

AN ACCOUNT
OF THE
CRUSTACEA
OF
NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY
G. O. SARS

VOL. IV
COPEPODA
CALANOIDA

PART V & VI
SCOLECITHRICIDÆ, DIAIXIDÆ, STEPHIDÆ, THARYBIDÆ,
PSEUDOCYCLOPIIDÆ

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM

SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1902

Fam. 8. Scolecithricidæ.

Characters.—Body of somewhat varying form, sometimes rather short and robust, sometimes more slender. Cephalosome coalesced with the 1st pedigerous segment, front carrying below 2 more or less distinct soft tentacular appendages. Last 2 segments of metasome generally united. Urosome, as a rule, short, 4-articulate in female, 5-articulate in male. Caudal rami short, with only 4 apical setæ. Eye small, simple. Anterior antennæ more or less slender, 19—23-articulate, with the outer 2 joints not distinctly defined; those in male transformed in the usual manner. Posterior antennæ with the outer ramus 6-articulate. Masticatory part of mandibles and maxillæ not very strong. Anterior maxillipeds comparatively small, with the setæ of the terminal part transformed to delicate sensory appendages, which are either all vermiform or some of them pedicellate, terminating in a knob-like dilatation. Posterior maxillipeds slender, with the terminal part reflexed. Oral parts in male more or less transformed. Natatory legs powerfully developed, and generally spinulose on the hind face, inner ramus of 1st pair uniaarticulate, of 2nd pair biarticulate, of 3rd and 4th pairs 3-articulate. 5th pair of legs sometimes wanting in female, but more frequently present, though of rather simple structure; those in male comparatively slender and rather asymmetrical.

Remarks.—In this family I propose to comprise the several forms referred by other authors to the genus *Scolecithrix* of Brady. There cannot, in my opinion, be any doubt that some at least of these forms ought to be generically separated from each other, as they differ in several very essential characters, e. g. in the presence or absence of the last pair of legs in the female, and in the structure of these legs in the male. Another character has been called attention to by Mr. Th. Scott, viz., the different development of the terminal appendages to the anterior maxillipeds. I think we must admit at least 4 different genera, viz., *Scolecithrix*, Brady; *Lophothrix*, Giesbrecht; *Amalophora*, Scott, and *Scolecithri-cellæ*, G. O. Sars. Of these genera, only the 2 last-mentioned are represented in the fauna of Norway.

Gen. 13. **Amalophora**, Scott, 1894.Syn: *Scolecithrix*, Giesbrecht (part)." *Scaphocalanus*, G. O. Sars.

Generic Characters.—Body more or less slender, and of very different appearance in the two sexes. Cephalosome in female attenuated anteriorly, and sometimes exhibiting in front a distinct crest wholly wanting in male; rostral prominence very small and undivided, tentacular appendages exceedingly delicate and filiform. Last segment of metasome united with the preceding one. Urosome less abbreviated than in most other forms, genital segment in female comparatively short and scarcely at all protuberant below, caudal setæ rather unequal, the innermost but one being much longer than the others. Anterior antennæ in female consisting of 23 articulations, of which the first 2 are unusually large and sharply marked off from the succeeding ones; those in male rather slender and angularly curved in the middle, with some of the articulations coalesced. Posterior antennæ with both rami slender and elongated, especially the inner one. Mandibles with the 3 outer denticles of the cutting edge of the same appearance, bidentate, palp with the outer ramus exceedingly large, inner comparatively small. Anterior maxillipeds with the 3 outer appendages of the terminal part vermiform, the remaining 5 shorter and each terminating in a bud-like dilatation (amallæ). Oral parts in male considerably transformed. 1st pair of natatory legs comparatively small, the succeeding ones very powerfully developed, with the inner ramus coarsely spinulose on the hind face; terminal spine of outer ramus strong, serrate outside. Last pair of legs in female distinctly developed, biarticulate or imperfectly triarticulate, last joint fusiform, with a slender denticulated spine inside, a very short one outside, and a somewhat longer one at the tip; those in male not very large, and rather asymmetrical, right leg with the 2nd basal joint greatly tumefied in its proximal part, and carrying inside a styliform appendage (inner ramus), its distal part attenuated and carrying at the tip a comparatively short 3-articulate appendage (outer ramus); left leg with the 2nd basal joint narrow cylindric, terminating in 2 subequal 3-articulate rami.

Remarks.—In the year 1894, the well-known Scotch naturalist, Th. Scott, published a most interesting Report on the Entomostraca collected during the expedition of the Telegraph Steamer "Buccaneer" in the gulf of Guinea. Among the numerous forms of Calanoids procured, there were some species, which, though on the whole exhibiting the characters of the genus *Scolecithrix* of Brady, differed very conspicuously in the peculiar transformation of some of the terminal

appendages to the anterior maxillipeds. These species were comprised within a particular sub-genus, to which the above-mentioned name was assigned. In my opinion, this sub-genus ought certainly to be raised to the rank of a true genus, as it also exhibits in several other respects well-marked differences from the type of the genus *Scolecithrix*, *S. danae* (Lubbock). One of the species included in this genus, viz., *A. typica*, Scott, has since been removed by Dr. Giesbrecht, who considers it to be the male of a species of the genus *Xanthocalanus*. The other 3 species are, however, undoubtedly congeneric, and one of them, *A. magna*, Scott, I now consider to be identical with the form I have described from Nansen's Polar Expedition as *Scaphocalanus acrocephalus*. Another polar form, likewise described in my Account of the Crustacea of that Expedition, viz., *Scolecithrix brevicornis*, has turned out, on a closer examination, to belong to the same genus. According to more recent investigations, both these forms are referable to the fauna of Norway, and they will therefore be described below.

21. *Amalophora magna*, Scott.

(Pl. XXXIV & XXXV).

Amalophora magna, Th. Scott. Report on Entomostraca from the Gulf of Guinea. Transact. Linn. Soc. London, Vol. IV, Part I, p. 55, Pl. IV, figs. 5—9.

Syn: *Scolecithrix cristata* Giesbrecht.

" *Scaphocalanus acrocephalus*, G. O. Sars.

Specific Characters.—*Female.* Body moderately slender, with the anterior division pronouncedly navicular in form, being gradually attenuated anteriorly; combined cephalosome and 1st pedigerous segment occupying fully half the length of the entire body. Frontal part, seen laterally, narrowly rounded and surmounted by a very distinct, helmet-shaped crest. Lateral parts of last segment of metasome slightly angular below. Urosome equalling in length about $\frac{1}{3}$ of the anterior division, genital segment scarcely longer than the succeeding one. Caudal rami very short, about as long as they are broad, apical setæ much elongated, especially the innermost but one. Eye apparently very small. Anterior antennæ, when reflexed, reaching about to the end of the anterior division. Anterior maxillipeds with the pedicellated terminal appendages comparatively small. Last pair of legs imperfectly 3-articulate, middle joint very small and not distinctly defined from the terminal one.

Male rather more slender in form than female, frontal part somewhat abruptly contracted, but without any trace of a crest. Last segment of metasome with the lateral parts rounded off. Urosome considerably longer than in female,

exceeding half the length of the anterior division, genital segment very short, 2nd segment large and tumid, 5th segment very small; caudal rami mobile and generally spread out. Anterior antennæ with well-marked, band-like, sensory appendages on the proximal part, 8th joint about the length of the 4 preceding ones, and composed of several coalesced articulations, outer half of the antennæ very slender. Last pair of legs, when reflexed, scarcely reaching beyond the middle of the urosome; both legs of about the same length, rami of the left one nearly as long as the 2nd basal joint, and slightly incurved.

Colour not yet ascertained.

Length of adult female about 5 mm., of male $4\frac{1}{2}$ mm.

Remarks.—This form was first described by Th. Scott from a solitary, somewhat defective female specimen, found in a plankton-sample taken off the São Thomé Islands in the Gulf of Guinea. Apparently the same species was recorded the following year by Dr. Giesbrecht from the Pacific, under the name of *Scolecithrix cristata*. Neither of these statements had come under my notice when I was examining the plankton-material from Nansen's Polar Expedition. Indeed, I could not, at that time, have imagined, that any of the polar forms were to be sought for among species collected in the tropical parts of the ocean. Recent investigations have, however, proved that pelagic organisms may occasionally be carried far from their true home by submarine currents; and therefore a thorough acquaintance with those from other tracts of the oceans is indispensable in the determination of such organisms. I cannot, indeed, find any essential difference between the northern form and those observed by Th. Scott and Dr. Giesbrecht; and I am therefore inclined to believe that all these 3 forms belong to one and the same species, in spite of their widely remote occurrence.

The present species may be easily recognised, at any rate in the female sex, by the peculiar, helmet-shaped crest on the frontal part. The caudal setæ are very brittle, and it is rather unusual to meet with a specimen having them all uninjured. In the specimen examined by Th. Scott they were all broken at the base, and in the greater number of specimens collected during Nansen's Polar Expedition, they were also more or less defective. It is owing to this circumstance that they have not been correctly figured in my account of that Expedition. I have subsequently convinced myself that, as in other *Scolecithricidæ*, only 4 such setæ in reality occur on each caudal ramus, the 5th (outermost one) only being present in quite a rudimentary condition, as a minute hair. The extremely delicate terminal appendages of the anterior maxillipeds are also easily damaged, and their peculiar structure was not clearly seen in the polar specimens at first examined.

Occurrence.—This handsome Calanoid, which is undoubtedly of true arctic origin, has recently been stated by Mr. O. Nordgaard to occur off the Norwegian coast, he having found some specimens, together with other relict arctic forms, in the Herlø Fjord near Bergen, at a depth of about 400 metres. I have myself found it occasionally in 2 different plankton-samples taken during the cruise of the "Michael Sars" in 1900, the one from Stat. 9, located at some distance north of the Shetland Islands, the other from Stat. 34, east of Jan Mayen, the depth being recorded to be from 200 to 1000 metres.

Distribution.—Gulf of Guinea (Scott), Pacific in 35° N. Lat., 125° W. Long. (Giesbrecht), Polar basin crossed by Nansen, in many places rather abundant up to the very surface of the sea.

22. *Amalophora brevicornis*, G. O. Sars.

(Pl. XXXVI).

Scolecithrix brevicornis, G. O. Sars. The Norwegian North Polar Expedition. Crustacea, p. 46, Pl. X.

Specific Characters.—*Female*. Body rather shorter and more robust in form than in the preceding species, being less attenuated anteriorly, frontal part obtusely rounded, and without any trace of a crest. Last segment of metasome with the lateral parts angularly produced. Urosome comparatively slender, somewhat exceeding $\frac{1}{3}$ of the length of the anterior division. Caudal rami about twice as long as they are broad, apical setæ less elongated than in *A. magna*. Anterior antennæ comparatively short, not nearly attaining the length of the anterior division, but otherwise agreeing in structure with those in *A. magna*. Posterior antennæ likewise of a very similar appearance. Pedicellated sensory appendages of anterior maxillipeds comparatively larger, and curved in different directions. Natatory legs very powerfully developed, and of almost exactly the same structure as in *A. magna*. Last pair of legs likewise rather similar, though comparatively smaller, and each only composed of 2 joints.

Male unknown.

Colour not yet ascertained.

Length of adult female not quite 2 mm.

Remarks.—This form, first described by the present author from Nansen's Polar Expedition, was at that time erroneously referred to the genus *Scolecithrix* of Brady. On a closer examination, I have now convinced myself that it ought really to be included in the genus *Amalophora* of Scott, as the terminal appendages of the anterior maxillipeds exhibit the peculiar structure charac-

teristic of that genus, and as also a great similarity in the structure of the various other limbs is found to exist between this and the preceding species. This form, however, exhibits a rather different external appearance owing to the less pronounced navicular form of the anterior division of the body, the complete absence of any frontal crest, and the shortness of the anterior antennæ. It is also of far inferior size.

Occurrence.—A solitary, but well preserved, female specimen (the one here figured) of this arctic form was found in a plankton-sample taken during the cruise of the "Michael Sars" in 1900, at Stat. 34. As this Station is located within the limits of the Norwegian Sea, the present Calanoid may properly be included in the fauna of Norway.

Distribution.—Polar basin crossed by Nansen, in one place, north of 81° of latitude.

Gen. 14. **Scolecithricella**, G. O. Sars, n.

Syn: *Scolecithrix*, auctorum (part).

Generic Characters.—Body not very dissimilar in the two sexes, and of comparatively short and robust form, with the anterior division more or less strongly vaulted above, and very smooth, without any crest in front. Rostral prominence bifurcate, each half tipped with a short, soft lappet. Last segment of metasome united with the preceding one, and having the lateral parts rounded off. Urosome comparatively small, especially in female. Caudal setæ not much elongated, and subequal. Anterior antennæ in female rather slender, 22-articulate, the last 2 joints being confluent, in male transformed in the usual manner. Posterior antennæ with the outer ramus longer than the inner. Mandibles with the masticatory part but slightly expanded, inner ramus of palp well developed, though smaller than the outer. Maxillæ and posterior maxillipeds about as in *Amallophora*. Anterior maxillipeds, however, with all the terminal appendages of the same appearance, vermiform. Oral parts in male slightly transformed. Natatory legs remarkably elongated, resembling in structure those in *Amallophora*; terminal spine of outer ramus, however, not serrate, but very minutely denticulated outside. Last pair of legs present in both sexes, in female very small, uniarticulate, lamellar, with 2 comparatively short spines inside the tip; in male considerably produced, right leg the longer and carrying at the end of the 2nd joint a styliform appendage, left leg simple, with the 1st joint conspicuously dilated distally.

Remarks.—I have felt justified in establishing this new genus to include a number of species previously referred to the genus *Scolecithrix* of Brady, but, like *Amalophora*, differing materially from the type of this genus, *S. danae* (Lubbock), in the presence in the female of a 5th pair of distinct, though small legs. This genus differs from *Amalophora* in the structure of these legs in both sexes, as also in the uniform appearance of the terminal appendages of the anterior maxillipeds, these being all vermiform as in *Scolecithrix*. The type of this genus is *S. minor* of Brady, a species which seems to have a very wide distribution, and also belongs to the Norwegian fauna. In addition to this, the following Mediterranean species, recorded by Dr. Giesbrecht, are in all probability referable to the same genus, viz. *S. vittata*, *tenuiserrata*, *profunda*, *longipes*, *abyssalis*, *dubia*, *dentata*, *marginata*, *longifurca*. In the Northern Ocean, only the type species is represented.

23. *Scolecithricella minor* (Brady).

(Pl. XXXVII & XXXVIII).

Scolecithrix minor, Brady, Report on the Copepoda of the Challenger Expedition, p. 58, Pl. XVI, figs. 15, 16; Pl. XVII, figs. 1—5.

Specific Characters.—*Female.* Anterior division of body, seen dorsally, oblong oval in form, greatest width but slightly exceeding $\frac{1}{3}$ of the length, anterior extremity narrowly rounded, posterior somewhat contracted; seen laterally, gently vaulted above and obtusely truncated anteriorly, the dorsal margin forming a remarkably bold curvature in front. Last segment of metasome with the lateral parts somewhat lamellar, forming an obtuse corner below. Urosome unusually small and narrow, only slightly exceeding $\frac{1}{4}$ of the length of the anterior division, genital segment constricted at the base and not at all protuberant below. Caudal rami comparatively short and somewhat divergent, with all the apical setæ of the same length. Eye very small, subventral. Anterior antennæ moderately slender, reaching, when reflexed, about to the end of the anterior division of the body, the first 2 articulations not distinctly defined. 2nd and 3rd pairs of natatory legs with scattered spinules on the hind face of both rami; 4th pair without such spinules. Last pair of legs forming each a broadly oval lamella armed inside the tip with 2 unequal spines, the distal one very small, the proximal one about half the length of the lamella, outer edge with a small ledge at about the middle.

Male resembling the female both in size and general form, though having the urosome more elongated and, as usual, 5-articulate, last segment very short. Caudal rami comparatively shorter than in female and mobile. Anterior antennæ with well-marked, band-like, sensory appendages on the proximal part, and angularly

curved in the middle, number of articulations considerably reduced. Last pair of legs very slender, reaching beyond the tip of the urosome, terminal joint of right leg bayonet-shaped, that of left leg transformed to a thin oblong lamella.

Colour. Body in both sexes highly pellucid, and almost without any pigment; natatory legs, however, generally tinged with yellow.

Length of adult female 1.40 mm., of male about the same.

Remarks.—I have been in some doubt about the identification of this form, chiefly because Prof. Brady describes the 5th pair of legs in the female as 3-articulate. I think, however, that this must be due to a mistake, and that in all probability the legs figured do not belong to a female specimen, but more properly to an immature male. Otherwise the figures given agree pretty well with the present form, the peculiar bayonet-shaped appearance of the terminal joint of the right last leg in the adult male being exactly alike in the 2 forms.

Occurrence.—I have met with this form occasionally along the greater part of the Norwegian coast, from the Christiania Fjord northwards at least to the Lofoten Islands. It has also recently been found, though rather sparingly, in some of the plankton-samples taken in the open sea during the cruise of the "Michael Sars" in 1900. In its habits this Calanoid is a true pelagic form, often occurring close to the surface of the sea.

Distribution.—North Atlantic Ocean (Brady), Gulf of Guinea (Scott), Indian Ocean (Giesbrecht).

Section 2.

Isokerandria.

This new section is established to comprise a number of Calanoids which are distinguished from those belonging to the 2 sections recorded by Dr. Giesbrecht (*Amphascandria* and *Heterarthrandria*) by the fact, that the anterior antennæ do not exhibit any conspicuous difference in the two sexes, and that the oral parts, as a rule, are also of much the same appearance in the male and the female. The hitherto known forms belonging to this section had previously been referred partly to the *Scolecithricidæ*, partly to the *Pseudocalanidæ*, and partly to

the *Misophridae*. I think, however, that at any rate some of these forms ought to be regarded as types of particular families. 4 such families are here established, each as yet containing only a very limited number of genera. It is however very probable that the number of genera will be considerably increased in the future; for, owing to the peculiar habits of these Calanoids, our knowledge of the existing forms is certainly still very imperfect. They all agree in being pronounced bottom-forms, and cannot of course be captured in the ordinary tow-net, but only by the aid of the dredge or by some other implements with which the very bottom is swept. As they are of a very small size, moreover, it will be easily understood, that they may to a great extent have escaped the attention of Carcinologists. Indeed, our knowledge regarding these peculiar Calanoids we owe almost exclusively to Th. Scott, who has succeeded in discovering many interesting deep-water Copepods by subjecting the trawl-refuse of fishermen to a minute microscopical examination. From other countries, we only know one solitary form referable to this section, viz. the peculiar Calanoid first described by Dr. Giesbrecht as *Moebianus gyrans*, a form which was only observed in the aquaria of the Zoological Station in Naples, having probably been transferred to them quite accidentally with the various bottom-organisms (Hydroids or Corals) growing in them. I myself, by the aid of a very light dredge, long ago procured several forms belonging to this section at different parts of the Norwegian coast. These will be described below. On the other hand, I have not felt justified in including in the Norwegian fauna any of the additional species observed off the Scottish coast, by Th. Scott, on account of the non-pelagic character of those Calanoids.

Fam. 9. Diaixidæ.

Characters.—General habitus recalling that in the *Scolecithricidæ*. Cephalosome united with the 1st pedigerous segment, front produced below to an undivided rostrum. Last segment of metasome distinctly defined from the preceding one. Urosome comparatively small, in female composed of 4, in male of 5 segments; caudal rami short, each with 4 subequal apical setæ. Eye distinct, double. Anterior antennæ scarcely differing in the two sexes, comparatively slender, with the last 2 articulations well defined. Posterior antennæ with the inner ramus unusually small. Oral parts on the whole resembling in structure those in the *Scolecithricidæ*, the terminal appendages of the anterior maxillipeds

having a similar vermiform shape. Natatory legs with the same number of joints in the rami as in that family. Last pair of legs wholly absent in female, in male of extraordinary size and very complicated structure.

Remarks.—This family bears a close resemblance in several points to the *Scolecithricidæ*, yet differing very materially, both in the uniform appearance of the anterior antennæ in the two sexes, and in the enormous development and peculiar structure of the last pair of legs in the male. It contains as yet but a single genus, to be described below.

Gen. 15. **Diaixis**¹⁾, G. O. Sars, n.

Syn: *Scolecithrix*, Scott (part).

Generic Characters.—Body not very slender, with the anterior division much vaulted in front. Rostral prominence simple, deflexed, without any tentacular filaments. Last segment of metasome in female with the lateral parts lamellarly produced. Urosome comparatively short, genital segment in female produced dorsally. Eyes subventral, placed close together, though well defined in the middle. Anterior antennæ 24-articulate, with some of the setæ of the terminal joints ciliated. Posterior antennæ with the outer ramus very large, 6-articulate, last joint much the longest. Mandibles slender, with the masticatory part scarcely at all expanded, inner ramus of palp poorly developed. Anterior maxillipeds with the terminal appendages very delicate and all of the same appearance. Posterior maxillipeds with the terminal part unusually short and reflexed. Natatory legs slender, without any spinules on the hind face, terminal spine of outer ramus in the 2nd to 4th pairs coarsely denticulate outside. Last pair of legs in male transformed to a powerful grasping organ, attached to the body by a thin and flexible stalk, and composed of a large and tumid basal part and 2 rami of nearly equal length, the right one forming the immediate continuation of the basal part, the left one being movably articulated to its posterior face.

Remarks.—This genus is established to include the peculiar form described by Mr. A. Scott as *Scolecithrix hibernica*, which species most certainly does not belong to Brady's genus. In addition to the typical form, another nearly-allied species has been recorded by Th. Scott as *Scolecithrix pygmæa*. Only the first of these species belongs to the fauna of Norway.

¹⁾ Nomen proprium.

24. *Diaixis hibernica* (A. Scott).

(Pl. XXXIX & XL).

Scolecithrix hibernica, Andr. Scott, Ann. Nat. Hist., 6th series, Vol. 18,
p. 362, Pl. XVII & XVIII.

Specific Characters.—*Female.* Anterior division of body, seen dorsally, elliptical in form, greatest width not attaining half the length, anterior extremity narrowly rounded, posterior considerably contracted; seen laterally evenly vaulted above and somewhat widening anteriorly, dorsal margin curving abruptly in front, rostral prominence conical in form and extended straight downwards. Last segment of metasome very short and deeply emarginated in the middle, lateral projections irregularly triangular, and defined above by a slight incision of the margin, being closely applied to the genital segment, to the end of which they extend. Urosome not attaining even $\frac{1}{3}$ of the length of the anterior division, genital segment with a very conspicuous gibbous prominence dorsally. Caudal rami somewhat longer than they are broad, and slightly dilated distally, each with a small dentiform projection outside the apical setæ, the latter but very slightly divergent and somewhat exceeding the urosome in length. Anterior antennæ, when reflexed, reaching about to the end of the genital segment. Posterior antennæ with the outer ramus more than twice the length of the inner. Anterior maxillipeds with about 5 vermiform appendages at the tip. Posterior maxillipeds with the terminal part scarcely exceeding $\frac{1}{3}$ of the length of the 2nd basal joint. Natatory legs successively increasing in length posteriorly, 4th pair very slender, with the terminal joint of outer ramus almost linear in form, and having the proximal spine of the outer edge placed beyond the middle.

Male on the whole resembling the female in the general shape of the body, but having the last segment of metasome very small and not produced laterally. Urosome more slender, and as usual 5-articulate, last segment very short. Last pair of legs, when reflexed, reaching far beyond the tips of the caudal setæ, basal part with a comb-like series of about 5 curved spines on the left side; right ramus somewhat band-like, irregularly flexuous and carrying on the tip a movable hand-like piece produced into 2 digitiform processes, left ramus 4-articulate, with the 2nd joint the largest and produced outside into several irregular projections, last 2 joints comparatively short and somewhat lamellar, the terminal one carrying inside a slender flexuous seta and 2 short spines.

Colour. Body in both sexes pellucid, with a faint carneous tinge, and partly mottled with a pale rose pigment.

Length of adult female 1.20 mm., of male 1.10 mm.

Remarks.—This form was first described in the year 1896 by Mr. Andrew Scott, the son of the well-known Scottish naturalist, Thomas Scott, from specimens procured in the Irish Channel by the aid of a small tow-net fastened to the beam of a fish-trawl. I had myself long before observed this form in the upper part of the Christiania Fjord, and had assigned to it the provisional name *Diaixis oleacea*, owing to a peculiarity to be mentioned farther on. This form, though resembling in its external appearance some species of the genus *Scolecithricella*, may on a closer inspection be easily recognized in both sexes, the female by the peculiar adpressed lateral projections of the last segment of the metasome, the male by its enormously developed legs of last pair.

Occurrence.—In addition to the Christiania Fjord, where it is rather common, I have met with this form occasionally in several other places of the Norwegian coast, as far as up to the Trondhjem Fjord. It is found in moderate depths, ranging from 20 to 60 fathoms, on a muddy bottom, and always close to the ground. For capturing this and other delicate bottom-organisms, I have employed a very light dredge, by which only a small portion of the superficial bottom-material is taken up. If this material be placed together with a small amount of sea-water in a shallow vessel, the specimens will at once make their appearance, owing to a peculiarity which they have in common with some other micro-organisms, namely, that when coming in contact with the surface, they invariably remain on it, floating about like small air-bubbles, and they can thus easily be picked up by the aid of a small feather.

Distribution.—Irish Channel (A. Scott), Scottish coast: Firth of Clyde, Moray Firth, off Fair Islands (Th. Scott).

Fam. 10. Stephidæ.

Characters.—Form of body generally short and stout, not very dissimilar in the two sexes. Cephalosome united with the 1st pedigerous segment, front simple, without any rostral prominence or tentacular appendages. Last 2 segments of metasome coalesced. Urosome in female composed of 4, in male of 5 segments. Eye wholly absent. Anterior antennæ of exactly the same appearance in the two sexes, and rather slender, with the last 2 joints distinctly defined. Posterior antennæ and oral parts normal, the latter not transformed in male.

Terminal appendages of anterior maxillipeds not sensory. Natatory legs with the same number of joints in the rami as in the *Diaixidae*, but not nearly so elongated. Last pair of legs present in both sexes, in female rather small and of simple structure, in male largely developed, uniramous, left leg the largest and having some of the joints conspicuously dilated.

Remarks.—The type of this family is the genus *Stephos* of Scott (= *Moebianus*, Giesbr.), which was placed by Dr. Giesbrecht within his subfamily *Clausocalaninae*, answering to the family *Pseudocalanidae* of the present account. I think, however, that this arrangement is quite inadmissible, since this genus differs in several points very essentially from the other genera of this family. The uniform structure of the anterior antennæ and the oral parts in both sexes proves it in reality to belong to the section *Isokerandria*, as here defined. The present family likewise differs rather materially from the *Diaixidae* in the structure of the anterior maxillipeds, as also in the presence of distinctly developed, though small, legs of the 5th pair in the female, and the structure of these legs in the male. In addition to the typical genus, *Stephos* Scott, another apparently nearly-allied genus, *Parastephos*, will be described below.

Gen. 16. *Stephos*¹), Scott, 1892.

Syn: *Moebianus*, Giesbrecht.

Generic Characters.—Body of a rather short and compact form, with the anterior division more or less tumefied. Front cut off, as it were, below, and not forming any perceptible prominence. Lateral parts of last segment of metasome rounded off, sometimes lamellarly expanded. Urosome comparatively short; caudal rami likewise short, but with the apical setæ rather elongated. Anterior antennæ moderately slender, 24-articulate, with scattered bristles in front. Posterior antennæ with the outer ramus longer than the inner. Anterior lip remarkably prominent. Mandibles strong, with the masticatory part somewhat expanded, outermost denticle not very different from the others; palp with the inner ramus fully as large as the outer. Anterior maxillipeds comparatively small; posterior ones well developed, with the terminal part elongated and not reflexed. Natatory legs with the rami normal in both sexes. Last pair of legs in female 3-articulate,

¹) I do not consider it necessary to change this name to *Stephus*, as proposed by Dr. Giesbrecht, since there are several generic names generally admitted in Zoology, which have a similar Greek termination (*Rhinoceros*, *Aceros*, etc.)

with the last joint spiniformly produced; those in male very large, both legs well defined and angularly curved near the base, the right one 4-articulate, terminating in a more or less claw-like piece, left 5-articulate, with the penultimate joint much tumefied, last joint incurved and provided with a number of delicate leaf-like appendages.

Remarks.—As above stated, this genus was first (in the year 1892) established by Th. Scott, to include a small Calanoid found by him off the Scottish coast, *S. minor*. In the same year, but somewhat later, Dr. Giesbrecht described a Mediterranean form, undoubtedly belonging to the same genus, under the name of *Moebianus gyrens*, and a 3rd species was subsequently recorded by Th. Scott as *S. Fultoni*. I have myself observed 2 additional species off the Norwegian coast, to be described below. The genus accordingly comprises at present 4 different species. In all these species the last pair of legs in both sexes are built upon the very same type, though those of the male, at any rate, exhibit characteristic differences in each species.

25. *Stephos lamellatus*, G. O. Sars, n. sp.

(PL. XLI & XLII).

Specific Characters.—*Female.* Body very short and robust, more so than in any of the other species, with the anterior division, seen dorsally, broadly oval in form, greatest width exceeding half the length, anterior extremity narrowly rounded, posterior slightly contracted and somewhat irregular; seen laterally, moderately vaulted above, dorsal margin forming, in front, a perfectly even curve. Last segment of metasome deeply emarginated in the middle, lateral parts lamellarly expanded and conspicuously asymmetrical, right lamella much larger and broader than left. Urosome very short, scarcely attaining $\frac{1}{3}$ of the length of the anterior division, genital segment asymmetrical, exhibiting on right side a rounded lamellar prominence, but without any spiniform processes. Caudal rami scarcely longer than they are broad, apical setæ exceeding in length the urosome. Anterior antennæ rather slender, reaching, when reflexed, to the base of the caudal rami. Posterior antennæ with the outer ramus only slightly longer than the inner. Last pair of legs with the terminal joint nearly straight, carrying outside, at some distance from the base, a small spinule, distal part spiniform and very finely ciliated outside.

Male resembling the female both in size and general form of body, but having the lateral parts of the last segment of metasome symmetrical and not lamellarly expanded. Urosome somewhat narrower, and, as usual, composed of

5 segments besides the caudal rami. Last pair of legs very massive, both legs of about equal length, but very dissimilar in form, penultimate joint of right leg rather elongated and somewhat lamellar in form, gradually tapering distally, terminal joint of same leg rather irregular in shape, with several obtuse, digitiform processes; penultimate joint of left leg very large and tumid, with a strong spiniform process inside at the base, and a row of delicate spinules along the inner face, terminal joint carrying at the tip a dense fascicle of lanceolate, leaf-like appendages.

Colour. Body in both sexes very pellucid and ornamented with a beautiful rosy pigment.

Length of adult female somewhat exceeding 1 mm., of male about the same.

Remarks.—This form may easily be recognized from any of the other species by its unusually short and robust form, as also by the lamellarly expanded lateral parts of the last segment of the metasome in the female, and the structure of the last pair of legs in both sexes. It is also of a larger size than any of the other known species.

Occurrence.—I have met with this form not unfrequently at Bodö and Hammerfest, Finmark, in depths of about 30 fathoms, muddy bottom. I have also come across it, though only occasionally, off the west coast of Norway (Christiansund).

26. *Stephos Scotti*, G. O. Sars, n. sp.

(Pl. XLIII).

Syn: *Stephos gyrans*, Scott (not Giesbrecht).

Specific Characters.—*Female.* Body comparatively less robust than in the preceding species, with the anterior division, seen dorsally, regularly elliptical in form, greatest width scarcely exceeding half the length, both extremities almost equally tapered; seen laterally, considerably vaulted above, with the dorsal margin strongly curved in front. Lateral parts of last segment of metasome perfectly symmetrical, not lamellarly expanded. Urosome exceeding in length $\frac{1}{3}$ of the anterior division, genital segment symmetrical, without any prominences or processes. Caudal rami somewhat longer than they are broad, apical setæ rather slender. Anterior antennæ, when reflexed, reaching about to the end of the 2nd caudal segment; posterior antennæ with the outer ramus almost twice as long as the inner. Last pair of legs with the terminal joint slightly flexuous, without any spinule at the base, but armed outside the distal part with about 10 coarse denticles.

Male somewhat smaller than female, and having the urosome considerably more slender. Last pair of legs very large, with the right leg somewhat longer and much more slender than left, its penultimate joint rather narrow and produced at the base outside to an acute lappet, terminal joint forming a strong curved claw, with a thumb-like projection at the base inside; penultimate joint of left leg much tumefied, but quite simple, without any processes or spinules, terminal joint carrying a row of 4 rather small leaf-like appendages outside, and at the tip 2 short, juxtaposed claw-like lamellæ.

Colour. Body in both sexes extremely pellucid, with a very faint yellowish tinge.

Length of adult female 0.95 mm., of male 0.85 mm.

Remarks.—This species is easily distinguished from the preceding one by its more slender form, the perfect symmetry of both the last segment of the metasome and of the genital segment, and finally by the structure of the last pair of legs in both sexes. The form recorded by Th. Scott from the Scottish coast as *S. gyrans*, Giesbrecht, is identical with the present species, as proved by the examination of a specimen kindly sent to me by that author. The female of the Mediterranean species differs very conspicuously in the asymmetrical shape of both the last segment of the metasome and the genital segment, the latter being moreover distinguished by a number of irregularly arranged spiniform processes not found in any of the northern species. In the male of that species, too, the last pair of legs, as figured by Dr. Giesbrecht, exhibit well marked differences from those in the present species, which more resemble those in *S. minor* of Scott.

Occurrence.—I observed this form, many years ago, in a single locality on the west coast of Norway, viz., Eggesbönæs, south of Aalesund. It occurred here not unfrequently at a depth of a few fathoms, on a sandy bottom covered with a thin layer of dark mud; and it was several times watched in the living state. Its movements are rather curious, constituting a perfectly regular whirling run, in which the body is kept in a horizontal attitude just above the bottom. For this reason I assigned to it the provisional name of *Typhlocalanus gyrator*, the generic name referring to the entire absence of visual organs. The same peculiar manner of motion is also mentioned by Dr. Giesbrecht in the Mediterranean species, and is most probably common to all the species of this genus.

Distribution.—Scottish coast: Loch Fyne, Firth of Forth (Scott.)

Gen. 17. **Parastephos**, G. O. Sars, n.

Generic Characters.—Form of body more slender than in *Stephos*, with the anterior division less tumefied and the urosome more elongated. Front blunt below, as in *Stephos*. Antennæ about as in that genus. Oral parts likewise of a very similar structure, except that the masticatory part of the mandibles is considerably more expanded, with the outermost cutting-tooth very large and claw-like. Natatory legs not particularly powerful, some of them (in male) peculiarly transformed. Last pair of legs in male largely developed and very asymmetrical, right leg slender and terminating in a strong denticulated claw, left leg much coarser, with the antepenultimate joint the largest.

Remarks.—This new genus is founded upon a solitary male specimen, which, though evidently referable to the present family, exhibits so many essential differences from the males of the genus *Stephos*, that it cannot properly be included in that genus. It is very probable, that also the female, when found, will exhibit some peculiarities, at least in the structure of the last pair of legs.

27. **Parastephos pallidus**, G. O. Sars, n. sp.

(Pl. XLIV).

Specific Characters.—*Male*. Anterior division of body, seen dorsally, oblong oval in form, greatest width not attaining half the length, anterior extremity narrowly rounded, posterior less attenuated; seen laterally, moderately vaulted above, with the dorsal margin forming a perfectly even curve as far as the blunt rostral part. Last segment of metasome with the lateral parts but slightly produced and narrowly rounded at the tip. Urosome comparatively slender, considerably exceeding half the length of the anterior division, last segment well developed. Caudal rami somewhat longer than they are broad, and not at all divergent; apical setæ about as in *Stephos*. Eye, as in that genus, wholly absent. Anterior antennæ, when reflexed, reaching about to the end of the 3rd caudal segment, structure exactly as in *Stephos*. Posterior antennæ with the outer ramus considerably longer than the inner. Outer ramus of right 2nd leg peculiarly transformed, being quite short, not even attaining the length of the inner ramus, and composed of only 2 joints, the proximal one simple, the distal one carrying at the tip 4 natatory setæ and a single spine outside them. Inner ramus of right, 4th leg much larger than that of the left, middle joint considerably dilated,

terminal one armed on the hind face with 2 very coarse spinules, and having moreover the proximal seta of the inner edge transformed into a slender spine, denticulated inside. Last pair of legs, when reflexed, reaching to the end of the caudal rami, distal part of right leg very narrow and (in the specimen examined) doubled back upon the proximal part, terminal claw very strong and somewhat flexuous, with a regular row of denticles along the concave edge; left leg with the antepenultimate joint much dilated, and projecting at the end outside into an oval lamella, terminal joint spoon-shaped.

Colour. Body highly pellucid, with a very faint yellowish tinge.

Length of adult male 1.90 mm.

Remarks. As stated above, this form is as yet only known in the male sex. The female will in all probability be less slender in form, with the urosome shorter and 4-articulate. Whether the last pair of legs of the female is constructed after the type of the species of *Stephos*, cannot be conjectured at present.

Occurrence.—The solitary specimen described above was found, many years ago, at Sjerjehavn, west coast of Norway, in a depth of about 100 fathoms, soft, muddy bottom.

Fam. 11. Tharybidæ.

Characters.—Form of body short and stout. Cephalosome united with the 1st pedigerous segment, front carrying below 2 soft tentacular appendages. Last 2 segments of metasome coalesced. Urosome short, in female 3-articulate, in male 4-articulate, the last segment being obsolete. Eye present. Anterior antennæ slender and of exactly the same appearance in the two sexes. Posterior antennæ with the outer ramus much larger than the inner. Oral parts of same appearance in the two sexes, and rather differing in structure from those in the 2 preceding families; terminal appendages of anterior maxillipeds very delicate, sensory. Natatory legs with the same number of joints in the rami as in the 2 preceding families. Last pair of legs present in both sexes, in female of comparatively simple structure, in male very large, though rather slender in form, with none of the joints conspicuously dilated.

Remarks.—This new family at present comprises only a single genus, which, however, cannot properly be placed in any of the other families here recorded. In some features, and more especially in the structure of the anterior maxillipeds, it exhibits some resemblance to the *Phaënnidæ*; but the uniform appearance of both the anterior antennæ and the oral parts in the two sexes proves it in reality not to belong even to the same section, but evidently to the one here in question, viz., the *Isokerandria*.

Gen. 18. **Tharybis**¹⁾, G. O. Sars, n.

Generic Characters. Body unusually short, with the anterior division considerably tumefied. Front without any rostral prominence. Urosome rather short in female, considerably more slender in male. Caudal rami short, each with 3 apical setæ. Eye of a somewhat unusual appearance, being very large and placed close to the dorsal face. Anterior antennæ 24-articulate, with scattered bristles in front, last 2 articulations well defined. Posterior antennæ with the inner ramus rather small. Mandibles strong, with the masticatory part very compact, cutting edge exhibiting outside 2 unusually strong bifid teeth followed by a dense series of partly ciliated setæ, palp with both rami well developed. Maxillæ of a somewhat unusual appearance, the masticatory lobe being exceedingly large, with strong spines inside, whereas the palp is comparatively poorly developed. Anterior maxillipeds with the terminal appendages extremely delicate and penicillate at the tip, as in the *Phaënnidæ*. Posterior maxillipeds not much elongated, 2nd basal joint fusiform, terminal part comparatively short and not reflexed. Natatory legs of moderate size, and without any spinules on the hind face. Last pair of legs in female 3-articulate, terminal joint linear and strongly spinous at the tip; in male very large and rather asymmetrical, left leg biramous, right simple.

Remarks.—Dr. Giesbrecht would probably have placed this genus within his sub-family *Scolecithricinæ*, which also comprises the genera *Xanthocalanus* and *Phaënnæ*; and indeed, in external appearance, and more especially in the structure of the anterior maxillipeds, it strongly recalls the last-mentioned genus. It is, however, in reality very different, being not only distinguished by the uniform appearance in the two sexes of both the anterior antennæ and the oral parts, but also by the presence in the female of distinctly developed legs of the 5th pair. We know at present only a single species, to be described below.

¹⁾ Nomen proprium.

28. *Tharybis macrophthalma*, G. O. Sars, n. sp.

(Pl. XLV & XLVI).

Specific Characters.—*Female.* Anterior division of body, seen dorsally, regularly elliptical in form, greatest width equalling about half the length, both extremities almost equally attenuated; seen laterally, much vaulted above, with the dorsal margin forming quite an even curve throughout. Front scarcely at all produced below, tentacular filaments very delicate and reflexed. Lateral parts of last segment of metasome but slightly produced, forming narrowly rounded lobes. Urosome scarcely exceeding in length $\frac{1}{3}$ of the anterior division, genital segment about twice as large as the succeeding one, and slightly protuberant below. Caudal rami a little longer than they are broad, apical setæ of moderate length, the innermost but one the longest. Eye very large and conspicuous in the living animal, oblong quadrangular in form, and occurring close to the dorsal face, pigment bright red. Anterior antennæ, when reflexed, reaching about to the end of the anterior division. Posterior antennæ with the inner ramus scarcely half as long as the outer, terminal joint of the latter much the largest. Last pair of legs with the terminal joint more than twice the length of the other 2 combined, nearly straight and of uniform width throughout, exhibiting outside in the middle a small dentiform projection, tip armed with 3 short, thick, denticulated spines, the innermost the largest and distinctly defined at the base, the other 2 confluent with the joint.

Male somewhat smaller than female, and having the urosome considerably more slender, equalling about half the length of the anterior division. Last pair of legs, when reflexed, reaching far beyond the caudal rami, right leg doubly geniculate, 3-articulate, 1st joint rather thick and forming outside an angular prominence, 2nd joint slender, slightly widening distally, terminal joint constituting a claw-like incurved piece; left leg with the 2 basal joints very movably connected, outer ramus 3-articulate, terminating in a bunch of delicate hairs, inner ramus uniarticulate, styliform, and nearly twice as long as the outer.

Colour.—Body in both sexes highly pellucid, with translucent dark yellowish brown intestine.

Length of adult female 1.40 mm., of male 1.30 mm.

Remarks.—This Calanoid may be easily recognized by its unusually short and robust form, and in the living state, also by the large, dorsally placed, bright red eye. The anterior antennæ in the living animal are born in a somewhat unusual manner, exhibiting at the base an abrupt curve, and pointing obliquely backwards.

Occurrence.—I first found this peculiar Calanoid, many years ago, in the Christiania Fjord at Dröbak, where some few specimens were taken up in the dredge from a depth of about 100 fathoms. Subsequently I have also met with it occasionally off the west coast of Norway, and as far north as in the Trondhjem Fjord, where a solitary specimen was procured from a depth of about 150 fathoms.

Fam. 12. Pseudocyclopiidæ.

Characters.—Form of body unusually compact, recalling that in some of the *Cyclopoida*. Cephalosome confluent with the 1st pedigerous segment; front produced below to a distinct rostrum. Last 2 segments of metasome united. Urosome in female distinctly 4-articulate, in male 5-articulate. Eye wholly absent. Anterior antennæ of exactly the same appearance in the two sexes, and remarkable for their shortness and restricted number of articulations. Posterior antennæ with the basal part imperfectly defined from the inner ramus, which is much longer than the outer. Oral parts on the whole normal, except the mandibles, the cutting edge of which does not exhibit the regular dentition found in other Calanoids. Natatory legs having the same number of joints in the rami as in the 3 preceding families, being, however, distinguished by their unusually short and compact form, somewhat recalling that in the *Cyclopoida*. Last pair of legs present in both sexes, in female comparatively simple, in male rather complicated and very asymmetrical.

Remarks.—This new family is established to include the genus *Pseudocyclopia* of Scott, which, though evidently belonging to the present section, cannot properly be placed in any of the 3 preceding families. It is more especially the unusual appearance of the 2 pairs of antennæ, which distinguishes this genus, and tends to remove it from the general Calanoid type. We are at present only acquainted with this solitary genus; but it is very probable, that on a future, closer examination of the small Calanoids living at the bottom of the sea, some other nearly-related genera will be found to exist.

Gen. 19. *Pseudocyclopia*, Scott, 1892.

Generic Characters.—Body short and compact, with the anterior division strongly vaulted above and more or less compressed. Rostral prominence deflexed, without any tentacular appendages. Lateral parts of last segment of metasome rounded off. Urosome with the last segment well developed in both sexes; caudal rami short, each with 4 apical setæ. Anterior antennæ very unlike those in other Calanoids, being unusually short and tapering rapidly distally, with 16 to 20 articulations, the 1st very large. Posterior antennæ with the outer ramus 6-articulate and much shorter than the inner. Mandibles very strong, masticatory part thickened and having the cutting edge irregularly curved and minutely denticulate, palp with both rami well developed. Maxillæ normal. Anterior maxillipeds with the terminal appendages simple, setiform. Posterior maxillipeds slender, with the 1st basal joint remarkably produced at the end anteriorly; terminal part reflexed. Natatory legs with the spines of the outer ramus remarkably strong, the terminal one in 2nd to 4th pairs coarsely serrate outside; seta of the 1st basal joint in 3rd pair transformed to a strong elongated spine. Last pair of legs in female 3-articulate, terminal joint the largest and spiniferous; those in male of moderate size, both legs uniramous, the right terminating in a styliform claw, the left with the basal part considerably tumefied, outer part slender, triarticulate.

Remarks.—This genus, established by Th. Scott, was erroneously referred by that author to the family *Misophriidae*, which, as shown by Dr. Giesbrecht, does not even belong to the *Calanoida*, but more properly to the *Cyclopoida*. The generic name *Pseudocyclopia*, proposed by Th. Scott, bears an inconvenient resemblance to *Pseudocyclops*, a genus which does not belong to this, but to the next section (*Heterarthrandria*), though it certainly exhibits some resemblance in its external appearance, to the genus in question. Th. Scott records no less than 3 different species of this genus, viz., *P. crassicornis*, *minor* and *caudata*, all of them found in the Firth of Forth. None of these species have hitherto come under my notice. On the other hand, a form observed by me many years ago off the west coast of Norway, has proved to be identical with a 4th species recently described by Mr. Thompson from Liverpool Bay. This species will be described below.

29. *Pseudocyclopia stephoides*, Thompson.

(Pl. XLVII & XLVIII).

Pseudocyclopia stephoides, J. C. Thompson. Proc. Liverp. Biol. Soc., Vol. 9, p. 96, Pl. 6, figs. 1, 2. Pl. 7, figs. 8—14.

Specific Characters.—*Female.* Anterior division of body, seen dorsally, of nearly uniform width throughout, and oblong oval in form, anterior extremity obtusely rounded, posterior scarcely at all contracted; seen laterally, considerably vaulted above, dorsal margin forming in front a perfectly even curve as far as the rostrum; the latter somewhat flattened and acutely triangular in form. Lateral parts of last segment of metasome forming short rounded lobes. Urosome comparatively robust, about equalling in length $\frac{1}{2}$ of the anterior division, and without any dorsal processes (present in *P. minor*), genital segment about the length of the 2 succeeding segments combined. Caudal rami only slightly longer than they are broad, and obliquely rounded at the tip, apical setæ of moderate length. Anterior antennæ not attaining even half the length of the anterior division of body, and composed of 20 articulations, the 1st of which is very large, though not attaining half the length of the remaining part of the antennæ. Posterior antennæ with the inner ramus remarkably produced, being about twice as long as the outer. Last pair of legs with each of the first 2 joints exhibiting a small dentiform projection inside, 2nd joint not conspicuously dilated, terminal one produced at the tip to a slender, straight spine, and carrying outside, attached to separate ledges, 2 similar, though somewhat smaller spines.

Male resembling the female both in size and general form, though having the urosome, as usual, more slender. Last pair of legs very asymmetrical, right leg exceedingly slender, with the terminal joint occupying more than half its length and having the distal part straight and band-like; left leg with the basal part tumefied to an extraordinary degree, penultimate one carrying outside, at some distance from the base, a small seta, distal part slightly expanded and having on each side an acute lappet, terminal joint small and somewhat spoon-shaped.

Colour. Body in both sexes pellucid, with a faint yellowish tinge.

Length of adult female 1.20 mm., of male about the same.

Remarks.—This is the largest of the 4 hitherto known species, and moreover easily recognized by the 20-articulate anterior antennæ, the greatly produced inner ramus of the posterior ones, and the structure of the last pair of legs in both sexes. In its external appearance it bears a very close resemblance to *P. crassicornis*, Scott. which, however, has the anterior antennæ still shorter and composed of only 16 articulations.

Occurrence.—Some few specimens of this form were found, many years ago, at Christiansund, west coast of Norway, in a depth of about 30 fathoms. This is the only place on the Norwegian coast where I have as yet met with it.

Distribution.—Liverpool Bay (Thompson).

Section 3.

Heterarthrandria.

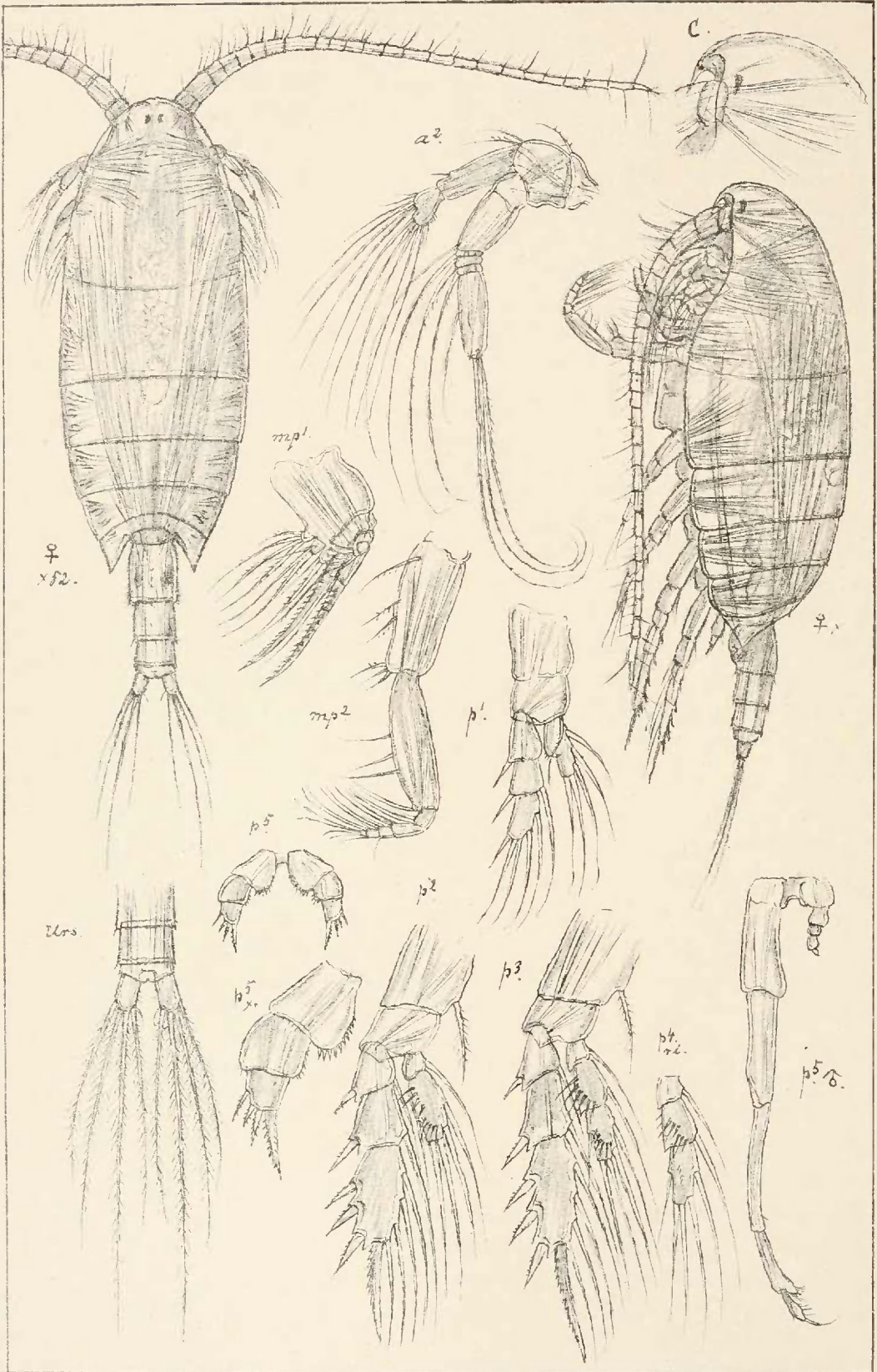
This section comprises the greater number of the hitherto known Calanoids, and among them are some of the most highly organized forms. Whereas the 2 preceding sections only contain marine forms, the present one is represented both in the sea and in inland-lakes and ditches; some forms being also found in more or less brackish water. The name of the section refers to the very dissimilar appearance of the 2 anterior antennæ in the male, one of them being much of same structure as in the female, whereas the other, as a rule the right one, is peculiarly transformed, constituting a powerful grasping organ, by the aid of which the female is seized during copulation. This prehensile antennæ exhibits beyond the middle a very movable articulation, which admits the terminal part to be doubled back upon the adjoining part, the latter being, as a rule, greatly tumefied and traversed by a strong muscle, which acts upon the terminal part. Thereby the said antenna becomes, as it were, divided into 3 successive sections, generally well defined from each other: a basal, a median, and a terminal one. More rarely the geniculate character is less pronounced, for instance in the genus *Acartia*; but in the far greater number of forms it is very conspicuous, so as at once to make these Calanoids recognizable from those belonging to the 2 preceding sections. The 5th pair of legs are always present in both sexes, though in the female they may be much reduced in size. In some cases these legs are natatory, like the preceding pairs; but in the male the outer ramus is always somewhat transformed, and at any rate in one of the legs, generally the right one, pronouncedly prehensile in structure. No difference whatever is found in the structure of the oral parts in the two sexes, and, on the whole, the general

Copepoda

Calanoida.

Phaënnidæ

Pl. XXXIII.



G. O. Sars autogr.

Trykt i den private Opmaaling Chra

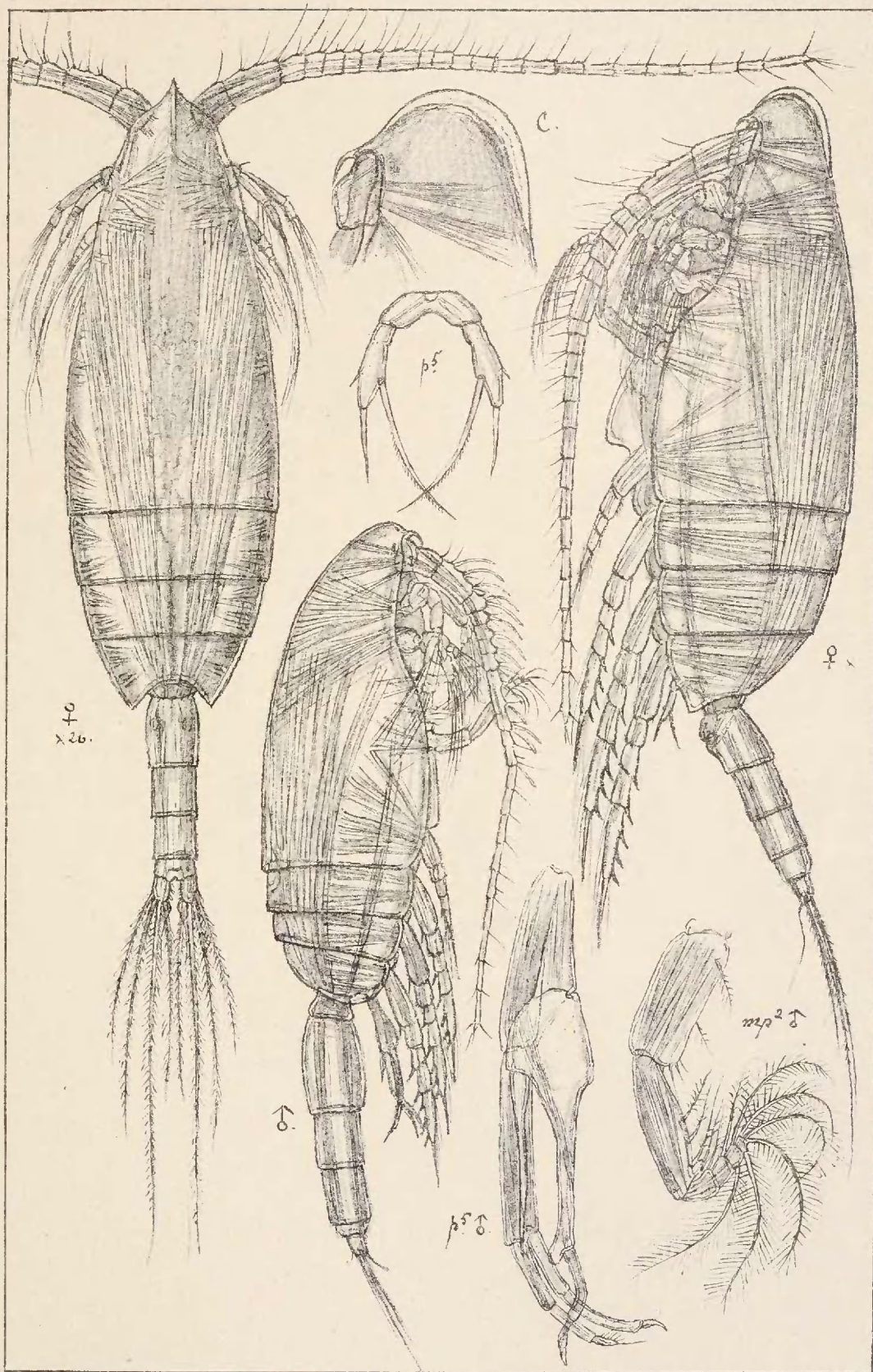
Xanthocalanus propinquus. G. O. Sars

Copepoda

Calanoida.

Scolecithricidæ

Pl. XXXIV.



G.O. Sars autogr.

Trykt i den private Opmaalings, Chra

Amalophora magna, Scott

Copepoda

Calanoida.

Scolecithricidæ

Pl XXXV



G. O. Sars autogr.

Trykt i den private Opmaaling, Chra

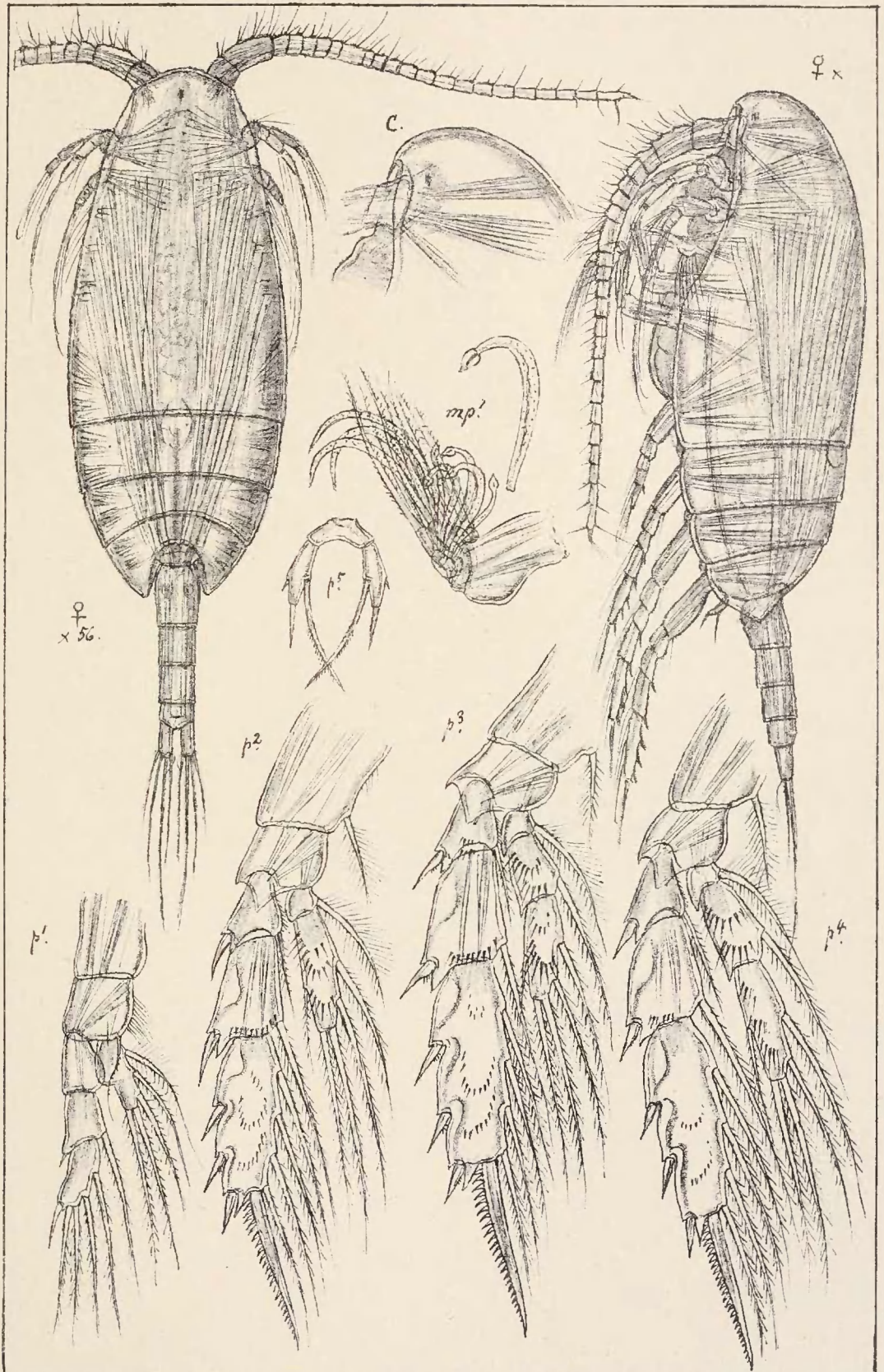
Amallophora magna, Scott
(continued)

Copepoda

Calanoida.

Scolecithricidæ

Pl. XXXVI



G. O. Sars autogr.

Trykt i den private Opmaalng. Chra

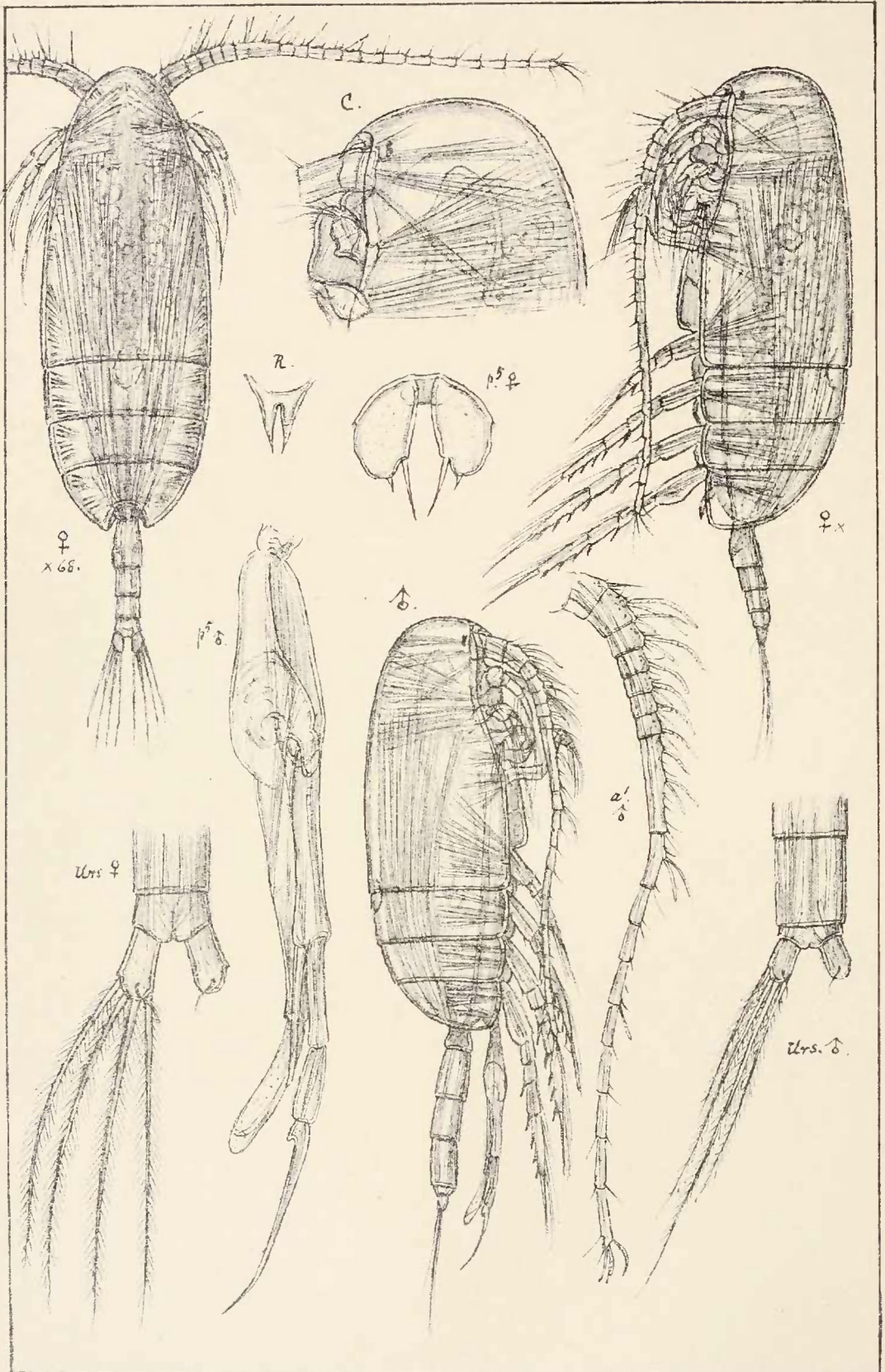
Amallophora brevicornis, G. O. Sars

Copepoda

Calanoida.

Scolecithricidæ.

Pl XXXVII



G. O. Sars autogr.

Trykt i den private Opmaaling, Chra

Scolecithricella minor (Brady.)

Copepoda

Calanoida.

Scolecithricidæ.

Pl. XXXVIII



G. O. Sars autogr.

Trykt i den private Opmaaling Chru

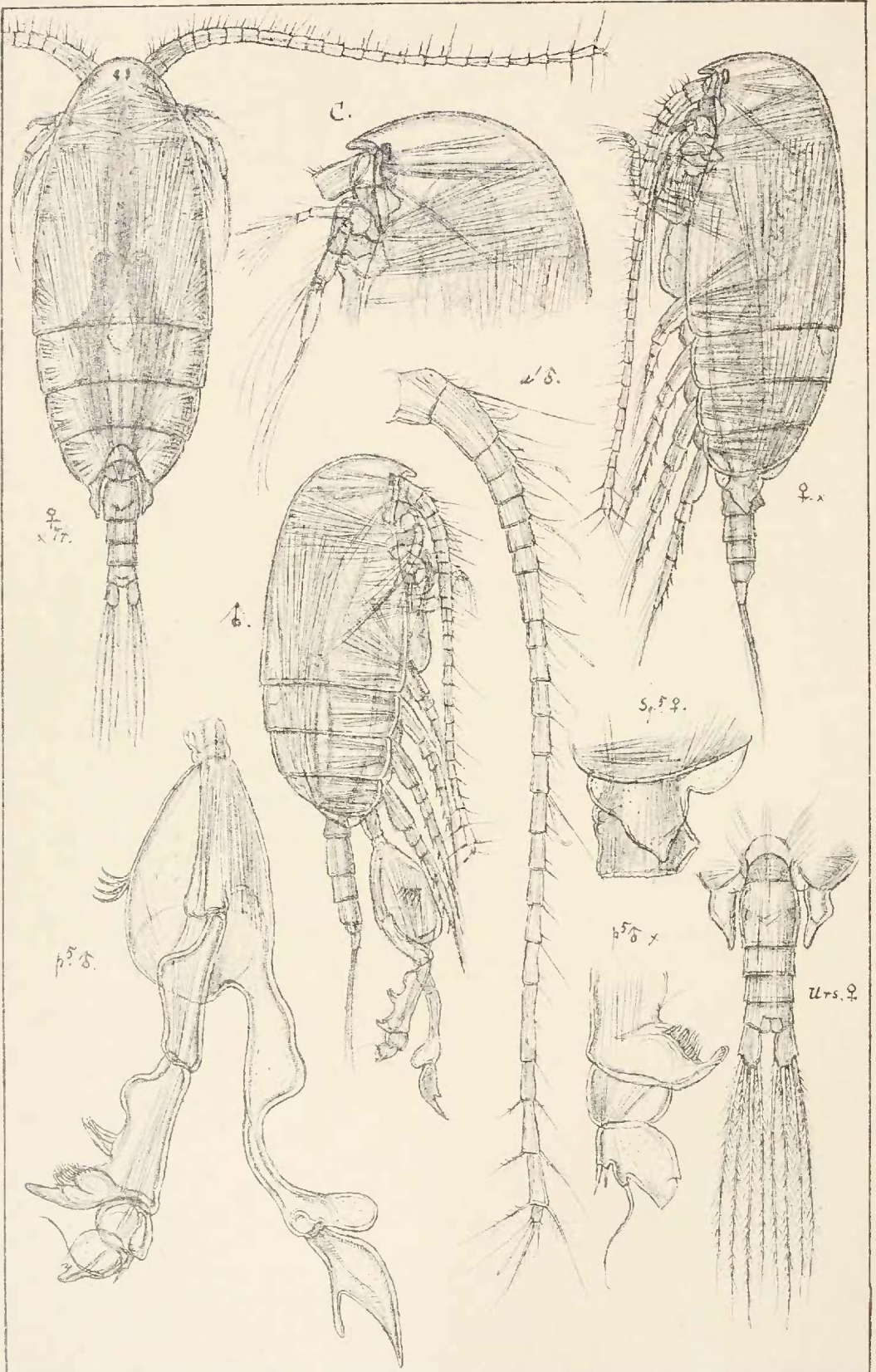
Scolecithricella minor (Brady.)
(continued.)

Copepoda
Calanoida.

Calanoida.

Diaixidae.

Pl. XXXIX.



60 Sars autogr.

Frykt i den private Opmaalning, Chra

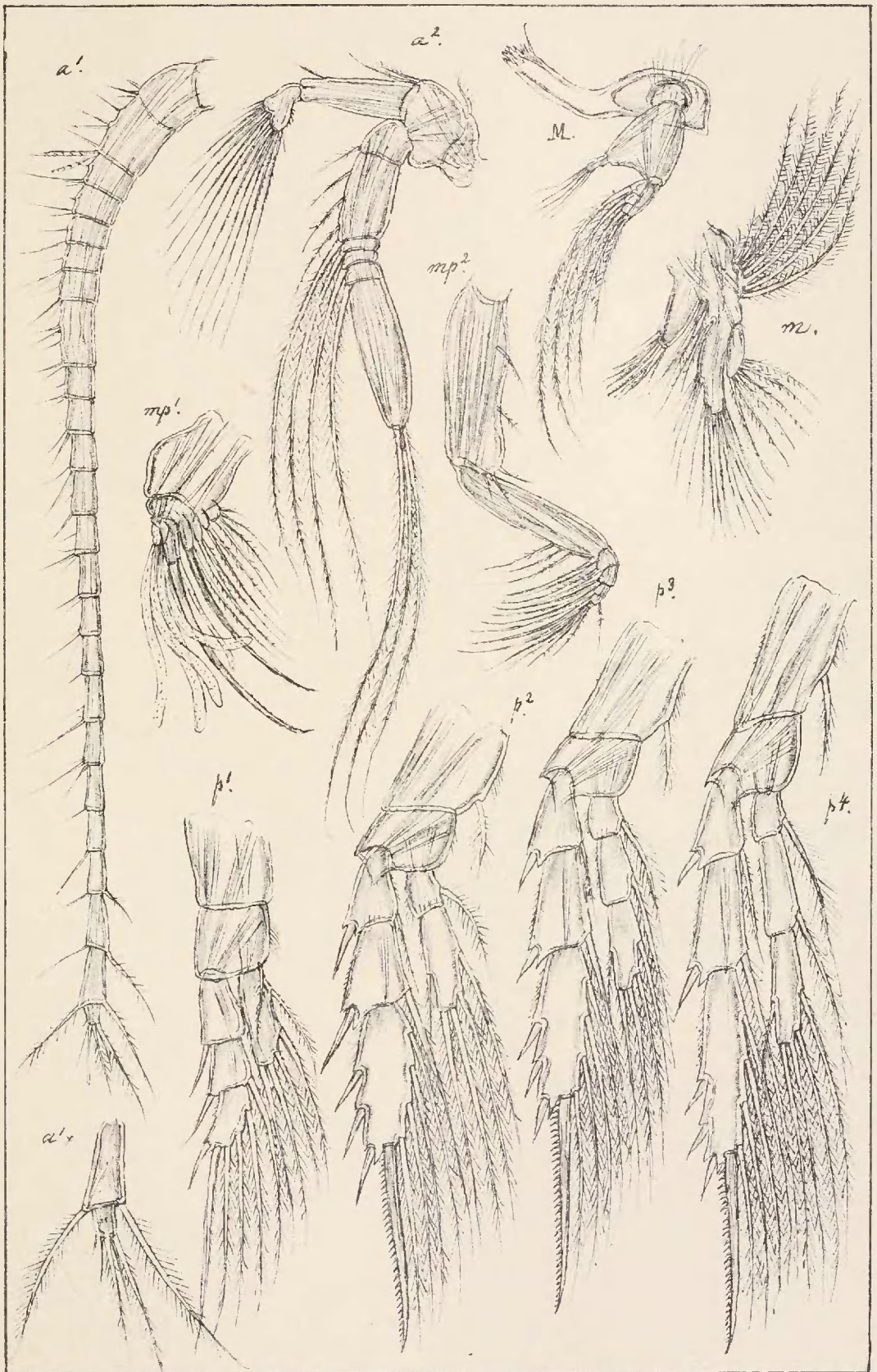
Diaixis hibernica (Scott.)

Copepoda

Calanoida.

Diaixidæ.

Pl. XL.



G.O Sars autogr.

Trykt i den private Opmaaling, Chra

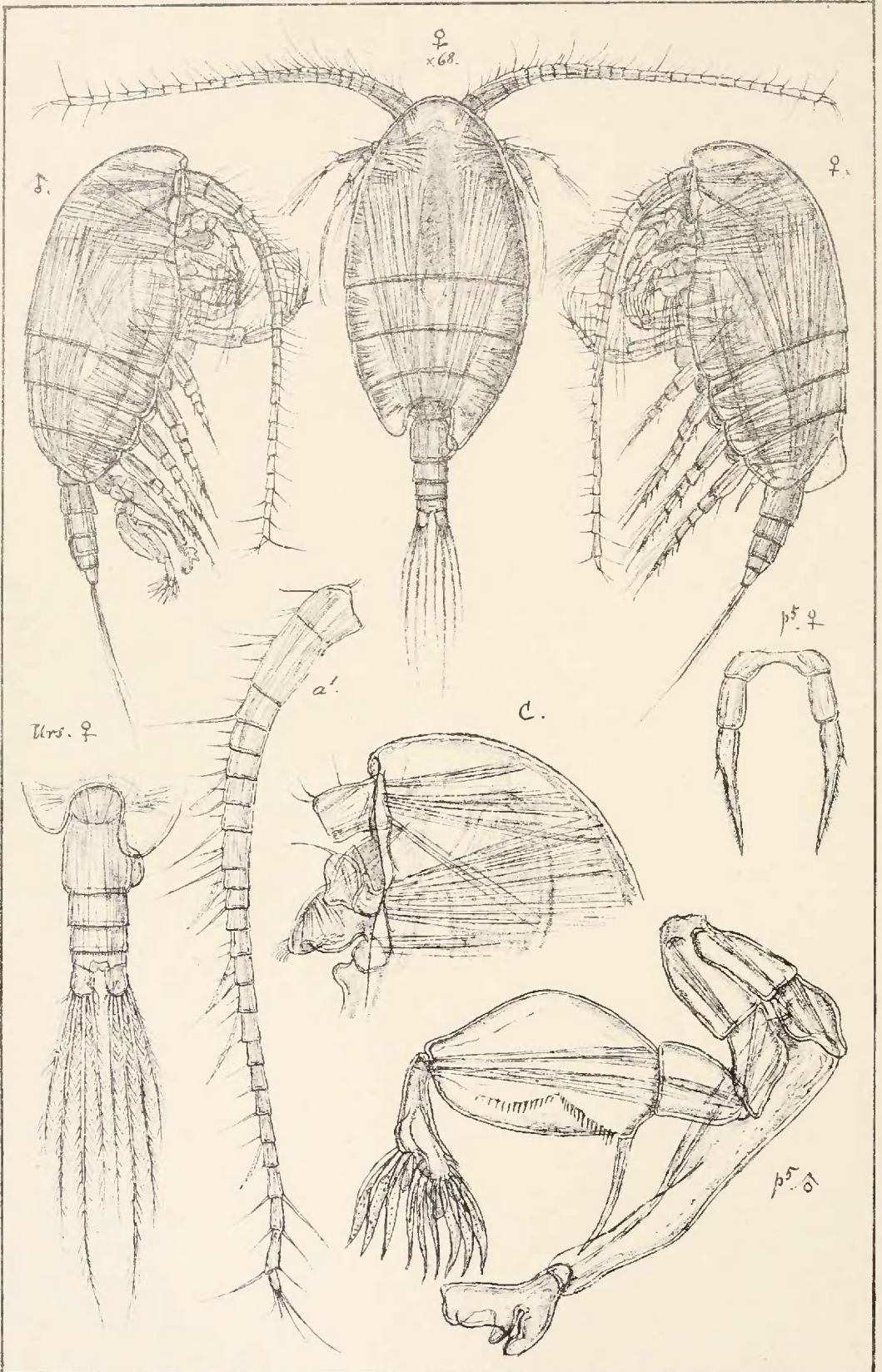
Diaixis hibernica (Scott.)
(continued.)

Copepoda

Calanoida

Stephidæ

Pl. XII

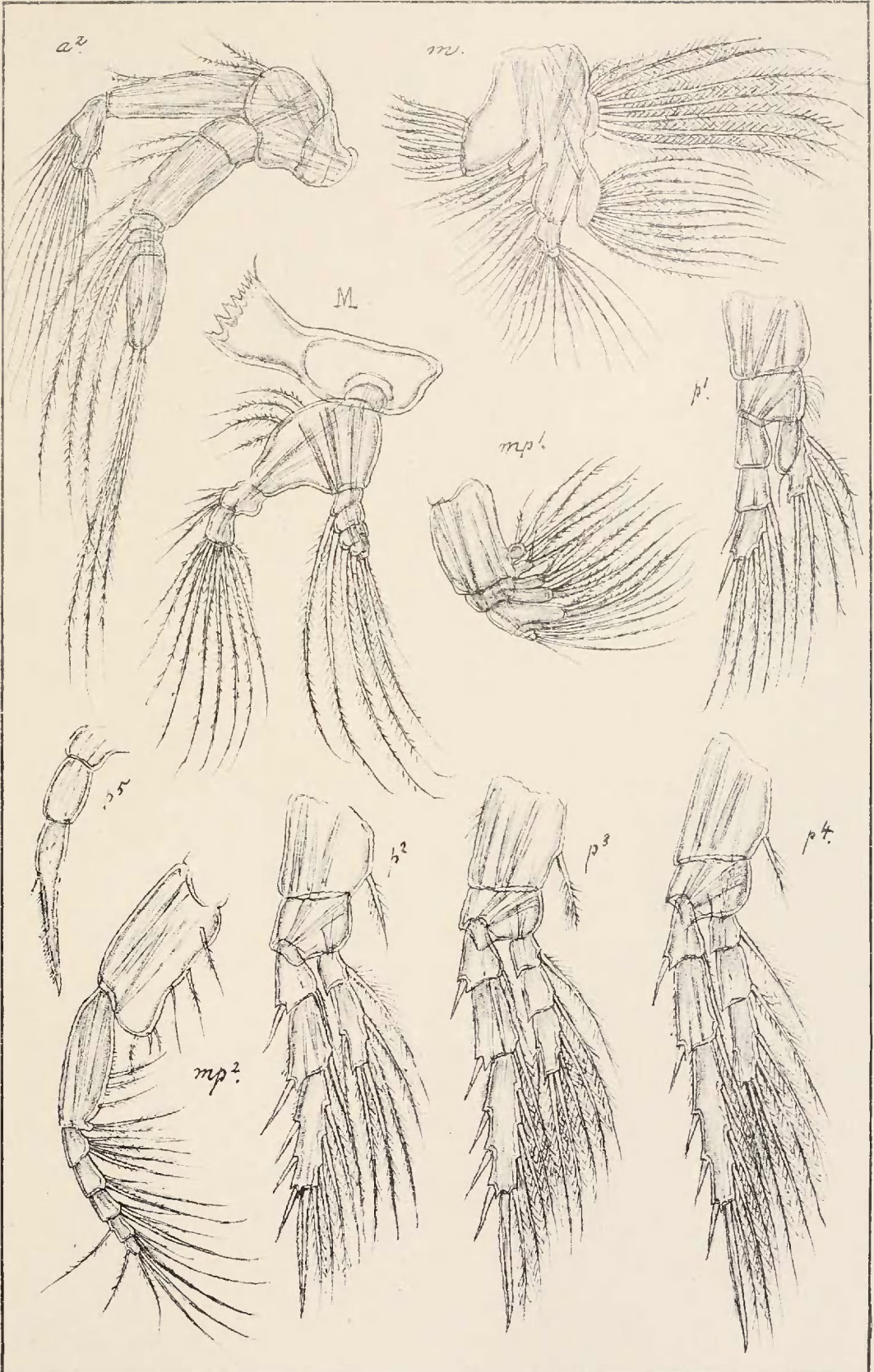


Copepoda

Calanoida

Stephidæ

Pl. XLII.

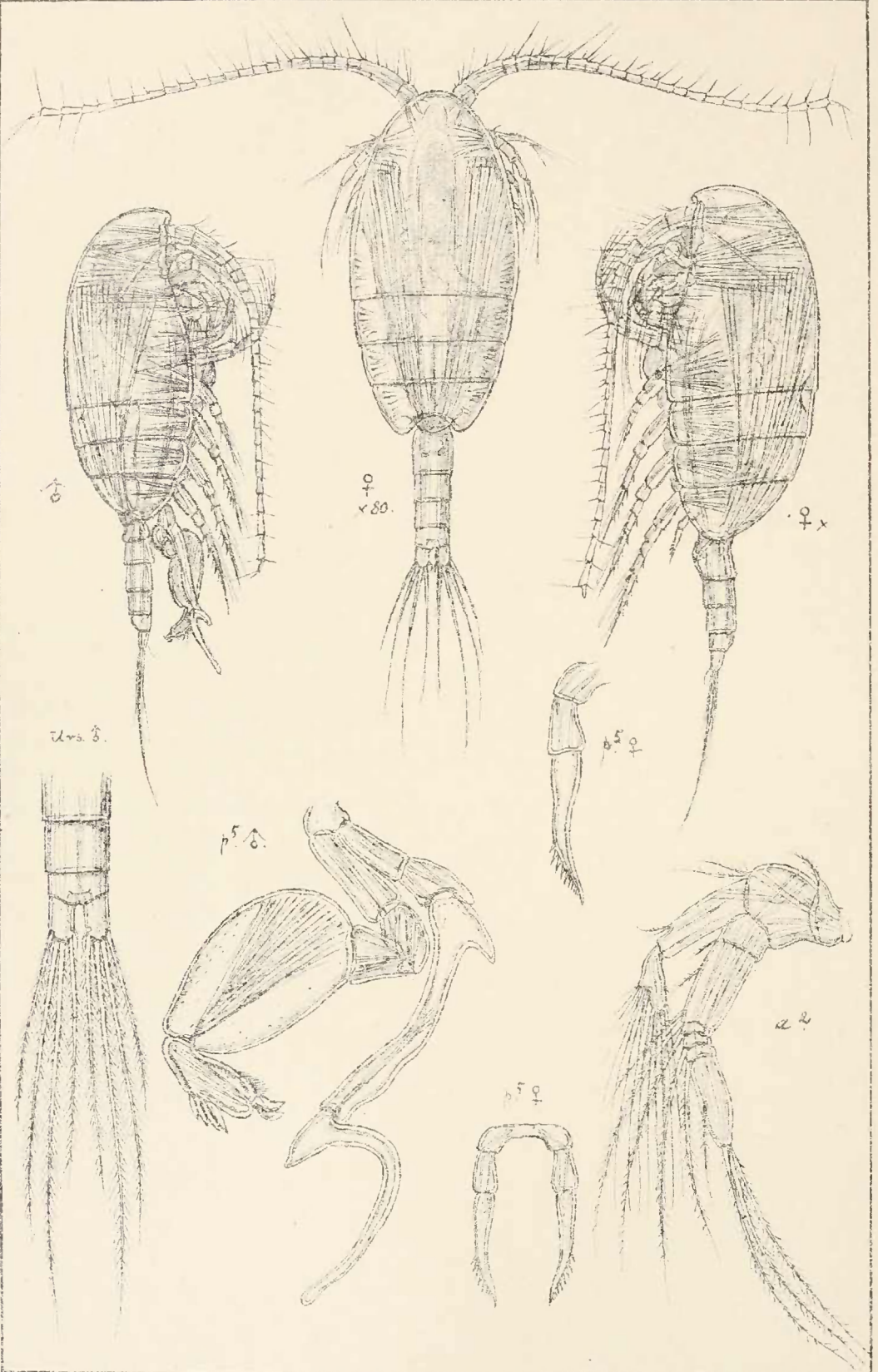


Copepoda

Calanoida

Stephidæ

Pl XLIII.



G. O. Sars, author

Stephos Scotti G. O. Sars.

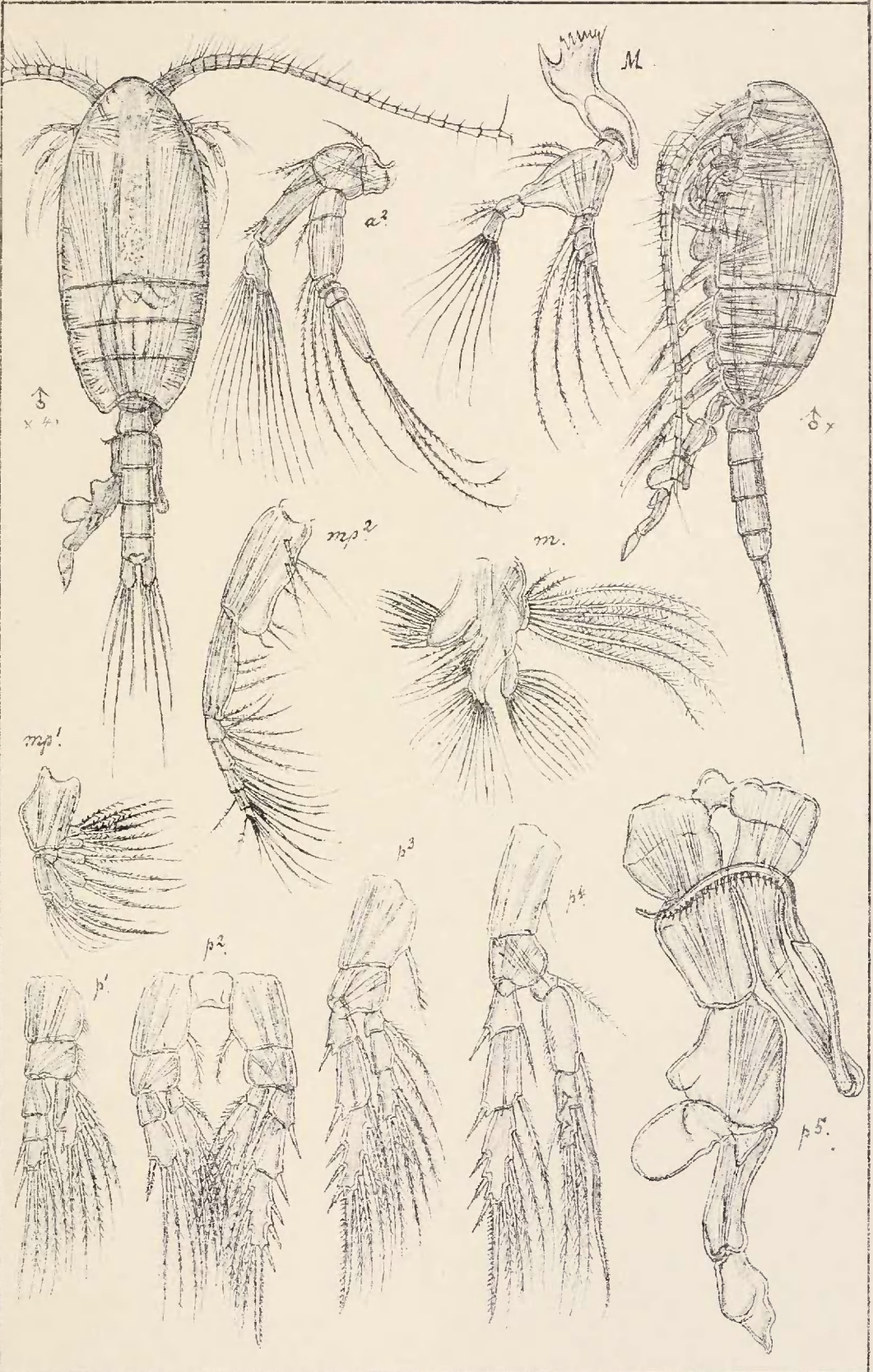
Tratte della Anatomia Comparata

Copepoda

Calanoida

Stephidae

Pl. XLIV.



G. O. Sars auteur.

Tykt den private Opmaaling Chra.

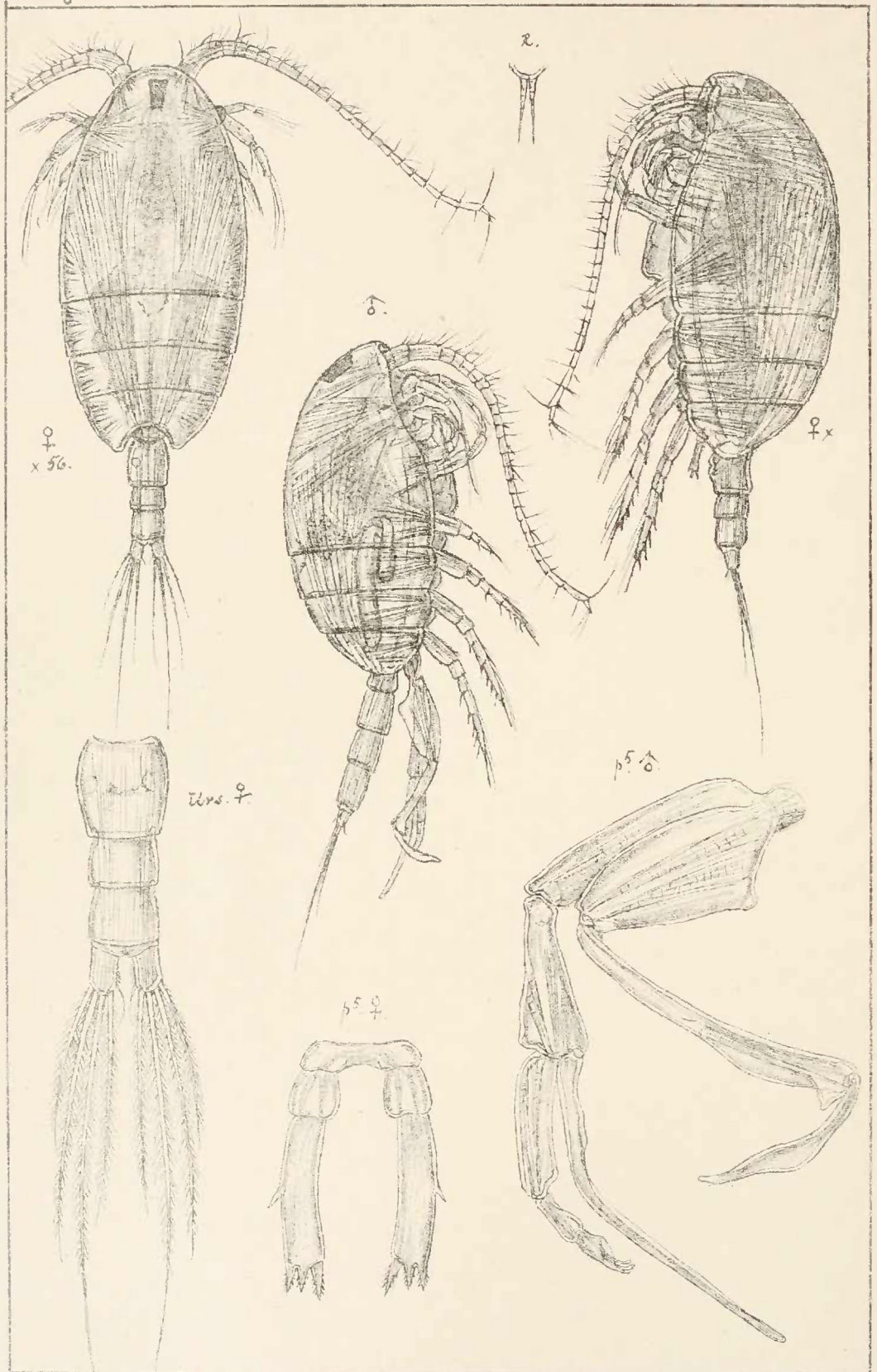
Parastephos pallidus G. O. Sars.

Copepoda

Calanoida.

Tharybidae.

Pl. XIV



G. O. Sars autogr.

Trykt i den private Opmåling Chro

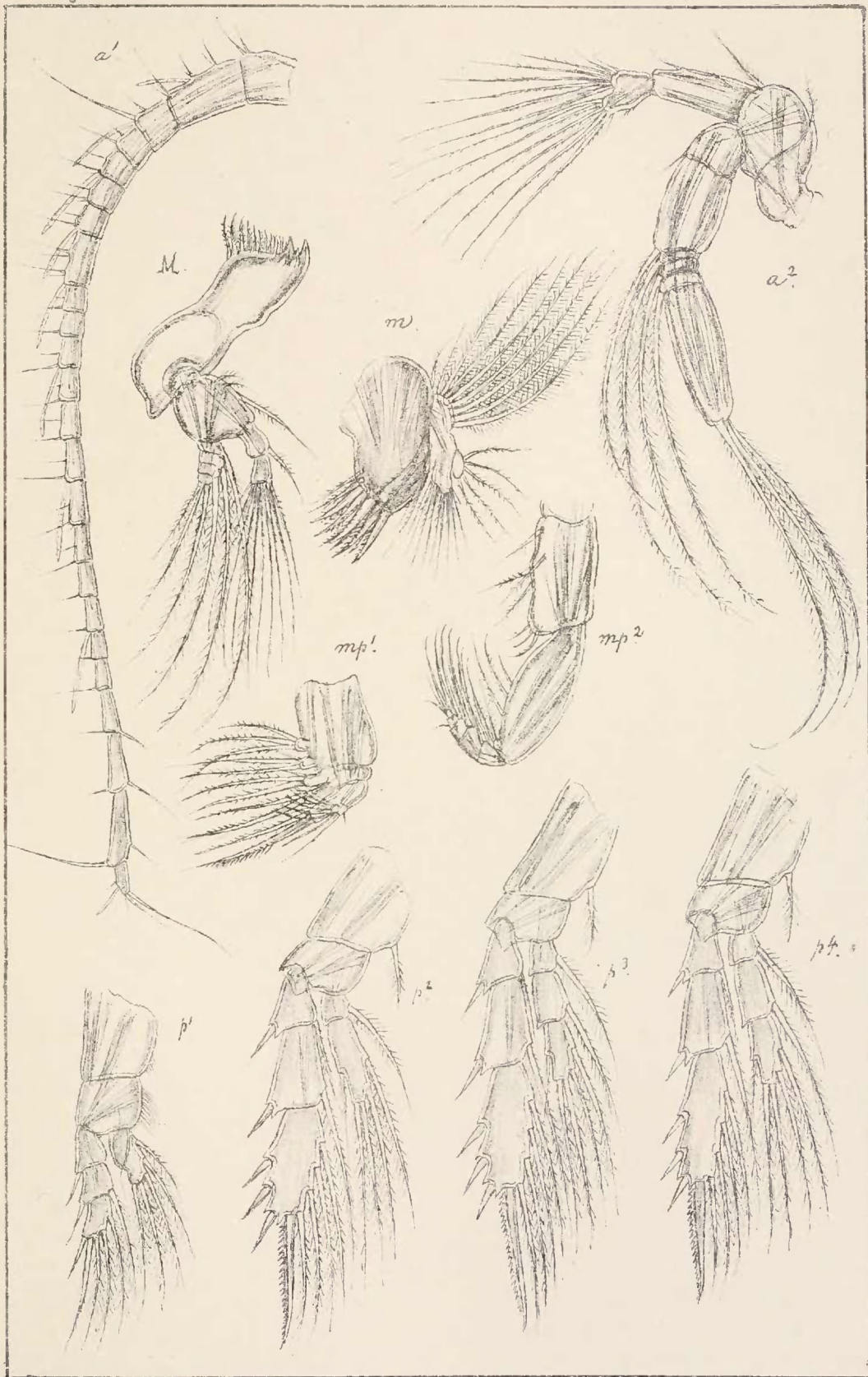
Tharybis macrophthalma G. O. Sars.

Copepoda

Calanoida.

Tharybidæ

Pl. XLVI



G. O. Sars autogr

Trykt i den private Opmaaling, Chra

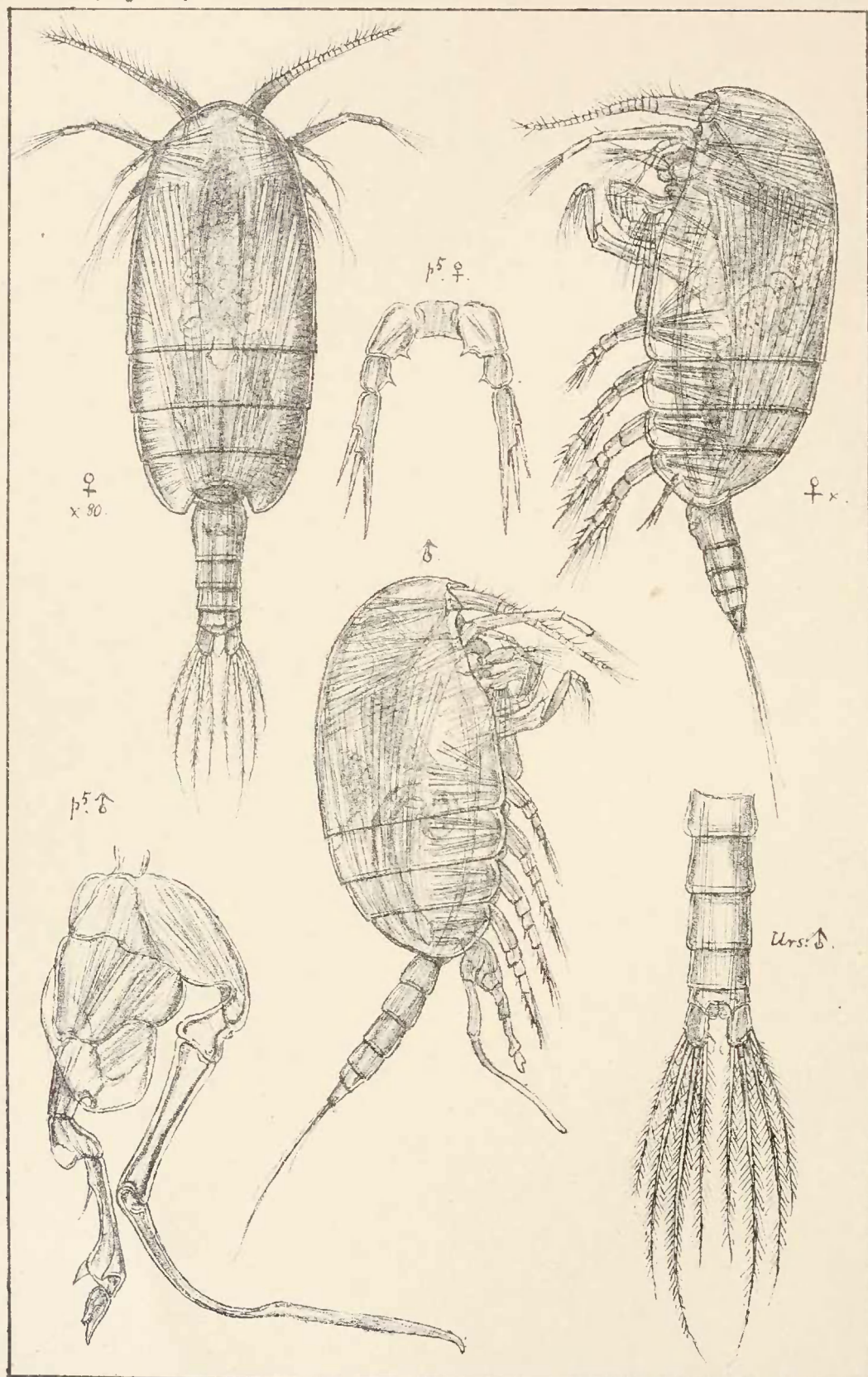
Tharybis macrophthalma G. O. Sars.
(continued.)

Copepoda

Pseudocyclopidæ

Calanoida

Pl. XIVII



G. O. Sars autogr.

Trykt i den private Opmaalings-Chra.

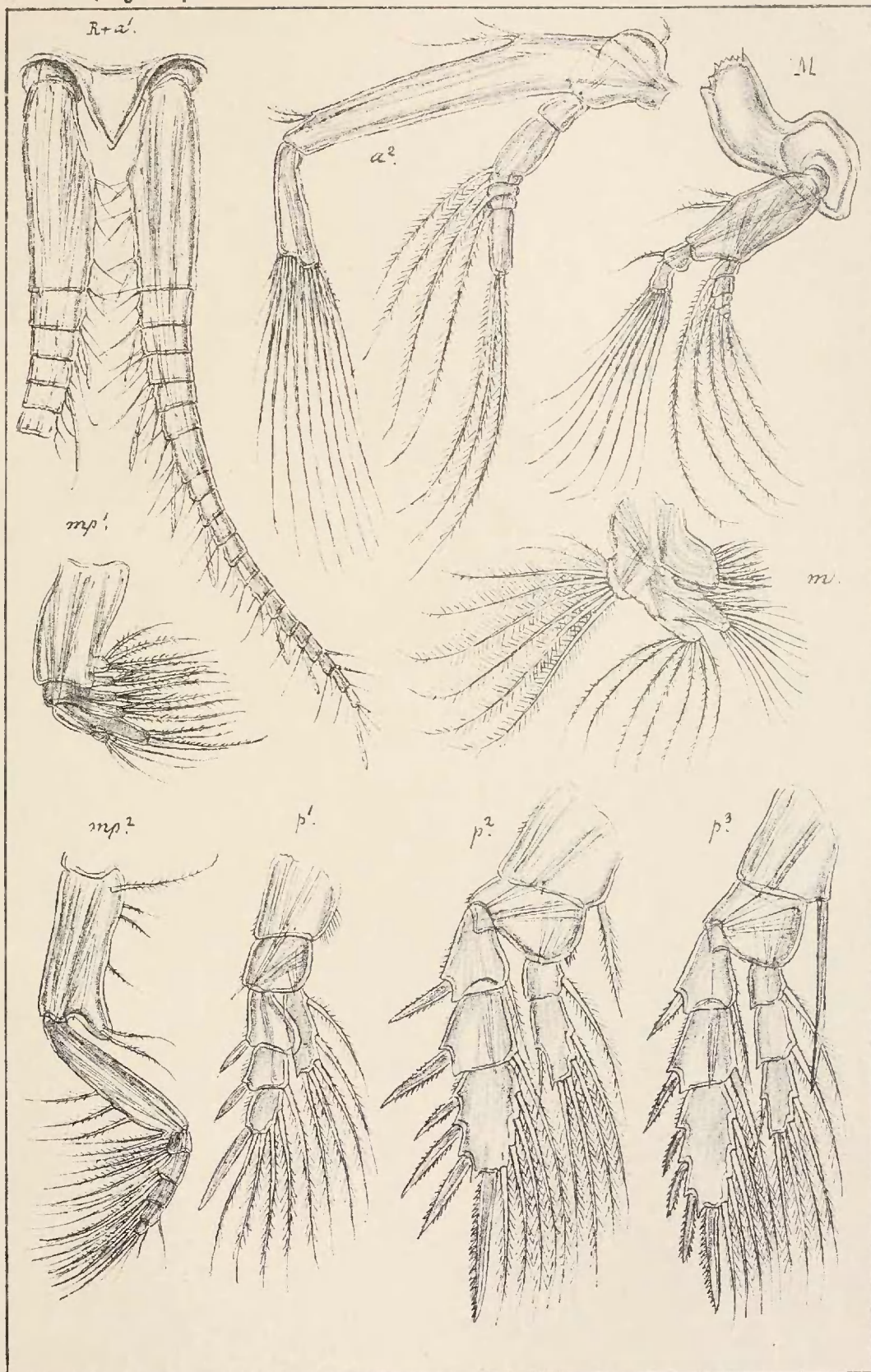
Pseudocyclopia stephoides, Thomps

Copepoda

Pseudocyclopiidæ

Calanoida

Pl. XLVIII.



60 Sars autogr.

Trykt i den private Opmaalings Chra

Pseudocyclopia stephoides, Thomps
(continued.)

