

REPORT  
ON THE  
AMPHIPODA

COLLECTED BY

PROFESSOR HERDMAN, AT CEYLON, IN 1902.

BY

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[WITH EIGHT PLATES.]

THE collection of AMPHIPODA made by Professor HERDMAN and Mr. HORNELL on the coasts of Ceylon is undoubtedly the most important that has ever been brought from a tropical sea. It consists of 80 species, of which 36 are new to science. Six new genera have been found necessary for the reception of some of the species. Several interesting forms have been found among them. The new genus *Vijaya* is characterized by a curious difference in the structure of the upper antennæ in the males and females, as is also the case with the remarkable genus *Platyischnopus*, STEBBING, the male of which is now first described. *Gallea tecticauda*, n. gen. and sp., seems to be an abundant form of peculiar structure, being a link between the Amphilochidæ and Leucothoidæ, though I have thought it desirable to place it in the former family. *Chevalia avicula*, again, I have found difficult to place—its affinities are with the Photidæ on the one hand, and the Corophiidæ on the other. So far it has only been found in pearl oyster washings, and as it is probably, from the structure of the last 3 pairs of peræopods, tubicolous, it is possible that it may be confined to these shells.

Two of the species taken, *Hyperia galba* and *Leucothoë spinicarpa*, appear to be cosmopolitan, and as the first is commonly found in Medusæ and the second in Tunicates, it is interesting to note that, possibly from this cause, they show a remarkable power of accommodating themselves to great changes of temperature.

The size of the Ceylon specimens is generally small, even as compared with Amphipoda from our own coasts, while they are pigmies alongside of those from the Arctic and Antarctic seas. The largest measured is 10 millims. long; our own *Amathilla homari* is 25 millims. and some of the Arctic and Antarctic species are still larger.

Two species of different families, viz., *Melita anisochir* and *Cheiriphotis megacheles*, deserve notice from the great size of the "hands" of the 2nd pair of feet (gnathopods) in the males and their resemblance to a broken bit of shell. One would suppose their use to be protective, as they are large enough to cover the animal when half buried in sand, but it is difficult to see why the males only should be so protected; in both instances the females have quite small hands.

The list of areas from which species have been previously recorded is only to be regarded as an indication of distribution and does not pretend to be complete, nor is that of much importance, as the Amphipoda have been so little collected in most seas. Roughly speaking, it may be said that of the Gammaridea 19 species have been recorded from the Northern Hemisphere, 8 from the Southern, and 7 may be considered Equatorial, but it must be remembered that the number of collectors is far greater in the North. The greatest number of individuals taken in this collection belong to the Southern genus *Platophium*.

The Caprellidæ are treated separately, by Dr. PAUL MAYER, in the Report that precedes this in the present volume.

The following Amphipoda were taken by Professor HERDMAN while tow-netting in the Indian Ocean to the south of Sokotra and eastwards towards Ceylon from January 15 to January 18, 1902:—

- Vibilia viatrix*, BOVALLIUS, 2 specimens;
- Paraphronima gracilis*, CLAUS, 2 specimens;
- Hyperia bengalensis* (GILES), several specimens;
- Phrosina semilunata*, RISSO, 1 young male, length 2 millims.;
- Anchylomera blossevilliei*, M. EDW., a considerable number of specimens;
- Sympronoë parva*, CLAUS, 1 male specimen.

#### CLASSIFIED LIST OF SPECIES IN THE COLLECTION.

The capital letters affixed to the names of the species in the list below indicate parts of the coast of Ceylon, as follows:—

- (A), south of Karativo to Colombo (Stations I. to V. and LXVI. to LXIX.).
- (B), north of Karativo to Kodramallai Point (Stations VI. to VIII. and LVI. to LX.).
- (C), north of Kodramallai to Bengalli (Stations IX. to XVII., XLVII. to LII., LV., and LXI. to LXV.).

- (D), north of Bengalli (Stations LIII. and LIV.).  
 (E), south of Colombo (Stations XLII. to XLVI.).  
 (F), in or near Galle Harbour (Stations XXXV. to XLI.).  
 (G), in or near Trincomalee Harbour (Stations XX. to XXXI.).  
 (H), general coast of Ceylon, under 100 fathoms, exact locality not recorded.

The localities and other details of the stations referred to in Roman numerals will be found in the "Narrative," at p. 17, in Part I. of this series of Reports.

TRIBE: HYPERIIDÆ.

FAMILY: HYPERIIDÆ.

- Hyperia galba* (MONT.)—(F). Probably cosmopolitan.  
*H. crucipes*, BOVALLIUS—(B). Tropical Atlantic; off Barbadoes (BOV.).  
*H. bengalensis*, GILES—(B). Bay of Bengal.  
*Hyperoche cryptodactylus*, STEBBING—(F). Near Cape of Good Hope.

FAMILY: PHROSINIDÆ (STEBBING, 1888).

*Phrosina* sp.

FAMILY: SCELIDÆ (CLAUS, 1879).

*Parascelus parvus*, CLAUS—(C). Atlantic Ocean.

FAMILY: LYCÆIDÆ (CLAUS, 1879).

*Elsia indica*, GILES—(B) (D). Bay of Bengal.

TRIBE: GAMMARIDEA.

FAMILY: ORCHESTIDÆ.

*Hyale nilssoni* (RATHKE)—(B). Atlantic and Mediterranean; Azores; Sokotra.

FAMILY: LYSIANASSIDÆ.

- Ichnopus taurus*, COSTA—(F). Mediterranean.  
*Socarnes schmarda* (HELLER)—(B). Mediterranean.  
*Socarnella bonnieri*, n. gen. and sp.—(F).  
*Lysianax cinghalensis*, STEB.—(B) (C). Ceylon.  
*L. cælochir*, n. sp.—(B) (D).  
*Orchomenella nana* (KRÖYER)—(C). Norwegian, British and French coasts.  
*Tryphosa cucullata*, n. sp.—(B).  
*Vijaya tenuipes*, n. gen. and sp.—(H).

## FAMILY: PONTOPOREIIDÆ.

*Urothoë spinidigitus*, n. sp.—(C).

## FAMILY: ARGISSIDÆ, nov.

*Argissa hamatipes* (NORMAN)—(B). Greenland (HANSEN); Norway; Britain.

*Platyischnopus herdmani*, n. sp.—(C).

## FAMILY: PHOXOCEPHALIDÆ.

*Leptophoxus uncistrostratus* (GILES)—(G). Bay of Bengal.

## FAMILY: AMPELISCIDÆ.

*Ampelisca tridens*, n. sp.—(B) (C) (D) (F).

*A. scabripes*, n. sp.—(A) (C) (H).

*A. brachyceras*, n. sp.—(B) (C).

*A. brevicornis*, COSTA—(B) (F). Atlantic; Mediterranean.

*A. cyclops*, n. sp.—(B) (F).

*A. chevreuxi*, n. sp.—(B) (C).

## FAMILY: AMPHILOCHIDÆ.

*Amphilochus neapolitanus*, DELLA VALLE—(B). Mediterranean; Britain.

*Gallea tecticauda*, n. gen. and sp.—(B) (C) (D) (F).

## FAMILY: LEUCOTHOIDÆ.

*Leucothoë spinicarpa* (ABILD.)—(A) (B) (C) (F) (H). Probably cosmopolitan; from Greenland to the Azores and perhaps Australia.

*L. hornelli*, n. sp.—(A) (D) (G).

*L. stegoceras*, n. sp.—Singapore.

## FAMILY: ANAMIXIDÆ (STEBBING, 1898\*).

*Anamixis stebbingi*, n. sp.—(B).

## FAMILY: STENOThOIDÆ.†

*Stenothoë marina* (SP. BATE)—(C). Norway; Britain; France; Mediterranean.

*S. monoculoides* (MONT.)—(C) (F). do. do. do. do.

*S. gallensis*, n. sp.—(B) (C) (F) (H).

## FAMILY: ŒDICERIDÆ.

*Periocolodes serra*, n. sp.—(B) (C).

*Synchelidium brevicarpum* (SP. BATE)—(C). Britain; Norway.

\* 'Ann. and Mag. Nat. Hist.' (7), vol. IV., 1898, p. 210.

† Owing to the connexion between Amphilochidæ and Leucothoidæ shown by *Gallea*, I have placed the latter family before instead of after Stenothoidæ.

## FAMILY: SYRRHOIDÆ.

*Tiron thompsoni*, n. sp.—(B).

## FAMILY: CALLIOPIIDÆ.

*Eusiroides cæsaris*, STEB.—(B) (C) (F). Australia.

*E. orchomenipes*, n. sp. (?)—(C).

## FAMILY: ATYLIDÆ.

*Paratylus granulosus*, n. sp.—(C).

FAMILY: DEXAMINIDÆ (STEBBING, Ann. and Mag., *loc. cit.*).

*Dexamine serraticrus*, n. sp.—(A).

*Tritata antarctica*, STEBBING—(A) (C) (H). Australia.

*Guerneæ lævis*, CHEVREUX—(B) (C). France.

## FAMILY: GAMMARIDÆ.

*Hornellia incerta*, n. gen. and sp.—(B) (C).

*Melita obtusata* (MONT.)—(A) (C) (D) (E) (G). Norway; Britain; France;  
Mediterranean.

*M. anisochir* (KRÖYER)—(A) (B) (C) (G) (H). Rio Janeiro.

*Mara othonides*, n. sp.—(A) (C) (D) (F) (H).

*M. scissimana*, COSTA—(B) (F) (H). Mediterranean.

*M. rubromaculata* (STIMPSON)—(B) (C) (E) (F). Pacific; Australia; Cape  
Aguilhas.

*M. tenella* (DANA)—(C). Fiji Islands.

*M. tenuicornis* (DANA)—(C). New Zealand.

*Elasmopus subcarinatus* (HASWELL)—(A) (B) (C) (D) (F) (G). Australasia.

*E. spinimanus*, n. sp.—(F).

*E. serrula*, n. sp.—(C) (F).

*E. dubius*, n. sp.—(C).

*Parcelasmopus suluensis* (DANA)—(C). North Australia; Sulu Sea.

*Cheirocratus* sp.—(C).

*Megaluropus agilis*, NORMAN—(B) (C). Britain; Holland; Mediterranean.

FAMILY: LILLJEBORGIDÆ (STEBBING, *loc. cit.*).

*Lilljeborgia pallida*, SP. BATE—(B) (D) (H). Norway; Britain; France.

FAMILY: AORIDÆ (STEB., *loc. cit.*).

*Lembos podocerooides*, n. sp.—(B) (C) (D) (G) (H).

*L. chelatus*, n. sp.—(A).

## FAMILY: PHOTIDÆ.

*Gammaropsis zeylanicus*, n. sp.—(A) (B) (C) (D) (F) (G).

*Cheiriphotis* (n. gen.) *megacheles* (GILES)—(A) (B) (C) (D). Bay of Bengal.

*Photis longicaudata* (SP. BATE)—(B) (C) (F). Norway; Britain; France; Mediterranean.

*P. longimanus*, n. sp.—(C).

*P. nana*, n. sp.—(B).

*Chevalia aviculæ*, n. gen. and sp.—(B) (C).

FAMILY: AMPHITHOIDÆ (STEB., *loc. cit.*)

*Amphithoë intermedia*, n. sp.—(A) (B) (C) (Station XXXIV.).

*A. vaillanti*, LUCAS—(B). Mediterranean.

FAMILY: ISCHYROCERIDÆ (STEB., *loc. cit.*)

*Ischyrocerus anguipes*, KR.—(H). Arctic Seas; Norway.

*Jassa*, sp.—(B).

*Erichthonius abditus* (TEMPLETON)—(A) (B) (C) (F). European coasts; Azores.

*E. macrodactylus* (DANA)—(D). Sulu Sea.

## FAMILY: COROPHIIDÆ.

*Cerapus calamicola* (GILES)—(C) (D) (H). Bay of Bengal; Australia; Sokotra.

*Siphonæcetes orientalis*, n. sp.—(A) (B) (D).

*Corophium crassicorne*, BRUZELIUS—(C). Jan Mayen; Norway; Britain; France.

## FAMILY: DULICHIDÆ.

*Platophium læve* (HASWELL)—(A) (B) (C). Australia.

*P. synaptochir*, n. sp.—(B) (C) (F).

*P. zeylanicum*, n. sp.—(C).

FAMILY: COLOMASTIGIDÆ (STEB., *loc. cit.*)

*Colomastix pusilla*, GRUBE—(B). Britain; France; Mediterranean.

## DESCRIPTION OF THE SPECIES.

The following terms are used in the description :—

- “Pleon” = Metasome, G. O. SARS; the first 3 abdominal segments.
- “Urus” = Urosome, G. O. S.; the last 3 abdominal segments.
- “Ocular lobe” = Lateral angle of the head.
- “Appendage” = Secondary or accessory appendage of the upper antennæ.

In the peduncle of the antennæ the “first joint” is the ante-penultimate; in the limbs it is the basipodite, the propodos, or hand, thus being the 5th joint.

The measurements are from the tip of the uropods to the base of the antennæ when the Amphipod is laid straight.

When a joint is said to be as long as two or more it means as long as those joints united.

In the following classification the system used by Professor G. O. SARS in his ‘Amphipoda of Norway’ has been followed, except as to the position of the genus *Leucothoë*.

### TRIBE: HYPERIIDEA.

#### FAMILY: HYPERIIDÆ.

#### *Hyperia*, LATREILLE, 1825.

##### *Hyperia galba* (MONT.).

Two from the Reef, Galle, the largest 7·5 millims.

The serration of the hind margin of the 1st gnathopod is simple, as figured by BOVALLIUS for *H. gaudichaudi*, M. EDW. (Hyperidea, Plate X., fig. 20). If *H. latreillei*, M. EDW., is to be united to *H. galba*, as proposed by SARS (‘Amph. of Norway,’ p. 7), there seems to be no reason why *H. gaudichaudi*, which BOVALLIUS (*loc. cit.*, p. 176) considers “a link between” these 2 species, should not also be included. The shape of the gnathopods in the present specimens is nearer to *H. galba* than to *H. gaudichaudi* as figured by BOVALLIUS.

##### *Hyperia bengalensis* (GILES).

*Lestrigonus bengalensis*, GILES, ‘Journ. of Asiatic Soc. of Bengal,’ 1887, p. 224.

*Hyperia dysschistus*, STEBBING, “Chall.” Amph., p. 1388, Plate 167, 1888.

There can be little doubt of the identity of the above; STEBBING, with his usual acuteness, observed the similarity, but was misled partly by the distance between the two stations (*H. dysschistus* was taken off Cape Howe, Australia) and partly by errors in GILES’ description of the telson and uropods. As suggested by BOVALLIUS (*loc. cit.*, p. 200), GILES has mistaken the projecting hind margin of the urosome for the

telson, which is unusually diaphanous and easily overlooked; while he has mistaken the 1st uropods for the 2nd owing to the former crossing the latter, as is common in a mounted specimen. As a matter of fact, the uropods are quite normal. The line of demarcation between the 2nd and 3rd urosome segments is also very difficult to see; it is correctly shown by STEBBING (*loc. cit.*, Plate 167) at the base of what was believed by GILES to be the telson. The posterior angle of the 3rd pleon segment is a sharp right angle as in *H. dysschistus*, and not rounded as drawn by GILES.

There is no doubt that our specimens are *H. dysschistus*, STEB., and, considering the localities and the deceptive nature of the characters in which Dr. GILES has erred, that they are also *H. bengalensis* (GILES).

The gnathopods agree well with the figures of *H. dysschistus* in BOVALLIUS (*loc. cit.*, Plate XI., figs. 1, 2).

This species presents a curious case of male dimorphism. The lower antennæ of the *smallest* males (2.25 millims.) have the very long and slender flagella generally considered characteristic of sexual maturity, while other males, with the antennæ imperfectly developed, measure 3.25 millims. Perhaps, as in the case of *Bathyporeia pilosa*, LIND., mentioned by BONNIER ('Travail du Lab. de Zoologie de Wimereux'), the males become sexually mature before they are full grown, and lose their nuptial appendages after copulation.

Several specimens from various localities at Ceylon.

#### **Hyperia crucipes, BOVALLIUS.**

In addition to the distinctive characters given by BOVALLIUS may be mentioned the great relative width of the 4th and the ciliate margin of the 5th joint in the 1st and 2nd peræopods.

Two, young, Station LXVI. Length 2.5 millims.

#### **Hyperoche, BOVALLIUS, 1887.**

**Hyperoche cryptodactylus, STEBBING, "Chall." Amph.,** p. 1399, Plate 170.

One male, length 4 millims., Galle harbour.

The "Challenger" specimen was taken near the Cape of Good Hope.

#### **Phrosina, RISSO, 1822.**

**Phrosina** sp.

One, young—no locality. Length 2.5 millims.

Too young for identification.

#### **Parascelus, CLAUS, 1879.**

**Parascelus parvus, CLAUS—**Plate I., fig. 1.

One, male, length 3.5 millims.

The first (upper) antennæ have the 1st joint of the flagellum very wide and as long as the next two (fig. 1. ant.<sup>1</sup>).

The second antennæ have the last 3 joints subequal.

The gnathopods agree with STEBBING'S description ('Chall.' Amph.,' p. 1501); I could see no trace of the teeth shown on the carpus in CLAUS' figure ('Platysceliden,' p. 47, Plate VII., fig. 15); this is probably, from his description, exaggerated in the drawing.

**Elsia**, GILES, 1888.\*

**Elsia indica**, GILES—Plate I., figs. 2.

Five or six male, female, and young. Length of male 5 millims., female with ova rather less.

Description of male (now found for the first time):—The head is produced and tumid in front, the eyes occupying the posterior half; it is fully as long as the first 4 segments.

Mesosome rather longer than pleon; the first 2 segments together as long as the 3rd, the 5th and 6th longest. The 1st segment of the pleon is longest, the 3rd shortest, the hinder angle of the latter is bluntly rectangular.

Upper antennæ attached to the extreme edge of the lower part of the front of the head, inflated, with the upper surface depressed and the lower convex. Flagellum minute, apparently 2-jointed (fig. 2. ant.<sup>1</sup>).

Lower antennæ of the usual form in males of this family, the 1st joint widened distally; the 3rd longer than the 4th and 5th, the latter very short.

No mouth organs or maxillipeds were found.

Gnathopods alike, small; 1st joint narrow, margin straight and parallel, longer than the remaining 5 joints; 2nd and 3rd subequal; hind margin of wrist extending nearly to the end of that of the hand, like a pair of shears with smooth inner margins; hand much shorter and narrower than the wrist, tapering slightly to the dactylus, which is very small (fig. 2. gn.<sup>1</sup>).

First and 2nd peræopods very slender, 1st joint as long as and scarcely wider than the 3rd and 4th; margins straight, parallel; 4th and 5th subequal; dactylus minute.

Third peræopods very powerful; 1st joint ovate, about as long as and but little wider than the 4th, narrowing distally; front margin obsoletely serrate; 3rd about two-thirds of the 4th, both widening distally; 4th and 5th subequal in length and width, the 4th rather wider at its distal end, both obsoletely serrate on both margins; dactylus very minute (fig. 2. pp.<sup>3</sup>).

Fourth peræopods like the third, but rather smaller.

Fifth peræopods small; 1st joint oval, widest near the base, and scarcely as long as the remaining joints; 3rd about twice as long as 4th; 5th as long as 3rd and 4th, narrowing distally; dactylus minute (fig. 2. pp.<sup>5</sup>).

\* 'Journ. Asiat. Soc. of Bengal,' 1888, p. 250, Plate VI.

Uropods shortening progressively in extent, so that the 1st project the furthest; the inner ramus of the 1st is about half as large as the outer; the rami of the 2nd and 3rd pairs are subequal in length and breadth, and are all ciliate on the inner margins.

The telson is semi-oval, covering two-thirds of the rami of the 3rd uropods.

The only known species of the genus, and easily recognizable by the powerful 3rd and 4th peræopods.

**Hyale, RATHKE, 1837.**

**Hyale nilssoni (RATHKE), var.**

Station XLVII., 1 male; Station LVIII., 9 specimens.

This is the same form as that taken by Dr. H. O. FORBES on shore on the island of Abd-el-Kuri ('Nat. Hist. of Sokotra and Abd-el-Kuri,' 1903, p. 219). As there stated, it differs from the type in the length of antennæ (in the specimen from Station XLVII. not even in that); in the more rounded lobe of the wrist in the 1st gnathopod of the male and the 1st and 2nd gnathopods of the female; and in the 1st joints of the last 3 pairs of peræopods, which are serrate instead of smooth. I do not consider these differences sufficient to constitute a new species, but, if anyone wishes to do so, I suggest the name "*kuriensis*." They seem to me, however, quite as important as those that characterize some other species, such as *H. stebbingi*, CHEVREUX, and *H. grimaldi*, CHEV. ('Résult. des Camp. Sci. de "l'Hirondelle,"' pp. 8-10), but the genus appears to have been rather overworked.

**Ichnopus, A. COSTA, 1853.**

**Ichnopus taurus, COSTA.—Plate I., fig. 3.**

One male, Station XLI., about 100 fathoms.

The only point in which this species seems to differ from DELLA VALLE's description, &c. ('Gamm. d. Golfo di Napoli,' p. 802, Plate 27), is in the comparative squareness of the 1st joint and the greater width of the 3rd and 4th joints of the 3rd peræopods in our specimen (fig. 3. pp.<sup>3</sup>). I agree with DELLA VALLE that *I. spinicornis*, BOECK, and *I. affinis*, HELLER, can hardly be considered distinct species.

**Socarnes, BOECK, 1870.**

**Socarnes schmardæ (HELLER).**

*Anonyx schmardæ*, HELLER, 'Amph. des Adriatischen Meeres.'

*Ichnopus schmardæ*, HELLER, DELLA VALLE, *loc. cit.*

One male, Station VI.

Lateral angle of the head moderately produced, acute. Eyes occupying almost the whole head. Posterior margin of the 3rd pleon segment slightly convex, lower margin straight, angle rounded. The 1st urus segment is dorsally depressed.

The wrist of the 1st gnathopods is considerably wider at the distal end than the base of the hand; the latter has 2 or 3 spines on the posterior margin just beyond the widest part.

**Socarnella**, n. gen.

Upper antennæ with the 2nd and 3rd joints well developed, and the 1st joint of the flagellum like the succeeding joints.

Mandibles as in *Amaryllis*.

First maxillæ with a palp.

First gnathopod not subchelate.

Second gnathopod with hand long and widening distally.

Outer ramus of 3rd uropods without a terminal joint.

Telson small, emarginate at the tip.

**Socarnella bonnierii**,\* n. sp.—Plate I., figs. 4.

One female; length 5 millims. Reef, Galle, with compound Ascidians (February 16, 1902). Head with the ocular lobe produced; convex on the upper side. Eyes large, oval, dark, with large crystalline facets.

Third segment of pleon with the hind margin convex, the lower margin straight, posterior angle rounded (fig. 4. pl.<sup>3</sup>); the 2nd segment has the posterior angle acute.

First 4 side plates rather deeper than the segments.

First segment of urus even.

Upper antennæ: 1st joint twice as long as wide, and as long as the 2 succeeding; 2nd rather longer than 3rd, which is subequal to the 1st joint of the flagellum. Flagellum setose, 9-jointed; the 1st joint like the succeeding, but twice as long as the 2nd. Appendage strong, 5-jointed, reaching to the 4th joint of the flagellum. The 1st and 2nd joints of the peduncle are acutely produced below, the 2nd more than the 1st (fig. 4. ant.<sup>1</sup>).

Lower antennæ: 2nd joint widening distally, rather longer than the 3rd, the two together about as long as the 7-jointed flagellum.

Mandible much as in *Amaryllis*, the palp placed near the proximal end, the 3rd joint about one-third of the 2nd, bent at a right angle (fig. 4. m.).

First maxillæ with a strong 2-jointed palp; outer plate with about 7 dentate spines; inner plate half as high as the outer, pointed, with 2 or 3 unequal setæ at the tip (fig. 4. mx.<sup>1</sup>).

Maxillipeds: inner plates reaching beyond the 1st joint of the palp, dentate at the ends, setose on the inner margin; outer plates broad, reaching the middle of the 3rd joint, margins smooth. Dactylus distinctly unguiform, acute (fig. 4. mxp.).

\* I have much pleasure in dedicating this species to Mons. JULES BONNIER, who has contributed so much to a better knowledge of the Amphipoda.

First gnathopods: 1st joint with almost parallel margins, as long as the next 4; 2nd as wide, about one-fourth as long as the 1st and longer than 3rd or 4th; the 3rd overlapping the 4th, cordate, the point distal, hind margin very convex; wrist rather shorter than the hand, widening distally; base of the hand as wide as the wrist, narrowing to the dactylus; the latter short, curved, with a secondary tooth near the point. All the joints, except the 1st and 6th, have long setæ on the hind margin. Side plates subrectangular with rounded angles, wider than the next two (fig. 4. gn.<sup>1</sup>).

Second gnathopods: 1st joint about as long as the next 3, curved and widening distally; 2nd almost as long as the 4th, with 2 or 3 long stiff setæ in a depression on the hind margin near the distal end; 3rd very convex, with a group of erect setæ on the hind margin. Length of wrist to hand as 5:3, the former narrow, hind margin slightly concave, with short setæ and scanty fur at the distal end: the hand widens gradually to the end, furred on the hind margin, with short setæ on the front and a tuft of long setæ at the base of the dactylus; this is strong and overlaps the hind margin (fig. 4. gn.<sup>2</sup>).

First and 2nd peræopods slender, with few setæ and no spines.

Third peræopods: side plates wider than deep, lobes equal, larger than the 1st joint, which is suborbicular, flattened behind, margins smooth, a few setæ on the lower part of the front.

Fourth peræopods: the 1st joint flattened behind, the lower part of the front margin spinous; the upper part of the hind margin faintly serrate.

Fifth peræopods: the 1st joint rounded and more distinctly serrate behind, spinous on the lower part of the front margin.

First uropods spinous, the rather slender peduncle considerably longer than the subequal rami.

Second uropods: peduncle wide at the base, narrowing distally and about as long as the outer ramus, which is rather longer than the inner and spinous; the inner has one spine near the end (fig. 4. up.<sup>2</sup>).

Third uropods: peduncle longer than the rami, with 2 or 3 spines and a distal tooth on the outer margin; outer ramus rather the longer, *without a terminal joint*, with 2 spines dividing it into 3 equal parts (fig. 4. up.<sup>3</sup>).

Telson about half the length of the peduncle of the 3rd uropods, oval, deeply emarginate at the end, with a short spine on each of the lobes (fig. 4. ur.).

This genus differs from *Amaryllis* in the presence of a palp to the 1st maxillæ and in the smaller side plates of the first 4 segments. From *Socarnes* it differs in the mandibles, maxillipeds, 2nd gnathopods, telson, and 3rd uropods. It may be considered as connecting these two genera. The excavated point of the telson separates it from *Lysianax*, though DELLA VALLE (*loc. cit.*, p. 789, plate 25) has described a species under the name of *L. punctatus* with a similar telson. From this the present species differs in the antennæ, 1st maxillæ, &c.

**Vijaya**,\* n. gen.

Upper antennæ in the male with the 1st joint of the flagellum much longer than any of the succeeding joints and very setose.

Mandibular palp set on in the middle of the trunk.

The remaining characters and the female antennæ as in *Amaryllis*, STEBBING, 'Chall.' Rep., p. 699.

The curious difference in the male and female antennæ makes a new genus necessary.

**Vijaya tenuipes**, n. sp.—Plate I., figs. 5.

Coast of Ceylon, shallow water, 2 specimens, length 4 millims.

Head very deep, rostrum small, bent downwards; ocular lobe obtuse-angled. Eyes very large, long-oval.

Third pleon segment with the hind margin slightly convex, lower almost straight; the posterior angle acute, upturned, with a sinus above it, as in the other species of this genus (fig. 5. pl.<sup>3</sup>).

Antennæ in female subequal, reaching the hind margin of the 4th side-plates, which are very large.

Upper antennæ (female): 1st joint about twice as long and wide as the 2nd, produced below in a distal tooth; the 2nd the same proportion to the third; flagellum considerably longer than the peduncle, *the 1st joint resembling and rather shorter than the 2nd, quite naked*; appendage barely reaching the end of the 1st joint of the flagellum; 2-jointed, the 1st twice as long and wide as the 2nd (figs. 5. ant.<sup>1</sup>).

*The upper antennæ in the male have the 1st joint of the flagellum as long as the next three and densely setose on the inner side*, both flagella are broken, one at the 12th joint; the appendage is 3-jointed, the 1st joint twice as long as the 2nd, which is about in the same proportion to the 3rd; this is extremely narrow and reaches the end of the 2nd joint of the flagellum (fig. 5. ant.<sup>1</sup>).

Lower antennæ: the 1st joint very short, the 2nd half as long again as the 3rd (figs. 5. ant.<sup>2</sup>).

Maxillipeds: inner plates reaching beyond the middle of the palp, the ends cut into 3 teeth, sides setose; outer plates transparent, broad, reaching the end of the 3rd joint, dentate on the distal half, the indentations deeper towards the end. Second joint of the palp rather longer than the 1st or 3rd, which are subequal. Dactylus slender, with the inner margin finely denticulate and 2 or 3 setæ on the point.

First gnathopods: 1st joint as long as the remaining joints, about 5 times as long as wide; margins subparallel, 2nd longer than 3rd, which is irregularly triangular; wrist about two-thirds as long as the hand, with 3 fascicles of setæ on the hind

\* VIJAYA, an ancient king in Ceylon. See this Report, Part I., 'Introduction,' p. 1.

margin. The hand tapers gradually to the base of the dactylus without a palm, the hind margin finely pectinate with 4 spines and as many pairs of unequal setæ. Dactylus about one-fifth the length of the hand, curved. Side-plates small, oval below (fig. 5. gn.<sup>1</sup>).

Second gnathopods long and slender, the joints of almost uniform width throughout; the 1st slightly curved, about 6 times as long as wide; the 2nd twice as long as the 3rd; the wrist about equal to the two last named, margins straight, the hind margin setose; hand about two-thirds as long as the wrist, margins parallel, the hind margin with long setæ directed forwards. Side-plates nearly as long as the 1st joint, about twice as deep as wide, oval below (fig. 5. gn.<sup>2</sup>).

First and 2nd peræopods: 1st joint about as long as the next three; 2nd very short, 3rd, 4th, and 5th subequal; dactylus strong, about half as long as the preceding joint. Side-plate of the 2nd about as wide as one-fourth of the length of the whole body; hind margin excavated above and rounded below; *front margin with the lower angle produced and acute* (fig. 5. pp.<sup>2</sup>).

The remaining peræopods have the 1st joints expanded and serrate behind, the lower margins in the 3rd and 4th rounded, in the 5th almost straight; front margins spinous; 3rd joints spinous before and behind.

The uropods are damaged; the 1st pair extends the furthest, then the 2nd, which have the peculiar character shown by STEBBING in his figure of *A. macrophthalmus* ('Chall.' Rep., Plate 29). The rami of the 3rd pair are straight and lanceolate.

The telson reaches to about one-third of the length of the peduncle of the 3rd uropods, and is cleft for about one-third of its length, the cleft dehiscent.

This species may be distinguished by the acute anterior angle of the 4th side-plate, and by the straightness of the wrist and hand of the 2nd gnathopods. It may be identical with *Glycerina affinis*, CHILTON ('Trans. N.Z. Institute,' vol. xxiv., p. 2, Plate XLVII.), but the description of that species is not sufficient to determine the point.

#### **Lysianax**, STEBBING, 1888.

*Lysianax cinghalensis*, STEBBING.\*—Plate I., fig. 6.

*L. urodus*, A. O. WALKER, 'Nat. Hist. of Sokotra,' &c., 1903, p. 220, Plate XIV., fig. 4.

Various localities round the coast of Ceylon.

This appears to be a variable species. Most of the specimens examined have a 4-jointed appendage to the upper antennæ, and, while in one male the 1st gnathopod resembles that of Mr. STEBBING's specimen, in another the hand is conical, with a straight dactylus continuous with the hand. The 1st joint of the 5th peræopods also varies, having the lower margin truncate in some and rounded in other specimens.

\* 'Trans. Linn. Soc.,' Ser. 2, vol. 7, p. 28; Plate VII., A, 1896.

The apex of the telson is sometimes truncate. The small setiferous notch in the front margin of the side-plate of the 1st gnathopod, figured by STEBBING, is a constant character; it occurs also in *L. urodus*, which I consider identical with this species.

The mandibular palp has 1 or 2 spines in the middle of the concave side of the 3rd joint, which is rather more than half as long as the 2nd (fig. 6. mp.).

Length of male, 6 millims.; of female, 10 millims.

*Lysianax cœlochir*,\* n. sp.—Plate I., figs. 7.

Stations LIII., LVIII.—about 16 specimens, males and females.

Head rather longer than the 1st segment; ocular lobe produced, subacute.

Epistome prominent.

Hind margin of the 3rd pleon segment rounded.

Anterior angle of 1st pleon segment rounded, posterior acute.

Upper antennæ subequal to the lower; 1st joint more than half as wide as long and rather longer than the next two. First joint of the 8-jointed flagellum subequal to and like the 2nd, shorter than the 3rd; appendage 4-jointed, the 2nd and 3rd the longest (fig. 7. ant.<sup>1</sup>).

Mandibles normal, the 2nd joint of the palp nearly 3 times as long as the 3rd, which has no spine on the concave margin. Remaining mouth organs normal.

First gnathopods strong, the hand and dactylus in the same line; side plates large, much widened below with a small notch in the anterior margin near the lower angle, as in *L. cinghalensis* (fig. 7. gn.<sup>1</sup>).

Second gnathopods: 1st joint almost as long as the next 3; 2nd joint subequal to the 4th; 3rd much shorter and almost as wide as the wrist, which has the hind margin very convex and squamous, the front margin straight, with divergent setæ. The hand is about two-thirds the length of the wrist, the front margin rather convex and truncate at the end; the distal portion of the hind margin hollowed out, the whole very setose. Dactylus much curved, the base at the angle formed by the truncate end and the posterior sinus (fig. 7. gn.<sup>2</sup>).

Peræopods as in *L. cinghalensis*.

The 2nd uropods have spines on both the subequal rami and extend beyond the 3rd (fig. 7. ur.).

The 3rd uropods have the peduncles produced to a tooth at the outer angle and considerably longer than the rami, of which the outer is slightly the longer; the whole limb without spines (fig. 7. ur.).

Telson oval, barely reaching half the length of the 3rd uropods, not truncate.

Length 7.5 millims.

This species can hardly be distinguished from *L. cinghalensis*, except by the characteristic and peculiar hand of the 2nd gnathopods.

\* From κοίλος, hollow, χείρ, hand referring to the excavated palm of the 2nd gnathopods.

**Orchomenella**, Sars, 1894.

**Orchomenella nana** (KRÖYER) = **O. ciliata**, Sars, 'Amph. of Norway.'

Cheval Paar; February, 1902; 30-40 specimens.

Length of male, 5.5 millims.

**Tryphosa**, BOECK, 1870.

**Tryphosa cucullata**,\* n. sp.—Plate IV., fig. 8.

Kondatchi Paar; 17th November, 1902; one male. Length 5.5 millims.

Body compressed; first 4 side-plates twice as deep as the segments, the 4th deeply excavated behind; the 5th deeper than wide. The 3rd pleon segment has the hind and lower margins straight, the posterior angle bluntly rectangular; the upper margin produced in a subacute tooth behind. The 1st urus segment has a deep dorsal depression with a subangular carina behind it.

Head nearly as long as the 1st segment, produced in front; ocular lobe acute, produced to the 2nd joint of the upper antennæ. Eyes large, oval, red.

Upper antennæ: 1st joint tumid, projecting over the 2nd, which again completely overhangs and conceals the 3rd. First joint of the flagellum fully as long as the remaining 5, with about 10 rows of setules and a dense brush of long setæ. Appendage 5-jointed, not reaching the end of the 1st joint of the flagellum, the joints subequal (fig. 8).

Lower antennæ of the usual character of the males of this family, the flagellum reaching the urus.

Mouth organs and maxillipeds not examined.

First gnathopods as in *T. angulata*, G. O. Sars, the palm very oblique.

Second gnathopods: wrist much expanded below, without furring or setæ; lower margin of the hand produced; dactylus small.

The last 3 pair of peræopods are subequal and have the 1st joints wide, smooth, and rounded behind, spinous in front; the 3rd joints are much expanded behind, more so than in any of the species of *Tryphosa* figured by Sars.

The 3rd uropods have the rami widely lanceolate, rather longer than the peduncle, and spinous on their inner margins; they extend rather beyond the 2nd and as far as the 1st pair.

Telson convex on the upper side, long, reaching to the middle of the 3rd uropods, divided nearly to the base, with 2 or 3 submarginal spines and a larger apical spine on each division.

The single specimen was not dissected, but it is distinguished by the peculiar hooded character of the peduncular joints of the upper antennæ, in which respect it resembles the genus *Ambasia*, from which, however, it differs in the form of the 1st gnathopod.

\* From the hood-like character of the first 2 joints of the upper antennæ.

**Urothoë**, DANA, 1852.

**Urothoë spinidigitus**,\* n. sp.—Plate I, figs. 9.

Cheval Paar; November, 1902. One male, length 4 millims.

Body rounded, as deep as wide. Pleon segments all rounded behind.

Eyes very large, contiguous above, round, with large facets, red (fig. 9. c.).

Upper antennæ: 1st joint about three-fourths as long and twice as wide as the 2nd.

Lower antennæ: 1st joint very short, 2nd considerably longer than the 3rd; widening distally, setose on the upper and outer margins, and with an irregular row of spines (longer and sharper at the distal end) on the lower outer margin; 3rd joint swollen in the middle, with calceoli on the upper margin, and 7 or 8 long and weak setæ below. Flagellum very long and slender (fig. 9. c.).

Mandibles normal; the last joint of the palp with 6 setæ on the distal half and one or two very long setæ at the tip.

Maxillipeds: inner plates reaching half way up the outer, narrowed distally and crowned with 2 strong spine-teeth and one or two intermediate setules. Outer plates with curved spines and intermediate setæ; they barely reach the end of the 2nd joint of the palp, which is very broad.

First and 2nd gnathopods: side-plates very small, the 1st acutely angled in front, the 2nd rectangular, both without setæ. The limbs are similar in form and armature, the 2nd pair being rather the larger; the 1st joint is pyriform, as long as the hand and wrist; the 2 next short, with very long setæ on the hind margin of the 2nd, as also on the distal portion of the 1st. The wrist is rather longer than the hand in the 1st pair and subequal to it in the second—this joint and the hand are of the usual form, the hand being widest in the middle; the palm of the hand is defined by a peculiar rod-like spine, the end obliquely truncate with a setule at the tip; that of the 1st pair is half as long as the 2nd. The wrist is clothed with long setæ on the projecting portion, and the hand just below the palmar spine on the hind margin. Dactylus slender, with a setule on outer margin near the point (fig. 9. gn.<sup>1</sup>).

Side-plates of the 1st peræopods small, irregularly oblong; 1st joint rather longer than 3rd and 4th, the 3rd longer than the 4th, which has 4 blunt spines on the hind margin; 5th joint shorter and much narrower than the 4th, dilated and rounded at the end, where there are 4 spines of unequal length on the hind margin and 2 very short ones at the base of the dactylus. The dactylus is straight and slender, with 5 denticles on the inner side, the one nearest the point being the largest (fig. 9. pp.<sup>1</sup>).

Third peræopods: the 1st joint has the upper part projecting behind with 7 or 8 marginal setæ; front margin almost straight; 2nd joint very short; 3rd twice as long as 2nd, with a row of blunt spines just above the lower margin and 4 or 5 plumose setæ on the hind margin; 4th greatly expanded, with 2 parallel transverse ridges bordered with strong blunt spines and very long plumose setæ; 5th longer

\* From the peculiar character of the dactylus of the 3rd peræopods.

and narrower than the 4th, with 3 irregular rows of similar, but more unequal, spines and setæ. Dactylus wide, with 4 long and 4 short spines in 2 parallel longitudinal rows on the front side (fig. 9. pp.<sup>3</sup>).

Fourth peræopods: 1st joint oblong, widening distally, and almost as long as the 3rd and 4th; a submarginal row of plumose setæ near the hind margin, which ends in a blunt right angle, and a few spines and simple setæ on the front margin; 2nd joint about half as long as the 3rd, which is about three-fourths of the 4th, and has 7 long plumose setæ on the hind margin; the 4th is nearly twice as long as the 5th, very spinous on the front and with simple setæ on the hind margin; 5th spinous in front and at the end; dactylus almost straight, slender, minutely and irregularly tuberculated with a denticle near the points (fig. 9. pp.<sup>4</sup>).

Fifth peræopods like the 4th, except the 1st joint, which is more than twice as long as wide, narrowing distally and rounded behind, without setæ or spines on either margin; the 3rd joint has no setæ on the hind margin except a distal tuft (fig. 9. pp.<sup>5</sup>).

First and 2nd uropods: peduncles with a distal spine at the outer and a seta at the inner angle; rami straight and subequal.

Third uropods as in *U. norwegica*, BOECK, as figured by G. O. SARS ('Amph. of Norway,' Plate 47), except that there are fewer spines on the outer margin of the outer ramus. Telson also as in *U. norwegica*.

A small male and female from the same tube, with well-developed lower antennæ, but only 2.5 millims. long, might, from observation of external characters only, be *U. elegans*, SP. BATE. I have long believed that differences of age would account for some of the species that have been established, and for which I would refer to Mr. STEBBING'S valuable paper on the genus ('Trans. Zool. Soc. of London,' vol. 13, Part 1, 1891). The species described above may be distinguished by the curious spiny dactylus of the 3rd peræopods (Plate I., fig. 9. pp.<sup>3</sup>).

FAMILY: ARGISSIDÆ, nov.

First or upper antennæ in the males with the flagellum longer and more slender than in the females.

Gnathopods subequal and similar.

Last one or two pairs of peræopods much more powerful than the rest of the limbs.

**Argissa**, BOECK, 1870.

**Argissa hamatipes** (NORMAN).

*Syrrhoë hamatipes*, NORMAN, 'Brit. Assoc. Shetland Dredging Rep.,' 1868.

*Argissa typica*, BOECK, 'Crust. Amph. bor. and arct.,' 1870, p. 45.

*Chimæropsis danica*, MEINERT.

*Argissa typica*, G. O. SARS, 'Amphipoda of Norway,' p. 141, Plate 48.

*Argissa hamatipes*, NORMAN, 'Ann. and Mag. Nat. Hist.,' 7, vol. 10, p. 480, 1902.

Kondatchi Paar; 17th November, 1902; one female with ova.

Length 2.5 millims.

**Platyischnopus**, STEBBING, 1888.

**Platyischnopus herdmani**, n. sp.—Plate II., figs. 10.

Periya Paar Kerrai and E. Cheval Paar, November, 1902.

About 21 specimens. Colour in spirit, light brown.

Body compressed. Head nearly as long as the first 4 segments, produced to a point which is wrinkled or puckered, as in *P. mirabilis*, STEBBING, and surrounded with short spines (fig. 10. c. ♂). No eyes discernible.

The first 3 segments are subequal and shorter than the other mesosome segments, which increase in length successively.

The 3rd pleon segment has 2 dorsal and 1 or 2 dorso-lateral teeth just below the dorsal on each side on the hind margin, the posterior angle upturned, acute; the lower margin convex (fig. 10. pl.<sup>3</sup>).

Upper antennæ placed considerably in front of the lower; in the female they are short, the 3rd joint of the flagellum reaching the end of the head; two joints only of the peduncle are visible, the 1st shorter than the 2nd; the flagellum 6-jointed; appendage barely reaching the end of the 2nd joint of the flagellum, 2-jointed, the 1st longer than the 2nd; the whole antenna without spines or setæ, except single ones at the ends of joints (fig. 10. ant.<sup>1</sup> ♀).

In the male the upper antennæ are entirely different; the 1st joint of the peduncle is swollen and hemispherical, the 2nd twice as long as the 3rd, which has a dense fringe round the distal end; the flagellum is longer than the whole animal and very slender, the 1st joint as long as the next 3; appendage 2-jointed, about one-fourth the length of the 1st joint of the flagellum, which is more than twice as long as the 2nd (fig. 10. c. ♂).

Lower antennæ (female): the 2nd joint four times as long as, and but little narrower than the 1st, and one-third longer than the 3rd, with 4 nearly equi-distant spines on the front margin and 2 setæ at the end of the hind; otherwise the whole antennæ is naked; the flagellum is 9-jointed, as long as the last 2 joints of the peduncle (fig. 10. ant.<sup>2</sup> ♀).

Mandibles as in *P. mirabilis* (fig. 10. m.).

Maxillipeds with the inner plate very small, and tapering, with a short spine and strong plumose setæ on the top; inner edge almost smooth. Palp with the 3rd joint shorter than the 2nd, widening distally.

First gnathopods: side-plates small and narrowly oval; 1st joint as long as the next two, much distended distally; wrist almost as long as the 1st joint, narrow; hand about half as long as the wrist, sub-triangular, the hind margin produced to form a chela as in *P. mirabilis* (fig. 10. gn.<sup>1</sup>).

Second gnathopods like the first, but the wrist nearly twice as long (fig. 10. gn.<sup>2</sup>).

First peræopods: side-plates rhomboidal, widening below. First joint as long as the next 3; the 3rd longer than the 5th, which is longer and narrower than the 4th; the 4th has a long and a short spine, and the 5th a group of strong spines on the postero-distal margin. Dactylus slender, slightly curved.

Second peræopods with the side-plates much produced behind, otherwise like the 1st (fig. 10. pp.<sup>3</sup>).

Third peræopods: 1st joint narrow-oblong, widening distally, about as long and wide as the 4th, naked except a long spine on the produced end of the front margin, the remaining joints spinous, the 5th about half as wide as the 4th. Dactylus slender, straight (fig. 10. pp.<sup>3</sup>).

Fourth and 5th peræopods: 1st joints broadly oval, with two teeth on the lower part of the hind margin; 2nd very small; 3rd much expanded behind, almost as wide as the 1st and considerably wider than the 4th; remaining joints as in the 3rd peræopods. The three last pairs of peræopods increase in length successively, the last two pairs being much the strongest, the 3rd hardly reaching below the 1st joints of the 5th (fig. 10. pp.<sup>5</sup>).

The 1st and 2nd uropods are slender, the peduncles shorter than the equal rami, all spinous; the 1st are much longer than the 2nd. Third uropods: peduncle strong, cylindrical, with 2 or 3 teeth on the distal margin; outer ramus lamellar, spear-shaped; inner apparently wanting in all the specimens (fig. 10. up.<sup>3</sup>).

Telson convex above, broad, cleft less than half its length; a tooth on the outer side, 2 upright spines near the middle and a group by the tooth of each division (fig. 10. t.).

This curious genus was first described by STEBBING in the "Challenger" Report, from two imperfect specimens of which only one, a female, had a head, so that he was not aware of the remarkable development of the *upper* antennæ in the male. He therefore placed the genus provisionally in the Pontoporeiidæ. I have thought it advisable to form a new family for it and the genus *Argissa*, which also has been placed by SARS, with hesitation, in the same family and, like *Platyischnopus*, is characterised by a similar development of the last peræopods and of the upper antennæ of the male. The present species has much the same general appearance as *P. mirabilis*, STEB., but differs in the sculpture of the last pleon segment, the absence of eyes, the proportions and armature of the antennæ, form of telson, &c. Subsequently ('Ann. and Mag. Nat. Hist.,' Ser. 6, vol. xix., 1897, p. 1, plate v.) Dr. C. CHILTON described another species (*P. neozelanicus*) from Otago, also from an imperfect female specimen, which differs in the gnathopods, and many other points from the other two species. It is to be hoped that specimens of the present species will be taken with perfect 3rd uropods; from the appearance of the peduncle I should expect the inner ramus to be long and easily detached as in the case of some of the Gammaridæ.

**Leptophoxus**, G. O. Sars, 1895.**Leptophoxus uncistrostratus** (GILES).

*Phoxus uncistrostratus*, GILES, 'J. Asiat. Soc. Bengal,' vol. 59, Pt. II., 1890, p. 65, pl. ii., fig. 2.

Station XXXVII., one old female; length, 10 millims. Station LVIII., one young female.

**Ampelisca**, KRÖYER, 1842.

It will be useful to give here a synopsis of the following species of the genus:—

Upper antennæ extending beyond the peduncle of the lower by *more* than 3 joints of the flagellum.—*A. tridens*, n. sp.

Upper antennæ extending beyond the peduncle of the lower by *less* than 3 joints of the flagellum.

Lower antennæ reaching beyond the pleon.—*A. scabripes*, n. sp.

„ „ not reaching beyond the pleon.—*A. brachyceras*, n. sp.

Upper antennæ not reaching the end of the peduncle of the lower.

Third uropods ovate; inner margin of outer ramus distinctly serrate.

Posterior angle of 3rd pleon segment acute, much produced, and upturned; head angular below.—*A. brevicornis*, COSTA.

Posterior angle of 3rd pleon segment scarcely produced or upturned; head rounded, narrow; one large red eye on each side of the head.—*A. cyclops*, n. sp.

Third uropods lanceolate, outer ramus not serrate.—*A. chevreuxi*, n. sp.

***Ampelisca tridens***,\* n. sp.—Plate II., figs. 11, and Plate IV., figs. 11.

Generally distributed round the coast of Ceylon.

Head rather longer than the first 2 segments, not much produced, with a distinct but rounded lateral angle, just below which the lower and larger eye is placed; the other is close to the base of the upper antennæ (Plate II., fig. 11. c.).

Third pleon segment with the hind margin slightly convex; the posterior angle acute, scarcely upturned; the 2nd pleon segment has the hind margin more convex and the angle less produced.

First urosome segment with a deep dorsal depression, on which are 3 carinæ, each ending in a knob-like prominence. The 2nd segment is also dorsally depressed, with the sides elevated distally, forming a rounded prominence on each side of the base of the telson. The 3rd segment is hidden by the 2nd (Plate IV., fig. 11. ur.).

Upper antennæ reaching to about half the length of the flagellum of the lower, the peduncle to a little beyond the middle of the 2nd joint of its peduncle.

\* From the three prominences on the 1st urosome segment.

Lower antennæ about as long as the body.

First and 2nd gnathopods normal; hind margins very setose. Side-plates wider below, with a strong curved tooth at the posterior angle.

First and 2nd peræopods: dactylus nearly twice as long as the 2 preceding joints. Side-plates of the 2nd with the upper posterior angle hollowed, leaving an acute angle below (fig. 11. pp.<sup>2</sup>).

Third peræopods: 1st joint convex in front, with a rounded expansion behind; a submarginal row of 5 short spines on the 4th joint; 5th joint widening distally, with 3 short submarginal spines on the proximal half.

Fourth peræopods: 1st joint subquadrate.

Fifth peræopods: lower margin of the 1st joint slightly concave, reaching to the end of the 2nd joint, with many long setæ; 2nd joint subquadrate; 3rd joint shorter than 4th, front angle produced with 2 or 3 spines, hind angle slightly produced; 4th joint rather shorter than 2nd, front angle much produced, hind angle not at all; 5th joint oval, widest near the base, about one-fourth longer than the 2nd, a few short spines at the distal end. Dactylus as long as the 5th joint, tapering gradually to a long crooked point (fig. 11. pp.<sup>5</sup>).

First uropods reaching the end of the peduncle of the 2nd; rami slender, curved, unarmed, about as long as the peduncle. Second reaching beyond the end of the peduncle of the 3rd, rami wider than those of the 1st pair, straight, subequal; a few short spines on their inner margins, the outer with a long serrate spine near the end of the inner margin.

Third uropods: the peduncle narrowed abruptly in the middle, where there is a curved spine and a setule; outer ramus narrower and a little shorter than the inner, with a long simple spine near the tip and a few plumose setæ on the distal half of the inner margin; inner ramus with the end slightly curved outwards, 3 slender spines near the end of the inner margin and 2 unequal setæ on the rounded point; both rami are widest at about one-fourth their length from the peduncle (fig. 11. ur.).

Telson divided to the base, without spines; a few setules on a median fold of each division; this is sometimes notched at the end with a setule in the notch (fig. 11. t.).

Length, 10 millims.

Distinguishable by the prominences on the urosome segments.

***Ampelisca scabripes***,\* n. sp.—Plate II., figs. 12.

Areas (A), (C), (H): apparently not abundant.

Head as long as the first 2 segments, rounded below the upper antennæ. Eyes distant, with a crimson spot behind each, and a smaller one behind the uppermost (fig. 12. c.).

Hind margin of the 3rd pleon segment convex, the angle upturned but rounded (fig. 12. pl.<sup>3</sup>).

\* From the scabrous 4th joint of the 3rd and 4th peræopods.

First urosome segment with a dorsal depression, not carinate.

Upper antennæ reaching a little beyond the peduncle of the lower; the latter longer than the body.

First gnathopods strong; side-plates rounded before, straight behind. First joint widening distally; wrist and hand subequal, about twice as long as wide, setose.

Second gnathopods: 1st joint twice as wide at the distal end as any of the remaining joints; wrist half as long again as the hand.

First and 2nd peræopods: dactylus hardly as long as the two preceding joints (fig. 12. pp.<sup>1</sup>).

Third and 4th peræopods very short and much alike, except that the upper margin of the membranous posterior lobe of the 1st joint originates from the top of the hind margin in the 3rd, and from lower down in the 4th pair. The 4th joint is broad and produced behind in a truncate lobe, which is scabrous with minute spines, and terminates in a group of unequal spines, of which the longest reaches the end of the 5th joint and is denticulate (fig. 12. pp.<sup>4</sup>).

Fifth peræopods: hind margin of the 1st joint extending downwards to the end of the 2nd, a few short setæ on the lower part of the posterior curve and a long plumose one on the upward recurvature; 2nd joint the longest and the 3rd the shortest of the remaining joints, neither produced at the angles; 4th and 5th subequal in length and width, the latter ovate; last joint ovate, with a minute point and setule at the end (fig. 12. pp.<sup>5</sup>).

First uropods reaching the end of the 2nd pair; rami curved, rather shorter than the peduncle.

Second uropods with straight rami considerably shorter than the peduncle, inner ramus finely serrate on the outer, outer ramus on the inner margin.

Third uropods: rami\* nearly twice as long as the peduncle, lanceolate, the inner the wider dentate along the distal half of its inner margin, the teeth increasing in size distally, and 3 or 4 setæ near the end of the outer; outer ramus minutely spinous near the end of the outer margin, with 3 or 4 fine submarginal and a pair of terminal setæ (fig. 12. ur.).

Telson divided to the base and covering a fourth of the length of the rami of the 3rd uropods; a notch and spine at the end of each division, a marginal spine just behind the end, and a seta behind the spine.

Characterized by the spinous 4th joints of the 3rd and 4th peræopods, the form and proportions of the joints of the 5th and the serrate and dentate 3rd uropods.

Length, 6 millims.

**A. brachyceras**, † n. sp.—Plate II., figs. 13.

Kondatchi Paar, 1; Cheval Paar, 1; both November, 1902.

\* In the specimen figured the rami are double—probably the result of an imperfect moult.

† In allusion to the shortness of the antennæ.

Head of an unusual form in this genus, the lower antennæ originating immediately below the upper with a well-defined but rounded lateral angle. Eyes scarcely discernible (fig. 13. c.).

Third pleon segment with the hind margin slightly convex, the lower margin straight till turned up to meet the slightly produced angle (fig. 13. pl.<sup>3</sup>).

First segment of the urus with a small carina.

Antennæ short, the lower rather the longer, reaching the end of the 2nd mesosome segment. First joint of the upper about twice as long and as thick again as the 2nd; 3rd not distinguishable from the flagellum, which is 5-jointed without the above doubtful joint, with a long terminal seta. The lower have the first 2 joints subequal, the 3rd the longest, with 5 spines on the lower margin.

Gnathopods normal.

First and 2nd peræopods of the usual form, the dactylus about as long as the 2 preceding joints.

Third and 4th peræopods: 1st joint fully as wide as long; 4th joint has the posterior longitudinal half produced downwards for two-thirds of the length of the 5th joint, terminating in 2 long, unequal serrate spines. In the 4th pair the dactylus is rudimentary (fig. 13. pp.<sup>4</sup>).

Fifth peræopods: 1st joint with the front margin longer than the remaining joints; it is concave on the upper and convex on the lower part; the hind margin evenly convex, reaching downwards to the 5th joint; about 9 simple unequal setæ and 4 or 5 setules on the lower part; 2nd joint longer than any of the succeeding, 4th, 5th, and 6th subequal, the last lanceolate, acute. None of the joints have their angles materially produced (fig. 13. pp.<sup>5</sup>).

First uropods: peduncles almost twice as long as the subequal rami; 2 spinous and finely pectinate ridges on their upper sides; rami curved, unarmed, except a spine near the base of the inner.

Second uropods: peduncles rather longer than the subequal rami, sparsely spinous; rami straight, 5 spines on the inner margin of the inner (fig. 13. ur.).

Third uropods: rami rather longer than the peduncles, the outer having the outer margin very convex, the distal half beautifully ornamented with a double row of minute spines; the inner margins straight with a few long setæ; inner rami concealed by the outer—apparently as long and wide as these—with long and dense setæ at the tips (fig. 13. ur.).

Telson divided about three-fourths of its length, with long upright setæ along the margins of the cleft.

Length 4.5 millims.

Easily recognisable by the short antennæ, the peculiar structure of the 4th joints of the 3rd and 4th and the 1st joint of the 5th peræopods, and the curiously formed and ornamented 3rd uropods.

**Ampelisca brevicornis** (COSTA, 1853).**A. lævigata**, LILLJEBORG, 1855.

For the synonymy of this species, see NORMAN in 'Ann. and Mag. Nat. Hist.,' Ser. 7, vol. V. (1900), p. 342.

Stations XXXIV., XXXV., and pearl oyster washings, Muttuvaratu Paar.

Length 5-7 millims.

**Ampelisca cyclops**,\* n. sp.—Plate II., figs. 14.

Galle, 14th February, 1902; Kondatchi Paar, 17th November, 1902.

Head as long as the first 3 segments, produced to the end of the 1st joint of the upper antennæ, where it is almost cylindrical. At the extreme end are 2 large confluent crimson spots in which are placed 1 or 2 (I could only see one, apparently between the 2 red spots) crystalline lens (fig. 14. c.).

The 2nd and 3rd segments of the pleon have a low dorsal carina, and the 1st urus segment a higher one, ending abruptly. The hind margin of the 3rd pleon segment is convex and hollowed out just above the acute posterior angle.

The upper antennæ are placed much in front of the lower and reach nearly to the end of the peduncle of these; the 1st joint twice as thick and more than half as long as the 2nd; the 3rd rather shorter than the 1st joint of the flagellum, which is 5-jointed and scarcely as long as the peduncle; this, in the adult, has 9 or 10 long plumose setæ on the lower side.

The lower antennæ reach to the pleon; the 1st joint does not reach the end of the 1st joint of the upper, though nearly twice as long; the 2nd joint is nearly twice as long as the 1st, the 3rd a little shorter than the 2nd.

Palp of the mandibles long and slender, the 1st joint about half as long as the 3rd, the two together about equal to the 2nd. *This is not dilated, the 3 joints being sub-equal in width* (fig. 14. m.).

Maxillæ normal, a single setule near the top of the inner lobe of the 1st.

Maxillipeds with the outer plate reaching the top of the 3rd joint of the palp and furnished with 6 disproportionately large oval spine-teeth.

First and 2nd gnathopods normal; the side-plates widened below and fringed with plumose setæ.

First and 2nd peræopods: 5th joint 3 times as long as the 4th, dactylus longer than the two united; side-plates of the 2nd with the upper posterior angle cut away and slightly hollowed; front and hind margin parallel.

Third peræopods: 1st joint wide, posterior lobe rather small, projecting; a long spine on the distal end of the front margin of the 4th joint.

Fourth peræopods: 1st joint subquadrate, 4th and 5th joints very spinous on the front margin. Dactylus like a bird's head (fig. 14. pp.<sup>4</sup>).

\* From the apparently single eye.

Fifth peræopods : posterior lobe of the 1st joint reaching to the end of the 2nd, the anterior half of the lower margin fringed with long plumose setæ ; 2nd and 3rd joints short, their angles hardly produced ; anterior angle of the 4th joint produced one-third of the length of the 5th, spinous on the truncate end ; 5th joint wide oval, truncate at the end ; 6th as long as the 5th, tapering gradually to a long curved, very sharp point (fig. 14. pp.<sup>5</sup>).

First uropods reaching to the middle of the rami of the 2nd ; rami smooth, curved, subequal, considerably longer than the peduncle ; 2nd pair longer than the 1st, peduncle longer than rami, which are subequal, straight and spinous, the spines slender and, at the distal end of both, very long (fig. 14. up.<sup>2</sup>).

Third uropods : peduncle shorter than the rami in the proportion of 3 : 5, unarmed except 3 slender spines on the inner side ; outer ramus a little longer than the inner, outer margin, with 4 small spines and plumose setæ, prolonged to a point beyond the inner, which is furnished with long plumose marginal setæ on the distal half ; this ramus is narrow near the base and widest near the middle ; the inner ramus is widest about one-third of the distance from its base and is naked except 2 or 3 slender spines near the rounded point and 3 slender spines and 2 plumose setæ on the tip (up.<sup>3</sup>).

The telson is convex on the upper side, cleft rather more than half its length, the sides of the cleft contiguous almost the whole length ; margins of the divisions parallel, the ends rounded with a terminal notch and 2 slender spines (fig. 14. t.).

The peculiar shape of the head and appearance of the eye distinguishes this species at once. In the form of the mandibular palp it differs from G. O. SARS' definition, but as one or two of Mr. STEBBING'S "Challenger" species differ in the same way, it would seem advisable to disregard that part of the definition.

***Ampelisca chevreuxi*,\* n. sp.**—Plate III., figs. 15.

Station LIII. One specimen. Length, 7 millims.

Head narrow and rounded in front, longer than the first 2 segments. Eyes large and prominent, one at the extreme end of the head, the other below the base of the upper antennæ.

Third pleon segment : the hind and lower margins rather convex, the posterior angle a little produced, obtuse (fig. 15. pl.<sup>3</sup>).

Urus with a shallow carina on the 1st segment.

Upper antennæ reaching to about one-third of the last joint of the peduncle of the lower ; 1st joint more than half as long as 2nd, 3rd shorter than the 1st joint of the flagellum, which is about 8-jointed.

Lower antennæ scarcely half the length of the body, the 3rd joint rather longer than the 2nd.

Gnathopods and 1st and 2nd peræopods of the usual form ; dactylus of the latter rather longer than the 2 preceding joints.

\* Named after that distinguished Amphipodist, Monsieur E. CHEVREUX.

Third peræopods: 1st joint wide, as long as the next 3, the posterior lobe projecting one-third of the length of the hind margin below the top of it; front margin with plumose setæ on the upper part and irregular spines on the lower; 4th joint considerably longer than the 5th, the hind margin produced in a spinous lobe (fig. 15. pp.<sup>3</sup>).

Fourth peræopods: 1st joint as wide as long, the front margin subangular, the part below the angle irregularly spinous; posterior lobe large, the margin evenly rounded and smooth; 2nd joint short, with an angular prominence behind and 2 or 3 short spines in front; 3rd joint longer than the 2nd, with 3 spines on the front margin; 4th joint twice as long as the 3rd, unevenly spinous on the front margin, which ends with 1 long and 2 short spines; the hind margin is naked, but ends in a cluster of unequal spines (one very long) on a truncate lobe; the 5th joint has 12 spines, increasing in length distally and a long terminal one on the front margin, and 3 short ciliate spines on the hind (fig. 15. pp.<sup>4</sup>).

Fifth peræopods: 1st joint produced behind to the end of the 2nd joint, with long plumose setæ on the lower margin; 2nd joint as long as the 2 next and much wider at the top than any of the succeeding joints—*the distal third of the front margin cut away*; 3rd joint about half as long as the 4th, somewhat produced in front; 4th as wide and more than half as long as the 5th, the front angle rounded off and spinous, hind angle slightly produced and spinous; 5th joint oval; 6th narrowed rather suddenly to a long crooked point (fig. 15. pp.<sup>5</sup>).

First uropods: rami curved, subequal, rather longer than the peduncle, inner margins of peduncle and inner ramus spinous.

Second uropods: rami straight, shorter than the peduncle, and spinous on their inner margins, the peduncle stout, with a strong spine at the end of the inner margin.

Third uropods: rami narrow, lanceolate, longer than the peduncle, subequal; the outer the narrower, with a few very small spines on the outer and plumose setæ on the inner margin; the inner has a few setæ on the outer margin near the end (fig. 15. ur.).

Telson divided almost to the base, the divisions pointed, with 3 spines before the point on the outer margin (fig. 15. ur.).

This species may be known by the form of the 2nd joint of the 5th peræopods, &c.

#### **Amphilocheus, SP. BATE, 1862.**

##### **Amphilocheus neapolitanus (?), DELLA VALLE.**

Muttuvaratu pearl oyster washings; 19th November, 1902.

One young and imperfect specimen, length 1.5 millims.

For the synonymy of this species see 'Jour. Linn. Soc.,' vol. 28 (Zool.), p. 300.

**Gallea**,\* n. gen.

Body tumid, integuments strong; 3rd and 4th side-plates very large. Head with a deflexed rostrum. Antennæ subequal; the upper without an appendage and having the 2nd joint produced in a hood-like process over the 3rd. Mandibles with the molar tubercle obsolete; the palp long and slender, the 3 joints subequal.

Gnathopods stout, dissimilar, the 1st pair complexly subchelate as in *Leucothoë*; the 2nd pair rather less powerful, subchelate, as in *Amphilochooides*. Peræopods slender.

Second pair of uropods longer than the 3rd.

A carina runs along each side of the pleon and urus, uniting to form a pointed roof-like projection above the telson. Telson entire.

This is an aberrant genus resembling *Leucothoë* in its first and *Amphilochooides* in its second gnathopods. The length of the 2nd uropods is also unusual in this family, in which they are generally shorter than the 3rd; and the absence of a molar tubercle in the mandibles is inconsistent with G. O. SARS' definition of the family. It is a link between Amphilochidæ and Leucothoidæ.

**Gallea tecticauda**,† n. sp.—Plate III., figs. 16, and Plate VIII., fig. 16.

An abundant species in several localities round Ceylon.

Head with a small pointed and deflexed rostrum; no ocular lobe. Eye large, round, red, with many facets.

First and 2nd side-plates very small and hidden by the very large 3rd plate, which, with the still larger 4th plate, forms a complete cuirass (Plate VIII., fig. 16).

The 4th and 5th segments are subequal, and each of them as long as the 6th and 7th together; the latter have their lower part produced behind in an acute point; the 2nd pleon segment has the hind angle acute, and the 3rd is considerably produced behind, the convex hind and lower margins together forming a semi-oval.

Urus as long as the last 2 pleon segments, not counting the hood-like process; the 1st segment dorsally depressed, the 2nd produced in a roof-like process convex above and extending over half the telson (Plate III., fig. 16. ur.).

Upper antennæ: 1st joint shorter and wider than the 2nd, its upper and lower margins produced distally; 2nd with an elevated ridge produced above the short 3rd joint for half its length; flagellum 8 or 9-jointed, with 1 or 2 jointed (?) setæ at the end of each joint.

Lower antennæ: 1st joint contracted beyond the middle, the lower margin produced in a short tooth, about two-thirds the length of the 2nd; 3rd rather longer than the 2nd; flagellum 3-jointed, about as long as the 1st joint.

\* From the port of Galle.

† From the roof-like projection over the telson.

Mandibles much hollowed below with a roughened portion, which probably represents the molar tubercle and spine row, in the concave part near the cutting edge; this is double in one mandible (in which the spine row also is more conspicuous), is expanded, and has 9 strong teeth (fig. 16. m.).

The palp is as long as the mandible, slender and tapering from the base to a point with a single seta, the joints subequal, the 2nd rather the longest.

First maxillæ: palp 2-jointed, the 2nd the longer; the outer plate is rather wide and crowned with simple spine-teeth; inner plate small, quadrate, with rounded corners and a few fine setules on the top (fig. 16. mx.<sup>1</sup>).

Second maxillæ normal.

Maxillipeds: inner plate hardly reaching beyond the base of the 1st joint of the palp, with 2 spine teeth a little below the upper margin; outer plate reaching half-way up the 1st joint, with a strong in-curved spine at the outer angle. First and 3rd joints of the palp subequal and longer than the 2nd; dactylus rather long and slender (fig. 16. mxp.).

First gnathopods: 1st joint about as long as the 4th and 5th; 2nd produced behind in a setose spur about half as long as the hind margin of the 3rd; the 3rd longer than the 2nd, produced at both angles; wrist with the hinder part produced in a pointed spur to the end of the hand as in *Leucothoë*, with a few stiff setæ on the inner margin. Hand oblong, with the palm at right angles to the hind margin, the angle rounded; hind margin finely serrate on the distal half, with an intra-marginal row of equidistant spinules; dactylus rather longer than the palm (fig. 16. gn.<sup>1</sup>).

Second gnathopods less powerful than the 1st; the 1st joint rather longer than the hand with a carina on the distal half of the front margin; wrist rather less than half as long as the hand, the hind margin prolonged in a setose spur along the hand for about one-third of its hind margin, and ending in a cluster of long spines; front margin of the hand straight, hind margin evenly curved, without a definite palm, the edge very minutely pectinate and with an intra-marginal row of spinules. Dactylus curved and slender, not reaching the end of the carpal spur, finely pectinate on the inner margin of the proximal half (fig. 16. gn.<sup>2</sup>).

First and 2nd peræopods: side-plates rounded below and obtusely angulated above, the 2nd larger than the 1st; limbs slender and naked, except a few spinules on the front margin of the 5th joint; 1st joint narrow (fig. 16. pp.<sup>1 & 2</sup>).

The remaining peræopods are like the first 2 pairs, but the side-plates are small and much wider than deep, those of the last pair produced behind to an acute angle.

First uropods: peduncle nearly twice as long as the smooth, styliform, equal rami.

Second uropods: peduncle longer than the rami, which are rather unequal, minutely pectinate, and spinulose on the inner margins.

Third uropods: peduncle shorter than the inner and about as long as the outer ramus; rami styliform, the margins minutely pectinate.

The 1st uropods extend beyond the 2nd, and these beyond the 3rd.

Telson entire, oblong-oval, concave above, reaching to the end of the peduncle of the 3rd uropods (fig. 16. ur.).

Length 4 millims.

**Leucothoë, LEACH, 1813.**

**Leucothoë spinicarpa (ABILDGAARD).**

Generally distributed.

I can find no differences in the specimens examined to justify referring them to any later species. In a male, 7 millims. long, from Cheval Paar the distal half of the palm of the second gnathopod was more deeply toothed than in Sars' figure, while in smaller specimens from the same tube it agreed. The hind angle of the 3rd pleon segment varies from a blunt right angle to an acute angle in different specimens.

**Leucothoë hornelli,\* n. sp.—Plate III., figs. 17.**

Various localities: in the branchial sacs of Tunicates, &c.

Head as long as the 1st body segment; ocular lobe square, with the upper and lower angles rounded.

Eyes large, dark, pyriform, with the small end lowest.

Segments of the mesosome subequal; first 4 side-plates scarcely deeper than the segments.

First and 3rd pleon segments respectively longer than the 2nd; posterior angle of the 2nd acute; the 3rd has the hind margin of the epimere at first straight, then abruptly incurved, forming a sinus above the acute and slightly upturned angle (fig. 17. pl.<sup>3</sup>).

Antennæ, mouth organs, maxillipeds, and 1st gnathopods as in *L. spinicarpa*.

Second gnathopods: hand more than twice as long as wide; front margin almost straight or very slightly convex; hind margin with a deep sinus about one-third of its length from the base of the dactylus, followed by 2 smaller sinus, the 3rd being close to the base of the dactylus. In other respects the limb resembles *L. spinicarpa* (fig. 17. gn.<sup>2</sup>). Peræopods as in *L. spinicarpa*.

\* Third uropods with the inner ramus almost as long as the peduncle, outer about one-fourth shorter (fig. 17. up.<sup>3</sup>).

Telson reaching beyond the end of the peduncle of the 3rd uropods, tapering gradually to a very diaphanous blunt point, with 2 small spines on it (fig. 17. up.<sup>3</sup>).

Length, 5 millims. to 6 millims.

This species resembles *L. spinicarpa* very closely, except in the sculpture of the hand of the 2nd gnathopods and the posterior angle of the 3rd pleon segment, which is nearer *L. lilljeborgii*, BOECK. In young specimens, 2 millims. long, "from *Rhabdocynthia*, Station XIX.," the characteristic indentation of the 2nd gnathopod is plainly

\* Named after Mr. JAS. HORNELL, F.L.S., now Marine Biologist to the Ceylon Government, by whom, when assisting Professor HERDMAN, many of the species of Amphipoda described in this work were taken.

to be seen. From *L. furina*, SAVIGNY, it differs in the convex front margin of the hand of the 2nd gnathopod; in the 3rd uropods reaching beyond the 1st and 2nd; and in the quite different shape of the telson.

**Leucothoë stegoceras**,\* n. sp.—Plate III., figs. 17A.

Three specimens from the branchial sac of an Ascidian (*Polycarpa*) from Singapore, sent by Dr. HANITSCH to Professor HERDMAN in 1898.

Head a little longer than the first segment, *produced in front to a hood-like projection over the base of the upper antennæ*. Ocular lobe rounded. Eyes round, colourless in spirit, probably red (fig. 17A, c.).

First 5 segments of the mesosome subequal, the remaining 2 longer.

Posterior angle of the 3rd pleon segment subrectangular.

Upper antennæ a little longer than the lower; the proximal third part of the 1st joint overlapped by the hood of the head; flagellum a little longer than the 2nd joint, 8–9-jointed.

Lower antennæ: flagellum about half as long as the 3rd joint, 6-jointed.

First gnathopods: side-plates securiform, the angles rounded. The rest of the limb as in *L. spinicarpa*, except the 1st joint, which is stronger.

Second gnathopods: side-plates subquadrate, angles rounded. First joint strong, two-thirds of the length of the hand. Carpal process about one-third of the hind margin of the hand, setose. Hand widest opposite the end of the carpal process, where the palm is obscurely defined by a small obtuse tooth; this is succeeded distally by a slightly concave space; then 2 deep sinus and a smaller one followed by a nodular tubercle near the base of the dactylus: this does not quite reach the palmar tooth (fig. 17A. gn.<sup>2</sup>).

The rest of the animal resembles *L. spinicarpa* so closely that further description is unnecessary. Length, 6 millims.

Easily distinguished by the form of the head.

**Anamixis**, STEBBING, 1896.†

**Anamixis stebbingi**, n. sp.—Plate III., figs. 18.

Muttuvaratu pearl oyster washings, 19th November, 1902. One imperfect specimen. Head produced in the middle. Ocular lobe rather deep, the lower angle produced and upturned. Eye round, colourless in spirit.

First body segment apparently coalesced with the head. Posterior angle of the 3rd pleon segment a rounded right angle.

First side-plates rudimentary and concealed by the 2nd, which are much deeper than the segments, pyriform, widest below the middle with a small tooth on each

\* Στεγος = roof; κερως = horn; from the roof-like projection over the base of the antennæ.

† 'Trans. Linn. Soc.,' vol. 7, p. 35, Plate 11.

margin ; 3rd similar in form, but narrower and without the teeth ; 4th rather smaller, with a shallow emargination on the lower margin ; remaining side-plates comparatively small.

Upper antennæ rising from the point of the hood-like projection of the head, the peduncle reaching to the end of the 2nd joint of the lower antennæ ; the 1st joint much wider and rather longer than the 2nd, which is subequal to, but thicker than, the 3rd. Flagellum 6-jointed, about as long as the last 2 joints of the peduncle.

Lower antennæ apparently originating behind the articulation of the 2nd gnathopods to their side-plates ; the 3 peduncular joints subequal. Flagellum 3-jointed, half as long as the last joint of the peduncle.

Mouth organs obsolete, except a pair of minute processes called by STEBBING "oral laminæ" in the form of 2 small plates below the head, which are probably rudimentary mandibles.

Maxillipeds : no inner or outer plates ; palp apparently 5-jointed, including the dactylus, the joints subequal, but the 3rd rather the shortest and widest with a long spine on an angular projection on the inner margin ; the 4th rather the longest and narrowest ; the dactylus is slender, curved, and as long as the 4th joint.

First gnathopods very small and perfectly chelate ; the 1st joint as long as all the rest, narrow at the top and widening suddenly a little below the middle ; 2nd joint rather shorter than the 3rd ; this takes the place of the wrist, which is obsolete, and supports the hand ; this has the hinder part produced in an immovable finger as long as the rest of the hand, the end curved upwards and rounded at the point. The dactylus is a little shorter than the immovable finger and curved downwards, the ends of the fingers crossing ; to complete the resemblance to the chelipe of a crab, the inner margin is furnished with blunt teeth. The entire limb extended is slightly longer than the hand of the 2nd gnathopods (fig. 18. gn.<sup>1</sup>).

Second gnathopods : the 1st joint conspicuously articulated to the middle of the side-plate, as long as the hand, curved and widening distally ; 2nd joint with a wide groove to receive the base of the wrist ; 3rd joint oval, pointed, and articulating with the wrist at about one-fourth of its length from the base ; wrist produced in a curved and pointed process almost as long as the hind margin of the hand, denticulate on the inner margin near the base. Hand widest near the base, front margin convex, hind rather concave beyond the middle. Dactylus about two-thirds of the length of the hand and meeting the end of the carpal spur, convex and denticulate on the proximal half (fig. 18. gn.<sup>2</sup>).

First and 2nd peræopods : side-plates wide and irregularly angulated below ; 1st joints reaching below the side-plates, widening distally.

Third and 4th peræopods : 1st joint expanded and rounded behind.

Fifth peræopods : 1st joint expanded behind with the margin subangular above and divided by a series of short transverse ridges into 10 or 11 irregularly angulated spaces (fig. 18. pp.<sup>3</sup>).

Uropods: the 1st and 2nd have the inner ramus about twice as long as the outer, both styliform; the 3rd are wanting.

Telson entire, concave above, spoon-shaped.

Length 2 millims.

This curious genus was described by Mr. STEBBING from 2 specimens in the Copenhagen Museum, taken by Dr. H. J. HANSEN in the West Indies, and named *A. hanseni*. Mr. A. SCOTT, A.L.S., who was kind enough to dissect, mount, and draw the gnathopods of the very small specimen, informs me that there were 2 oral laminae, Mr. STEBBING having only observed one. In their general appearance the two species resemble each other, but differ considerably in the structure of the 1st and 2nd gnathopods. I have taken the liberty of naming the present species after the distinguished naturalist, to whom all Amphipodists owe a deep debt of gratitude for the invaluable "Challenger" volumes.

**Stenothoë, DANA, 1852.**

***Stenothoë marina* (SP. BATE), var. *sinhalensis*.**

Cheval Paar, 1st March, 1902. One female with young. Length 4 millims.

Differs from the type in its larger eye, in having the penultimate joint of the upper antennæ produced in an infero-distal tooth; the flagellum of the lower antennæ longer than the peduncle; and the absence of spines on the telson.

***Stenothoë monoculoides* (MONT.).**

Tow-nets, Galle, 7th July, 1902, 3 specimens; Cheval Paar, February, 1903, 5 specimens. Length 2.5 millims.

The upper antennæ are about one-fourth longer than the lower; the 3rd joint of the latter is not longer than the 2nd; and the telson has 2 pairs of submarginal spines, but in other respects it agrees with G. O. SARS' description.

***Stenothoë gallensis*, n. sp.—Plate III., figs. 19.**

An abundant species on the Ceylon coast.

Head scarcely produced in a rostrum. Ocular lobe truncate. Eyes round, rather large.

Segments of the mesosome increasing in length successively. Posterior angle of the 3rd pleon segment acute.

Upper antennæ a trifle longer than the lower; 1st and 2nd joints subequal in length, 3rd rather longer than the 1st joint of the flagellum, which has 22 joints in the female.

Lower antennæ: 2nd and 3rd joints subequal; flagellum longer than the peduncle, 18-jointed.

Mouth organs and maxillipeds as in *Stenothoë marina*.

First gnathopods: side-plates small, rounded below; wrist barely half as long as the hand, otherwise as in *S. marina* (fig. 19. gn.<sup>1</sup>).

Second gnathopods (male): very like *S. marina*, but the 3rd joint has the hind margin crenate, with a setule in each notch. Hind margin of the hand straight and densely hirsute; near the base of the dactylus a double-pointed tooth, the proximal point the highest, the irregular distal one with 6 intra-marginal setules. Dactylus as in *S. marina* (fig. 19. gn.<sup>2</sup> ♂). In the female the posterior margin of the hand is convex, even, with the palm quite undefined, but 4 nearly equidistant spines and some setæ near the middle (fig. 19. gn.<sup>2</sup> ♀).

First and 2nd peræopods as in *S. marina*.

Third peræopods: side-plate small, produced and rounded behind; 1st joint oval, about half as wide as long, longer than the next 2; 3rd joint but little produced behind; 5th joint nearly as long as the 2 preceding; dactylus strong (fig. 19. pp.<sup>3</sup>).

Fourth and 5th peræopods as in *S. marina*, hind margin of the 1st joint obscurely crenate.

First uropods reaching to the end of the 3rd; peduncle longer than the rami; rami subequal, a spine in the middle of the inner and 2 or 3 spines in the middle of the outer (fig. 19. ur. ♂).

Second uropods shorter than the 1st and 3rd.

Third uropods: the peduncle longer than the 2 remaining joints, with 5 or 6 spines on the upper margin; the last joint bent upwards in the middle and finely denticulate on the upper margin (fig. 19. ur.).

Telson concave above, oblong, with 4 spines increasing in size distally on the proximal half of each side (fig. 19. ur.).

Length of adult male, 6 millims.; female, with ova, 5 millims.

This species is undoubtedly very near *S. valida*, DANA, 1852, but the dentition of the hind margin of the hand in the male is somewhat different in that species as figured, and the same part in the female is described and figured as having "the palm nearly straight and armed with a stout tooth towards the apex." From *S. marina* it may be distinguished by the relatively short wrist of the 1st gnathopods and the different dentition of the 2nd; the wider 1st joint of the 3rd peræopods; the peculiar structure of the last joint of the 3rd uropods, and the oblong truncate form and armature of the telson.

#### *Periiculodes*, G. O. SARS, 1894.

*Periiculodes serra*,\* n. sp.—Plate IV., fig. 20.

Kondatchi Paar and Cheval Paar, November, 1902.

Head as long as the first 3 segments. Rostrum deflexed to the level of the rounded ocular lobe and reaching the end of the 1st joint of the upper antennæ.

First segment of the mesosome twice as long as the 2nd, which is the shortest.

Pleon segments obscurely carinate.

\* From the saw-like character of the 1st uropods.

First uropods not reaching the end of the 2nd, outer rami half as long as the inner, *the upper margins of the rami in adults strongly serrate*; 2nd and 3rd uropods subequal in extent, denticulate on the inner and spinous on the outer margins (fig. 20. up.<sup>1</sup>).

Length of adult male, 5 millims.

This species much resembles *P. longimanus* (SP. BATE), the details above indicating the principal points of difference. As is usual with its congener on sandy coasts in the British Seas and Mediterranean, it is found associated with a *Synchelidium*.

**Synchelidium**, G. O. SARS, 1894.

**Synchelidium brevicarpum** (SP. BATE).

*Kroyera brevicarpa*, BATE and WESTWOOD, 'Brit. Sess. Crust.,' App., p. 508.

Cheval Paar, November, 1902, 1 specimen. Length 3 millims.

Agrees with British examples even to the dark brown blotches on the 5th and 6th segments of the mesosome.

**Tiron**, LILLJEBORG, 1865.

**T. thompsoni**,\* n. sp.—Plate IV., figs. 21.

Kondatchi Paar, 17th November, 1902, 1 specimen; Station LXVI.; 1 female with ova.

Head rounded above, almost as long as the first 3 segments; the front deflexed; ocular lobe rounded; eyes obliterated.

First mesosome segment almost as long as the next 2 and subequal to the 4th. Segments of the pleon and first 2 of the urus slightly carinate, the carinæ produced to teeth which are very conspicuous on the urus, as in *Tiron acanthurus*, LILLJE.

Upper antennæ reaching the end of the peduncle of the lower; 1st joint twice as wide and long as the 2nd, with a long distal spine; 3rd much narrower and almost as long as the 1st; flagellum 6-jointed; appendage reaching the end of the 2nd joint of the flagellum, 3-jointed, the first 2 subequal, the last minute (fig. 21. ant.<sup>1</sup>).

Lower antennæ: 1st joint thick, about half as long as the 2nd, which is subequal to the 3rd; flagellum 6-jointed, shorter than the 2 last joints of the peduncle (fig. 21. ant.<sup>2</sup>).

Maxillipeds: inner plate reaching a little beyond the end of the 1st joints of the palp, the top rounded with plumose submarginal setæ; outer plate membranous, the surface concave, margins irregular and setose; 1st joint of the palp shorter than the 2nd, which is swollen and about as long as the 3rd; dactylus slightly curved, acute (fig. 21. mxp.).

First gnathopods: side-plates widened below, rounded in front, with about 6 submarginal setæ on the lower margin; 1st joint shorter than the next 3, widening distally; wrist rather longer and considerably wider than the hand to which it

\* Named after my late friend and fellow-worker, Mr. ISAAC C. THOMPSON, F.L.S.

tapers, 4 pectinate spines and a few long setæ on the hind margin. Hand slightly tapering, with 5 or 6 pectinate spines on the hind margin. Dactylus continuous with the hand and about one-fourth as long, contracting to a curved point beyond the middle (fig. 21. gn.<sup>1</sup>).

Second gnathopods are rather longer than the 1st; the wrist has 4 pectinate spines on the distal half, of which the 2nd and 3rd are longer than the others and have a shorter spine at the base.

First and 2nd peræopods are much shorter than the gnathopods, the 1st joint as long as all the rest; 3rd, 4th, and 5th subequal. Dactylus small and curved, with a seta in the middle of the front margin; a curious strong curved spine rises from the distal end of the anterior margin of the 5th joint and appears to duplicate the dactylus (fig. 21. pp.<sup>1</sup>).

Remaining peræopods are alike; the 1st joint oval; the 3rd much longer and wider than the subequal 4th and 5th, which have the anterior margin spinous and minutely pectinate. Dactylus with a supplementary point.

First uropods extending beyond the 2nd, rami shorter than the peduncle, subequal

Second uropods extending a little beyond the end of the peduncle of the 3rd, outer ramus the shorter.

Third uropods: rami narrow, lanceolate, considerably longer than the peduncle, subequal in extent; the outer spinous on the distal half of the outer margin and with a central row of spines; the inner with the tip truncate and emarginate, with a spine at each angle (fig. 21. up.<sup>3</sup>).

Telson not quite reaching the end of the 3rd uropods, cleft almost to the base, the divisions pointed, tips spinous, a submarginal spine near the distal end of the inner margins (fig. 21. up.<sup>3</sup>).

Superficially very like *T. acanthurus*, LILLJË., but differs in the single dorsal tooth instead of the serrate hind margin of the pleon segments, and in the structure of the maxillipeds, gnathopods, antennular appendage, 3rd uropods, &c.

#### **Eusiroides**, STEBBING, 1888.

**Eusiroides cæsaris**, STEB. var.—Plate IV., fig. 22.

Various localities round Ceylon.

Agrees with the type except as regards the pleon segments, which are not dorsally produced, and the 3rd has the hind margin only slightly convex, with but 3 teeth on the lower third part; the posterior angle is a rounded right angle (fig. 22. pl.<sup>3</sup>). The telson is divided more than half its length.

Length of female with ova 8 millims.

**Eusiroides orchomenipes**, n. sp.—Plate IV., figs. 23.

In a tube marked "Cheval Paar, February, 1902," with 2 large normal specimens of the last form, was an ovigerous female 5 millims. long. This has the entire hind

epimeral margin of the 3rd pleon segment faintly crenate (fig. 23. pl.<sup>3</sup>), a dorsal carina on the 1st urus segment; the 3rd joint of the last 3 pairs of peræopods about as wide as long and very convex behind; the rami of the 3rd uropods unequal, the outer being much the longer and *with a terminal joint* (fig. 23. ur.). In spite of these very considerable differences, I am disposed to think that sexual maturity has here preceded that of the integument and limbs, which probably require another moult or two to bring them to the fully adult form. I believe this to be a not uncommon condition in the Amphipoda, and one that accounts for a good many so-called species. At the same time it must be admitted that the changes required to make this form identical with *E. caesaris* are great, and it would almost seem as if it were passing through a Lysianassid form; the 3rd peræopods with their bi-lobed side-plates larger than the wide 1st joint (fig. 23. pp.<sup>3</sup>); their shortness compared to the next 2 pairs, and the structure of the 3rd uropods reminding one of *Orchomene*. On the other hand, the fore part, including head and mouth organs, is distinctly *Eusiroides*. On the whole, I have thought it advisable to record this as a new species, which I would call *E. orchomenipes*.

**Paratylus**, G. O. SARS, 1894.

**Paratylus granulatus**, n. sp.

Cheval Paar, 8 specimens.

Body moderately compressed, *the whole integument granulose*. Second pleon segment with a shallow carina slightly produced behind; 3rd segment with a deeper carina produced in an acute tooth.

First segment of the urus as in *P. vedlomensis* (SP. BATE), *i.e.*, with a small setiferous tooth, a deep depression, and a large arched and pointed hood-like process. Second segment elevated behind. Third peræopods with the 1st joint considerably wider than in *P. vedlomensis*.

Length of male, 4 millims.; female, with ova, rather smaller.

In other respects the animal closely resembles *P. vedlomensis*.

**Dexamine**, LEACH, 1814.

**Dexamine serraticrus**, n. sp.—Plate IV., figs. 24.

Cheval Paar, 1; Talaivillu Paar, 1. Length 3 millims.

Head as long as the first 3 segments, with a distinct rostrum. Eyes very large, roundish oval, dark; ocular lobe rounded.

Mesosome segments increasing in length successively. Pleon segments carinate, the carinæ produced behind as in *D. spinosa* (MONT.). Hind margin of the 3rd segment concave, the angle produced and upturned. First segment of urus with a prominent carina.

Antennæ subequal, not half as long as the body, like *D. spinosa*.

First and 2nd gnathopods almost alike, the wrist as long as the hand, which is subtriangular, the palm almost rectangularly transverse (fig. 24. gn.<sup>1</sup>).

Peræopods as in *D. spinosa*, except the last pair, which have the 1st joint expanded behind and coarsely and irregularly toothed or serrate (fig. 24. pp.<sup>5</sup>).

Telson divided nearly to the base; the divisions truncate at the tips, the outer margin acutely produced, then a spine and 4 minute spinules (fig. 24. t.).

Very near *D. spinosa*, from which it differs in the more transverse palms of the gnathopods, the coarsely serrate and expanded 1st joint of the last peræopods, and the armature of the telson.

***Tritæta*, BOECK, 1876 (= *Polycheria*, HASWELL, 1880).**

***Tritæta antarctica*, STEBBING\*—Plate IV., fig. 25.**

*Polycheria tenuipes*, HASWELL, 'Proc. Linn. Soc. N.S. Wales,' vol. 4. (For further remarks on the synonymy of this species, see "Challenger Report," pp. 451, 512, 945.)

Station XLIX., 7 specimens. Talaiyillu Paar, 1. Length of ovigerous female, 3.5 millims.

I have no doubt that these specimens are identical with Mr. STEBBING'S species. It is a question, however, whether, owing to the different structure of the terminal joints in the peræopods, this can properly be included in the genus *Tritæta*. In the type, *T. gibbosa* (BATE), the clasping by these limbs is effected by the point of the dactylus meeting the prominent hind margin of the *carpal* joint, and G. O. SARS, in his definition of the genus, says that "the 2 outer joints are modified for grasping," so that unless one may consider the dactylus as one of the 2 joints (in which case the definition is insufficient as regards the type), it does not apply to *T. antarctica*, in which the short dactylus and the somewhat expanded and transverse palm of the propodos form the grasping part (fig. 25. pp.<sup>1</sup>). HASWELL'S genus *Polycheria* might be revived if thought desirable.

This species exactly resembles *T. gibbosa* in two respects: its extreme dirtiness and its habit of carrying the antennæ flexed at a right angle from the 2nd joint of the peduncle.

***Guernea*, CHEVREUX, 1887† (= *Helleria*, NORMAN, 1868‡).**

In his definition of the genus *Helleria*, Canon NORMAN writes: "Superior antennæ . . . with secondary appendage"; but his figure of the head and antennæ does not show one. § CHEVREUX also, in his definition of *Guernea*, writes: "*Antennæ*

\* 'Ann. and Mag. Nat. Hist.,' Ser. 4, 1875, vol. 15, p. 184, Plate XVA.

† 'Bull. de la Soc. Zool. de France,' vol. 12, 1887.

‡ 'Ann. and Mag. Nat. Hist.,' December, 1868, p. 418, Plate XXII., XXIII.

§ Canon NORMAN informs me that the words "with secondary appendage" are an accidental error, Monsieur CHEVREUX no doubt took his description from NORMAN'S. See also STEBBING, 'Ann. and Mag. Nat. Hist.,' Ser. 6, vol. 5 (1890), p. 192.

*superiores flagello appendiculari instructæ*"; but neither does he show any appendage in his figure (which in my copy is accidentally misplaced and numbered as fig. 1, p. 5). I have not been able to find one either in the species to be described or in British specimens of *G. coalita* (NORMAN). DELLA VALLE ('Gam. d. Golfo di Napoli,' p. 570, Plates 31 and 58) neither figures nor mentions one.

*Guerneæ lævis*, CHEVREUX.\*—Plate IV., figs. 26.

Station LXVI., Cheval Paar, February; Shoal Buoy, Karativo, February.

Description of female:—

Body tumid. Head longer than the first 2 segments, which are much shorter than the rest, the 5th and 6th being the longest; first 4 side-plates as deep as the segments. Pleon not much longer than the 3 last segments of the mesosome. Urus rather shorter than the last 2 segments of the pleon, the segments coalesced and carinate, *the edge of the carina not denticulate*.

Ocular lobe rather deep, flattened in front, rounded below. Eye large, round; colour red.

Upper antennæ rather longer than the head; 1st joint twice as long as and much wider than the 2nd; 3rd about half as long and thick as the 2nd. Flagellum 4-jointed.

Lower antennæ about as long as the head; 1st joint very short, 2nd longer than the 1st and 3rd united; flagellum very small, about half as long as the 3rd joint. (In the male the 2nd joint is convex below, setose above; the flagellum long and slender, reaching the pleon.)

Mandibles without palps; these organs were not clearly distinguished owing to their small size, but they appear to be of a more complex structure than is shown by DELLA VALLE in *G. coalita*. The remaining mouth organs and maxillipeds seem to agree with DELLA VALLE's figures.

First gnathopods: side-plates oblong, rounded below; the 1st joint much swollen distally, as long as the 3rd, 4th, and 5th together; 2nd and 3rd subequal; wrist as long and almost as wide as the hand, with 4 spines on the hind margin; hand with subparallel margins, a few fine setæ on the hind margin, palm obliquely truncate, defined by 3 long spines, the margin straight, spinous and setose. Dactylus scarcely as long as the palm, with a secondary tooth; a tuft of long setæ at the base (fig. 26. gn.<sup>1</sup>).

Second gnathopods very like the 1st, but rather longer and more slender in all the parts; the 1st joint with 3 long setæ on the hind and about 6 short setules on the front margin.

First and 2nd peræopods: side-plates oblong, rounded below; 1st joint with subparallel margins, about as long as the next 3; 4th joint with 4 spines on the hind margin, increasing in length distally.

\* 'Crust. Amph. de S. O. Bretagne,' p. 41 (separate copy), Note.

Third peræopods: side-plates broad; 1st joint expanded before and behind, as wide as the side-plate, the front margin setose; 3rd joint longer and twice as wide as the 4th; 5th about as long as the 3rd (fig. 26. pp.<sup>3</sup>).

Fourth peræopods like the 3rd.

Fifth peræopods: side-plates much smaller than the 1st joint, which is much expanded behind, straight in front; 3rd joint widening somewhat distally and produced at the posterior angle; 4th shorter and narrower than the 3rd, oblong, narrowing distally; both these joints densely setose and spinous on the front and sparsely on the hind margin; 5th joint as long as the 4th, very slender, naked. Dactylus small, in a straight line with the 5th joint. The setæ on the 3rd and 4th joints are simple, *i.e.*, not plumose (fig. 26. pp.<sup>5</sup>).

First uropods extending beyond the 2nd and these beyond the 3rd; rami of the 1st hardly as long as the peduncle; inner ramus of the 2nd shorter than the outer; rami of the 3rd pair wider than the others, about twice as long as the peduncle, without setæ or spines.

Telson divided almost to the base with a setule at the tip of each division.

Length of female with ova 2 millims.

The most conspicuous difference between this species and *G. coalita* is the smoothness of the dorsal surface of the urus, but there are also differences in the form and armature of the limbs. Both NORMAN and DELLA VALLE have described male specimens; besides the shorter lower antennæ and absence of plumose setæ on the 3rd uropods, there is a curious difference in the relative proportions of the mesosome segments in the 2 sexes of both species.

#### **Hornellia,\*** n. gen.

Body rather tumid. Segments of pleon and urus with postero-dorsal teeth.

Head not rostrate or vaulted in front. Eyes distinct, not coalescent.

Upper antennæ with an appendage; flagellum slender, much longer than the peduncle.

Mandibles with well-developed molar tubercle, spine-row, and toothed cutting edges; palp long, 3-jointed, 2nd and 3rd joints subequal (fig. 27. m.).

First maxillæ with the 2nd joint of the palp widened towards the obliquely truncate end, which is crowned with spine-teeth and setæ alternately (fig. 27. mx.<sup>1</sup>).

Maxillipeds well-developed in all parts; 4th joint of palp dactyliform (fig. 27. mxp.).

Gnathopods subequal and similar, like those in *Halimodon*.

Third uropods of moderate length, with subequal rami.

Telson long and deeply cleft.

This genus will probably find a place in the as yet undefined family Melphidippidæ, STEBBING.

\* See footnote, p. 258.

**Hornellia incerta**, n. sp.—Plate IV., figs. 27.

Station LIII., 4 or 5 ; off Chilavaturai, 4 ; Cheval Paar.

Description of female with ova.

Head as long as the first 2 segments, which, as well as the head, are shorter in the male. Eyes large, wide-oval, red.

Second and 3rd pleon and 1st and 2nd urus segments postero-dorsally dentate, the teeth subequal. Hind margin of the epimere of the 3rd pleon segment rather concave, the angle produced and acute.

First segment of the urus dorsally depressed, twice as long as the 2nd or 3rd.

(In the male the teeth on the hind margins of the segments and the dorsal depression are more conspicuous than in the female.)

Upper antennæ more than half as long as the body, the peduncle scarcely half the length of the flagellum ; the 1st joint considerably wider and longer than the 2nd, which is more than twice as long as the 3rd ; flagellum slender, 14-jointed ; appendage 2-jointed, the 1st the longer.

Lower antennæ imperfect in all the specimens. In the male the 2nd joint is as wide as the 1st of the upper antennæ, and reaches to the 3rd joint of the upper flagellum ; it is densely setose above.

Mandibular palp projecting beyond the end of the 1st joint of the upper antennæ.

First gnathopods : side-plates oblong, deeper than wide, expanding below with marginal setules and intramarginal setæ. Wrist as long and wide as the hand, being much widened behind ; hand oval, widest near the base ; palm scarcely defined by 2 sets of spines ; the 3rd, 4th, and 5th joints are furnished with many long spines, of which many are pectinate ; dactylus slender, about two-thirds the length of the hind margin of the hand (fig. 27. gn.<sup>1</sup>).

Second gnathopods nearly resembling the 1st, but rather larger ; the spines fewer and simple. The coxopodite is remarkably large and distinct in both the gnathopods.

First and 2nd peræopods : side-plates of the 1st as in the gnathopods ; of the 2nd much wider below and sloped away behind ; 1st joint rather longer than the 2 next, narrow, slightly curved ; 3rd joint somewhat dilated behind, subequal to the 5th, the 3rd shorter. Dactylus strong, slightly curved. A few slender spines on all the joints.

Remaining peræopods imperfect ; the 1st joint about twice as long as wide, sub-ovate ; the 3rd joint about as long as the 1st.

First uropods long, slender, and spinous ; rami and peduncle all subequal.

Second uropods : outer ramus as long as the peduncle, the inner about one-fourth longer ; both spinous.

Third uropods : narrow, lanceolate ; the inner ramus rather longer than the outer and twice as long as the peduncle.

Telson cleft almost to the base, each division notched at the tip, the outer angle of the notch longer and wider than the inner (fig. 27. t.).

Length of female with ova, 3 millims.

**Melita**, LEACH, 1813.**Melita obtusata** (MONTAGU).

Stations V., XVII., XXIII., XLIII., LIII., LXIV.

Females only.

**Melita anisochir** (KRÖYER).—Plate IV., figs. 28.**Gammarus anisochir**, KRÖYER, 1845.**Melita cotesi**, GILES, 'Journ. Asiatic Soc., Bengal,' 1890, vol. 59, p. 64, Pl. ii., fig. 1.

It is probable that the following species ought also to be referred to *M. anisochir*, viz., *M. valida* (DANA), *M. setipes* (DANA), and *M. australis*, HASWELL. According to DELLA VALLE all these should be referred to *Gammarus fresnelii*, AUDOUIN and SAVIGNY, 1825.

This is an abundant species all round Ceylon.

Description of female:—

Head longer than the first 2 segments of the mesosome, which increase in length progressively. Eyes large, round, red.

Pleon segments with dorsal teeth on the hind margin, the teeth increasing in size posteriorly; the 1st has 4 subequal teeth, the 2nd and 3rd 6 unequal; the epimeral hind margin of the last is concave, with marginal setules, the posterior angle produced and acute (fig. 28. pl. & ur.).

The 1st urus segment has a small central tooth, with a large and a small one below it; there is a dorsal indentation on the anterior part; the 2nd segment, which is the shortest of the three, has a small central tooth, with a long spine and 2 minute subdorsal teeth on each side; the 3rd segment has a conical tooth just above the base of the telson. The number and proportions of the teeth, especially in the pleon segments, vary considerably (fig. 28. pl. & ur.).

Upper antennæ nearly as long as the body, the 1st joint twice as wide and two-thirds as long as the 2nd, lower margin convex, with 2 or 3 subcentral and a distal spine; 2nd joint 4 times as long as the 3rd. 1st joint of the flagellum as long as the next 2. Appendage varying in the number of joints, generally 3 subequal, with a minute terminal, reaching beyond the end of the 3rd joint of the flagellum.

Lower antennæ about two-thirds of the length of the upper and stouter than these, except the 1st joint.

Mouth organs normal; the 3rd joint of the mandibular palp is rather longer than the 2nd.

First gnathopods: side-plates oblong, with rounded angles, wider below, with marginal setules; 1st joint widening distally, as long as the next 3; wrist longer than and fully as wide as the hand, with many short and a few long setæ on the hind margin; hand widely oval, palm undefined, hind margin very convex and setose like the wrist. Dactylus about half as long as the hand (fig. 28. gn.<sup>1</sup>).

Second gnathopods larger than the 1st; side-plates oblong, not wider below;

1st joint subequal in length and width to the hand, which is rather longer than the wrist, front and hind margins subparallel, slightly convex; palm oblique, well defined, uneven and setose (fig. 28. gn.<sup>2</sup> ♀).

First and 2nd peræopods: 1st joint widening abruptly. Dactylus strong, with a secondary tooth on the outside and a short spine on the inside (fig. 28. pp.<sup>1</sup>).

Third peræopods: 1st joint oblong and subequal in length to the 5th.

Fourth and 5th peræopods much more powerful than the 3rd, and reaching backwards much beyond the ends of the uropods; the joints spinous. All the peræopods have the secondary tooth on the dactylus.

First uropods extending a little beyond the 2nd, slender; peduncles and rami subequal, spinous; 2nd pair resembling the 1st.

Third uropods with the outer ramus about twice as long as the peduncle, with 3 "whorls" of spines between the base and the extremity; inner ramus quite rudimentary.

Telson not unlike that of *M. palmata* (MONT.), but the divisions are sharply pointed without terminal spines, but with a long upright one at the angle on the inner side, and a horizontal one between it and the point.

Length 5 millims.

The male has been described and figured by Dr. GILES (*loc. cit.*). It is remarkable for the large size and peculiar form and colouring of one of the 2nd gnathopods. I think there can be little doubt, from its resemblance to a bit of broken shell, that its use is protective, the animal covering itself with it as it lies partly buried in the sand. Dr. HERDMAN informs me that he has seen them in this position.

#### Mæra, LEACH, 1813.

*Mæra othonides*, n. sp.—Plate V., figs. 29.

Stations V., LIII., LXIV., Cheval Paar.

Very near *M. othonis* (M. EDWARDS), from which it differs as follows:—

The ocular lobe is *rounded*.

The 3rd pleon segment has *no teeth on its lower* and from 1 to 3 teeth on the hind margin (fig. 29. pl.<sup>3</sup>).

The appendage of the upper antennæ is *3-jointed*.

The palp of the mandibles has the 3rd joint *considerably shorter than the 2nd*.

The side-plates of the gnathopods are *not serrated* below; there is a single tooth at the posterior angle of the 1st pair. In the hand of the 2nd pair in the female the palm is concave.

The 3rd uropods have their ends *truncate* with a group of spines (fig. 29. up.<sup>3</sup>).

The telson has a *second notch* above the terminal one on the inside of each division (fig. 29. t.).

Length 8 millims.

Of the above characters the least valuable is that of the 3rd pleon segment, as the number and position of the teeth vary considerably.

**Mæra rubro-maculata** (STIMPSON).—Plate V., fig. 30.

*Gammarus rubro-maculatus*, STIMPSON, 'Proc. Acad. Nat. Sci.,' Philadelphia, 1855.

*M. rubro-maculata* (STIMPSON), "Challenger" Amphipoda,' p. 1008, Plates XCV., XCVI.

*Ceradocus rubro-maculatus* (STIMPSON), DELLA VALLE, 'Gamm. d. Golfo di Napoli,' p. 720.

From Kodramallai Point southward to Galle.

Length of adult male 10 millims.

In the specimen dissected, the mandibular palp was set far back, the 1st joint produced forward in a sharp point; the 2nd widened abruptly near the base, then narrowing gradually (fig. 30. m.).

**Mæra tenella** (DANA).—Plate V., figs. 31.

*Gammarus tenellus*, DANA, 'U.S. Explor. Expn.,' p. 952, Plate 65, fig. 7.

*Mæra tenella*, SP. BATE, 'Cat. Amph. Crust. Brit. Mus.,' p. 193, Plate XXXV., p. 3.

Cheval Paar, 10th November, 1902. One male, length 6 millims.

Head about as long as the first 2 segments. Eye nearly round, rather small.

Mesosome and pleon without dorsal teeth; epimere of the 3rd pleon segment with 6 or 7 unequal teeth on the hind margin, the posterior angle acute and somewhat upturned (fig. 31. pl.<sup>3</sup>). First segment of the urus with 3 small postero-dorsal teeth and a dorsal depression; 2nd segment with 1 tooth.

Upper antennæ reaching to the end of the pleon; 1st joint twice as thick and nearly as long as the 2nd; 3rd very short; flagellum rather shorter than the first 2 joints of the peduncle, 13-jointed; appendage 8-jointed, two-thirds of the length of the flagellum.

Lower antennæ scarcely reaching beyond the end of the peduncle of the upper; the flagellum about as long as the 3rd joint.

Both upper and lower antennæ are sparsely setose, except the flagellum of the lower, which is more hairy.

First gnathopods: side-plates small, produced in front to an acute angle; wrist longer than the hand, the hind margin densely setose; hand with the palm ill-defined, and transverse rows of setæ on the hind margin (fig. 31. gn.<sup>1</sup>).

Second gnathopods: side-plates small, quadrate, with rounded angles; 1st joint stout, two-thirds of the length of the hand and nearly twice as long as the next 3 joints together; wrist transverse; hand large, widening distally; hind margin as long as the front, straight, with a few setæ, and ending in a strong curved tooth which defines the palm; this is transverse, convex, uneven, and spinulose (fig. 31. gn.<sup>2</sup>).

First and 2nd peræopods slender, slightly longer than the 1st gnathopods; 1st joint

narrow, subequal to the next 2; 5th longer than 4th and not so long as 3rd; 2 distal spines on the hind margin of the 4th and a row of 4 on that of the 5th joint. Dactylus with a strong tooth behind the point (fig. 31. pp.<sup>2</sup>), giving it the appearance of being bifid (fig. 3K, SP. BATE, *loc. cit.*).

The rest of the peræopods are altogether wanting.

The 1st and 2nd uropods are subequal in extent, not quite reaching the middle of the outer ramus of the 3rd pair; the rami are subequal; in the 1st they are rather shorter and in the 2nd rather longer than the peduncles; all spinous on both margins, with groups of terminal spines.

Third uropods: peduncle little more than half as long as the outer ramus, which is but little longer than the inner and has 4 deep notches with fascicles of long spines on the outer margin; both are truncate, with groups of long spines at the ends (fig. 31. up.<sup>3</sup>).

Telson small, cleft to the base, and widely dehiscent, each division ending in a double point with 2 long and 2 or 3 short spines (fig. 31. t.).

DANA'S specimen was from the Fiji Islands. This species has a strong general resemblance to the next, from which, however, it differs in the toothed epimeres of the 3rd pleon segment; the relatively longer and more equal 3rd uropods; the different form of the dactyli of the 1st and 2nd peræopods, &c. It is unfortunate that the specimen had lost the last 3 pairs of peræopods, as these have a very distinctive character in *M. scissimana*.

***Mæra scissimana*** (COSTA)—Plate V., fig. 32. pp.<sup>1</sup>.

*Gammarus scissimanus*, A. COSTA, 1853.

*Mæra truncatipes* (WHITE), DELLA VALLE, *loc. cit.*, p. 725, Plate 22.

West Coast of Ceylon.

Length 5 millims.

This species forms a connecting link between the genera *Mæra* and *Elasmopus*. The fore part, including the 3rd peræopods, is typical *Mæra*, while the massive and very spinous 4th and 5th peræopods (a character that is much more marked in Ceylon than in Mediterranean specimens), and the comparatively short rami of the 3rd uropods, resemble *Elasmopus*. Another peculiarity of the species is that the size and shape of the hand of the 2nd gnathopods is much the same in males and females.

***Mæra tenuicornis*** (DANA)—Plate V., figs. 33.

*Melita tenuicornis*, DANA, *loc. cit.*, p. 963, Plate 66, fig. 5.

*Mæra tenuicornis*, SP. BATE, 'Cat. Amph. Crust. Brit. Mus.', p. 195, Plate XXXV., fig. 6.

Tow-net off Marichchikadi, 1st February, 1903. One male, and one young.

Segments of the mesosome and pleon without carinæ or dorsal teeth. Hind margin of the 3rd pleon epimere concave, smooth; lower margin rather convex,

obscurely toothed; posterior angle acute (fig. 33. pl.<sup>3</sup>). First segment of urus with a double carina produced backwards in 2 points; 2nd segment with a small tooth and a long upright spine (fig. 33. ur.).

Upper antennæ: 1st joint stout, two-thirds as long as the 2nd and about twice as long as the 3rd. Flagellum long and slender, broken at the 18th joint. Appendage small, with 2 subequal joints and a minute terminal one, barely reaching the end of the 1st joint of the flagellum.

Lower antennæ: peduncle reaching a little beyond that of the upper; 1st joint short, 2nd and 3rd subequal in length, but the 2nd much the wider; flagellum shorter than the last 2 joints of the peduncle.

Mandibles as in *Elasmopus subcarinatus* (vide "Challenger" Amph., Plate 98, *E. persetosus*), but the 2nd joint of the palp is subequal to and rather wider than the 3rd; very few setæ (fig. 33. m.).

First maxillæ: the inner plate oblong, with 7 plumose terminal setæ (fig. 33. mx.<sup>1</sup>).

Maxillipeds as in *E. persetosus*, but the outer plate reaching the end of the 2nd joint of the palp.

First gnathopods: side-plates subtriangular, with rounded angles; 1st joint stout, margins parallel, as long as the 3rd and 4th united; 2nd and 3rd subequal. Wrist nearly twice as long and about as wide as the hand. Hand widening distally, the hind margin straight, the front convex and bent at the distal end at a right angle round the base of the dactylus in a tooth-like process reaching beyond the middle of the dactylus, and having the appearance of a 2nd dactylus; the hind margin ends in a densely spinous lobe. The dactylus is very small, crooked, and deeply sunk in the hand. The whole limb is setose and recalls the 2nd gnathopod of a *Lysianax* (fig. 33. gn.<sup>1</sup>).

Second gnathopods: side-plates deeper than wide, oblong, rounded and a little wider below, about as long as the 1st joint; this is rather longer than the next 3 joints, but shorter than the hand; 2nd and 3rd joints subequal. Wrist triangular, about as wide as long; the hind margin with about 8 setiferous ridges. Hand long-oval, widest about one-third of its length from the base; palm undefined, the hind margin densely clothed on the distal half with incurved plumose setæ. Dactylus fully half as long as the hind margin (fig. 33. gn.<sup>2</sup>).

First and 2nd peræopods: side-plates fully as deep as the segments, rounded below; hind margin of the 2nd pair concave. The entire limb is as long as the last 2 pairs of peræopods, in which respect they differ from DANA'S description and figure; 1st joint as long as the 3rd and 4th united; 3rd longer than 4th; 4th and 5th subequal, a few small spines on their hind margins; the rest of the limb has only a few scattered setæ (fig. 33. pp.<sup>2</sup>).

Remaining peræopods of similar form, the 3rd rather the shortest; 1st joint wide-oval, the width more than half the length, the hind margin smooth, front margin with small spines; 2nd joint short; 3rd joint very wide, 3 times as wide as the 4th, with

long spines on setæ, before and behind; 5th joint three-quarters of the length of the 3rd and 4th together. Dactylus rather small, curved at the point (fig. 33. pp.<sup>4</sup>). In the 3rd pair the hind margin of the 1st joint is straight, in the 4th and 5th convex.

First uropods: rami subequal, shorter than the peduncle; all spinous.

Second uropods like the 1st, but the rami rather longer than the peduncle.

Third uropods wanting.

Telson cleft almost to the base, the divisions pointed with an angle on the inside.

Length 5 millims.

There are certain discrepancies between our specimens and DANA'S description and figures of the New Zealand form, as given by SP. BATE. I attach no importance to the omission of the antennular appendage, as this is small and not easy to see. But if we are to take the proportions of the first 2 and last 3 pairs of peræopods shown in the figure as even approximately correct, they are quite different from ours. On the other hand, the 1st gnathopods are so peculiar and the description and figures of both pairs agree so well, that I feel justified in considering them identical. The species requires a new genus, but the absence of the 3rd uropods makes a satisfactory definition impossible.

#### **Elasmopus**, COSTA, 1856.

The mandibular palp in this genus is of two distinct forms; the one (A) with the 3rd joint slender, its hind margin straight, and its front margin rather sparsely setose or naked, approaching the same appendage in *Mæra*, e.g., *M. obtusata* (MONT.); the other (B) as in *E. rapax*, COSTA, with the 3rd joint strong, the hind margin convex and the front margin pectinate.

To (A) belong, of the species under consideration,

*E. subcarinatus* (HASWELL) = *E. persetosus*, STEBBING.

To (B) belong the new species *E. serrula*, *E. spinimanus*, and *E. dubius*.

(A) **Elasmopus subcarinatus** (HASWELL)—Plate V., figs. 34.

*Megamæra subcarinata*, HASWELL, 'Proc. Linn. Soc. N.S.W.,' vol. 4, p. 335, Plate XXI.

*E. subcarinata* (HASWELL) (*E. persetosus*, STEBBING), "Chall." Amph., p. 1019, Plate XCVIII.

Abundant and occurs all round Ceylon.

Length of adult male 7.5 millims.

The antennular appendage is 2-jointed instead of 6, otherwise it agrees with the "Challenger" description, except in the sculpture of the hand of the 2nd gnathopods of the male, which varies considerably. In the smaller specimens there is generally a single flat-topped lobe near the base of the dactylus; in the larger this is divided in two by a sinus. In the largest of all there is hardly a trace of a lobe or tooth on any part of the hind margin, which is densely setose in all (figs. 34. gn.<sup>2</sup> ♂ and ♀). None are quite like the "Challenger" drawing. The 3rd joint of the mandibular palp is distinctly longer than the 2nd.

(B) *Elasmopus dubius*, n. sp.—Plate V., figs. 35.

One male from pearl oysters, East Cheval Paar, 8th November, 1902.

Body smooth, without dorsal teeth.

Head: ocular lobe rounded, with an acute, re-entering angle and a narrow rounded lobe below, as in *E. rapax*. Eyes large, wide-oval, dark.

First 4 side-plates about as deep as the segments.

Upper antennæ of moderate length; the 1st joint as long and twice as thick as the 2nd and about one-third longer than the 3rd. Flagellum 16-jointed, a little shorter than the peduncle. Appendage 2-jointed, the 2nd rather the longer, a little longer than the 1st joint of the flagellum.

Lower antennæ reaching the end of the peduncle of the upper, 2nd and 3rd joints subequal; flagellum 8-jointed, rather longer than the last joint of the peduncle.

Mouth organs as in *E. rapax*.

Maxillipeds as in *E. rapax*.

First gnathopods: side-plates irregularly rhomboidal, the anterior angle rounded, with a few setæ on the lower margin. First joint about as long as the next 3; wrist rather shorter than the hand, the hind margin densely setose; hand with the palm rounded off into the hind margin, but defined by a spine (fig. 35. gn.<sup>1</sup>).

Second gnathopods: side-plates rounded below, not reaching half-way down the 1st joint; this is longer than the next 3; 3rd joint produced behind in a narrow lobe with 5 or 6 setæ; wrist very short and wide, hind margin with a dense tuft of setæ. Hand nearly twice as long as the 1st joint, margins subparallel and subequal, the front slightly the longer and smooth, except 2 or 3 setules; the hind margin has 9 or 10 fascicles of setæ and ends in a strong tooth which defines the palm; this is transverse, not oblique, narrow, with a central tubercle; the hinge of the dactylus is as wide as the palm. *Dactylus peculiar, bulbous at the base and very strong, with a curved blunt point which meets the defining tooth of the hind margin* (fig. 35. gn.<sup>2</sup>).

First and 2nd peræopods almost as long as the 4th and 5th; 1st joint narrow, as long as the 3rd and 4th together; 4th and 5th spinous on the hind margin.

Third peræopods wanting.

Fourth and 5th peræopods subequal and similar, stout; 1st joint five-sixths as wide as long, hind margin serrate, front spinous; 3rd joint produced downwards *in front*; otherwise subequal to 4th and shorter than 5th; all the joints spinous. *Dactyli strong* (fig. 35. pp.<sup>5</sup>).

First uropods: rami subequal, shorter than the peduncle; all spinous.

Second uropods short and stout; outer ramus shorter than the inner and subequal to the peduncle; all spinous.

Third uropods wanting.

Telson reaching beyond the middle of the 2nd uropods, divided nearly to the base, the divisions notched at the tip with a long and a short spine in each notch.

Length 5 millims.

This species is certainly very near *Mæra festiva*, CHILTON, 'Proc. Linn. Soc., N.S.W.,' vol. 9, Part 4, p. 3, Plate XLVI., fig. 2. As, however, Professor CHILTON has only described the antennæ and gnathopods, and as both of these differ somewhat from the specimen described above (considering also the distance between Sydney and Ceylon), it seems better to consider them as distinct. It is unfortunate that, in both cases, the 3rd uropods, so important in this family, should be wanting.

**Elasmopus spinimanus**, n. sp.—Plate V., figs. 36.

Reef, Galle, Station XXXVIII.

Very near *E. rapax*, from which it differs in the following points:—

The hind margin of the epimere of the 3rd pleon segment is slightly concave, the lower margin convex with submarginal spines, the posterior angle upturned, acute (fig. 36. pl.<sup>3</sup>).

The 1st gnathopods have the hand longer than the wrist, the palm very oblique and only defined by a spine. The anterior angle of the side-plates is rounded.

The hand of the 2nd gnathopods in the male has no tubercle, except near the base of the dactylus; *this is flat-topped and crowned with 7 or 8 spines; below this is a row of 6 spines on the distal third of the hind margin*, with rather scanty fascicles of setæ below this. The side-plates are rounded below (fig. 36. gn.<sup>2</sup> ♂). In the female the limb nearly resembles that of *E. rapax*, female.

The last 3 pairs of peræopods are more slender than in *E. rapax*; the 1st joint with the hind margin obscurely serrate, and in the 3rd pair concave.

The 3rd uropods have the rami subequal in length and breadth, and considerably longer (as 5 : 3) than the peduncle, the outer with 4 fascicles of spines on the outer margin (fig. 36. up.<sup>3</sup>).

The divisions of the telson are narrower at the end and more deeply notched.

Length 5 millims.

From *E. affinis*, DELLA VALLE, it differs in the absence of the median tubercle and the presence of the 6 spines on the hind margin of the hand of the 2nd gnathopods.

**Elasmopus serrula**, n. sp.—Plate VIII., figs. 37.

Galle; basket hung to buoy, 9th May, 1902, 1 male; from pearl oyster washings, Cheval Paar, several.

This species resembles *E. rapax* in the form and character of the body, the head, antennæ, mouth organs, peræopods (so far as relates to their proportions), and uropods.

The 3rd pleon segment has the hind margin almost straight, the lower convex and the posterior angle a little produced and upturned.

The side-plates of the first gnathopods have the front margin concave and the angle rounded; the limb as in *E. rapax*.

The 2nd gnathopods in the male have the hand of similar form to *E. rapax*,

but the hind margin is without spines or dentiform projections, except the large flat-topped one (as in the last species) at the base of the dactylus; it is densely clothed with long setæ rising from numerous transverse ridges (fig. 37. gn.<sup>3</sup>). In the female the hand resembles *E. rapax*.

The 3rd peræopods are very short and stout, the hind margin of the front joint almost straight, narrowing distally, and obscurely toothed.

The 4th and 5th peræopods are subequal; the 1st joint, which is rather wider and more convex in the 5th, has the greater part of the hind margin elegantly cut into flat-topped teeth of a peculiar form (fig. 37. pp.<sup>4</sup>).

The telson has the end of the divisions rather deeply notched, with the angles equally produced; 2 unequal spines and 2 spinules in each notch (fig. 37. t.).

**Pareiasmopus**, STEBBING, 1888.

**Pareiasmopus suluensis** (DANA).—Plate VI., figs. 38.

*Gammarus suluensis*, DANA, 'U.S. Exploring Expedition,' 1852.

*Megamæra suluensis*, SP. BATE, 'Cat. Amph. Crust. Brit. Mus.,' 1862.

Cheval Paar, Gulf of Manaar.

The palm of the 2nd gnathopod in the male is much less oblique than in the "Challenger" figure.\* In the female this limb resembles the 1st gnathopods, except in being rather longer and more slender. The hand is considerably longer and narrower than the wrist, with 5 fascicles of setæ on each margin; palm very oblique (fig. 38. gn.<sup>2</sup>).

The 3rd uropods (wanting in the "Challenger" specimen) have the rami half as long again as the peduncle, subequal in length and width, the outer slightly the longer, with 4 spiniferous notches on the outer edge; the inner has 4 pairs of submarginal spines on the inner side (fig. 38. up.<sup>3</sup>).

The telson reaches to the end of the peduncle of the 3rd uropods.

The length of a female (tube 94) is 13 millims.

**Cheirocratus**, NORMAN, 1865.

A single female with ova from Periya Paar Kerrai, November, 1902; length 4 millims. There was only one postero-dorsal tooth on the urus and that on the 1st segment. A description without the male would be useless.

**Megaluropus**, NORMAN, † 1889.

**Megaluropus agilis**, NORMAN.

*Cheirocratus drechselii*, MEINERT, 'Crust. Malacostr. Daniae,' 1890.

*Megaluropus agilis*, NORMAN, DELLA VALLE, *loc. cit.*, p. 695, plates 3 and 34.

Kondatchi and Cheval Paars, November, 1902. About 30 specimens.

Notwithstanding the following differences between the Ceylon and English speci-

\* In this respect our specimens resemble *P. setiger*, CHEVREUX ('Mém. de la Société Zool. de France,' t. xiv., p. 412, fig. 32, 1901), as also in some other small details.

† 'Ann. and Mag. Nat. Hist.,' Ser. 6, vol. 3 (1889), p. 446, Plate XVIII., and vol. 4, p. 123.

mens, I consider them to be substantially identical. In the former the denticulation of the hind margin of the 3rd pleon segment is finer; the flagellum of the upper antennæ is 9-jointed and considerably *longer* than the peduncle in the female; the last 3 pairs of peræopods have the 1st joint narrower, the hind margin concave, obscurely serrate, and produced downwards.

Length barely 4 millims.

To illustrate the difficulties one has to contend with in determining species from specimens sent from abroad in spirit, I may mention that of the 30 odd specimens only one had the lower antennæ, and perhaps 5 or 6 the broad 3rd uropods. It would be far better if specimens, when picked out, were sent home in *pure* glycerine.

**Lilljeborgia**, SP. BATE, 1862.

**Lilljeborgia pallida**, SP. BATE.

**L. pallida**, BATE, NORMAN, 'Ann. and Mag. Nat. Hist.,' Ser. 6, vol. 4 (1889), p. 116, plate x.

**L. pallida**, BATE, G. O. SARS, 'Amph. of Norway,' p. 530, plate 187.

**Nicippe pallida** (BATE), DELLA VALLE, *loc. cit.*, p. 658, plate 19.

Stations XIX., LI. Length 4.5 millims.

**Lembos**,\* SP. BATE, 1857 (= **Autonoë**, BRUZELIUS, 1859, in part).

**Lembos podoceroides**, n. sp.—Plate VI., figs. 39.

Coast of Ceylon, under 100 fathoms, generally distributed.

Head as long as the first 2 segments; ocular lobe as in *L. (Autonoë) websteri*, BATE. Eye round-oval, dark.

Third segment of the pleon, with the hind and lower margins of the epimere convex, the posterior angle subacute and produced; a diagonal line running forward and upward from it (fig. 39. pl.<sup>3</sup>).

First segment of the urus almost as long as the remainder, including the telson.

Upper antennæ reaching to the pleon, peduncle reaching about the middle of the last joint of that of the lower; 1st joint about 3 times as wide and three-fourths as long as the 2nd, and 3 times as the 3rd. Flagellum about 22-jointed in the male, the joints lengthening distally. Appendage 7-jointed, the last minute, reaching the 7th joint of the flagellum.

Lower antennæ reaching to the middle of the flagellum of the upper; 2nd and 3rd joints subequal; flagellum in female 5-jointed, shorter than the last joint of the peduncle. Both pair of antennæ very sparsely setose.

Mandibular palp large and projecting, the 3rd joint as long as the 1st and 2nd united; the 2nd expanded distally (fig. 39. m.).

First gnathopods in the female (fig. 39. gn.<sup>1</sup> ♀):—

Side-plates rhomboidal, shorter than the 1st joint, the anterior angle blunt; 1st joint stout, rather longer than the next 3; wrist about half the length of the

\* For the reasons for re-instating this genus see STEBBING, 'Ann. and Mag. Nat. Hist.,' Ser. 6, vol. xvi., 1895, p. 206.

hand, hind margin convex and setose. Hand wider than the wrist and widening distally, the palm about half as long as the hind margin, oblique, with a shallow sinus above the palmar angle, below which is a strong spine; the hind margin, palm, and sides of the hand and wrist are furnished with fascicles of setæ. The dactylus has the inner margin serrate and reaches below the strong spine mentioned above.

In young male: side-plates with the anterior angle acute; the first 4 joints very stout, the 1st about half as long as the hand and longer than the next 3; wrist about one-fourth of the length of the hand; the front margin of this is convex and naked; the hind margin has near the base a strong, somewhat everted tooth, above which is an angular sinus; above this is a flat-topped projection, with a rough edge and submarginal setæ, and a small sinus near the base of the dactylus: this has a central projection on the inner side which corresponds with the flat-topped one; the point reaches slightly beyond the basal tooth; the outer margin is rough with minute granules, as also is the lower margin of the basal tooth (fig. 39. gn.<sup>1</sup> ♂ jr.).

In adult male: the first 4 joints as in the young male, except the 1st joint, which is wider, being half as wide as long. The hand has the base produced backwards in a long pointed spur, above which the hind margin is straight, with a small semicircular sinus near the hinge of the dactylus; the latter is relatively much longer than in the young male, evenly curved like a sabre, without the central projection, and with a row of 7 or 8 setules along the inner margin (fig. 39. gn.<sup>1</sup> ♂ adult).

The 2nd gnathopods are as usual in this family small and alike in both sexes, except that in the female the wrist is rather shorter and in the males subequal to or slightly longer than the hand; of this the margins are subparallel, the palm obliquely transverse. This limb and the rest of the animal so closely resemble *L. (Autonoë) websteri*, SP. BATE, that I refer my readers to Professor G. O. SARS' excellent description and figures ('Amph. of Norway,' p. 547, plate 194).

Length 8 millims.

The resemblance between the *first* gnathopods of the young and old males of this species and the *second* gnathopods of the same in *Jassa (Podocerus) falcata* (MONT.) is very striking (*conf.* SARS, *loc. cit.*, plate 212, *p*<sup>2</sup> ♂-*p*<sup>2</sup> ♂').

*Lembos chelatus*, n. sp.—Plate VI., figs. 40.

One specimen from north end of Chilaw Paar, 2nd February, 1902.

Head longer than the first 2 segments. Ocular lobe prominent, angular. Eye roundish, large, dark.

Third pleon segment rounded behind.

Upper antennæ: peduncle shorter than that of the lower; 1st joint twice as thick and more than half as long as the 2nd; the 3rd rather shorter than the 2nd; 1st joint of the flagellum almost as long as the last of the peduncle; appendage very small, 2-jointed, about one-third of the 1st joint of the flagellum. The flagellum was broken at the 2nd joint.

Lower antennæ reaching the 4th body segment; the 2nd joint rather shorter than the 3rd; flagellum subequal to these united.

Mandibular palp with the 3rd joint shorter and wider than the 2nd, sub-oval, widest near the distal end, which is truncate; 1st joint very short (fig. 40. mp.).

First maxillæ: inner plate minute, with a single setule near the rounded top.

Palps of the maxillipeds more slender than in *L. websteri*, the outer plates reaching about the middle of the 2nd joint, armed with spine-teeth which increase in length distally.

First gnathopods: side-plates fully as deep as the segments, wider below, the angles rounded; 1st joint about twice as long as the next 3, rather shorter than the hand; 3rd joint rounded behind; wrist small, triangular, almost coalescent with the base of the hand; this has the front and hind margins subparallel and sparsely setose; the latter produced in a strong tooth beyond the base of the dactylus to the point of which it is opposed, forming a chela; a smaller tooth between this and the base of the dactylus; this has a prominent rounded tooth on the inner margin (fig. 40. gn.<sup>1</sup>).

Second gnathopods: side-plates irregularly rhomboidal, with rounded angles; 1st joints stronger than in the 1st pair, wider than any of the other joints, and about as long as the hand; this is a little longer than, and subequal in width to, the wrist, margins parallel, setose; palm small, oblique. Dactylus reaching much beyond the palm (fig. 40. gn.<sup>2</sup>).

First and 2nd peræopods: side-plates rounded below, deeper than the segments; 1st joint relatively wide, 3rd nearly twice as long as the 4th, and wider at the distal end; the whole very sparsely setose (fig. 40. pp.<sup>1</sup>).

Third peræopods but little longer than the 2nd; 1st joint widely oval and about as long as the next 3; 3rd longer than 4th, the two together rather longer than the 5th, which is slender, and has 2 or 3 spines on the front margin.

Fourth and 5th peræopods are subequal, the latter shorter than is usual in this genus, only reaching the 2nd urus segment; they are but little longer than the 3rd pair, which they resemble, except the 1st joint, which is relatively shorter and narrower (fig. 40. pp.<sup>5</sup>); the 3 pairs are almost entirely without setæ.

The 3rd uropods extend a little beyond the 2nd, and these beyond the 1st; the outer ramus of the 3 pairs is shorter than the inner; in the 3rd the inner ramus is as long as the peduncle, with a spine near the middle and 3 unequal terminal spines; the outer has 2 or 3 short and 2 or 3 long terminal spines (fig. 40. up.<sup>3</sup>).

Telson rounded at the end, with a spine and a seta at each side.

Length 2.5 millims.

The characteristic features of this species are the angular ocular lobes, resembling *Gammaropsis*, the chelate hand of the 1st gnathopods, and the comparative shortness of the last peræopods. It is, however, very possible that the specimen was immature.

Another species of *Lembos* from Cheval Paar has the 1st gnathopods very like

*L. websteri*. Another from East Cheval Paar appears to be a *Lemboides*, STEBBING, 'Ann. and Mag. Nat. Hist.,' Ser. 6, vol. 16 (1895), p. 209, plates ix. and x., but both are too imperfect for description.

**Aora**, KRÖYER, 1844.

***Aora gracilis*** (?), SP. BATE.

Pearl oyster washings, Gulf of Manaar.

A very small (2 millims.) and imperfect male from Muttuvaratu had the characteristic gnathopods of this species, and a female, with ova, length 2.5 millims., from East Cheval Paar may possibly belong to it.

**Gammaropsis**, LILLJEBORG, 1854.

***Gammaropsis zeylanicus***, n. sp.—Plate VI., figs. 41.

Generally distributed round the coast of Ceylon.

Head as long as the first 2 segments. Ocular lobe produced to more than one-third of the length of the 1st joint of the upper antennæ, subangular; the extremity generally entirely occupied by the eye, which is dark and variable in size and shape.

Hind margin of the 3rd pleon segment rounded. Urosome about as long as the last pleon segment, its 1st segment dorsally depressed.

Upper antennæ more than half as long as the body and longer than the lower, the peduncles subequal; 1st joint twice as thick and two-thirds as long as the 2nd, which is longer than the 3rd; flagellum subequal to the peduncle, with about 14 joints; appendage reaching the middle of the 5th joint of the flagellum, 5-jointed, the last joint the longest.

Lower antennæ: 2nd and 3rd joints subequal, longer than the 11–12-jointed flagellum. Both pairs of antennæ are sparsely setose.

Mouth organs and maxillipeds normal.

First gnathopods (female): side-plates rhomboidal, front not produced, angles rounded; 1st joint subequal to the next 3; wrist subequal to the hand in length and width, very setose on the side and hind margin; hand oval, palm undefined, with setiferous ridges on both margins; dactylus rather long, serrate. In the immature male from the same tube as the female (Station LVIII.) the 1st joint is stronger and has 3 strong curved pectinate setæ at the end of the hind margin; these were not seen on the female or the adult male. In this last the front margin of the side-plates is considerably produced to a rounded acute angle and the 1st joint is very stout, with scattered setæ along the hind margin (fig. 41. gn.<sup>1</sup> ♀).

Second gnathopods (female): side-plates as in the 1st pair, but rather wider; 1st joint strong, the margins subparallel, considerably longer than the next 3 joints; wrist triangular, about half as long as the hand; this is oval, palm only defined by a blunt spine a little beyond the middle of the hind margin, which, as well as that of the

wrist, is very setose; the dactylus reaches a little beyond the spine and is not serrate (fig. 41. gn.<sup>2</sup> ♀).

In the young male the side-plates are oblong, about twice as wide as deep, the angles rounded; 1st joint very stout (width to length as 3 : 5) and longer than the next 3, a number of long setæ on the outer side; wrist short and triangular; hand subovate, margins to the palmar angle subparallel; palm very oblique, uneven, defined by a small blunt tooth, and occupying nearly half of the hind margin, which is setose; the front margin is naked; the dactylus reaches to the palmar tooth and is not serrate (fig. 41. gn.<sup>2</sup> ♂ jr.).

In the adult male the anterior angle of the side-plates is less rounded. The palm of the hand is deeply sculptured with a double tubercle in the middle. The dactylus has an obtuse tooth in the middle of the inner side (fig. 41. gn.<sup>2</sup> ♂ adult).

First and 2nd peræopods: 1st joint rather longer than and twice as wide as the next 2; 3rd joint much longer than the 4th and rather longer than the 5th, which tapers to the base of the dactylus. The whole very sparsely setose.

Third peræopods much shorter than the 4th, the 1st joint wide-oval with smooth margins; 3rd and 4th much wider, but together scarcely longer than the 5th, on which there is a row of spines.

Fourth and 5th peræopods like the 3rd, but longer; the 3rd pair reaches the 4th joint of the 4th pair, and the 4th pair to the same joint of the 5th.

The uropods are subequal in extent, the peduncles of the 1st and 2nd subequal to the rami, with a row of spines on the outer margin; rami also spinous. The 3rd pair have the peduncle considerably longer than the rami, of which the inner is the shorter and pointed with 3 small spines on the outer margin and a terminal spine; the outer has a short spine on the upper side near the middle, with 3 or 4 short and 2 long spines on the tip (fig. 41. up.<sup>3</sup>).

Telson as in *G. erythrophthalmus* (LILLJÉ.).

Length 6 millims.

#### **Cheiriphotis**, n. gen.

Body very slender, scarcely compressed laterally; side-plates very small.

Head slightly produced in front, ocular lobes more so, angular or cuspidate.

Upper and lower antennæ subequal, the latter stronger; appendage well developed.

Mandibles with the palp long, 2nd and 3rd joints subequal, the whole as in *Gammaropsis*.

Second gnathopods of moderate size in the female, but immensely developed and peculiarly formed in the male; urus small; the 3rd uropods with the outer ramus very short, without a terminal joint, and the inner rudimentary.

This genus is nearly allied to *Microprotopus*, from which it differs chiefly in the smallness of the side-plates.

*Cheiriphotis megacheles* (GILES).—Plate VI., figs. 42.

*Melita megacheles*, GILES (male), 'Journ. Asiatic Soc. Bengal,' 1885, vol. liv., p. 70, pl. iii.

*Eurystheus hirsutus*, GILES (female), 'Journ. Asiatic Soc. Bengal,' 1887, vol. lv., p. 227, pl. viii.

Rather abundant along the West Coast from Colombo northwards.

Third pleon segment rounded behind; lower margin straight, hind margin convex.

Head not quite as long as the first 2 segments, of which the 1st is the shorter; ocular lobe moderately produced, angular, the angle obtuse and apiculate (fig. 42. o.l.).

Upper antennæ: peduncle subequal to that of the lower; 1st joint shorter and wider than the 2nd, longer than the 3rd; flagellum rather variable in length, generally subequal to the last 2 joints of the peduncle, about 13-jointed. Appendage (in female) reaching the end of the 4th joint of the flagellum, 4-jointed, the first 2 joints together subequal to the 4th. In the males the appendage is 3-jointed, the 1st joint shorter than the 2nd, the 2nd and 3rd subequal; the whole reaching to the end of the 2nd joint of the flagellum; the appendage has, in addition, a minute terminal joint in both sexes.

Lower antennæ rather stronger than the upper, the 1st joint about one-third of the 2nd; 2nd, 3rd, and flagellum subequal, the last 9-jointed. Both pairs of antennæ are rather thinly clothed on the under side with long setæ.

Mouth organs as in *Gammaropsis*, except the inner plate of the 1st maxillæ, which is round-oval, with 4 setules on one side.

Maxillipeds as in *Gammaropsis*.

First gnathopods: side-plates acutely produced in front and fringed round the blunt point and below with long setæ, especially in the female. The 1st joint is as long as the wrist, which is longer than the hand and has the hind margin rather flattened and very setose; the hind margin of the hand is evenly convex, with no definite palm, and is setose on the middle part. Dactylus about half as long as the hind margin, with a row of setules on the inner margin (fig. 42. gn.<sup>1</sup>).

Second gnathopods (female): Side-plates small subquadrate, angles rounded, lower margin fringed with long setæ. First joint very strong, subequal to the hand, with long setæ on the front margin; wrist half as long as the hand, triangular, produced and setose behind; hand subovate, palm oblique, uneven, defined by a strong tooth just below the point of the dactylus (fig. 42. gn.<sup>2</sup> ♀).

The young male has the hand much wider than the female, though less so than the adult male; the palm is somewhat obliquely transverse, defined by a strong pointed tooth; near the middle is a double pointed tooth and a single one near the base of the dactylus; the latter is wider in the middle than in the adults. The wrist is produced towards the *front* margin of the hand and cannot be seen behind (fig. 42. gn.<sup>2</sup> ♂ jr.).

In the adult male the 1st joint is shorter, the width being three-fourths of the length, which is subequal to the next 2 joints. The wrist has disappeared or can only be seen in a reduced form through the wall of the 3rd joint. The hand is

subquadrate, as long and wide as the first 3 segments united; the proximal part of the front margin is very convex and fringed with long plumose setæ; the palm is rectangularly transverse, defined by a sharp tooth with 5 equidistant, irregular teeth between it and the hinge of the dactylus. The hind margin is almost straight and about two-thirds as long as the front, with a few setæ below the palmar angle. Dactylus slightly curved, narrow, with subparallel margins, the point meeting that of the defining tooth (fig. 42. gn.<sup>2</sup> ♂). Dr. GILES' specimen had only 3 teeth on the palm, but this is a feature that doubtless varies with age.

First peræopods rather longer than the first 3 joints of the 2nd gnathopods in the male, and as long as the whole limb in the female; 1st joint curved in the male, straight in the female, rather stout; 3rd and 5th subequal in length, the 3rd widened distally with a group of long stiff setæ at the anterior angle. Dactylus rather slender and recurved (fig. 42. pp.<sup>1</sup>). In the female this limb is much more setose than in the male.

Second peræopods in the female like the 1st pair; in the male smaller and with the 1st joint straight.

Third peræopods about as long as the 2nd pair in the male: 1st joint much expanded behind and fringed on both margins; next 3 joints subequal in length and width; 5th longer and narrower, with 5 or 6 spines on the hind margin. All the joints have long plumose setæ on the front margin and the 3rd and 4th joints have a group at the posterior angle as long as the next joint. Dactylus rather short, recurved, and reversed as in *Photis* (fig. 42. pp.<sup>3</sup> ♂).

The remaining peræopods increase in length successively, the last pair extending beyond the uropods and having the 1st joint broader than the 4th pair. Both pairs are densely hirsute.

The first uropods extend a little beyond the 2nd, and these beyond the 3rd; in the 1st and 2nd the rami are subequal and shorter than the peduncles, all the parts being spinous.

The 3rd uropods have the outer ramus shorter than the peduncle, without a terminal joint, but with 3 short spines and some stiff setæ at the tip; inner ramus a spiniferous tubercle (fig. 42. up.<sup>3</sup>).

Telson as in *Microprotopus*, squarely truncate when seen from above mounted, with 3 or 4 setæ in each angle; it does not quite reach the end of the peduncle of the 3rd uropods.

Length of male, 4 millims.

Incubatory lamellæ elongate-triangular, the apex below.

The great size and resemblance in shape and colour to a broken piece of shell in the hands of the 2nd gnathopods of the male suggest, as in *Melita anisochir*, KR., a protective purpose. It is, however, not easy to see why, in both species, the males only should be protected. There can, I think, be little doubt that *Eurystheus hirsutus*, GILES (*loc. cit.*), is the female of this species.

**Photis, KRÖYER, 1842.****Photis longicaudata** (SP. BATE).—Plate VI., figs. 43.

West Coast of Ceylon, from Galle northwards; generally abundant.

Length of female with ova, 3.5 millims.

I have referred the specimens examined to the above species chiefly on account of the prominence of the ocular lobe (fig. 43. c.). In other respects it is equally near the other two species described by G. O. SARS, the limbs in some specimens being as robust and hairy as in *P. reinhardi*, KR., while the hand of the 2nd gnathopods resembles that of *P. tenuicornis* (fig. 43. gn.<sup>2</sup>). It is a question whether these 3 species and *P. pollex*, A. O. WALKER, ought not to be merged in the oldest recorded form, *P. reinhardi*. The Ceylon specimens are remarkably variable. The colour in spirit is dark yellowish-green spotted with black or brown.

One of the forms has the hind margin of the outer ramus of the last 2 pairs of pleopods expanded near the base and furnished with peculiar longitudinally-striated, tapering plumose setæ radiating symmetrically from the curved margin (fig. 43. plp.). In this form the side-plates and gnathopods are setose.

**Photis longimanus**, n. sp.—Plate VII., figs. 44.

From pearl oysters, East Cheval Paar, 8th November, 1902; 5 specimens.

*Male*.—Head about as long as the first two segments.

Ocular lobe reaching almost to the end of the 1st joint of the lower antennæ. Eye large, occupying almost the whole lobe, dark.

Hind angle of the 3rd pleon segment rounded.

Upper and lower antennæ subequal, scarcely reaching to the pleon, sparsely setose; 1st joint of the upper twice as thick as, but shorter than, the 2nd, and subequal to the 3rd; flagellum 6-jointed, subequal to the 2nd and 3rd joints of the peduncle together.

First joint of the lower antennæ about half as long as the second, which is subequal to the 3rd; flagellum 6-jointed, rather shorter than the last 2 joints of the peduncle.

Mouth organs and maxillipeds normal.

First gnathopods: side-plates oblong, much wider than deep, angles rounded; 1st joint as long as the 3rd and 4th and at least as wide as the hand; wrist as wide as, and considerably longer than, the hand, which is oval; the palm undefined (fig. 44. gn.<sup>1</sup>).

Second gnathopods: side-plates small, rounded-oblong; the first 4 joints very short and stout. *Wrist brought round the base of the hand on the outside and produced beyond it in an oval lobe.* Hand long, narrowing distally, a strong blunt tooth near the base on the *inner* surface, the hind margin divided into 3 nearly equal concave spaces by this and 2 other teeth, the middle one being the smallest. Dactylus strong, reaching the basal tooth (fig. 44. gn.<sup>2</sup> ♂).

The peræopods do not differ materially from those of *P. reinhardi*, KR., except in being less setose; the last pair extends to the end of the 3rd uropods.

The segments of the urus decrease successively in length; the 1st has a dorsal depression.

The uropods are subequal in extent, short and stout; the outer rami in the 1st and 2nd rather shorter than the inner and about half as long as the peduncles, without terminal spines or setæ. The 3rd pair has the inner ramus almost rudimentary, the outer curved, rather longer than the peduncle, with a minute terminal joint and 1 or 2 slender spines on it. With the exception of 2 or 3 setules on the telson, the urus appears to be entirely destitute of setæ.

Telson not quite reaching the end of the peduncle, of the usual form.

Length 3 millims.

Colour in spirit yellowish, with a few dark-red blotches on the body and limbs. No female was observed. The species may be distinguished by the peculiar form of the wrist and hand of the 2nd gnathopods.

**Photis nana**, n. sp.—Plate VII., figs. 45.

Pearl oyster washings, Muttuvaratu, 19th Nov., 1902. Two females with ova.

Head longer than the first 2 segments. Ocular lobe distinct, but not prominent. Eye round, rather small.

Posterior angle of the 3rd pleon segment rounded.

Antennæ subequal in length and width, except the 1st joint of the upper, which is at least twice as wide as any of the other peduncular joints; both pairs are almost naked. In the upper pair the 3 joints of the peduncle are subequal in length, the 1st with a group of setæ at the distal end; the flagellum about as long as the last 2 joints of the peduncle, with 3 rather long subequal joints and a minute terminal one which, as well as the 2 preceding, has one or two strap-shaped setæ at the end. The lower antennæ have the 1st joint very short; the 2nd shorter than the 3rd; the flagellum as long as the peduncle.

First gnathopods: 1st joint curved, as long as the next 3; wrist about two-thirds as long as, but wider than, the hand, with a group of setæ on the convex hind margin. The hand narrows distally to the base of the dactylus, the distal half of the hind margin setose (fig. 45. gn.<sup>1</sup>).

Dactylus with a spine and 2 setules on the inner margin, which is finely pectinate.

The 2nd gnathopods resemble the 1st in size and form, but the 1st joint is less curved and the 3rd has the end of the hind margin squarely truncate (fig. 45. gn.<sup>2</sup>).

First and 2nd peræopods: 1st joint pyriform, longer than the next 3, the hind margin convex and setose at the distal end (fig. 45. pp.<sup>1</sup>).

Third peræopods as in *P. reinhardi*, but without setæ, except one at the end of the hind margin of the 4th joint and one at the base of the dactylus.

Fourth and 5th peræopods as in *P. reinhardi*, except the 1st joint, which is more oblique and the whole less setose.

The uropods are without spines or setæ, except at the ends of the joints. The 3rd

pair extends slightly beyond the 2nd; the inner ramus very small, the outer almost as long as the peduncle, curved, with a minute terminal joint, no spines or setæ (fig. 45. up.<sup>3</sup>). Telson obtusely pointed.

Length 2 millims.

The peculiar gnathopods of this small species seem to indicate that a new genus will be required for it when the male is found.

#### **Chevalia**, n. gen.

Body laterally compressed.

Head without a rostrum.

Antennæ subequal, the upper with an appendage.

Mandibles small; palp long and slender, 3-jointed.

First and 2nd maxillæ as in *Cerapus*, but relatively smaller.

Palp of the maxillipeds with the last joint blunt.

First gnathopods slender, as in *Gammaropsis*.

Second gnathopods with large wrist and hand alike in both sexes.

The last 3 pairs of peræopods with the dactyli inverted, as in *Cerapus*.

First and 2nd uropods with dissimilar rami; 3rd with 2 well-developed rami.

Telson, as in the Photidæ.

This curious genus is intermediate between the Photidæ and the Corophiidæ. It resembles the former in the form of the body, head, antennæ, gnathopods, and telson; and the latter in the inverted peræopods and the dissimilar rami of the 1st and 2nd uropods, though in the new genus the dissimilarity is greater. Notwithstanding these points and the similarity of the 2nd gnathopods in the males and females, I have placed this form under the Photidæ as the family with which it has the greatest affinity.

**Chevalia aviculæ**, n. sp.—Plate VII., figs. 50, and Plate VIII., fig. 50).

Pearl oyster washings, East Cheval and Muttuvaratu paars: about 20 specimens

Body smooth, without dorsal spines or teeth; much curved; speckled with red.

Head as long as the first 2 segments; ocular lobe subangular, not very prominent.

Eyes oval—colourless in spirit.

Segments of the mesosome increasing in length successively, the 7th twice as long as the 1st.

Pleon segments with a pair of upright setæ on their postero-dorsal margins; the epimere of the 3rd rounded behind and below.

First 2 segments of the urus coalesced and subequal to the last pleon segment; 3rd segment about half as long.

Antennæ about two-thirds of the length of the body, subequal in the female; the upper rather the longer in the male; in the upper the 1st and 2nd joints are subequal, about one-third longer than the 3rd; flagellum 7-jointed; appendage 1-jointed, as long as the 1st joint of the flagellum.

Lower antennæ: 1st joint about half as long as the 2nd, which is rather longer than the 3rd; flagellum 6-jointed, subequal to the last 2 peduncular joints. Both pairs are similarly fringed below with long curved setæ.

Mandibles small, shorter than the 2nd joint of the palp; cutting edge double; molar tubercle rather large, but not prominent, palp projecting to the middle of the 2nd joint of the lower antennæ; 1st joint very small, 2nd and 3rd subequal (fig. 50. m.).

Maxillipeds: inner plate reaching the end of the 1st joint of the palp, spinous on the angle; outer narrow, reaching the middle of the 2nd joint, with slender curved spines near the top; 1st and 3rd joints of palp subequal; 2nd about twice as long; 4th rather more than half as long as the 3rd, the apex rounded and setose.

First gnathopods: side-plates small, front angle acute, with a setule on the point; 1st joint subequal to the wrist, curved; wrist subequal to the hand in length and width, the hind margin setose; hind margin of the hand convex and setose, the palm undefined. Dactylus half as long as the hind margin (fig. 50. gn.<sup>1</sup>).

Second gnathopods: side-plates as in the 1st, but smaller; 1st joint stout, subequal to the next 3; wrist subequal in width to the hand, along the anterior margin of which it is carried for about one-third of its length. Hand longer than the wrist, subquadrate, the palm almost rectangular to the hind margin, convex, and defined by a strong tooth, behind which is a notch which receives the point of the dactylus (fig. 50. gn.<sup>2</sup>).

First and 2nd peræopods are rather longer than the 2nd gnathopods and strongly built; the side-plates alike small and triangular, the angles rounded. The 1st joint is subequal to the next 3, about twice as wide as the 3rd joint, and widening distally; the front margin distally convex in the 1st pair and straight in the 2nd; the 3rd joint as long as the 2nd, 4th, and 5th together, and twice as wide as the last 2. Dactylus short (fig. 50. pp.<sup>2</sup>).

Third peræopods hardly reaching the end of the 1st joint of the 2nd pair; 1st joint almost as wide as long, the front margin very convex; the 2nd subequal to the 4th and the 3rd to the 5th, which is the narrowest; the 3rd and 4th are obcordate. Dactylus reversed, with a secondary tooth on the outer side (fig. 50. pp.<sup>3</sup>).

Fourth peræopods like the 3rd, but longer.

Fifth peræopods rather longer than the 4th; the 1st joint with the hind margin almost straight and ending in a rounded right angle; otherwise as in the preceding pairs (fig. 50. pp.<sup>5</sup>).

The last 3 pairs of peræopods are feeble, the last pair hardly reaching the 3rd pleon segment, and neither as long or strong as the first 2 pairs of peræopods; they are almost devoid of spines or setæ.

First uropods: peduncle rather shorter than the upper ramus, which is styliform, curved and spinulous on the proximal half of the inner margin; the lower ramus is about one-fourth shorter than the upper, obliquely truncate at the end, where there

is a crowded group of short blunt spines; the inner margin has a row of microscopic ciliæ (fig. 50. up.<sup>1</sup>).

Second uropods of similar structure to the 1st, but shorter in extent.

It is very difficult to determine which is the "inner" or the "outer" ramus, as, in fact, the one lies immediately above the other in these 2 pairs.

Third uropods: peduncle subequal to the inner ramus, which is rather longer than the outer; both are alike and simple, with obliquely truncate setose ends (fig. 50. up.<sup>3</sup>).

Telson as in *Gammaropsis*.

Length of ovigerous female 4 millims.

Probably a tubicolous species, from the structure of the last 3 pairs of legs. So far it has only been obtained from the washings of pearl oysters.

#### Amphithoë, LEACH, 1813.

##### *Amphithoë intermedia*, n. sp.—Plate VII., figs. 46.

West Coast of Ceylon, from Colombo northwards.

Head shorter than the first 2 segments. Ocular lobe slightly produced, subangular. Eye round, red.

Third pleon segment: lower and hind margins convex, angles rounded.

Upper antennæ: 1st joint stout, almost as long as the slender 2nd; the 3rd barely one-third of the 2nd; flagellum slender, 30-jointed.

Lower antennæ: 1st joint very short, 2nd and 3rd subequal, but the 2nd the wider; *flagellum subequal to the last joint of the peduncle, 9-jointed.*

Mandibles normal, the palp scarcely as long as the mandible; 1st joint about half as long as the 2nd, which is subequal to the 3rd; this widens distally and is obliquely truncate, with 7 pectinate setæ on the truncate part and 1 below (fig. 46. m.).

First maxillæ: inner plate with 3 setæ (fig. 46. mx.<sup>1</sup>).

Remaining mouth organs and maxillipeds normal.

First gnathopods in the female as in *A. rubricata* (MONT.), the side-plates rather wider below, with a few setæ on the rounded posterior angle. In the male the whole limb is more robust; the hind margin of the wrist straight, crenate, setose, and ending in an acute angle; the hand scarcely as wide as the wrist, oblong; the dactylus strong and serrate (figs. 46. gn.<sup>1</sup> ♀ and ♂).

Second gnathopods in the female very like and but little larger than the 1st; the side-plates oblong, with setæ as in the 1st; the wrist is produced behind in a truncate lobe which is densely setose; the hand is about half as long again as the wrist, *the palm slightly convex, defined by a spine, but rounded off into the hind margin*, which is rather the longer; the whole hind margin setose. Dactylus reaching a little beyond the palmar spine, serrate (fig. 46. gn.<sup>2</sup> ♀).

In the male the side-plates are suborbicular, the diameter less than the length of the 1st joint, which is subequal to the next two; the front margin of the wrist is

about half as long as that of the hand, and has a few unequal spines near its proximal end; the hind margin is a small, rounded, setose lobe. The hand has its anterior surface furnished with numerous setiferous ridges, the setæ very long; this part is produced in a rounded lobe beyond the base of the dactylus. The hind margin is subparallel with the front for about half its length, where it forms a strong tooth\* which forms a deep V-shaped sinus with the palm. The point of the dactylus just meets that of the tooth (fig. 46. gn.<sup>2</sup> ♂).

The peræopods resemble those of *A. rubricata*, but are rather more slender.

The 1st and 2nd uropods have their outer rami subequal to the peduncles, the inner rather longer; all the parts are spinous.

The 3rd uropods have the inner ramus slightly longer than and subequal in width to the outer, the end rounded with a group of unequal spines at the end and 4 along the inner margin; the outer as in *A. rubricata*.

Telson as in *A. rubricata*.

Length of female with ova, 4 millims.

This species appears to connect *A. rubricata* with *A. vaillanti*, LUCAS; the female agreeing with the former, but differing from the latter in the hand of the 2nd gnathopods, while the reverse is the case in the male. The form described by DELLA VALLE as *A. rubricata* is, as pointed out by CHEVREUX ('Amphipodes des campagnes de "l'Hirondelle,"' 1885-8, p. 100,† who also gives the synonymy of that species), *A. vaillanti*.

The incubatory lamellæ of the 2nd gnathopods are narrow; the branchial pyriform broader at the lower end than in *A. rubricata*.

#### ***Amphithoë vaillanti*, LUCAS.**

Station LVIII., two females with ova; length 6 millims.

#### ***Ischyrocerus*, KRÖYER, 1838.**

##### ***Ischyrocerus anguipes*, KR. (?).**

Coast of Ceylon, under 100 fathoms, exact locality not known.

One male and 1 female with ova; length 2.5 millims.

I should not hesitate to refer these specimens to KRÖYER'S species were it not for the entire absence of their antennæ, their very small size (neither of these characters being, however, of much importance in this genus), and the fact that the species has not been recorded south of the Kattegat. The shape of the hand of the 2nd gnathopods in the male agrees exactly with SARS' figure of *I. anguipes*, differing in the concave hind margin from its nearest and more southern ally, *I. minutus*, LILLJEBORG. With the latter species I am well acquainted, having formerly described it under the name of *Podocerus isopus*.

\* In a male from Station LVI. (tube 43) this tooth becomes a lobe.

† "Résultats des Campagnes scientifiques du Prince de Monaco," 1900.

**Jassa**, LEACH, 1813 (= **Podocerus**, AUCT.).

**Jassa falcata** (MONTAGU) (?).—Plate VII., fig. 47.

Muttuvaratu Paar, 19th November, 1902. One female without ova; length 4 millims.

In the absence of a male it is impossible to be sure of the species, but in its principal features this agrees with the above. The limbs and antennæ are more robust; the flagellum of the upper antenna is 6-jointed, about as long and half as wide as the last joint of the peduncle, the 1st joint as long as the next 3; appendage 1-jointed, about one-third of the 1st joint of the flagellum. The terminal joint of the palp of the maxillipeds is oblong, not pointed. The 2nd gnathopods are very robust, but of much the same form as in *J. falcata*. The 1st joint is about half as long as the hand; the separation of the 2nd and 3rd joints is not very distinct, and the wrist appears to be entirely coalesced with the hand. The dactylus is apparently encased in a sort of sheath to within a short distance of the point, the lower margin being studded with minute equidistant denticles.

**Erichthonius**, MILNE EDWARDS, 1830.

**Erichthonius abditus** (TEMPLETON).

Abundant from a basket hung to a buoy in Galle Harbour, 9th May, 1902; also from other localities along the coast.

Length of female with ova, 7 millims.

**Erichthonius macrodactylus** (DANA).—Plate VII., figs. 48.

*Pyctilus macrodactylus*, DANA, 'U.S. Exploring Exp.,' p. 974, plate 67.

Station LIII., north part of Gulf of Manaar; a few specimens.

Head as long as the first 2 segments, of which the 1st is very short, the remainder subequal. Ocular lobe moderately produced. Eye medium sized, dark, roundish-oval.

Upper antennæ reaching the middle of the flagellum of the lower; the 1st joint little more than half the length of the 2nd, which is rather longer than the 3rd; flagellum 13-jointed, subequal to the last 2 joints of the peduncle.

Lower antennæ: peduncle longer than that of the upper, the 2nd joint shorter than the 3rd, a red blotch upon both; flagellum rather longer than these two together.

Mouth organs normal except the palp of the mandible, which, both in this species and in *E. abditus*, differs from the European form of the latter in having the 3rd joint rather narrower than the 2nd and less expanded towards the tip (fig. 48. m.).

Maxillipeds normal.

First gnathopods as in *E. abditus*.

Second gnathopods as in *E. abditus* in the female. In the male it is very near to *E. difformis*, M. EDW., but the thumb-like process of the wrist has the outer margin

quite straight, while the inner is parallel to the outer for half its length, and thence tapers to a very sharp point, with a tuft of setæ on the outer margin; the distal half of the proper hind margin of the wrist is quite straight. The hand is narrow and curved, the margins parallel without any prominence on the inner. Dactylus fully as long as the hand (fig. 48. gn.<sup>2</sup> ♂).

First and 2nd peræopods as in *E. abditus*.

Third peræopods: in the male the 1st joint has the hind margin produced downwards in a narrow rounded (not "acute," as described by DANA, though figured rounded) lobe reaching beyond the end of the 2nd joint; the 3rd joint is longer than the next 3, curved and expanded at the end (fig. 48. pp.<sup>3</sup> ♂). In the female the 1st joint is without the lobe, and the 3rd joint is straight and shorter than the next two.

The 4th pair are slender and much longer than the 3rd, the 3rd and 5th joints subequal.

The 5th pair are longer than the 4th and extend considerably beyond the uropods; the 5th joint is as long as the 3rd and 4th together.

First uropods: peduncle considerably longer than the rami, the inner margin with 5 or 6 spines, rounded off and pectinate or finely serrate at the end; inner ramus a little shorter than the outer, both spinous and minutely pectinate.

Second uropods like the 1st, except the inner margin of the peduncle, which is not rounded or pectinate on the inner margin.

Third uropods as in *E. abditus*—two unequal spines near the middle of the outer margin and a small one near the base of the peduncle.

Telson as in *E. difformis*, with an obtuse central tooth.

Length 5 millims.

The colour of the specimens (in spirit) was lighter than in *E. abditus*, with dull red blotches and transverse bars on the body and limbs. This species may be considered as the eastern form of *E. difformis*, from which the male differs in the even hind margin of the hand, the somewhat differently formed wrist of the 2nd gnathopods, and, still more, in the peculiar construction of the 3rd peræopods. The female can only be distinguished from *E. abditus* by its greater slenderness generally, and especially by the great length of the 5th joint of the last peræopods.

### Cerapus, SAY, 1817.

#### *Cerapus calamicola* (GILES).

*Cyrtophium calamicola*, GILES, 'Journ. Asiatic Soc. Bengal,' vol. liv., 1885, p. 54, pl. ii. ♂.

*Cerapus findersi*, STEBBING, 'Chall.' Amph., p. 1163, plate cxxv. ♀.

*Cerapus findersi*, STEB., CHILTON, 'Rec. Aust. Mus.,' vol. ii., p. 1 (separate copy), pl. 1. ♂.

Station LIII., Periya Paar Kerrai, many, with tubes. East Cheval Paar.

A female from Station LIII. measured 6 millims.; those from Periya Paar Kerrai only 3 millims.

**Siphonœcetes, KRÖYER, 1845.****Siphonœcetes orientalis, n. sp.—Plate VII., figs. 49.**

Station V., several; Station LIII., two; and Station LVIII., two specimens.

Rostrum acute deflexed, as long as the ocular lobes, which are almost rectangular, narrowing distally. Eyes small but distinct, with about 6 lenses.

First 4 side-plates acutely angled and fringed with rather long setæ.

Upper antennæ reaching beyond the middle of the 3rd joint of the peduncle of the lower, the 1st and 3rd joints equal; flagellum shorter than the peduncle, 14-jointed.

Lower antennæ almost as long as the whole body, the 1st joint about half as long as the 2nd, which is a little longer than the 3rd; flagellum about half as long as the last joint of the peduncle, 3-jointed, the 2nd one-fourth as long as the 1st, the 3rd minute. The whole of the flagellum is armed with a row of 5 or 6 strong recurved spines on each margin of the lower side. The lower side of the 2nd joint of the peduncle is sparsely, and that of the 3rd densely, clothed with long plumose setæ (fig. 49. ant.<sup>2</sup>).

First gnathopods: 1st joint, hand, and wrist subequal, the hand throughout narrower than the wrist, and narrowing gradually from the base to the end with 4 spines on the hind margin; both hand and wrist setose on both margins. Dactylus with a row of spines on the inner margin, increasing in size distally (fig. 49. gn.<sup>1</sup>).

Second gnathopods: much as in *S. colletti*, BOECK, but the hand narrower, the widest part near the base, from which point to the dactylus the hind margin is slightly concave, with 5 spines increasing in size distally (fig. 49. gn.<sup>2</sup>). Dactylus as in the 1st gnathopods.

The rest as in *S. colletti*.

Length 5 millims.

The narrowness of the hands of the gnathopods distinguishes this species from the others, but I confess that I am inclined to agree with DELLA VALLE (*loc. cit.*, p. 362), that the points of difference between *S. typicus*, KRÖYER, the original Arctic species, *S. colletti*, BOECK, and *S. pallidus*, SARS, are not greater than can be accounted for by age, &c., so that both these species, as well as the present one, might well be united to *S. typicus*.

**Corophium, LATREILLE, 1807.****Corophium crassicorne, BRUZELIUS.**

Periya Paar Kerrai, 9th November, 1902. Two males, one female.

Length 2.5 millims.

The only difference observed between this and the European form was that there are 2 spines on the 3rd joint of the lower antennæ in the female instead of one.

**Platophium**, DANA, 1852.

**Platophium læve** (HASWELL).—Plate VII., figs. 51.

*Dexiocerella lævis*, HASWELL, 'Proc. Linn. Soc., N.S. Wales,' vol. x., 1886, p. 111, pl. xviii.

*Cyrtophium haswelli*, CHEVREUX and DE GUERNE, 1888.

Stations V., XLVII., LVIII., all in Gulf of Manaar.

The first 5 segments of the mesosome with a median transverse depression, the last segment and the first 2 of the pleon carinate, the carinæ not produced behind.

Head considerably longer than the 1st segment. Lower angle of the ocular lobe bluntly rectangular. Eyes wide-oval, dark in the centre.

Upper antennæ about as long as the head and first 2 segments; 2nd and 3rd joints of peduncle subequal, the flagellum the same length, 4-jointed in the females, 5-jointed in the males, the 1st joint much the longest. Appendage about one-third of the 1st joint. The whole setose below.

Lower antennæ are longer and less setose in the male than in the female, the 2nd joint considerably shorter than the 3rd and subequal to the 3-jointed flagellum.

First gnathopods: side-plates rhomboidal; 1st joint rather shorter than the next 3; hind margin of the wrist almost straight, setose. Hand subtriangular, longer than the wrist in the male, widest near the base, the palm occupying two-thirds of the hind margin and defined by a group of spines. Dactylus barely reaching the palmar spines; a row of spines on the inner margin and an obscure denticulation on the outer near the point, which has a secondary tooth, giving it a split appearance. In the female the hand is proportionately shorter than in the male, being only about as long as the wrist (figs. 51. gn.<sup>1</sup>).

Second gnathopods, female (fig. 51. gn.<sup>2</sup> ♀): the whole limb short and stout; the 1st joint subequal to the next 3; 3rd joint produced behind to a point tipped with a spine; wrist triangular, cup-shaped, with spines round the margin, about one-third as long as the hand; this is widely oval, the palm about 3 times as long as the rest of the hind margin, from which it is defined by a spine; about 6 spines and 4 long setæ on the palmar edge, and 4 marginal and 3 submarginal spines on the front margin; dactylus rather longer than the palm. In the male the hand is 4 times as long as the wrist, about 3 times as long as the hand in the female and proportionately narrower; the palm occupies nearly the whole of the hind margin, is defined by a small tooth, and is spinous, with a few short setæ throughout its length; there are 5 groups of spines (1 long and 2 short spines in each) along the front margin (figs. 51. gn.<sup>2</sup>).

First and 2nd peræopods: the 1st joint narrow and as long as the next 2; the 3rd joint expanded distally, the front margin subangulate; 5th joint almost as long as the 3rd and 4th; all the joints spinous (fig. 51. pp.<sup>1</sup>).

Third peræopods: 1st joint with a projecting lamina behind narrowing distally; 3rd and 4th joints subequal, 5th nearly twice as long; dactylus strong (fig. 51. pp.<sup>3</sup>).

Fourth and 5th peræopods like the 3rd, except the 1st joint, which is wider and rounded behind.

The outer rami of the 1st and 2nd uropods are shorter than the inner and are terminated by a long spine, as also the inner ramus of the 2nd pair; the inner ramus of the 1st pair has 3 shorter and unequal spines and the inner margin finely pectinate and spinulose (fig. 51. ur.).

The 3rd uropods are uni-ramous, oval, acuminate, with a setule at the tip, about two-thirds covered by the telson (fig. 51. up.<sup>3</sup>).

The telson seen in profile is triangular, with 2 spines on the summit and the margin of the extended base upturned (fig. 51. t.).

Length of female with ova, 3.5 millims., but the females appear to become sexually mature very young in this genus, as much smaller females are full of ova.

In 1888, CHEVREUX and DE GUERNE referred HASWELL'S genus *Dexiocerella* to *Cyrtophium*, DANA, and as the specific name *læve* was preoccupied by *C. læve*, HELLER, they re-named HASWELL'S species *C. haswelli*. As, however, the species belongs to *Platophium*, I have reverted to HASWELL'S name, HELLER'S species having no antennular appendage.

It is possible that this species is identical with *Cyrtophium orientale*, DANA, in which, however, no antennular appendage is figured or described.

***Platophium synaptochir*,\* n. sp.—Plate VIII., figs. 52.**

Galle Harbour and Bay, very abundant. Kondatchi Paar, Periya Paar Kerrai, East Cheval Paar. All taken from May to November, 1902.

Male:—The first 4 segments of the mesosome are subequal, the 5th rather shorter, the 6th longer; the 7th the longest; all, as well as the pleon segments, have a transverse dorsal depression, and are elevated behind, but not carinate or produced behind. Urus with 3 distinct segments. Head longer than the 1st segment; ocular lobe subangular. Eye large, round, dark red.

Upper antennæ reaching to one-third of the last joint of the peduncle of the lower; the 1st joint twice as thick and more than half as long as the 2nd, which is about one-fourth longer than the 3rd. Flagellum as long as the 3rd joint, 5-jointed, the 1st joint as long as the remaining 4. Appendage 1-jointed, nearly half as long as the 1st joint of the flagellum; the whole rather sparsely clothed below with long, simple setæ.

Lower antennæ as long as the mesosome; the 1st joint less than half as long as the 2nd, which is much shorter than the 3rd. Flagellum shorter than the 2nd joint, 4-jointed, the 1st longer than the remaining 3; the whole sparsely furnished with short setæ.

\* From *συνάπτω*, to join, and *χειρ*, hand, in allusion to the coalescence of the hand and wrist in the 2nd gnathopods of the male.

Palp of the 1st maxillæ with the 2nd joint not wider than the 1st and not expanding distally (fig. 52. mx.<sup>1</sup>).

Other mouth organs as in *P. inconspicuum*, STEB. ('Chall. Amph.', p. 1194, pl. cxxxi.).

First gnathopods: side-plates small, produced to a blunt point with a setule. First joint short and stout, longer than the next 2; wrist shorter than the hand, but fully as wide, the front margin with curved spines, the hind margin flattened and densely setose; the hand has the hind margin concave near the base, with a straight and very setose palm; the front margin convex (fig. 52. gn.<sup>1</sup> ♂).

Second gnathopods of male: side-plates oblong, wider than deep, rounded in front. First joint about half as long as the hand, 3rd joint convex and setose, with the hind margin produced distally. Wrist merged in the hand, which is narrow-oval, with the hind margin slightly concave and densely setose; the palm is undefined. The front is convex, with groups of spines. Dactylus reaching rather beyond the middle of the hind margin (fig. 52. gn.<sup>2</sup> ♂).

The gnathopods in the female much resemble those of *P. inconspicuum*, STEB., but the wrist of the 1st pair is as wide as the hand, and the point of the dactylus is not divided as in that species. In the 2nd pair the 3rd joint is more produced behind, and the wrist, which is quite distinct, though small, is not produced at all (fig. 52. gn.<sup>2</sup> ♀).

First and 2nd peræopods: first joint narrow and subequal to the 4th, with long spines on the front margin; the 5th the longest, its hind margin, with 5 spines, increasing in length distally (fig. 52. pp.<sup>1</sup>).

Third peræopods: side-plates bilobed, the front lobe the larger. First joint with the lamina projecting beyond the proximal part of the hind margin, the distal part fringed with slender, unequal spines; 3rd joint acutely produced behind; 5th joint rather shorter than the 3rd and 4th together; the whole limb spinous (fig. 52. pp.<sup>3</sup>).

Fourth and 5th peræopods resembling the 3rd, except in the 1st joint, in which the posterior lamina is continuous along the hind margin (fig. 52. pp.<sup>5</sup>).

Uropods: the outer ramus of the 1st as long as the inner of the 2nd, the peduncles shorter than the inner rami; the whole spinous (fig. 52. ur.).

The 3rd pair small and spoon-shaped, with a setule on the inner margin, barely reaching beyond the end of the telson.

Telson as in the last species, but with 2 groups of 3 or 4 spines on each side.

Length of adult male, 6.5 millims. Female, with ova, 3.5 millims.

***Platophium zeylanicum*, n. sp.**—Plate VIII., figs. 53.

From pearl oysters, East Cheval Paar, November, 1902; several.

Segments of mesosome and pleon dorsally depressed in the middle, not carinate or dentate. Urus with 3 segments, the division between the 2nd and 3rd somewhat indistinct. Head shorter than the first 2 segments. Ocular lobe little produced. Eyes round and prominent.

Upper antennæ: the 1st joint half as long and twice as wide as the 2nd, which is equal to the 3rd; flagellum subequal to the 3rd joint, 3-4-jointed, the 1st as long as or longer than the remainder; appendage about half as long as the 1st joint of the flagellum, 1-jointed (fig. 53. ant.<sup>1</sup>).

Lower antennæ: the 1st joint sub-globose, more than twice as wide as the 2nd, which is considerably shorter than the 3rd and subequal to the flagellum; this is 3-4-jointed.

First gnathopods: side-plates much produced in an acute angle, with a seta at the tip; the rest of the limb much like the last species (fig. 53. gn.<sup>1</sup> ♂).

Second gnathopods of female: side-plates small, subquadrate, with rounded angles. First joint rather shorter than the hand; 3rd more than twice as long as the 2nd, and produced beyond the wrist as in the last species; wrist small and triangular; hand wide-oval, both margins convex, especially the front, and setose; palm hardly defined, but a spine within the point of the dactylus, which is slender; the setæ are stiff and spine-like. Incubatory lamellæ very large, sub-oblong, the upper part spotted with red (fig. 53. gn.<sup>2</sup> ♀).

Second gnathopods of male: 1st joint expanded distally, longer than the next 3, with a channel in front to receive the hand; 3rd joint twice as long as the 2nd, the hind margin rectangular; the wrist very small and almost concealed by the 3rd joint; hand much longer than all the preceding joints united, oval, a strong tooth near the middle of the hind margin defining the palm, between which and the base of the dactylus are two tubercles with concave interspaces, the whole clothed with unequal plumose setæ. Dactylus barely reaching the palmar tooth, with a row of denticles on the inner margin. The sculpturing of the palm is somewhat variable (fig. 53. gn.<sup>2</sup> ♂).

First and 2nd peræopods: the 1st joint subequal to the 4th joint, with a laminar expansion of the front margin which is rounded and furnished with a group of stiff setæ; 3rd joint shorter than the 4th, produced and spinous in front; 5th joint almost as long as the 3rd and 4th united (fig. 53. pp.<sup>1</sup>).

Third peræopods: 1st joint shorter than the 4th, with a semicircular membranous expansion behind (fig. 53. pp.<sup>3</sup>); the rest as in the preceding pairs.

Fourth and 5th peræopods: 1st joint wider above, but otherwise like the 3rd pair; the 5th pair reaches far beyond the ends of the uropods (fig. 53. pp.<sup>5</sup>).

First uropods: peduncle subequal to the outer ramus, reaching beyond the telson; inner ramus about one-fourth longer and wider (fig. 53. ur.).

Second uropods shorter in extent than the 1st; peduncle reaching to the end of the telson, shorter than the outer ramus, which is one-third shorter than the inner. In both pairs the rami are spinous, the terminal spines about one-fourth of their length.

Third uropods not reaching beyond the end of the telson.

The telson has the form of a truncated cone, the apex directed backwards, with a long terminal and 2 shorter subterminal spines (fig. 53. t.).

Length of male, 4 millims.; of female, with ova, 2.5 millims.

The males of this species may be distinguished by the 2nd gnathopods; the females in the genus *Platophium* are very much alike, but in this case may be known by the triangular expansion of the 1st joint of the 1st and 2nd peræopods.

**Colomastix, GRUBE, 1861.**

**Colomastix pusilla, GRUBE.**

*Cratippus tenuipes*, SP. BATE.

*Exunguia stilipes*, NORMAN.

Pearl oyster washings, Muttuvaratu Paar—2 specimens.

EXPLANATION OF PLATES.

LIST OF ABBREVIATIONS USED WITH THE FIGURES.

*c.* and *ceph.* = cephalon, head.

*o.l.* = ocular lobe.

*ant*<sup>1.</sup>, *ant*<sup>2.</sup> = upper and lower (1st and 2nd) antennæ.

*m.* = mandible.

*mp.* = mandibular palp.

*mx*<sup>1.</sup> = 1st maxillæ.

*l.* = posterior lip.

*mxp.* = maxillipeds.

*gn*<sup>1.</sup>, *gn*<sup>2.</sup> = 1st and 2nd gnathopods.

*pp.* 1-5 = peræopods, 1st to 5th pairs.

*up.* 1-3 = uropods, 1st to 3rd pairs.

*t.* = telson.

*pl*<sup>3.</sup> = 3rd segment of the pleon.

*ur.* = urus, last 3 abdominal segments.

PLATE I.

Fig. 1. *Parascelus parvus*, CLAUS.

„ 2. *Elsia indica*, GILES.

„ 3. *Ichnopus taurus*, COSTA.

„ 4. *Socarnella bonnierii*, n. gen. et sp.

Fig. 5. *Vijaya tenuipes*, n. gen. et sp.

„ 6. *Lysianax cinghalensis*, STEBBING.

„ 7. „ *celochir*, n. sp.

„ 9. *Urothoë spinidigitus*, n. sp.

PLATE II.

Fig. 10. *Platyischnopus herdmani*, n. sp.

„ 11. *Ampelisca tridens*, n. sp. (see also Pl. IV.).

Fig. 12. *Ampelisca scabripes*, n. sp.

„ 13. „ *brachyceras*, n. sp.

Fig. 14. *Ampelisca cyclops*, n. sp.

PLATE III.

Fig. 15. *Ampelisca chevrouxi*, n. sp.

„ 16. *Gallea tecticauda*, n. gen. et sp. (see also Pl. VIII.).

Fig. 17. *Leucothoë hornelli*, n. sp.

„ 17A. „ *stegoceras*, n. sp.

„ 18. *Anamixis stebbingi*, n. sp.

Fig. 19. *Stenothoë gallensis*, n. sp.

## PLATE IV.

- Fig. 8. *Tryphosa cucullata*, n. sp.  
 „ 11. *Ampelisca tridens*, n. sp. (see also Pl. II.).  
 „ 20. *Perioculodes serra*, n. sp.  
 „ 21. *Tiron thompsoni*, n. sp.  
 „ 22. *Eusiroides cæsaris*, STEBBING.  
 Fig. 23. *Eusiroides orchomenipes*, n. sp.  
 „ 24. *Dexamine serraticrus*, n. sp.  
 „ 25. *Tritata antarctica*, STEBBING.  
 „ 26. *Guernea levis*, CHEVREUX.  
 „ 27. *Hornellia incerta*, n. gen. et sp.  
 Fig. 28. *Melita anisochir* (KRÖYER).

## PLATE V.

- Fig. 29. *Mæra othonoides*, n. sp.  
 „ 30. „ *rubro-maculata* (STIMPSON).  
 „ 31. „ *tenella* (DANA).  
 „ 32. „ *scissimana* (COSTA).  
 Fig. 33. *Mæra tenuicornis* (DANA).  
 „ 34. *Elasmopus subcarinatus* (HASWELL).  
 „ 35. „ *dubius*, n. sp.  
 „ 36. „ *spinimanus*, n. sp.

## PLATE VI.

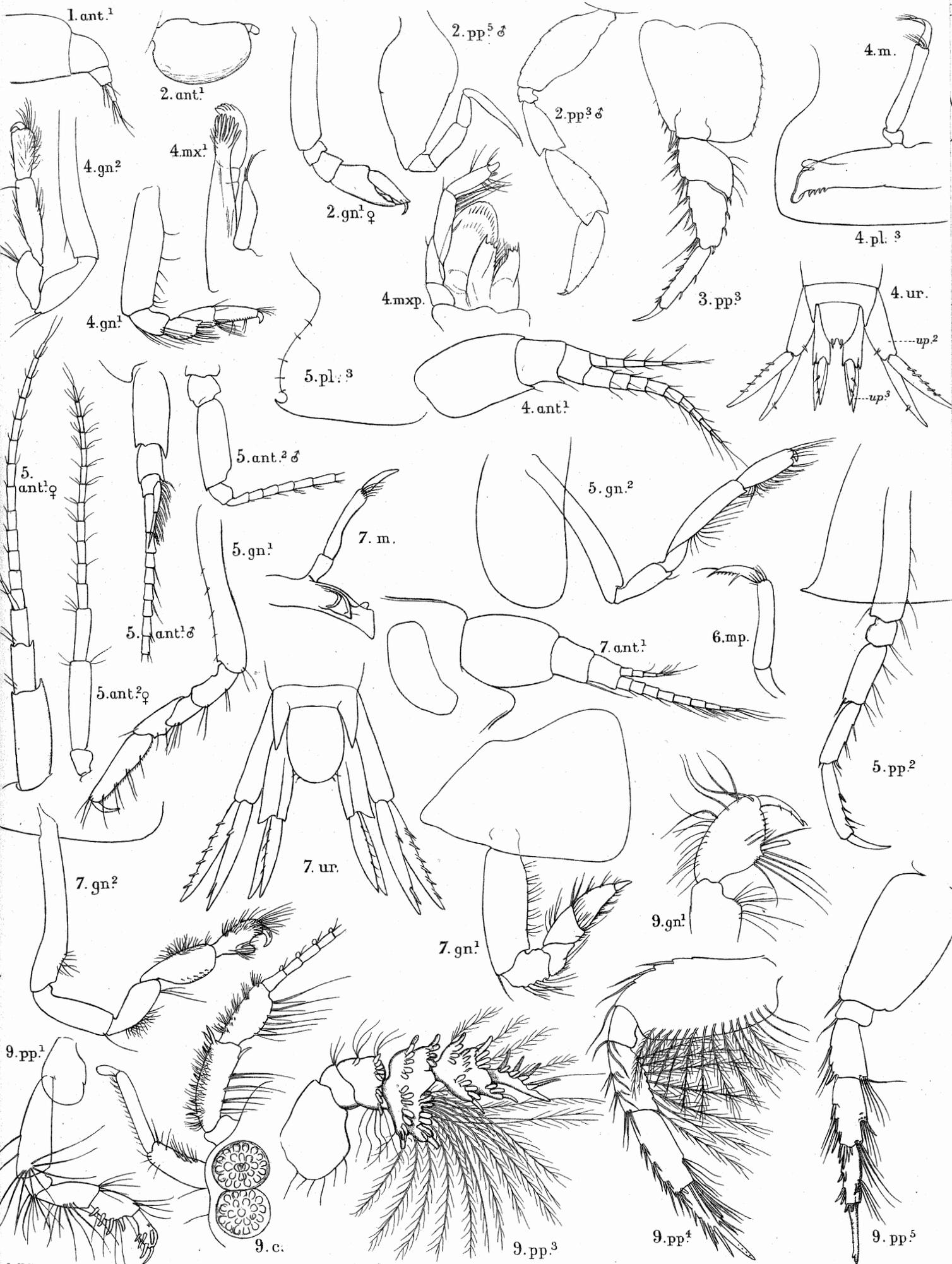
- Fig. 38. *Pareiasmopus subuensis* (DANA).  
 „ 39. *Lembos podoceroïdes*, n. sp.  
 „ 40. „ *chelatus*, n. sp.  
 Fig. 41. *Gammaropsis zeylanicus*, n. sp.  
 „ 42. *Cheiriphotis megacheles* (GILES).  
 „ 43. *Photis longicaudata* (SP. BATE).

## PLATE VII.

- Fig. 44. *Photis longimanus*, n. sp.  
 „ 45. „ *nana*, n. sp.  
 „ 46. *Amphithoë intermedia*, n. sp.  
 „ 47. *Jassa falcata* (MONT.).  
 Fig. 48. *Erichthonius macrodactylus* (DANA).  
 „ 49. *Siphonæctes orientalis*, n. sp.  
 „ 50. *Chevalia aviculæ*, n. gen. et sp. (see also Pl. VIII.).  
 Fig. 51. *Platophium læve* (HASWELL).

## PLATE VIII.

- Fig. 16. *Gallea tecticauda*, n. gen. et sp. (see also Pl. III.).  
 „ 37. *Elasmopus serrula*, n. sp.  
 Fig. 50. *Chevalia aviculæ*, n. gen. et sp. (see also Pl. VII.).  
 „ 52. *Platophium synaptochir*, n. sp.  
 Fig. 53. *Platophium zeylanicum*, n. sp.

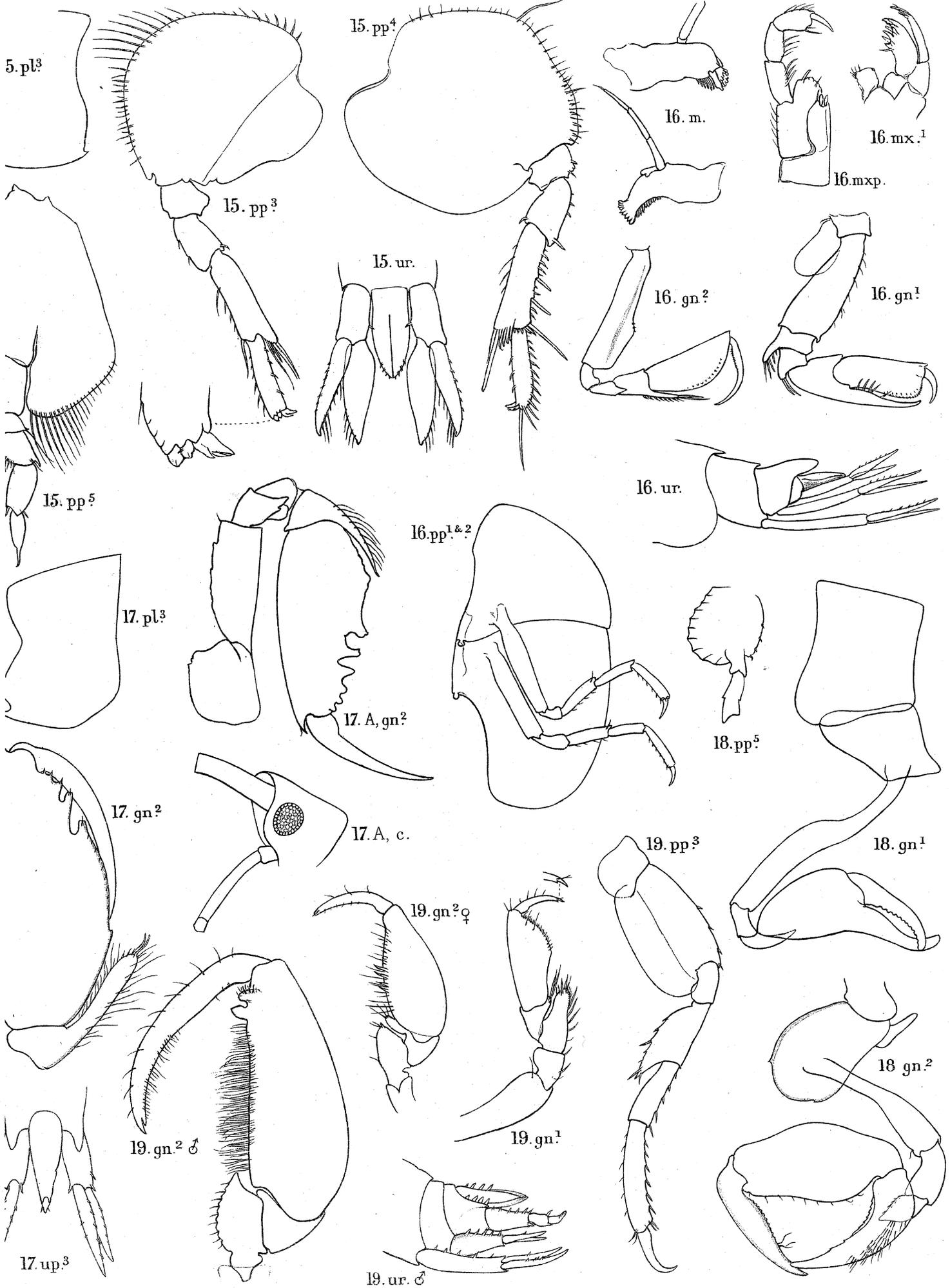


O. Walker, del.  
P. Highley, col.

- |                       |                         |                           |                       |
|-----------------------|-------------------------|---------------------------|-----------------------|
| 1. PARASCELUS PARVUS. | 3. ICHNOPUS TAURUS.     | 5. VIJAYA TENUIPES.       | 7. LYSIANAX CŒLOCHIR. |
| 2. ELSIA INDICA.      | 4. SOCARNELLA BONNIERI. | 6. LYSIANAX CINGHALENSIS. | 8. (See Plate IV).    |
|                       | 9. UROTHŒ SPINIDIGITUS. |                           |                       |

McFarlane & Erskine, Lith. Edin.





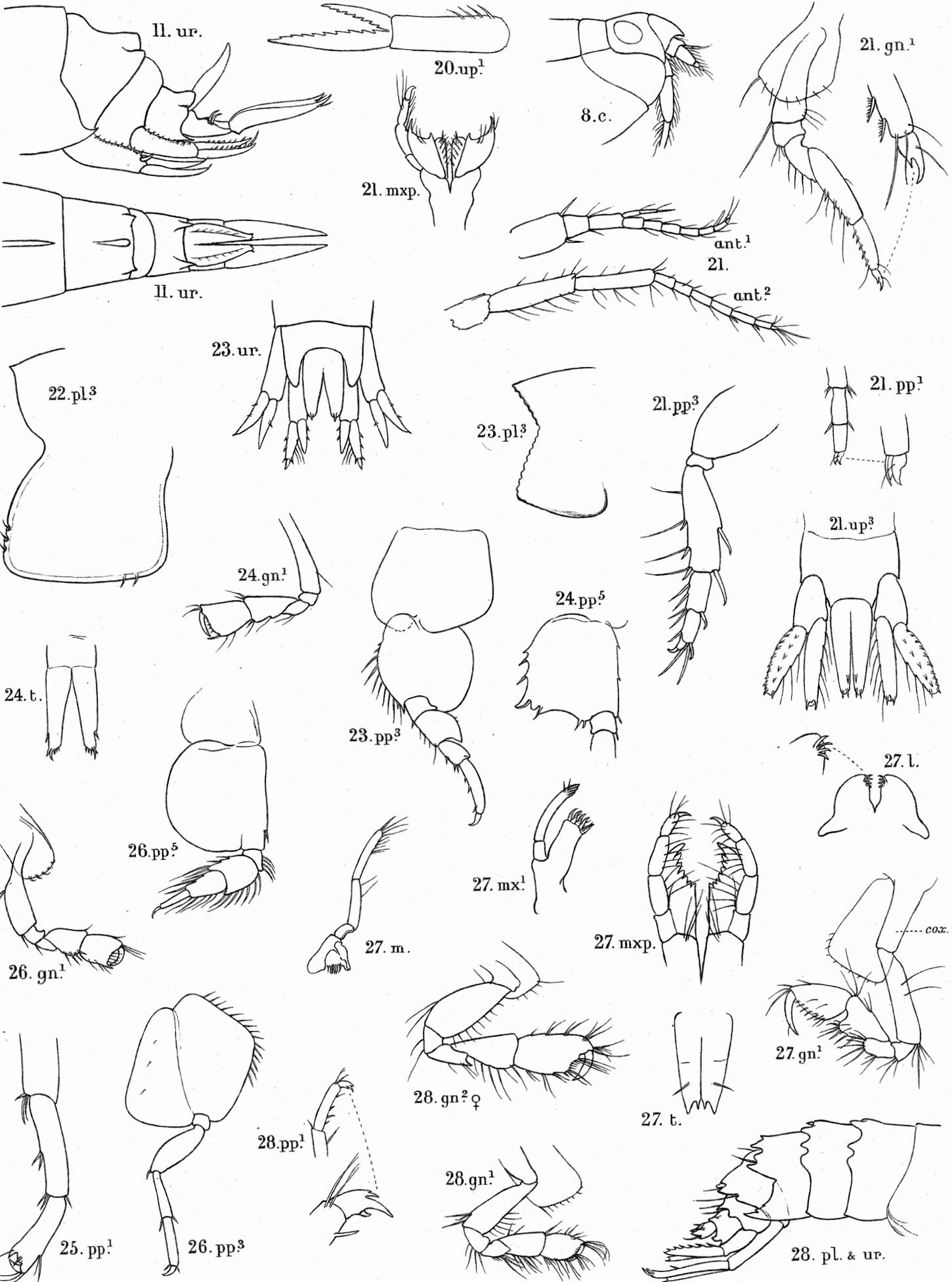
Walker del. Ghiesb.

M. Farlane & Erskine, Lith. Edinb.

15. AMPELISCA CHEVREUXI.  
16. GALLEA TECTICAUDA.

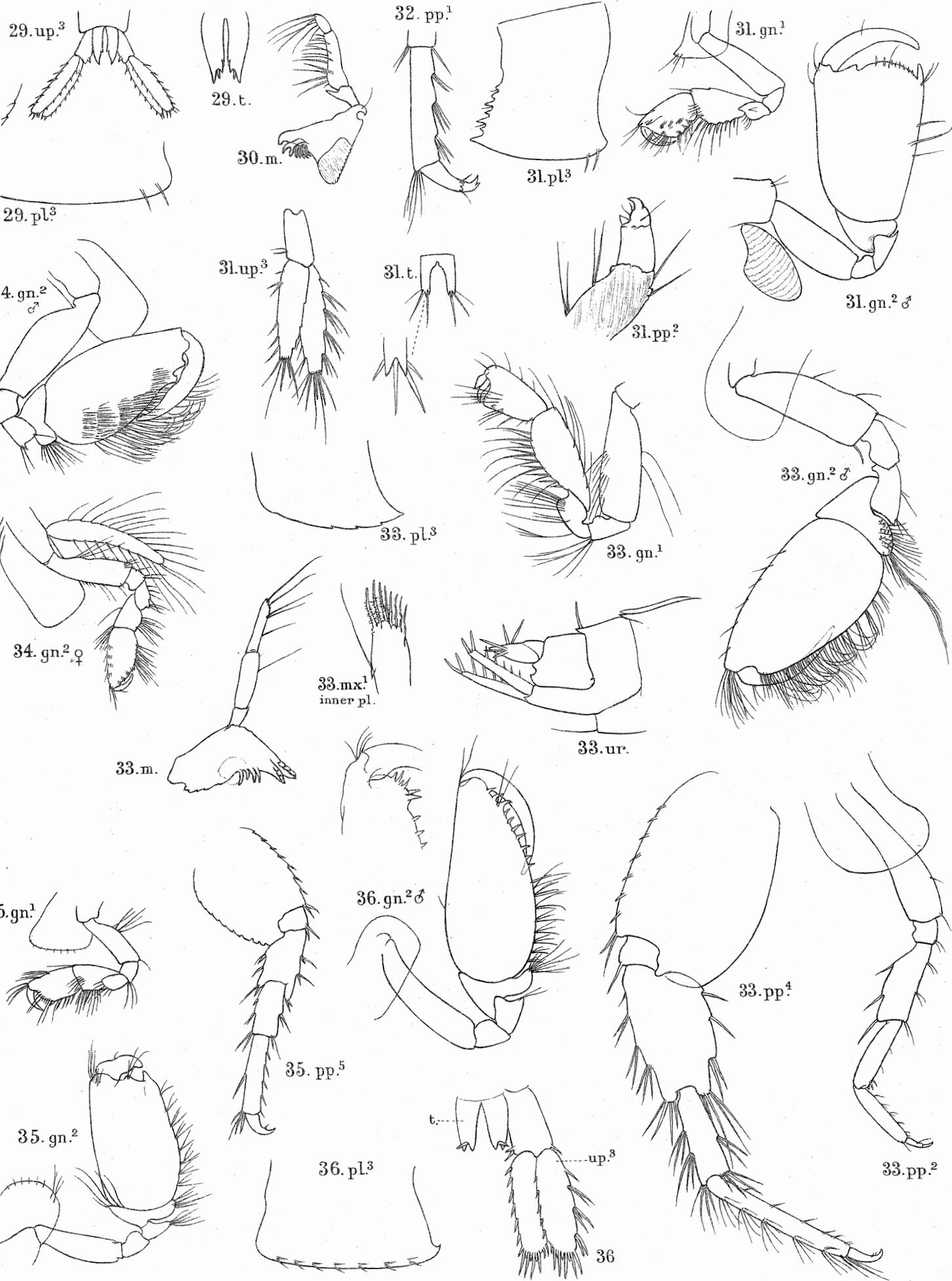
17. LEUCOTHÖE HORNELLI.  
17.A, L. STEGOCERAS.

18. ANAMIXIS STEBBINGI.  
19. STENOTHÖE GALLENSIS.



Walker } del.  
Highley }  
8. TRYPHOSA CUCULLATA. 20. PERIOCULODES SERRA. 22. EUSIROIDES CÆSARIS. 24. DEXAMINE SERRATICRUS.  
11. AMPELISCA TRIDENS. 21. TIRON THOMPSONI. 23. E. ORCHOMENIPES. 25. TRITETA ANTARCTICA.  
26. GUERNEA LÆVIS. 27. HORNELLIA INCERTA. 28. MELITA ANISOCHIR.

McFarlane & Erskine, Lith. Edin.



J. Walker del.  
P. Highley

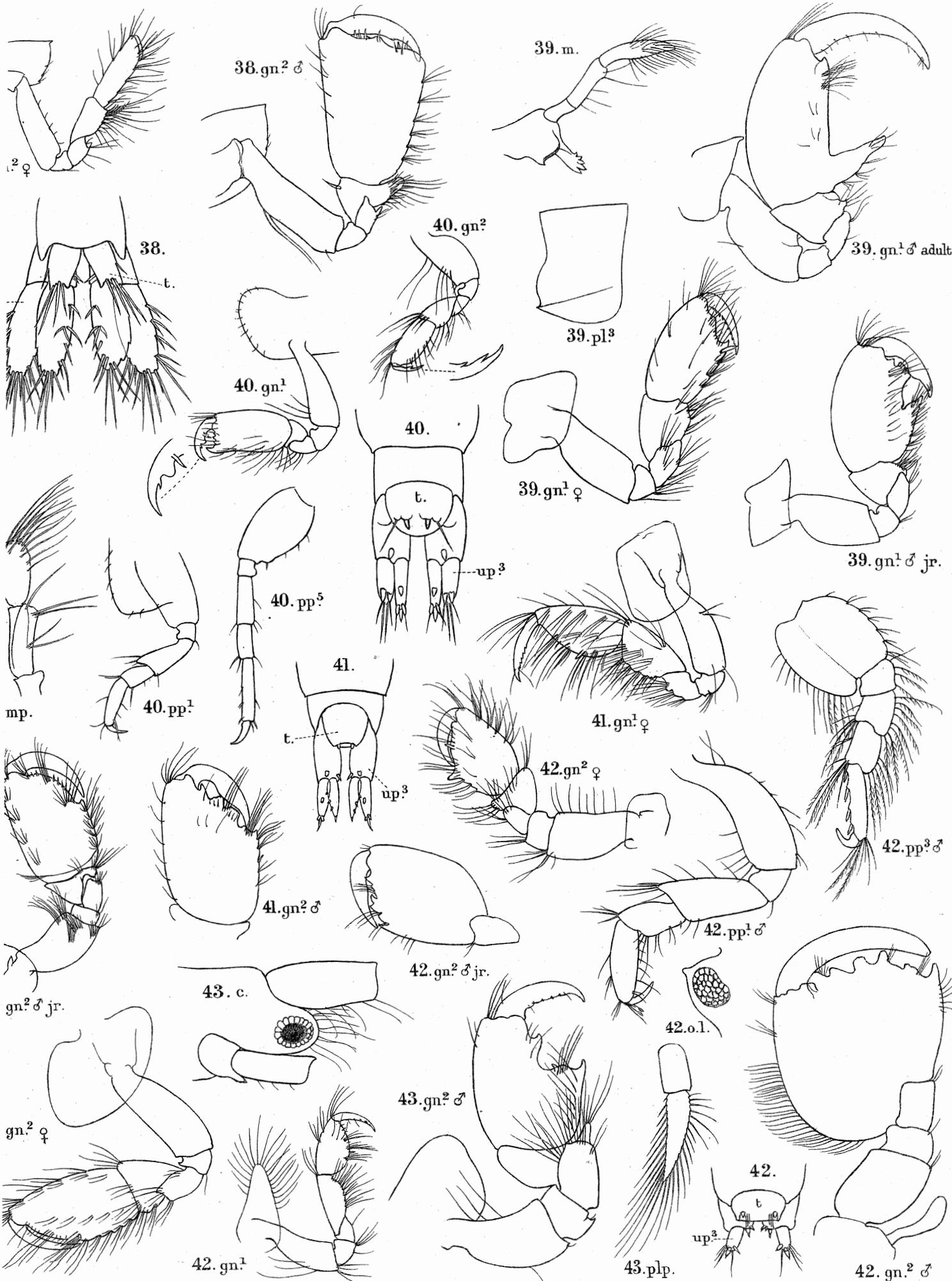
M'Farlane & Erskine, Lith. Edin'

29. MÆRA OTHONIDES.  
30. M. RUBROMACULATA.

31. MÆRA TENELLA.  
32. M. SCISSIMANA.

33. MÆRA TENUICORNIS.  
34. ELASMOPUS SUBCARINATUS.

35. ELASMOPUS DUBIUS.  
36. E. SPINIMANUS.



Walker } del.  
Highley }

M<sup>c</sup>Farlane & Erskine, Lith. Edin<sup>r</sup>

38. PARELASMOPUS SOLUENSIS.

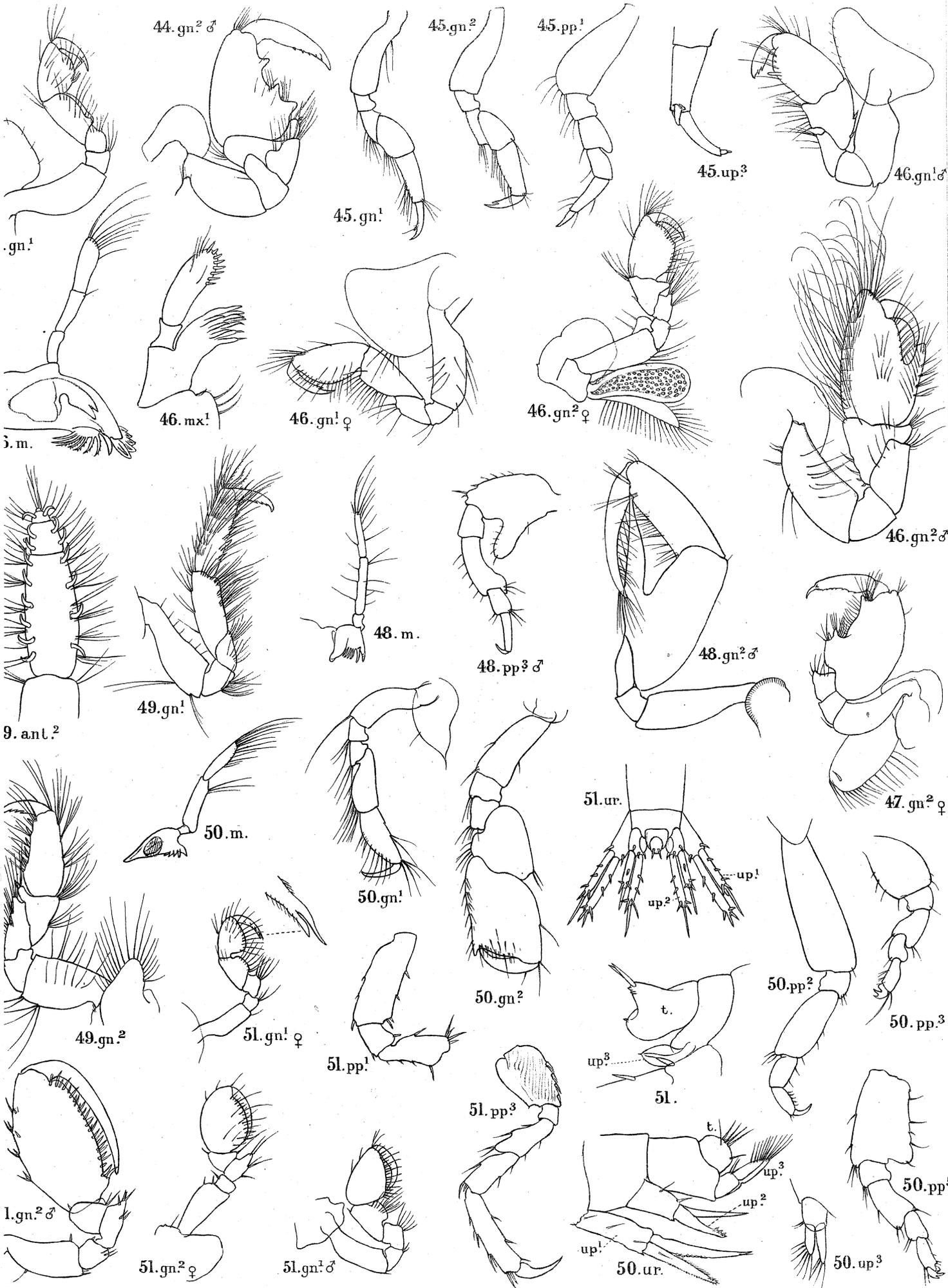
39. LEMBOS PODOCEROIDES.

40. LEMBOS CHELATUS.

41. GAMMAROPSIS ZEYLANICUS.

42. CHEIRIPHOTIS MEGACHELES.

43. PHOTIS LONGICAUDATA.



Walker) del.  
Highley)

M<sup>r</sup>Farlane & Erskine, Lith. Edin.

44. PHOTIS LONGIMANUS.

45. PHOTIS NANA.

46. AMPHITHOË INTERMEDIA.

47. JASSA SP.

48. ERICHTHONIUS MACRODACTYLUS.

49. SIPHONŒCETES ORIENTALIS.