. O. Sars.
2. Idomene borealis, G. O. Sars.

Supplm. Pl. 14.
Idomenella coronata, Scott.

Supplm. Pl. 15.
Westwoodia monensis, (Brady).

Supplm. Pl. 16.
Amphiascus latifolius, G. O. Sars.

Supplm. Pl. 17.
Amphiascus thalestroides, G. O. Sars.

Supplm. Pl. 18.
Amphiascus denticulatus, (Thompson).

Supplm. Pl. 19.
1. Amphiascus Normani, G. O. Sars.
2. — amblyops, G. O. Sars.

Supplm. Pl. 20.
Amphiascus lagenirostris, G. O. Sars.

Supplm. Pl. 21.
1. Amphiascus nanoides, G. O. Sars.
2. — bulbifer, G. O. Sars.

Supplm. Pl. 22.
Amphiascus spinulosus, G. O. Sars.

Supplm. Pl. 23.
Amphiascus confusus. (Scott).

Supplm. Pl. 24.
1. Amphiascus typhloides. G. O. Sars
2. — lamellifer, G. O. Sars.

Supplm. Pl. 25.
1. Stenheliopsis latifurca, G. O. Sars.
2. — media. G. O. Sars.

Supplm. Pl. 26.
1. Mesochra exigua, G. O. Sars.
2. Nitocra pusilla, G. O. Sars.

Supplm. Pl. 27.
Ameira tenuicornis, Scott.

Supplm. Pl. 28.
Parameira propinqva, (Scott).

Supplm. Pl. 29.
Pseudameira crassicornis, G. O. Sars.

Supplm. Pl. 30.
Pseudameira furcata, G. O. Sars.

Supplm. Pl. 31.
Ameiropsis nobilis, G. O. Sars.

Supplm. Pl. 32.
Ameiropsis angulifera, G. O. Sars.

Supplm. Pl. 33.
Ameiropsis abbreviata, G. O. Sars.

Supplm. Pl. 34.
Stenocopia spinosa, (Scott).

Supplm. Pl. 35.
Malacopsyllus fragilis, G. O. Sars.

Supplm. Pl. 36.
Tetragoniceps Scotti, G. O. Sars.

Supplm. Pl. 37.
1. Tetragoniceps Scotti, G. O. Sars, (continued).
2. Phyllopodopsyllus Bradyi, Scott (male).

Supplm. Pl. 38.
Pteropsyllus consimilis, Scott.

Supplm. Pl. 39.
Evansia incerta, Scott.

Supplm. Pl. 40.
Leptastacus macronyx, Scott.

Supplm. Pl. 41.
Leptomesochra attenuata, (A. Scott).

Supplm. Pl. 42.
Leptomesochra tenuicornis, G. O. Sars.

Supplm. Pl. 43.
Leptomesochra confluens, G. O. Sars.

Supplm. Pl. 44.
Phyllocamptus minutus, G. O. Sars.

Supplm. Pl. 45.
Paramesochra dubia, Scott.

Supplm. Pl. 46.
Laophonte karmensis, G. O. Sars.

Supplm. Pl. 47.
Pseudolaophonte spinosa, (Thompson).

Supplm. Pl. 48.
Rhizothrix gracilis, (Scott).

Supplm. Pl. 49.
Anoplosoma sordidum, G. O. Sars.

Supplm. Pl. 50.
Stenocaris minor, (Scott).

Supplm. Pl. 51.
Tachidiopsis cyclopoides, G. O. Sars.

Supplm. Pl. 52.
Ectinosoma tenuireme, Scott.

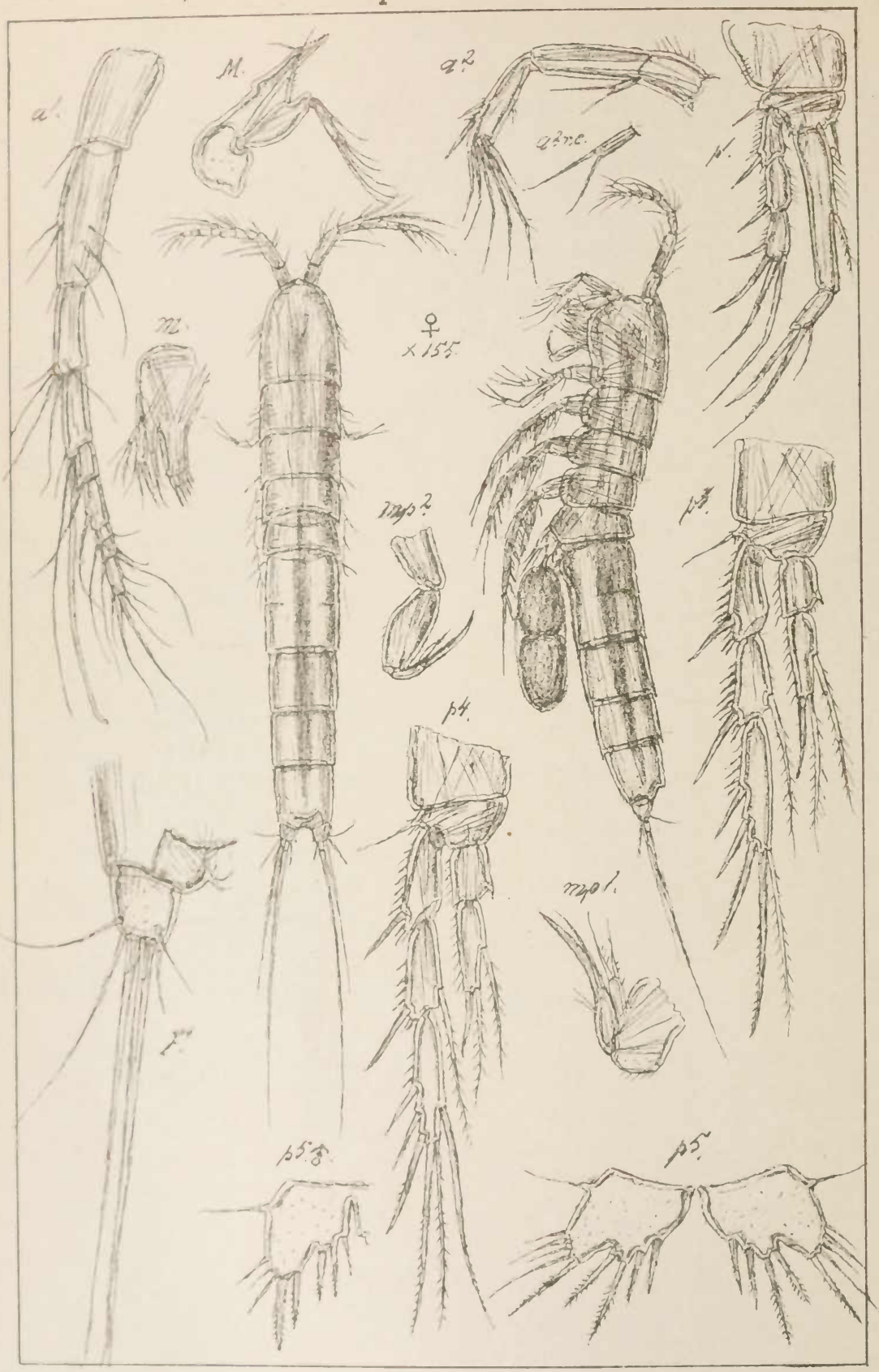
Supplm. Pl. 53.
Neobradya pectinifera, Scott.

Supplm. Pl. 54.
Amphiascus simulans, (Scott).

Copepoda

Canthocamptidæ Harpacticoida

Suppl. Pl. 43.



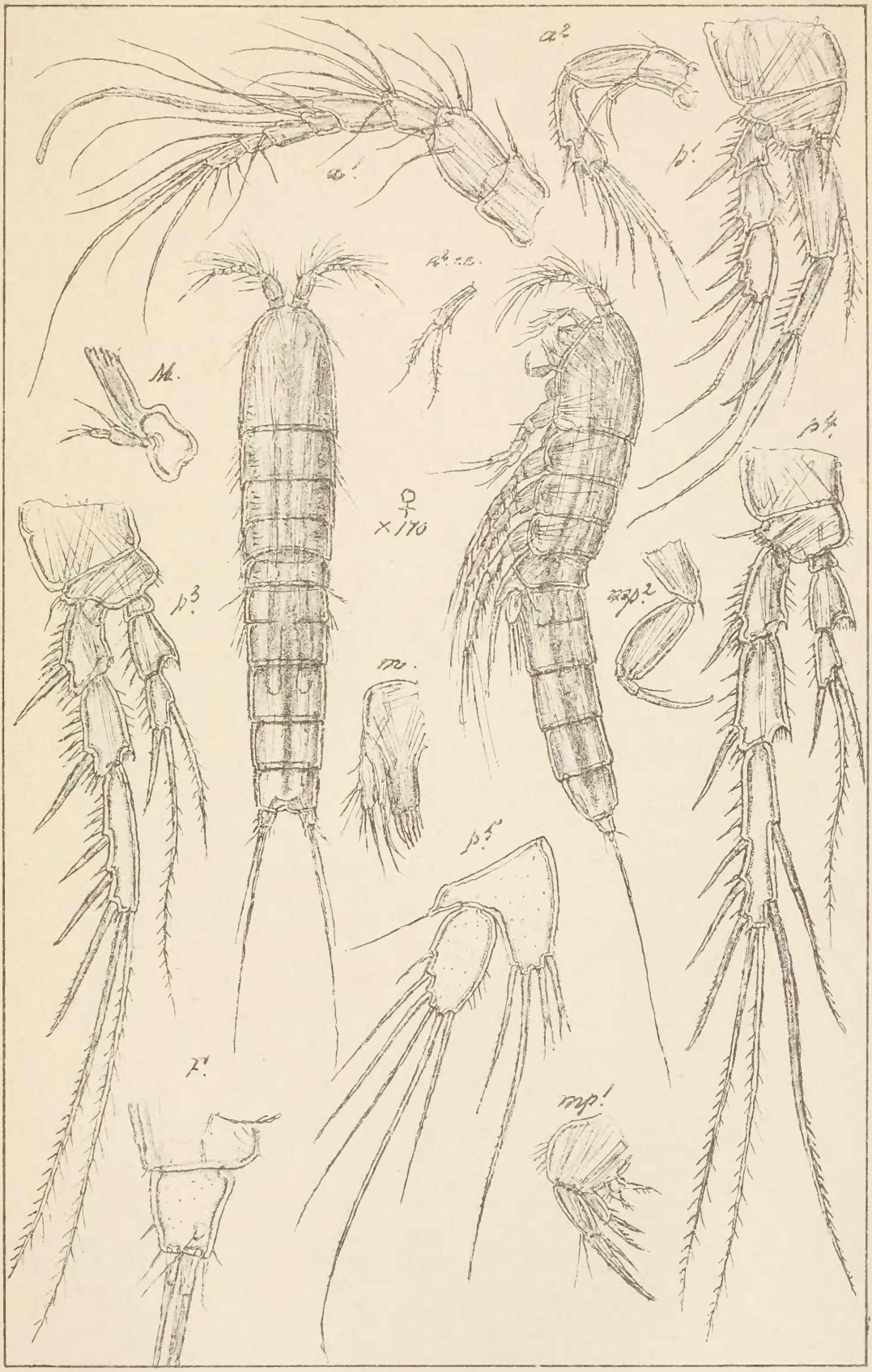
G.O. Sars, autogr.

Norsk Lithgr. Officin.

Leptomesochra confluens, G.O. Sars.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 44

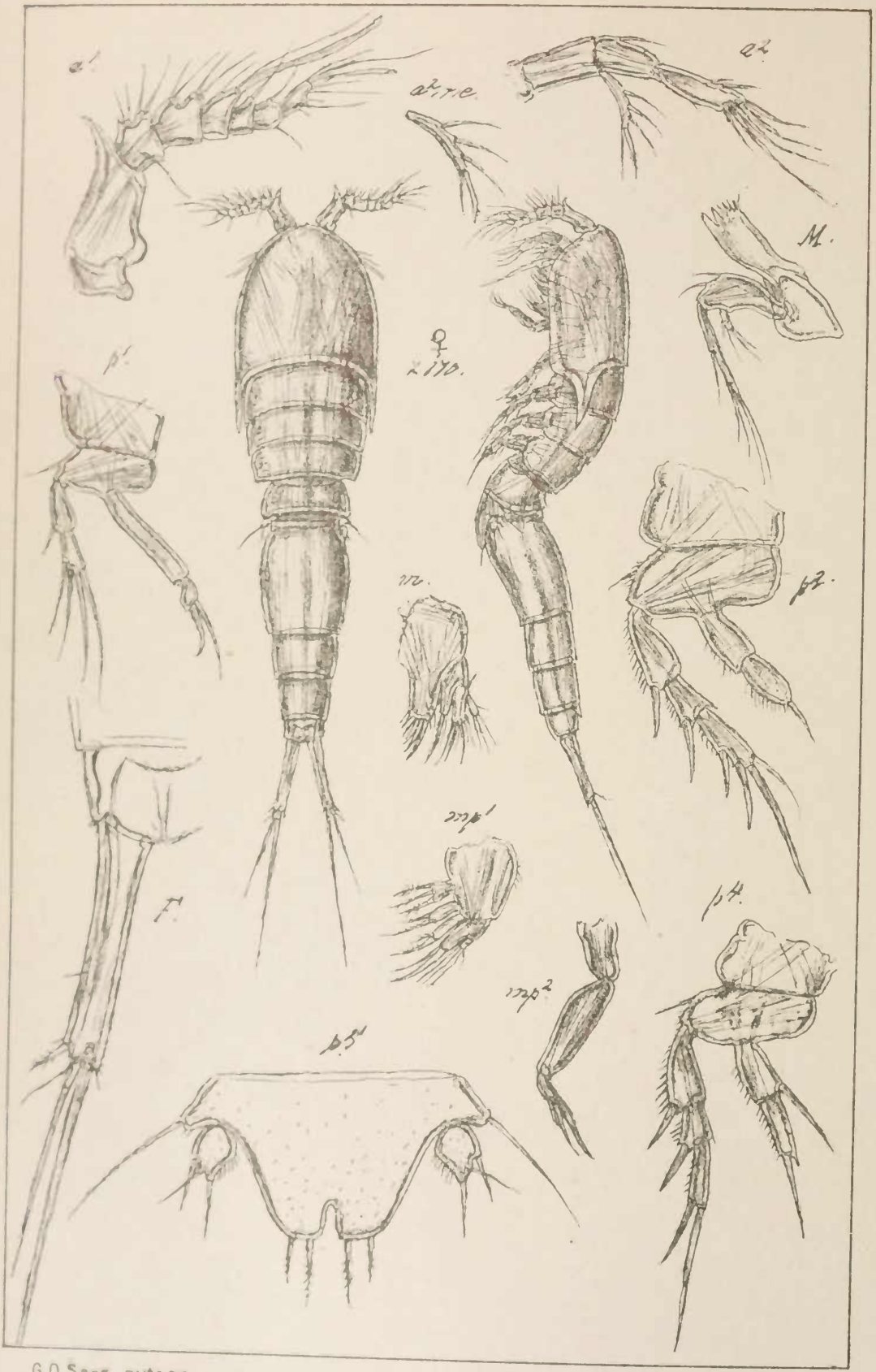


G.O.Sars, autogr. Norsk Lithgr. Officin.

Phyllocamptus minutus, G.O.Sars.

Copepoda

Canthocamptidæ Harpacticoida Suppl. Pl. 45.



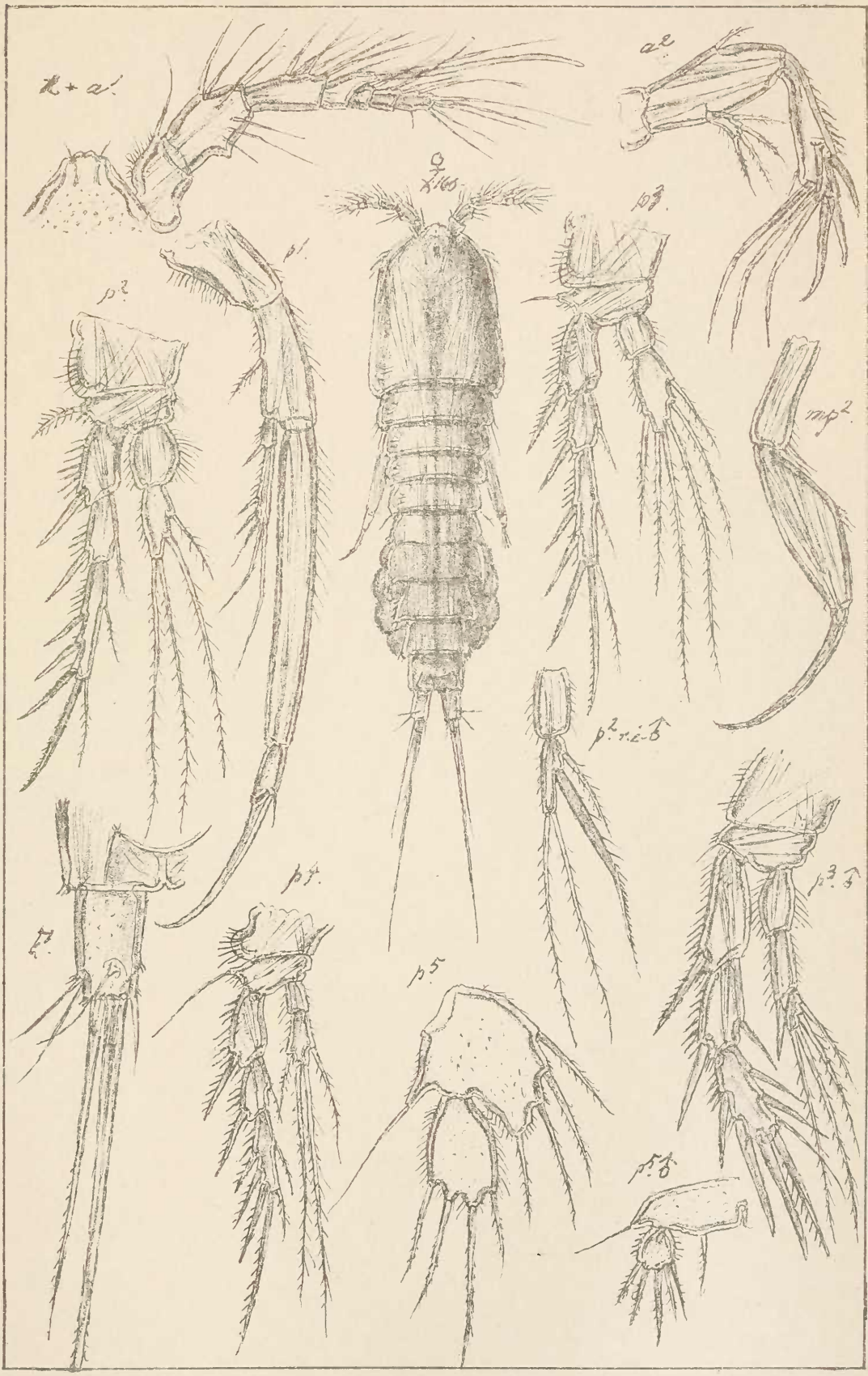
G.O. Sars, autogr.

Norsk Lithgr. Officin.

Paramesochra dubia, Scott.

Copepoda

Laophontidæ — Harpacticoida — Suppl. Pl. 46

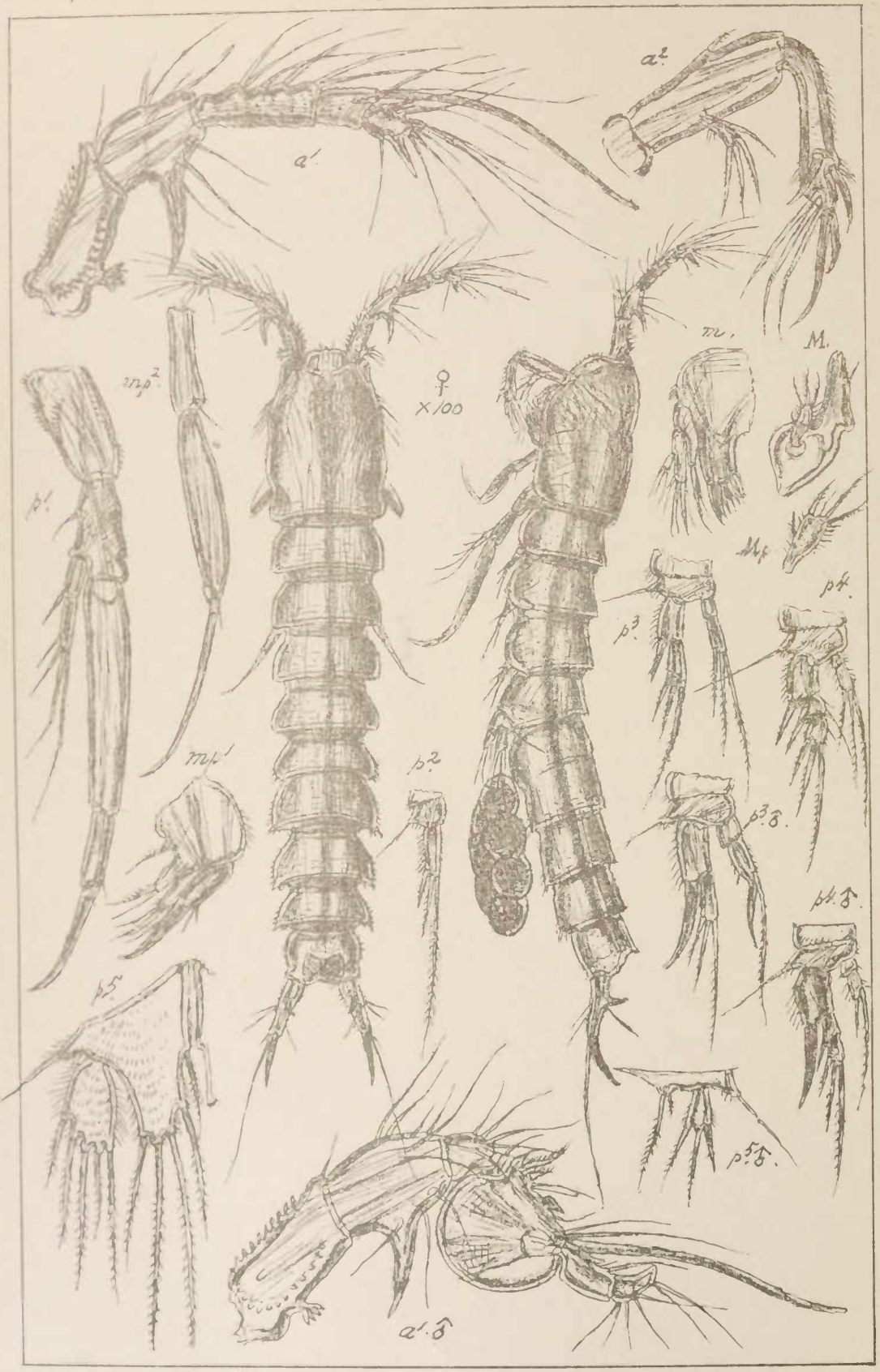


G.O.Sars, autogr. — Norsk Lithgr. Officin.

Laophonte karmensis, G.O.Sars.

Copepoda

Laophontidæ — Harpacticoida — Suppl. Pl. 47

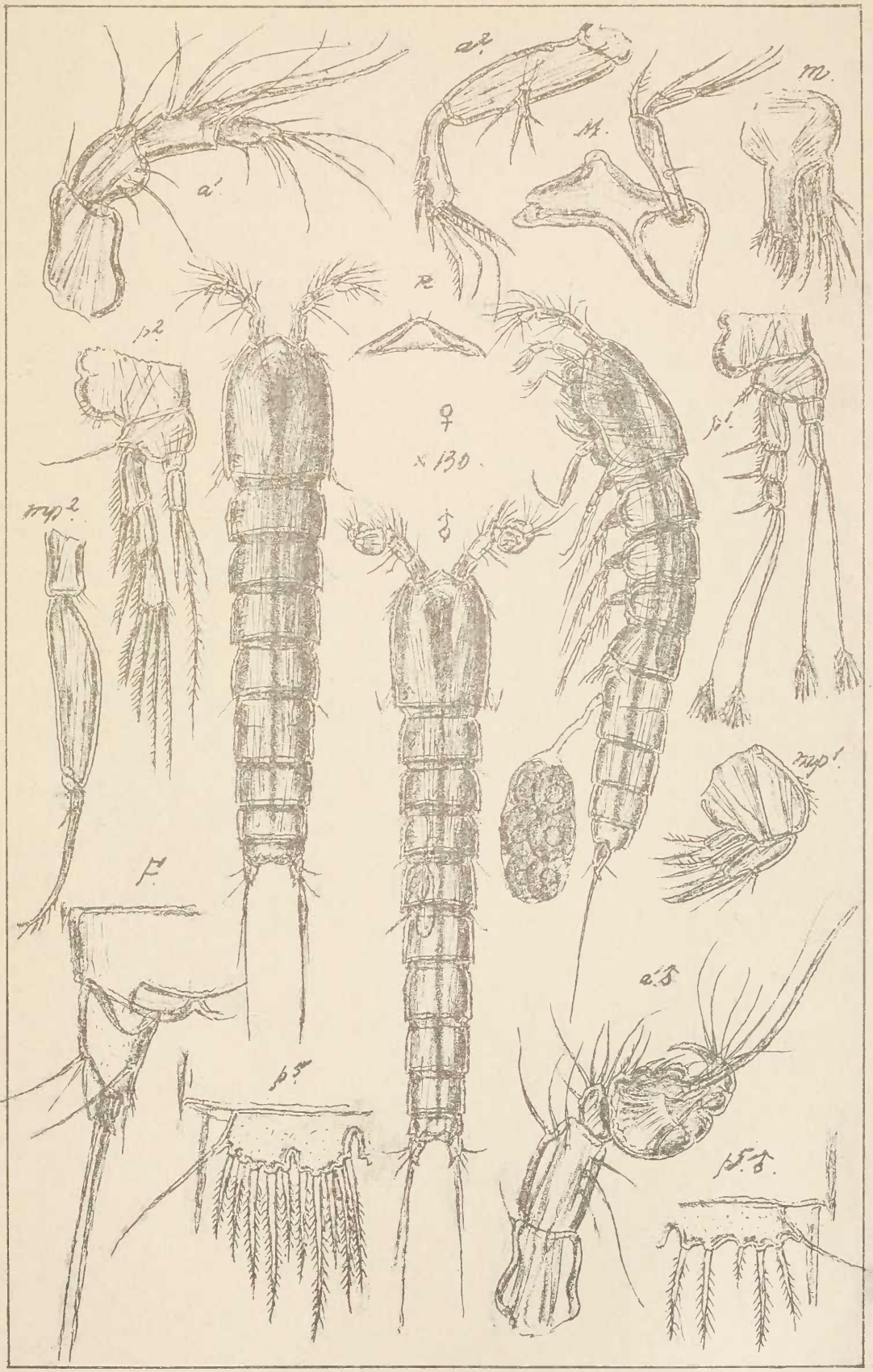


G.O. Sars, autogr. — Norsk Lithgr. Officin.

Pseudolaophonte spinosa, (Thomps)

Copepoda

Cletodidæ — Harpacticoida — Suppl. Pl. 48

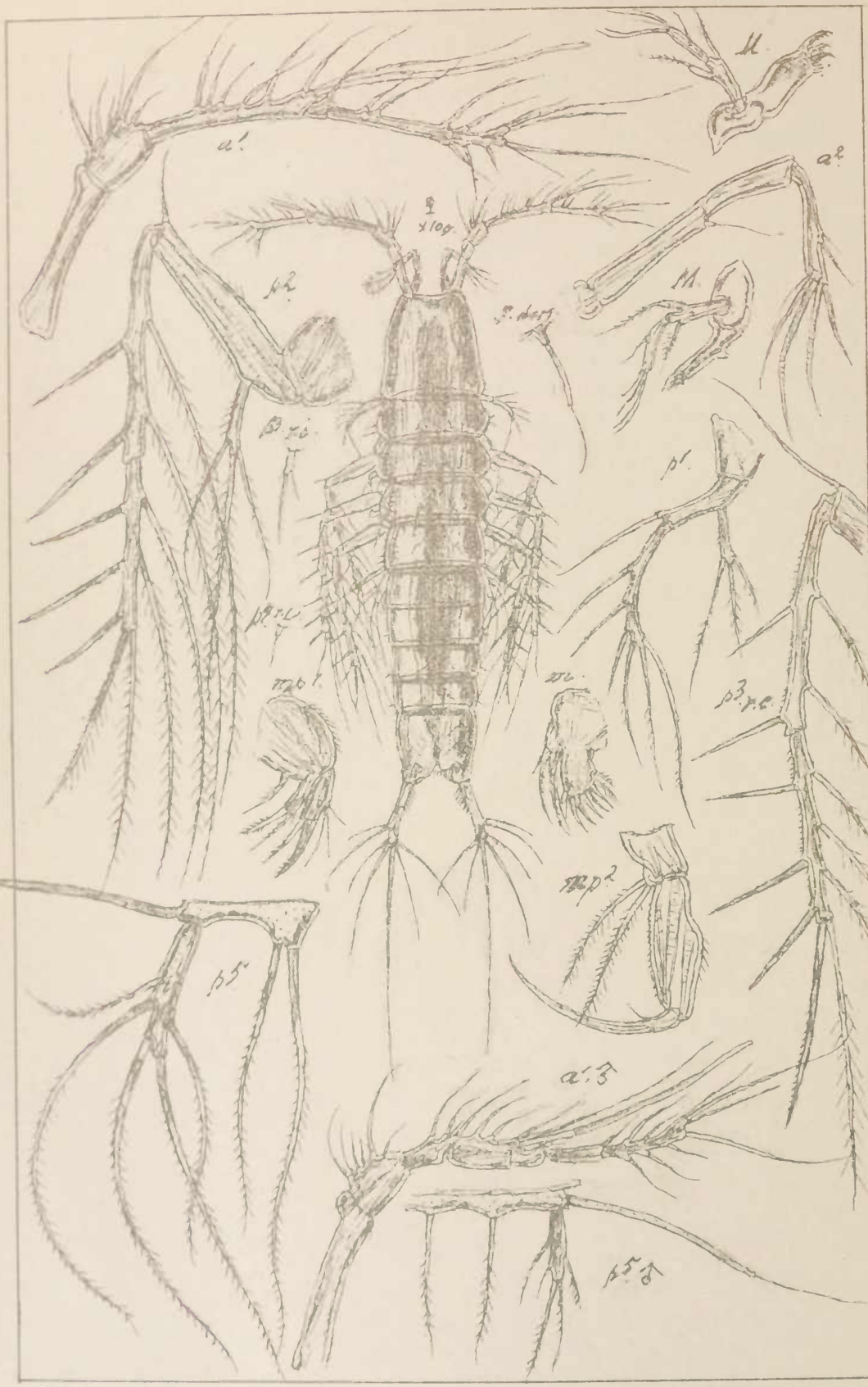


G.O.Sars, autogr. — Norsk Lithgr. Officin.

Rhizothrix gracilis, (Scott).

Copepoda

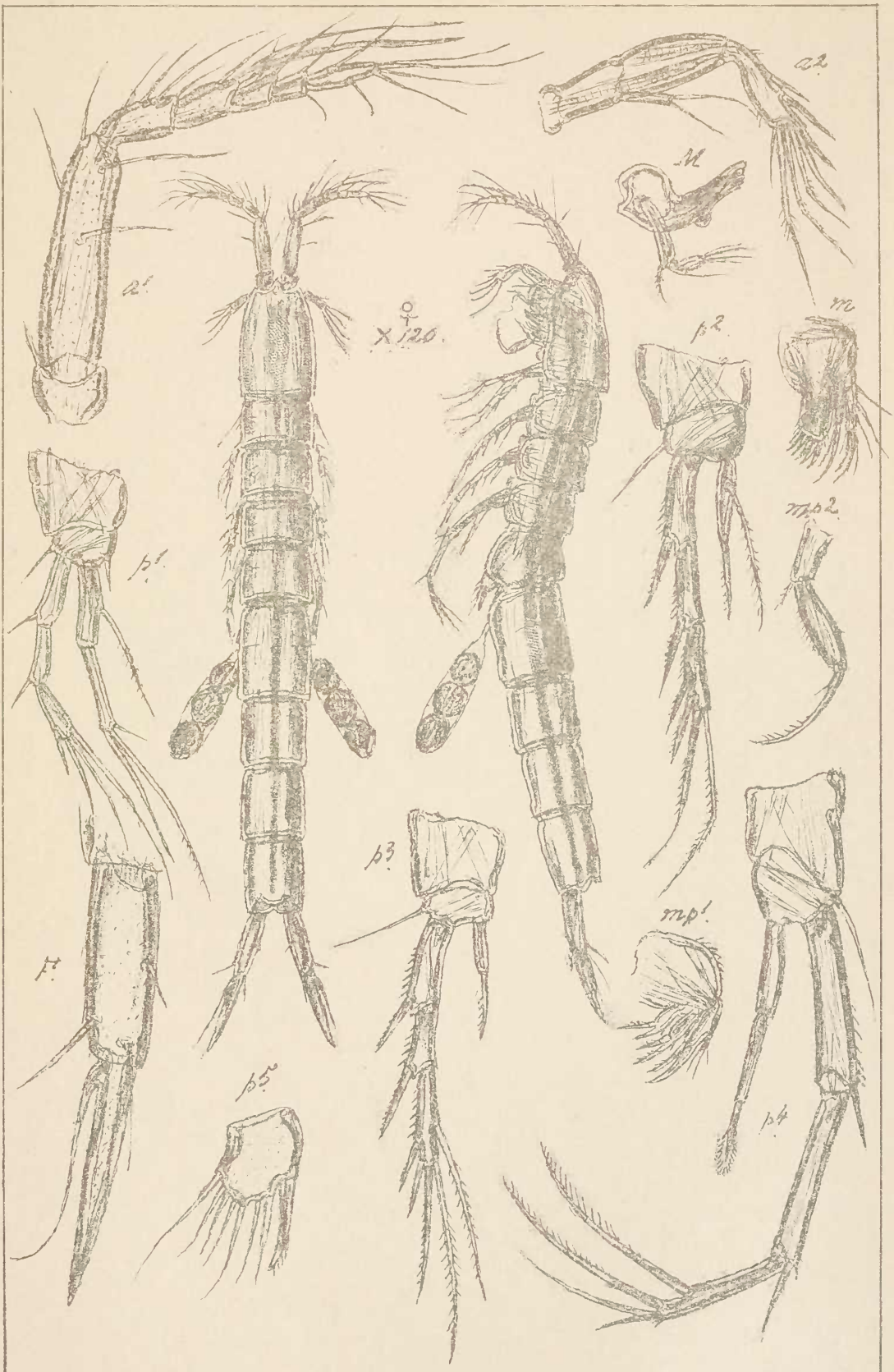
Anchorabolidæ Harpacticoida Suppl.Pl.49.



G.O.Sars, autogr. Norsk Lithgr. Officin.

Anoplosoma sordidum, G.O.Sars

Copepoda

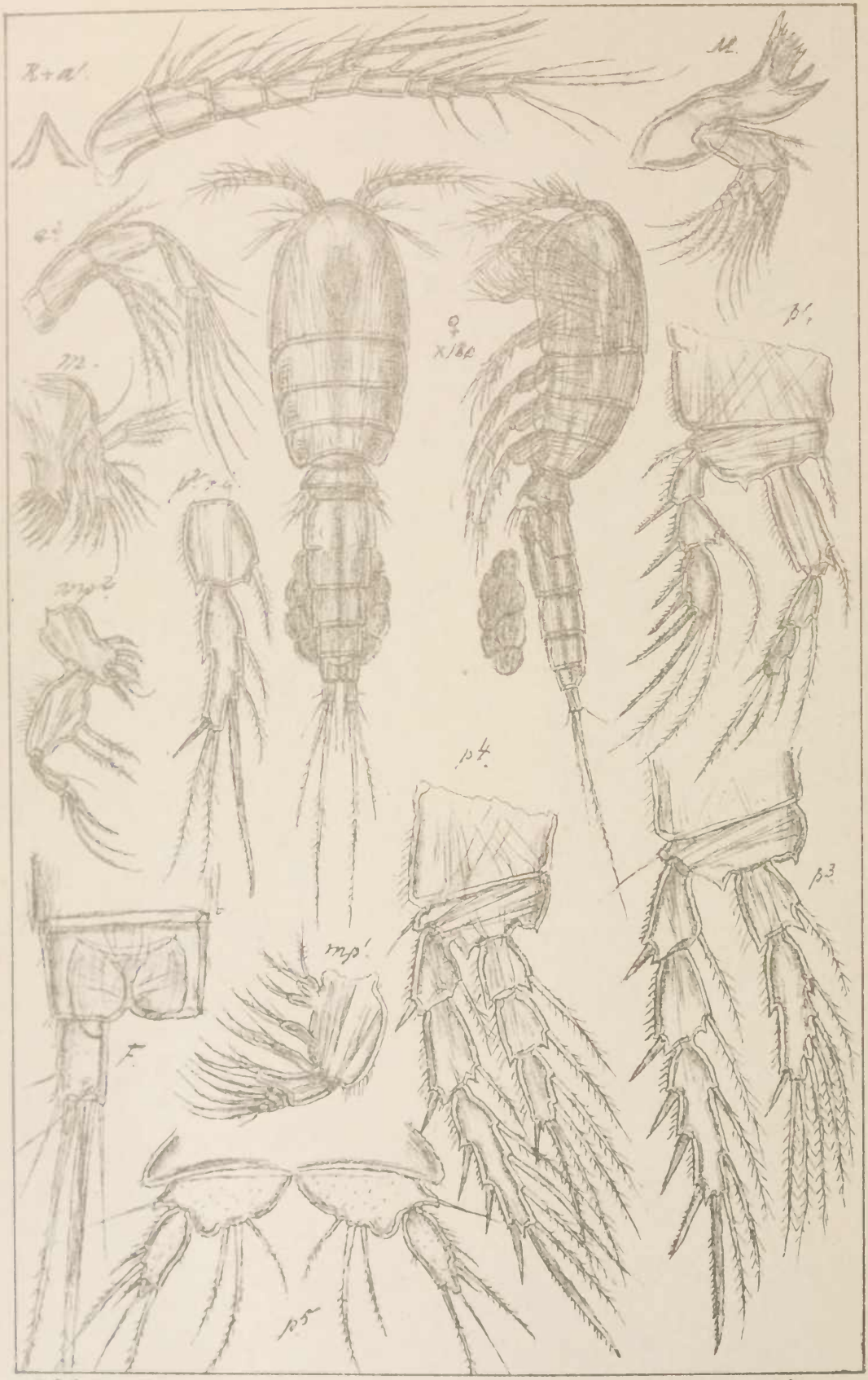


G.O.Sars, autogr. Norsk Lithgr. Officin.

Stenocaris minor, (Scott).

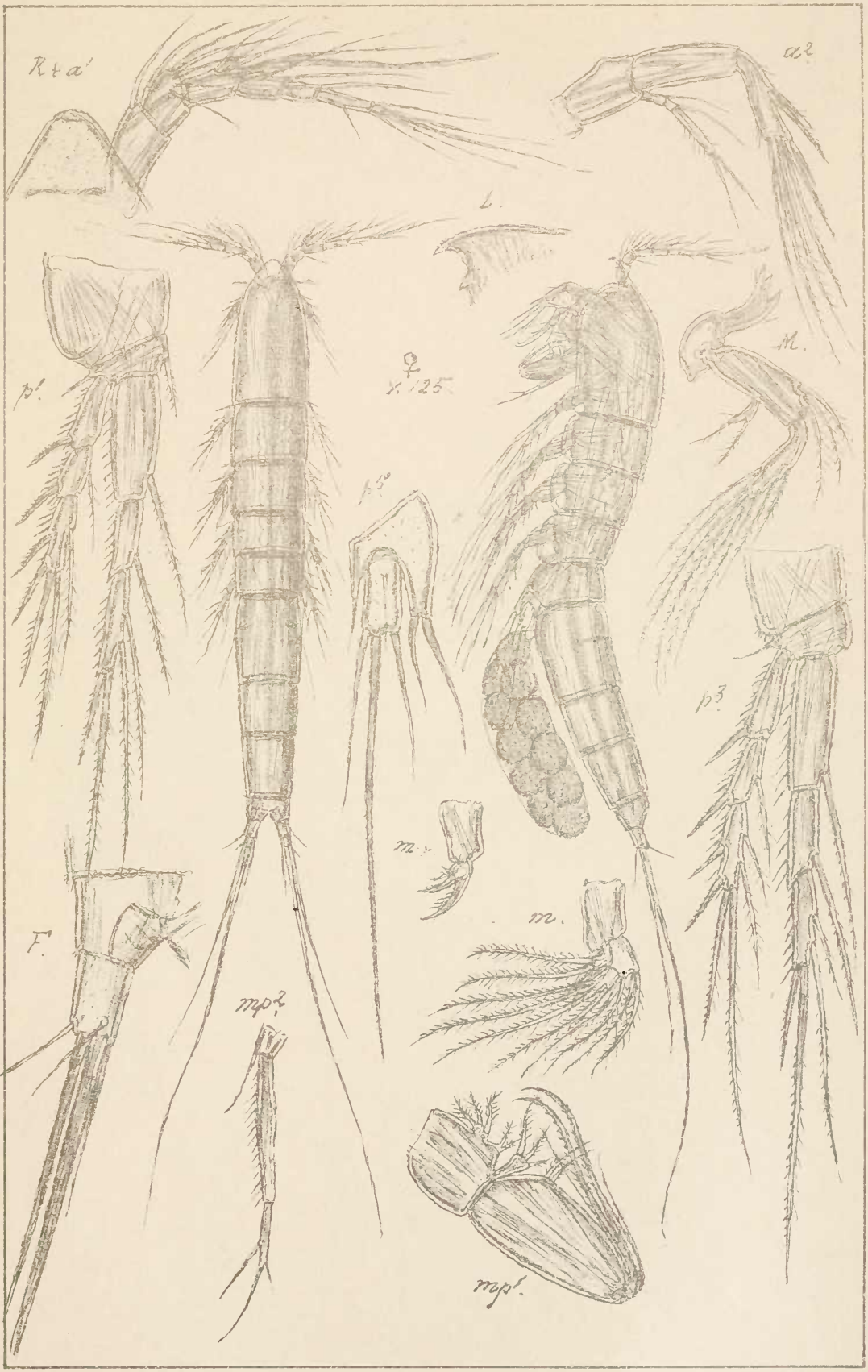
Copepoda

Tachidiidæ — Harpacticoida — Suppl. Pl. 51.



G.O.Sars, autogr. — Norsk Lithgr. Officin.

Tachidiopsis cyclopoides, G.O.Sars.

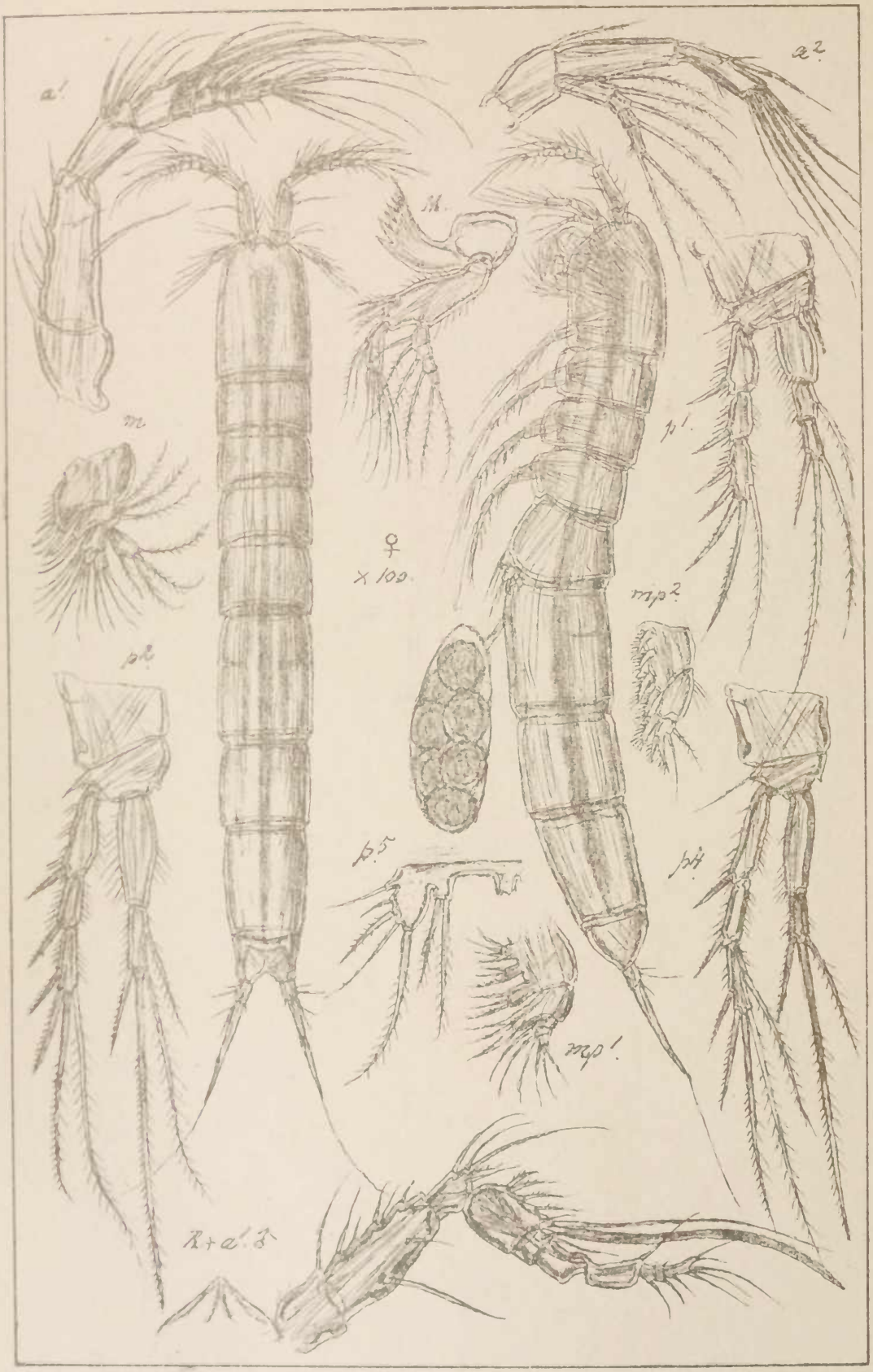


G.O. Sars, autogr. Norsk Lithgr. Officin.

Ectinosoma tenuireme, Scott.

Copepoda

Ectinosomidæ Harpacticoida Suppl. Pl. 53

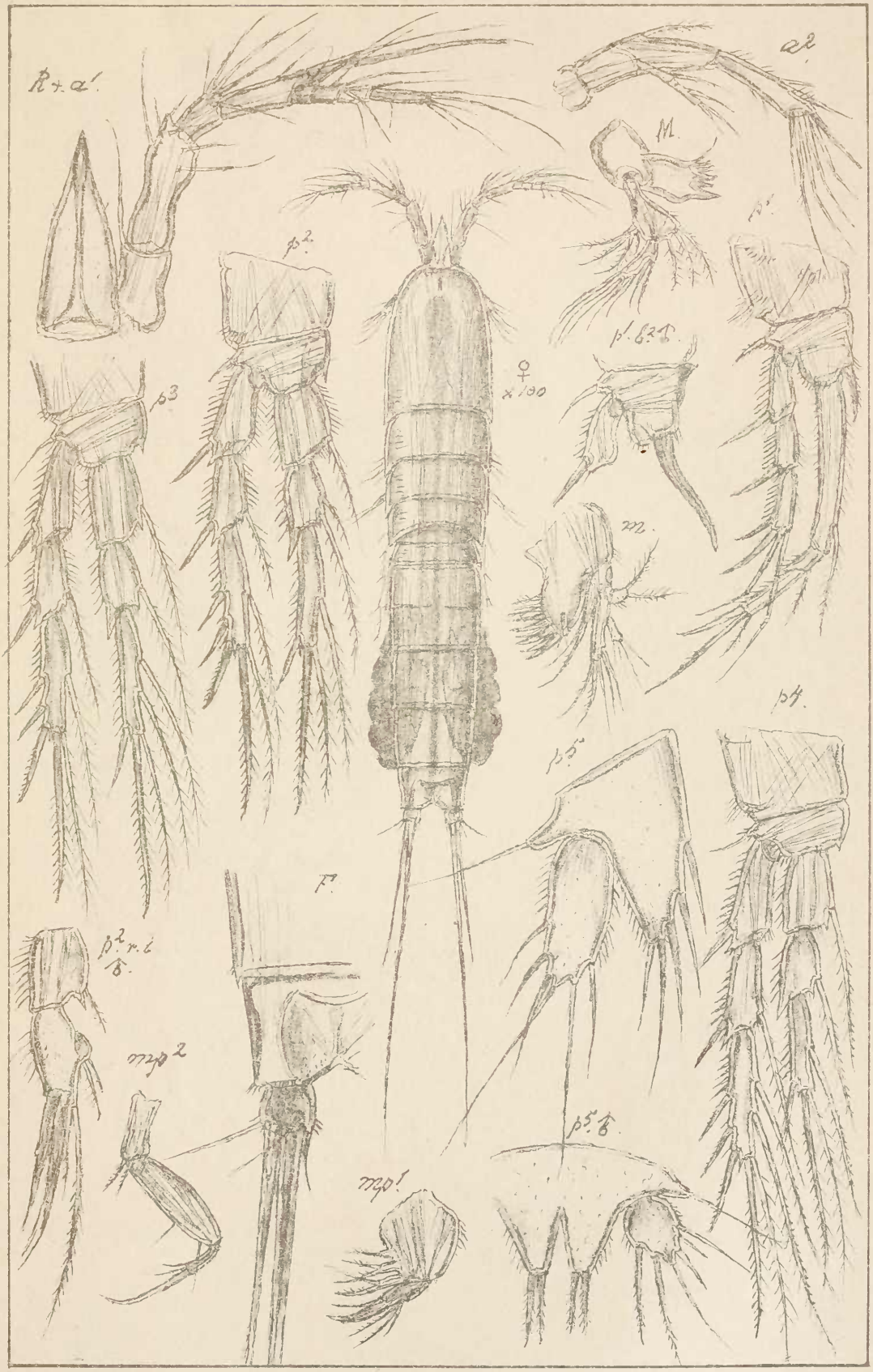


G.O. Sars, autogr. Norsk Lithgr. Officin.

Neobradya pectinifera, Scott.

Copepoda

Diosaccidæ — Harpacticoida — Suppl. Pl. 54



G.O. Sars', autogr. — Norsk Lithgr. Officin.

Amphiascus simulans, Scott.