

*E. Maudslayi*

LIBRARY  
Division of Crustacea

CRUSTACEA LIBRARY  
SMITHSONIAN INST.  
RETURN TO W-119

LIBRARY  
Division of Crustacea

9QL  
435  
D16  
1852

V. 13  
Pt. 2  
Invertebrat

UNITED STATES

EXPLORING EXPEDITION.

DURING THE YEARS

1838, 1839, 1840, 1841, 1842.

UNDER THE COMMAND OF

CHARLES WILKES, U.S.N.

VOL. <sup>14</sup> ~~XIII~~.

CRUSTACEA.

BY

JAMES D. DANA, A.M.,

MEMBER OF THE SOC. CES. NAT. CUR. OF MOSCOW; THE SOC. PHILOMATHIQUE OF PARIS; THE  
GEOLOGICAL SOCIETY OF LONDON; THE AMERICAN ACADEMY OF ARTS AND SCIENCES  
AT BOSTON; THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, ETC.

WITH A FOLIO ATLAS OF NINETY-SIX PLATES.

PART II.

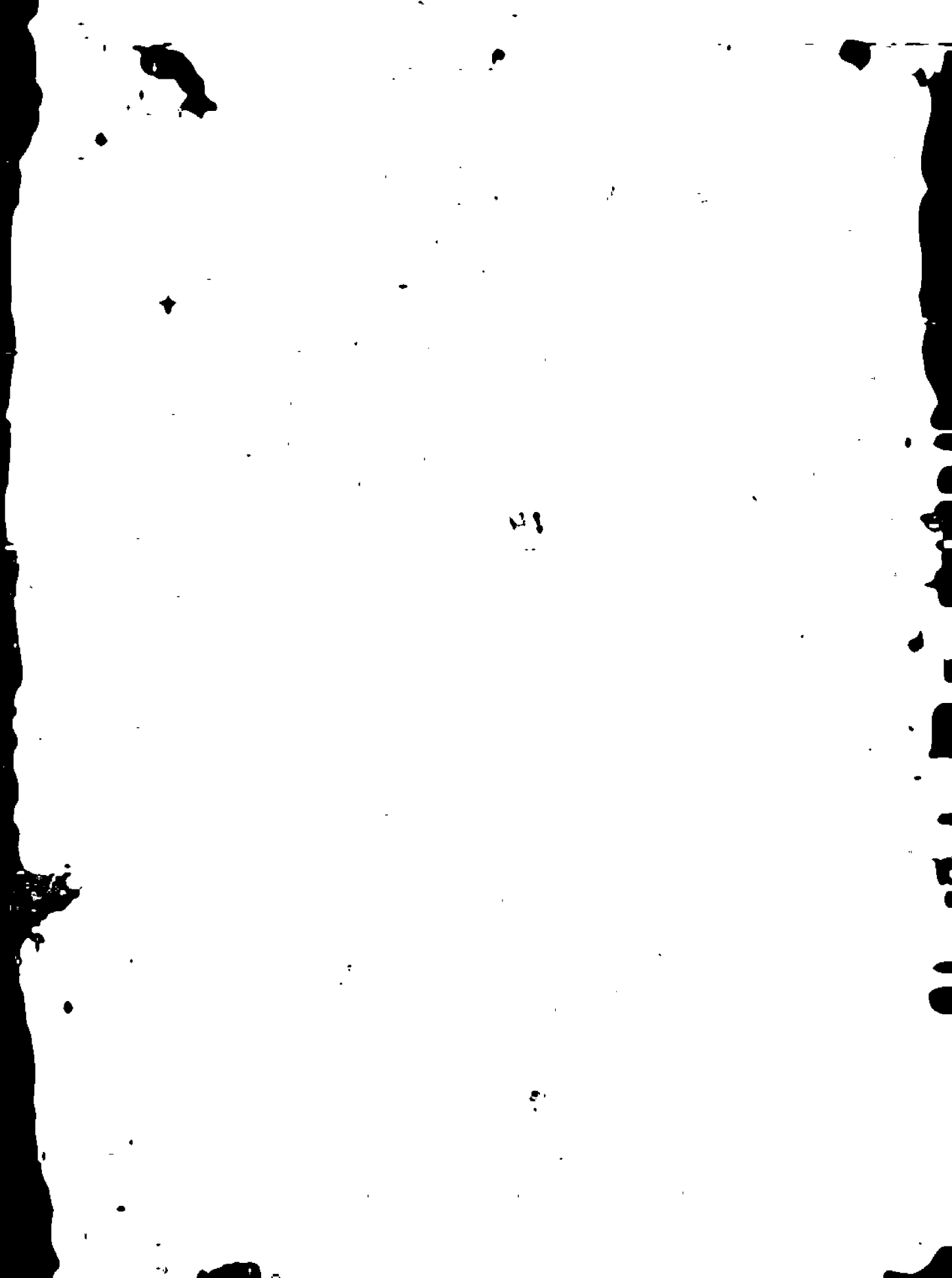
PHILADELPHIA:

PRINTED BY C. SHERMAN.

1853

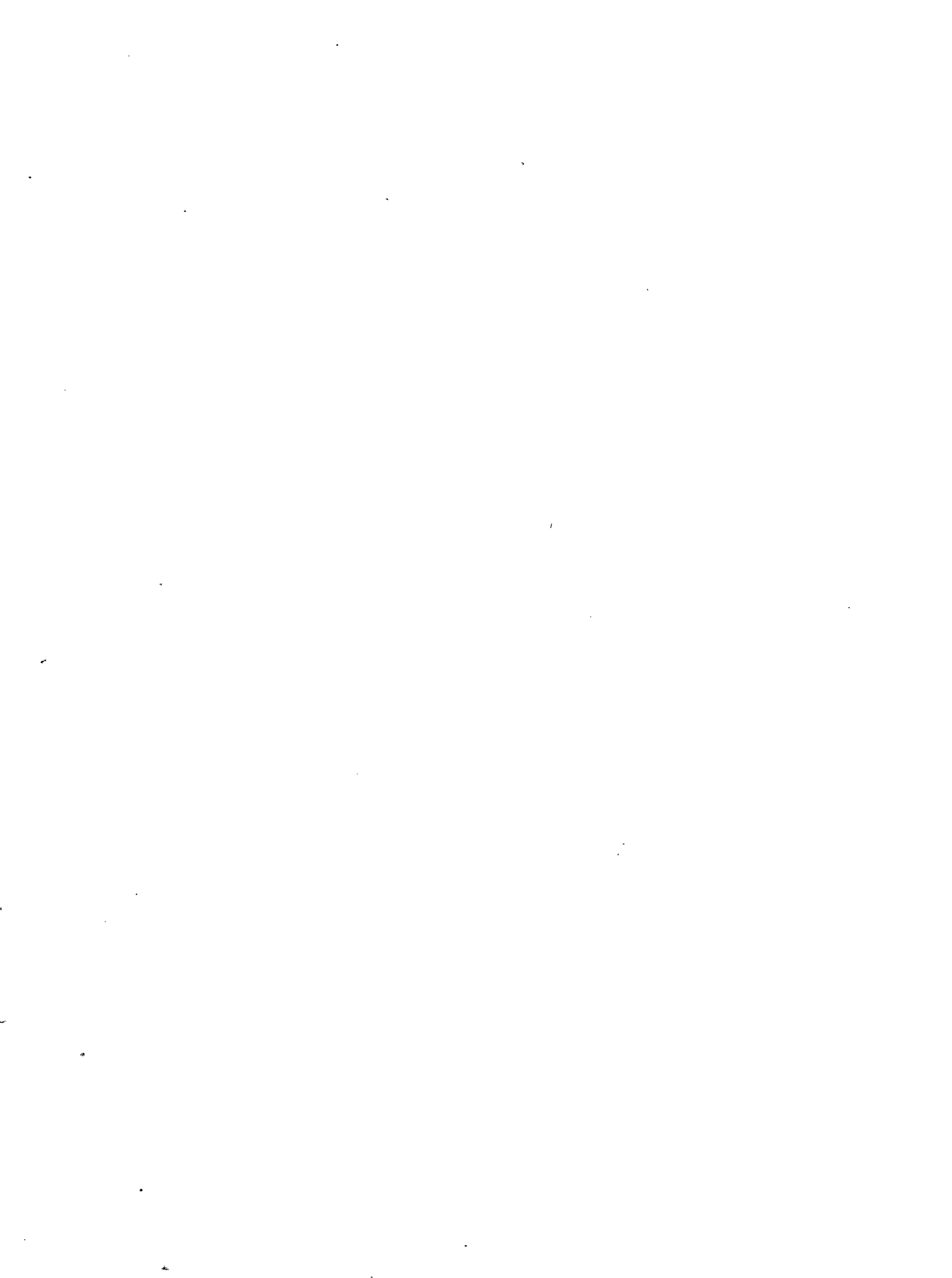


LIBRARY  
Division of Crustacea



CRUSTACEA.

PART II.



CRUSTACEA LIBRARY  
SMITHSONIAN INST.  
RETURN TO W-119

## C O N T E N T S.

---

	PAGE
EDRIOPHTHALMIA, . . . . .	691
CHORISTOPODA OR TETRADECAPODA, . . . . .	692
TRIBE I. ISOPODA, . . . . .	696
IDOTÆIDEA, . . . . .	697
ONISCOIDEA, . . . . .	713
CYMOTHOIDEA, . . . . .	745
TRIBE II. ANISOPODA, . . . . .	786
SEROLIDEA, . . . . .	794
ARCTURIDEA, . . . . .	795
TANAIDEA, . . . . .	796
TRIBE III. AMPHIPODA, . . . . .	805
CAPRELLIDEA, . . . . .	806
GAMMARIDEA, . . . . .	825
HYPERIDEA, . . . . .	978
ENTOMOSTRACA, . . . . .	1019
GNATHOSTOMATA, . . . . .	1020
LEGION I. LOPHYROPODA, . . . . .	1023
CYCLOPOIDEA, . . . . .	1023
DAPHNIOIDEA, . . . . .	1262
CYPROIDEA, . . . . .	1277
LEGION II. PHYLLOPODA, . . . . .	1304

## CONTENTS.

	PAGE
CORMOSTOMATA, . . . . .	1308
I. PŒCILOPODA, . . . . .	1309
ERGASILOIDEA, . . . . .	1311
CALIGOIDEA, . . . . .	1314
LERNÆOIDEA, . . . . .	1377
II. ARACHNOPODA OR PYCNOGONOIDEA, . . . . .	1382
CIRRIPEDIA, . . . . .	1394
REVIEW OF THE CLASSIFICATION OF CRUSTACEA, . . . . .	1395
GEOGRAPHICAL DISTRIBUTION OF CRUSTACEA, . . . . .	1451
ADDENDA ET CORRIGENDA, . . . . .	1598
INDEX, . . . . .	1597

## SUBCLASS II.

### CRUSTACEA EDRIOPHTHALMIA.

ON pages 8 to 12 of this volume, the prominent points in the classification of the Edriophthalmia have been considered, and the grand divisions laid down. These divisions or ORDERS are as follows:—

Ordo I. CHORISTOPODA. — Cephalothorax multi-annulatus, segmentis thoracis numero septem, pare pedum utroque ad segmentum singulum pertinente, segmento anteriore cephalico brevi. Pedes thoracis pediformes, sæpissime unguiculati. Abdomen paribus appendicum pluribus infra instructum. Appendices branchiales sive thoracici sive abdominales.

Ordo II. TRILOBITA. — Cephalothorax multi-annulatus, numero segmentorum thoracis et abdominis sæpe valde multiplicato. Pedes thoracis foliacei et non unguiculati (?). Abdomen cum paribus appendicum pluribus seriatis instructum (?).

Ordo III. ENTOMOSTRACA. — Cephalothorax sæpissime parce annulatus, segmento utroque par singulum pedum thoracicorum tantum rarissimè gerente. Pedes sive prehensiles, sive natatorii. Abdomen paribus appendicum seriatis carens. Appendices branchiales nulli.

Ordo IV. ROTATORIA. — Corpus parce annulatum, minutum, a ciliis non pedibus motum, pedibus et appendicibus branchialibus omnino carens.



## ORDER I.

### CHORISTOPODA, OR TETRADECAPODA.

THE three divisions of the Choristopoda, the AMPHIPODA, ANISOPODA, and ISOPODA, are pointed out on pages 10 and 11 of this Report, and the reasons are there stated for rejecting the subdivision of *Lœmipoda*, introduced by Latreille.

The Amphipoda are uniformly characterized by having—

1. The three posterior pairs of thoracic legs in one series, and the four anterior pairs in two other series of two pairs each. The branchiæ are thoracic.
2. The abdominal members in two sets, the three anterior pairs subnatatory, the three posterior styliform.

The Isopoda through all the typical groups have

1. The four posterior pairs of thoracic legs in one series, and the three anterior in another series. The branchiæ are abdominal.
2. The abdominal members in two sets, the five anterior pairs branchial (the first or exterior sometimes an operculum), the sixth pair more or less styliform.

Expressing these distinctions in figures, and numbering the pairs of appendages 1 to 7 for the thorax, and 1 to 6 for the abdomen, we have for the series in the

	Thorax.	Abdomen.
AMPHIPODA, . . . .	4 (or 2+2) : 3	3 : 3.
ISOPODA, . . . .	3 (or 1+2) : 4	5 : 1.

In these particulars we observe two distinct types of structure of fundamental character; and any species which do not partake of these peculiarities, or such as are intermediate forms, partly having the characteristics of the Isopoda and partly those of the Amphipoda, may be arranged in a distinct group.

Of these intermediate forms, the group Anisopoda consists. They have

1. *Like Amphipoda*, the three posterior pairs of thoracic legs in one series, and the four anterior in a different series.
2. *Like Isopoda*, the three posterior pairs of abdominal members are not styliform, only the last having this character.

These are constant characters, distinguishing the whole group. But there are various degrees of divergence from either the Amphipoda or Isopoda, or of convergence towards one or the other tribe, which mark out their affiliations, and show the true transition character of this section of Choristopods.

In some species (Arcturi) all the abdominal appendages are precisely as in the Isopods, although Amphipodan in the thoracic appendages, and at the same time the abdomen has the joints hardly flexible, instead of allowing free motion, as in the Amphipods.

In others, not far remote (species of Tanais, male Bopyri, etc.), the abdomen is more elongated; the joints have some free motion; the appendages are but imperfectly branchial, the branches being elongated and long ciliated, as in the Amphipods, and moving freely beneath the somewhat elongated abdomen. Yet although so much like Amphipods, as, in the case of one or two genera, to have been referred to the Amphipoda rather than the Isopoda, the fourth and fifth pairs of abdominal appendages are not styliform like the sixth, as in the Amphipods; the sixth, on the contrary, is Isopodan in character, and the fourth and fifth, in Isopod style, hardly differ from the second and third. Thus, while these appendages are nearly Amphipodan in structure (excepting the sixth), instead of there being only three pairs subnatatory, all five pairs have a similar character, so that the members in the two series have the Isopod number, 5 : 1, and not 3 : 3.

In other species, the abdomen diverges from the Isopod form in another manner. It gives the Amphipod ratio, 3 : 3; and the three anterior pairs have nearly the Amphipod form, being elongated and

ciliated. Yet the fourth and fifth pairs, instead of being styliform, as in Amphipods, are branchial, as in Isopods. Such are the species of the *Serolis* group. This is a divergence from the Isopod type of structure of a very wide and important character; and still the general habit of the species is Isopodan.

From these observations, it is obvious that there is a group of Choristopods which has not hitherto been recognised. Till now, they have been mostly placed with the Isopods; and it is of much interest to observe, that nearly all of the larger groups in Edwards's system, are divided by him into two parts, one part including the true Isopoda, the other, the species here classed as Anisopoda. In his more recent paper on the *Serolis* group, he recognises the great difference between the species and other Isopoda, but still continues them with that tribe, referring them to its lower grades, or as the link between the Isopoda and Trilobita.

The characters of the tribes are as follows :—

Tribus I. ISOPODA.—Appendices branchiales pedes sunt abdominales, foliaceæ. Pedes thoracici seriei anticæ antrorsum porrecti numero sex. Pedes abdominales decem antichi foliacei, duo postici sæpe styliformes. Abdomen breve.

Tribus II. ANISOPODA.—Appendices branchiales pedes sunt abdominales, foliaceæ. Pedes thoracici seriei anticæ antrorsum porrecti numero octo (ac in *Amphipodis*). Pedes abdominales decem antichi foliacei, interdum subnatorii, duo postici sæpe styliformes. Abdomen breve vel breviusculum.

Tribus III. AMPHIPODA. — Appendices branchiales pedibus thoracis appendiculatæ. Pedes thoracici seriei anticæ antrorsum porrecti numero octo. Pedes abdominales sex antichi elongati, natorii, reliqui sex plus minusve styliformes. Abdomen elongatum, raro obsoletum.

It is obvious that the Anisopoda constitute a type intermediate between the Isopoda and Amphipoda; but not so apparent, whether the Amphipoda or Isopoda should rank first in order.

The position of the branchiæ in the Amphipoda, as appendages to

the thorax, while in the Isopoda they are abdominal, might seem to settle the question in favour of the former, as thoracic branchiæ characterize all the higher Crustacea. But, as we have observed in other places, general structure in the body takes precedence of characters of the above kind. The position of the branchial appendages may confirm the conclusions from structure, but cannot set them aside. The main facts upon which we rest, are those pertaining to the appendages, and these appear to show that the Isopoda and Amphipoda have a relation to one another, analogous to that of the Brachyura and Macroura.

*a.* In the first place, the Isopoda have the abdomen quite short, with no proper feet, and instead, only branchial leaflets, besides a single pair of stylets, which last are sometimes wanting.

*b.* Again, the antennæ are commonly very short, as in the Brachyura.

*c.* Again, the anterior set of legs includes three pairs instead of four, the addition of the fourth pair to the anterior three, where it occurs, being an evidence of a less concentration of force in the cephalic ganglions, precisely as the addition of the third pair to the series of chelate legs, places the Penæi below the Palæmons.

In each of these points the Amphipods show inferiority.

1. They have an elongated abdomen, with natatory appendages below, and are thus analogous to the Macroura.

2. The antennæ are usually quite long, also a Macroural characteristic.

3. The anterior set of legs includes four pairs.

In addition, we observe, that the body in the Isopoda has in every part a more compact aspect. Moreover, the species are often terrestrial, a fact, as Prof. Agassiz has shown, marking the higher grades among classes or groups of species.

A significant fact of still higher moment is presented by the nervous system. The Amphipods have often the two dorsal cords distinct between the ganglia, while in the Isopods, there is but a single cord. The Amphipods have thus their less concentration of nervous influence and general force exhibited prominently in the nervous system itself. This double cord is seen in none of the higher Crustacea, and as we descend in the scale, first makes its appearance in the Amphipoda.

The Caprellidæ among the Amphipods, appear to militate with the

above conclusion, inasmuch as the abdomen in these species is nearly or quite obsolete. These are, however, aberrant forms, bearing a resemblance in essential points of structure to the Amphipoda. They have the long antennæ of the Amphipods; and whenever the abdomen is partly developed, as in some of the species, it has rudiments of the same members that are observed in that tribe.

These species—the Caprellidæ—are also peculiar in often wanting the third and fourth pairs of legs, so that the cephalothorax consists of two distinct divisions. This tendency to abortion in the legs at the middle of the thorax, is also presented by some of the Macrourea, as in certain Crangonidæ. The posterior part of the thorax in such cases appears to be in some sense separate from the anterior in its developments, as if pertaining to a different centre.

---

#### TRIBE I. ISOPODA.

THE tribe Isopoda, as here adopted, corresponds to that of other authors so called, except that the groups named by Milne Edwards “*Idoteides Arpenteurs*,” “*Asellotes Heteropodes*,” “*Praniziens*,” “*Bopyriens*,” and the Serolis group, are excluded, as they are properly Anisopoda. There are three subtribes.

- I. IDOTÆIDEA.—Appendices abdominales duæ posticæ bene operculiformes, appendices alias optimè tegentes.
- II. ONISCOIDEA.—Appendices abdominales duæ posticæ styliformes et non operculiformes, fere terminales, raro obsolete.
- III. CYMOTHOIDEA.—Appendices abdominales duæ posticæ lamellatæ, apud abdominis latera dispositæ.

## SUBTRIBE I. IDOTÆIDEA.

THIS division contains, as far as known, two families, which, with their genera, are characterized as follows:—

## FAM. I. IDOTÆIDÆ.

Pedes fere consimiles, plus minusve ambulatorii.

- G. 1. IDOTÆA, *Fabr.*—Antennæ externæ internis longiores, flagello multiarticulato confectæ.
- G. 2. EDOTEA, *Guerin.*—Antennæ externæ internis parce longiores, flagello pauciarticulato confectæ, basi paululo longiore quam basis internarum.
- G. 3. ERICHSONIA, *Dana.*—Antennæ externæ multo longiores, geniculatæ, 6-articulatæ, flagello carentes. Pedes subæqui, consimiles.
- G. 4. CLEANTIS, *Dana.*—Antennæ externæ multo longiores, 5–6-articulatæ, non geniculatæ, flagello carentes. Pedes 4ti 3tiis valde breviores, et 4ti 5ti 6ti 7mi longitudine sensim increscentes. Abdominis opercula laminam appendiculatam parvam ad articulationem gerentia.
- G. 5. EPELYS, *Dana.*—Antennæ breves, subæquæ, externæ flagello carentes non geniculatæ. Pedes subæqui, 4ti 3tiique non valde inæqui. Oculi minuti, remoti.

## FAM. II. CHÆTILIDÆ.

Pedum 6 posticorum duo vel plures longissimi setiformes et multiarticulati.

- G. CHÆTILIA, *Dana.*—Antennæ 1mæ longiores, superiores, 2dæ flagello multiarticulato confectæ. Pedes 7mi breves, non unguiculati; 6ti longissimi, setiformes. Abdominis opercula laminam appendiculatam ad articulationem gerentia.

The genera *Arcturus* and *Anthura* belong with the Anisopoda.

## FAMILY IDOTÆIDÆ.

## GENUS IDOTÆA.

THE flagellum of the outer antennæ distinguishes *Idotæa* from the following groups. Moreover, the exterior plates of the abdomen are destitute of the inner lamina that characterizes the genus *Cleantis*. The body is oblong, varying in form between linear and oblong oval. The young of species that are oblong-oval when mature, are often broadest in front and narrow backward. The outer antennæ have a five-jointed base, and the flagellum is five to twenty-one-jointed. The legs are approximately equal in length; the posterior pairs sometimes exceed a little the fifth or fourth pairs in length; but again, they are often shorter than these. The feet are all subprehensile.

The abdomen consists of one to five segments; and it appears that the first normal segment is sometimes obsolescent, or is concealed beneath the extremity of the thorax.

1. *Abdomen 3-articulatum, articulis duobus anticis simplicissimis, ultimo suturâ utrinque notato. Corpus sat latum.*

## IDOTÆA ARGENTEA.

*Elongatè subelliptica, anticè truncata vel obsoletè excavata, superficie œquâ et lævi, epimeris latiusculis, integris. Abdomen latè oblongum postice paululo angustius, truncato-rotundatum. Oculi prominuli, ad capitis angulos insiti. Antennæ internæ dimidio basis externarum vix longiores, articulo ultimo longiore, extus parce subtilissimè setuloso. Antennæ externæ fere dimidii corporis longitudine, flagello 7-articulato et breviorè quam basis, articulis 2 ultimis minutis, setulis minutis paucis.*

Long subelliptical, truncate or slightly excavate in front; surface even and smooth; epimerals rather broad, entire. Abdomen broad oblong, a little narrower behind, and broad truncato-rotund at apex.

Eyes prominent, situated on the angles of the head. Inner antennæ hardly half as long as base of outer, last joint as long as two preceding, very minutely setulose on the outer side. Outer antennæ nearly half as long as the body, flagellum seven-jointed and shorter than the base, setæ minute and rather few.

Plate 46, fig. 1 *a*, animal, enlarged; *b*, *c*, antennæ more enlarged; *d*, under view of mouth; *e*, one of the legs; *f*, abdominal plates.

Taken from a Porpita, July 27, 1839; latitude 16° 50' south, longitude 107° 45' east.

Length, five lines. Colour, silvery, with a bluish shade, which is deeper towards the sides.

The body is broadest at the fourth thoracic segment, which segment is the longest in the thorax. The outline is long elliptical, as far as the abdomen; but from the abdomen, the curving line is less convergent, though the narrowing of the body continues slightly. The lateral margins of the thoracic segments bear a few very short hairs, visible under a high magnifier, and there are also others on the last joint of the abdomen. The abdomen is rather longer than half the rest of the body, and the last segment is nearly one-third the length of the whole body. The *facets* of the eyes are *square*. The inner antennæ are a little longer than first three basal joints of outer pair, the first and second joints are very short, the third is longer than the second. The outer antennæ have the first three joints quite short, and the fourth oblong, but shorter than the fifth; the last two joints of the flagellum are minute. Anterior legs shortest; the pairs gradually increase backward. The seventh pair is much more slender than the preceding. The claw of each has a few spinules especially on the inner side, and the preceding joint has spinules on the sides and at apex; these spinules are bearded.

The maxillipeds have a granulose surface; last joint subovate; basal joint and lamella attached to its outer side of nearly equal size.

Fig. 1 *g*, represents a young individual, probably of this species. It was found on a Porpita, at the same time with the above. Length, one-



ninth of an inch. The body is broadest anteriorly. There are only six thoracic segments, the normal first being probably concealed by the following. The abdomen has three segments, besides an appearance of another, anterior to these, situated mostly beneath the last thoracic segment. Of the three segments alluded to, the first two are very short; the last is oblong, narrows behind, and is regularly rounded at its extremity, with a few short ciliations. Only six pairs of legs were distinguished, three posterior and three anterior. The eyes were situated on the angles of the head, and were a little prominent.

The outer antennæ have basal joints, and a terminal portion consisting of three joints; the first four basal joints are short; the fifth oblong. The inner antennæ are quite short; the third joint is longer than the fourth.

Figures 1*h* and 1*i*, are from a specimen six lines long, collected near New Zealand, and probably identical with *I. argentea*. The abdomen is very similar. The outer antennæ have the flagellum about as long as the base, and eight-jointed; surface minutely scabrous, under a high magnifier.

#### IDOTÆA MARGARITACEA.

Plate 46, fig. 2*a*, animal, enlarged; *b*, caudal extremity; *c*, outer antennæ; *d*, extremity of flagellum of another specimen.

Length, five lines. Colour, bluish, with the back pearly white. Differs from the preceding somewhat in its antennæ and front of head; and the body is not quite as much narrowed behind. The three teeth of the front are very low; one occupies either angle, and the third, which is less distinct, the middle of the front; the outer are subacute; the spaces between are low concave. The inner antennæ extend to apex of antepenult joint of base of outer antennæ, and there are a few short setæ at apex on outer side. The outer antennæ have the third joint two-thirds the following, and the fifth four-thirds the fourth, but this may not be constant; the flagellum has but four or five joints, the number being five through a subdivision of the first of the four when four-jointed. The surface of the

joints is very minutely scabrous, as seen under a high magnifier. Length, four to five lines.

Obtained between New Holland and Northern New Zealand, five hundred miles from Port Jackson, N. S. W.

## IDOTÆA ANNULATA.

*Elongata, parce elliptica; fronte truncato, obsoletè arcuato; superficie annulatâ, segmentis prominentibus; epimeris latiusculis. Abdomen latè oblongum, lateribus fere parallelis, apice truncato angulis rotundatis. Oculi prominentes, ad angulos insiti. Antennæ internæ dimidio basis externarum non longiores, articulo ultimo longiore, obtuso. Antennæ externæ fermè dimidii corporis longitudine, flagello breviorè quam basis, 7-articulato, articulis duobus ultimis non breviores; setulis paucis brevissimis. Pedes nudiusculi.*

Elongate, sparingly elliptical, front truncate or slightly arcuate; surface annulate, the segments being prominent; epimerals rather broad. Abdomen broad oblong, sides nearly parallel, apex truncate, with the angles rounded. Eyes prominent, situated on the angles. Inner antennæ not longer than half the base of the outer, last joint longest, obtuse. Outer pair about as long as half the body; flagellum shorter than the base, seven-jointed, last two joints not shorter than the preceding; setæ few and very short. Feet nearly naked.

Plate 46, fig. 3 *a*, animal, enlarged; *b*, *c*, antennæ, more enlarged; *d*, first pair of legs; *e*, third pair.

Taken in the Antarctic Seas, south of New Holland, in 1840. Collected by Mr. John Dyes.

Length, three-fourths of an inch; greatest breadth, one-fourth of an inch. The abdomen is more than half as long as the rest of the body; the segments of the thorax are prominent between the articulations. The outer antennæ have the last joint of the base about one-third the length of the preceding. The joints of the flagellum

are oblong, nearly naked, there being a few very minute setules at apex; on the joints, the most prominent setules are at the outer apex of the penult joint at base. Legs very nearly naked; the fourth joint very short; first pair shortest and stoutest, and well adapted for prehension; third pair longer than second.

IDOTÆA BREVICAUDA.

*Angustè ovato-elliptica, fronte truncato. Abdomen latè oblongum, posticè paululo angustius et truncatum, angulis prominulis medioque postico apiculato. Oculi laterales, oblongi, vix prominentes. Antennæ internæ parvulæ, dimidio basis externarum non longiores. Antennæ externæ dimidium corporis longitudine non superantes, flagello 9-10-articulato, paulo longiore quam basis, articulis brevibus, fere nudis. Pedes longitudine posticè sensim paululo incrementes, nudiusculi.*

Narrow ovato-elliptic, truncate in front. Abdomen broad oblong, posteriorly a little narrower and truncate behind, angles rounded and a little prominent, at middle of posterior margin apiculate. Eyes lateral, oblong, hardly prominent. Inner antennæ small, not longer than half the base of outer; outer pair scarcely longer than half the body, second joint short, with outer apex prominent, flagellum nine to ten-jointed, rather longer than base, joints short, nearly naked. Feet increase slightly from the first pair to the last, nearly naked.

Plate 46, fig. 4 *a*, animal, enlarged; 4 *b*, part of flagellum of outer antennæ.

Abundant in the harbour of Rio Janeiro. Taken, December 25, 1838.

Length, one-half to three-fourths of an inch. Colour, brownish gray. Body broadest at the third thoracic segment. The first thoracic segment is very short, except laterally, and receives the head; the third is a little the longest; the sixth and seventh have the posterior angles subacute, which in the others are rounded. The abdomen narrows posteriorly, very exactly in conformity with the thorax

just anterior to it, so that the outline of the body either side is convex throughout. Like the front, the centre of the caudal margin is apiculate. The outer antennæ have the first two joints shortest; the second broadest, with the outer apex elongated; the fifth joint little longer than fourth. The whole length of the inner antennæ scarcely exceeds first three joints of outer. The claws of the legs have a minute spine under the apex. The external plates of the abdomen beneath are truncate behind.

Figure 5 *a*, Plate 46, represents an animal found at the same time with the preceding, and supposed to be a young individual of some other species. It is broadest anteriorly, and has rather large eyes situated on the lateral margin and containing about fifteen facets. The head is transverse, and is not embraced behind by the following segment; it is subtruncate in front, with the centre slightly projecting, and the sides rounded. Anterior thoracic segment very short, or only partly visible. The thoracic segments increase in length from the first to the last; the three posterior are sublunate in an upper view, the posterior margins being concave, and the angles prolonged but obtuse, or nearly so. Abdomen five-jointed, the first four transverse, and subequal in length; the first abruptly narrower than the following or preceding thoracic segment; the fifth oblong, shield-shape, the sides curving and meeting behind in an angle. The exterior plates of the abdomen have a triangular subobtuse termination. Inner antennæ less than half the length of the outer; the third joint smaller than the second. The outer antennæ consist of seven joints, the first five of which correspond to the basal portion; the first three joints are quite short; the second has the outer apex prolonged the length of the third joint; the fourth and fifth joints are a little oblong, but shorter than the sixth and seventh; the last is pointed. A few short hairs on the joints. Legs subequal; increase from the first pair to the last. The claw nearly straight, has a largish subconical base. 5 *b*, represents the leg of the fifth pair; 5 *c*, the plate covering the branchial leaflets.

Length, one line. Colour, brownish gray.

Several specimens were taken December 23, 1838, in the harbour of Rio, near the city.

## IDOTÆA HIRTIPES.

*Sat lata, fronte truncato, vix excavato. Epimeræ latiusculæ, posteriore equilateraliter triangulatâ. Abdomen latè oblongum, postice parce angustius, apice paulo truncatum, angulis posticis rotundatis medioque postico paulum apiculato. Pedes infra plus minusve hirti. Antennæ internæ articulum penultimum basalem externarum attingentes. Antennæ externæ dimidio corporis non longiores, flagello 16-18-articulato, nudo.*

Rather broad, front truncate, hardly excavate. Epimerals somewhat broad, the posterior equilaterally triangular. Abdomen broad oblong, a little narrower behind and subtruncate, posterior angles rounded and having a small, prominent, apical point. Feet rough, and rather close hairy below. Inner antennæ reach to penultimate basal joint of outer pair; outer antennæ not half as long as body, flagellum sixteen to eighteen-jointed, naked.

Plate 46, fig. 6 *a*, animal, natural size; *b*, first antennæ, enlarged; *c*, posterior pair of legs, *ibid*.

Puget's Sound, Oregon.

Length of body, 1.45 inches; breadth, 0.42 inch; ratio, 3.5:1. This large species, when of full growth has the under side of the legs quite thick and rough hairy. The last pair has the fourth joint transverse, and the third hardly oblong, and the margins as well as the surface below, are short hairy.

2. *Abdomen 1-articulatum, versus basin suturâ utrinque notatum.*

## IDOTÆA STRICTA.

*Sat angusta, fronte excavato, capite paulo transverso. Epimeræ parvulæ. Antennæ externæ fere dimidii corporis longitudine, flagello brevior quam basis, 10-articulato, nudo. Antennæ internæ penulti-*

*mum articulum basalem externarum vix attingentes. Abdomen angustè oblongum (plus duplo longius quam latum) extremitate triangulatum et subacutum, marginibus lateralibus paulo excavatis. Pedes infra parce hirsuti.*

Narrow, front excavate, head a little transverse. Epimerals very small. Outer antennæ about half as long as body, flagellum shorter than the base, ten-jointed, naked. Inner antennæ hardly reaching to penultimate basal joint of outer pair. Abdomen narrow oblong (length more than twice the breadth), triangulate at extremity and subacute, lateral margins a little excavate or concave. Feet sparingly hirsute below.

Plate 46, fig. 7 *a*, animal, enlarged two diameters; *b*, part of leg of seventh pair.

New South Wales, Australia.

Length of body, 0·86 inch; breadth, 0·17 inch; ratio, 5:1. This narrow species has the epimerals occupying only part of the margin of each segment. The abdomen is longer than half the cephalothorax. The surface is not distinctly granulate.

#### GENUS EPELYS, Dana.

*Antennæ breves, subæquæ; externæ non geniculatæ, flagello non confectæ. Pedes subæquales, quarti tertiis vix breviores. Oculi minuti, remoti.*

Antennæ short, subequal, outer not geniculate and without a flagellum. Feet subequal, the fourth pair differing little in size from the third. Eyes minute, remote.

The only species of this genus seen by the author was of very small size, and occurred upon the upper surface and imbedded among the tentacles of an *Asterias*. From its form and the minute eyes, it was evidently not the young of an *Idotæa*, as might have been inferred from the tentacles; and even the tentacles are peculiar, since in young *Idotææ* they are still very unequal in length, as in adults,

though of less inequality. These differences and its parasitic habit require the institution of a new genus.

The *legs* are all similar in form and terminate in a small claw; the first pair is the shortest. The *mandibles* have a number of corneous spines at apex; and also below the apex, a second prominence, placed obliquely, and having a truncate extremity, edged or set with minute spines; this prominence is much stouter than the terminal process of the mandible. The inner maxillæ differ little from the same organs in other *Idotæidæ*.

The maxillipeds are five-jointed; the first joint is very short beneath the second, but is broadly enlarged and prolonged on the outer side, and bears a large lamella or palpus; the second joint is stout, and a little oblong, and its apex is prolonged in the form of a lamella, which reaches to the last articulation; the third very short; the fourth and fifth together nearly obovate, flattened on the inner side; the fifth joint largish and having a short ciliate or pubescent margin.

The name of the genus is from *επηλυς*, a stranger.

#### EPELYS ANNULATUS.

*Angusto-subellipticus. Caput transversum, medio fronte apiculato, angulis rotundatis. Segmenta thoracis prominentia, transversa, longitudine subæqua, tribus posticis sublunatis. Abdomen 2-articulatum, segmento primo brevissimo, fere obsoleto, valde angustiore quam secundum; secundo scutellato, posticè triangulato, obtuso, lateribus fere parallelis. Antennæ breves, latitudine capitis non longiores; internæ parce breviores, 4-articulatæ, articulo tertio paulo longiore; externæ 5-articulatæ, articulis brevibus, tribus ultimis paululo longioribus.*

Narrow subelliptic. Head transverse, front margin apiculate at middle, angles rounded. Segments of thorax prominent, transverse, nearly equal in length, the three posterior sublunate (seen from above). Abdomen two-jointed; first segment very short, nearly obsolete, much narrower than following; the second scutellate, triangular behind, the sides towards base about parallel. Antennæ short, not longer than the breadth of the head; inner sparingly the shorter, four-jointed; third joint a little longer than the others; outer five-jointed; joints short, the last three a little the longest.

Plate 46, figure 8 *a*, animal, enlarged; *b*, inner antennæ; *c*, outer antennæ; *d*, mandible, in one view; *d'*, extremity of the same, in another view; *e*, inner maxilla; *f*, maxilliped; *g*, leg of fourth pair.

From near Viña del Mar, three leagues north of Valparaiso, Chili; found on an Asterias.

Length, one-fifth of an inch. Colour, yellowish-white. The head is rather longer than the first thoracic segment; the front margin is a little concave either side of the prominence that forms its centre, and from beneath this part the tentacles proceed. The thoracic segments are all short, and the last four are a little separated on either side. There is a slight pubescence and a few very short hairs at the extremity of the abdomen. The exterior plates cover completely the abdomen below; margins of the plates hirsute. The antennæ are stoutish, and bear a few short hairs. The legs are all rather short.

GENUS CLEANTIS, Dana.

*Antennæ externæ valde longiores, non geniculatæ, 5-6-articulatæ, flagello articulado non confectæ, articulo ultimo oblongo. Pedes quarti tertiis valde breviores; parium quatuor ultimorum sensim longitudine increscentes. Abdominis opercula laminam internam parvulam ad articulationem gerentia.*

Outer antennæ much the longer, not geniculate, five to six-jointed, without a flagellum. Feet of fourth pair very much shorter than third; last four pairs gradually increase in length. Outer abdominal plates or opercula having a small lamina attached inside at the articulation.

The body of the species of Cleantis collected is slender linear, and the legs increase from the first to the third pair, and again from the fourth to the seventh, the third and seventh pairs being the longest, and the fourth very short. The outer antennæ have a single joint in place of a flagellum, and are very much longer than the inner.

The mandibles have two processes besides the terminal; the terminal is rather slender and imperfectly dentated at apex; the second, just below, is equally slender and alike dentated; the third, corre-



sponding to the usual molar prominence of this division of Crustacea, is stouter, a little reflexed, with a truncate apex, and short hairs or spinules just below the apex. The exact character of its surface was not observed. The maxillæ are nearly as usual (see figures); the maxillipeds have five joints, and the two are in close contact along the medial line. The first or basal joint is very short, and projecting laterally, but diminishing nearly to a point; it bears a triangular lamella or palpus; the second joint is oblong, and has its inner apex lamellarly prolonged; the third is short; the fourth and fifth together elliptical in outline. The outline of the whole pair is nearly an equilateral triangle. The mandibles are to a great extent visible in an under view, just exterior to the maxillipeds.

The first and second pairs of abdominal appendages are furnished with very long plumose setæ, and the second bears from the base of the inner plate, a slender spiculiform process, as long as the rest of the organ, obtuse at apex. These two pairs are attached to the free abdominal segments. The outer pair has a small oval plate inside, attached at the articulation.

#### CLEANTIS LINEARIS.

*Angusto-linearis, fronte truncato, parce excavato, capite parce transverso, per segmentum proximum partim amplexo. Oculi mediocres, reniformes, remoti. Segmenta thoracis paulo transversa. Abdomen 3-articulatum, segmentis duobus brevissimè transversis; tertio valde oblongo, prope basin suturâ notato, lateribus fere parallelis, angulis posticis truncatis, apice truncato aut obsolete excavato. Antennæ internæ parvulæ, dimidio externarum valde breviores. Antennæ externæ crassiusculæ, articulo ultimo breviorè quam precedens, longè ovato, pubescente. Pedes tertii primis duplo longiores.*

Very narrow linear, front truncate or a little excavate, eyes situated near its angles. Head subtriangular behind and obtuse, being set into the following segment. Thoracic segments somewhat transverse. Abdomen three-jointed, first two segments very short transverse, the third twice as long as broad, having a suture near base, sides nearly parallel, posterior angles truncate, apex truncate or slightly excavate. Inner antennæ very small, not half the length

of the outer. Outer antennæ rather stout, last joint shorter than preceding, long ovate, pubescent. Third pair of feet twice longer than the first.

Plate 46, fig. 9 *a*, animal, enlarged; *b*, inner antenna; *c*, extremity of outer; *d*, view of mouth, in position showing maxillipeds and part of mandibles; *e*, mandible; *f*, first maxilla; *g*, second maxilla; *h*, first pair of abdominal appendages; *i*, second pair; *k*, outer pair; *l*, tarsus.

Rio Negro, Northern Patagonia. Taken from the stomach of a *Silurus*.

Length, nine or ten lines. Colourless when obtained. Length of body full six times its width. The head and first thoracic segment together longer than broad; fourth, fifth, sixth thoracic segments longest, the fourth nearly quadrate. Outer antennæ shorter than half the body; last four joints each oblong. Basal joint of inner antennæ stoutish, third shortest, obconical; the fourth as long as second and third together.

Legs compressed; last joint longest. Claw with a short spine beneath the apex. The three anterior pairs were thrown forward, and reached alike just beyond the front of the head; the others were spread laterally. Inner oval lamina of exterior abdominal plates ciliated, much shorter than the other plate with which it is associated.

GENUS ERICHSONIA, Dana.

*Antennæ externæ valde longiores, geniculatæ, 6-articulatæ, flagello nullo, sed articulo obtuso confectæ, subclavatæ. Pedes subæqui, quarti tertii-que non valde inæqui. Oculi mediocres, remoti.*

Outer antennæ much longer than inner, geniculate, six-jointed, ending in an obtuse joint and no flagellum, subclavate. Feet subequal, the third and fourth pairs but little different in size. Eyes of moderate size, remote.

The single species of this genus discovered, has an angular outline to its segments, and a row of small tubercles along the back. The club-shaped outer antennæ are geniculate at the antepenult articulation; the last joint is clavate and pubescent. The inner pair is not one-third as long as the outer. The thorax has seven segments; the abdomen only one. The legs are similar and subequal, and all in their natural position were spread more or less laterally, as in the true *Idotææ*.

This genus is named in honour of Erichson, successor of Wiegman as editor of the *Archiv für Naturgeschichte*.

It is near *Eidotia* of Guèrin; but in that genus, the inner and outer antennæ differ but little in length, and the outer have a flagellum of three or four joints.

#### ERICHSONIA ANGULATA.

*Elongato-elliptica, fronte excavato, capite et segmentis thoracis angulatis, transversis. Segmenta thoracis quatuor antica medio tuberculum gerentia. Abdomen uni-articulatum, oblongum, subscutellatum, ad latera sinuosum, versus apicem latius, extremitate triangulatum, obtusum. Antennæ internæ fere quadruplo breviores, 4-articulatæ; externæ dimidio corporis longiores, 6-articulatæ, articulis tribus ultimis subæquis, penultimo brevioribus, ultimo obtuso, breviter hirsuto. Pedes subæqui, duobus posticis et anticis brevioribus; articulo basali crasso, plerumque tuberculato.*

Long elliptic, front excavate, head and thoracic segments angulate, transverse; four anterior segments of thorax with a tubercle at middle. Abdomen one-jointed, oblong, subscutellate, margin sinuous, broadest near apex, extremity triangulate, obtuse. Inner antennæ nearly four times the shorter, four-jointed. Outer longer than half the body, six-jointed, last three joints subequal, the penult shortest, the last obtuse and short hirsute. Feet subequal, two posterior and two anterior shortest; basal joint stout and generally tuberculate.

Plate 46, fig. 10, animal, enlarged.

Among sea-weed, harbour of Rio Janeiro; December, 1838. Found along with Caprellas.

Length, half an inch. Colour, brown or yellowish brown; penult joint of legs, with a black or brownish transverse band. Body a little convex. Head excavate in front, and having on each side two crenations, in the posterior of which the eyes are situated. There are two tubercles on the centre of the anterior margin; in the specimen examined, these tubercles were a little to the left of the centre. The fourth thoracic segment is broadest and longest. The first and second are triangular in outline on either side, the third and fourth polygonal. The epimerals are also angular, and may be seen from above excepting the third and fourth pairs, and the third is sometimes apparent in an upper view. The basal joints of the legs bear three or four tubercles; none were observed on the anterior pair. The right of the outer antennæ was a little larger than the left.

---

#### FAMILY CHÆTILIDÆ.

THE sixth pair of legs, in the only species of this family discovered, terminates in a very long, bristle-like extremity, which consists of numerous joints; it is twice as long as the body. The seventh pair is similar in being without the usual claw, and has a multiarticulate extremity, but is quite short. The antennæ of the first pair are situated over (and not inside of) those of the second pair.

The Chætiliæ belong to quite a distinct group from the preceding Idotæidea. It is doubtful, however, whether the group may not rest for its distinctions more properly on other characters than those mentioned. This cannot be fully known until other related genera are discovered.

#### GENUS CHÆTILIA.

*Antennæ 1mæ super 2das insitæ et longiores; inferiores (2dæ) flagello*

*multiarticulato confectæ. Opercula abdominis lamellam parvulam internam ad articulationem gerentia. Pedes 8 antici tarso tenui confecti et subprehensiles.*

First pair of antennæ situated above the second and longest, four-jointed. Inferior (second) pair ending in a multiarticulate flagellum. Outer abdominal plates having an inner lamella at the articulation. Eight anterior feet terminating in a slender tarsus, which closes on the preceding joint.

Both pairs of antennæ are moderately long and are reflexed either side of the body; the second pair is here the shorter, and is situated beneath the first pair.

#### CHÆTILIA OVATA.

*Ovata, posticè acuminata. Caput postice arcuatum, fronte paulo excavatum. Oculi remoti, rotundati, mediocres. Thorax 7-articulatus, segmento septimo valde angustiore quam sextum et partim celato, sexto utrinque posticè acuto. Abdomen 4-articulatum, 3 segmentis transversis, quarto perangusto, longoe acuminato, subacuto, apice ciliato, prope basin suturâ notato. Antennæ superiores fere dimidii corporis longitudine, 4-articulatæ, articulis tribus ultimis tenuibus longis, ultimo extus subtiliter setuloso. Antennæ inferiores valde breviores, flagello fermè 10-articulato, articulis basis duobus ultimis anticè setulosis. Pedes sexti corpore fere duplo longiores.*

Ovate, acuminate posteriorly. Head arcuate behind, front a little excavate. Eyes remote, round, of moderate size. Thorax seven-jointed, seventh segment much narrower than sixth and partly concealed by it, sixth on either side acute. Abdomen four-jointed, three segments transverse, fourth long and narrow triangular, subacute and ciliate at extremity, having a suture near base. Superior antennæ nearly half as long as body, four-jointed, the last three joints long and slender; the terminal one setulose on outer side. Inferior antennæ one-fourth shorter, flagellum about ten-jointed, last two joints of base setulose on anterior margin, and hairy on the posterior. Sixth pair of feet almost twice as long as the body.

Plate 46, fig. 11 *a*, animal, enlarged; *b*, part of head, with antennæ; *c*, one of three anterior pairs of legs; *d*, fourth pair; *e*, fifth pair; *f*, outer abdominal plates.

Rio Negro, Patagonia. Taken from the stomach of a *Silurus*.

Length, nine lines. The cephalothorax is oval and broad, and there is an abrupt diminishing of the breadth where the abdomen begins. The last abdominal segment is narrow elongate, with the sides very slightly arcuate, and the apex pointed. The superior antennæ, thrown back either side of the body, reach to the second articulation in the thorax, or the third thoracic segment; the first of the slender joints is the longest, and the third the shortest. The setæ in the last increase in length towards the apex. The inferior antennæ were flexed backward, like the superior; only four basal joints were observed, and these about equal the flagellum in length. Outer abdominal plates broadest at base; inner lamella oblong ovate, plumosely ciliate.

The organs of the mouth have a general resemblance to those of the *Cleantis*.

---

#### SUBTRIBE II. ONISCOIDEA.

THE Oniscoidea are distinguished from the other Isopoda by having the posterior pair of abdominal appendages, which are either styliform or small lamellar, appended as a caudal pair to the extremity of the abdomen. They may be suboperculiform, and cover the ventral surface of the last abdominal segment, as in *Tylus*; but they never form a pair of valves covering the other abdominal appendages, as in *Idotæa*.

The families included are as follows:—

Fam. I. ARMADILLIDÆ.—Corpus bene convexum, strictè articulatum. Abdomen multiarticulatum, segmento ultimo parvo. Appendices

caudales ultra abdomen non exsertæ, lamellatæ. Mandibulæ non palpigeræ. Antennæ internæ inconspicuæ.

Fam. II. ONISCIDÆ.—Corpus sæpius minus convexum, vel strictè vel laxè articulatum. Abdomen multiarticulatum, segmento ultimo parvo. Appendices caudales bene exsertæ, styliformes. Mandibulæ non palpigeræ. Antennæ internæ inconspicuæ.

Fam. III. ASELLIDÆ.—Corpus sæpius valde depressum et laxè articulatum. Abdomen 1-6-articulatum, segmento ultimo magno, scutellato. Appendices caudales styliformes, raro obsoletæ. Mandibulæ palpigeræ. Antennæ internæ conspicuæ.

The Asellidæ correspond to the "Isopodes Asellotes" of Edwards, excepting that we exclude his "Asellotes Heteropodes," which are Anisopoda. The Oniscidæ include the "Cloportides Maritimes" of this distinguished author, together with part of the "Cloportides terrestres," viz., the "Porcellioniens;" while the Armadillidæ comprise the remainder of the "Cloportides terrestres."

The Armadillidæ and Oniscidæ appear to rank before the Asellidæ. This is to be inferred from the fact, that the former are mostly terrestrial, while the latter are aquatic; for the principle which Agassiz has brought forward appears to be of very general application, that in a given group, the terrestrial species are highest in organization. Moreover, the loose structure of the Asellidæ seems to be proof of inferiority to the well-formed, compact, and symmetrical Armadillo and Oniscus. The antennæ of the Asellidæ also are more largely developed, and the caudal stylets are usually longer and more projecting than in the Armadillidæ and most Oniscidæ, giving farther evidence of vegetative elongation in either direction, at the expense of concentration. These reasons may not be of great weight, yet they seem, in the doubtful state of the case, to point to the conclusion here adopted.

The following are the known genera of living species, and the subfamilies into which they are naturally grouped.

## FAM. I. ARMADILLIDÆ.

SUBFAM. 1. TYLINÆ.\*—Appendices caudales infra abdominis segmentum posticum celatæ et operculiformes.

G. 1. TYLUS, *Latr.*

SUBFAM. 2. ARMADILLINÆ.† — Appendices caudales inter abdominis segmenta duo postica partim visæ.

G. 1. ARMADILLO, *Latr.* partim, *Brandt, Edwards.*‡—Basis appendicum caudalium magnus, ramo interno parvulo, altero obsolete.

G. 2. SPHERILLO, *Dana.* — Basis appendicum caudalium grandis, ramo interno parvulo, externo parvulo, laterali, in latere basis interiore versus apicem insito.

G. 3. ARMADILLIDIUM, *Brandt.*§ — Basis appendicum caudalium brevis, ramo externo lato, terminali, interno parvulo.

G. 4. DIPLOEXOCHUS, *Brandt.* — *Armadilloni* appendicibus caudalibus similis. Segmenta thoracis processu horizontali utrinque armata.

## FAM. II. ONISCIDÆ.

SUBFAM. 1. ONISCINÆ.||—Maxillipedes 3-articulati, articulis duobus ultimis brevibus et parvulis. Antennæ externæ ad articulationem 5tam bene geniculatæ. Basis appendicum caudalium perbrevis, duos stylos multum inæquos gerens, stylo interno sub abdomine sæpissimè partim celato.

G. 1. ONISCUS, *Linn.*—Antennæ externæ subcylindricæ, ad basin fronte partim tectæ. Flagellum 1-3-articulatum, articulo precedente vix brevius vel longius.

Subgen. 1. TRICHONISCUS, *Brandt.*—Antennæ externæ 6-articulatæ.

Subgen. 2. PORCELLIO, *Latr.*—Antennæ externæ 7-articulatæ.

Subgen. 3. ONISCUS, *Latr.*—Antennæ externæ 8-articulatæ.

\* *Tylosiens*, Edwards. The Greek τυλος, would make Tylus in Latin; and from the genitive comes, according to rule, the derivative, *Tylinæ*.

† *Armadilliens*, Edwards.

‡ *Pentheus*, Koch.

§ *Armadillo* of Koch, and in part of other authors.

|| *Porcellioniens*, Edwards. *Porcellionidæ*, Cat. Brit. Crust., Brit. Mus., 1850. We derive the family name from the name of the old Linnæan genus, believing this more correct and even more significant.



G. 2. PHILOSCIA. — Onisci subgeneri *Porcellioni* antennæ externis 7-articulatis affinis. Antennæ externæ usque ad basin apertæ.

G. 3. PLATYARTHURUS, *Brandt.* — Antennæ externæ quoad articulum 5tum latæ, latere externo dilatatæ.

G. 4. DETO, *Guérin.* — Flagellum antennarum externarum perbreve, 4-articulatum, articulo precedente multo brevius; articulus 5tus cylindricus.

SUBFAM. 2. SCYPHACINÆ. — Maxillipedes 2-articulati, articulo 2do lamellato. Antennæ externæ ad articulationem 5tam non geniculatæ. Styli caudales fere ac in *Oniscinis*; basis vel brevis vel oblongus, ramo interno interdum omnino aperto.

G. 1. SCYPHAX, *Dana.* — Flagellum antennarum 1-3-articulatum.

G. 2. STYLONISCUS, *Dana.* — Flagellum antennarum tenue, multi-articulatum.

SUBFAM. 3. LYGINÆ. — Maxillipedes 4-articulati, elongati. Antennæ externæ ad articulationem 5tam non bene geniculatæ. Styli caudales longi, basi longe exserto, stylis setiformibus subæquis et æque apertis.

G. 1. LYGIA, *Fabr.* — Basis appendicum caudalium apice simplex, ramosque duos simul gerens.

G. 2. LYGIDIUM, *Brandt.\** — Basis appendicum caudalium apice furcatus, brachio utroque ramum gerente.

### FAM. III. ASELLIDÆ.

SUBFAM. 1. LIMNORINÆ. — Abdomen 5-6-articulatum.

G. 1. LIMNORIA. — Segmenta abdominis duo postica grandia, simul sumta scutellata.

SUBFAM. 2. ASELLINÆ. — Abdomen 1-2-articulatum.

#### 1. *Pedes thoracici quatuordecim subæqui.*

G. 1. JÆRA, *Leach.* — Appendices caudales perbreves, branchiales laminâ impari tectæ.

G. 2. JÆRIDINA, *Edw.* — Appendices caudales perbreves, branchiales apertæ.

G. 3. ASELLUS, *Geoffroy.* — Appendices caudales elongatæ. Pedes antici subchelati.

G. 4. JANIRA, *Leach* (*Oniscoda*, *Latr.*) — *Asello* affinis. Pedes toti unguiculati, ungue bifido.

\* *Zia*, Koch.

2. *Pedes posteriores valde elongati.*

- G. 5. HENOPOMUS, *Kröyer*.\*—Pedes 1mi subchelati, digito 2-articulato; reliqui ambulatorii, articulo 6to subrudimentario. Appendices branchiales laminâ unicâ permagnâ tectæ. Thoracis segmenta latere incisa et dentata.
- G. 6. MUNNA, *Kroyer*.†—Appendices caudales rudimentariæ. Pedes antichi crassiores, subchelati. Pedes posteriores corpore multo longiores.

## FAMILY ARMADILLIDÆ.

## SUBFAMILY TYLINÆ.

## TYLUS SPINULOSUS.

*Corpus antennæque spinulosæ, spinulis brevissimis et sæpe subclavatis. Caput processibus truncatis prominentibus sub oculis ornatum. Antennæ fere ad segmentum thoracis 2dum attingentes, articulo 2do antice salienter angulato, flagello 3-articulato, articulo 1mo parce brevior quam articulus precedens, et duplo longiore quam sequens.*

Body and antennæ spinulous, spinules very short and often subclavate. Head below either eye having a prominent process which is truncate at extremity. Antennæ reaching barely to second segment of thorax, second joint having a salient angle on anterior side near base, flagellum three-jointed, the first joint but little shorter than the preceding joint, and twice as long as the following.

Plate 47, fig. 1 *a*, body, enlarged four diameters, the head thrown outward; *b*, part of antenna, enlarged twenty-four diameters; *c*, caudal lamellæ.

Nassau Bay, Fuegia.

\* *Ibid.* [2], ii. 1847. Both this genus and *Munna*, are stated by *Kröyer* to be related to *Asellus* and *Jæra*.

† *Nat. Tidsskr.*, ii. 1838, 1839, p. 612, and [2], ii. 1847.

Length, four lines ; breadth, half the length. The so-called spinules are not acute, and might perhaps be more properly called setules. The processes on the head below the eyes are not in view, unless the head is placed out horizontally, as it would be carried by the animal when walking. The epistome is spinulous like the back. The caudal lamellæ have a small joint at the extremity, as described by Krauss in his South African species (Südaf. Crust., p. 63, pl. 4, f. 5, 6) ; and as he suggests, there are differences between the specimens and the figures of Savigny's species, in this and other respects, which may require the institution of a new genus. The animal rolls up into a ball, like the Spheromæ.

SUBFAMILY II. ARMADILLINÆ.

ARMADILLO SPECIOSUS.

*Corpus valde convexum, subtiliter granulosum. Caput anticè fere truncatum. Segmenta thoracis lateraliter non acuta, anticum majus. Abdominis segmenta strictè conjuncta, ultimum apice arcuatum et valde latius, lateribus excavatis. Appendices caudales angustæ, ad apicem truncatæ, marginibus parallelis integris et nudis. Antennæ tenues, flagello plane breviorè quam articulus quintus.*

Body much convex, finely granulate. Head nearly truncate in front. Segments of thorax laterally not acute, anterior largest. Segments of abdomen with their margins closely in contact throughout, the last much broadest at apex, and with the sides excavate. Caudal appendages narrow, apex truncate, margins entire, nearly parallel, naked, basal portion rectangular, produced inward. Antennæ slender, flagellum distinctly shorter than fifth joint.

Plate 47, fig. 2 *a*, animal, natural size ; *b*, under view of abdomen ; *c*, caudal stylets, separated and much enlarged ; *d*, antenna, much enlarged.

From moist soil, among leaves, in the crater of Taiaimmai, New Zealand, in the vicinity of the Bay of Islands. Collected, March, 1840.

Length, nearly seven-eighths of an inch. Colour, dark brown, with a few small yellow spots on several of the joints; segments, laterally a little reddish; also, margin of abdomen the same. Head about half the width of next segment, and rather less than half as long, somewhat narrower in front. Eyes with few facets, situated near middle of lateral margin of head. First thoracic segment very large. None of the segments properly acute at the latero-posterior angles. The last abdominal segment has a faint suture across it, which appears to show the outline of a seventh normal segment. Third and fourth joints of antennæ equal, fifth about as long as third and fourth together, flagellum about two-thirds the fifth; penult shorter than last.

The caudal appendages have an oblong rectangular form, and the outer basal angle of the base is a little prominent. The other abdominal appendages scarcely occupy more than one-third of the width of the abdomen.

#### GENUS SPHERILLO.

*Armadillini affinis. Appendices caudales ramis duobus instructæ, utroque laterali, parvulo, breviter styliformi.*

Near *Armadillo*. Caudal appendages having two branches, both lateral and small and short styliform.

The two branches of the caudal appendage are both situated on the inner margin of the base, one near the medial line of the abdomen, and the other on the inner side of the base, not far from the apex. The species are intermediate between those of *Armadillo* and *Armadillidium*. The outer branch is visible, in a dorsal view, between the last abdominal segment and the base of the caudal appendage, and sometimes it is not distinguished at all in a ventral view, when distinct in a dorsal.

#### SPHERILLO MONOLINUS.

*Caput anticè arcuatum. Segmenta thoracis ad latera truncata, supernè lineâ elevatâ monilinâ transversim ornata, primo majore et lineis*

*duabus monilinis notato. Abdomen semicirculare, segmentis tertio quarto quintoque ad latera obtusis, ultimo ad apicem quadrato, ad basin valde latiore. Appendices caudales subtriangulatae, latitudine breviores, margine interno latè excavato. Antennæ fere nudæ, flagello vix breviorè quam articulus precedens.*

Head arcuate in front. Segments of thorax transversely marked with a beaded ridge and laterally truncate, anterior segment longest and marked with two beaded ridges. Abdomen semicircular, third, fourth, and fifth segments laterally obtuse, the last with a nearly subquadrate apex and much broader at base. Caudal appendages subtriangular, shorter than breadth at base, inner margin broadly excavate. Antennæ nearly naked, flagellum hardly shorter than preceding joint.

Plate 47, fig. 3 *a*, animal, enlarged; *b*, antennæ; *c*, posterior leg; *d*, extremity of abdomen, under view, showing caudal appendages.

From under rotten wood, up the Wykare River, near Bay of Islands, New Zealand. Collected by Dr. C. Pickering.

Length, four lines. Segments of thorax, towards the lateral margin, not in contact; sixth and seventh longer than either of three preceding; their posterior margin nearly straight across the back, but bending backward either side. Width of head about half that of thorax, and its length much less than half its width. The outer side of the triangular caudal appendage is arcuate, the inner deeply concave, with a small cylindrical branch near its centre. The transverse ridge on the thoracic segments is minutely beaded. The legs are short spinulous; tarsus very slender. The antennæ have the fourth joint a little longer than the third, and shorter than the fifth, but hardly longer than the second; the flagellum is about as long as preceding joint.

The figure (fig. 3 *d*) represents the outer branch of the caudal appendages, and not the inner; and as the specimen is not in our collections, the author is doubtful whether the inner are obsolete or not.

## SPHERILLO VITIENSIS.

*Caput subrectangulatum, anticè truncatum. Segmenta thoracis nuda, lævia, margine postico concavo. Abdomen extremitate rotundatum, segmento ultimo ad apicem fere truncato, ad basin angustiore, utrinque excavato. Appendices caudales latitudine valde longiores, apice plus duplo angustiore, truncato, margine externo recto, interno rectangulatè emarginato. Antennæ latitudinis corporis longitudine, fere nudæ, flagello articulum quintum longitudine æquante.*

Head subrectangular, truncate in front. Segments of thorax naked, smooth, posterior margin concave. Abdomen rounded at extremity, last segment almost truncate at apex, narrower at base and sides excavate. Caudal appendages much longer than broad, apex truncate and more than twice as narrow as base, outer margin straight, inner having a rectangular notch near apex. Antennæ as long as breadth of thorax, nearly naked, flagellum as long as fifth joint.

Plate 47, fig. 4 *a*, animal, enlarged; *b*, antenna; *c*, leg of fifth or sixth pair; *d*, caudal appendage.

Feejees, island of Vanua Lebu.

Length, two lines. Head nearly half the breadth of the thorax, with the eyes on the *posterior* angles. The caudal appendages are oblong, and subrectangular in form, except that a rectangular piece is taken out from the inner angle. The inner branch is not more than half as long as the base of the organ, and is attached very near the inner angle of base, which inner angle is but little widened or prolonged inward. Fourth joint of antennæ little longer than third joint, and shorter than fifth or second; the hairs are extremely minute, so that the organ appears nearly naked; they are more numerous on the joints of the flagellum. Hairs of legs extremely short, mostly shorter than diameter of joints. Claw of sixth pair about half the length of the tarsus.

## SPHERILLO HAWAIIENSIS.

*Corpus minutissimè confertim granulatum et pubescens, valde convexum, segmentis thoracis margine postico plerumque concavis, segmento antico juxta marginem postero-lateralem fisso, reliquis longitudine subæquis. Antennæ subtiliter hirsutæ, pilis dimidio latitudinis articuli paulo brevioribus, articulis flagelli subæquis. Appendices caudales subquadratæ, viæ longiores quam latitudo apicalis, margine interno superne viso emarginato articulumque minutum gerente.*

Body very minutely close granulate and pubescent, much convex, segments of thorax having posterior margin mostly concave, anterior segment with a fissure in the postero-lateral margin; following segments about equal in length. Antennæ very short hirsute, the hairs not half as long as breadth of joints, the two joints of the flagellum subequal. Caudal appendages subquadrate, hardly longer than the apical breadth, inner margin (as seen from above) having an emargination, whence proceeds a minute joint.

Plate 47, fig. 5 *a*, animal, enlarged three diameters; *b*, antennæ; *c*, leg of fifth pair; *d*, under view of abdomen; *e*, caudal appendage, upper view, showing the outer of the branches of the appendage, a minute joint.

## Hawaiian Islands.

Length of body, six lines. The small joint, which is properly the outer branch of the caudal stylets, and the emargination in which it lies, is not seen, except in an upper view; and the breadth at the extremity below the emargination, is as great as that anterior to it. The pubescence and granulation of the body are only distinguishable with a high magnifying power. The fifth pair of legs has the fourth joint rather crowdedly spinous, there being about twelve pairs of spines (often serrated, or divided at top), none longer than greatest diameter of the joint. The fifth joint has about six pairs of spines, some a little longer than those of the fourth joint.

## SPHERILLO SPINOSUS.

*Corpus spinis subacutis omnino echinatum, marginibus parce productis; segmentis ad latera truncatis. Caput trapeziale, anticè arcuatum et paulo latius. Segmentum thoracis anticum majus. Segmenta abdominis lateraliter obtusa, ultimum subquadratum, ad basin non latius, et apicem truncatum.*

Body bristled throughout with subacute spines, margin either side a little produced and segments laterally truncate. Head nearly trapezial, arcuate in front and a little broader than behind. First segment of thorax largest; segments of abdomen laterally obtuse, the last subquadrate, not broader at base, truncate at apex.

Plate 47, fig. 6 *a, b*, animal, enlarged; *c*, under view of head; *d*, spine, much enlarged; *e*, upper view of extremity of abdomen; *f*, under view of same, showing caudal stylets; *g*, part of antennæ, much enlarged.

New Zealand, near Bay of Islands; from under the bark of pine trees. Collected by Dr. Pickering, March, 1840.

Length, three lines. Colour, chestnut brown, with brownish yellow along margin, and irregularly spotted along the back. The spines cover closely the head, thorax, and abdomen, but not the margin of the body. These spines are minutely pubescent. The margin is a little flattened out or recurved, so as not to be in the same curvature with the back. The joints laterally are not in contact; they are narrow, rectangular, and obtuse. Surface of segments below and lateral portions pubescent like the spines. Eyes situated near centre of lateral margin of head. Posterior angles of first thoracic segment obtuse. The antennæ in a dead specimen were folded under the head, as in figure 6 *c*. The flagellum is about as long as the fifth joint.



## FAMILY ONISCIDÆ.

## SUBFAMILY ONISCINÆ.

THE *Oniscinæ* are the "Porcellionides" of Edwards. The distinctions of this group have been well drawn out by this author. We add only a few remarks on the antennæ. A characteristic feature of these organs, as regards position, is the fact, that they are geniculated at the fifth articulation as well as near the head, which gives them two abrupt flexures, somewhat like the form of the letter Z. The flagellum consists of one to three oblong joints, besides (as appears not to have been noticed) two or three small apical joints. Of the former there are commonly but two; and when there are three, it arises from a subdivision of the first of these two. This was evident to us in a species of *Scyphax*, which, though not correctly one of the *Oniscinæ*, is similar in its antennæ: in specimens three to three and a half lines long, the flagellum was two-jointed, with the first joint the longer; while, in specimens four to four and a half lines long, the flagellum was three-jointed, and the first articulation was fainter than the second, and plainly cut across the first of the two joints in the two-jointed flagellum. The joints at the extremity are either two or three in number; the last is slender and somewhat spiniform or subcylindrical, with a few setules at apex; the other one or two are quite short, and the articulations sometimes are not very distinct. These parts are illustrated in our figures on Plates 47 and 48. The surface of the antennary joints is usually thick set with very short hairs, or more sparsely with spines. In the genus *Deto*, the flagellum of the antennæ is said to have four joints; whether this includes the last of these small terminal joints or not, we cannot say from observation. It is possibly so, as all the joints of the flagellum are very short.

From the occurrence of both two and three-jointed flagella, in different specimens of the same species that are so nearly of the same size, as in the *Scyphax*, alluded to above, it is apparent that the distinction as to number of joints cannot be a generic characteristic, and at the most would separate only subgenera. It is on this account, added to other points of identity, that we have not retained *Porcellio*, *Oniscus*,

and *Trichoniscus*, as distinct genera, but as subgenera of the genus *Oniscus*. *Deto*, in having the flagellum so remarkably short, diverges more from the *Oniscus* type; and *Platyarthrus*, in the broad, flattened fifth joint of the antennæ is also sufficiently distinct; but we make this flattened joint the characteristic of the genus, without adding to it the number of joints in the flagellum, except so far as to say, that the number is small (one to three or four), as in *Oniscus*.

PORCELLIO GEMMULATUS.

*Abdomen thorace non subito angustius. Capitis processus antero-lateralis valde prominens, subtruncatus, fronte triangulatus. Segmenta thoracis abdominisve granulis ornata, granulis juxta marginem segmentorum posticum bene seriatis, alioque partim seriatis; segmenta abdominis 3tio 4to 5toque lateribus expansa et salientia, ultimum triangulatum et subacutum, latere excavatum, latitudine basali vix longius, basi stylorum vix longius ramos internos non superans. Antennæ subtiliter hirsutæ, articulo tertio spinâ non armato, flagello biarticulato paulo brevior quam articulus precedens.*

Abdomen not abruptly narrower than thorax; antero-lateral process of the head very prominent, subtruncate, front triangular. Segments of both thorax and abdomen with granules, a row along posterior margin of each, and others partly seriate; third, fourth, and fifth of abdomen laterally expanded and salient; last segment triangular and subacute, hardly longer than breadth at base, but slightly longer than base of caudal stylets, and hardly projecting as far as apex of inner branch of the stylets. Antennæ very finely hirsute, third joint without a spine, two-jointed flagellum shorter than preceding joint.

Plate 47, fig. 7 *a*, animal, enlarged four diameters; *b*, extremity of antenna, much more enlarged; *c*, apex still more enlarged; *d*, leg of second pair, enlarged; *e*, *f*, *g*, spines of under surface of same leg, from fourth joint.

California, near San Francisco; also, Puget's Sound.

Length, half an inch. The joints of the thorax have the segments flexed backward on either side. The last abdominal segment is not narrow oblong, as in the *scaber*. The stylets are about half as long as the abdomen. The under surface of the anterior legs of the first and second pairs especially, are thickly set with spines, which are partly laminated, and have a ragged edge. The extremity of the flagellum of the antennæ consists of two or three small joints, the last of which is slender and setulose at extremity.

PORCELLIO? FUEGIENSIS.

*Abdomen thorace subito paulo angustius. Caput antice bene præruptum, processu antero-laterali parvulo, subrectangulato, fronte saliente fere recte transverso. Segmenta thoracis partim rugato-granulata, abdominis subtilissimè granulata, 3tium, 4tum, 5tumque latere paulo expansa et salientia, ultimum triangulatum, paulo transversum, paulo concavum, basin stylorum vix superans; ramo stylorum interno longè saliente et hirsutiusculo, externo dimidii abdominis longitudine.*

Abdomen abruptly a little narrower than thorax. Head anteriorly with an abrupt vertical surface and acute edge above, antero-lateral process very small and subrectangular, front salient, nearly straight transverse. Segments of thorax in part rugato-granulate; segments of abdomen very finely granulate, third, fourth, and fifth laterally expanded and salient, last triangular, somewhat transverse, and above concave, hardly projecting beyond base of stylets; inner branch of stylets long salient, and short hirsute; outer branch half as long as abdomen.

Plate 47, fig. 8 *a*, animal, enlarged; *b*, part of body, with the posterior abdominal segments bent on either side as in some preserved specimens; *c*, extremity of abdomen; *d*, extremity of posterior legs.

Near Nassau Bay, Tierra del Fuego.

Length of body, four lines. The projection of the inner branches of the stylets is a striking character, since they are in sight from above nearly their whole length, and extend one-third of the distance to the

apex of the longer stylets. The antennæ of the specimens were mutilated, and we are, therefore, in some doubt as to the number of joints of the flagellum. The granules of the surface are hardly granules, they appearing partly like wrinkles though raised, ranging longitudinally across the segments of the thorax near their middle.

PORCELLIO CHILENSIS.

*Levissimè granulatus.* Caput bene transversum, a segmento sequente non amplexum, processibus antero-lateralibus minutis, rectangulatis, fronte parce arcuato. Antennæ subtiliter hirsutiusculæ, flagello vix brevior quam articulus precedens, articulo flagelli 1mo fere duplo longiore quam 2dus. Thoracis articulationes 5tæ anticæ fere recte transversæ. Abdomen breve, non longius quam latum, segmentis 3tio 4to 5toque lateribus salientibus et acutis, ultimo triangulato, subacuto, lateribus excavato, latitudinem basalem longitudine fere æquante. Styli caudales hirsutiusculi, abdominis longitudine, basi extremitatem abdominis non attingente, ramo interno bene exserto, crassiusculo, subulato, apicem 3-setigero, externo crasso acuminato plus triplo longiore.

Very faintly granulate. Head much transverse, not imbedded in following segment, antero-lateral processes minute, rectangular, front sparingly arcuate. Antennæ very minutely hirsute, flagellum slightly shorter than preceding joint, its first joint nearly twice as long as the second. Five anterior articulations of thorax nearly straight transverse. Abdomen short, not longer than broad, third, fourth, and fifth segments laterally salient and acute, last triangular, subacute, sides excavate, breadth at base a little greater than its length. Caudal stylets as long as abdomen, the base hardly reaching to apex of abdomen, shorter branch exsert, a little stout, subulate, having three setæ at apex, outer branch stout, acuminate, more than three times as long as the other.

Plate 47, fig. 9 *a*, animal, enlarged; *b*, base of antenna; *c*, extremity of antenna; *d*, extremity of leg of first pair in outline; *e*, caudal stylets.

Valparaiso, Chili.

Length, six to eight lines. There is a resemblance in this species to the *fuegiensis*; yet it is much larger and lighter-coloured. The shorter branch of the stylets is not slender linear, as in the *fuegiensis*, and has three setæ at apex; the front is much less projecting. The granules of the surface are quite small, and there is some pubescence.

PORCELLIO? HAWAIIENSIS.

*Corpus læve. Frons arcuatus, non prominens, processu antero-laterali rotundato, prominulo. Segmentum abdominis ultimum fere T-formis, parte posticâ anguste triangulatâ, subacutâ, stylis caudalibus oblongis, basi et ramo interno extremitatem abdominis non superantibus.*

Body smooth. Front arcuate, not prominent, antero-lateral process rounded, not very prominent. Last segment of abdomen nearly T-shape, the posterior part very narrow triangular, subacute; caudal stylets oblong, neither the base nor the inner branch extending beyond the extremity of the abdomen.

Plate 47, fig. 10, animal, enlarged three diameters.

Island of Maui, Hawaiian Islands.

The basal part of the last abdominal segment is very short, or transverse linear, and the rest of the segment is narrow and quite prominent; the longer branch of the caudal stylets projects beyond the abdomen, two-thirds the length of the abdomen or more. The articulations of the thorax are but slightly arcuated, excepting the two posterior, and these are not very much so. The antennæ of the specimen were mutilated.

ONISCUS NIGRESCENS.

*Corpus nitidum, anticè vix angustius, rotundatum. Abdomen thorace subito valde angustius, breve, paulo oblongum, parce pubescens, margine laterali recto, vix interrupto, segmento ultimo breviter transverso, transversim triangulato, segmentis aliis latere brevissime acutis. Caput*

*paulo transversum, anticè subtruncatum, a segmento proximo partim amplexum. Segmentum thoracis primum majus, ultimum angulis productum et acutum. Styli caudales abdomine parce longiores, ramo majore triplo longiore quam minor, reverso-scabriculo.*

Body somewhat shining, scarcely narrower in front, rounded. Abdomen suddenly much narrower than thorax, short, a little oblong, sparingly pubescent, last segment very short, transverse triangular. Head somewhat transverse, subtruncate in front, and setting deeply into next joint. First joint of thorax largest; last with the angles produced and acute. Caudal stylets scarcely longer than the abdomen, branches very unequal, one three times longer than the other, the longer finely reversed scabrous.

Plate 48, fig. 1 *a*, animal, enlarged; *b*, under view of abdomen of male; *c*, outer maxilliped.

Found under stones, near Rio Janeiro, December, 1838.

Length of male, six lines; of female, eight lines. Colour, black, or nearly black, with some irregular lighter spots (sometimes nearly white) along the anterior portion of the thoracic segments, and also along the median line of the abdomen, at times giving the animal a dark grayish aspect. The head is not wider than half the next segment, and is nearly two-thirds encircled by it. Last abdominal segment slightly longer than preceding, low pointed behind; the three preceding segments laterally produced backward and acute. Eyes, black, situated obliquely on the latero-anterior angles of the head. Legs scabrous, the last pair spinous; claw very short, on last pair not longer than one-sixth the preceding joint. Abdominal lamellæ, five pairs; the anterior smallest, bidentate at apex, the inner tooth longer. The following pairs of lamellæ elongate and acute near the median line. A broad oblong oval plate between first and second pairs, which terminates behind in two oblong styliform organs (in male) acute and curved a little outward.

Another specimen, mutilated in its antennæ, resembled the above, except that the abdominal plates were obtuse, instead of acute, and the organ between the first and second pairs was wanting, indicating that it was a female.

## ONISCUS PUBESCENS.

*Corpus pubescens, subellipticum. Abdomen thorace subito valde angustius, breve, latitudine non longius, segmento ultimo breviter transverso, et postice non producto. Caput transversum, segmento proximo paulo brevius et angustius. Segmenta thoracis subæqua, ultimum utrinque posticè acutum sed vix productum. Styli caudales parvuli, abdomine breviores, ramis valde inæquis, tenuissimis, acutis. Antennæ subtiliter hirsutæ.*

Body pubescent, subelliptic. Abdomen abruptly much narrower than thorax, short, not longer than broad, last segment very short transverse, and not produced backward. Head transverse, a little shorter and narrower than next segment. Thoracic segments nearly equal in length, last on either side acute, but hardly prolonged. Caudal stylets quite small, shorter than abdomen, branches very unequal, very slender, acute. Antennæ finely hirsute.

Plate 48, fig. 2 *a*, animal, enlarged; *b*, antennæ; *c*, sixth pair of legs; *d*, stylets.

Under rotten wood, in forests, ten miles from the Bay of Islands, New Zealand, up the Whykare River.

Length, three lines. Colour, brown and brownish white, with irregular bands and spots of deeper brown. The articulation between the head and first thoracic segment is nearly straight. The abdomen is shorter than breadth of thorax, and hardly longer than its own breadth at base. Antennæ eight-jointed; third and fourth joints together about equalling the fifth; so also, the three last together exclusive of the terminal spine. Legs minutely hirsute or pubescent. Tarsus scarcely longer than preceding joint. Inner branch of stylet scarcely half the length of the outer; both minutely pubescent.

## ONISCUS? ANGUSTUS.

*Corpus angustum, læve. Caput prominens, processibus antero-lateralibus non exsertis, fronte paulo arcuato. Abdomen thorace subito paulo angustius, lateribus rectis et integris, segmentis latere non salientibus, ultimo breviter transverso, triangulato.*

Body narrow, smooth. Head not embedded in following joint, but prominent, the antero-lateral processes absent, and front a little arcuate. Abdomen abruptly a little narrower than thorax, sides straight and entire, the segments not being salient either side; last segment short transverse, triangular.

Plate 48, fig. 3 *a*, animal, enlarged; *b*, outer maxilliped; *c*, first pair of legs; *d*, extremity of last pair.

Near Nassau Bay, Tierra del Fuego.

Length, four lines. The antennæ and stylets are both wanting in our specimens, and the subgenus to which they belong is, therefore, undetermined. The habit of the body is somewhat like that of a *Styloniscus*; but the character of the maxillipeds shows that they are not related to that group. The fifth joint of the last pair of legs is very slender, and the short setæ on the under side are not longer than the breadth of the joint; the fourth joint of the first pair bears below a few long, slender spines, longer than half the next joint; the fifth joint is very nearly naked.

## ONISCUS? MACULATUS.

*Caput suborbiculare, fronte arcuatum, processibus antero-lateralibus salientibus non instructum. Corpus nitidum, non granulatum. Segmenta thoracis 5 antica fere rectè transversa. Abdomen thorace subito multo angustius, vix longius quam latum, lateribus integris et rectis (segmentis utrinque non salientibus), segmento ultimo valde transverso, margine postico latè triangulato, stylis abdomine parce brevioribus, ramis am-*



*bobus omnino exsertis, minore dimidio brevior, basi brevi. Articulus pedum posteriorum 5tus infra spinulis longiusculis et crassiusculis armatus.*

Head suborbicular, front arcuate, no antero-lateral processes prominent. Body shining, not granulate. Five anterior segments of thorax nearly straight transverse. Abdomen abruptly much narrower than the thorax, hardly longer than broad, sides entire, the segments not projecting either side, last segment very transverse, the posterior margin broad triangular; stylets a little shorter than the abdomen, both branches exsert, the inner half shorter than the outer, base short. Fifth joint of posterior legs armed below with longish spinules.

Plate 48, fig. 4 *a*, animal, enlarged, mutilated in its antennæ; *b*, outer maxilliped; *c*, extremity of posterior leg, upper view; *d*, same, lateral view; *e*, tarsus of same, more enlarged; *f*, caudal stylets.

Sandwich Islands.

Length, three to four lines. Strongly marbled with brownish black, and often a black spot below on the bases of the legs. The last abdominal segment does not cover the bases of either branch of the stylets, the base of the shorter being nearly in the same line with that of the longer. The species is broader than the *angustus*, and the fifth joint of the last pair of legs in that species is furnished only with short setules, not longer than the diameter of the joint.

#### PHILOSOCIA — ?

Plate 47, fig. 11 *a*, animal, enlarged; *b*, extremity of antennæ; *c*, apex of second joint of flagellum.

Madeira.

The recognised species of *Philosocia* are so imperfectly characterized, that we forbear referring our specimen to any species, especially as the caudal stylets are wanting, these being the organs particularly

referred to in the descriptions. The surface of the segments of the thorax is corrugate, except a smooth medial surface, and a band across adjoining the posterior margin; the articulations are nearly straight across, the postero-lateral angles being little prolonged backward, except for the last thoracic segment. The head is granulate. The antennæ have the same kind of extremity as in other Oniscinæ. Length, four lines.

#### SUBFAMILY SCYPHACINÆ.

This subfamily embraces two genera, as present known. Although the general form of the body and structure of the caudal appendages are nearly as in the Oniscinæ, there is a wide difference in the outer maxillipeds, the extremity consisting only of a single lamellar joint, which in one genus is half as long as the preceding joint. One of the genera includes species found in a sand-beach bordering the sea, while the other belongs, like the Onisci, to damp places about the land, remote from the sea.

The head is not set into a concavity in the anterior thoracic segment, and is broad transverse, with large reniform eyes in one genus. The mandibles are rather slender, without palpi.

#### GENUS SCYPHAX, Dana.

*Oculi grandes. Antennæ pediformes, ad articulationem 5tam non geniculatæ, flagello 1-3-articulato articulis apicalibus minutis exclusis. Articulatus maxillipedis terminalis latus et margine lobatus. Styli caudales ac in Oniscinis. Pedes septimi valde minores, debiles.*

Eyes quite large. Antennæ pediform, not geniculate at the fifth articulation, flagellum 1-3-jointed, the minute apical excluded. Terminal joint of maxillipeds broad and serrately lobed. Stylets as in the *Oniscinæ*. Feet of seventh pair much smaller than the others, weak.

The sides of the head are occupied by the oblong reniform eyes. The antennæ are eight-jointed, and bend outward at the articulation between

the fourth and fifth joints; they have at apex, like those of the *Oniscinae*, two or three very short joints, the last of which is slender and somewhat spiniform, with short setules at the extremity. The legs are all similar, or nearly so, and subequal, excepting that the seventh pair is shorter and smaller, and unarmed with spinules. The last thoracic segment is correspondingly much shorter than the preceding. The mandibles have a denticulate apex, and plumose setæ beneath. The first pair of abdominal appendages in the male consists of a small branchial plate, and a jointed pediform organ, consisting of five joints and a small claw at apex. The other abdominal appendages to the fifth inclusive are nearly circular lamellæ. The stylets have a stout but very short base, and two styliform branches.

#### SCYPHAX ORNATUS.

*Corpus ellipticum, abdomine non abrupto angustiore quam thorax. Caput segmento proximo non brevius, transversim ellipticum, oculis latera capitis tegentibus. Segmenta thoracis subœqua. Abdomen 6-articulatum, segmentis duobus anticis thorace partim tectis, ultimum valde angustius, ad basin latius. Styli caudales fere abdominis longitudine, basi perbrevis, ramis paulo inœquis, hirsutiusculis. Antennæ dimidio corporis paulo longiores. Antennæ pedesque minute hirsuti.*

Body elliptic, abdomen not abruptly narrower than thorax. Head not shorter than following segment, transversely elliptical, eyes occupying the whole of the lateral margin. Segments of thorax subequal. Abdomen six-jointed, two anterior segments partly concealed by thorax, last segment very much narrower than preceding and widest at base. Caudal stylets as long as abdomen, branches little unequal, minutely hirsute. Antennæ a little longer than half the body. Antennæ and feet minutely hirsute.

Plate 48, fig. 5 *a*, animal, enlarged; *b*, *b'*, antenna; *c*, *c'*, mandible, in different positions; *d*, *e*, maxillæ; *f*, maxillipeds; *g*, *g'*, languette; *h*, *h'*, part of last pair of thoracic feet, from different specimens; *i*, second pair of abdominal appendages; *k*, *l*, third and fourth pairs; *m*, fifth pair; *n*, sixth pair or caudal stylets much enlarged; *o*, part of sixth pair of legs; *p*, part of seventh.

New Zealand, Bay of Islands; abundant on beach of Parua Harbour, and found in the sand by turning it over for a depth of a few inches; often seen running on the beach.

Length, 6–10 lines. Colour, variegated; irregularly spotted with bright yellow, red, brownish red, and jet black, producing a beautiful appearance; antennæ, colourless, or nearly so. Body quite evenly elliptical, and surface indistinctly a little spinulose. Posterior angles of thorax acute. Last abdominal segment subtriangular, with apex truncate, not more than half the width of the preceding. Caudal stylets have the branches straight; the base fills up the interval between the last two abdominal segments. Legs have second, third, fourth, and fifth joints subequal. Antennæ have last three joints together (corresponding to a flagellum) but little longer than the preceding one, and this a little longer than the next preceding; the first three about equal in length to last three.

Plate 48, fig. 6, represents a smaller animal, found in and upon the same beach, which we suspect to be young of the above. Still, the differences are so great, that we are not sure that it may not be a distinct species. The general form was that of an adult. The reasons for supposing it young, are the resemblance between the two in the outer maxillipeds, a general similarity in colouring, and their occurrence together in the same locality. All the specimens found were of the same size, being about two lines long. In the caudal extremity, the differences are very considerable. The last segment of the abdomen does not project at all between the stylets, so as to separate the bases of the stylets; on the contrary, these stylets are close alongside of one another from their bases; moreover, they project but very little beyond the outline of the abdomen, the large branch being very short and obtuse, and not long and subulate, as in the adult *ornatus*; and the smaller branch quite slender, and arising from a point far anterior to the base of the larger branch. The head is short transverse. The eyes are rather large and prominent. The antennæ are short and curve outward; they consist of five basal joints, and a terminal flagellum, which is indistinctly five or six-jointed; the surface is minutely spinulose. The last thoracic segment is not shorter than the preceding, and the last pair of thoracic legs is also of the usual size and character. The abdomen fills the concavity below the last

thoracic segment, and forms a semicircle beyond it. Last abdominal segment smallest; third, fourth, and fifth segments much produced backward on either side. Surface of thorax and abdomen with a few very short scattered spinules.

If this is a distinct species, it is also a new genus, the seventh pair of legs being of full size; and it may be named the *Actæcia euchroa*, the name by which it was designated by the author in his earlier manuscripts.

Plate 48, fig. 6 *a*, animal, enlarged three diameters; *b*, outline of back; *c*, outline of front of head; *d*, abdomen in outline, upper view; *e*, antenna, enlarged; *f*, outer maxilliped; *g*, extremity of one of the legs; *h*, caudal appendages, under view.

GENUS STYLONISCUS, Dana.

*Oculi mediocres. Antennæ ad articulationem 5tam geniculatæ, flagello multiarticulato, elongato. Styli caudales ac in Oniscinis. Pedes septimi vix minores, non debiles.*

Eyes of moderate size. Antennæ geniculate at the fifth articulation, flagellum multiarticulate, elongate. Caudal stylets as in the *Oniscinæ*. Feet of seventh pair of full size.

The species of this genus approach the *Lygiæ* in form, and one of the two here described has the base of the stylets oblong and projecting much behind the abdomen. The last abdominal segment does not project backward between the caudal appendages. The head is not set deeply into the next segment, as in the *Porcellios*, and has the posterior margin little arcuate.

STYLONISCUS MAGELLANICUS.

*Corpus nitidum, angustè ellipticum, anticè rotundatum. Abdomen thorace subito paulo angustius, oblongum, segmento secundo brevissimo, ultimo non longiore quam penultimum. Caput segmento proximo paulo brevius et paulo angustius. Styli caudales divaricati, fere abdo-*

*minis longitudine, ramo majore fere duplo longiore quam minor. Antennarum flagellum subulatum, 7-10-articulatum.*

Body shining, narrow elliptical, rounded in front. Abdomen abruptly a little narrower than thorax, oblong, second segment very short, last not longer than penult. Head a little shorter and narrower than next segment. Caudal stylets divaricate, nearly as long as abdomen, longer branch nearly twice the length of the other. Flagellum of antennæ subulate, seven to ten-jointed.

Plate 48, fig. 7 *a*, animal, enlarged; *b*, antenna; *c*, extremity of antenna; *d*, maxilliped; *e*, maxilla of second pair; *f*, extremity of leg of seventh pair; *g*, caudal stylets.

In damp woods, under rotten stumps and trunks of trees, near Nassau Bay, Tierra del Fuego.

Length, four lines. Colour, dirty brown, a little clouded. The head is transverse, and arcuate less behind than before. The first three thoracic articulations are convex backward; the last two convex forwards. Lateral margins of thoracic segments finely serrulate, with a few minute spinules at intervals. Last joint of base of antennæ longer than preceding and a little shorter than flagellum; posterior margin very minutely and evenly spinulose; anterior margin with four or five short spines. Claw of legs short and more or less spinous. In the posterior pair, the outer or superior margin of the fifth joint is finely pectinated for a part of its extent; on the inner side, adjoining the base, the joint is enlarged and villose, and there are a few short spinules beyond. The pectination on the dorsal margin of the joint is seen only with a high magnifier, and is often not visible in dried specimens.

#### STYLONISCUS LONGISTYLIS.

*Corpus angusto-ellipticum, anticè rotundatum. Abdomen thorace subito angustius, subquadratum, latitudine parce longius, articulis sex subæquis. Segmenta thoracis subæqua, anticum parce longius. Styli caudales elongati, basi oblongo (dimidio abdominis longiore) crasso,*

*ramo majore abdominis longitudine, crassè subulato. Antennæ longæ, flagello fermè 16-articulato, subtiliter spinuloso.*

Body narrow elliptic, rounded in front. Abdomen abruptly narrower than thorax, subquadrate, a little longer than broad; segments six, subequal. Segments of thorax subequal, the first slightly the longest. Head transverse. Caudal stylets elongate, base oblong (longer than half the abdomen), longer branch as long as abdomen, stout subulate. Antennæ long, flagellum about sixteen-jointed, minutely spinulous.

Plate 48, fig. 8 *a*, animal, enlarged; 8 *b*, part of flagellum, more enlarged.

Island of Tongatabu, Friendly Islands.

Length, about three lines. The articulation behind the head is but little arcuate. The abdomen has the last segment but slightly longer than preceding, and obtuse behind. The stylets are peculiar in having an oblong base; the bases of the two are parallel, but the longer branch diverges widely from the medial line. The flagellum of the antennæ is longer than the preceding joint, and that is but little longer than the next preceding. The joints of the flagellum are somewhat oblong, and have a circle of minute setules at apex. The legs are minutely spinulous.

#### SUBFAMILY LYGINÆ.

#### LYGIA EHRENBERGII?

Plate 49, fig. 1 *a*, animal, enlarged; *b*, abdomen, more enlarged; *c* to *g*, abdominal appendages of the five pairs in succession.

Island of Madeira.

Length, eight to nine lines. Colour, grayish, or dotted with black on a light ground. Length of body, excluding stylets, to breadth, as 17 to 7. Eyes large, black. Abdomen narrow, abruptly much nar-

rower than thorax, the first abdominal segment being about two-thirds as broad as the last thoracic. Caudal stylets slender, the base as long as the abdomen, a little incurved; setæ about equal, fully as long as whole body (the stylets excluded). Antennæ as long as the body; last basal joint nearly twice as long as preceding; flagellum about twenty-three-jointed.

LYGIA NOVI-ZEALANDIÆ.

*Latiior, elliptica, dorso scabriculo. Abdomen thorace non subito angustius, segmento postico longiore, posticè paulo arcuato, angulis breviter acutis. Styli caudales basi fere abdominis longitudine, ramis scabriculis, multo inæquis, thorace non longioribus. Antennæ corporis longitudine, flagello 18-21-articulato, scabriculo.*

Elliptical, broader than preceding species. Surface of thorax and abdomen covered with very short hairs. Abdomen not suddenly narrower than thorax; last segment arcuate behind, and angles short acute. Base of caudal stylets nearly as long as abdomen; branches quite unequal, scabrous, the longer hardly as long as thorax. Antennæ as long as the body, finely scabrous; flagellum 18-21-jointed.

Plate 49, fig. 2 *a*, animal, enlarged; *b*, view of flagellum, more enlarged; *c*, outline of extremity of abdomen; *d*, part of larger seta of stylet.

Along shores of Bay of Islands, New Zealand, under kelp, &c.

Length, six lines; width of the head, about half that of the thorax; longer caudal seta, stouter than the other; last joint of base of antennæ, about four-fifths the preceding; penult joint of all the legs, excepting anterior pair, very slender and styliform; in fourth pair, about five-fourths the length of the fourth joint; third, fourth, and fifth segments of the abdomen much prolonged backward on either side, the prolonged sides of the penult segment reaching nearly as far as the angles of the last segment.



*Lygia australiensis*.—(Pl. 49, f. 3.) We thus indicate a species which was collected by us in New South Wales, but of which our single specimen is in too mutilated a state for full description, as it wants both the antennæ and stylets. The abdomen has the three segments before the last but little prolonged backward on either side, and the sides of the penult do not reach half way to the angles of the last segment. The postero-lateral angles of the last segment are very short acute, and do not reach beyond the low tooth on the posterior margin at the base of the stylets. The body is rather narrow, and the surface is fine granulous all over, the granules scattered. Length of body, seven lines.

LYGIA HAWAIIENSIS.

*Corpus sat latum, fere læve, ad abdominis basin paulo interruptum. Oculi pergrandes, superficie frontali oculos sejungente duplo breviora quam oculi. Antennæ fere corporis longitudine, flagello 27–28-articulato, articulis plerumque triplo vel quadruplo longioribus quam latis, spinulis subtilissimis, perpauca, dimidio latitudinis articuli brevioribus. Segmentum abdominis ultimum non duplo latius quam longum, angulis postero-lateralibus brevissimè acutis, margine postico paulo triangulato, versus angulos parce undulato sine dente acuto.*

Body rather broad, very nearly quite smooth, a little interrupted at base of abdomen. Eyes quite large, the frontal surface between them, not half as great as the horizontal length of the eye. Antennæ very nearly of the length of the body; flagellum 27–28-jointed, joints mostly three or four times as long as broad; spinules very minute and few, not as long as half the breadth of the joints. Last segment of abdomen not twice as broad as long; posterior angles very short acute; posterior margin somewhat triangulate, towards the angles a little undulate, but without an acute tooth.

Plate 49, fig. 4 *a*, animal (except caudal stylets), enlarged three diameters; *b*, part of flagellum of antennæ from basal half; *c*, extremity of flagellum; *d*, extremity of leg of seventh pair; *e*, outline of extremity of abdomen, more enlarged.

Oahu and Kauai, Hawaiian Islands.

Length of body, eight lines. The acute latero-posterior angles of the last abdominal segment are very short, not reaching beyond the obsolescent rounded tooth at the base of the stylets. In this respect, as well as the smooth body, much shorter space between the eyes, and longer joints of the flagellum, this species differs from the *L. occidentalis*. The abdomen at base is but slightly narrower than the posterior part of the thorax, the general outline of the two being continuous. The antennæ are shorter and smoother than in the *cursor*, with longer joints to the flagellum.

*Lygia vitiensis*.—A species of *Lygia* was collected at the Feejees, differing from the *hawaiiensis*; but the only specimen is mutilated in its last abdominal segment, besides wanting the stylets and antennæ. The surface is quite smooth, unlike the above; also the last abdominal segment is full twice as broad as long. The abdomen at its third segment is not abruptly narrower than the thorax, and the sides of the third, fourth, and fifth segments are much prolonged backward. The legs have very few spinules on the joints. The medial point of the posterior margin of the last segment of the abdomen, appears to project but little beyond the low tooth at the base of the stylets, the extremity being very low triangular. The fourth joint of the sixth and seventh pairs of legs projects but little (not half its length) beyond the side of the thorax, when in their natural position for walking.

Plate 49, fig. 5 *a*, extremity of abdomen, exclusive of latero-posterior angles, which are broken, but appear, from what remains, to have been rather long acute; *b*, leg of fifth pair, enlarged.

LYGIA GAUDICHAUDII ?

Common at Manila, Luzon, and at Singapore.

Plate 49, fig. 6 *a*, head and first thoracic segment; *b*, extremity of abdomen; *c*, caudal stylets; *d*, base of antennæ; *e*, basal part of fla-

gellum, more enlarged; *f*, extremity of flagellum, *ibid.*; *g*, tarsus of sixth or seventh pair of legs; *h*, outline of eye, in lateral view.

Length, twelve lines, exclusive of caudal stylets. Base of stylets as long as breadth of last abdominal segment; the branches equal, slender, with an oblique seta at apex of the inner. Joints of flagellum mostly having their length more than twice their breadth, twenty-seven to thirty-two in number, the spinules few, exceedingly short, not one-fourth the diameter of the joints in length; terminal joints appear scabrous under a high magnifying power. The last segment has the posterior angles prominent and acute; and a short distance inside of the angles, the posterior margin has a crenature with an angle either side, while the middle of the margin is low triangular and subacute. Surface of thoracic segments very nearly smooth.

#### LYGIA OCCIDENTALIS.

*L. Gaudichaudii affinis.* *Segmenta thoracis plane sed minutè granulata. Antennæ thorace non longiores, flagello 16-18-articulato, articulis versus basin latitudine raro duplo longioribus, spinulis subtilissimis, paucis. Styli caudales fere dimidii corporis longitudine, basi latitudinem segmenti ultimi vix æquante, ramis æquis, interno setâ obliquâ confecto.*

Near the *Gaudichaudii*. Segments of thorax distinctly though minutely granulate. Antennæ not longer than thorax; flagellum sixteen to eighteen-jointed; joints towards basal portion rarely twice as long as broad; spinules very minute and few. Caudal stylets not half as long as body; base shorter than breadth of last abdominal segment; branches equal, the inner with an oblique seta at apex.

Plate 49, fig. 7 *a*, abdomen, enlarged; *b*, part of base of antennæ; *c*, basal part of flagellum; *d*, extremity of flagellum; *e*, tarsus of sixth or seventh pair of legs.

Near Sacramento River, California.—C. Pickering.

Length, exclusive of caudal stylets, one inch. The eyes are large

and the front narrow, as in the *L. Gaudichaudii*. The antennæ and stylets are shorter, and the extremity of the flagellum was not scabrous, or scarcely so; the last joint is about as long as the preceding. The granulation of the surface is also much more distinct than in the *Gaudichaudii*.

## LYGIA CURSOR.

*Antennæ cephalothoracis longitudine, flagello 21-articulato [in specimine scrutato post 14 articulos constricto deinde articulis septem brevioribus confecto] versus apicem setis latitudinis articulo longitudine sæpeque setulâ utrinque armatis. Abdomen parce longius quam latum, thorace subito paulo angustius, segmento postico apice triangulato, angulis posticis breviter acutis.*

Antennæ as long as the cephalothorax, flagellum twenty-one-jointed [in the specimen examined, after the fourteenth joint, a constriction and then seven smaller joints]; surface of the joints towards extremity bearing many setæ, which are as long as the diameter of the joints, and have often a setule on either side. Abdomen sparingly longer than its breadth, abruptly a little narrower than thorax; last segment triangulate at apex, the posterior angles short acute.

Plate 49, fig. 8 *a*, abdomen, without the stylets, enlarged; *b*, antenna; *c*, extremity of flagellum, more enlarged.

Valparaiso ?

Length of body, exclusive of stylets, ten lines. The stylets were not present in our specimen. The last joint of the flagellum is much longer than the preceding, and as in other species, has a tuft of setules or very short hairs at apex, as seen when magnified. The constriction in the flagellum appears to separate the extremity from the rest, and as it occurs just seven joints from the extremity (one-third the whole number), it may be a permanent characteristic of the species.

## FAMILY ASELLIDÆ.

## SUBFAMILY ASELLINÆ.

## GENUS JÆRA.

## JÆRA PUBESCENS.

*Corpus elongato-ellipticum, pubescens, anticè truncatum, medio fronte apiculatum. Oculi parvuli, remoti. Caput segmento sequente longius. Abdomen rotundato-ovatum, prope basin suturâ obsoletâ notatum. Styli caudales dimidii abdominis longitudine. Pedes subæqui. Antennæ internæ basi externarum paulo breviores; externæ dimidio corporis longiores, flagello tenuissimo, duplo longiore quam basis.*

Body oblong-elliptic, pubescent, truncate in front and apiculate at middle. Eyes quite small, remote. Head longer than next segment. Abdomen round-ovate; an indistinct suture near base. Caudal stylets half as long as abdomen, three or four-jointed. Feet subequal, apex prolonged beyond the claws. Inner antennæ shorter than base of outer; outer longer than half the body; flagellum twice longer than basal portion, very slender.

Plate 49, fig. 9 *a*, animal, enlarged; *b*, part of flagellum of outer antennæ; *c*, extremity of leg; *d*, abdomen in outline.

From Nassau Bay, Tierra del Fuego, found parasitic on the large common *Spheroma*, *S. lanceolata*.

Length, one line. The greatest breadth of the body is nearly twice that of the head; head but slightly narrower than first thoracic segment; length of head about half its breadth. Base of outer antennæ as long as breadth of head, four-jointed, fourth joint scarcely longer than the third. Thoracic segments gradually shorter from the fourth to the last, and the last not half the length of the fourth. The stylets are largish at base.

## SUBTRIBE III. CYMOTHOIDEA.

EXCLUDING the Praniza and Serolis groups from the Cymothoidea, this subtribe has trenchant limits. The large abdomen, having the last segment broad and often scutiform, widened on either side by the lamellate or falciform caudal appendages, so as to make it a powerful natatory organ, give a peculiar character to the species. The five anterior pairs of abdominal appendages have a general similarity of form and structure, and are not divided between the third and fourth pairs into two series, like the Amphipods, and the Serolis group of Anisopods. The anterior pair of legs is sometimes more or less subcheliform, but rarely the second pair, unless at the same time the following pair and others, are also subcheliform.

The families in this subtribe are as follows:—

Fam. I. CYMOTHOIDÆ.\*—Maxillipedes breves, 3-4-articulati, operculiformes, articulis terminalibus angustis, brevibus. Appendices caudales liberæ, marginibus rarissimè ciliatæ. Antennæ sub capite infixæ. Abdomen 4-6-articulatum, segmentis anterioribus raro coalitis. Pedes toti ancorales. Branchiæ sæpissime non ciliatæ. Epimeræ conspicuæ.

Fam. II. ÆGIDÆ.†—Maxillipedes elongati, 4-6-articulati, articulis totis lamellatis, terminalibus latis et brevibus. Appendices caudales liberæ, marginibus ciliatæ. Antennæ ad frontis marginem capitis affixæ, apertæ. Abdomen 4-6-articulatum. Pedes 6 antici interdum ancorales aut prehensiles, sæpe simpliciter unguiculati, 8 postici unguiculati et nunquam ancorales. Branchiæ ciliatæ. Epimeræ conspicuæ.

Fam. III. SPHEROMIDÆ.—Maxillipedes elongati, 5-6-articulati et palpi-

\* *Cymothoadiens Parasites*, Edwards, Crust., iii., 228, 247.

† *Cymothoadiens Errans*, Edwards; *ibid.*, 228, 233.

formes. Appendices caudales margini abdominis laterali per ramum internum conjunctæ. Antennæ ad frontis marginem capitis affixæ, apertæ. Abdomen 1-2-articulatum. Pedes non ancorales [raro 4 antichi ancorales]. Branchiæ ciliatæ. Epimeræ non distinguendæ.

The Cymothoidæ, in their non-ciliate branchiæ and simply operculiform maxillipeds, appear to rank first in this subtribe. The high value of this non-ciliate character of the branchiæ in fixing the rank of the species, is apparent from the fact, that they are in this particular farthest removed from the Amphipods. In the passage to the Amphipod form, the first step is a ciliation of the margin, the next, an elongation of form, and finally appears the oblong natatory shape. The Cymothoidæ pass into the Ægidæ through certain species of the former group (Ægathoinæ), in which the caudal pair of abdominal appendages is ciliated, as in the Ægidæ, though not the branchial pairs.

The Ægidæ, hitherto ranked in the same family with the Cymothoidæ, have, in fact, an intermediate character between them and the Spheromidæ. Like the former, it is true, they have the caudal stylets free, and not attached by one of the plates to the abdomen; besides, the joints of the abdomen are free, and there are distinct thoracic epimerals: but in other important characteristics they are Spheromoid. For example, the antennæ are attached to the front margin of the head, and not to its under surface; the branchial leaflets are ciliated; the maxillipeds have usually the full number of joints, although unlike those of the Spheromidæ in being broad and short; the feet are not all ancoral, only the six anterior pair at the most having this character. The Spheromidæ are peculiar in their one or two-jointed abdomen, the more elongated palpiform maxillipeds, the absence of distinct epimerals, and in having the caudal stylets fixed by the inner plate to the side of the abdomen.

The following are the subfamilies and genera of these groups:—

#### FAM. I. CYMOTHOIDÆ.

SUBFAM. 1. CYMOTHOINÆ.—Lamellæ caudales nudæ. Abdomen multiarticulatum, segmentis liberis.

G. 1. CYMOTHOA, *Fabr.*—Femora lata, posteriora latissima. Segmenta thoracis

2 3ve postica multo breviora nunquam latere acutè producta. Segmentum caudale sæpissimè valde transversum. Antennæ graciles, 1mæ ad basin paulo remotæ.

G. 2. CERATOTHOA, *Dana*.—*Cymothoæ* affinis. Caput postice latum, fronte productum et sæpe angustum. Antennæ 1mæ crassæ, basibus conjunctæ.

G. 3. LIVONECA, *Leach*.—Femora latiuscula, 6ta vel 7ma 5tis vix latiora, non angustiora. Segmenta thoracis 3tium 4tum, 5tum 6tum longitudine fere æqua, 7mum paulo brevius. Abdomen thorace subito vix angustius. Caput parvulum. Frons non involutus et in processum inter-antennalem conspicuè non productus. Segmentum caudale vix transversum. [Corpus sæpe obliquè distortum.]

G. 4. ANILOCRA, *Leach*.—Femora angusta, posteriora angustiora. Segmenta thoracis ac in *Nerocilâ*. Abdomen thorace subito angustius, segmentis processu laterali spiniformi infra non instructis, ultimo vix transverso.—Subgenus *Anilocra* ramis appendicis caudalis multo inæquis; *Canolira*, *Leach*, ramis iisdem subæquis.

G. 5. NEROCILA, *Leach*.—Femora angusta, posteriora angustiora, pedibus posticis minoribus. Segmenta 2dum 3tium 4tum 5to 6to 7mo multo breviora. Abdomen thorace subito angustius, segmentis processu laterali spiniformi infra instructis, ultimo vix transverso.

G. 6. OLENCIRA, *Leach*.—Femora latitudine mediocria. Segmenta thoracis 3 postica anterioribus non longiora. Abdomen thorace subito multo angustius, segmentis processibus spiniformibus infra non instructis, ultimo non transverso.

SUBFAM. 2. OROZEUKTINÆ.—Segmentum abdominis posticum ac in *Cymothoâ*; alia coalita et non libera.

G. 1. OROZEUKTES, *Edw*.

SUBFAM. 3. ÆGATHOINÆ.—Lamellæ caudales ciliatæ. Abdomen multiarticulatum, segmentis liberis.

G. 1. ÆGATHOA, *Dana*.—Abdomen thorace subito non angustius, segmentis subæquis. Caput latum, subtriangulatum, segmento proximo parce angustius. Oculi grandes.

## FAM. II. ÆGIDÆ.

SUBFAM. 1. ÆGINÆ.—Pedes 6 antici ancorales, unguibus validis confecti, reliqui unguibus parvulis.

G. 1. ÆGA, *Leach*.—Pedes 6 antici æque ancorales. Antennæ 1mæ basi contiguous; 2dæ per epistomatis processum sejunctæ. Frons non saliens.

Subgenus 1. ÆGA.—Oculis remotis; antennis 1mis basi complanatis.

Subgenus 2. CONILERA, *Leach*.—Oculis remotis; antennis 1mis basi subcylindricis.

Subgenus 3. ROCINELA, *Leach*.—Oculis grandioribus inter se fere contiguis, antennis 1mis basi complanatis.



- G. 2. *ACHERUSIA*, *Lucas*.—*Ægæ* affinis. Antennæ 2dæ per processum non se-junctæ. Frons capitis saliens.
- G. 3. *PTERELAS*, *Guerin*.—*Ægæ* affinis. Pedes 2di 3tii sæpeque 1mi subdidactyli, processu e articulo penultimo instar digiti immobilis processu sive acuminato sive acie instructo.

SUBFAM. 2. *CIROLANINÆ*.—Pedes nulli ancorales.

- G. 1. *CIROLANA*,\* *Leach*.—Segmenta thoracis subæqua. Pedes unguibus parvulis confecti. Antennæ 2dæ per processum epistomatis tenuem sejunctæ. Abdomen 6-articulatum.
- G. 2. *CORALLANA*, *Dana*.—Segmenta thoracis subæqua. Pedes unguibus parvulis confecti. Antennæ 2dæ epistomate transverso latissimè sejunctæ et partim tectæ, epistomate antennisque 1mis latè conniventibus.
- G. 3. *ALITROPUS*, *Edw*.—Segmenta thoracis 3 postica anterioribus longiora, ac in *Nerocilâ*. Pedes unguibus crassiusculis confecti.

FAM. III. *SPHEROMIDÆ*.

SUBFAM. 1. *SPHEROMINÆ*.—Lamella appendicis caudalis externa sub internâ se latens. Pedes nulli ancorales.

1. *Corpus in globum contractile*.

- G. 1. *SPHEROMA*, *Latr*.—Lamellæ appendicis caudalis subæquæ.

2. *Corpus in globum non contractile*.

- G. 2. *CYMODOCEA*, *Leach*, *Edw*.†—Caput valde transversum, multo convexum. Lamellæ appendicis caudalis subæquæ.
- G. 3. *CERCEIS*, *Edw*.—Caput parce transversum, subtriangulatum, vix convexum. Antennæ 1mæ quoad basin capite tectæ, processu non sejunctæ.
- G. 4. *CASSIDINA*, *Edw*.—Corpus latum. Caput valde transversum. Lamellæ appendicis caudalis angustæ, valde inæquæ, externâ parvulâ. Antennæ 1mæ quoad basin processu frontis sejunctæ.
- G. 5. *AMPHOROIDEUM*, *Edw*.—Antennæ quoad basin lamellate portentosè productæ.

SUBFAM. 2. *NESÆINÆ*.—Lamella appendicis caudalis externa sub internâ se non latens, usquam aperta. Pedes nulli ancorales.

\* *Eurydice* and *Nelocira* of Leach are here included.

† *Dynamena* of Leach is included.

G. 1. NESÆA, *Leach, Edw.*\*—Lamella caudalis externa recta.

G. 2. CAMPECOPEA, *Leach.*—Lamella caudalis externa arcuata.

SUBFAM. 3. ANCININÆ.—Pedes 4 antici ancorales.

G. ANCINUS, *Edw.*—Appendices caudales unâ lamellâ oblongâ saliente basi que brevissimo instructæ.

The genus ANCINUS, we suspect may belong with the Anisopods, from the fact, that the two anterior pairs of legs are alike and unlike the following, this seeming to point to the serial arrangement of the legs 2 : 2 : 3, instead of that of 3 : 4, as in true Isopods. But, having seen no specimen of the genus, we leave it in this place, where it is arranged by Edwards. If Anisopodan, the type of structure is still like that of the Spheromidæ.

---

## FAMILY I. CYMOTHOIDÆ.

### SUBFAMILY CYMOTHOINÆ.

#### CYMOTHOA EXCISA. *Perthy.*

*Corpus subovatum, crassum. Caput transversum, fronte arcuatum, inter segmenti thoracis 1mi processus dimidio inclusum, processibus subconicis, obtusis vel subacutis. Abdominis segmentum posticum plus duplo latius quam longum, margine postico paulo excavato. Articulus 1mus pedis 4ti versus basin tuberculo infra non armatus nec angulatus, pedis 7mi latissimus, parce longior quam latus. Styli caudales breves, ramis subæquis.*

Body subovate, stout. Head transverse, rounded anteriorly; processes of anterior segment of thorax either side of head projecting to half the length of the head. Caudal segment very broad, much more than twice as broad as long; posterior margin a little excavate. First joint of fourth pair of legs without a prominence below near

\* *Cilicæa* of Leach is included.

base, and not angulate, of seventh pair very broad, but not as broad as its length. Caudal appendages shorter than the last segment, branches subequal.

Plate 49, fig. 10 *a*, dorsal view, enlarged; *b*, ventral; *c*, leg of seventh pair; *d*, caudal appendage.

Rio Janeiro, from the outside of a fish, frequently about the head, and especially the upper part.

Length, one to one and one-eighth inches. Colour, pale yellowish white. Greatest breadth at articulation between fourth and fifth thoracic segments. Body somewhat compressed. Form and outline of head nearly semicircular. Abdomen one-third narrower at base than across last segment. Branches of caudal appendages a little unequal, slightly incurved, obtuse. Antennæ about seven-jointed. In female, membranous plates attached to ten posterior legs, which cover the whole thoracic venter; eggs abundant under them. Liver consists of two oblong masses, which extend either side of the intestine through the three anterior segments.

Var. *compressa*.—Plate 49, fig. 11 *a*, represents a *Cymothoa*, from Rio, probably a variety of the preceding. The body is more narrow and compressed; the last abdominal segment has the basal angles a little prominent, and is broadest at base, with the posterior side arcuate, and breadth about twice the length; the caudal appendages (fig. 11 *b*) extend quite to line of extremity of abdomen; the first thoracic segment projects either side of head, almost quite to line of front, and the projections are obtuse. Shell much thicker than the above.

*Cymothoa excisa*, PERTHY, Delect. An. Artic. Brasil. col. Spix et V. Martius, p. 211, pl. 40, f. 11.

#### CYMOTHOA FRONTALIS? *Edwards*.

Plate 49, fig. 12 *a*, dorsal view; *b*, extremity of abdomen.

Oahu, Hawaiian Islands; from the body of a fish.

Length, eight lines; length of head, equal to its greatest breadth.

Cephalothorax broader posteriorly. First joint of thorax nearly twice as long as second; second, third, and fourth subequal; the following shorter than preceding and subequal. Lateral angles obtuse. First five segments of abdomen together, about equal the last; last twice as broad as long, arcuate behind (thus differing from the preceding species). Stylets reaching as far backward as extremity of caudal segment; branches straight and rounded at apex.

## CYMOTHOA RECTA.

*Corpus latè lineare, lateribus parallelis. Caput paulo transversum, antice arcuatum, inter segmenti sequentis processus plus dimidio inclusum, processibus extremitate latis, arcuatis vel subtruncatis. Abdomen basi angustum, segmento ultimo parce latiore quam thorax, multo transversum, postice arcuatum, stylis extremitatem abdominis fere attingentibus, ramis obtusis, externo parce arcuato. Articulus 1mus pedis 4ti latus, postice versus basin subrectangulatus, non tuberculiger, pedis 7mi perlatus, parce oblongus.*

Body broad linear, the sides being parallel. Head somewhat transverse, anteriorly arcuate; processes from following joint projecting beyond half the length of the head and very broad at extremity, and rounded or subtruncate. Abdomen narrow at base, last segment sparingly broader than thorax, very transverse; posterior margin arcuate, stylets reaching nearly or quite to line of extremity; stylets obtuse, outer slightly curved. First joint of fourth pair of feet quite broad, posteriorly near base subrectangulate but with no tubercle; of seventh pair very broad, a little oblong.

Plate 49, fig. 13 *a*, animal in outline, enlarged two diameters; *b*, leg of fourth pair; *c*, leg of fifth pair.

Obtained by Dr. C. Pickering, at Hilo, Hawaii.

The parallel sides of this species distinguish it from other species. The first thoracic segment has the breadth about twice as great as the length behind the head; the next three segments are each about three times as broad as long, and the last three, about five times as

broad as long. The posterior epimerals are smaller than the anterior.

GENUS CERATOTHOA, Dana.

*Cymothoæ affinis.* Caput postice latum, fronte productum et sæpe angustum. Antennæ 1mæ crassæ et basi contiguæ.

Near *Cymothoa* in most characters. Head broad at base, but with the front produced and often narrow. Superior antennæ stout and exposed nearly from base, in contact at base.

The caudal stylets are often partly concealed under the sides of the abdomen. This genus is in part *Cymothoa* of authors.

CERATOTHOA LINEARIS.

*Corpus elongatè lineare.* Caput transversum, fronte saliens, processibus anticis segmenti sequentis perbrevibus. Segmenta thoracis 4 antica paulo breviora quam lata. Antennæ ante frontem salientes, compressæ, validæ, 1mæ 5-articulatæ, 2dæ 7-articulatæ parce longiores. Segmentum abdominis ultimum paulo transversum, thorace non angustius, postice profundè emarginatum, angulis posticis latè rotundatis.

Body long linear. Head transverse, front prominently projecting; processes of next joint either side of head very short. Four anterior segments of thorax much longer than half their breadth. Antennæ prominent, compressed, very stout; first pair five-jointed, second pair seven-jointed, a little the longer. Posterior abdominal segment somewhat transverse, not narrower than thorax, posterior angles very broadly rounded, and margin behind deeply emarginate.

Plate 50, fig. 1 *a*, dorsal view, somewhat enlarged; *b*, ventral view; *c*, under view of head; *d*, mandible.

From a fish in the Gulf Stream.

Length, one and one-fourth inches. Antennæ curve around in a semicircle near the head; third and fourth joints of second pair longer than second joint. The four anterior thoracic segments are but little shorter than their breadth. The epimeral pieces of the anterior segments of thorax are oblong and prominent either side. Coxæ of legs very broad, claws large and much curved. Caudal appendages do not extend beyond the extremity of the abdomen; not seen in dorsal view, being concealed under the margin. Eyes near anterior angles of head, not very distinct.

## CERATOTHOA CRASSA.

*Corpus latum, crassum, subovatum, segmento thoracis 4to duplo latiore quam 1mum. Caput fronte productum. Segmentum thoracis 1mum capite subito latius, antice parce productum, processibus latis, truncatis. Segmentum caudale 4to thoracis segmento paulo angustius, duplo latius quam longum, extremitate rectiusculum, parce excavatum, stylis caudalibus brevibus, non exsertis, ramis ovatis, subacutis. Coxa pedis 7mi latè transversa.*

Body broad and stout, subovate; fourth thoracic segment twice broader than first. Head produced in front. First thoracic segment abruptly wider than head, the processes either side of head very short, but wide and truncate in front. Caudal segment a little narrower than the fourth thoracic, twice as broad as long; posterior margin nearly straight transverse, slightly excavate; caudal stylets short, not exsert, branches ovate, subacute. Coxa of seventh pair of feet very broad transverse.

Plate 50, fig. 2 *a*, body in outline, enlarged one and one-half diameters; *b*, stylets, enlarged one and one-half diameters; *b'*, same, more enlarged; *c*, leg of sixth pair, showing coxa much wider than its length.

From the Southwestern Pacific.

Length of body, thirteen lines; breadth at middle, six lines; breadth of last abdominal segment, five lines. The preceding four

abdominal segments are as broad nearly or quite as the last thoracic segment. The antennæ are stout and flattened, and project either side of the prominent front.

The specimen is a dried one, and in some points the body may have lost somewhat its natural shape. The projections of the first thoracic segment either side of the head, are exceedingly short in the specimen, though broad, and have the anterior margin straight transverse, with the outer side a little revolute, and having an edge rising upward from the antero-lateral angle of the projection.

GENUS LIVONECA, *Leach*.

LIVONECA LONGISTYLIS.

*Corpus duplo longius quam latum. Segmentum abdominis posticum paulo transversum, basi latius, posticè obtusi-angulatum. Styli caudales segmentum caudale multum superantes, angulo basis interno obtuso, ramis inæquis, lamellatis, interno obliquè truncato, externo obtuso, recto, longiore. Epimeræ breves, acuminatæ, obtusæ, segmenta vix superantes.*

Body twice as long as broad. Last abdominal segment, shorter than broad, broadest at base, obtuse-angled behind. Caudal appendages extending a little beyond apex of abdomen; inner angle of base obtuse, branches unequal, lamellar; inner obliquely truncate, outer obtuse, straight, longer than the inner. Epimerals short, acuminate, obtuse, hardly reaching beyond their respective segments.

Plate 50, fig. 3 *a*, dorsal view; *b*, caudal appendage.

Rio Janeiro; found within the gills and on the body of an Ehippus; also, from the Sandwich Islands.

Length, about one inch. Colour, pale yellowish. Head semicircular in front; posterior angles projecting; eyes indistinct. Thoracic segments subequal, first longest, not extending forward either side of head. Claws of third pair of legs not smaller than on preceding pair; of seventh pair a little smaller than the preceding, but leg scarcely at

all more slender, its basal joint about as long as following portion. Posterior antennæ a little the longer, nine (or ten) jointed, last three joints smaller than the preceding; anterior pair eight-jointed, three basal joints largest. Caudal segment much narrower than tergal part of last thoracic segment.

The *L. Redmannii*, as figured by Milne Edwards, has not the inner branch of the stylets obliquely truncate, as in the *longistylis*.

## LIVONECA EMARGINATA.

*Corpus duplo longius quam latum. Segmentum abdominis posticum paulo transversum, fere semicirculare, posticè emarginatum, basi latius. Appendices caudales segmentum caudale superantes, angulo basis interno elongato, subacuto, ramis valde inæquis, interno brevi, crasso, compresso, ad apicem rotundato, externo tenui, obtuso, recto, longiore.*

Body twice as long as broad. Last segment of abdomen somewhat transverse, almost semicircular, emarginate behind, broadest at base. Caudal appendages extending beyond line of extremity of abdomen; inner angle of base elongate, subacute; branches much unequal; inner short, stout, compressed, rounded at apex; external slender, obtuse, considerably the longer.

Plate 50, fig. 4 *a*, dorsal view; *b*, caudal appendage.

From the body of a fish, at Rio Janeiro.

Length, one inch. Colour, whitish, a little yellow. Head nearly semicircular, a little more prominent; posterior angles projecting; eyes indistinct. Joints of thorax subequal, first segment longest. Five abdominal segments very short transverse, equal. Antennæ moniliform; posterior pair a little the longest; anterior eight-jointed, three basal joints largest; posterior nine-jointed, last three joints much smaller than preceding. Seventh pair of legs more slender than preceding, or a little longer, and claw smaller. Claw of third pair not smaller than that of second. The body is a little oblique, from its position on the fish.



## LIVONECA LATA.

*Corpus latius, sesqui longius quam latum. Segmentum abdominis ultimum dimidio thoracis latitudine, basi latius, postice arcuatum et non angulatum nec emarginatum. Styli caudales abdominis extremitatem non superantes, ramis latis, apice rotundatis, paulo inæquis. Epimeræ posticæ ultra segmentum paululo salientes et non attenuatæ, obtusæ.*

Body one and a half as long as broad. Last segment of abdomen half as broad as thorax, broadest at base, rounded behind, without an angle or emargination. Caudal stylets not reaching beyond line of extremity of abdomen, branches broad, rounded at apex, somewhat unequal. Posterior epimerals but slightly salient beyond the adjoining part of thoracic segment, not attenuated, obtuse.

Plate 50, fig. 5 *a*, animal, one and a half times the natural size; *b*, fourth, fifth, sixth, and seventh epimerals, left side, and part of attached segments; *c*, caudal stylet.

Sandwich Islands.

Length of body, eleven lines. Like the specimens of the other species, the body is distorted, owing to its position on the fish upon which it was found. The head is subtriangular, and its greatest breadth is about half that of the next segment. The posterior epimerals are the only ones that project beyond the segment adjoining, and these project but slightly. The caudal segment is much narrower than tergal part of last thoracic segment.

GENUS NEROCILA, *Leach*.

One of the most striking characters, separating *Nerocila* from either of the three preceding genera, is the different relative lengths of the six posterior thoracic segments. In *Livoneca*, these segments are subequal, as to length, the last being a little the shortest. In *Cymothoa*

and Ceratothoa, the three posterior are much shorter than the others, while in Nerocila, the three posterior are much longer than the others. Again, in the three preceding genera none of the thoracic segments nor their epimerals are acute behind, while in Nerocila, the posterior, at least, in all the species, are acute, and sometimes the anterior. The spiniform pieces below the abdominal segments distinguish the species from the Anilocræ, to which they are otherwise related.

## NEROCILA LATA.

*Corpus latius, vix sesqui longius quam latum. Thorax non oblongus segmentis 3 posticis latere acute productis. Epimeræ thoracis totæ acutæ, breves, 6tæ basin 7marum attingentes. Abdomen non oblongum, segmentis 5 anticis lateraliter productis, tenuibus, ultimo scutiformi, multo angustiore quam quintum, non oblongo, basi paulo latiore, extremitate late rotundatâ et medio subangulatâ. Appendices caudales aculeatæ, acutæ, externâ longiore, paulo curvatâ.*

Body broad; length about one and a half times its breadth. Thorax not oblong, armed with acute points on sides of last three segments. Epimerals of thorax all acute, short; sixth reaching base of seventh. Abdomen shorter than broad; five anterior segments laterally long-produced and slender, the last scutiform, not oblong, little broader at base, widely rounded at apex, a low angle at middle of posterior margin. Caudal appendages aculeate, both acute; the exterior longer and a little curved.

Plate 50, fig. 6 *a*, animal, natural size; *b*, same, more enlarged, ventral view; *c*, first antenna; *d*, second antenna, right side; *d'*, same, left side.

Rio Janeiro.

Length, one inch; greatest breadth, two-thirds of an inch. Colour bluish-slate, little clouded with a darker or brownish shade. Head small, posterior angles nearly acute, about as long as broad. Thorax not longer than greatest breadth. Epimerals all aculeate, increasing

in length from the first to the sixth; sixth and seventh equal. The lateral prolongations of the first five abdominal segments are as long on either side as half the rest of the segment, and those of the fifth segment project beyond base of stylets. The last segment is as long as the five preceding together. The shorter branch of the caudal appendages is about two-thirds as long as the longer. Antennæ short and slender, each pair seven-jointed, posterior a little the longer. Eyes scarcely apparent at the posterior angles of the head. Legs increase in size from first pair to sixth; seventh more slender than the preceding. First joint in all nearly cylindrical; second, third, and fourth joints together shorter than the first, except in the seventh pair, in which they are about as long as the first. Claw of seventh pair about half the size of that of the preceding pair. Branchial plates beneath abdomen oblong; exterior one with a very short transverse basal joint, the inner margin of which forms an angle posteriorly, which is subacute.

This is a broad species, like the *depressa*; but the anterior thoracic segments are not laterally prolonged, as in that species. The sixth and seventh thoracic epimerals are shorter than in the *Blainvillii*, and longer than in the *maculata*, or *aculeata*; moreover, the three posterior thoracic segments are acute on either side, unlike the *maculata* or *affinis*.

#### NEROCILA LATIUSCULA.

*Corpus ovatum, sesqui longius quam latum. Thorax parce oblongus, segmentis 5 anticis latere obtusis, duobus posticis acute productis; epimeris 2 anticis lateris utriusque extremitate rotundatis, proximâ subacutâ, reliquis acutis, sextâ basin 7mæ non attingente. Abdomen vix oblongum, segmento 5to basin stylorum utrinque attingente, segmento 6to paulo transverso, postice rotundato, medio emarginato (?). Styli caudales longi, ramis inaequis, externo styliformi.*

Body ovate, one and a half times as long as broad. Thorax sparingly oblong; five anterior segments obtuse, last two acutely produced into a spine either side; epimerals of first two segments obtusely rounded, next subacute, the rest acute; sixth not reaching to base of seventh. Abdomen hardly oblong; fifth segment prolonged either side to base of caudal stylets; sixth segment a little transverse,

rounded behind, emarginate (?) at middle. Caudal stylets long, branches unequal, outer branch styliform.

Plate 50, fig. 7 *a*, body, enlarged one and a half diameters; *b*, side view, showing epimerals, enlarged two diameters.

Rio Janeiro.

Length, one inch; breadth, six to six and a half lines. Like the *maculata* and *affinis*, the five anterior thoracic segments are obtuse either side; but the epimerals are not all acute, those of the second and third thoracic segments being rounded, and as long as the tergal part of the segment, and those of the third segment are hardly acute. In the right caudal stylet, the outer branch is obtuse, and the inner branch is the longer and substyliform; while in the left, the inner is the shorter and is obtuse, and the right is long and slender styliform. The posterior legs are smaller than the penult.

#### NEROCILA BRASILIENSIS.

*Corpus duplo longius quam latum, oblongo-ellipticum valde convexum.*

*Thorax oblongus, segmentis 3 posticis lateraliter acutis sed non valde divaricatis. Epimeræ acuminatæ, lateris utriusque 3 4ve posticæ acutæ.*

*Abdomen vix oblongum, segmentis quinque lateraliter productis, præcipue duobus anticis, ultimo scutiformi ad basin latiore, paululo transverso, postice semicirculari sed medio paulo angulato, obtuso. Styli caudales abdomine multo longiores, ramis inæquis, externo fere cylindrico, acuminato, interno compresso.*

Body long-elliptical (twice as long as broad), very convex. Thorax much longer than broad; three posterior segments laterally acute, points prominent, but not much divaricated. Epimerals acuminate, those of fifth, sixth, and seventh segments acute. Abdomen hardly oblong; first five segments laterally produced, especially the two anterior, the fifth but little wider than following segment; last segment scutiform, broader at base, distinctly shorter than broad, posteriorly semicircular, with the middle angulate, obtuse. Caudal appendages straight, acute; outer branch nearly cylindrical, acuminate; inner compressed.

Plate 50, fig. 8 *a*, dorsal view; *b*, first antenna; *c*, second antenna; *d*, caudal appendage; *e*, side view, showing epimerals.

From the body of a fish, Rio Janeiro.

Length, about one inch. Colour, mostly brownish black. Head semicircular in front. Epimerals oblong, pointed, and those of the last three segments acute. Inner angle of base of caudal appendages prolonged and acute. Lateral processes of two anterior abdominal segments longest, each nearly one-half the breadth of the rest of the segment; the others rather long and about equal. Claw of third pair of legs scarcely smaller than that of second. Seventh pair of legs more slender than sixth, and claw much smaller.

This species is unlike the *maculata* and *affinis* in having the three posterior thoracic segments either side acutely prolonged, and in this character agrees with the *aculeata*, from which, however, it differs in its stylets, neither branch of which is truncate, and in the epimerals, only the three posterior of which are properly acute. Its acute branches of the caudal stylets and the character of the epimerals remove it from the *bivittata*. The epimerals of the third and fourth segments project a little posterior to the segments and are obtusish; while the fourth reaches about as far as the segment; and the fifth and sixth fall short of the posterior outline of the segment.

#### NEROCILA ACULEATA.

Plate 50, fig. 9 *a*, animal, dorsal view; *b*, anterior antennæ; *c*, caudal stylets.

From the body of a fish, Rio Janeiro.

The specimens referred to this species are similar to those of the *brasiliensis* in the thoracic segments; but the inner branch of the stylets is obliquely truncated, and the outer is hardly acute; and the caudal segment is but slightly transverse. Length, about one inch. Colour, light brownish black. Head subtruncate in front. Epimerals of second, third, and fourth segments rather short and obtuse; of three posterior long and acute. Claw of third pair of legs

a little smaller than that of second, posterior leg more slender than preceding, and claw smaller. Anterior antennæ rather the largest, eight joints, three basal largest. In the fact that the anterior epimerals are obtuse, the specimens do not agree with the description of the *aculeata*.

## NEROCILA ARMATA.

*Corpus angustum (plus duplo longius quam latum), oblongo-ellipticum. Segmenta thoracis 1mum 4tumque lateraliter breviter acuta, 3 postica elongatè producta instar spinæ longæ et divaricatæ. Epimeræ totæ acutæ, segmentorum 2di 3tiqque longæ et marginem lateralem multo superantes, reliquæ breves, 6tâ basin 7mæ non attingente. Abdomen oblongum, segmentis duobus anticis lateraliter longè productis et reflexis, sequentibus breviter productis, ultimo paulo oblongo, scutiformi, ad basin parce latiore, apicemque obtusi-angulato. Appendices caudales ultra abdomen elongatæ, ramis acutis, interno fere dimidio brevior.*

Body narrow elliptical, length, considerably more than twice the width. First and fourth segments of thorax with an acute tooth on either side; the fifth, sixth, and seventh prominently produced into a spine, which is divaricate. Epimerals all acute, those of second and third segments long, much exceeding lateral margin of segments; the others short, sixth not reaching base of seventh. Abdomen oblong, two anterior segments much produced laterally, and reflexed; next three short produced; last a little longer than broad, scutiform, slightly broadest at base, obtusely angled at apex. Caudal appendages elongate, extending much beyond the abdomen, branches acute, inner nearly half the shorter.

Plate 50, fig. 10 *a*, animal; *b*, ventral view, enlarged; *c*, side view, showing epimerals, enlarged three diameters; *d*, stylet.

From the body of a fish, Rio Janeiro.

Length, one inch. Colour, whitish, or white with three longitudinal brown or purplish-brown bands, one central and the other two along the sides. The second and third segments of the thorax

which have the longest epimerals, have no spine or tooth on either side; the epimerals of these segments are full one-half longer than the length of the segment along the back. The lateral process of the two anterior abdominal segments is bent backward, and reaches even beyond the line of base of last segment. Outer branch of caudal appendages extends nearly half its length beyond the abdomen, and is almost twice as long as inner; inner angle of base prolonged and acute. Eyes scarcely visible, very pale. Anterior antennæ seven-jointed, posterior ten-jointed; first joint of anterior longest, and penult longer than either of the two preceding; first joint of posterior short, second longest. Third pair of legs little smaller and with smaller claw than either of the two preceding; seventh pair more slender than preceding, the basal joint about as long as the remaining portion, while in the other legs it is nearly twice as long as the following joints; claw also half smaller. Five pairs of thoracic membranous leaflets, arising from base of five anterior pairs of legs; eggs below, as in *Cymothoa*. Distance between the fifth, sixth, and seventh legs larger, the anterior legs rather crowded.

NEROCILA TENUIPES.

*Corpus angustum, oblongo-ovatum, paulo convexum. Thorax lateribus non armatus, segmentis duobus posticis lateraliter brevissimè acutis et strictè appressis. Epimeræ duæ posticæ utriusque lateris acutæ, 5ta subacutá, 6ta basin 7mæ non attingente. Abdomen vix oblongum, segmentis duobus anticis lateraliter longè productis, tribus sequentibus paulo productis, ultimo paululo transverso, scutiformi, posticè ad medium obtusi-angulato. Appendices caudales abdomine paululo longiores, angulo basis interno obtuso, ramis fere æquis, externo obtuso, interno parce breviorè, obliquè truncato.*

Body narrow, oblong-ovate, little convex. Thorax with the sides not armed, last two segments very short acute either side and close appressed. Two posterior epimerals either side acute; the fifth subacute, sixth not reaching to base of seventh. Abdomen a little oblong, first two segments long-produced on either side, next three short-produced; last not as long as broad, scutiform, at middle behind low obtuse-angled. Caudal appendages slightly longer than

the abdomen, inner angle of base obtuse, branches nearly equal, external, slightly the shorter, obliquely truncate.

Plate 50, fig. 11 *a*, dorsal view; *b*, ventral; *c*, side view, showing epimerals; *d*, antennæ; *e*, claw of legs; *f*, caudal appendage.

From Rio Janeiro—rare.

Length, three-fourths of an inch. Colour, brownish yellow, with three broad brown longitudinal lines. The thorax widens slowly from the head and attains its greatest width at the penult joint; the articulations are convex backward to that between the last and preceding segment, which is nearly straight or slightly convex forward. Epimeral of second segment scarcely longer than segment, obtusish; of third and fourth longer than segment; of fifth subacute, and reaching as far back as lateral margins of segment; of sixth and seventh very acute, and much shorter than lateral margin of the segments; of the seventh attached to seventh segment beneath lateral margin of sixth segment. The linear processes each side of first two abdominal segments about as long as half the width of the segment. Third pair of legs and claw much smaller than first or second; seventh pair more slender than the preceding, and distant from it; the basal joint about as long as following portion; claw about half as large as that of sixth pair. Claws of legs very long, and gibbous within near base.

Anterior pair of antennæ seven-jointed; posterior ten-jointed; first joint of anterior pair short, second largest and longest; of posterior pair, fifth longer than either of the terminal *five*.

This species resembles the *aculeata* in the oblique truncation of the inner branch of the caudal appendages; but the inner angle of the basal portion is obtuse, the general form is different, the body narrower and the antepenult thoracic joint is not acute, and is quite closely appressed to the following on either side.

#### SUBFAMILY ÆGATHOINÆ.

##### GENUS ÆGATHOA, Dana.

*Corpus angustum, elongate ellipticum, ad abdominis basin non interruptum (abdomine non angustiore), segmentis thoracis subæquis, abdo-*



*minis parce minoribus, ultimo scutiformi. Caput subtriangulatum, segmento proximo parce angustius. Oculi pergrandes. Epimeræ segmentorum abdominis triquetræ, non spiniformes. Lamellæ caudales ciliatæ.*

Body narrow and long elliptic, not interrupted at base of abdomen (abdomen not being here narrower than thorax), segments of thorax subequal, those of abdomen sparingly shorter, the last scutiform. Head broad subtriangular, but little narrower than next segment. Eyes very large. Epimerals of abdominal segments triquetrous, not spiniform. Caudal lamellæ ciliate.

The species of *Ægathoa* have the general habit of an *Æga*, although with the large hooked claws of *Cymothoa*. The abdomen and thorax are so evenly continuous, that no subdivision into these two parts is apparent in a dorsal view, and it is necessary to count off the thoracic number before pronouncing which is the first abdominal. The sides of the thorax form an unbroken line without projecting spines or teeth. In the breadth and size of the head, as well as the ciliate caudal lamellæ, they are unlike the *Cymothoinæ*; while in the non-ciliate branchiæ and other characters, they are related to that group.

#### ÆGATHOA MACROPHALMA.

*Oculi pergrandes, latera capitis omnino tegentes, antice bene approximati super caput angulati. Caput non transversum. Styli caudales subæqui, abdomine vix longiores, externo parce longiore et angustiore, interno lato, rectè truncato, angulis rotundatis.*

Eyes very large, quite covering the sides of the head, and approaching one another rather nearly anteriorly, on top of head having an angle in the outline. Head not transverse. Caudal stylets hardly longer than abdomen, subequal, the outer little the longer and narrower, inner broad and straight truncate at apex, with the angles rounded.

Plate 50, fig. 12 *a*, animal, enlarged three diameters; *b*, oblique side view of part of abdomen, showing epimerals; *c*, leg of fifth pair; *d*, leg of seventh pair; *e*, caudal stylets.

Nassau Bay, Fuegia? Rio Janeiro?

Length, one-half an inch. The outer caudal lamella has its outer side nearly straight or but slightly arcuate, and the inner projecting somewhat into an angle. The head is longer than the first abdominal segment, and the antennæ are short, not as long as breadth of head. The last abdominal segment is about as long as broad, or scarcely longer, somewhat broadest at base and slightly angled at extremity.

ÆGATHOA LATICEPS.

*Æ. macrophthalmæ affinis. Caput parce latius et brevius, vix transversum. Oculi grandes, antice remotiores, super caput marginibus oculorum rectis et inter se postice propinquioribus.*

Near *Æ. macrophthalma*. Head a little broader and shorter, slightly transverse. Eyes large, more remote anteriorly, the outline on top of head straight, and those of the two eyes nearest behind.

Plate 50, fig. 13, animal, enlarged three diameters.

Nassau Bay, Fuegia? Rio Janeiro?

Length, half an inch. The eyes in an upper view are nearest to one another on the posterior part of the head at the articulation, and the margins as here seen diverge forward, so as to be nearly twice as far apart anteriorly.

---

FAMILY II. ÆGIDÆ.

SUBFAMILY ÆGINÆ.

THE species of this subfamily are often found attached to the body of fishes; while the Cirolaninæ do not appear to be parasitic in habit.

## GENUS ÆGA, Leach.

## ÆGA EFFERATA.

*Corpus sat angustum, nudum. Segmenta thoracis subæqua, segmentis quatuor posticis quoad epimeras acutis et strictè appressis. Abdomen 6-articulatum, thorace subito angustius, lateribus parallelis, articulo sexto subtriangulato, ad basin latiore, latitudine parce brevior, extremitate rotundato et ciliato. Appendices caudales abdominem vix superantes, apice rotundatæ, angulo basis interno producto et acuto, lamellâ internâ paulo longiore, duplo latiore.*

Body rather narrow, naked. Segments of thorax subequal, four posterior segments having the epimerals acute and closely appressed. Abdomen six-jointed, abruptly much narrower than thorax, sides parallel, sixth segment subtriangular, broadest at base, slightly shorter than its breadth at base, extremity rounded and ciliate. Caudal appendages scarcely extending beyond abdomen, rounded at apex, inner angle of base prolonged and acute, inner lamella a little the longer and twice the broader.

Plate 51, fig. 1 *a*, animal, enlarged; *b*, antennæ; *c*, one of the three anterior pairs of legs; *d*, one of the four posterior pairs; *e*, caudal stylet.

From a Serranus (?), harbour of Rio Janeiro. December, 1838.

Length, three lines. Colour, yellowish. Head short, posterior margin concave, and applied against the entire convex anterior margin of first thoracic segment. The acute angle of the four posterior thoracic segments belongs properly to the epimerals. Four anterior abdominal segments equal and similar; sixth about as long as five preceding. Caudal lamellæ extend to same line with apex of abdomen; the ciliation rather long, being nearly two-thirds as long as the branches. Anterior margin of first pair of antennæ on a line with the front margin of the head; basal joints followed by five shorter and smaller; second pair one-half the longer, not one-third the length

of the body; three basal joints observed, the second longest; flagellum ten-jointed, joints near the middle longest. Legs increase in length from the first to the seventh pair; anterior have the inner apex of antepenult joint prominent and armed with a short spine, which is opposed to the claw in clinging. Claws of eight posterior legs little curved.

ÆGA NOVI-ZEALANDIÆ.

*Corpus nudum, sat angustum. Caput perbreve. Segmentum thoracis anticum longius, segmentis reliquis longitudine subæquis. Abdomen thorace subito non angustius, sensim latitudine decrescens, 6-articulatum, segmento 1mo partim celato, ultimo vix transverso, non triangulato, extremitate latè rotundato, breviter ciliato. Appendices caudales abdomine non longiores, breviter ciliatæ.*

Body naked, rather narrow. Head very short. First thoracic segment longest, others subequal; abdomen not abruptly narrower than thorax, gradually narrowing, six-jointed, posterior segment broad but not transverse, not triangular, broadly rounded at extremity and ciliate. Caudal appendages not longer than abdomen.

Plate 51, fig. 2 *a*, animal, enlarged; *b*, anterior antenna; *c*, posterior antenna.

New Zealand, at Bay of Islands. Came up on bait while fishing.

Length, three lines. Colour, dirty brown. Length of posterior antennæ, about twice the breadth of the head; flagellum over twenty-jointed, joints short. Anterior antennæ more than half the length of posterior. The breadth of last abdominal segment at apex about half its breadth at base. Third and fourth segments of abdomen laterally much recurved and acute.

My notes fail to give the character of the feet, so that there is a little uncertainty whether the species is an *Æga* or a *Cirolana*; although its relation to *Æga* is most probable, since the bases of the antennæ are concealed by the head, as in our specimens of the *efferrata*, and they are not so in our *Cirolanæ*.

## ÆGA MULTIDIGITA.

*Dorsum corporis dimidio postico laxè pubescens. Segmentum abdominis ultimum precedentibus duplo longius, bene triangulatum, parce transversum, apice paulo obtusum. Lamellæ caudales extremitatem abdominis parce superantes, interior paulo latior et margine externo fere recta. Antennæ 2dæ longæ, segmentum thoracis 5tum attingentes. Tarsus pedis 1mi 2dive quatuor spinis oblongis crassis obtusis infra armatus et extremitate altero longiore deflexo, pedis 3tiii tribus spinis perbrevibus tuberculiformibus. Articuli pedum 6 posticorum nudiusculi præter apices articularum breviter spinulosas.*

Back of body, through its posterior half lax pubescent. Last abdominal segment twice as long as all the preceding, triangular, a little transverse, somewhat obtuse at apex. Caudal lamellæ reaching a little beyond extremity of abdomen, inner lamella the broadest and nearly straight on its outer margin. Antennæ of second pair long, reaching to fifth thoracic segment. Tarsus of feet of first or second pair having the terminal spine flexed downward nearly at right angles with the preceding part, and on under side four oblong stout obtusish spines; tarsus of third pair with three similar spines, but obsolescent and like tubercles. Joints of last six feet nearly naked, excepting their apices, which are set with spinules or setæ.

Plate 51, fig. 3 *a*, animal, enlarged; *b*, under view, showing antennæ; *c*, leg of first pair; *d*, extremity of leg of second pair; *e*, ibid. of third pair; *f*, ibid. of sixth pair.

Balabac Passage, north of Borneo.

Length of body, three lines. The tarsi of the six anterior legs are very peculiar, as described. The preceding joint in the first pair is naked below; but in the second pair there are four short and stout spines, and in the third pair a tuft of short hairs at apex. The fifth joint of the sixth pair is slender, and has two pairs of minute spinules or setæ (not half the width of the joint in length), on lower side, besides others at lower and upper apices; the tarsus is nearly straight,

about half as long as the sixth joint, and somewhat gibbous below, with a minute seta below in advance of the gibbosity, and another above. The apex of the third and also that of the fourth joint is mostly set around with spines, in part about as long as the breadth of the joint at apex. The seventh pair is stouter and a little longer than the sixth.

GENUS PTERELAS, Guérin.

The specimen we refer to the genus Pterelas, has all the three anterior pairs of legs subdidactyle, and the process on the penult joint of the legs is hatchet-shape. It may, perhaps, be properly the type of a new genus; yet it seems to be preferable with our present knowledge to modify the characteristic of Pterelas so as to include it, this genus hitherto embracing only species having the second and third legs subdidactyle, while the first pair is ancoral simply.

PTERELAS MAGNIFICUS.

*Corpus læve, sat angustum, ad abdominis basin non interruptum. Caput transversum, oculis grandibus paulo remotis. Pedes 6 antici subdidactyli, articulo penultimo processu lato axiniformi armato, articulo 3tio brevi, et spinibus brevibus infra armato, 8 postici spinulis paucis appressis armati. Abdomen 6-articulatum, segmentis 5 anticis subæquis, ultimo subtriangulato, lateribus arcuate dilatatis, extremitate subacutâ. Styli caudales abdomine parce longiores, basi producto et paulo brevioribus quam rami, ramis angustis, longitudine fere æquis, externo angustiore, interno ad apicem extus dilatato.*

Body smooth, rather narrow, not interrupted at base of abdomen. Head transverse, eyes large but rather remote. Six anterior feet subdidactyle, the penult joint with a broad axiniform process; third joint short, and having a few very short spines on under surface. Abdomen six-jointed, five anterior segments equal in length, last subtriangular, with sides arcuately dilated, extremity subacute. Caudal stylets slightly projecting beyond abdomen, base produced and a little shorter than branches, branches narrow, equal, outer narrowest, inner with apex dilated on outer side.

Plate 51, fig. 4 *a*, animal, enlarged one and a half diameters; *b*, front view of front; *c*, leg of second pair; *d*, leg of seventh pair; *g*, caudal stylet; *e*, epimeral of first segment; *f*, epimeral of seventh segment.

Nassau Bay, Fuegia.

Length of body, fourteen lines; breadth, four and one-half lines. Colour, according to a sketch by Mr. J. P. Couthouy, bluish in the three posterior segments of the thorax, with the middle of the back bordering on a slate-green, and the lateral portions of the four anterior segments of the thorax and the abdomen a rose-red. The antennæ of the second pair are of sufficient length to reach to second thoracic segment; those of the first pair are half shorter; the latter meet at base on the medial line, and the first joint is very broad, being a little transverse and marginate below. The surface of the body is shining, and the texture of the shell is hard. The three posterior segments of the thorax are longer than the three next anterior, as in *Nerocila*. The short spines on the under side of the six anterior legs are evidently to aid in crawling, while the claw is used for prehension; the eight posterior legs are cylindrical, with a few spinules at apex of joints, and on their under surface. The abdomen and stylets are short ciliate.

The epimerals have two oblique (nearly longitudinal) lines on each. The posterior is nearly an oblique parallelogram in form, the lower posterior angle being considerably prolonged and subacute.

#### SUBFAMILY CIROLANINÆ.

#### GENUS CIROLANA, *Leach*.

The similarity in general character between the following two species, and the partly concealed first abdominal segment of the first while the same is wholly concealed in the second, seem to show that the distinction between *Cirolana* and *Eurydice* is generically of small importance.

## CIROLANA ARMATA.

*Corpus sat angustum, dorso nudum, ad abdominis basin paulo interruptum. Caput multum transversum. Abdomen paulo oblongum, segmento 1mo partim celato; ultimo subpentagono, non oblongo, postice obtuso, longissime ciliato. Styli caudales abdominem multo superantes, ramis latis, extremitate obliquè truncatis, interno duplo latiore, parce longiore, triangulato, ciliis longissimis (ramos longitudine æquantibus). Pedes toti spinis et setis longis densè armati. Antennæ 1mæ 2dæque longitudine subæquæ.*

Body rather narrow, naked above, a little interrupted at base of abdomen. Head very transverse. Abdomen a little oblong, first segment partly covered; last segment subpentagonal, not oblong, obtuse behind, very long ciliate. Caudal stylets extending much beyond the abdomen, branches broad, at apex obliquely truncate, inner branch twice the broader, a little the longer, triangulate, ciliation as long as the branch. All the feet thickly armed with spiniform setæ, and slender setules. Antennæ of first and second pairs subequal in length.

Plate 51, fig. 5 *a*, head, much enlarged, the antennæ except basal joint, concealed by being thrown back under the sides of the body; *b*, abdomen; *c*, part of flagellum of second antennæ; *d*, leg of third pair; *e*, extremity of leg of sixth or seventh pair.

Rio Janeiro.

Length, four lines. The densely spinulous legs, the very broad triangular inner branch of the caudal stylets, the very long plumose ciliation of the stylets and extremity of the abdomen, are distinguishing characters. The stylets are narrow in the *hirtipes*, according to Edwards's figure (Cuv., pl. 67, f. 6), and the ciliation is short. The second antennæ when thrown back just reach to the fifth thoracic segment; the flagellum has ten joints, these joints are a little oblong, and have several spinules or setæ about the outer apex, and longish hairs on the inner side. The abdomen tapers slightly from its base; the



last segment has its sides slightly converging, and then towards its extremity there is a sudden convergence to the rounded apex.

CIROLANA LATISTYLIS.

*Corpus læve, nudum, ad abdominis basin vix interruptum. Caput transversum, antice rotundatum, segmento proximo non longius. Abdomen 6-articulatum, segmento 1mo sub thorace fere celato; ultimo subtriangulato, paulo oblongo, extremitate late rotundato et crenulato, spinulis et pilis longiusculis ornato. Appendices caudales abdomen non superantes, lamellâ internâ latè subovatâ, pilis et spinulis ac in segmento caudali, pilis dimidio lamellæ brevioribus, externâ plane brevior, duplo angustiore.*

Body smooth, naked, but slightly interrupted at base of abdomen. Head transverse, anteriorly rounded, not longer than next segment. Abdomen six-jointed; first segment nearly concealed under the thorax; caudal segment subtriangular, a little oblong, broadly rounded at extremity and crenulate, and ornate with spinules and shortish hairs. Caudal appendages not reaching beyond line of abdomen, inner lamella broadly subovate, having crenulations, spinules, and hairs like the caudal segment; the hairs not half as long as the lamella; outer lamella considerably the shorter and half narrower.

Plate 51, fig. 6 *a*, abdomen, much enlarged; *b*, part of flagellum of longer antennæ; *c*, leg of third pair.

Straits of Balabac, north of Borneo.

Length of body, three lines. The legs of the three anterior pairs are rather spiny below, especially the third joint; the fourth joint of the third pair is a little shorter than either the third or fifth pairs, and longer than the tarsus. The spinules of the extremity of the abdomen arise from the bottom of the crenulations. The joints of the flagellum of the second antennæ are quite oblong; there is a hair or two at upper apex as long as the diameter of the joint, and another below, a little shorter.

## CIROLANA (EURYDICE) ORIENTALIS.

*Corpus sat angustum, dorso nudum, ad basin abdominis interruptum. Caput multum transversum. Abdomen paulo oblongum, 5-articulatum, segmentis 4 anticis longitudine æquis, ultimo subtriangulato, lateribus arcuato, postice rotundato, brevissimè ciliato. Styli caudales abdomen superantes, ramis angustis, breviter ciliatis, externo angustiore, parce longiore, apice rotundato, interno angustè triangulato. Pedes sat nudi, spinulis brevibus paucis armati. Antennæ 2dæ multo longiores, segmentum thoracis 4tum fere attingentes.*

Body moderately narrow, naked above, interrupted at base of abdomen. Head much transverse. Abdomen a little oblong, five-jointed, four anterior segments of equal length; last subtriangular, sides arcuate; behind rounded, very short ciliate. Caudal stylets extending beyond abdomen; branches narrow, short ciliate; outer narrow, slightly longer, apex rounded; inner triangular. Feet almost naked; a few short spinules. Second antennæ much the longer, reaching nearly or quite to fourth thoracic segment.

Plate 51, fig. 7 *a*, head, much enlarged and thrown up obliquely, so as to show the process between the antennæ; *b*, abdomen; *c*, part of leg of first pair; *d*, *ibid.* of fifth pair.

Sooloo Sea.

Length, five lines. The first antennæ when thrown back reach to second thoracic segment nearly; and also half way to extremity of flagellum of second pair; the first basal joint is quite broad. The eyes are of moderate size, and the facets are rather large. The tarsus of all the legs has a short spine, not far from the apex on inner side. The sides of the last thoracic segment project as far backward as to the third abdominal segment.

GENUS CORALLANA, *Dana*.

*Cirolanæ affinis. Epistoma antice valde transversim lineare juxtaque bases antennarum 1marum insitum. Antennæ 1mæ basi contiguæ.*

Related to *Cirolanæ*. The epistome anteriorly very broad and transversely linear, and situated against the bases of the anterior antennæ. The anterior antennæ contiguous at base.

The general habit of the species here included is like that of the *Ægæ* and *Cirolanæ*; and the position of the bases of the antennæ is somewhat as in *Æga*. But the epistome is very short, being transversely linear, and the second pair of antennæ seem to come out partly from under it.

#### CORALLANA HIRTICAUDA.

*Corpus sat angustum, dimidio postico dorsi hirsutum usque ad abdominis extremitatem. Caput parce transversum. Oculi grandes. Antennæ valde inæquæ; 2dæ longæ segmentum thoracis 5tum attingentes, flagello fermè 18-articulato; 1mæ basi 2darum parce longiores. Abdomen 6-articulatum, segmento ultimo triangulato, lateribus recto, extremitate rotundato. Styli caudales abdominem non superantes, ramis obtusis, externo multo angustiore, non longiore. Pedes breviter setulosi.*

Body moderately narrow, posterior half of back to extremity of abdomen hirsute. Head a little transverse. Eyes large. Antennæ very unequal; second pair long, reaching to fifth segment of thorax; flagellum about eighteen-jointed; first pair not much longer than base of second. Abdomen six-jointed, last segment triangular; sides straight; extremity rounded. Caudal stylets not extending beyond abdomen, branches obtuse, outer much the narrower, not longer than the inner. Feet short setulose.

Plate 51, fig. 8 *a*, animal, enlarged three and a half diameters; *b*, head, seen from above, more enlarged; *c*, head, seen obliquely, from above and forward, showing its actual form and the position of the antennæ; *d*, antennæ (*a*<sup>1</sup> and *a*<sup>2</sup>) seen obliquely from below, showing the epistome (*e*) and their bases; *e*, extremity of leg of fifth pair.

From the coral reefs of Tongatabu, where it was found in cavities in dead coral.

Length, nearly five lines. The posterior margin of the fourth thoracic segment is short pubescent; that of the next and others following, including the abdominal segments, is longer hairy. The epimerals are very distinct.

---

FAMILY III. SPHEROMIDÆ.

SUBFAMILY SPHEROMINÆ.

GENUS SPHEROMA.

1. *Abdomen posticè integrum.*

*a. Segmenta thoracis nulla medio marginis postici vel processum vel dentem gerentia.*

SPHEROMA GIGAS, *Leach.*

Plate 52, fig. 1, represents an under view, showing the caudal stylets and outline of the abdomen.

New Zealand, along shores of Bay of Islands.

The specimens here referred were four to five lines in length. Colours, brown to brownish black, with some irregular whitish spots. The caudal lamellæ do not quite reach to the line of the extremity of the abdomen; they are lamellate, the inner rounded at extremity, but subacute. The last segment of the abdomen is evenly convex, with the sides arcuate (and not sinuous), and extremity rounded and moderately narrow. The surface of the body is smooth, but some appearance of granulation may be detected under a high magnifying power.

SPHEROMA LANCEOLATA, *White.*—Plate 52, fig. 1 *a*, view of mouth;

*b, c*, mandible, in different positions; *d*, lower lip; *e*, maxilla of first pair; *f*, maxilla of second pair.

Nassau and Good Success Bay, Fuegia, along shores, under stones.

This species, as collected in Nassau Bay, where it is common and of large size, has the following characters. Three posterior thoracic segments scarcely shorter than three preceding. Caudal lamellæ lanceolate, equal, both obtuse; the inner reaching as far back as line of apex of abdomen. Outline of abdomen arcuate either side, and rather narrowly rounded at apex; its surface evenly convex, so that a medial longitudinal line is very nearly straight, or with a slight convexity. The epistome is but little broader posteriorly than its length. Flagellum of second antennæ eighteen to twenty-jointed. The texture of the shell corneous, as usual. Mandible with black or brownish-black summits; in a profile view (showing the breadth of the summit, the triturating edge extending inward from the ventral surface in the animal), there are three tooth-like prominences; the apical two are stout, oblong, and corneous, obtusely pointed; the outer has a notch just below the summit, and the other bears a cluster of setæ, the lower of which are gradually longer; the third prominence has a broad truncate summit, which is minutely scabrous or denticulate. The palpus of the mandible consists of three oblong joints; the second is longest, and on outer apex there are a few ciliæ; the third joint is curved acute, and has a few short setæ on the margin below the apex. Lower lip bilobate, lobes large, rounded, margin edged with extremely short spines or stiff hairs. Upper lip subtriangular, nearly equilateral, anterior angle broad and rounded, posterior side convex, others concave.

#### SPHEROMA CALCAREA.

*Testa calcarea, levis. Thorax posticè paulo latior et depressior. Segmentum abdominis posticum subtriangulatum, superficie convexum, extremitate paulo productum angustum et obtusum. Appendices caudales abdomine parè breviores, lamellis subæquis, lanceolatis, obtusis. Pedes mediocres, articulis 3tio 4to 5toque densè villosis. Flagellum antennarum 2-darum 14-16-articulatum.*

Shell calcareous, smooth. Thorax little broader posteriorly and somewhat more depressed; posterior segment of abdomen subtriangular, surface convex, apex a little produced, narrow, obtuse. Caudal appendages reach almost to line of apex of abdomen, the two lamellæ subequal, lanceolate, obtuse. Legs moderately short, three joints before the last densely villous. Flagellum of inferior antennæ fourteen to sixteen-jointed.

Plate 52, fig. 2 *a*, animal, enlarged; *b*, under view of mouth; *c*, inferior antennæ.

Latitude 46° 53' south, longitude 65° 11' west, off Fuegia, in fifty fathoms water. Collected by Lieut. Case.

Length, six-tenths of an inch; breadth, three-tenths of an inch. Finely coloured; but as Lieut. Case placed in my hands only specimens in alcohol, the exact colours were not ascertained; probably yellow, with large regularly arranged spots of reddish purple; these spots largest on the four anterior segments. The calcareous texture is quite peculiar. The first thoracic segment is, as usual, the longest; the next three are about equal, and longer than the following three; lateral portions of the segments abruptly inflexed. The last segment of the abdomen has a smooth even surface, but the median longitudinal line is a little concave towards the extremity. The interval between the two emarginations in the basal margin of this joint about equals one-third the length of this margin, which is much less than the same in the *lanceolata*. Length of the inferior antennæ, rather greater than width of head. Claw of legs short and dark-coloured; a short spine just below base of claw. Maxillipeds nearly as in the *lanceolata* (see figure). Tips of mandibles brownish black. Lower lip with the anterior margin hairy.

#### SPHEROMA CHILENSIS.

*Corpus læve. Abdomen prominentiis duâbus obsoletis supernè ornatum, segmento caudali brevi, postice latè rotundato. Styli caudales abdomen non superantes, lamellâ internâ extus arcuatâ, apice subacutâ, externâ rectè lanceolatâ, apice rotundatâ. Flagellum antennarum 1marum 5-articulatum.*

Body smooth. Abdomen with two obsolete prominences above, caudal segment short, very broadly rounded behind. Caudal stylets reaching just to line of extremity of abdomen; inner lamella arcuate on outer side, subacute at apex; outer, straight lanceolate, rounded at apex.

Plate 52, fig. 3 *a*, animal, enlarged six diameters; *b*, under view of abdomen, in outline; *c*, antenna of first pair.

Valparaiso, Chili.

Length of body, two lines. The prominences on the last abdominal segment are barely apparent, and have the same position as those in the *armata*.

#### SPHEROMA OREGONENSIS.

*Corpus læve. Segmentum caudale breve, posticè latissimè rotundatum, supra læve. Styli caudales abdomen non superantes, lamellâ internâ multo longiore quam externa, fere obtusâ, externâ obtusâ. Flagella antennarum 1marum 2darumque 12-14-articulata.*

Body smooth. Caudal segment short, very broadly rounded behind, smooth above. Caudal stylets not reaching beyond line of extremity of abdomen; inner lamella much the longer, nearly obtuse; outer obtuse. Flagella of antennæ of both pairs twelve to fourteen-jointed.

Plate 52, fig. 4 *a*, animal, enlarged three diameters; *b*, part of antennæ of second pair; *c*, under view of extremity of abdomen, showing caudal appendages.

Puget's Sound, Oregon; also, Bay of San Francisco, California. Collected by Dr. C. Pickering.

Length of body, four and a half lines. This species is near the *chilensis*; but the lamellæ of the caudal appendages are much more unequal, the flagellum of the first antennæ has many more joints, and the abdomen is more broadly rounded behind.

## SPHEROMA OBTUSA.

*Corpus læve, nudum. Segmentum abdominis posticum subtriangulatum, lateribus prope apicem subito convergentibus, apice obtuso; concavitate ventrali posticè latâ. Lamellæ caudales abdomine plane breviores, integræ, ad apicem ambæ truncatæ. Pedes læves, fere nudæ, æquè tenues; secundi primis tertiusve longiores.*

Body smooth, naked. Feet smooth, nearly naked. Segments of thorax similar. Last abdominal segment subtriangular, the sides towards apex abruptly convergent, apex obtuse; ventral cavity broad behind. Caudal lamellæ shorter than abdomen, entire, both truncate at apex. Feet smooth, nearly naked, all equally slender; second pair longer than first or third.

Plate 52, fig. 5 *a*, animal, enlarged; *b*, abdomen, under view.

Bay of Islands, New Zealand, along shores of Parua Harbour.

Length, three lines. Colours, dull yellow or brownish yellow. The first thoracic segment is nearly as long as the next two together. The outer of the caudal lamellæ has both sides slightly convex, and has the same width nearly at base and apex. Tarsus of the legs terminates obtusely and is furnished at apex with a very short and slightly curved hook, a short spine below the hook, and a slender pair of setæ between the two.

SPHEROMA VERRUCAUDA? *White.*

From Bay of Islands, New Zealand; found in rotten wood, in cavities bored by *Teredo*.

Length, seven lines. Colour, dirty gray, and without lustre. In the specimens referred to this species, the surface has a tomentose appearance and is granulous. Abdomen with a granular surface and



slightly prominent either side of medial line, behind broad truncate entire. Caudal appendages small, not shorter than abdomen, outer lamella obliquely truncate at apex and 3-4-dentate (Plate 52, f. 6), inner lanceolate and subacute. In the dentate outer lamella, this species differs from all the preceding. Flagellum of anterior antennæ about seven-jointed; of posterior, fifteen to eighteen-jointed; posterior antennæ very slender; anterior with basal joint stout. First three pairs of legs more slender than the following; second pair longer than first or third; from fourth to seventh gradually increase in length. Abdomen broadly truncate, so that the posterior margin is half as long as basal, or even exceeds this; ventral cavity of abdomen broadly rounded at apex.

*Spheroma verrucauda?* A. WHITE, Voyage of Erebus and Terror, pl. 6, f. 1.

*b. Segmentum thoracis 7<sup>mo</sup> medio marginis postici dentem processumve gerens.*

#### SPHEROMA ARMATA, *Edwards.*

Bay of Islands, New Zealand, along rocky shores.

Body smooth, a little shining, under a high magnifier granulous. Seventh thoracic segment having a tooth behind, the tooth sometimes obsolescent; last segment of abdomen triangular, sides obsoletely sinuous, apex narrow and obtuse, dorsal surface near base with two slight prominences; cavity below narrow at apex (Plate 52, fig. 7); caudal lamellæ not reaching to apex of abdomen; inner truncate; outer acuminate, tip curved outward a little. Flagellum of anterior antennæ eight to twelve-jointed; of outer, fourteen to sixteen-jointed. The legs of the fourth to seventh pairs are hairy on the posterior side of third and fourth joints. Anterior three pairs nearly naked, and not more slender than the following; second pair longer than first; third about as long as second. Length, three to four lines. Colour, whitish, bluish white; also, brownish, with whitish spots.

#### SPHEROMA SPINIGERA.

*S. armatæ similis. Corpus depressius, læve, nudum, posticè ad apicem*

*abdominis obtusius. Dens posticus segmenti thoracici septimi spiniformis, dimidio abdominis longior. Lamellæ caudales latiores et abdomen longitudine paulo superantes; externâ prope apicem obsolete serrulatâ.*

Near *S. armata* in form, caudal lamellæ and abdomen above and below. Body more depressed, smooth, naked, apex of abdomen more blunt. Tooth of seventh thoracic segment elongate spiniform, longer than half the abdomen. Caudal lamellæ broader, and extending a little beyond the abdomen; outer near its apex obsoletely serrulate.

Plate 52, fig. 8 *a*, animal, enlarged; *b*, under view of antennæ; *c*, abdomen, under view.

In bored wood, and in pools of water along shores of Parua Harbour, Bay of Islands, New Zealand.

Length, three to four lines. Colour, brown or brownish green; some specimens with a longitudinal medial broad line of emerald green. This species is very near the *armata*. But its caudal lamellæ, though like those of the *armata* in form, extend beyond the apex of the abdomen, and are broader; and the spiniform process of the seventh thoracic segment is quite long.

2. *Abdomen posticè emarginatum vel fissum.*

SPHEROMA GLOBICAUDA.

*Corpus fere læve, partim subtilissimè granulosum et pubescentulum. Abdomen subtriangulatum, præter partem versus margines valde tumidum, posticè unifissum, fissurâ profundâ et ad ejus extremitatem internam utrinque paulo transversim productâ. Appendices caudales abdomen parce superantes, lamellâ internâ latiore, parce longiore, apice latè rotundatâ, externâ quoad marginem externum valde reflexâ.*

Body nearly smooth, in part very fine granulous and pubescent. Abdomen subtriangular, very tumid, excepting the part towards the margin around; at extremity a deep fissure, which at its inner end is produced a short distance transversely in either direction.

Caudal appendages reaching slightly beyond line of abdomen; inner lamella the broader and slightly the longer, broadly rounded at apex; outer having the external margin much reflexed.

Plate 52, fig. 9 *a*, animal, enlarged six diameters; *b*, abdomen, more enlarged.

*Nassau Bay, Fuegia.*

Length of body, two and a half lines. The fissure in the extremity of the abdomen is of peculiar depth and shape; the part of the surface of the abdomen anterior to its inner extremity is a little raised, independently of the general globose elevation which characterizes the whole segment anterior to this raised point. The minute hairs of the surface and slight granulation, are seen with a lens most distinctly on the caudal segment.

#### SPHEROMA SAVIGNII, *Edw.*

*Corpus fere læve, subtilissime granulatum. Thoracis margines subtilissime et sparsim pubescentes. Segmentum abdominis posticum subtriangulatum, latitudine non longius, parte versus margines exceptâ valde tumidum, apice emarginato, emarginatione simplice, paulo oblongâ. Antennæ 2dæ flagello 10-12-articulato; 1mæ flagello 7-8-articulato. Styli caudales abdomine vix breviores, lamellis extremitate late rotundatis, externâ brevior vix angustiore.*

Body nearly smooth, very minutely granulous. Margin of thoracic segments minutely and sparingly pubescent. Posterior abdominal segment somewhat triangular, about as long as broad, very tumid, excepting parts towards margins; at base much narrower than thoracic segment, near apex pubescent, sides arcuate, apex emarginate, emargination small, a little oblong. Second antennæ having the flagellum ten-jointed; flagellum of first pair seven-jointed. Caudal stylets scarcely shorter than abdomen; lamellæ broadly rounded at extremity, or subtruncate; outer the shorter; both entire.

Plate 52, fig. 10 *a*, animal, magnified six diameters; *b*, part of flagellum of second antennæ; *c*, antenna of first pair; *d*, margin of segments of thorax, much enlarged.

Harbour of Rio de Janeiro; caught in the cavities among Balani, on the shores of Rat Island.

Length, one-fifth of an inch. Colour of head, light greenish yellow, a central longitudinal line along thorax of same colour, which widens near the middle of the body; other parts deep brown, with some light spots. Colours sometimes faint.

*Spheroma Dumerilii*, AUDOUIN, Explic. des planches de M. Savigny, Egypte, pl. 12, f. 4.

*Spheroma Savignii*, EDWARDS, Crust., iii. 208.

#### SPHEROMA ORIENTALIS.

*Corpus fere læve. Segmentum abdominis ultimum subtriangulatum, tumidum, dimidio vel tertio dorsi postico subito depresso, extremitate emarginato, emarginatione rectangulatâ, latiore quam profundiore. Appendices caudales laterales ciliatæ, extremitatem abdominis paulo superantes, externâ acutâ, internâ apice emarginatâ.*

Body nearly smooth. Last segment of abdomen subtriangular in outline, tumid. Posterior half or third abruptly depressed, extremity bidentate, the emargination rectangular, broader than deep. Caudal appendages ciliate, extending a little beyond extremity of abdomen, outer acute; inner emarginate or bidentate at apex.

Plate 52, fig. 11 *a*, body, much enlarged; *b*, part of leg of one of three posterior pairs; *c*, lateral profile of abdomen, upper side, showing the abrupt depression of posterior part; *d*, under view.

Singapore.

Length of body, one and a half to two lines. The tarsus of the six posterior legs has a prominent spine or tooth on under side; preceding joints nearly naked, a spinule at lower apex. Segments of thorax

either side produced backward considerably; first segment of abdomen as long as three preceding thoracic segments. Inner caudal lamella somewhat denticulate on outer margin.

CASSIDINA LATISTYLIS.

*Corpus sat angustum, multum convexum. Caput paulo transversum. Segmenta thoracis 2-7 subœqua. Abdominis segmentum ultimum parce brevius quam latum, extremitate latè rotundatum, truncatum. Styli caudales abdomen paulo superantes, lamellâ internâ perlatâ, subtriangulatâ, extremitate obliquè truncatâ, externâ parvulâ oblongo-ovatâ, subacuminatâ, triplo breviorè et plus triplo angustiorè quam interna.*

Body rather narrow, much convex. Head somewhat transverse. Segments of thorax from second to seventh subequal. Abdomen sparingly shorter than broad, broadly rounded at extremity, and truncate. Caudal stylets extending a little beyond line of abdomen, inner lamella very broad, subtriangular, extremity oblique truncate; outer oblong-ovate, subacuminate, quite small, one-third the length and less than one-third the breadth of the inner lamella.

Plate 52, fig. 12 *a*, animal, enlarged two diameters; *b*, under view of abdomen; *c*, upper view of caudal appendage; *d*, under view of head, showing mouth, antennæ, and anterior legs (except part of the leg on the right in the figure); *e*, extremity of leg of fourth pair.

Locality doubtful.

Length of body, six and a half lines; breadth, three lines. The front has nearly the same outline as in Amphoroidea. A median process extends downward between the bases of the superior antennæ, which bases are rather broad. The legs are very nearly naked; the tarsus of the different legs has a small spine beneath the terminal claw. The first antennæ are about two-thirds as long as the second, and the flagellum of the latter has seventeen or eighteen joints.

GENUS AMPHOROIDEA, *Milne Edwards*.AMPHOROIDEA TYPICA, *Edwards*.

Plate 52, fig. 13 *a*, animal, enlarged; *b*, under view of head; *c*, under view of abdomen; *d*, mandible; *d'*, profile of its extremity; *e*, maxilliped.

From floating fucus (*Macrocystis*) near Valparaiso; found about the bases of the fronds, and near the roots.

Length, nine lines to one inch. Colour, olive-green, often with a browner green line in basal joints of superior antennæ parallel with its margin; also, sometimes in other parts of the body; in some large specimens a medial longitudinal line along back, white. The lamellar bases of the anterior antennæ, in this species, are scarcely as long as their breadth; the emargination of the caudal segment at its extremity is rounded within; the outer of the lamellæ of the caudal appendages is broadest at its middle, or just below it; the antero-lateral margin of the caudal segment is straight. Flagellum of second antennæ about eighteen-jointed, the joints not oblong.

## AMPHOROIDEA AUSTRALIENSIS.

*A. typicæ affinis.* *Articulus antennarum 1marum basalis lamellatus parce oblongus, margine apicali arcuato, angulo externo rotundato. Flagellum antennarum 2darum 20-articulatum. Abdomen postice emarginatum, emarginatione triangulatâ, margine segmenti ultimi antero-laterali paulo sinuoso. Appendices caudales abdomen parce superantes, lamellâ internâ recte truncatâ, externâ acuminatâ, angustiore quam lamella A. typicæ externa.*

Near the *A. typica*. The lamellar basal joint of the anterior antennæ sparingly oblong, the apical margin arcuate, and outer angle rounded. Flagellum of inferior antennæ twenty-jointed. Abdomen emarginate behind, the emargination triangular; antero-lateral margin

of last segment a little sinuous in outline. Caudal appendages extending somewhat beyond line of extremity of abdomen; inner lamella straight truncate; outer acuminate, narrower than the same lamella in the *typica*.

Plate 52, fig. 14 *a*, head, much enlarged; *b*, dorsal view of extremity of abdomen; *c*, under view of same; *d*, basal portion of second antennæ.

New South Wales.

Length, ten lines. The resemblance to the *typica* is at first sight very close; yet the differences are important, and authorize the separation of the species. The surface is smooth and naked.

---

## TRIBE II. ANISOPODA.

THE relations of the group Anisopoda to the other Choristopods have been briefly pointed out. The exact extent of this subtribe is, however, not yet ascertained. We may briefly mention the genera hitherto ranked with the Isopoda that appear to be Anisopodan, and remark upon the characters which lead us to conclude that this is their true relation.

1. *Arcturus* and *Leachia*.\*—The thoracic members in these genera are Amphipodan in arrangement, and, as in the Caprellids, the three posterior pairs are used as feet for clinging, while the four anterior pairs are extended forward as arms for collecting their food. The abdominal members are as in *Idotæa*.

\* These are the *Idotéides Arpenteuses* of Edwards, Crust., iii. 122.

2. *Anthura*.\*—In *Anthura* there is the same Amphipod arrangement in the thoracic legs, the series being 4 (or 2+2) : 3, and not 3 : 4, as in Isopods. The genus is, therefore, near *Arcturus*.

3. *Tanais*, *Apseudes*, *Rhœa*.†—The thoracic members in *Tanais* are as in *Arcturus*, and the three posterior pairs are used in the same manner. The four anterior pairs, Amphipod-like, are in two sets of 2+2 (or 1+1+2). *Apseudes* and *Rhœa* are closely related to *Tanais*, and more like Amphipods than Isopods in habit.

4. *Praniza* and *Anceus*.‡—The three posterior pairs of thoracic legs belong to a distinct set from the preceding, as in Amphipods. The abdomen is considerably elongated in *Praniza* and flexible, though still Isopodan in having but a single pair of stylets.

5. *Serolis*.§—The structure of these species and their relation to the Amphipoda and Isopoda are mentioned on a preceding page. We only add here, that the two anterior pairs of thoracic legs differ from the following, indicating the Amphipod series, 2+2 : 3.

6. *Ancinus*.—On page 749 we have suggested that this genus may possibly be Anisopodan.

7. *Bopyridæ*.||—It is sometimes difficult to distinguish any difference among the several pairs of thoracic legs of the Bopyri, especially in females. Yet, in males, the Amphipod arrangement is often apparent, and besides, there is at times an elongated abdomen, with lateral appendages very unlike those of the true Isopoda. Certain figures by Krøyer illustrate these points. Fig. 1 A, Pl. 28, of the Voyage to Scandinavia, represents a Bopyrid, called *Dajus Mysidis*. Five pairs of abdominal appendages are long, and the abdomen has the elongate form and free articulation of *Tanais*; at the extremity there is a short caudal pair of stylets. In the male *Bopyrus abdominalis*, and the young female (figs. 1 o, 1 q, Pl. 29), the abdomen is similarly jointed, but the appendages appear to be short. In a female, not adult (fig. 1 l), the thoracic legs are obsolete on one side, excepting the three posterior pairs,—a fact that seems to show that these legs conform to the Amphipod series (4 : 3).

\* *Idotéides Ordinaires*, in part, of Edwards, Crust., iii. 124.

† *Asellotes Hétéropodes* of Edwards, Crust., iii. 137. *Apseudes* was referred to the Amphipoda by Latreille.

‡ Family *Pranisiens* of the *Isopodes Nageurs* of Edwards, Crust., iii., 191; *Amphipoda* according to Latreille.

§ *Cymothoadiens Ravisseurs* of Edwards, Crust., iii. 228.

|| *Isopodes Sédentaires* of Edwards, Crust., iii. 277; *Epicarides* of Latreille.



Among the figures by Rathke, in his Norwegian Fauna,\* we find the same conclusion sustained. The figure of a Bopyrid, called by him *Phryxus Hippolytes* (fig. 3, Pl. 2), represents the male, with the *three posterior* pairs of legs thrown obliquely backward, and the *four anterior* obliquely forward, with a wide interval between the two series. In this case, the Amphipod character (supposing the figure to be correct) is beyond dispute. This species, as Rathke states, appears to be identical with the Bopyrus Hippolytes of Kröyer. The genus Ione much resembles Phryxus, especially in the males of the species.

In the Bopyrid genus, Cepon of Duvernoy, the three posterior pairs of appendages, both dorsal and ventral, differ in certain points from the four pairs preceding, as represented in the figures.

These facts appear to determine the true nature of the Bopyri, showing that they are related most closely to Tanais, and through this genus to the Jæræ, which also are partly parasitic species. But there is another fact, proving even more strongly their Amphipod affinities, which is, the occurrence in some species of *thoracic* branchiæ; for these are the only species among all the so-called Isopoda that have this prominently Amphipodan characteristic. We are, therefore, fully authorized in arranging the Bopyridæ with the Anisopoda.

8. *Liriope*, *Crossurus*.—These genera, established by Rathke in his Norwegian Fauna, are related both to the male Bopyri and Tanais, but more closely to the latter. There is the same grouping of the legs as in Tanais, the three posterior pairs being in one group, and the two anterior pairs being chelate. The abdominal appendages are elongated in *Liriope*† nearly as in the Amphipoda, and to this group the genus is referred by Rathke. The legs of the three anterior pairs are two-branched; of the three posterior, simple.

A related genus, named by the author *Cryptothir*, has thoracic legs like those of *Liriope*, the two anterior pairs being chelate, and the three posterior in one group apart from the preceding. The species occurred as a parasite within a *Creusia* (barnacle).

The tribe Anisopoda hence embraces a considerable number of known genera, and this number will no doubt be greatly increased; for

\* Fauna Norwegens, pl. 1, 2.

† The species described by Rathke was found as a parasite to a worm (*Peltoaster Paguri*), found on the abdomen of *Bernhardus streblonyx*.

the species are, to a great extent, very small, and have not been generally sought for.

The name of the tribe is from the Greek  $\alpha$ , *not*, and *Isopoda*. To most of the species, the name has also a literal application, as they have commonly one or two pairs of anterior chelate legs, differing from the following; and, in some cases, as in *Arcturus* and *Tanais*, the uses of the three hinder pairs and the four preceding are widely different. Thus the species are as strikingly *Anisopodous* or *unequal-footed*, as the *Isopoda* are *isopodous* or *equal-footed*.

In arranging the Anisopoda, we should regard the striking parallelism that exists between the several groups of genera, and those of the *Isopoda*: thus, corresponding

1. To the *Idotæidea*, there are *Arcturus*, *Leachia*, *Anthura*.
2. To the *Oniscoidea*, there are *Tanais*, *Apseudes*, *Rhæa*, *Bopyris*, *Ione*, and the allied.
3. To the *Cymothoidea*, there are *Serolis*, *Praniza*, and *Anceus*.

There are, therefore, three grand divisions, similar in character to those of the *Isopoda*, as follows:—

Subtribus I. SEROLIDEA, vel ANISOPODA CYMOTHOICA.—Appendices abdominis duæ posticæ lamellatæ, apud abdominis latera dispositæ.

Subtribus II. ARCTURIDEA, vel ANISOPODA IDOTÆICA.—Appendices abdominis duæ posticæ operculiformes, laminas branchiales tegentes.

Subtribus III. TANAIDEA vel ANISOPODA ONISCICA.—Appendices abdominis duæ posticæ plus minusve styliformes, fere terminales, raro obsoletæ.

Viewing the species with reference to their greater or less divergence from the *Isopodan* type, we arrive essentially at the same arrangement. This divergence is to be distinguished mainly in the character of the abdominal appendages. In the first group, part or all of the five anterior pairs of abdominal appendages are well-formed branchial leaflets, as those of the *Cymothoidæ*. In the second, the same is equally true, and the first pair are opercula, like those of the true *Idotæidæ*. In the third, the divergence is wider, the abdo-

men being usually more elongated and freer in its articulations, and the appendages below, although Isopod in arrangement, usually more elongated, so as to approximate to the Amphipod type. And, as we descend in the scale, we find in *Liriope* nearly the Amphipod character. Through *Praniza* and *Anceus* the Cymothoid division descends in scale. Both of these genera correspond to imperfect forms, the two anterior thoracic segments being obsolete, and the legs but ten in number.

Some of the Anisopods appear to be inferior in character to the Amphipods, although ranking between this, the lower group, and the Isopoda. But this is no objection to our views, and is strikingly in harmony with a general principle already explained. The Anisopoda, as stated, constitute a transition group. There are two distinct types of structure among the Choristopods, that of the Amphipods and that of the Isopods, and between these, lie these connecting links, which are the Anisopods. So, between the *Brachyura* and *Macroura*, there are transition species, which are called *Anomoura*, not conforming to either of the two great types among the Eubranchiata Decapoda, but of an intermediate or transition character. And, as among the *Anomoura*, we find forms of less perfection as to structure, more sluggish as to habits, and evidently lower in rank as regards intelligence, than occur among the great majority of the *Macroura*, although these are inferior in grade of structure; so, in the Anisopoda, the most sluggish of the Choristopods are to be found. These two transition groups are analogous in this respect, and illustrate a fundamental truth of great interest.

The following is a synopsis of the families, subfamilies, and genera of Anisopoda, as far as they are ascertained:—

SUBTRIBUS I. SEROLIDEA, *vel* ANISOPODA CYMOTHOICA.

FAM. I. SEROLIDÆ.

Appendices abdominales sex anticæ liberæ, subnatatoriæ, quatuor sequentes branchiales, bene lamellatæ, ultimæ ac in *Cymothodis*.  
Antennæ 1mæ sub capite insitæ.

G. 1. SEROLIS, *Leach*.

## FAM. II. PRANIZIDÆ.\*

Appendices abdominales totæ ac in *Ægidis*. Antennæ 1mæ sub capite insitæ. Pedes thoracis numero decem, paribus duobus anticis rudimentariis. Thoracis segmenta numero quinque non superantia.

SUBFAM. 1. PRANIZINÆ. — Caput parvum. Mandibulæ vix salientes.

G. 1. PRANIZA, *Leach*.

SUBFAM. 2. ANCEINÆ. — Caput grande. Mandibulæ ultra caput longè exsertæ.

G. 1. ANCEUS, *Risso*.

SUBTRIBUS II. ARCTURIDEA, *vel* ANISOPODA IDOTÆICA.

## FAM. I. ARCTURIDÆ.

SUBFAM. 1. ARCTURINÆ.—Opercula abdominis ad ventrem stricte appressa.

G. 1. ARCTURUS, *Latr.*—Segmenta thoracis subæqua. Antennæ 2dæ flagello longo confectæ.

G. 2. LEACHIA, *Johnston*.—Segmentum thoracis 4tum prælongum. Antennæ 2dæ longæ, ungue 1-3-articulato confectæ. Pedes 8 anticis ciliati, non unguiculati.

SUBFAM. 2. ANTHURINÆ.—Opercula abdominis ad ventrem non bene appressa, sed libera et latera abdominis partim tegentia.

G. 1. ANTHURA, *Leach*. — Antennæ breves, 4-8-articulatæ. Pedes anticis subchelati.

\* *Pranisiens* of Edwards, *Crust.*, iii. 191. The subdivisions adopted are those of Edwards, the first being his "Tribu des Pranisiens Ordinaires," and the second, "Tribu des Anceens."

SUBTRIBUS III. TANAIDEA, *vel* ANISOPODA ONISCICA.

## FAM. I. TANAIIDÆ.

Pedes 1mi 2dive subchelati, sequentes non ancorales. Abdomen paribus quinque appendicum subnatatoriis unoque postico stylium instructum.

SUBFAM. 1. TANAINÆ. — Corpus lineare, segmento thoracis 1mo sæpe oblongo capiteque parvulo. Styli caudales longo.

- G. 1. TANAI, *Edw.*\*—Antennæ 1mæ flagello non confectæ. Pedes antici breves crassè chelati, digitis vix hiantibus; reliqui unguiculati. Styli caudales sat longi, 3-7-articulati, simplices.
- G. 2. PARATANAI, *Dana.*—*Tanai* similis. Styli caudales biramei, ramis inæquis, articulis uno vel pluribus instructis.
- G. 3. LEPTOCHELIA, *Dana.*†—Antennæ 1mæ longæ, flagello confectæ. Pedes antici longi, manu elongatâ, digitis hiantibus; reliqui unguiculati. Styli caudales sat longi, articulati, ramo laterali instructi.
- G. 4. APSEUDES, *Leach.*—Antennæ 1mæ 2dæque flagello unico confectæ. Pedes antici breves, crassè chelati, 2di extremitate laminati, non unguiculati.
- G. 5. RHŒA, † *Edw.*—Antennæ 1mæ 2dæque flagello confectæ, 1mis quoque flagello appendiculari. Pedes 1mi 2dique crassi, 1mis chelatis, 2dis unguiculatis.

SUBFAM. 2. LIRIOPINÆ.—Corpus antice latius, postice sensim angustans, segmento thoracis 1mo reliquis vix longiore, capite mediocri. Appendices abdominales numero decem elongatæ.

- G. 1. LIRIOPE, *Rathke.*§—Pedes 4 antici subprehensiles, 5ti 6tique unguiculati, 7mi abbreviati, articuloque styliiformi confecti. Antennæ 1mæ perbreves [setarum scopulâ ornatæ].
- G. 2. CRYPTOTHIR, *Dana.*—*Liriopi* affinis. Pedes 7mi non abbreviati, unguiculati.

SUBFAM. 3. CROSSURINÆ. — Corpus antice latius, postice sensim angustatum, segmento thoracis 1mo vix longiore, capite mediocri. Appendices abdominales inferiores numero sex, ciliatæ.

\* Genus *Zeuzo*, Templeton (Trans. Ent. Soc., ii. 203), is included.

† Amer. Jour. Sci. [2], viii. 425, 1849.

‡ Genus *Triura*, Teilkampf (Archiv. f. Nat., 1844, p. 321), is probably near *Rhœa*. Caudal styles very long and setiform. The description and figures are unsatisfactory.

§ Faun. Norw., 60, pl. 1, f. 8-12.

- G. 1. *CROSSURUS*, *Rathke*.\*—Pedes antici chelati, robusti, reliquis unguiculatis. Abdomen duabus tæniis semicircularibus e magno pilorum erectorum numero compositis fimbriasque duas exhibentibus cinctum.

## FAM. II. BOPYRIDÆ.†

Pedes toti sæpius aliquo modo subprehensiles vel ancorales. *Maris*, corpus angustum, abdomen 1–6-articulatum, appendicibus subnatoriis stylisque duobus sæpe instructum, interdum totis appendicibus obsoletis; *feminæ*, corpus latum et obesum, oculis carens, et quoad pedes sæpe partim obsoletum.

SUBFAM. 1. BOPYRINÆ. — Thorax appendicibus branchialibus carens.

- G. 1. *BOPYRUS*, *Latr.*—Pedes thoracis *feminæ* manu imperfectâ confecti. Appendices abdominis branchiales laminatæ, laminâ unicâ compositæ et abdomine tectæ.
- G. 2. *PHRYXUS*, *Rathke*.‡—Pedes thoracis *maris* ancorales, *feminæ* manu imperfectâ confecti. Appendices abdominis *feminæ* branchiales magnæ, laminis duabus inæquis nudis compositæ, una vel ambæ laminæ laterales; *maris* rudimentariæ.
- G. 3. *CEPON*, *Duvernoy*.§—Pedes thoracis *feminæ* non unguiculati, per pulvillum terminalem ancorales. Appendices abdominis *feminæ* branchiales numero duodecim elongate lamellatæ et bene ciliatæ.
- G. 4. *DAJUS*, *Kröyer*.||—*Maris* abdomen 6-articulatum, segmento ultimo prælongo; pedes thoracis bene unguiculati; appendices abdominis numero decem oblongæ, ciliatæ, aliis duabus terminalibus minutis. *Feminæ* appendices abdominis laterales, duæ posticæ caudales breves, exsertæ.

SUBFAM. 2. IONINÆ.—Pedes thoracis *feminæ* appendices branchiales ad basin gerentes.

- G. 1. *IONE*, *Latr.*—Pedes thoracis manu imperfectâ confecti. Appendices abdominales laterales, *maris* tenuiter cylindricæ, *feminæ* ramosæ præter duas ultimas simplices.
- G. 2. *ARGEIA*, *Dana*. — Pedes thoracis manu imperfectâ confecti. Appendices *feminæ* abdominales laterales, birameæ, ramis simplicissimis, nudis; *maris* nullis abdomine non articulado, nudo.

\* *Ibid.*, 35, pl. 1, f. 1–7.

† *Epicarides*, *Latr.*; *Isopodes sedentaires*, *Edw.*, *Crúst.*, iii. 277.

‡ *Fauna Norwegens*, p. 40. § *Annales des Sci. Nat.* [2], xv. 110, pl. 4.

|| *Voy. Scand.*, etc., *Crúst.*, tab. 28, 29.

## SUBTRIBE SEROLIDEA.

## FAMILY SEROLIDÆ.

## SEROLIS PLANUS.

*Corpus fere planum. Segmenta 1-6 thoracis lateraliter vix producta, tota usque ad marginem strictè appressa. Segmentum caudale juxta marginis lateralis medium unidentatum, dente vix marginali, superficie costâ obliquâ carente sed costam medianam parvulam et aliam prope marginem ante dentem lateralem habente. Antennarum 2darum articuli duo basales ultimi longitudine æqui.*

Body very nearly flat. First to sixth thoracic segments hardly produced backward at sides, all closely in contact quite to the lateral margin. Caudal segment having a submarginal tooth near middle of lateral margin; no oblique costa, but a small one at middle, and another near margin either side anterior to the tooth. Last two basal joints of second antennæ of equal length.

Plate 53, fig. 1 *a*, male, enlarged two diameters; *b*, opercular plate of abdomen; 1 *c*, part of flagellum of inferior antennæ.

Fuegia.

Length, one inch; breadth, three-fourths of an inch. As the segments of the thorax are in contact quite to the lateral margin, the margin of the body is very even and uninterrupted. The sixth segment is much less produced backward, either side, than that of the *S. Gaudichaudii*. Moreover, the articulation in the opercular abdominal plates is much more nearly transverse, than in that species, and the margin of the abdomen, above, has the tooth mentioned, situated just below the termination of the marginal costa. The medial costa is obsolete posteriorly. The eyes are rather near, and subconical. The

fourth thoracic segment has a low prominence just inside of the epimeral suture. The hands of the first pair of legs resemble those of the *Gaudichaudii*.

---

SUBTRIBE ARCTURIDEA.

FAMILY ARCTURIDÆ.

GENUS LEACHIA, *Johnston*.

LEACHIA NODOSA.

*Corpus tuberculosum. Thoracis segmenta secundum tertiumque brevissima; quartum maximum, valde elongatum, anticè latius et utrinque cuspidatum. Abdomen 2-articulatum; segmento primo transverso; secundo oblongo, posticè parce latiore, rotundato, ad latera prope basin emarginato. Antennæ superiores tenues, articulis duobus inferiorum parce longiores; inferiores pediformes fere corporis longitudine, 6-articulatæ, articulo quinto breviorè quam quartus, infra brevissimè paulum setuloso, sexto quadruplo breviorè, unguiformi, fere recto, infra parce setuloso.*

Body tuberculate. Second and third segments of thorax very short; fourth large and much elongate, widest anteriorly with a pointed prominence either side. Abdomen two-jointed; first segment transverse; second oblong, not narrower posteriorly, rotund behind, on either side near base emarginate. Superior antennæ slender, hardly longer than the first two joints of the inferior; inferior pair pediform, nearly as long as body, six-jointed, fifth joint shorter than fourth, and very short and setulose below; sixth hardly one-fourth the fifth, unguiform, nearly straight, sparingly setulose below.

Plate 53, fig. 2 *a*, lateral view of animal, enlarged; *b*, dorsal view; *c*, one of the anterior legs.



Balabac Passage, off Mangsi Islands, north of Borneo; brought up from a depth of thirty-one fathoms.

Colour, dull yellow. Length, half an inch. This species attaches itself to seaweeds or Corallines by means of its six hinder legs, and stands like a Caprella, with the body nearly erect; the anterior legs are commonly thrown over the mouth, being used principally for taking food, for which purpose they are adapted by means of their ciliæ, which form a kind of net for capturing prey. These four anterior pairs are five-jointed; they gradually increase in length from the first to the fourth; and the last three pairs as gradually diminish. The latter are naked or nearly so; of the six joints, the second is longer than the third or fourth; the sixth is shorter than the fifth, and has a tooth under the extremity. The head is oblong, with five tubercles on the dorsal surface, and one spinous process in front below. The eye is lateral and prominent. The inner antennæ have a few short hairs at tip. The second joint of the outer or inferior antennæ is stout and angular. The abdomen is very convex below. The plates below are barely seen in a dorsal view projecting a little on either side, near the apex.

*Leachia nodosa*, DANA, Amer. J. Sci. [2], viii. 424, 1849.

---

SUBTRIBE TANAIDEA.

FAMILY I. TANAIIDÆ.

SUBFAMILY TANAINÆ.

GENUS TANAIIS.

THE head in this genus is very short, and often appears as if soldered to the first thoracic segment; and the latter is oblong and of diffe-

rent shape from the following, being narrower anteriorly. The segments of the abdomen are five or six in number, and often subequal, yet usually the posterior is largest. The stylets are simple, and three to seven-jointed. The anterior or cheliform legs are short and stout, and well fitted for prehension; the fingers are short, and touch by their inner sides. The second pair of legs is monodactyle, and very slender. The eyes consist of but few facets; in the *T. brasiliensis* there are only six facets, five being arranged around a central one: in some instances, the eyes form a projecting protuberance at the anterior angles of the front. The abdomen is commonly about as long as the last two thoracic segments.

TANAIS (PARATANAIS?) BRASILIENSIS.

*Segmentum thoracis primum anticè valde angustius, septimum sexto vel quinto brevius. Abdomen oblongum, ad extremitatem apiculatum, 6-articulatum, segmentis subæquis, ultimo non longiore quam penultimum, stylis abdomine paulo brevioribus, 6-articulatis. Pedes antici crassi, manu ad basin angustiore, carpo oblongo, recto, nudo, articulo precedente recto. Antennæ primæ paulo majores, corpore quadruplo breviores, secundæ 6-articulatæ.*

First thoracic segment much narrowed anteriorly; seventh shorter than fifth or sixth. Abdomen oblong, apiculate at apex, six-jointed, segments subequal, the last not longer than the preceding, stylets but little shorter than the abdomen, six-jointed. Anterior feet stout; the hand narrower at base; carpus oblong, straight, naked; preceding joint straight. Superior antennæ a little the larger, about one-fourth as long as the body, inferior six-jointed.

Plate 53, fig. 3 *a*, animal, enlarged; *b*, eye; *c*, caudal stylet; *d*, second antennæ; *e*, anterior legs; *f*, second pair of feet; *g*, one of three posterior pairs.

At Rio Janeiro, on sea-shores in cavities among Serpulas.

Length, four lines. Colour, pale greenish or yellowish green. The head and first thoracic segment together have a somewhat pyriform

outline. The eyes consist of six facets. None of the thoracic segments are as long as broad; the fifth and sixth are somewhat the longest, and are much longer than the seventh, which is twice as broad as long. The segments of the abdomen are of nearly equal length, the last not being longer than the preceding. The stylets consist of a rather stout basal joint and five more slender joints; they are somewhat hairy. The legs, excepting the first pair, terminate in a claw, which is short, excepting in the second pair; in this the claw is slender and nearly as long as preceding joint, upon which it closes. First pair of legs thrown forward either side of head. The thumb has a depression in the inner margin near its base, and another near its apex; to the former a tooth in the finger corresponds; and into the latter the extremity of the finger closes; the intermediate portion of both thumb and finger is finely denticulated; the second joint of the leg is compressed near its base. The superior antennæ decrease in diameter from base to apex. The second pair has a two-jointed base and a four-jointed extremity.

This species is near the *Tanais dubius* of Kröyer (Tidsskr. Heft., 2, 1842); but it is peculiar in having the last of the six abdominal segments not longer than the preceding, and also slightly apiculate behind.

*Tanais brasiliensis*, DANA, Amer. J. Sci. [2], viii. 425.

#### GENUS PARATANAIS, Dana.

*Tanai pedibus anticis breviter et crassè chelatis antennisque 1mis flagello non confectis similis. Styli caudales biramei, ramis inæquis, uno vel pluribus articulis instructis.*

Like *Tanais* in having the anterior feet stout chelate and short, and the antennæ without a flagellum. Caudal stylets two-branched, branches unequal, one or many-jointed.

This genus is separated from *Tanais* by only a single character; yet the distinction may be convenient. The accessory branch of these stylets may exist in the preceding Brazilian species; and, if so,

it was overlooked in the examinations made when the specimen was obtained by the author.

PARATANAIS ELONGATUS.

*Gracilis.* Caput segmentumque thoracis primum simul sumta subelliptica. Oculi minuti. Segmenta quatuor thoracis postica subæqua, fere quadrata. Abdomen pubescens, 6-articulatum, posticè rotundatum, articulo postico longiore, semicirculari. Styli caudales biramei, ramo uno 2-articulato, altero breviorè 1-articulato, apicibus setulosis. Antennæ primæ 4-articulatæ; secundæ quoque 4-articulatæ. Manus crassa, ad basin non angustior, articulo pedis 2do supra profundè excavato.

Quite slender. Head and first thoracic segment together nearly elliptical in outline. Eyes minute. Last four thoracic segments subequal, nearly quadrate. Abdomen pubescent, six-jointed, rounded behind; last segment longest, semicircular. Caudal stylets two-branched, one branch two-jointed, the other shorter, one-jointed; tips with a few hairs. Superior antennæ four-jointed, apical joint longest; inferior pair also four-jointed. Hand not narrower at base; second joint of leg profoundly excavate on upper side.

Plate 53, fig. 4 *a*, animal, enlarged; *b*, antennæ; *c*, first pair of legs; *c'*, hand, more enlarged; *d*, second pair of feet; *e*, caudal stylet.

Sooloo Archipelago.

The second thoracic segment is much the shortest, and the last is not shorter than the preceding. The antennæ are shorter than one-fourth the length of the body. The anterior feet, as in the preceding species, extend forward just beyond the line of the front, and then are flexed downward, the inflexed part being the hand. The thumb has a seta on the under side, as well as one on the inner, at the summit of a triangular prominence. The body of the hand, preceding the articulation with the finger, is nearly square, a little oblong. The second pair of legs is quite slender and small.

*Tanais elongatus*, DANA, Amer. J. Sci. [2], viii. 425.

## GENUS LEPTOCHELIA.

*Tanais similis*. *Pedes antici longi, digitis tenuibus hiantibus. Antennæ Imæ elongatæ, et flagello confectæ. Abdomen 6-articulatum, styliis caudalibus articulatis.*

Near *Tanais*. Anterior feet long, fingers slender and gaping. Superior antennæ elongate and ending in a flagellum. Abdomen six-jointed; caudal stylets jointed.

The head, thorax, and abdomen, and general characters are like those of *Tanais*. The anterior feet, in the species examined, are much longer than the body, and the hand alone more than two-thirds as long. The exterior antennæ are but little shorter than the body. The caudal stylets have a short branch from the base. The feet are otherwise nearly as in *Tanais*; the second pair is rather longer than the two following, and has a longer claw. *Tanais Edwardsii* of Kröyer (Tids. iv. 1842), is of this genus.

*Leptochelia*, DANA, Amer. J. Sci. [2], viii. 425, 1849.

## LEPTOCHELIA MINUTA.

*Corpus lineare, capite angusto, fronte fere truncato, thoracis segmentis duobus posticis fere quadratis, aliis brevioribus. Abdomen postice subobtusum, segmentis subæquis. Styli caudales abdominis longitudine, ramo longo 6-articulato, altero minuto 2-3-articulato. Antennæ superiores corpore paulo longiores, basi longissimo, 4-articulato, articulo secundo longiore; flagello 6-7-articulato vix longiore quam articulus basis secundus. Pedes antici corpore valde longiores, carpo dimidium corporis longitudine valde superante, manu paulo longiore, digitis tenuissimis incurvatis, nudis, digito immobili prope apicem infra dentigero.*

Body linear; head small, front nearly truncate; two posterior segments of thorax transverse but nearly quadrate, the others shorter. Abdomen subobtuse behind; segments subequal. Caudal stylets as long as abdomen, longer branch six-jointed, shorter minute, two or three-

jointed. Superior antennæ a little longer than the body, or of same length; base elongate, four-jointed; second joint longest; flagellum hardly longer than this joint, six to seven-jointed. Anterior feet much longer than body; carpus much longer than half the body; hand still longer; fingers very slender and incurved, naked, the immoveable one with a low tooth within near apex.

Plate 53, fig. 5 *a*, dorsal view of animal, enlarged; *b*, lateral view; *c*, posterior leg; *d*, caudal stylet.

From among sea-weed and small corals, Feejees, Island of Ovalau.

Length, one-tenth of an inch. The head is transverse, and nearly a rectangular segment, with the eyes near the anterior angles; the following segment is somewhat ovate, wider behind; the next three are short, but very gradually increasing. The caudal stylets are a little hairy. The superior antennæ have the second joint about as long as third and fourth together. The inferior antennæ are slender, and shorter than the first two basal joints of the inner antennæ. The anterior legs excluding the hand are nearly as long as the superior antennæ. The fingers are very slender, and widely separated when their apices are in contact. There are one or two setæ on the finger near apex. Abdominal legs five pairs.

This species is Caprelloid in habit. It was observed by the author attached by its hinder legs to sea-weed, and reaching out the long arms in different directions, as if in search of prey.

#### SUBFAMILY LIRIOPINÆ.

#### GENUS CRYPTOTHIR.

*Maris*:—*Corpus angustum, 14-articulatum, annulatum, posticè acuminatum. Pedes 4 antici cheliformes, reliquis unguiculatis, unguibus longis, 6 posticis subæquis. Abdomen stylis tenuibus acutis strictè appressis confectum. Antennæ quatuor, secundæ elongatæ, flagello confectæ, primæ perbreves, breviter scopuligeræ.*

*Male*:—Body narrow, fourteen-jointed, annulate, narrowing behind

nearly to a point and terminating in a pair of slender pointed stylets, which are not jointed. Four anterior legs subchelate, the rest unguiculate; six posterior subequal. Antennæ four; second pair having a flagellum; first pair very short, with a tuft of short hairs at apex.

The animal for which this genus is instituted resembles much the males of some Bopyri in form and its members. It is very close to Rathke's *Liriope* (Beit. Fauna Norweg., p. 60, tab. 1), which this author makes an Amphipod; but the *Liriope* has the posterior legs short, and ending in a slender styliform joint, not unguiculate.

#### CRYPTOTHIR MINUTUS.

*Corpus oblongo-lanceolatum, posticè acuminatum, anticè truncatum. Caput transversum, segmento proximo majus, ad frontem paulo angustius. Abdomen 6-articulatum, segmento postico minore. Styli caudales terminales, strictè appressi, articulos abdominis quatuor longitudine æquantés. Antennæ primæ 3-articulatæ, scopulâ perbrevis instructæ; secundæ corpore fere triplo breviores, basi 4-articulato, flagello fere duplo longiore, 7-articulato.*

Body oblong lanceolate, acuminate behind, truncate in front. Head transverse, larger than next segment, a little narrower in front than behind. Abdomen six-jointed, posterior segment smallest. Caudal stylets terminal, close appressed together, as long as last four segments of abdomen. First pair of antennæ minute, three-jointed, furnished with a small brush of setæ; second pair about two-fifths as long as body, base four-jointed, flagellum nearly twice as long as base, seven-jointed.

Plate 53, fig. 6 *a*, animal, enlarged; *b*, inner antenna; *c*, outer antenna; *d*, foot of second pair.

Feejee Islands. Found in a *Creusia*, three or four specimens in different individuals of this corallidomous barnacle.

Length, about half a line. Body broadest near middle of thorax;

seven joints to thorax; six to abdomen; segments very distinct, and a little prominent, all transverse. Head of trapezoidal form. First and second thoracic segments shorter than the following. Abdominal stylets naked, the two forming a prolonged pointed termination to the body. Inner antennæ not seen in upper view, excepting the tuft of hairs which projects at either corner of the head. Flagellum of outer antennæ very slender; joints slender, nearly naked. First pair of legs minute; second has a short and stout triangular hand, with the base of the triangle set against the carpus; breadth less than length; moveable finger at apex of hand, not half length of hand. Following five pairs of legs similar; third and fourth pairs a little the stoutest; claw slightly curved, half or two-thirds as long as preceding joint.

---

## FAMILY II. BOPYRIDÆ.

### SUBFAMILY IONINÆ.

#### GENUS ARGEIA, Dana.

*Corporis articulationes uti in Bopyro. Appendices abdominis femine non ramosæ, vesiculiformes. Thorax appendicibus branchialibus instructis. Abdomen maris appendicibus carens, non articulatum.*

Like *Bopyrus* in general form. Abdominal appendages quite simple sacs. Thorax furnished with branchial appendages of similar form. Male abdomen without appendages and not jointed.

Ione differs from this genus in having the female abdominal appendages branched, and the male abdomen jointed and furnished with appendages. The feet in the males are all similar, and terminate in a small hand. The first thoracic segment is united to the head by a separating suture. The following six segments are similar and free. The abdomen is oval, pointed behind, and without any division into segments. The female abdomen has six pairs of appendages, and each



pair excepting the last consists on either side of two blind sacs. The branchial thoracic appendages are attached to the margins of the segments, or normally to the bases of the legs. The legs are quite small, and terminate in a small hand.

ARGEIA PUGETTENSIS.

*Feminae*:—*Corpus parce oblongum, usque ad extremitatem bene articu-  
latum, segmentis numero 15. Caput transversum. Appendices  
abdominales submarginales, 10 anticæ bi-partitæ, ramo externo sat ob-  
longo, interno subgloboso, parvo; duæ posticæ simplicissimæ, oblongæ.*  
*Maris*:—*Corpus fere lineare. Abdomen latè ovatum, margine inte-  
gram, postice subacutum.*

*Female*:—Body sparingly oblong, quite to the extremity prominently jointed, the segments fifteen in number. Head transverse. Abdominal appendages submarginal; the ten anterior bi-partite; outer branch oblong, inner subglobose and small; two posterior quite simple, oblong. *Male*:—Body nearly linear. Abdomen broad ovate, margin entire, subacute at extremity.

Plate 53, fig. 7 *a*, male, enlarged; *a'*, extremity of leg; *b*, female, upper view; *c*, same, under view; *d*, leg of fourth pair of female; *d'*, same, in another position; *e*, fifth pair; *e'*, same, in another position.

From *Crangon munitus*, Puget's Sound, Northwest Coast of America.

Length of female, three to four lines; of male, a line. The egg-pouch of the females is nearly circular in outline, and lies beneath the thorax, encroaching hardly upon the abdomen. The under surface of the female abdomen is naked, showing well the articulations across, and having only a narrow part towards the margin covered with the inner branch of the abdominal appendages. The maxillipeds in the females are each a small oblong plate, placed transversely, not one-sixth as large as the left lamina of the first pair covering the eggs. In their natural position, the male legs do not project beyond the margin of the body, as observed in a dorsal view. The head in the

male is very nearly as broad as the first thoracic segment. The six posterior thoracic segments are truncate either side.

---

### TRIBE III. AMPHIPODA.

THE thoracic position of the branchial appendages, and the styli-form or non-branchial character of the three posterior pairs of abdominal appendages, distinguish all the Amphipoda from both the Isopoda and Anisopoda.

Among the Amphipoda, two types of structure, as regards the organs of the mouth, are recognised, and the distinctions of the two sections thus indicated, extend to various parts of the body. In one type, the outer maxillipeds are small and operculiform; the eyes are large, the facets covering the greater part of the large head, and giving the animal a wild, staring look; the extremity of the abdomen is broad and depressed, and the natatory abdominal appendages are usually oval lamellar. Such are the species of the *Hyperia* group—the HYPERIDEA.

In the other type, the outer maxillipeds are elongated and palpi-form, the eyes are small, the head of moderate size, the abdomen, when not obsolete, narrow, and the natatory abdominal appendages usually slender.

Under this second type all the Amphipoda, excepting the Hyperidæ, are included. They comprise, however, two distinct groups, based upon as important characters as those which separate them from the Hyperidea. These differences are most prominently exhibited in the abdomen. In *one* section, the CAPRELLIDEA, embracing *Caprella*, *Cyamus*, and related genera, the abdomen is obsolescent. In a second, the GAMMARIDEA, the abdomen is fully developed, with three pairs of natatory appendages, and as many of stylets. This second section embraces the typical Amphipods, the Gammari, Talitri, and the like. The abdomen in these species is usually a powerful organ of motion.

The nearest approach of the Amphipoda to the Isopoda, or rather, to the Anisopoda, takes place in the Caprellidea and the Gammaridea.

In the Caprellidea the resemblance to Isopods is close in general form; the broad Cyami have the habit of a Cymothoidan, and the lank Caprella, that of a Tanais or Arcturus.

The Gammaridea are, in general, widely diverse from the Isopods, through the long inflexed abdomen, which is used in locomotion, often as an organ for leaping, and their thoracic legs, which are unfit for walking or clinging. Yet, there are genera representing the Caprellidea and Anisopoda, which have a gressorial habit. In *Corophium* and the related genera the species are simply gressorial; while the genus *Dulichia* includes slender species that cling by their hind legs, like Caprella and Tanais, and have a similar mode of life.

The subtribes which have been enumerated, are distinguished as follows:—

Subtribus I. CAPRELLIDEA.—Maxillipedes caputque ac in *Gammarideis*.  
Abdomen obsolescens.

Subtribus II. GAMMARIDEA.—Maxillipedes palpiformes, elongati, 5–6-articulati. Caput oculique mediocres. Appendices abdominales sæpius perangustæ.

Subtribus III. HYPERIDEA. — Maxillipedes operculiformes, breves. Caput grande, oculorum corneis plerumque tectum. Appendices abdominales sæpius latiores.

---

#### SUBTRIBE I. CAPRELLIDEA.

THE Caprellidea pertain to two families, as laid down by different authors:—

FAM. I. CAPRELLIDÆ. — Corpus anguste elongatum, fere filiforme. Antennæ 2dæ longitudine mediocres. [Species non parasiticæ.]

Fam. II. CYAMIDÆ.—Corpus late depressum. Antennæ 2dæ rudimentariæ. [Species parasiticæ.]

The Caprellidæ cling by their six hinder legs to sea-weeds, coralines, and other objects of support, while the long body moves in various directions, and wields its well-handed anterior legs for taking its prey. The Cyamidæ, on the contrary, are found attached like the Cymothoidæ, to the body of marine animals.

The genera in these families, thus far recognised, are as follows:—

#### FAM. I. CAPRELLIDÆ.

##### 1. *Pedes thoracis numero 14.*

- G. 1. PROTO,\* *Leach*.—Mandibulæ palpigeræ. Branchiæ segmentis 2do 3tio 4toque affixæ. Pedes thoracis toti articulis normales.  
 G. 2. PROTELLA, *Dana*.—Mandibulæ palpigeræ. Branchiæ segmentis 3tio 4toque affixæ. Pedes 3tii 4tique obsoleti articulo 1mo styliformi excepto.

##### 2. *Pedes thoracis 3tii 4tique omnino obsoleti.*

- G. 3. CAPRELLA, *Lamk.*—Mandibulæ non palpigeræ. Branchiæ segmentis thoracis 3tio 4toque affixæ. Abdomen brevissimum, 1-2-articulatum.  
 G. 4. ÆGINA, *Kröyer*.†—Mandibulæ palpigeræ, palpis 3-articulatis. Branchiæ ac in *Caprellâ*. Abdomen brevissimum, 1-2-articulatum.  
 G. 5. CERCOPS, *Kröyer*.‡—Mandibulæ palpigeræ. Branchiæ segmentis 2do 3tio 4toque affixæ. Abdomen 5-articulatum, appendicibus 4 elongatis 3-articulatis.

##### 3. *Pedes 3tii 4ti 5tique obsoleti.*

- G. 6. PODALIRIUS, *Kröyer*.§—Branchiæ segmentis 3tio 4toque affixæ.

#### FAM. II. CYAMIDÆ.

##### G. 1. CYAMUS.

\* *Leptomera*, Latreille.

† Tids., iv. 1842.

‡ Ibid.

§ Voy. Scand., pl. 25, and Tids. [2], i. 288.

## FAMILY CAPRELLIDÆ.

IN the study of the Caprellidæ, the sexual differences are found to be great and perplexing, and even in the same sex there are wide variations of form in a single species. These differences are most strikingly exhibited in the relative lengths of the head and first thoracic segments, the character of the hands of the second pair, the position of the second pair of legs on the segment bearing it, and also, to some extent, in the relative lengths of the pairs of antennæ, and the several thoracic segments. Besides these differences, there is the existence of ovarian plates in females, beneath the third and fourth segments of the thorax, which are wanting in males.

In a single species, the *males* may have the head three or four times shorter than the first thoracic segment; while in the *females* it is but twice as large. Again, in other males of the same species, the proportion may be nearly that of the female.

In *males*, the second pair of legs is often attached to some part of the posterior half of the second thoracic segment; in *females*, the attachment is always anterior to the middle of this segment, and often quite to the anterior extremity. But, while there is the widest diversity in this respect between the males and females of the true Caprellæ, the difference is slight, or none, in Proto and Protella, the attachment being in neither sex posterior to the middle, and often much anterior.

The hand of the second pair in *male* Caprellæ of some species, has often two prominent teeth anterior to the middle of the palm, one of the two (the more apical) sometimes truncate and rhombic, and the palm is frequently a little concave; besides these teeth, there may be another on the same margin, exterior to where the end of the finger shuts down. But this arrangement does not occur in all males, nor is it absent from all females, unless it be that the truncate rhombic form of tooth is a male characteristic, whenever it occurs, as we deem probable. In females, the teeth on the palm are usually less prominent, and the palm itself is more frequently somewhat convex.

The second, third, fourth, and fifth segments of the body in Caprellæ are commonly approximately equal in length. In the more

slender species, however, the second segment is often much longer than the third and following. But, while this may be true of the male of a species, it sometimes is not true, or but slightly so, of the female.

The ovigerous females are readily distinguished from males by the plates beneath the third and fourth thoracic segments. But females without eggs appear to be without this mark of the sex, and resemble the males.

There are, hence, hardly any characters which are with certainty common to both sexes in a species. The occurrence of individuals at the same locality, the similarity in the hairs of the antennæ, and in the form of the joints of the flagellum (not their number), and the spines or tubercles of the body, are the most important characteristics common to the sexes—yet, even in the spines, the sexes may differ. In *Caprellæ*, the articulation of the second pair of legs with the *posterior* half of the thoracic segment in males, and with the *anterior* half in females, appears to be a constant character.

GENUS PROTO, *Leach*.

PROTO ELONGATUS.

*Corpus gracile, omnino inerme et inornatum. Caput antice rotundatum segmento proximo fere duplo longius. Segmenta thoracis 2dum, 3tium, 4tum, 5tum, 6tumque oblonga et subæqua. Antennæ 1mæ dimidio corporis parce longiores, flagello 8-10-articulato, paululo brevior quam basis, articulis oblongis, setis paucis, brevioribus quam articuli. Antennæ 2dæ basi 1marum vic longiores, flagello 4-articulato, paulo brevior quam articulus precedens. Manus 1ma oblonga, triangulata, margine inferiore ad basin dente saliente armato, digito parce brevior quam manus. Manus 2da elongata, palmâ rectiusculâ prope manus basin dente acuto armatâ, et maris dente alio versus apicem. Branchiæ longæ fere lineares. Pedes 3tii 4tive 5tis longiores.*

Body slender, without spines or tubercles. Head rounded in front, about twice as long as next segment. Second, third, fourth, fifth, and sixth thoracic segments subequal, oblong. Superior antennæ longer than half the body; flagellum hardly as long as base, eight

to ten-jointed, joints oblong, setæ few, shorter than joints. Inferior antennæ about as long as base of superior; flagellum four-jointed, and about as long as fourth basal joint. Hand of first pair triangular, lower angle near base prolonged into an acute tooth. Hand of second pair elongate, palm nearly straight, having an acute tooth near base, and in males, a tooth towards apex. Branchiæ long, and nearly linear. Third and fourth pairs of feet longer than fifth pair.

Plate 54, fig. 1 *a*, male, enlarged; *b*, hand of first pair; *c*, *ibid.* of second pair; *d*, mandible; *e*, lip; *f*, second pair of maxillæ; *g*, maxillipeds; *h*, extremity of abdomen; *i*, female, probably of this species; *k*, antenna of first pair.

Rio Janeiro, in ten to twelve fathoms water; taken from the anchor along with various Caprellids, January, 1839.

Length, two-thirds of an inch. Head and first thoracic segment together but little shorter than second thoracic segment; fifth thoracic segment somewhat the longest; seventh very short, but slightly oblong and rounded behind. Eyes large and round. Second joint of base of superior antennæ about twice as long as first, and one-third longer than third; joints of flagellum oblong and slender. First pair of thoracic legs nearly half as long as second pair; first joint about equal to three following; hand broadest at base, and with a straight transverse basal margin, extending into the tooth below, this tooth tipped with one or two short spines; a few short hairs on posterior margin of third and fourth joints. Second pair of legs has a slender basal joint, as long as the segment or a little exceeding it, and as long as hand; the finger is nearly as long as hand and much curved, rather abruptly so, just exterior to centre; branchia of this pair about half as long as basal joint; when the finger is closed on the hand there is an interval between it and the palm. The hand of males has the palm somewhat concave, a low convex prominence near its middle, an emargination for the extremity of the finger, with a spine below, and one or two smaller above; also a tooth near apex. In the female, the hand is narrow subelliptical; it has a tooth, as in the male, near base, which is the limit of the palm, but the palm is slightly arcuate instead of excavate, and has some small teeth. Third and fourth

pairs of legs similar, subequal; basal joint of fourth pair shorter than that of third pair; third joint in fourth pair longer than in third; fifth joint with four or five short spines on the inner margin; fourth and fifth joints subequal; claw a little longer than the joint. Branchiæ in male, one-fourth shorter than basal joint; in female, about as long as this joint. Fifth pair of legs much smaller than fourth, rather more than half their length; fourth joint about one-third the fifth; claw shorter than fifth; no spines on inner side of fifth joint. Sixth and seventh legs long, subequal; coxa of sixth pair longest and most slender; claw shorter than last joint; three or four short spines on inner margin of this joint. Abdomen very short; but there are two pairs of very slender and very short appendages, and the first pair terminates in a short moveable joint, which is subacute.

The mandibles terminate in a flat dentated edge; palpus long, three-jointed; first joint shortest; second longest; third a little curved and acute. Palpi usually seen extending in front of the head, just below the antennæ. Maxillipeds six-jointed; terminate in a stout claw, as the sixth joint; fifth joint shorter than the claw; first joint prolonged and enlarged on inner side; second prolonged at inner apex, and extremity finely denticulated. Lower lip obtusely emarginate with membranous suboval appendages on either side.

The female in most respects resembles the male. The second pair of feet is attached, in males, to the middle of the second segment, and in females, just forward of middle.

GENUS PROTELLA, Dana.

*Segmenta thoracis tertium quartumque branchias et pedes rudimentarios uni-articulatos gerentia. Pedes sex ultimi subæqui. Mandibulæ palpigeræ.*

Third and fourth thoracic segments bearing branchiæ and rudimentary one-jointed feet. Feet of last three pairs subequal. Mandibles palpigerous.

The rudimentary feet of the third and fourth pairs, which distinguish this genus from Caprella, are simply an oblong, styliform joint. As in *Ægina*, the mandibles are furnished with a three-jointed palpus.



## PROTELLA GRACILIS.

**Maris:**—*Corpus gracile, aculeis tuberculisve non ornatum, fronte obtuso, segmento thoracis 1mo paulo longiore quam caput, segmentis 2do 3tio 4to 5to subæquis, bene oblongis. Antennæ 1mæ gracillimæ, corpore longiores, basi paulo brevior quam corpus, articulis 2do 3tioque subæquis, flagello plus dimidio longiore quam articulus precedens; 2dæ articulis 1marum duobus basalibus parce longiores. Manus 1ma parvula, carpo non brevior quam manus; 2da plus quadruplo longior, sat angusta, palmâ fere nudâ, dentibus tribus armatâ, uno externo\* acuto, uno prope hunc interno acuto, uno subapicali truncato rhombico. Pedes rudimentarii tenuiter styliformes, segmento paulo breviores. Branchiæ anguste ellipticæ.*

**Feminæ:**—*Manus 2da vix latior, infra arcuata, palmâ spinulosâ, 3-dentatâ, dente uno externo, duobus acutis brevissimis subapicalibus.*

**Male:**—Body slender, without spines or tubercles, front obtuse, first segment of thorax a little longer than head; second, third, fourth, and fifth segments subequal, rather oblong. Superior antennæ very slender, longer than the body; the base but little shorter than body; second and third joints of base subequal; flagellum more than one and a half times the preceding joint. Hand of first pair very small, carpus not shorter. Hand of second pair four times as long as hand of first pair, rather narrow; palm nearly naked, armed with three teeth, one external, one internal, and one subapical, truncate and oblique. Rudimentary feet slender and styliform, a little shorter than segment. Branchiæ narrow subelliptic.

**Female:**—Hand of second pair hardly broader than in male; palm arcuate, spinulous, short three-toothed, one exterior acute, and two acute very short subapical teeth.

Plate 54, fig. 2 *a*, male, enlarged; *b*, part of flagellum of superior antennæ; *c*, extremity of leg of last pair; *d*, female; *d'*, part of flagellum of superior antennæ, *ibid.*; *e*, head of another variety; *f*, hand of female of second pair of legs.

From thirty-one fathoms water, in Balabac Passage, attached to a Plumularia and a Gorgonia.

\* The finger closes upon the hand just inside of the tooth here referred to as the *exterior*.

Length, seven-eighths of an inch. Colour, pale yellowish. Second thoracic segment is about as long as head and first thoracic segment. Joints of flagellum of superior antennæ oblong cylindrical; setæ minute, one on under side close appressed to the joint, which is about as long as the joint, besides two or three others much smaller; base naked, or very nearly so. Inferior antennæ with fourth joint about as long as preceding part, and remaining portion not half the fourth joint in length; a row of about six extremely short setules on under margin of fourth joint, and four on preceding joint. First joint of second pair of legs longer than second thoracic segment. Finger of same much curved, about two-thirds as long as hand; fifth pair of legs more slender than sixth or seventh. The rudimentary legs end in a few minute setules.

The female is closely like the male in all points nearly, excepting the hand of the second pair. The third joint of the superior antennæ may be a little longer or a little shorter than the second; the first joint is not half the second.

GENUS CAPRELLA, *Lamarck*.

I. THORAX NEC ACULEATUS NEC TUBERCULATUS.

1. *Frons aut dorsum capitis spinâ tuberculove armata*.

CAPRELLA DILATATA, *Kröyer*.

Plate 54, fig. 3 *a*, animal, enlarged; *b*, side view of head; *c*, hand of second pair of legs; *d*, abdomen; *e*, part of flagellum of superior antennæ.

Rio Janeiro; brought up on the anchor, January, 1839; also, on sea-weed, along the sea-shore, beyond Praya Grande, December 21, 1838.

Body slightly granulous under a high magnifier, stout, segments but little oblong or not at all so. Head twice as long as next segment, armed in front with a horizontal spine. Third segment of thorax somewhat quadrate, anterior angles prominent, fourth triangular. Superior antennæ a little shorter than half the body, very

stout at base, the first two joints being about four times as thick as the following joint; last joint of base slender; flagellum about twelve-jointed, a little shorter than base, joints slightly oblong, narrow at base; inferior antennæ slender, ciliate below, sparingly longer than base of superior pair. Hand of first pair of legs with a small acute prominence on the palm near the base of the joint, and the palm is hairy; length of the hand half that of the second pair. Hand of the second pair broad and oblong, narrowing from middle towards apex, with the lower posterior angle rounded; palm nearly straight and densely hirsute, without a tooth or spine where the closed finger reaches; it has a slender acute tooth near middle, and an oblique, truncate, subquadrate one, just anterior. Flagellum of the superior antennæ about twelve-jointed. Branchial appendages nearly round. First joint of last six legs with the upper apex prolonged and acute; second joint very small; tarsus stout, and having a prominence with two short spines, below near base. Length, one half to two-thirds of an inch. Colour of specimens found on sea-weed, nearly brick-red.

*Caprella dilatata*, KRÖYER, Tidssk., iv. 1843, 585, pl. 8, figs. 1-9. Krøyer's specimens were also obtained from the anchor. Krøyer makes both teeth of the palm of the hand of second pair of legs acute; but our specimens have the anterior one truncate, giving it an oblique, subquadrate form.

#### CAPRELLA ROBUSTA.

*C. dilatata* rostro horizontali, capite brevi, branchiis, aliisque affinis, sed paulo angustior, segmentis paulo oblongis, 3tio thoracis vix latiore quam 2dum. Antennæ 1mæ basi graciliores, articulis flagelli ac in dilatatâ, sæpe paucioribus, 2dæ basi 1marum longiores, infra ciliatæ. Branchiæ rotundato-ellipticæ. Manus 2da lata, palmâ sparsim hirsutâ, versus basin acutè dentigerâ, et ante medium dente acuto sæpe armatâ.

Near the *C. dilatata* in the horizontal beak, short head, the branchiæ, and other characters, but somewhat narrower. Superior antennæ more slender at base, a little longer than half the body; flagellum a little shorter than the base; inferior pair longer than base of superior, ciliate below. Branchiæ round-elliptic. Hand of second pair broad, palm sparsely hirsute, near base bearing an

acute tooth, and above the middle usually another small acute tooth.

Plate 54, figs. 4 *a*, *b*, male, enlarged; *c*, part of female; *d*, hand of second pair, in another specimen; *e*, extremity of leg of fifth pair.

Rio Janeiro; from among sea-weed near the fort, not far from Praya Grande, abundant; also, brought up with the anchor in the harbour.

Length, about half an inch. Colour, dirty yellowish, or reddish to flesh-red. Vertical width of head about equal to its length. The spine on the head forms a short horizontal beak in advance of the front, as in the *dilatata*. The first four joints of the inferior antennæ are about equal in length to the first three (basal portion) of superior antennæ. The flagellum of the superior antennæ consists of ten joints in the specimen figured; but the first joint was long, and apparently corresponded to three or four joints; the joints bear a few very short setæ. Two rows of ciliæ on the inferior antennæ, as usual. Anterior hand about two-thirds as long as second pair. Superior apex of basal joint of posterior feet acutely prolonged.

The female is rather smaller than the male, and has the second pair of legs proceeding from the anterior part of the second thoracic segment, near the articulation. But the proportion of the head to the first thoracic segment is the same very nearly in both sexes. The scales forming the egg-sac are nearly quarters of a hemisphere, and the form of the sac is almost hemispherical.

The last two joints of the inferior antennæ are together little longer than the preceding one.

The females were supposed by the writer to be the females of the *dilatata*, but as there are males with like hands to the second pair of legs, the species seem to be distinct. The males and females are distinguished by the articulation of the second pair of legs with the segment which is posterior to the middle in the males, and close to the anterior extremity in the females (fig. 4 *c*). The males differ from those of the *dilatata* in the tooth of the hand limiting the palm; which tooth is wanting in the *dilatata*, though described by Krøyer as characterizing the female.

## CAPRELLA CORNUTA.

*Corpus gracile, segmentis oblongis, 2do thoracis, 3tio, 4to, 5toque inter se longitudine subæquis. Caput aculeo arrecto prope dorsum medium armatum, segmento proximo interdum dimidio brevius. Segmentum thoracis 2dum non triplo longius quam latum. Antennæ 1mæ dimidio corporis paulo longiores, sat graciles, flagello 10-14-articulato, 4tâ parte breviora quam basis. Antennæ 2dæ basi superiorum vix longiores aut breviores. Branchiæ angustè ellipticæ. Manus 1ma parva, secunda oblonga, duplo longior, palmâ rectiusculâ dente sub-basali et altero ante medium acutis armatâ.*

Body slender, segments oblong, second, third, fourth, and fifth of thorax subequal in length. Head hardly higher than long, a little shorter than next segment, armed near middle of dorsal surface with an acute spine, obliquely erect. Second thoracic segment not three times as long as broad. Superior antennæ rather longer than half the body, moderately stout; flagellum ten to fourteen-jointed, one-fourth shorter than base. Inferior antennæ very little longer or slightly shorter than base of superior. Branchiæ narrow elliptic. Hand of first pair small; hand of second pair oblong; palm nearly straight, having an acute tooth on palm near base, and another anterior to middle.

Plate 54, fig. 5 *a, b*, views, enlarged; *c*, part of flagellum of superior antennæ; *d*, third thoracic segment; *e*, hand of first pair; *f*, *ibid.* of second pair; *g*, extremity of leg of last pair.

From among sea-weed near the fort, not far from Praya Grande, Rio Janeiro. December, 1838; both males and females were abundant.

Length, about one-half an inch. Colour, dull yellowish, reddish. The acute spine on the head is situated near middle of dorsal surface. The flagellum of the superior antennæ had but ten joints; but the first joint was oblong, and seemed to consist of three or four joints united; the last two joints of the inferior antennæ are together as long as preceding one; the joints are oblong, more than twice as long

as broad, and the few setæ are a little shorter than the joint. The segments of the thorax, from the second to the fifth inclusive, are subequal, and the two following are about as long as the preceding one. The third thoracic segment is broader posteriorly, and in some males both this and the following have a low oblong prominence below, as in figure *d*, and the first pair is but little longer than half the second. The legs of the second pair, in males, are inserted quite near the posterior part of the second thoracic segment, and in females near the anterior margin.

Var. *obtusirostris*.—Fig. 6 *a, b*, Plate 54, represents a variety of the preceding, from the same locality.

Length, half an inch, or nearly so. Colour, dirty yellowish or reddish. It has a small, obtuse tubercle, which, in a vertical view, projects upon the head between the eyes, and not in front of it. The second, third, fourth, and fifth thoracic segments are subequal in length. The first four joints of the inferior antennæ are about equal to basal portion of superior, and the remaining portion is slightly longer than the preceding joint, or about half the flagellum of the superior pair. Hand of first pair of legs about two-thirds as long as hand of second pair. Spine near base of tarsus of posterior six legs on lower side very slender; outer apex of first joint of these legs not prolonged.

The specimen figured had the second pair of legs attached to second segment *just anterior to middle*, as if it were a female; yet there were no ovarian lamellæ.

#### CAPRELLA ATTENUATA.

*Corpus gracillimum, segmentis elongatis, 2do thoracis gracili, multo longiore quam 3tium. Caput segmento proximo quadruplo brevius, prope dorsum medium aculeo acuto arrecto armatum. Antennæ 1mæ dimidio corporis longiores, articulo 1mo fere dimidii 2di longitudine, flagello 8-10-articulato, duplo brevior quam basis, articulo 1mo longo composito. Antennæ 2dæ articulos basis 1marum duos basales fere æquant. Branchiæ fere lineares. Manus 2da perangusta, fere*

*sextuplo longior quam lata, infra dente acuto pone medium et altero ante medium armata, digito sat brevi.*

Body very slender, segments elongate, second thoracic segment nearly twice as long as third, and very slender. Head hardly one-fourth as long as next segment, bearing an acute spine on middle of dorsal surface. Superior antennæ longer than half the body; first joint about half as long as second; flagellum eight to ten-jointed, about half as long as base, the first joint very long and composite. Inferior antennæ about as long as first two joints of base of superior. Branchiæ nearly linear. Hand of second pair very narrow (about one-sixth as broad as long), having an acute tooth just posterior to middle of lower margin, and another anterior to middle.

Plate 55, fig. 1 *a, b*, male, enlarged; *c*, another variety; *d*, flagellum of superior antennæ of same; *e*, extremity of inferior, *ibid.*; *f*, finger of anterior hands; *g*, hand of second pair.

Rio Janeiro, with the preceding; abundant.

Length, two-thirds of an inch. Colour, yellowish white, sometimes with a tinge of red. The head is small, rather higher than long, and but one-fourth as long as the first thoracic segment. The flagellum of the superior antennæ, is usually shorter than the two preceding joints, and the first joint appears to be made up of five to seven segments, indicated by the notches and setæ of the margin. Inferior antennæ about as long as base of superior, excluding the last joint, which is a long one. The last two joints together of the inferior antennæ are hardly as long as preceding joint. The anterior legs are about half as long as basal joint of second pair. This basal joint is very slender, and rather longer than the segment to which it is attached, and longer than the hand of the same pair. The finger is hardly half as long as hand. The second pair of feet is attached to second segment, in the individual figured, very near its posterior margin. The palm of the hand bears a few very short hairs.

Var. *subtenuis*.—Our figure 1 *c*, represents this variety. It differs in its less slender form, the second joint of the thorax about one-half longer than the third, the inferior antennæ slightly longer than the

first two joints of the superior antennæ, the legs of the first pair stouter, the head about one-third the length of the first thoracic segment. The finger of the hand of second pair reaches nearly two-thirds of the way to the base, and closes beneath an acute process or tooth. The hands of the first pair are rather more than half as long as those of second pair.

The second pair of legs in the specimen figured is united to the posterior part of the second thoracic segment, and the individual was therefore a male. The basal joint of this pair of legs is slender, and about as long as the segment, and also about as long as the hand.

2. *Caput non armatum nec rostratum.*

CAPRELLA JANUARI (Kröyer).

Maris:—*Corpus gracillimum, segmento thoracis 1mo quadruplo longiore quam caput, 2do 1move gracili duplo longiore quam 3tium. Antennæ 1mæ dimidio corporis longiores, 2dis plus duplo longiores, articulo 1mo brevior quam 2di dimidium, flagello brevi, valde brevior quam articulus precedens. Branchiæ elongato-ellipticæ. Manus paris secundi oblonga, palmâ pubescente, dentibus acutis duobus armatâ et altero intermedio obsoleto.*

Body very slender, first segment of thorax four times as long as the head, second or first quite slender, and either twice as long as third. Superior antennæ longer than half the body, and more than twice the length of the inferior; first joint not half as long as second; flagellum much shorter than preceding joint of base. Branchiæ narrow-elliptical. Hand of second pair of legs oblong, palm pubescent, and armed with two acute teeth and another obsolete intermediate.

Plate 55, fig. 2 *a*, animal, enlarged; *b*, probably the female; *c*, part of flagellum of the superior antennæ; *d*, extremity of inferior pair; *e*, hand of second pair; *f*, extremity of leg of last pair.

Rio Janeiro; from the anchor, in ten to twelve fathoms.

Length, one and one-fourth inches. Head quite small, obtuse in



front. Margin of body very finely serrulate, as seen in vertical view, and the whole thorax pubescent. Inferior antennæ about half as long as base of superior, ciliate below. Superior pair pubescent; second joint very long and slender, more than twice the first in length; the third joint a little shorter than the second. The flagellum slightly longer than first basal joint, few-jointed. Hand of first pair of legs about one-third the length of hand of second pair. Anterior margin of coxa of second pair, serrulate; near base there is a short spinous process attached to the thoracic segment. The tarsus of the six posterior legs has two short spines below near base, not situated on a prominence, and the joint suddenly decreases from these spines towards the apex. Last two joints of inferior antennæ together about as long as preceding.

Krøyer described and figured this species in his *Tidsskrift*, iv. 1843, Heft 5, and tab. 6, figs. 14–20. He makes the body and superior antennæ a little less slender than in our specimens. He figures a female, which may possibly be another species.

The animal which we have figured (fig. 2*b*, pl. 55), as the female, differs widely from the *Januarii*, and may be distinct. The head is unarmed, as in the *Januarii*, but it is but slightly shorter than the first thoracic segment; the flagellum of the superior antennæ is much longer than the preceding joint, and about twelve-jointed, joints rather long; the second thoracic segment is hardly longer than the third; the inferior antennæ are as long as first two basal joints of superior, and half of nearly third joint; the branchiæ are narrow elliptical, but not linear. The hand of the second pair is narrow, the palm slightly arcuate, and armed with four or five minute spinules; a tooth below rather near base, two near apex; finger three-fourths as long as the hand.

This species is named in the author's earlier manuscripts *Caprella humilis*, and should it prove that the species is distinct, the name may be retained. One specimen of similar characters appears to be a male, as the second pair of legs are attached to the segment posterior to its middle; and if this is a safe criterion the species should be sustained.

#### CAPRELLA GLOBICEPS.

*Corpus crassiusculum, segmentis thoracis 2do 3tio 4to 5toque, longitudine*

*subæquis, paulo oblongis. Caput rotundatum, segmento proximo duplo longius. Antennæ 1mæ pubescentes, dimidio corporis paulo longiores et inferioribus plus duplo longiores, articulo 1mo parce brevior quam 2dus, flagello vix brevior quam basis, 10-12-articulato. Antennæ 2dæ parvulæ, basi 1marum multo breviores. Branchiæ oblongæ. Manus secunda oblonga, palmâ rectiusculâ, pubescente, versus basin prominulâ.*

Body rather slender, second, third, fourth, and fifth thoracic segments subequal, somewhat oblong. Head rounded, twice as long as next segment. Superior antennæ pubescent, rather longer than half the body, and more than twice as long as the inferior, first joint a little shorter than second; flagellum ten to twelve-jointed, hardly shorter than the base. Inferior antennæ much shorter than base of superior, quite short ciliate. Branchiæ oblong. Hand of second pair oblong; palm pubescent, nearly straight; a prominence towards base.

Plate 55, fig. 3, animal, enlarged.

Rio Janeiro, in ten to twelve fathoms; taken from the anchor with the preceding.

Length, half an inch. The rounded front of the head is peculiar; so, also, the small size of the inferior antennæ, which are not half as long as the superior, while the flagellum of the superior antennæ is about half the whole organ. The head, moreover, is twice as long as the first thoracic segment. The inferior antennæ are about as long as first two basal joints of the superior. The first basal joint of the superior is but little shorter than second, and about equal to third. Hand of first pair of legs very small, less than half the length of second pair. Branchial appendages subovate. Fifth thoracic segment is but little shorter than the preceding.

In the specimen figured, the second pair of legs is attached below to the second thoracic segment near its middle, and not anterior to it.

The species may possibly be a variety of the *dilatata*.

GENUS *ÆGINA*, Kröyer.

The character of this genus of Kröyer's, derived from the length of the abdomen, appears to have comparatively small importance; a strict adherence to the distinction "abdomen 2-articulatum," is not, therefore, considered necessary or convenient.

*ÆGINA?* TENELLA.

*Corpus gracillimum. Caput fronte subacutum, sed instar rostri non productum, segmento proximo paulo longius. Segmentum thoracis secundum 3tio 4to 5tove brevius, aculeis mediano et postico dorso armatum, tertium postice aculeatum tantum, reliqua ineremia. Antennæ 1mæ tenues, dimidio corporis multo longiores, articulo 1mo dimidii 2di longitudine, flagello articulado, paulo breviorè quam basis. Antennæ 2dæ basi 1marum parce longiores. Manus 2da angusta, apice obliquè truncata, palmâ non arcuatâ, medio obliquè profundè excavatâ sparsim brevissime pubescente. Branchiæ parvulæ, oblongæ.*

Body very slender. Head subacute in front, but not produced into a beak, longer than next segment. Second segment of thorax shorter than either of the three following, armed with spines on the middle and posterior margin of the back; the third aculeate at posterior margin only; remaining segments unarmed. Superior antennæ slender, much longer than half the body, first joint half as long as second, flagellum jointed, a little shorter than base. Inferior pair hardly longer than base of superior. Hand of second pair narrow oblong, with a broad obliquely truncate apex; palm not arcuate, near middle obliquely excavate, a few minute tufts of pubescence. Branchiæ quite small, oblong.

Plate 55, fig. 4, animal, enlarged.

Coral reef, Sooloo Sea; from the shores of a small island off the harbour of Soung, in the large island Xolo.

Length, half an inch. Colourless, or yellowish. Our doubt about

referring this and the following species to *Ægina*, rests mainly on our not knowing whether the mandibles are palpigerous or not; the drawings and description drawn up in the East Indies by the author, containing no information on this point, and the specimens being lost. Moreover, the species have seven joints to the inferior antennæ; the last three joints (corresponding to a flagellum in other Amphipods), are together much shorter than the preceding.

The third basal joint of the superior antennæ is nearly as long as the second; the first is about half shorter; the flagellum of this pair consists of slender oblong joints, and bears a few short setæ at apex of each. Hand of first pair of legs not half as long as in second pair; claw about as long as hand. Hand of second pair with the dorsal margin arcuate, the opposite straight and thin through basal half, and nearly parallel to dorsal, then a deep rounded emargination, directed towards base, and bounded outwardly by an acute point. Claw or finger nearly as long as hand. The last two thoracic segments are hardly longer than half the preceding. The branchiæ are less than one-third the length of the segments to which they are attached. Head vertically oblong in profile view. Second thoracic segment as long as head and first thoracic together; third as long as first and second. One of the spines of the second thoracic segment is at the middle of the back, and the other near the articulation behind. The legs of the second pair in the specimen examined, were attached quite near the anterior extremity of the second segment, as in female *Caprellæ*; but there were no ovarian lamellæ under the third and fourth segments.

*ÆGINA? ACULEATA.*

*C. tenellæ affinis, paululo crassior. Caput ad frontem vix acutum. Segmenta thoracis secundum tertiumque aculeis duobus quoad dorsum armata, reliquis inermibus. Manus secunda latè elliptica, infra arcuata, obsoletè erosa et remotè pubescens. Branchiæ parvulæ, oblongæ.*

Near *tenella*, slightly stouter. Head hardly acute in front. Second and third thoracic segments armed with two curved spines on the back, the others unarmed. Hand of second pair broad elliptical, arcuate below, obsoletely erose and remotely pubescent. Branchiæ quite small, oblong.

Plate 55, fig. 5 *a*, animal, enlarged; *b*, portion of flagellum of superior antenna.

Found with the preceding.

Length, nearly half an inch. This species has nearly the same proportional lengths between the thoracic segments as in the preceding. The antennæ are also similar, though stouter. The flagellum consists of cylindrical joints, and at apex there is a seta on the under side as long as the joint, while on the outer apex, the seta is not half as long. This species differs from the preceding widely in the hands of the second pair of legs, and moreover, it has two hooked spines to both the second and third segments of thorax—one at middle of back and the other posteriorly near articulation. The flagellum of the superior antennæ is about as long as base, or but little shorter; the third joint of base is *not longer than first*. The fourth joint of inferior pair (as in the *tenella*), is slender and much longer than the following portion, which appears to consist of *three* joints. Finger of hand of second pair nearly as long as hand.

The feet of the second pair in the specimen figured, were attached quite near the anterior extremity of the segment, as in females; consequently this is probably of the same sex with the specimen of the *tenella* described, and the two are not, therefore, male and female of the same species, as might be deemed possible from the general similarity of habit.

It is possible, however, that the rule with regard to the second pair of legs in the Caprellæ may not hold for these species, and the two, the *tenella* and *aculeata*, may then be male and female of the same species. The hands of the second pair correspond with this view, the *tenella* having a male character, and the *aculeata* a female character. As our specimens are not in the collections for farther study, we cannot settle this point.

## SUBTRIBE II. GAMMARIDEA.

THE subdivision of the Gammaridea into families depends partly on the adaptation of the thoracic legs to different modes of locomotion, and partly on the character of the abdomen, which is also an organ of motion, and undergoes wide variations. Species with the habit of certain Anisopods, naturally stand apart from the typical families or groups.

The species that have pre-eminently the narrow elongate body and habit of *Tanais* and *Caprella*, are the DULICHIDÆ; the abdomen is abbreviated, the six posterior legs are fitted for clinging, *Caprella*-like, while the anterior legs are used for taking its food. They are, in fact, but a grade removed from certain *Caprellids*—the *Cercopes*—in which the abdomen has four or five joints developed. Still they are quite distinct; for the five joints existing have regular abdominal appendages, and the thoracic branchiæ are more fully developed. These are the *Caprelloid* Gammaridea.

A second group includes the boring Gammaridea—the CHELURIDÆ. The abdomen has the fourth and fifth segments united into a long styliform joint, and the three pairs of caudal stylets are very unlike, and of abnormal forms.

The above two families are the *aberrant* groups among the Gammaridea. We pass now to the family of gressorial Gammarids, which is *subtypical*.

The species—the COROPHIDÆ—differ widely from the *typical* Gammaridea in being capable of walking on a flat surface like *Isopoda*, and they have nearly the habit of animals of that tribe. Yet, in structure, excepting the power of spreading the legs for gressorial use, they are closely like the Gammarids. They are usually broader species with a somewhat depressed body, and very narrow or obsolescent epimerals, while the typical Gammarids have compressed bodies, often with large epimerals, which so confine the legs that they could not be spread laterally, if the articulation at base admitted of it. The articulations and members of the abdomen and thorax are of the normal type.

The *typical* Gammaridea pertain to two groups, differing in habit, and somewhat in structure.

In one of these groups—the GAMMARIDÆ—the mandible is, with a rare exception, furnished with a palpus, and the palpus or outer branch of the inner maxillæ is largely developed, being two-jointed (very rarely one-jointed). They are thus like the Corophidæ. They farther approach that group in the extremity of the abdomen. The structure of this part is of unusual importance among the Gammaridea because of its use in locomotion. The Gammaridæ are either natatory, or imperfectly saltatory; and have not the pre-eminent leaping power of the Orchestidæ. We find, consequently, that the caudal stylets are commonly unequally or irregularly projecting, and rather lax in their motions; the last pair is usually two-branched and elongated, and often projects beyond the others; they are, therefore, not constructed in the most effective manner for leaping.

In the other group—the ORCHESTIDÆ—the mandibles are *without* palpi; the inner maxillæ have the palpus *small* and one-jointed, or obsolete; the habits of the species are peculiarly saltatory; the caudal stylets project behind in such a way that the tips lie in a straight line, the last pair being very short and simple, and the others in order projecting beyond it, so that the whole combine together to render the extremity of the abdomen peculiarly well fitted for their saltatory habits; the stylets are less free in their motions than those of the Gammaridæ, and are consequently calculated to act more unitedly. The Orchestidæ have the body much compressed, with large epimerals. The Gammaridæ are sometimes as much compressed; but there is a gradation to species with a subdepressed body, and very small epimerals, and thence by an easy transition to the Corophidæ.

The Orchestidæ probably rank higher than the Gammaridæ. The organs of the mouth in the latter may appear to be better furnished for action, by the presence of mandibular palpi and more fully developed maxillary palpi. Yet such accessories, may be only a mark of inferiority, as they show that there is something lacking in the other parts, which render them necessary. The highest Crustacea, the Brachyura, have no mandibular palpi; while among the Macroura, a lower order of the Eubranchiates, such palpi are common.

The Orchestidæ are mainly land species of Gammaridea, living to great extent in sand-beaches or similar places; and they are exceed-

ingly agile; while the Gammaridæ are water species, and generally less active in their movements.

The several families above mentioned may be characterized as follows:—

Fam. I. DULICHIDÆ.—Habitu Caprelloideæ. Corpus lineare, epimeris obsoletis. Pedes 6 postici longi, subprehensiles. Abdomen 5-articulatum.

Fam. II. CHELURIDÆ.—Corpus fere cylindricum, epimeris mediocribus. Abdomen abnormale, segmentis 4to 5toque coalitis et oblongis, stylis inter se valde dissimilibus.

Fam. III. COROPHIDÆ.—Gressoriæ, pedibus partim lateraliter porrectis. Corpus plus minusve depressum, sive latum sive lineare, epimeris perbrevibus, interdum obsoletis. Abdomen formâ appendicibusque normale. Antennæ sæpe pediformes.

Fam. IV. ORCHESTIDÆ.—Saltatoriæ, pedibus nullis lateraliter porrectis. Corpus compressum, epimeris magnis. Abdomen appendicibus normale. Antennæ non bene pediformes. Styli caudales 1mi 2dique biramei; 3tii simplices, brevissimi et ultra 2dos non prolongati. Mandibulæ non palpigeræ. Maxillæ 1mæ palpo sive parvulo et 1-articulato sive obsoleto instructæ.

Fam. V. GAMMARIDÆ.—Saltatoriæ vel natatoriæ, pedibus nullis lateraliter porrectis. Corpus sæpius compressum, raro subdepressum, epimeris sive magnis sive parvis. Styli caudales laxiores, duobus ultimis oblongis sæpiusque ultra 2dos prolongatis, raro simplicibus. Mandibulæ sæpissimè palpigeræ. Maxillæ 1mæ palpo 2-3-articulato (rarissimè 1-articulato) instructæ.

The homologies of the parts of the shell forming the surface of the head in the Gammaridea, are considered in our general remarks on the family Orchestidæ.

The most difficult point in the study of the Gammaridea, as in the Caprellidea, is that of ascertaining sexual distinctions. Males and females are often very diverse. The former may have the antennæ



twice as long as the latter, and the joints of the flagella twice as numerous, and the extremities of both the first and second pairs of legs may be entirely unlike, so that when the second pairs are dissimilar, we cannot look to the first as a guide to determine identity of species.

The relative lengths of the five posterior pairs of legs; the number and size of the hairs or setules on the legs, and their length, as compared with the diameter of the joints; the length and size, in the same manner, of the hairs on the antennæ; the size of the epimerals; the length and relative size of the caudal stylets,—appear to be constant characters for both sexes. The young, however, differ from adults in these respects, as well as others, their antennæ being not only shorter but far less hairy, and the legs and stylets shorter, and also more nude.

---

#### FAMILY I. DULICHIDÆ.

THERE is but one known genus of this family—*Dulichia* of Kröyer.\* It has the legs of the fifth, sixth, and seventh pairs subequal and prehensile, as in *Caprella*, and the first and second pair are furnished with hands, the latter the larger. The four antennæ are long, the supe-

\* Tids. [2], i. 512, 1845, and Voy. Scand., etc., pl. 22, fig. 1. He thus describes the genus:—

“Corpus valde elongatum, gracile. Antennæ longissimæ (imprimis superiores), subpediformes; superiores flagello instructæ appendiculari. Oculi prominentissimi, acuminati. Pedes thoracici 1mi paris compressi, manu (articulo 4to) magna, ungueque 2-articulato instructi (qui unguis articulo 5to 6toque junctis efficitur). Pedes 2di paris manu instructi subchælifirmi (quæ apud mares maxima est). Pedes 3tii 4tique paris minimi, fere filiformes, invicem ejusdem ferme longitudine et forma. Pedes 5ti 6ti 7mique paris elongati, lineares (femore non dilatato), prehensiles. 6tus thoracis annulus cum 7mo coalitus ut difficilium distinguantur. Epimera nulla vel prorsus rudimentaria. Abdomen 5 modo compositum annulus et 5 præditum pedum paribus quorum tria anteriora natatoria, duo posteriora saltatoria sunt.”

rior much the longer. The head is triangular in an upper view, and pointed rostrate in front. The segments in the species described are more or less nodose or spinous.

---

#### FAMILY CHELURIDÆ.

THE genus *Chelura* of Philippi,\* the only one of this family yet discovered, includes a boring species of Amphipod. The body, as described and figured, is nearly cylindrical; the epimerals of moderate size. The fourth and fifth segments of the abdomen are united, and form a long, styliform joint. The pairs of caudal stylets are very unlike one another, the last being very long and lanceolate; the preceding short and broad foliaceous; the first pair short styliform. The mandibles are palpigerous. The antennæ are short; the superior are the shorter and appendiculate; the inferior are pediform and without a flagellum.

---

#### FAMILY COROPHIDÆ.

THE Corophidæ are near the Gammaridæ in the general form of the thoracic legs, and in both sets of abdominal appendages, although usually very dissimilar in appearance when observed in motion. The more common species have pediform or subpediform antennæ; these form the subfamily COROPHINÆ (Podoceridæ, of Leach). There are others—ICILINÆ—which have slender flagella, as in the Gammari, with no pediform character. A few—CLYDONINÆ—have the caudal stylets simple, the legs long and slender, and two long, stout, rigid antennæ.

\* Archiv für Nat., 1839; *G. J. Allman*, Ann. and Mag. Nat. Hist., xix. 361, June, 1847.

The species of Corophinæ have generally the fingers of the hands of the first and second pairs of legs all simple; yet, in a few species, the second pair has the fingers two-jointed, the hand being formed of the fourth normal joint; and, in a few others, the legs of neither the first nor second pair are prehensile. The species also differ strikingly in the stylets, and are thus naturally divided into genera.

The posterior stylets may be exceedingly short and quite simple, or they may have two short branches, ending in a few short hairs or setæ; or they may have two branches, the outer of which is recurved uncinatè at apex. The stylets of the preceding pairs, as in *Corophium* and *Siphonocetes*, may be subcultriform, with the outer edge more arcuate and set with spines, which fits them for special action by their outer margin; or they have, in common style, the two sides or edges essentially alike, without spines on the outer margin or no more than on the inner. These characters appear to be proper distinctions for genera. The importance of characteristics based upon these organs will be farther considered in the remarks on the Gammaridæ. Their value may, however, be obvious, from the fact, that two of the forms mentioned are not found in the families Gammaridæ or Orchestidæ: for in no other groups, except certain Corophidæ is the posterior pair of stylets so short as to be concealed nearly by the extremity of the abdomen, nor the other stylets spinous and arcuated on the outer edge for special action by this margin.

Krøyer has stated that the hands of the second pair in the male of the *Podocerus Leachii* has the finger two-jointed, as in *Erichthonius*, and only the female has it one-jointed, corresponding with the generic character.\* We have not been able to verify this observation. Among our species of *Pyctilus* (which we think may still be true *Erichthonii*), we observed that there were *females* with the finger bi-articulate, and thus not at all like *Podocerus*. The posterior stylets in *Pyctilus* end in a single short conical branch, with a sub-reflexed apex; which is not a form occurring in *Podocerus*: whether this is the form in *Erichthonius*, is not given in the figures or descriptions published.

\* It is possible that the *Podocerus Leachii* (Krøyer) should form a distinct genus, as the animal lived in a tube like a *Cerapus*.

The subfamilies and genera of Corophidæ are as follows:—

SUBFAM. 1. CLYDONINÆ.—Styli caudales 1mi 2dique simplices, subulati.

G. 1. CLYDONIA, *Dana*.\*—Pedes filiformes, 5ti 6ti 7mique longitudine incrementes, 1mi 2dique non prehensiles. Antennæ duæ longæ, crassæ, rigidæ.

SUBFAM. 2. COROPHINÆ.—Antennæ plus minusve pediformes. Styli caudales 1mi 2dique biramei.

A. DIGITUS NULLUS 2-ARTICULATUS.

1. *Styli caudales 3tii minuti, simplices, 2di 1mique ramo externo cultriformi.*

G. 1. COROPHIUM, *Latr.*—Antennæ inferiores longiores et crassiores, flagello carentes. Pedes 2di non prehensiles, 1mis crassiores, articulo 4to latiore quam 5tus.

G. 2. SIPHONOCETES, *Kröyer*.†—Antennæ inferiores longiores, flagello carentes. Pedes 1mi 2dique subchelati. [Pedes 3tii 4tique articulo 4to laté obcordato. Tubum lapillis fragmentisque concharum formatum inhabitat.]

2. *Styli caudales 3tii minuti, vix exserti, simplices, 2di 1mique ramis extus non præcipue spinosis nec cultriformibus, interdum nudis.*

G. 3. PLATOPHIUM, *Dana*.—Corpus superne visum subellipticum, abdomine bene inflexo. Antennæ flagello brevi sæpe instructæ, inferiores longiores, superiores appendiculatæ. Pedes 1mi 2dique subchelati, 2dis validioribus. Pedes 10 postici mediocres.

G. 4. CYRTOPHIUM, *Dana*.—*Platophio* similis. Antennæ superiores non appendiculatæ.

\* Amer. J. Sci. [2], viii. 140.

† Voy. Scand., etc., 1838–1840, pl. 20, f. 1; Tidsskr. [2], i. 481, 1845. Kröyer, in his description, says:—

“Pedes thoracici primi et 2di paris validissimi, manu instructi subcheliformi. Pedes 3tii et 4ti paris articulo primo latissimo, laminari; articulo quarto obcordato, laminari, manum præbente, cujus unguis efficitur articulo quinto subconico articuloque sexto aciculari. Pedes 5ti 6tique paris minutissimi, sed robusti, recurvati, articulo primo clavato, ungue furcato. Pedes 7mi paris graciles, recurvati, articulo primo laminari, ungue minutissimo, furcato. Pedes abdominales 1mi, 2di et 3tii paris natatorii breves validissimi, parte basali latissima, rhomboidali; pedes 4ti 5tique paris saltatorii; pes abdominalis sexti paris natatorius unica instructus lamina terminali.”

3. *Styli caudales 3tiii parvuli, biramei, ramo externo non uncinato, 2di 1mique ramis extus non præcipue spinosis nec cultriformibus.*

G. 5. UNCIOLA, *Say*.\*—Pedes 1mi 2dique manu confecti, 1mis validioribus. Antennæ flagellis confectæ, subpediformes, validæ, superiores paulo longiores, appendiculatæ.

4. *Styli caudales 3tiii paulo elongati, biramei, ramo externo uncinato.*

G. 6. PODOCERUS, *Leach*.†—Pedes 1mi 2dique subchelati, 2dis validioribus. Antennæ superiores breviores, non appendiculatæ. [An maris digitus 2dus interdum 2-articulatus, Kröyer teste.]

G. 7. CERATOPHIUM, *Dana*.—Pedes 1mi 2dique subchelati, 2dis validioribus. Antennæ superiores breviores, appendiculatæ.

#### B. DIGITUS 2DUS 2-ARTICULATUS.

G. 8. CERAPUS, *Say*.—Antennæ pediformes, subæquæ, flagellis carentes. Pedes 1mi 2dique prehensiles, 1mis parvulis, 2dis manu bene confectis. Styli caudales 3tiii biramei, ramis subæquis, longiusculis. [Tubum membranaceum inhabitat.]

G. 9. CERAPODINA, *Edw.* (*Cerapus*, Templeton.) Antennæ totæ flagellis confectæ. Pedes 4ti 5ti 6tique obsoleti (?). [Tubum papyraceum inhabitat.]

G. 10. ERICHTHONIUS, *Edw.*‡—Antennæ flagellis confectæ. Pedes 10 postici

\* *Jour. Acad. Nat. Sci. Philad.*, i. 388.

*Glaucome* of Kröyer has the hands and antennæ and apparently the other characters of *Unciola*. *Say* describes the hands of the second pair in *Unciola* as *adactyle*; but they still are probably like those of *Glaucome*. The following is Kröyer's description:—

“*Antennæ* subpediformes; superiores flagello ornatæ appendiculari perparvo. *Oculi* minuti, parum distincti. *Mandibulæ* apex in duos fissus ramos qui dentibus sunt armati conicis; tuberculus molaris dentibus confertissimis instructus. *Labium superius* breve, depressum latissimum, margine anteriori medio inciso; *labium inferius* quatuor compositum laminis setosis. *Laminæ maxillares* pedum maxillarium dentibus armatæ validis; unguis palpi apice setosus. *Pes primi paris* robustissimus, manu subcheliformi; *pes secundi paris* gracilior, manu carens subcheliformi, pedes 3tiii 4tique paris pergraciles; pedes 5ti 6ti 7mique paris graciles femoribus parum dilatatis. Pedes abdominales 1mi 2di et 3tiii paris natatorii, breves sed robustissimi; 4ti 5tique paris saltatorii, validi; 6ti paris fere rudimentares, natatorii. *Epimera minima* fere evanescentia.”

† *Jassa* of *Leach* may, without inconvenience, be united to *Podocerus*, as there is no essential generic difference between them.

‡ The author obtained three species in the cruise of the Expedition having the hands

mediocres. Epimeræ anteriores obsoletæ. [An styli caudales 3ti simplicissimi?]

SUBFAM. 3. ICILINÆ.—Antennæ non pediformes nec subpediformes, flagellis sat longis basique sat brevi instructæ. Styli caudales ac in *Corophinis*.

- G. 1. ICILIUS, *Dana*.—Pedes toti unguiculati et tenues, 4 antici longi, non prehensiles, ciliati, 10 postici fere similes. Antennæ superiores breviores, non appendiculatæ.
- G. 2. PTERYGOCERA, *Latr.*—Pedes posteriores sublamellati. Antennæ superiores breviores, appendiculatæ, inferiores basi dilatatae.

---

SUBFAMILY CLYDONINÆ.

The Clydonia group is aberrant in most of its characters, as will be observed in the following descriptions and the illustrating figures. The caudal stylets are unlike any others in the Gammaridea. The antennæ are also anomalous. Only two were observed, and these were long, straight, stout, rigid organs, lying side by side, and excepting the basal joints, hardly articulated, or only indistinctly so. The legs are very long, and filiform; the fifth pair is much the longest, and from the fifth to the seventh the decrease in length is very rapid, the seventh being short. These legs appear to be used for standing; and, as the fifth pair is the longest, they are fitted to place the body in a horizontal position rather than in the erect posture, observed in the Caprellids and Arcturi. The claw, moreover, is exceedingly short.

The body is narrow, with very small or obsolescent epimerals. The abdomen has the usual number of segments, as also the thorax. The eyes are small. The specimens are not in our collections, and we are not, therefore, able to add more details to what are given in our original descriptions and figures, made in 1838 and 1839, when the specimens were taken. The following genus is the only one detected.

and many other characters of *Erichthonius*, but with the epimerals of the anterior thoracic segments of considerable size; and, moreover, no gressorial habits were observed. They are, therefore, with some hesitation, arranged in a genus named *Pyctilus*, among the Gammaridæ, subfamily Gammarinæ.

## GENUS CLYDONIA, Dana.

*Corpus elongatum paulo depressum. Abdomen 6-7-articulatum. Oculi parvi. Antennæ duæ elongatè styliformes, rectæ, rigidæ, articulo brevi basali et altero longissimo subulato obsolete multiarticulato instructæ. Pedes tenues, 6 postici filiformes, quintis longissimis.*

*Body* elongate, somewhat depressed. *Abdomen* six to seven-articulate. *Eyes* small. The two antennæ long styliform, straight, consisting of a short basal joint and a long, rigid, subulate, extremity, obsolete multiarticulate. Feet slender; six posterior long filiform; fifth longest.

The long, straight, and rigid antennæ of the species, and the long slender legs, are unlike what is elsewhere found in the Gammaridea. Owing to the very long legs, flexed as they are for walking, the species have some general resemblance in habit to a Mantis. The four anterior legs are the shortest, and have no proper hands.

These animals were procured in the open ocean, one species in the Atlantic, and the other in the Pacific. The name of the genus is from κλυδωνί, a wave, and alludes to the place of occurrence of the species.

DANA, Am. J. Sci. [2], ix. 1850.

## CLYDONIA GRACILIS.

*Antennæ duæ fere corporis longitudine, subulatæ. Oculi parvi, lenticulis 9. Styli caudales tenues, primi ultimique secundis longiores, ultimis medio ramum brevem acutum ferentibus. Pedes quinti corpore non breviores, articulo primo longissimo infra minute spinoso, apice spinose producto; septimi quintis plus dimidio breviores. Abdominis segmenta 3 antica latere acuta, angulo postico subtruncato.*

Two antennæ about as long as the body, subulate. Eyes small, with nine lenses. Caudal stylets slender; the first and last longer than

second; last having a short acute branch near middle. Fifth pair of feet as long as the body; first joint very long, minutely spinulous below; seventh pair less than half the fifth.

Plate 55, fig. 6 *a*, animal, enlarged; *b*, eye.

Atlantic Ocean, latitude 1° north, longitude 18° west. Collected, October 31, 1838, at 4 h. A. M.

Length, three lines. Colour, reddish in irregular spots; long antennæ, in part reddish. The body consists of a head, seven thoracic segments, and six abdominal. The head is short, about half as long as wide. The last three thoracic segments are as long as the first four. The three anterior abdominal segments are nearly of the same size, the anterior a little the longest; the following one is much smaller, and the others rapidly decrease in size. The stylets are slender acute. The posterior one is branched, and this branch is short acute, and is articulated with the middle of the organ. The antennæ are stout at base, and gradually taper to an acute apex, they have minute spines on the outer side, and are short pubescent on the inner. The eyes consist of eight lenses around a central one.

The four anterior legs are short hirsute, and end in a small claw; the second pair is a little longer than the first; the next two pairs are longer, and very nearly naked. The fifth pair is about twice as long as fourth, and equally slender or even more so; the first joint is about as long as the next three; the second is very short; the fifth is one-fourth the length of the first; the claw is very small. The sixth pair is much shorter than fifth, and the seventh not half the fifth.

In the specimen examined, one antenna was more than one-half shorter than the other, and yet apparently perfect. It is probable that it had been broken at the articulation below, and was growing out.

Along the sides of the segments of the body, the outline of the epimerals was barely distinguished.

#### CLYDONIA LONGIPES.

*C. gracili similis.* *Antennæ duæ fere corporis longitudine, subulatæ, parce crassiores, obsolete multi-articulatæ. Pedes septimi quintis non*



*dimidio breviores. Abdominis segmenta duo antica angulos posticos acuta non truncata.*

Similar to *C. gracilis*. The two long antennæ nearly as long as the body, a little stouter than in the preceding, obsoletely multiarticulate. Seventh pair longer than half the fifth. Two anterior abdominal segments with the posterior angles acute and not truncate.

Plate 55, fig. 7 *a*, animal, enlarged, posterior stylets and one antenna mutilated; *b*, outline of front in vertical view.

Pacific Ocean, latitude 18° 10' south, longitude 126° west. Collected, August 8, 1839.

Length, four to five lines. Colour of thorax, mostly brownish; of abdomen, red, and part of antennæ same colour. There is a prominent angle on front of head and a low angle over each of the antennæ; but the front angle is not apparent in a vertical view, as the front margin, which is in advance of the angle, is depressed below the upper surface of the head. The eyes are as in the *gracilis*. In the second and third pairs of legs the fourth joint is longer than either the fourth or third. A large oval lamella, branchial in character, is attached to the base of several of the legs. The posterior angles of the first two abdominal segments are acute, and the acute points occupy the posterior part of the margin, instead of being in advance of it, as in the *gracilis*.

#### SUBFAMILY COROPHINÆ.

#### GENUS COROPHIUM, Latr.

#### COROPHIUM? QUADRICEPS.

*Corpus depressum, lineare, capite quadrato, abdomine postice rotundato. Pedes 4 antici similes, primis minoribus. Pedes quinti quartis breviores, articulo primo non setoso; septimi tenues, articulo primo setoso, setis longiusculis, plumosis. Antennæ ad marginem posticum subæquæ; superiores parce breviores, 7-articulatæ, articulo primo longiore; inferiores crassiusculæ, 7-articulatæ, quartam partem corporis*

*longitudine vix superantes, articulo tertii longiore, tribus ultimis parvulis, subæquis.*

Body depressed, linear, head quadrate, abdomen posteriorly rounded. Four anterior feet similar; the first pair the smaller; fifth pair shorter than fourth, first joint not setigerous; seventh long and slender; first joint setigerous on posterior margin, setæ rather long and plumose. Antennæ subequal; superior a little the smaller, seven-jointed, the first joint longest; inferior rather stout, seven-jointed, about one-fourth as long as body, third joint longest; last three quite short and subequal.

Plate 55, fig. 8, animal, imperfectly figured, enlarged, the caudal extremity not finished.

Harbour of Rio Janeiro, near the city. Collected, December 22, 1838.

Length, nearly one line. Head longer than the two following segments, nearly square in a vertical view; in a lateral view largest posteriorly. Extremity of abdomen nearly as broad as thorax. Eyes small, with few facets, round, distant, black. Inferior antennæ with a whorl of short setæ at apex of each of the last four joints. The last three joints together about as long as either of the two preceding. The anterior four feet have a few short hairs on the joints. The claw is but slightly curved. There are plumose setæ on the first joint of the seventh pair of legs; also, a few on posterior margin of same joint of sixth pair; but none, or not more than one or two, on fifth pair. The first pair of stylets extends backward farther than the second, and the second pair farther than the third pair.

GENUS PLATOPHIUM, Dana.

*Cephalothorax anguste ellipticus, abdomine sub ventre bene inflexo, capite subquadrato, oculis ad angulos anticos insitis et sæpe paulo prominentibus. Antennæ inferiores paulo longiores, totæ bene pediformes, flagellis perbrevibus sæpe confectæ. Pedes 4 antici subchelati, 2dis validioribus. Styli caudales 3tiii minuti, simplicissimi, extremitate abdo-*

*minis partim celati; 2di 1mique biramei, ramis inæqualibus, extus non præcipue armatis.*

Cephalothorax narrow elliptical, abdomen inflexed under the venter; head subquadrate; eyes situated at the anterior angles, and a little prominent. Antennæ pediform, with a very short flagellum, or none, the inferior pair a little the longest. Four anterior feet subchelate; second pair much the stouter. Caudal stylets of the third pair minute, simple, partly concealed by the extremity of the abdomen; first and second pairs with the branches unequal, and not specially armed on the outer side.

The species of this genus, as the figures show, have somewhat of a spider-like aspect, when seen in a dorsal view. The abdomen is flexed commonly close against the venter, and is quite narrow, its width being less than half that of the thorax.

The branches of the stylets of the first and second pairs are subcylindrical, and the inner of each is considerably longer than the outer. Both are armed above with a few spines, in two series, and there are longer spines at the extremity. The extremity of the abdomen is gibbous and setose above, and covers mostly or wholly the third pair of stylets. The species approximate in form to the *Icilia*, but have the hands and antennæ of the *Corophinæ*.

#### PLATOPHIUM BRASILIENSE.

*Maris*:—*Corpus superne visum angustè ellipticum. Antennæ infra ciliatæ; internæ basi externarum breviores, flagello 3-5-articulato; externæ dimidio corporis paulo longiores, flagello 3-articulato. Pedes 1mi manu parvâ instructi; 2di manu validâ, oblongâ, infra fere rectâ, et pilis plumosis tenuissimis et longissimis (latitudine manus longioribus) et confertis ornatâ, carpo parce oblongo infra non producto, articulo 3tio anticè infra valde producto. Pedes 10 postici subæqui, setis brevibus, sat paucis, articuli diametro 5ti non longioribus.*

*Feminæ*:—*Corpus latius ellipticum. Antennæ paulo breviores, internæ basi externarum paulo longiores. Pedes 2di manu mediocri instructi, latâ, paulo oblongâ, infra arcuatâ et hirsutâ, pilis longis non ornatâ, carpo non oblongo.*

*Male*:—Body seen from above narrow-elliptical. Antennæ ciliate below; inner shorter than base of outer, flagellum three to five-jointed;

outer pair a little longer than half the body, flagellum three-jointed. Feet of first pair furnished with a small hand; hand of second pair short, oblong, nearly straight below, and furnished very thickly with very fine, long, plumose hairs, longer than the breadth of the joint; carpus slightly oblong, not produced below; third joint much produced below anteriorly; ten posterior feet subequal, setæ short, rather few, not longer than diameter of fifth joint.

*Female*:—Body more broadly elliptical than in male. Antennæ a little shorter, the inner pair a little longer than base of outer. Hand of second pair of legs of moderate size, broad and but little oblong, arcuate below and hirsute, but not furnished with long hairs like the male; carpus not oblong.

Plate 55, fig. 9 *a*, *male*, in dorsal view, much enlarged; *b*, same, lateral view; *c*, flagellum of superior antennæ; *d*, tarsus of one of the six posterior legs; *e*, extremity of abdomen, upper view; *f*, same, side view.—*g*, *female*, upper view; *h*, leg of first pair; *i*, part of leg of second pair; *k*, hand of same, seen somewhat obliquely, as in its natural position in a side view of the animal; *l*, extremity of one of the other legs.

Dredged in the harbour of Rio Janeiro.

Length, the abdomen inflexed, about two lines; with the extended abdomen, three lines. The epimerals are very small, but distinct. The hairs on the under side of the hand of the second pair of legs in the male are longer than the width of the hand, and much less than half the same width in the female. The hairs on the under surface of the third joint of the same legs are in a few transverse series. The tarsus has an angle below near base, and no setæ towards apex. The males and females differ very considerably; yet we think there is little doubt of their being the same species. Numerous specimens of both sexes were obtained together.

GENUS CYRTOPHIUM, *Dana*.

*Platophio ferme affinis*. *Antennæ superiores non appendiculatæ*.

Very near *Platophium*. Superior antennæ not appendiculate.

The single species of this genus obtained (at Singapore), has the

rings of the body very prominently projecting, giving the thorax a nodose appearance. It differs from the species of *Platophium* in the first and second pairs of stylets, one branch of which, the inner, is not only longer than the outer, but is lamellar, instead of subcylindrical or styliform, and the terminal spines or setæ are longer, the longest being nearly as long as the branch.

#### CYRTOPHIUM ORIENTALE.

*Antennæ bene pediformes, infra ciliatæ; inferiores flagello vix instructæ duobus articulis parvulis confectæ, articulo precedente (ad normam 1mo flagelli) valde oblongo, longiore quam proximus præcedens; superiores articulis apicalibus 3 subæquis simul sumtis articulum 3tium longitudine æquantibus confectæ, ciliis prælongis. Manus 2da crassa, subelliptica, infra fere recta et hirsuta, digito parce brevior quam manus. Pedes 6 postici subæqui, fere nudi. Styli caudales 2di 1mi-que apicè spinis longis armati, ramo interno lamellato et margine interno spinuloso, ramo externo brevior, subterete.*

Antennæ pediform, ciliate below; inferior pair hardly having a flagellum, ending in two very small joints, the preceding joint (normally the first of the flagellum), being long styliform, longer than the joint next preceding; superior antennæ with three subequal joints at extremity, which together are as long as the third joint of the antenna; ciliæ below very long. Hand of second pair quite stout, subelliptical, nearly straight below and hirsute; finger very nearly as long as hand. Caudal stylets of first and second pairs with very long spines at extremity (one nearly as long as the branch); inner branch lamellar, having inner margin spinulous; outer branch shorter than inner, and subterete.

Plate 56, fig. 1 *a*, lateral view, unfinished; *b*, dorsal view; *c*, leg of seventh pair; *d*, extremity of abdomen, showing stylets.

Singapore, East Indies.

Length two lines.

#### GENUS CRATOPHIUM, Dana.

*Podocero ferme similis, manu 2dâ validâ, antennis bene pediformibus,*

*superioribus brevioribus. Styli caudales 3tiii ramis duobus confecti, uno subconico apice uncinato altero paulo compresso. Antennæ superiores appendiculatæ.*

Very similar to *Podocerus*, the hands of the second pair being very stout, the antennæ pediform, the superior pair the shorter. The caudal stylets of third pair with two branches, one subconical and uncinatè at apex, the other somewhat compressed. *Superior antennæ appendiculate.*

The appendiculate character of the superior antennæ is the only essential point of difference between *Cratophium* and *Podocerus*. This accessory branch consists but of a single joint. The legs of the five posterior pairs have nothing peculiar. The basal joints of the six posterior legs are quite broad in the species observed.

The two forms under *C. validum* may be male and female of the same species, and are here so described, although we somewhat doubt it. The females were well furnished with eggs, and were collected at the same time with the males. They are remarkable for the large size of the hands of the second pair in this sex. The tarsi of the ten posterior legs are without a seta below near apex.

The abdomen was often flexed beneath the body in the specimens, but never thrown up as close to the venter as in the *Platophia*.

#### CRATOPHIUM VALIDUM.

Maris:—*Caput segmentis duo sequentibus vix brevius, ad oculum utrinque paulo saliens. Antennæ infra ciliatæ; superiores graciliores, flagello 5-articulato (articulo 1mo oblongo) confectæ, inferioribus parce breviores, articulo 3tio brevioribus quam 2dus; inferiores valde crassæ, articulo 4to multo longiore quam 3tius, 5to 3tium fere æquante, duobus sequentibus (ultimis) minutis. Pedes antici parvi, manu subovatâ; 2di validissimi, manu oblongâ, crassâ, nudâ, infra prope basin digito immobili longo crasso instructâ, digito mobili longiore, vix curvato. Styli caudales 3tiii ultra 1mos vix producti. Pedes 6 postici setis paucis brevibus ornati.*

Feminae:—*Corpus crassius. Pedes 2di manu validâ et vix minore confecti, manu oblongâ, supra arcuatâ, infra fere excavatâ 3-den-*

*tatâ et partim hirsutâ, dentibus duobus prope basin uno prope apicem.*

*Male*.—Head as long as next two segments together, a little salient before the eye. Antennæ long ciliate below; superior pair much more slender, sparingly shorter than inferior pair, third joint shorter than second, flagellum five-jointed, first joint oblong; inferior pair very stout, fourth joint much longer than third, fifth as long as third, sixth and seventh (last) minute. Anterior feet with a small subovate hand; second pair very stout, the hand oblong and thick, nude, having a long, stout, immoveable finger below near base, moveable finger longer than the other, scarcely curved. Posterior caudal stylets reaching back hardly beyond the first. Six posterior legs with few short setæ.

*Female*.—Body stouter. Hand of second pair stout, oblong, but little smaller than in males, arcuate above, somewhat excavate and hirsute below and three-toothed, two of the teeth near base, and one near apex.

Rio Janeiro, Brazil; dredged in the harbour.

Plate 56, fig. 2 *a*, *male*, much enlarged; *b*, part of superior antennæ; *c*, part of leg of first pair; *d*, leg of fifth pair; *e*, extremity of abdomen, upper view; *f*, upper view of last pair of stylets; *g*, same, side view.—*h*, *female*, much enlarged; *i*, mandibular palpus; *k*, maxillipeds; *l*, part of leg of first pair; *m*, *ibid.* of second pair; *n*, *ibid.* of third or fourth pair; *o*, *ibid.* of sixth or seventh pairs.

Length, five lines. The males are much more slender than the females. The large hand is as long as three of the thoracic segments, or even longer. The eye-margin of the head is somewhat salient between the bases of the inferior and superior antennæ. The hand of the first pair in males has a few hairs below; the carpus is but little shorter than the preceding joint, is protuberant a little below, and bears a tuft of rather long hairs. The same hand in the female is more hairy below, and the third joint of the leg is narrower, and not longer than the carpus.

The mandibular palpus, as observed in the female, is three-jointed; the second joint longer than the third, and furnished with many setæ

at apex, rather longer than the joint. Outer maxillipeds with the inner lamellar processes long.

CRATOPHIUM ORIENTALE.

*Feminae?*—*Oculi rotundati. Antennæ quatuor subæquæ, fere dimidii corporis longitudine, 1mæ paulo longiores, articulis basis tribus fere æquis, flagello duplo longiore quam articulus 3tius, 5-articulato, articulo 1mo reliquos longitudine æquante, appendice uni-articulato; 2dæ crassæ, 5-articulatæ articulis 2do 3tio 4toque subæquæ, ultimo minimo. Manus 1ma mediocris, oblonga, supra rectiuscula, infra arcuata et pilosa, digito sat longo; 2da paulo major, subovata, palmâ fere longitudinali, 3-dentatâ ac in C. validi feminâ, dente uno anteriore, uno submediano unoque posteriore, dente submediano obtuso, digito longo, carpo minimo inter manum articulumque 3tium non producto.*

*Female?*—Eyes round. The four antennæ subequal, about half as long as body; superior pair a little the longer, three basal joints nearly equal in length, flagellum twice as long as third joint, five-jointed, first of the joints as long as all the rest, appendage one-jointed; second pair stout, five-jointed, second, third, and fourth joints subequal, the last minute. Hand of first pair of moderate length, oblong, nearly straight above, arcuate and hairy below, finger rather long; hand of second pair somewhat stouter, subovate, palm nearly longitudinal, three-toothed like the female of *C. validum*, one tooth anterior, one submedian, and one posterior, the submedian obtuse; finger long, carpus very small, not produced below between hand and third joint.

Plate 56, fig. 3 *a*, animal, enlarged; *b*, hand of second pair.

From the sea, off the eastern entrance of the Straits of Sunda. Collected, March 4, 1842.

Length, nearly three lines. Finger of hand of first pair of legs two-thirds as long as the hand; folds against lower margin of hand. Finger in second pair, extends three-fourths of the distance to the base of the hand, as far as the posterior of the three teeth. The legs of the



third and fourth pairs are short and rather stout; the last three are subequal, and the basal joint is quite broad.

*Gammarus orientalis*, DANA, Proc. Amer. Acad., Boston, ii. 212.

#### SUBFAMILY ICILINÆ.

#### GENUS ICILIUS (*Dana*).

*Corpus valde compressum. Antennæ elongatæ, flagellis longis confectæ; inferiores longiores. Pedes non prehensiles, toti vergiformes, apice unguiculati. Styli caudales sex furcati.*

Body much compressed. Antennæ elongate, and having long flagella; the inferior pair longest. Feet not prehensile, all vergiform and unguiculate. Caudal stylets six, furcate.

The genus *Pterygocera* of Latreille has evidently close relations to *Icilius* and some other Corophidea, though peculiar in its legs and antennæ.

#### ICILIUS ELLIPTICUS.

*Cephalothorax ellipticus, capite brevi, latè triangulato, fronte lateribusque obtusis, oculis remotissimis, segmento proximo angustiore et brevissimo. Abdomen 7-articulatum, segmentis tribus anticis posticè ad medium acutis, segmento ultimo parvulo, ovato. Antennæ subteretes; inferiores corpore longiores, flagello fere duplo longiore quam basis, tenuissimo; superiores fere dimidio breviores, flagello non duplo longiore quam basis. Pedes 4 antici infra densè hirsuti; 3 postici consimiles, tenues, fere nudi; septimi sextis valde longiores.*

Cephalothorax oval; head short, broad triangular, front and side angles obtuse; eyes very remote; following segment narrower and very short. Abdomen seven-jointed, the last segment small ovate, the three anterior at middle of posterior margin acutely prolonged. Antennæ subterete; inferior longer than body, flagellum about

twice as long as base, very slender; superior nearly half shorter, flagellum not twice as long as base. Four anterior feet densely hirsute on the inner or anterior side of last two or three joints; three posterior pairs similar; the seventh much longer than the sixth.

Plate 56, fig. 4 *a*, animal, enlarged; *a'*, same, natural size; *b*, abdomen extended straight; *c*, outline of part of same, showing dorsal outline; *d*, mandible; *e*, maxilla of first pair; *f*, *ibid*, of second pair; *g*, maxilliped.

Balabac Passage, north of Borneo; brought up on corallines in thirty-one fathoms.

Length, two lines. Colour, a little reddish. The head is more than twice as broad as long and is triangular with one angle in front, and the eyes occupying the lateral angles. The fourth segment of the thorax is broadest; the first and second much shorter than either of the following; the last longest, and as narrow as the first. The legs are all vergiform and similar, except that the four anterior are hirsute on the anterior or inner side; in the second pair, only the last two joints preceding the claw are thus hirsute. The other legs have only a few very minute setæ. The eyes are a little oblong, nearly transverse with the head. The superior antennæ have the first joint of base largest; the second a little longer than third; the whole organ is a little longer than the thorax. The base of the inferior pair is longer than the base of the superior by its last or fourth joint, which is long and slender, and nearly as long as preceding part of base; third joint a little longer than half the fourth; two preceding short. The third and fourth pairs of legs are a little stouter than first or second, though still slender. The first joint of seventh pair is prominently acute at posterior apex; the fifth and sixth pairs are nearly equal.

The abdomen has an acute triangular process at centre of posterior margin of first three joints. As the abdomen is generally curved up under the body, at about the third articulation, one of these spines projects behind. The three pairs of stylets are rather long, and extend back some distance. The branches of the last pair are quite unequal. The forms of the organs of the mouth are shown in the figures.

## FAMILY ORCHESTIDÆ.

THE dissimilarity between the sexes in the Orchestidæ has produced some confusion in the genera as well as species of this family. Fr. Müller was the first to point out that the females have sometimes the characters of one genus, while the males have those of another.\* The Talitri have been characterized as having a styliform or unguiculate termination to the first pair of feet and no proper hand to the second pair, while the Orchestiæ have a hand to these legs, more or less distinct. It is now shown, and our own observations sustain it, that the females of certain Orchestiæ are true Talitri; and M. Müller hence brings the genera together in one which he calls *Orchestia*, this name being appropriated hitherto to much the larger group. The styliform or unguiculate termination of the legs of the first pair is the best characteristic of the old genus *Talitrus*; those of the second pair have hands, although small and imperfect.

In the species of *Orchestia* most widely distinct from Talitri, the first and second pairs have distinct hands; the first pair more or less small or rudimentary. In others, the males are true Orchestiæ, with hands to both of these pairs, while the females have hands only on the second pair; Talitrus-like, the first pair terminates in a claw not closing against the preceding joint. There is, beside these, a third group, in which both males and females have the first pair of legs without hands, and ending in a claw. In other words, in one group, the individuals of both sexes are Orchestiæ; in another, the males are Orchestiæ and the females Talitri; in a third, both sexes are Talitri. The transition to the Talitrus-form in the female Orchestiæ is very gradual. The finger of the small anterior hands, which closes against the apical margin of the preceding joint or hand, is, in the first step of the transition, a little longer than this margin; in the next, it is considerably longer, and only the basal portion of its inner side closes against the margin; in the next, it stands upon the whole breadth of the extremity of the penult joint, and has no power of flexing against any portion of the joint, in which case the leg is unguiculate, if the last joint is small like a claw, and styliform, if rather stout and nearly or quite straight.

\* Archiv für Naturgeschichte, 1848, p. 53.

It seems proper, that the three groups, just pointed out, although united by transitions, should still be kept apart as *subgenera* of a common genus, *Orchestia*; and we therefore so retain them, naming the subgenera *Talitrus*, *Talorchestia*, *Orchestia*.

The *Orchestiæ* have been described by previous writers as having the superior antennæ shorter than the base of the inferior pair. But there are other species of similar habit, and alike in the caudal stylets, mandibles, and maxillæ, in which the superior pair of antennæ is longer than the base of the inferior. They are distinct from *Orchestiæ*, moreover, in having the maxillipeds unguiculate, like the Gammarids. These species, not before recognised as distinct, constitute our genus *Allorchestes*.

*Structure*.—The mandibles in the *Orchestidæ* have a double denticulate summit, a lateral molar prominence, and a cluster or line of setæ on the space below the inner part of the summit.

The inner maxillæ have a number of stout serrulate or setulose setæ at the extremity, a slender inner branch terminating in two or more longish setæ, usually bent, and commonly a small, slender, one-jointed outer branch, arising from near the middle of the outer side of the main stem.

The maxillæ of the second pair consist of two oblong ligulate lamellæ, the outer properly a second joint to the other; both have a fine brush of shortish plumose hairs at summit, and on the inner they extend partly down the inner side; besides these hairs, there are two longer setæ on the inner side.

The maxillipeds are lamellar, and terminate in an obtuse joint, furnished with some short setæ or hairs, in *Orchestia*, and with a stout claw, and usually longer setæ, in *Allorchestes*.

The legs have the ordinary structure. The setæ are in pairs as usual along both margins; those of the upper or outer margin of the ten posterior pairs are usually shortest and sometimes obsolete. Alongside of the pairs, there is often another smaller spinule, on one side or both, sometimes a second; and rarely, there are scattered spinules upon the surface between. The tarsi are slender, and have a minute seta on the lower side towards apex, just below the base of the proper claw, and often a minute projecting point on the upper side. They are very similar in all the legs excepting in those of the fourth pair, in which they have generally greater breadth and an angle or gibbous prominence below.

The hands of the second pair in female *Orchestiæ*, have an oblong elliptical, ovate, or spatulate form, with a rounded apex. The finger is minute, and is more or less lateral in position, being articulated with the dorsal margin, and seldom reaching when closed as far as the extremity of the hand. Rarely, the finger is terminal, and then it is oblique from above outward, in the species examined. In some cases the hand is deeply emarginated below the finger; and the position of the closed finger may be either longitudinal or nearly transverse, and the latter even when remote from the extremity. The lower margin and adjoining part of the lateral surface of the hand, has a minutely scabrous surface, besides having some short hairs near the limits of this rasp or scabrous part. The preceding joint in its lower projecting part is in general similarly scabrous, and often also a corresponding part of the joint next preceding. The first pair of legs in the same females, has usually a still smaller size. The hand has a truncate extremity in most species, and the finger is articulated with the apex. The lower part of the outer and the under surface is often scabrous, like the same in the second pair, and the two preceding joints may have a similar character in this respect.

The large hand in the males (second pair) is commonly ovate, or triangulato-ovate, the triangular form arising from an oblique truncation of the margin for the finger to close against. This margin we call for convenience in description the *palm* of the hand. It is often spinulous and sometimes emarginate or dentigerous. The carpus (fourth joint) in these legs in the *Orchestiæ*, is very small, and never extends downward between the hand and the third joint; so that the third joint is contiguous anteriorly with the lower back margin of the hand. This is not true, however, of all *Allorchestes*. The articulation of the carpus with the preceding joint is longitudinal in both sexes, and approximately so, in the legs of the first pair.

The stylets have one and the same arrangement throughout the species of *Orchestidæ*. The two anterior pairs have two subequal branches, which are furnished with a few setæ or spinules along the upper side, and four or five unequal spinules at apex. The second pair projects less far than the first. The last pair is extremely short, and consists of a stout base and a very small terminating joint. At apex there are a few minute spinules, and often others on the upper margin towards the extremity.

The epimerals are seldom shorter than their width, and often are

much longer (that is, vertically). The fifth on either side in the *Orchestia* is generally about as long anteriorly as the fourth, and near its middle or just posterior, it narrows, and there is a second rounded lobe, about half the length of the anterior. In the *Allorchestes*, the fifth epimeral is abruptly much shorter than the fourth. The epimerals may be quite naked, or sparsely edged with minute hairs or setules; they are rarely sculptured or sulcate, and in this case, the bases of the six posterior legs, which are large and broad, have similar markings.

*Homologies of the parts of the head.*—On pages 23 to 28 of this Report, we have pointed out the subdivisions of the carapax, especially its anterior and buccal portions, in the *Brachyura*; and we now turn to the head of the *Orchestidæ*, taking these as the type of the *Amphipoda*. Figures *i*, *k*, *l*, on Plate 57, represent the head of the *Orchestia (Talitrus) insculpta* of the author, in different positions, fig. *i*, representing a side view; *k*, a front view; *l*, an under view (the front part or extremity of the maxillipeds being towards the observer); *m*, a view of the back part of the head below the ventral surface adjoining. Like parts are lettered alike in all these figures.

In figure *k* (the front view), *md*, *m*<sup>1</sup>, *m*<sup>2</sup>, *m*<sup>3</sup>, are respectively the mandibles, the first maxillæ, the second maxillæ, the maxillipeds, as they lie in sight, in their natural position; and *a*<sup>1</sup>, *a*<sup>2</sup>, are the bases of the two pairs of antennæ. The same parts are lettered by the same letters in figures *i* and *l*, except that the antennæ are, of course, not shown in an under view (fig. *l*), and they are added in full in the lateral view (fig. *i*).

Again, in figure *k* (with which the other figures should be compared), the areas of the shell or surface are—*b* *b'*, the top of the head and upper part of the sides of the head; *c*, an area adjoining the antennæ, having a membranous covering, and properly a part of the base of the outer antennæ; *d*, a shelly area either side of *e* or epistome; *l*, what is called the labrum, situated between the mandibles.

The epistome (*e*) is subtriangular in form. It extends upward to a narrow point between the antennæ; and below on either side it is prolonged by a narrow process. This process is united at its extremity by a suture with a piece *f*, of similar width. This piece *f*, as seen on figure *i*, extends backward, on the sides of the head, forming an area directly below *b'*, with which it coalesces posteriorly.

The area *l*, below the epistome, consists of an upper and lower part, it being divided transversely by a suture crossing it with a curve convex downward; this suture is much less distinct than that separating the labrum from the epistome.

In order to compare these parts with those corresponding in the *Brachyura*, the reader should refer again to figure 9 *d*, Plate 11, and to the description on pages 23 and beyond. It is there shown that anterior to the mandibles, there is what is called the prælabial plate and epistome; and that the posterior part of the so-called epistome, is, in fact, but a part of the prælabial plate, while the anterior part is normally distinct and the true epistome; the posterior part with the anterior part of the prælabial plate is the segment pertaining normally to the second antennæ; and the anterior part represents the first antennary segment; also, the outer part of the prælabial plate and the so-called epimerals (or lateral pieces) of the *Brachyural* carapax correspond to the mandibular segment.

In the *Orchestia*, the plate, *d*, appears to be part of the second antennary segment or annulus, judging from its connexion with the base of the second antennæ.

The epistome, *e*, lies between the two plates, *d*, and may be the sternal portion of the same annulus. The piece *f*, as it is continuous with the lower angles of *e*, appears at first to be of the epistome annulus. But this would make the epistome normally posterior to the second antennary annulus, as it is posterior to *d*, which is beyond doubt second antennary. Moreover, *f* is evidently mandibular, as it supports the base of the mandible. Hence as *d* stands against *e*, the first view, making the epistome antennary, is most probably correct.

The piece *f* terminates anteriorly at the upper lip (*l*) as well as against the lower angles of the epistome; and if *f* is mandibular in its relations, we should thence conclude that the labrum (*l*) also pertains to the mandibular annulus. The deep suture separating it from the epistome (*e*) is sufficient reason for considering the two as pertaining to distinct annuli.

The maxillipeds are supported on a piece, *n*, the back piece of the lower part of the head (*p*). *n* is, therefore, the proper episternal of the maxilliped annulus, and *p* the continuation of the segment. The maxillæ segments are not represented, unless combined with the maxilliped segment in the part *p*. The piece *h* is the proper base of the inner maxillæ.

In this view, the front of the head contains—

*e* (epistome) and *d*, representing the sternal and episternal pieces of the *second-antennary* annulus.

*l* (labrum) and *f*, representing the sternal and episternal pieces of the *mandibular* annulus; and *f'* is the continuation on either side of the same annulus.

The two annuli, the first and second maxillary, are not distinct; but along the posterior side, we have parts of the *maxilliped* annulus.

The sides and top of the head will hence correspond to the *first antennary* and *ophthalmic* annuli, one or both.

If the labrum (*l*) be considered an appendage to the epistome and its annulus, the mandibular annulus would be unrepresented in the front of the head.

The structure in the Gammaridæ is in general like that of the Orchestidæ. The most striking difference is the absence of the suture separating the piece *f*, from the part above. *e*, has nearly the same shape, though under considerable variations; and in some cases it is very prominently keeled, and the labrum also may be carinate, as in Plate 62, fig. 4 *f, g, h*. The piece *d* is distinct, and it lies, as in Orchestia, just below the base of the inferior antennæ, being plainly the episternal piece of the second antennary annulus. The labrum (*l*) is separated, as usual, by a deep suture from *e*. The mandibular palpus in its retracted position extends upward over the epistome either side of the medial line or carina. Compare also figures 5 *b, c*, Plate 64.

The following are the characteristics of the genera and subgenera of Orchestidæ:—

G. 1. ORCHESTIA.—Maxillipedes non unguiculati. Antennæ 1mæ basi 2darum breviores. Epimeræ 5tæ 4tis parce breviores.

Subgen. 1. TALITRUS.—Pedes 1mi *maris feminæve* manu non instructi.

Subgen. 2. TALORCHESTIA.—Pedes 1mi *maris ac in Talitro, feminæ* manu parvulâ instructi.

Subgen. 3. ORCHESTIA.—Pedes 1mi *maris feminæque* manu plus minusve instructi.

G. 2. ALLORCHESTES, *Dana*.\*—Maxillipedes unguiculati. Antennæ 1mæ minores, basi inferiorum sæpissime longiores. Epimeræ 5tæ 4tis sæpius multo breviores.

The very short posterior stylets readily serve to distinguish the

\* Amer. Jour. Sci. [2], viii. 136, 1849.



Allorchestes from species of Amphithoe which they may resemble, even if the mandibles are not examined.

---

ORCHESTIA (TALITRUS?) NOVI-ZEALANDIÆ.

*Feminae*:—*Epimeræ grandes, nudæ, spinulis minutis margine armatæ. Antennæ 2dæ dimidii corporis longitudine, setis brevissimis (latitudine antennæ plus dimidio brevioribus), flagello vix longiore quam basis, articulis transversis, numero 25–27. Antennæ 1mæ basi 2darum non dimidio breviores. Pedes 1mi validiusculi, elongati; 2di paulo breviores, articulo 5to obtuso, fere brevioribus quam precedens, digito minuto, in margine superno affixo. Pedes 10 postici densè setulosi, setulis diametrum articulorum longitudine partim æquantibus, 6 postici valde inæqui, 7mis duplo longioribus quam 5ti, articulo primo latissimo.*

*Female*:—Epimerals large, naked, edged with minute spinules. Inferior antennæ half as long as the body; setæ very short (not half the diameter of the antenna), flagellum scarcely longer than basal part, joints transverse, 25 to 27 in number. Superior antennæ more than half the length of base of inferior. Anterior feet stout, elongate; second pair slightly shorter, the fifth joint a little smaller than the preceding, finger minute. Feet of five posterior pairs densely setulose along the margin, the setules in part as long as diameter of joints; of the three posterior pairs, the last longest, the first but half the last, the basal joint very broad.

Plate 56, fig. 5 *a*, animal, enlarged; *b*, under lip; *c*, mandible; *d*, first pair of maxillæ; *e*, second pair of maxillæ; *f*, maxillipeds; *g*, part of flagellum of second antennæ; *h*, extremity of first pair of legs; *i*, ibid. of second pair; *k*, ibid. of third pair; *l*, ibid. of fifth pair.

Bay of Islands, New Zealand. Found under sea-weed along the shores.

Length, ten lines. The epimerals are moderately long, and the fifth are anteriorly but slightly shorter than the fourth. The superior

antennæ have the flagellum about as long as the base, and together they are as long as two-thirds the base of the inferior antenna. The third joint of base of inferior pair is about once and a half times as long as second joint. The joints of the flagellum are very short, and have each three or four minute spines at apex. There are many similar short spinules on the basal portion. The mouth is prominent, making the whole height of the head twice its length. The maxillipeds have an obtuse extremity, and the last three joints are rather broad. The first pair of feet is a little longer than the second, and terminates in a large claw, slightly curved, which does not fold against the preceding joint; fourth joint oblong and rather stout; the fifth much smaller than fourth; all the joints furnished with short spinules, especially the penult, which is thickly beset with them. The hand of the second pair is a small, flat, oblong joint, subspatulate in form, and having the short finger on the dorsal margin not reaching to apex, and lying in a line with the dorsal margin of the joint. The third joint is subquadrate, and bears the fourth by its anterior side. Spines or setæ of joints short. Third and fourth pairs subequal, the third a little the largest, and hardly exceeding half the length of the seventh pair. The spines are rather numerous on the joints of the three last pairs; on the penult joint of the fifth pair there are five or six pairs of spines along the lower margin, besides other spinules smaller, and as many pairs on the upper or dorsal margin, half the length of those below. The stylets are slender. The first pair is much the longest, and extends far beyond the others. There are numerous short spinules on the upper margin, and both branches of the first pair are thus spinulous, there being seven or eight sets of spinules. The third pair is about one-third as long as the first. The seventh abdominal segment is D-form, and has the surface and margin covered with minute spines.

The male of this species was not obtained, unless it be the *Orchestia Quoyana*, Edwards, which is barely possible, as the legs and caudal stylets are somewhat similar in their setæ. The flagella of the inferior antennæ of the *O. Quoyana* are less transverse, being as long as broad, but the number of joints is nearly the same, being about twenty-five; the setules appear to be shorter and fewer. If the *O. Quoyana* proves actually to be the male of the *Talitrus* here described, the species will belong to the subgenus *Talorchestia*.

TALITRUS BREVICORNIS, *Edwards.*

Plate 56, fig. 6 *a*, antennæ, enlarged; *b*, extremity of second pair; *c*, extremity of second pair of legs; *d*, *ibid.* of fourth pair; *e*, *ibid.* of fifth pair; *f*, *ibid.* of sixth pair; *g*, stylets of first pair.

Bay of Islands, New Zealand.

This species is near the *novi-zealandiæ*. The second pair of legs has a similar hand, the finger being on the dorsal margin, and not reaching to the apex; but the position of this finger is more oblique, and not in the same line with the dorsal margin of the joint. The inferior antennæ are shorter; the joints of the flagellum are slightly oblong, and about twelve or fourteen in number; the three or four spinules are half as long as the joint; the last joint of the base has but few (three or four sets) instead of many spinules along the margin. The legs have similar spinules but fewer of them; the penult joint of the fifth pair has but three sets on the lower margin, and they are without other shorter spinules; their length is not over the diameter of the joint; on the dorsal margin there are but two or three sets. The antepenult joint has three sets on the lower side, the apical much longer than the diameter of the joint; and there are two or three sets on the dorsal margin of this joint. The caudal stylets have fewer spinules than in the *novi-zealandiæ*; the two branches of the first pair of these stylets have each but three or four spinules or sets of spinules on the upper margin exclusive of the apical (three were observed on the outer and four on the inner branch). The fourth pair of legs is shorter than the third, and the tarsus differs from the tarsus of all the other pairs in being stouter and gibbous below (fig. 6 *d*); the other tarsi are slender and nearly straight. The spinules of the antennæ have a subdivided extremity, as shown in fig. *b*, and a cluster of setules forms the extremity of the organ.

*Talitrus brevicornis*, EDWARDS, Crust., iii. 15.

## ORCHESTIA (TALITRUS) INSCULPTA.

*Maris*:—*Segmenta cephalothoracis, epimeræ, et coxæ pedum 6 posteriorum insculptæ, vel lineis et granulis seriatis notatæ. Epimeræ latæ, 5tis sat breviores. Antennæ 1mæ basi 2darum plus duplo breviores; 2dæ dimidio corporis longiores, basi longo et crasso, flagello non longiore quam basis, fere nudo, articulis vix oblongis. Pedes 1mi subgraciles, ungue fere recto. Pedes 2di pervalidi, manu latâ, elliptico-subtriangulatâ, palmâ\* obliquâ rectiusculâ, medio emarginatâ, digito longo. Pedes 3tii 4tis longiores, 5ti breves, 6ti 7mi subæqui, 7mis brevioribus, setulis brevibus, diametro articuli non longioribus, articuli 6ti ad marginem inferiorem ferme 5 paribus setularum, ad marginem supernum setulis subtilissimis. Styli caudales dense spinulosi, ramis paris 1mi ambobus spinulosis.*

*Feminæ*:—*Segmenta cephalothoracis lævia, vix sulcata, epimeræ et coxæ pedum 6 posteriorum areolis leviter notatæ. Antennæ 2dæ dimidio corporis breviores, articulis flagelli transversis. Pedes 2di manu parvulâ fere ellipticâ, digito minuto in margine superno affixo, longitudinali, apicem manus vix attingente.*

*Male*:—Segments of thorax and epimerals, and also coxæ of six posterior legs, sculptured or marked with raised lines and seriate granules. Epimerals broad; fifth considerably shorter than the fourth. Superior antennæ more than twice shorter than base of inferior; inferior pair longer than half the body, base long and stout, flagellum not longer than base and nearly naked, joints but slightly oblong. Feet of first pair rather slender, claw nearly straight. Feet of second pair very stout, subtriangular, palm oblique, nearly straight, emarginate near middle, finger long; third pair of legs longer than fourth; fifth short; sixth and seventh subequal, seventh a little the shorter.

*Female*:—Segments of cephalothorax smooth, slightly sulcate. Epimerals and coxæ of six posterior legs slightly sulcato-areolate. Inferior antennæ hardly half as long as body; joints of the flagellum transverse. Feet of second pair with a small hand, which is nearly

\* By *palm* (*palm* of the hand) we mean the part of the margin of the hand against which the finger closes.

elliptical, finger minute and articulated with the hand by the dorsal margin, lying longitudinally, and hardly reaching to apex. In other characters like the *male*.

Plate 57, figs. 1 *a* to *m*, male; *n* to *r*, female: fig. 1 *a*, *male*, enlarged; *b*, mandible of same; *c*, maxilla of first pair; *d*, *ibid.* of second pair; *e*, maxilliped; *f*, leg of first pair; *g*, hand of second pair; *h*, leg of fifth pair; *i*, side view of head; *k*, front view *ibid.*; *l*, under view; *m*, view of lower part of same from behind.—*n*, *female*, enlarged; *o*, extremity of leg of sixth pair; *p*, *ibid.* of seventh pair; *p'*, same, more enlarged; *q*, extremity of second pair; *r*, *ibid.* of first pair.

Very abundant along the beaches near Valparaiso, burrowing in the sand. The females were also common under sea-weed thrown up by the tides.

Length, nine or ten lines. Colour, yellowish-white; base of inferior antennæ, orange. The males and females are very unlike in the markings of the segments and epimerals, the sculpturing of the male being represented in the female by merely a few faint sulcations, forming areolets, which are confined mainly to the epimerals and coxæ of the six posterior legs. Still they appear from the similarity of the setules of the legs, the stylets, the relative sizes of the legs, and other characters, to pertain to the same species. Moreover, they were found in the same sand beach very abundantly—the sculptured individuals all having large hands to the second pair of legs; the areolated all with rudimentary hands, like females.

*Males.* — Eye subrotund. The inferior antennæ vary much in length, from variations in the flagellum; in general, they are considerably longer than half the body. The flagellum of the superior antennæ contains about six or seven joints. In the first pair of legs, the fourth and fifth joints are subcylindrical, and the claw is about half as long as the fifth. The palm of the second hand is spinulous below the emargination, besides having a few minute spines above it. The claw of the third pair of legs is slender; and that of the fourth has a projecting angle below like a tooth; all the claws are without a seta below towards apex. The molar prominence of the mandible has a spinulous surface. The animal is rather sluggish in its motions.

*Females*.—The flagellum of the inferior antennæ, varies as in the males, though usually shorter, as the separate joints have less length; the number of joints is twelve to nineteen. The superior antennæ are about half as long as the base of the inferior; the flagellum is about five-jointed. The second pair of legs is usually concealed by being folded up under the body. The fourth joint of the first pair of legs is but slightly broader and longer than the hand; the lower margin is regularly arcuate and long. Hundreds were collected under the sea-weed thrown up on the beach, as well as in the sand; and they were exceedingly nimble in their movements.

It is still possible that the females and males may belong to distinct species.

*Talitronus insculptus*, DANA, Proc. Amer. Acad. Sci. Boston, ii. 202 (male), and *Talitrus ornatus*, D. (female) *ibid.*, p. 201.

#### ORCHESTIA (TALITRUS) BRASILIENSIS.

*Feminæ*:—*Corpus læve*. *Antennæ inferiores dimidio corporis breviores, flagello vix longiore quam basis, ferme 16-articulato, articulis parce oblongis, setis paucis diametrum articuli longitudine fere æquantibus, superiores perbreves dimidio basis inferiorum breviores, flagello 3-articulato. Pedes setis perbrevibus instructi, illis articuli 5ti parium 3 posticorum totis diametro articuli non longioribus; pedes 1mi 2dis longiores, unguiculati tantum, ungue crasso, curvato, parce brevior quam articulus precedens; 2di manu semi-ovatâ confecti, margine manus superno recto, digito minutissimo, marginali et ab apice remoto, longitudinali, articulo 3tio duplo brevior quam 4to, infra rectangulato. Pedes 5ti 6tis dimidio breviores, 6ti 7mique fere æqui, articulo 5to angusto, setulis supernis et inferis inter se æquis, utroque margine 6–7 paribus.*

*Maris*:—*Pedes 1mi ac in feminâ; 2di manu grandi instructi, manu ovatâ, palmâ longâ, non emarginatâ nec concavâ nec dentatâ, spinulis armatâ; digito longo, ad marginis inferi angulum attingente, carpo brevissimo, multo transverso, articulo 3tio rectangulato, parce oblongo, nudo.*

*Female*:—Body smooth. Inferior antennæ not half as long as the

body, flagellum hardly as long as the base, about sixteen-jointed, joints slightly oblong, setæ few, hardly as long as diameter of joints; superior pair very short, half shorter than base of inferior, flagellum three-jointed. Feet with short setæ, those of fifth joint of three posterior pairs not longer than diameter of joint; first pair of feet longer than second, ending in a curved claw, which is a little shorter than preceding joint; hand of second pair semi-ovate, the upper margin straight, minute finger ending remote from apex, longitudinal in position, third joint half shorter than fourth, rectangular below; fifth pair of legs half shorter than sixth; sixth and seventh subequal, fifth joint quite narrow, the setules of upper and under margins about equal, and in six or seven sets.

*Male*.—Feet of first pair, as in females; second with a large hand, which is subovate, the palm ending in a low angle, and not concave, nor emarginate, nor toothed, but set with spinules, finger long, carpus very transverse, third joint rectangular, a little oblong, naked.

Plate 57, fig. 2 *a*, female, enlarged; *b*, antenna of first pair; *c*, part of flagellum of second pair; *d*, extremity of same, more enlarged; *e*, extremity of leg of second pair; *f*, *ibid.* of fifth pair; *g*, *ibid.* of sixth pair.—*h*, hand of male.

Rio Janeiro; dredged in the harbour.

Length, six lines. The fifth epimeral is much smaller than the fourth, which is the largest. The eyes are rather large, and approximate in front. The flagellum of the female superior antennæ consists of three subequal joints, and together they are a little longer than half the three basal joints. The finger of the female hand of second pair is articulated with the dorsal margin of the hand about two-fifths its length from the extremity, and is very short, stopping far short of the extremity; the preceding joint is about twice as broad as the hand, very strongly arcuate below, somewhat less so above, and very nearly naked. The flagellum of the second pair of antennæ (as in other Gammaridea) terminates in a tuft of setæ, (fig. 2 *d*.) like the same in the Oniscidæ and other Isopoda. The posterior stylets are very short, and, as usual, simple. The setules of the other stylets are few and short.

## ORCHESTIA (TALITRUS) PUGETTENSIS.

*Feminæ*:—*Corpus læve. Epimeræ mediocres, 5tæ 4tis vix breviores. Oculi rotundati. Antennæ inferiores dimidio corporis non longiores, flagello fere brevioribus, articulis numerosis, transversis, setulis semidiametro articuli non longioribus, basi partim scabriculo; superiores basi inferiorum triplo breviores. Pedes 1mi unguiculati tantum, articulo penultimo scabriculo, ungue brevi, dimidii articuli precedentis longitudine; 2di manu angustè subellipticâ, digito marginali, longitudinali, fere ad apicem manus attingente, articulo 3tio parce oblongo, dimidio articuli 4ti longitudine minore, infra arcuato et processu brevi quasi 2-articulato et subacuto armato. Pedes 10 postici numerosis spinulis setisve brevibus fasciculatis armati sed non scabriculi, setis vix diametri articulorum longitudine; 6ti 7mi subæqui; 5ti tertiâ parte breviores. Styli caudales spinulis numerosis ornati, ramo externo paris 1mi nudo.*

*Female*:—Body smooth. Epimerals of moderate size, fifth hardly shorter than fourth. Eyes round. Inferior antennæ not longer than half the body, flagellum hardly as long as base, the joints numerous, transverse, the setules not a semidiameter of joints in length, base partly scabrous; superior pair one-third as long as base of superior. Anterior feet simply unguiculate, penult joint scabrous, claw short, half as long as preceding joint, hand of second pair narrow subelliptic, finger marginal, longitudinal, reaching nearly to apex of hand, third joint sparingly oblong, having a seemingly two-jointed process below, the extremity narrow and subacute. Ten posterior feet armed with numerous short setæ in sets, but not scabrous, the setæ hardly as long as breadth of joints; sixth and seventh pairs subequal; fifth one-third shorter. Caudal stylets with numerous setules, outer branch of first pair naked.

Plate 57, fig. 3 *a*, female, enlarged; *b*, part of flagellum of inferior antennæ; *c*, leg of second pair; *d*, part of leg of sixth or seventh pair.

Puget's Sound.



Length, eight lines. The inferior antennæ are rather stout; and the joints of the flagellum are but little longer than half their breadth. The superior antennæ are hardly longer than the head, and the flagellum is more than half shorter than the basal portion. The setæ or spinules of the legs are more numerous than usual, each set consisting of four to six setules, and those of the upper margin are about as long as those of the lower. The tarsus has a seta just beyond middle of lower margin.

ORCHESTIA (TALITRUS?) SCABRIPES.

Maris:—*Corpus læve. Epimeræ sat magnæ, 5tæ 4tis parce breviores.*

*Oculi magni, paulo reniformes. Antennæ inferiores prælongæ, corpore multo longiores, articulo ultimo basis plus duplo longiore quam precedens, flagello longiore quam basis, 20–22-articulato, articulis longiusculis, setis diametro articulorum brevioribus. Pedes 1mi 3tii et sequentes spinulis minutis scabriculi, 3tii, 4ti, 5ti, 6ti, 7mi spinulis aliis paucis longioribus; 1mi unguiculati tantum, ungue parvulo, triplo brevior quam articulus precedens; 2di manu pergrandi instructi, manu latè subtriangulatâ, palmâ obliquâ, scabriculâ, juxta digitum emarginatâ, digito longo, valde curvato; 3tii 4ti subæqui, 5ti 6ti 7mi longitudine sensim crescentes, ungue fere recto. Styli caudales spinulis numerosis ornati, ramo externo paris 1mi nudo.*

Male:—Body smooth. Epimerals rather large, fifth hardly shorter than fourth. Eyes large, a little reniform. Inferior antennæ very long, much longer than body, last joint of base more than twice the preceding in length, flagellum longer than the base, twenty to twenty-two-jointed, the joints long, the setæ shorter than the diameter of the joints. Feet of first, third, and following pairs scabrous over the surface with minute spinules, and these legs excepting first pair having also some longer spinules or setæ; first pair simply unguiculate; the claw quite small, one-third the preceding joint in length; second pair with a very large subtriangular hand, the palm oblique, scabrous, and having an emargination adjoining base of finger, finger long and very much curved; third and fourth legs subequal; fifth, sixth, and seventh gradually increase in length, tarsus nearly straight. Caudal stylets with numerous setæ, outer branch of first pair naked.

Plate 57, fig. 4 *a*, male, enlarged; *b*, extremity of leg of seventh pair.

Puget's Sound.

Length, eleven to twelve lines. The eye and inferior antennæ are very unusually large. The scabrous character of the legs distinguishes the species from the *pugettensis*; the longer setæ of the posterior legs are about two in a set, and they are not longer than the diameter of the fifth joint. The superior antennæ do not reach nearly to apex of penult joint of base; the flagellum is about seven-jointed, and is shorter than the base.

ORCHESTIA (TALORCHESTIA) GRACILIS.

*Feminæ*:—*Epimeræ grandes*, 5tæ *vix breviores*. *Antennæ 2dæ dimidio corporis valde longiores, setis brevissimis (latitudine antennæ duplo brevioribus)*; *flagello multo longiore quam basis, articulis paulo oblongis*. *Antennæ 1mæ basi secundarum triplo breviores*. *Pedes 1mi validiusculi, unguiculati, ungue parvulo, articulis 2do 3tio 4to 5to subæquis*. *Pedes 2di paulo breviores, articulo penultimo infra prominente; manu apice rotundatâ, margine antico parce excavato et digito minutum versus apicem gerente*. *Pedes 3tii 4tis longiores*. *Pedes 6 postici paulo graciles, minute setulosi, articulo primo anguste elliptico*; *7mi 6tis longiores 5tis multo longiores setulis in marginibus articuli 5ti numerosis et æquis, in utroque margine triplo brevioribus quam articuli diametrum*.

*Maris*:—*Antennæ 2dæ corpore longiores, flagello paulo longiore quam basis, ferme 30-articulato*. *Pedes 1mi manu parvulâ confecti, oblongâ, apice truncatâ, digito perbrevis, terminali*. *Pedes 2di manu grandî, ovatâ, infra integrâ et arcuatâ, spinulosâ, digito paulo brevior quam manus, carpo minimo, articulo 3tio vix oblongo*.

*Female*:—Epimerals large; the fifth pair hardly shorter than fourth. Inferior antennæ much longer than half the body, setæ very short (half shorter than diameter of antenna); flagellum much longer than base, joints a little oblong. Superior antennæ about one-third as long as base of inferior. Anterior feet rather stout, with quite a

small claw, and the second, third, fourth and fifth joints subequal. Second pair shorter than first, penult joint prominent behind; last joint lamellar, rounded at apex, nearly naked, concave on anterior side, and having on this margin towards apex a minute finger. Third pair of feet much longer than fourth; last three pairs gradually increase in length, rather slender, first joint narrow-elliptic, and edged with minute spinules, other joints with very short setæ at small intervals on the opposite sides; feet of seventh pair considerably longer than sixth, very much longer than those of fifth; the setules of the fifth joint numerous, and not one-third as long on either margin as the diameter of the joint.

*Male*.—Inferior antennæ longer than the body; flagellum a little longer than the base, about thirty-jointed. Feet of first pair with a small, narrow hand, the finger minute and acting against the truncate apical margin, and hardly longer than this margin. Feet of second pair having a large ovate hand, lower margin convex entire, and spinulose; finger a little shorter than hand. Carpus minute; third joint slightly oblong.

Plate 57, figs. 5 *a* to *f*, *female*, *g* to *m*, *male*.—5 *a*, *female*, enlarged; *b*, portion of flagellum of inferior antenna; *c*, extremity of legs of second pair; *d*, *ibid.* of third pair; *e*, *ibid.* of fourth pair; *f*, first pair of caudal stylets.—*g*, *male*, enlarged; *h*, extremity of leg of first pair; *i*, hand of second pair; *k*, extremity of leg of third pair; *l*, *ibid.* of fourth pair; *m*, third pair of stylets and extremity of abdomen.

Sandy shores of a small coral island in the Balabac Passage.

Length, about half an inch. Nearly colourless. The superior antennæ are short, with a flagellum shorter, or not longer, than the base, and the whole in both sexes, not reaching to apex of penult joint of base of inferior antennæ. The flagellum of the inferior antennæ is straight and not very flexible. The last joint of base is one-third longer in females than the preceding, and more than half longer in males. The claw of the legs is slender and nearly straight, excepting in fourth pair, in which it is gibbous below, or has a prominent angle and is stout. The caudal stylets of the first pair have the upper margin of outer branch naked in both sexes, and the inner branch with four or five setules or sets of setules besides the terminal. The

males and females were found together, and are judged to belong to the same species, from their similarity in the setæ of the legs, the narrow basal joint of the six posterior legs, the fifth epimeral hardly shorter than the fourth in both, and similar caudal stylets.

*Talitrus gracilis*, DANA, Proc. Amer. Acad. Sci. Boston, ii. 201 (female).

ORCHESTIA (TALORCHESTIA?) QUOYANA (*Milne Edwards*).

Plate 58, fig. 1 *a*, animal, enlarged; *b*, part of inferior antennæ, more enlarged.

Bay of Islands, New Zealand.

Epimerals rather broad; fifth anteriorly not narrower than fourth. Eye quite large and round. Superior antennæ more than half the length of base of inferior, extending beyond apex of penult joint; flagellum about half whole length. Inferior antennæ half as long as body; flagellum scarcely longer than base, joints not oblong, setæ nearly obsolete, last joint of base longer than preceding. Hand of last pair of feet slender, short hairy, apex not enlarged; claw minute, half as long as hand. Hand of second pair subtriangular, the palm nearly straight, and having a sharp, slightly curved tooth on the upper half, thumb (or prolonged inferior angle of hand) not like an acute tooth; following two pairs of feet subequal; next three pairs gradually increase in length, all rather densely setose, and first joint very broad, with posterior margin slightly uneven.

Length, about six lines. The body is naked; there are a few minute hairs on the edges of the epimerals.

*O. Quoyana*, EDWARDS, Crust., iii. 19, and Cuv. Illust., pl. 59, f. 4.

ORCHESTIA SCUTIGERULA.

Maris:—*Epimeræ sat latæ, quintis paulo brevioribus quam quartæ. Antennæ 2dæ breves, corpore fere triplo breviores, flagello moniliformi, paulo longiore quam basis, setis minutissimis, articulis non oblongis. Pedes 1mi parvuli, manu oblongâ, subtriangulatâ, apice transversâ*

*articulo 4to infra gibboso. Pedes 2di validi, manu latâ, subtriangulâtâ, supernè arcuatâ, palmâ obliquè transversâ, fere rectâ, medio dentigero, angulo infero acuto, digito longo, carpo brevissimo. Pedes 4 sequentes sat longi, subæqui; 6 ultimi sensim incrementes, 7mi 5tis plus duplo longiores, articulo primo elliptico et laminam crassam magnam latè ellipticam posticè gerente, setis perpaucis perbreuibus.*

*Feminæ:—Articulus pedis 7mi 1mus angustior. Pedes 1mi unguiculati et manu vix instructi, articulo 5to apice non latiore, apice inferiore parce prominente, digito unguiformi, quam margo articuli 5ti apicalis duplo longiore, articulo 4to paulo longiore quam 5tus et parce latiore. Pedes 2di manu minutâ subspatulâtâ, apice rotundâtâ, digito laterali subapicali, extremitatem manus non attingente, articulo 3tio infra arcuato.*

*Male:—Epimerals rather broad, fifth shorter than fourth. Inferior antennæ short, about one-third as long as the body, flagellum moniliform, a little longer than base, setæ very minute, the joints not oblong. First pair of feet small, hand oblong, subtriangular, apex transverse, claw not longer than apical margin, fourth joint gibbous below; second pair of feet stout, hand broad, subtriangular, with the dorsal margin arcuate, palm of hand oblique transverse, nearly straight, with a single prominence near middle, inferior angle acute, but scarcely prolonged. Following four feet subequal; last six gradually increase in length; seventh more than twice as long as fifth, the first joint bearing behind a broad elliptical plate; setæ few and very short.*

*Female:—First joint of seventh pair of legs much narrower than in the male. Feet of first pair unguiculate and hardly furnished with a hand, the fifth joint not being broader at apex, the lower apex not produced, and the unguiform finger stout and full twice as long as the apical margin, fourth joint a little longer than the fifth and sparingly broader. Feet of second pair with a minute subspatulate hand, rounded at apex, finger-lateral, subapical, not reaching to extremity of hand, third joint arcuate below.*

Plate 58, figs. 2 *a* to *h*, male, *i* to *l*, female:—fig. 2 *a*, male, enlarged; *a'*, part of flagellum of inferior antennæ; *b*, mandible; *c*, first pair of maxillæ; *d*, second pair of maxillæ; *e*, maxillipeds; *f*, leg of first

pair; *g*, leg of seventh pair.—*h*, female, side view of head; *i*, extremity of leg of first pair; *k*, ibid. of second pair; *l*, leg of seventh pair.

Abundant among the sea-weed thrown up on the shores of Nassau Bay, Tierra del Fuego.

Length, three-fourths to seven-eighths of an inch. Colour, greenish brown. The large peltate plates on either side of the body posteriorly, pertaining to the basal joint of the posterior legs, give the males a singular appearance. These plates, in a side view, conceal much of the abdomen and the appendages below; they are concave within. The superior antennæ are short, they extend beyond apex of penult joint of base of inferior pair; the flagellum is about six-jointed. The flagellum of the inferior antennæ contains sixteen to eighteen joints. The setæ of the flagella are about one-fourth the diameter of the joints in length; the base of this pair is quite short in males as well as females. Eye round. Mandible has a large molar prominence, which is minutely granulous at apex. The terminal setæ of the inner maxillæ are toothed within. The penult joint of first pair of feet in males is subtriangular like the hand, and nearly of the same size; lower apex of hand and also of preceding joint rounded and prominent. The hand of the second pair in males is large; the palm is nearly straight and almost naked, with a low triangular prominence just above its centre; the third joint of this pair is a little oblong and rectangulate below. In females, the second pair of legs has the fourth and fifth joints subequal in length, and longer than the third; the third and second subequal; the fourth is articulated with the third by nearly one-half of its lower side, the other half being regularly arcuated below. The first pair in females is nearly as in *Talitrus*; yet the claw does close so as to hit the lower apex of the preceding joint by its inner surface; the fifth joint has its two margins nearly parallel, and is sparsely scabrous below.

This species has many of the characters of the *O. chilensis* of Edwards; but the terminal segment of the abdomen is not longer than broad, and is D-shape (fig. 2*m*) instead of being long and pointed; moreover, the finger of the hand has but a single curvature.

## ORCHESTIA CAPENSIS.

*Maris*:—*Epimeræ permagnæ*, 5<sup>tæ</sup> 4<sup>tis</sup> parce breviores. *Oculi* subrotundati. *Antennæ inferiores* dimidio corporis paulo longiores, basi sat longo, articulo basis ultimo plus duplo longiore quam precedens, flagello paulo longiore quam basis, 14–16-articulato, articulis parce oblongis, setis minutissimis. *Antennæ superiores* breves, dimidio basis inferiorum breviores, flagello 7–10-articulato. *Pedes antici* angusti, manu oblongâ, apice excavata, truncatâ, digito latitudine manus vix longiore. *Pedes 2di* pervalidi, manu permagnâ, subtriangulatâ, supra arcuatâ, palmâ obliquo-transversâ, paucis subtilissimis spinulis instructâ, profunde excavatâ, juxta digiti basin dentigerâ. *Pedes 5ti* 6<sup>tis</sup> multo breviores; 4 postici subæqui, crassi, breves, valde spinulosi, articulo 5to crasso, spinulis diametro articuli vix brevioribus.

*Male*:—Epimerals very large, the fifth sparingly shorter than fourth. Eyes subrotund. Inferior antennæ a little longer than half the body, base rather long, last joint of base more than twice as long as preceding joint, flagellum a little longer than base, fourteen to sixteen-jointed, joints sparingly oblong, setæ very minute. Superior antennæ not half as long as base of inferior, flagellum seven to ten-jointed. Anterior feet narrow, hand narrow, scarcely broader at apex and excavato-truncate, finger hardly longer than breadth of joint. Hand of second pair very large and stout, subtriangular, upper margin arcuate, palm obliquo-transverse, deeply excavate, and having a tooth near base of finger, a few exceedingly minute spinules on palm, and no hairs. Feet of fifth pair much shorter than sixth; sixth and seventh subequal, quite stout and short, and strongly spinulous; the fifth joint stout, its spines about as long as breadth of joint.

Plate 58, fig. 3 *a*, male, much enlarged; *b*, part of flagellum of outer antennæ.

Cape of Good Hope.

Length, eight to nine lines. The superior antennæ reach to apex

of penult joint of base of inferior pair, and its flagellum is nearly half its whole length. The setules of the flagellum of the inferior antennæ are hardly one-fourth the diameter of the joints in length. The ten posterior legs are all stout, and the sets of spines are rather crowded; there being five sets on the margin of the fifth joint in the last two pairs; the margin of the joint is strongly serrated to receive the spines. The epimeral of the sixth joint is unusually long, being nearly as large as that of the fifth.

Krauss mentions that the *O. Bottæ*, Edwards, is found in South Africa, at Port Natal. The published description of that species is too brief to enable us to identify our species with that.

ORCHESTIA CHILENSIS? *Edw.*

*Feminae*:—*Epimeræ sat magnæ, 5tæ 4tis vix breviores. Antennæ 2dæ dimidio corporis breviores, basi sat brevi, articulo basis ultimo parce longiore quam precedens, flagello parce longiore quam basis, 19–20-articulato, articulis parce oblongis, setis minutissimis. Pedes 1mi 2dis breviores et tenuiores, manu apice truncatâ, paulo latiore, digito vix longiore quam margo apicalis; 2di manu subspatulatâ, digito marginali, longitudinali, apicem vix attingente. Pedes 10 postici setis minutis et sat paucis ornati, setis articuli 5ti inferis dimidii articuli longitudine, supernis multo brevioribus. Pedes 5ti 6ti 7mique graciles, 5tis brevioribus, 6tis 7misque æquis, coxis 7morum paulo latioribus.*

*Female*:—Epimerals rather large, fifth but slightly shorter than fourth. Inferior antennæ half shorter than the body, base rather short, last joint of base hardly longer than preceding, flagellum a little longer than base, nineteen to twenty-jointed, joints sparingly oblong, setæ very minute. Feet of first pair shorter and more slender than those of second, hand truncate at apex and here a little broader, finger as long as apical margin. Hand of second pair subspatulate, finger marginal, longitudinal, hardly reaching to apex. Feet of ten posterior pairs with the setæ minute and rather few; those of the fifth joint on its under surface half as long as width of joint; those on upper margin much shorter. Legs of fifth, sixth, and seventh pairs slender; fifth considerably shorter than sixth;



sixth and seventh equal; coxæ of seventh pair somewhat broader than that of preceding.

Plate 58, fig. 4 *a*, animal, much enlarged; *b*, part of flagellum of inferior antennæ; *c*, extremity of leg of first pair; *d*, *ibid.* of second pair; *e*, *ibid.* of leg of fourth pair.

#### Valparaiso.

Length, eight lines. The setæ of the flagellum of the inferior antennæ are not longer than half the breadth of the joints. The hand of the second pair is about half as broad as preceding joint, and much shorter; it is broadest towards the extremity and rounded at apex. The hand of the first pair is very short setulose below; the preceding joint is arcuate below, and furnished with five setæ (or sets of setæ), the middle of which is the longer.

We suspect that this may be the female of the *O. chilensis* of Edwards (Crust., iii. 18); but males and females are so very different, that it is impossible to be certain from a description of the male only. Our specimens are all like the figures.

#### ORCHESTIA NITIDA.

*Epimeræ mediocres, quintæ quartis breviores. Antennæ 2dæ dimidio corporis breviores, flagello longiore quam basis, moniliformi, 12-14-articulato, articulis parce oblongis, setis minutissimis. Antennæ 1mæ dimidio basis secundarum parce longiores, flagello 5-articulato. Pedes 1mi parvuli, manu brevi, apice oblique truncato et latiore, carpo juxta manum infra gibboso. Pedes 2di validi, manu subovatâ, palmâ rectâ vix excavatâ, fere longitudinali, digito dimidio manus longiore. Pedes 4 sequentes subæqui; reliqui breviusculi, sensim incrementes, setis articuli 5ti semidiametro articuli multo brevioribus, articulo primo lato, margine subtilissimè serrulato. Ramus stylorum 1morum externus nudus.*

Epimerals of moderate size, fifth smaller than fourth. Inferior antenna shorter than half the body; last two of the basal joints subequal, flagellum longer than base, moniliform, twelve to fourteen-jointed, joints slightly oblong, setæ very minute. Superior

antennæ about half as long as base of inferior, and flagellum five-jointed. First pair of feet having a small hand, slightly oblong, somewhat securiform, at apex somewhat broader and obliquely truncate, the carpus below near hand gibbous. Hand of second pair large subovate; palm straight, nearly longitudinal; finger longer than half the hand. Next four feet subequal, the rest gradually increasing in length, rather short; setæ of fifth joint much shorter than the semidiameter of the joint; first joint broad, margin minutely serrulate. Outer branch of first pair of stylets naked.

Plate 58, fig. 5 *a*, animal, enlarged; *b*, part of flagellum of inferior antennæ; *c*, superior antenna; *d*, extremity of leg of first pair; *e*, *ibid.* of third; *f*, *ibid.* of sixth pair.

From among floating *Fucus*, near the shores of Tierra del Fuego. Caught with a hand-net.

Length, one-third of an inch. Colour, green. Body compressed, shining. The head in profile is short vertically, but the organs of the mouth are not concealed. Eye round. The epimerals are broad and subrotund; the fifth a little smaller than fourth. The last segment of the abdomen is triangular, with the apex slightly recurved. The superior antennæ extend to apex of penult joint of base of inferior antennæ; the flagellum is five-jointed. The flagellum of inferior antennæ fourteen to fifteen-jointed and flattened, and in the specimens preserved in alcohol the margins are reddish; the base is short; the last two joints subequal. The claw of the hand of first pair of legs shuts against the apical margin, and is as long as this margin. The penult joint has a protuberance on the under side. The hand of the second pair has an emargination towards base on the inferior side, where the finger when closed terminates, and below the emargination, at the apex, there is a very minute spine. Breadth of hand, about half the length. The fifth joint of the sixth or seventh pair of legs has about five sets of setæ on the under side, none over one-third as long as the diameter of the joint, and four sets on the upper side, which are still shorter.

This species resembles the *Orchestia euchorus* of Fr. Müller (Archiv

f. Nat., 1848, 53, pl. iv.), but in that the finger of the large hand is shorter, and the palm has an emargination below its middle.

*O. nitida*, DANA, Proc. Amer. Acad. Sci., ii. 204.

Figures 6 *a* to *d*, Plate 58, represent parts of a female, which may possibly be female of the *nitida*, judging from the size and number of the setæ of the posterior legs. Fig. *a*, part of the anterior legs, the extremity mutilated; *b*, second pair; *c*, extremity of hand of second pair; *d*, extremity of leg of sixth pair.

The head in the only specimen in the collections is mutilated. The fifth epimeral is considerably shorter than the fourth. The setæ of the six posterior legs are very short; on the fifth joint of the sixth pair of legs there are five sets of setæ on the under side, hardly one-third as long as the diameter of the joint, and three sets (besides the apical) on the upper side, still smaller. The tarsus has below towards apex a setule, as in the *nitida*. The fourth joint is closely like that of the *nitida* in the number and size of the setæ (compare figures 5 *f* and 6 *d*). The second pair of legs has the hand subspatulate, the upper and under sides nearly parallel, the minute finger marginal, lying longitudinally, and not reaching to apex, the scabrous surface covering nearly half the whole width of the hand, and, as usual, some hairs near its upper limit. This scabrous surface under a high magnifier is minute hirsute. The fourth joint or carpus is strongly arcuate below, and has a rather broad scabrous surface upon its lower part, like the hand. The preceding joint has the lower apex projecting and rounded, and scabrous, with minute hairs under a magnifier, like the hand. The third joint of the first pair of legs has a low angle below near middle.

#### ORCHESTIA SERRULATA.

Maris:—*Epimeræ sat magnæ, quintæ anticè quartis non angustiores. Antennæ 2dæ ferme dimidiū corporis longitudine; flagello vix longiore quam basis, articulis non oblongis, setis fere obsoletis. Antennæ 1mæ dimidio basis inferiorum vix longiores, flagello 7-8-articulato. Pedes 1mi parvuli, manu subtriangulatâ, paulo oblongâ, apice latiore, trans-*

*versâ, parce excavatâ. Pedes 2di validi, manu magnâ, subellipticâ, palmâ infero-subapicali, excavatâ, subtilissimè spinulosâ, angulo infero rotundato. Pedes 3tii 4ti tenues, subæqui; 5ti 6ti 7mi sensim incrementes, setis minutissimis, paucis, articulo primo latissimo, margine postico serrulato, antico 2-3 setis minutis ornato.*

*Feminæ (?)*:—*Pedes 1mi manu parvulâ, breviter lineari, apice non latiore, truncatâ, articulo 4to longiore et parce latiore, infra fere recto; 2di manu subovatâ, supra fere rectâ, digito terminali, transverso, paulo obliquo, brevissimo. Flagellum antennarum 2darum 14-articulatum.*

*Male*:—Epimerals moderately broad, fifth anteriorly not narrower than fourth. Inferior antennæ about half as long as body, flagellum as long as base; joints not oblong, setæ nearly obsolete. Superior antennæ hardly longer than half the base of the inferior, flagellum seven or eight-jointed. Hand of first pair of feet quite small, broadest at apex, straight truncate, and a little excavate. Hand of second pair large suboval, palm infero-subapical, this part of inferior margin excavate and minutely spinulose. Third and fourth pairs of feet slender, subequal; fifth, sixth, and seventh gradually increase in length, similar setæ very minute and few, first joint very broad serrulate behind, and having two or three minute setæ on the front margin.

*Female (?)*:—Feet of first pair with a very small hand, short linear in form, not broader at apex, which is truncate, fourth joint longer and sparingly broader, below nearly straight, finger terminal, slightly oblique though transverse, very short. Flagellum of inferior antennæ fourteen-jointed.

Plate 58, fig. 7 *a*, male, enlarged; *b*, *b'*, mandible in different positions; *c*, *d*, maxillæ; *e*, maxillipeds; *f*, superior antenna; *g*, part of flagellum of same, much enlarged; *h*, hand of first pair; *i*, hand of second pair; *k*, posterior margin of first joint of seventh pair of feet; *l*, extremity of seventh pair.—*m*, female, part of leg of first pair; *n*, *ibid.* of second pair; *o*, *ibid.* of seventh pair.

From among the sea-weed thrown up by the tides, on the shores of islands called the Black Rocks, in the Bay of Islands, New Zealand.

Length, nine and a half lines. The epimerals are rather narrow. The flagellum of the superior antennæ consists of seven joints; of the

inferior, of fifteen to eighteen joints in the male, and about fourteen in the female.

*Male*.—The claw of finger of hand of first pair of feet is not as long as the apical margin. The finger of second pair when closed, extends half way or rather more toward base of hand; the hand is naked, except the minute spinules or setæ on the palm. The third and fourth pairs of legs are very slender; the fifth is much longer than half the seventh; the seventh is longer than the sixth. The setules of the legs of the fifth joint of the seventh pair are nearly alike on both margins, and about one-fourth the diameter of the joint in length. The tarsus is straight and slender.

*O. serrulata*, DANA, Proc. Amer. Acad. Sci., ii. 204.

#### ORCHESTIA TENUIS.

*Feminae*:—*Epimeræ sat breves*. *Antennæ 2dæ tenues, dimidii corporis longitudine, flagello tenuissimo, valde longiore quam basis, articulis oblongis, cylindricis, setis articulo vix brevioribus*. *Antennæ 1mæ basi 2darum vix breviores*. *Pedes 4 antici debiles; primi minimi; secundi parvuli, manu minutâ, oblongâ, retrorsum inflexâ, extremitate dimidio truncatâ, apice inferiore producto et obtuso, digito minuto, fere transverso, ab extremitate paulo remoto*. *Pedes 4 sequentes parvuli, 4tis brevioribus*. *Pedes 6 postici sensim increscentes, 7mis fere duplo longioribus quam 5ti; setis brevibus, articuli diametro non longioribus*.

*Female*:—*Epimerals rather narrow*. *Inferior antennæ slender, about half as long as body, flagellum very slender, much longer than base, joints oblong, setæ hardly shorter than joints*. *Superior antennæ about as long as base of inferior*. *Four anterior pairs of feet quite small and weak; first pair much the smallest; hand of second pair very small, oblong, bent backward, truncated half across towards apex, finger minute, rather remote from extremity and nearly transverse; third and fourth pairs small; the fourth pair smaller than third; three posterior pairs very unequal, increasing regularly in length; seventh pair nearly twice longer than fifth, setæ short, scarcely longer than diameter of joints*.

Plate 59, fig. 1 *a*, animal, enlarged; *b*, *b'*, different views of mandible; *b''*, molar prominence of mandible; *c*, inner maxilla; *d*, a maxilla of second pair; *e*, maxillipeds; *f*, part of flagellum of inferior antennæ, much enlarged; *g*, hand of second pair of feet.

Bay of Islands, New Zealand.

Length, half an inch. The flagellum of the inferior antennæ has about fourteen joints, and is very slender, the last joint of basal part is about one-fourth longer than the next preceding. The first pair of feet has similar hands to the second, though more than half smaller. The hand of the second pair has the apex prolonged and narrow; and, therefore, the joint appears to be abruptly narrowed where this apical prolongation begins, and has a transverse margin at the narrowing. The finger is applied against this transverse margin, being articulated apparently at its outer extremity, where there are a few very minute setæ. The mandible has the molar prominence transversely ribbed.

*O. tenuis*, DANA, Proc. Amer. Acad. Sci., ii. 202.

#### ORCHESTIA SYLVICOLA.

Feminae:—*Epimeræ mediocres*, 5<sup>tæ</sup> 4<sup>tis</sup> vix breviores. Antennæ 2<sup>dæ</sup> tenues, dimidii corporis longitudine; flagello longiore quam basis, articulis oblongis, setis verticillatis paulo numerosis, articulo parce brevioribus. Antennæ 1<sup>mæ</sup> basi 2<sup>dæ</sup> dimidio breviores, flagello 6–7-articulato. Pedes 4 <sup>antici debiles</sup>; 2<sup>di paulo majores</sup>, manu oblongâ, subellipticâ, antrorsum inflexâ, apicem rotundatâ, digito minuto, ad marginem versus medium affixo, longitudinali. Pedes 4 <sup>sequentes subæqui</sup>, ungue parvulo. Pedes 6 <sup>ultimi paulo inæqui</sup>, setis brevibus, his articuli 5<sup>ti in marginibus ambobus inter se æquis</sup>, utroque margine pedis 7<sup>mi paribus setarum ferme sex</sup>, articulo primo pedum 5<sup>torum oblongo</sup>, 7<sup>morum latissimo</sup>. Styli caudales ramo externo paris 1<sup>mi non nudo</sup>.

Female:—Epimerals of moderate size, fifth hardly shorter than fourth. Inferior antennæ slender, about half as long as body, flagellum

longer than base, its joints oblong, and setæ very nearly as long as joints, verticillate and rather numerous. Superior antennæ half shorter than base of inferior. Four anterior feet quite small; those of the second pair a little the largest, the hand oblong sub-elliptic, reversed or bent forward, broadly rounded at apex, the minute finger articulated with the margin towards its middle, and lying longitudinally along the joint. Four following feet subequal, claw small. Last six feet not very unequal, setæ or spinules short, those of the fifth joint on both margins about equal, and in seventh or sixth pair of legs about six sets of spinules; first joint of fifth pair oblong, of seventh very broad. Outer branch of first pair of caudal stylets bearing a few spinules.

Plate 59, fig. 2 *a*, animal, enlarged; *b*, mandible; *c*, inner maxilla; *d*, second pair *ibid.*; *e*, maxillipeds; *f*, part of flagellum of inferior antennæ, much enlarged; *g*, hand of second pair of feet; *h*, superior antennæ.

From moist soil in the bottom of the extinct volcano of Taiamai, New Zealand, twenty miles from the sea, and about the joints of succulent plants.

Length, one-half to two-thirds of an inch. The superior antennæ reach to apex of penult joint of base of inferior antennæ. The joints of the flagellum of the inferior antennæ are rather longer than twice their breadth, and the last of the basal joints—all of which are very slender—is two-thirds the length of the next preceding. The hands are very small. In the second pair the length is more than twice their breadth, and they are bent forward at right angles with the preceding portion of the leg; they are naked except some very minute setæ on the under side near apex, at a faint emargination, just where the extremity of the finger terminates. The setules of the legs are in pairs, as usual, with one or two additional of smaller size. The tarsi are slender and nearly straight. The tarsus of the fourth pair of legs is much stouter than the others.

This species is quite similar to the *tenuis* in the superior antennæ, even to the whorl of setæ at the apex of the joints. But the superior antennæ are very much shorter, and the hands of the second pair are very different.

The following is the description of a male which probably pertains to the above species:—

*Maris*:—*Pedes 3tii et sequentes ac supra. Antennæ inferiores paulo longiores, articulis flagelli valde oblongis. Antennæ superiores dimidio basis inferiorum paulo longiores, flagello 6-articulato. Pedes 1mi manu minutâ oblongâ, apice truncato et digitum minutum gerente; 2di manu grandi, subovatâ, palmâ obliquâ, dimidio manus parce longiore, integrâ, spinulosâ, carpo brevissimo, transverso, articulo 3tio infra obtuso-rectangulato, nudo, brevior quam articulus 2dus. Styli caudales pauci-spinulosi, ramo externo paris 1mi nudo.*

*Male*:—Feet of third and following pairs as above. Inferior antennæ longer, and joints of flagellum three or more diameters in length. Feet of first pair having a very small oblong hand, truncate at apex and having a minute finger; of second pair, with a large hand, subovate, palm oblique, a little longer than half the hand, spinulous, entire, carpus very short and transverse, third joint below obtuso-rectangular, naked, shorter than second joint. Caudal stylets with a few spinules, outer branch of first pair naked.

Plate 59, fig. 3 *a*, male, enlarged; *b*, side view of head; *c*, part of flagellum of outer antennæ; *d*, extremity of leg of first pair; *e*, *ibid.* of second pair; *f*, *ibid.* of third pair; *g*, *ibid.* of seventh pair; *h*, stylet of first pair.

New Zealand, but whether from the Bay of Islands or the volcano of Taiamai, we are uncertain.

The difference in the first pair of stylets, the outer branch being naked in the male and not so in the female, is one point which suggests a doubt as to the two being of the same species. If not the male of the *O. sylvicola*, it is, probably, male of the *O. tenuis*.

*O. sylvicola*, DANA, Proc. Amer. Acad. Sci., ii. 202.

#### ORCHESTIA SPINIPALMA.

*Maris*:—*Epimeræ sat breves, quartæ quintis parce longiores. Antennæ*



*2dæ dimidii corporis longitudine, setis minutissimis semidiametro articulorum non longioribus, flagello basin longitudine æquante, articulis plerumque paulo oblongis, setis semidiametro articulorum vix longioribus. Antennæ 1mæ minutæ, basi secundarum quadruplo breviores, flagello 3-5-articulato. Pedes 1mi parvuli, manu minutâ, oblongâ, apice vix latiore quam articulus precedens, apice rectè truncato, digito minuto. Pedes 2di validi, manu subovatâ, margine inferiore (palmâ) arcuato et versus apicem parce concavo, spinulis armato, digito longo, paulo brevioris quam manus. Pedes sequentes tenues; 4 proximis subæquis; 4 ultimis subæquis; setis in paribus numerosis articuli 5ti inferis et supernis æquis, diametro articuli non longioribus.*

*Feminæ:—Pedes 2di debiles, manu minutâ, elongatè obovatâ, apice rotundatâ, digito laterali, longitudinali, apice extremitatem manus vix attingente.*

*Male:—*Epimerals rather narrow, fifth slightly narrower than fourth. Inferior antennæ scarcely longer than half the body, setæ very minute, flagellum as long as base, the joints mostly a little oblong, setæ half the diameter of the joints in length. Superior antennæ one-fourth the length of base of inferior, the flagellum three to five jointed. First pair of feet small and weak, hand minute, oblong, with the sides parallel, and apex straight truncate, finger minute. Second pair of feet stout, hand subovate, lower margin (palm) a little excavate and spinulous, finger elongate, somewhat shorter than hand. Following feet slender; the next four subequal; last four subequal; fifth pair shorter; setæ of the margins of the fifth joint equal.

*Female:—*Hand of second pair minute, obovate, oblong, rounded at apex, finger lateral, longitudinal, its apex reaching nearly to extremity of hand.

Plate 59, fig. 4 *a*, animal, enlarged; *b*, more enlarged view of flagellum of inferior antennæ; *c*, hand of second pair of feet; *d*, extremity of last pair of feet; *e*, second pair of feet in female.

Tongatabu, under sea-weed on beaches.

Length, half an inch. The body is naked. The hand of the first pair of feet in males is a little shorter than the preceding joint, and

both are alike in having the inferior margin nearly parallel with the superior. The claw shuts against the truncate apex. The hand of the second pair has no angle at the termination of the palm. The setæ or hairs of the legs are very short, hardly as long as diameter of the joint bearing them. The ten posterior legs are all very slender. These animals were very active.

*O. spinipalma*, DANA, Proc. Amer. Acad. Sci., ii. 203.

#### ORCHESTIA TAHITENSIS.

*Feminæ*:—*Epimeræ mediocres*, margine minutè setulosæ. Antennæ 2dæ dimidii corporis longitudine, flagello parce longiore quam basis, articulis paulo oblongis, setis brevibus latitudinem articuli fere æquantibus. Antennæ 1mæ, basi 2darum tertiâ parte breviores, flagello fere 7-articulato. Pedes 4 antici debiles, 1mis subtilissimè unguiculatis, manu imperfectâ; 2dis paulo longioribus, manu parvulâ rectâ, subspatulatâ, apice rotundatâ, digito minuto laterali, longitudinali, apicem articuli vix attingente. Pedes 4 sequentes subæqui. Pedes 6 ultimi non multo inæqui, setis brevibus, articulo primo latissimo, margine postico setuloso.

*Female*:—Epimerals rather broad, margin minutely setulose. Inferior antennæ about half as long as body, flagellum little longer than base, the joints a little oblong, setæ not longer than diameter of joints. Superior antennæ one-third shorter than base of inferior, flagellum about seven-jointed. Four anterior feet quite small; first pair having a minute claw and an imperfect hand; hand of second pair oblong, spatulate with rounded apex, minute finger lateral and longitudinal, hardly reaching to apex of joint. Next four feet subequal; last six not very unequal, first joint very broad and posterior margin setulose, setæ of feet very short.

Plate 59, fig. 5 *a*, animal, enlarged; *b*, mandible; *c*, first pair of maxillæ; *d*, second pair; *e*, maxillipeds; *f*, antennæ, much enlarged; *g*, extremity of leg of second pair.

In damp places among leaves, and under rotten wood in the damp

earth, at fifteen hundred feet elevation, on the island of Tahiti, several miles from the sea.

Length, one-fourth to one-third of an inch. Colour, bluish to bluish green. The epimerals of the fifth segment may be too narrow in the figure: the loss of the specimen prevents our verifying this point. The superior antennæ are nearly three-fourths as long as the base of the inferior. The abdominal natatories are very small. The stylets of the first and second pairs are quite long and slender; those of the third pair are very short.

These animals hop off with agility, when exposed by turning over the leaves that cover them, until they reach a spot where they are more or less concealed, and there they lie quiet till disturbed again.

*Orchestia rectimana*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 203.

#### ORCHESTIA DISPAR.

*Maris*:—*Epimeræ mediocres, quintæ 4tis vix breviores. Antennæ 2dæ vix dimidii corporis longitudine; flagello paulo longiore quam basis, articulis vix oblongis, setis brevissimis semidiametrum articuli non superantibus. Antennæ 1mæ dimidio basis secundarum longiores. Pedes 1mi parvuli, manu ad apicem latiore, obliquè truncatâ et excavatâ. Pedes 2di validi, manu late subellipticâ, obliquè truncatâ, palmâ paulo sinuosâ, pubescente. Pedes 3tii 4tis parce longiores; 7mi 6tis paulo breviores, articulis tertio quartoque incrassatis, late compressis, setis perbrevis, illis articuli 5ti semidiametro articuli vix longioribus.*

*Male*:—Epimerals of moderate size, fifth but little shorter than fourth. Inferior antennæ scarcely half as long as body, last two joints of base subequal, flagellum longer than base, joints hardly oblong, setæ not longer than half the diameter of the joints. Superior antennæ shorter than base of inferior. First pair of feet having the hand quite small, broadest at apex and obliquely truncate, with the apical margin excavate. Hand of second pair stout, broad, subelliptical, obliquely subtruncate, palm of hand a little sinuous, pubescent. Third pair of feet longer than fourth; seventh a little shorter than sixth, and *having the third and fourth joints stout, and*

*very broad*, being much compressed, setæ very short, on fifth joint about as long as semidiameter of the joint.

Plate 59, fig. 6 *a*, animal, enlarged; *b*, mandible; *c*, inner maxilla; *d*, second pair; *e*, maxillipeds; *f*, part of flagellum of inferior antennæ; *g*, hand of first pair of legs; *h*, hand of second pair; *i*, leg of seventh pair; *k*, stylet of first pair; *l*, stylet of last pair; *m*, side view of extremity of abdomen.

Sea-shores of Illawarra, New South Wales.

Length, six to seven lines. The head is but little longer than the first thoracic segment. The flagellum of the superior antennæ is nearly half the whole length. The hand of the second pair of feet has the apex slightly prominent, and the palm below is a little sinuous, the claw or finger not fitting tightly to it when closed; the hand is naked, except a few extremely minute hairs on the margin against which the finger shuts. The broad compressed third and fourth joints of the last pair of legs are peculiar; the next joint is slender as usual.

This species is near the *O. littorea* of Europe.

*O. dispar*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 204.

#### ORCHESTIA QUADRIMANA.

Maris:—*Epimeræ sat magnæ, 5tæ 4tis breviores. Antennæ 2dæ dimidio corporis paulo breviores, bene setulosæ, basi brevi; flagello parce longiore quam basis, articulis non oblongis, cylindricis, setis verticillatis, diametro articulorum fere duplo longioribus. Antennæ 1mæ basi 2darum fere dimidio breviores. Pedes 1mi parvuli, manu fere triangulatâ, apice latiore, truncatâ, paululo excavatâ. Pedes 2di validi, manu subquadratâ, paulo oblongâ, palmâ apicali, transversâ, paulo excavatâ. Pedes 3ti 4ti debiles subæqui; 5ti 6ti 7mi similes, sensim incrementes, valde inæqui (7mis duplo longioribus quam 5ti), bene setulosi, setis articuli 5ti numerosis longioribus quam diametrum articuli.*

Male:—Epimerals rather broad, fifth shorter than fourth. Inferior

antennæ hardly half as long as the body, neatly setose, base short, flagellum sparingly longer than base, joints not oblong, cylindrical, setæ verticillate and nearly twice longer than joints. Superior antennæ nearly half shorter than base of inferior. First pair of feet minute, hand subtriangular, apex truncate and a little excavate. Hand of second pair stout, quadrate, a little oblong, apex nearly straight truncate, the palm of the hand consequently transverse, or but slightly oblique, somewhat excavate. Third and fourth pairs weak, subequal; fifth, sixth, seventh similar, very unequal, but gradually increasing in length; fifth half shorter than seventh, setæ of fifth joint numerous, rather crowded, and exceeding the diameter of the joint in length.

Plate 59, fig. 7 *a*, animal, enlarged; *b*, part of flagellum of inferior antennæ; *c*, maxilla of first pair; *d*, second pair; *e*, maxillipeds; *f*, hand of first pair of feet.

Illawarra, New South Wales.

Length, seven lines. Head but little longer than first thoracic segment. Epimerals short. Last joint of base of inferior antennæ but little longer than preceding, joints of flagellum not longer than breadth, and as large at base as at apex, setæ six or eight in a whorl and mostly longer than the joint. The hands of the second pair are oblong quadrate (the two equal), and the finger closes against the broad transverse apical margin, leaving a space between it and the palm, the length of the palm equalling the breadth of the hand, and being three-fourths as long as the hand; the carpus is very short and is not produced below between the hand and third joint. The setæ of the posterior legs are in close clusters or whorls, though short, and there are seven or eight sets on either margin of the fifth joint of the seventh pair. The first pair of caudal stylets have the outer branch naked above.

*O. quadrimana*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 204.

#### ORCHESTIA HAWAIIENSIS.

Feminæ:—*Epimeræ sat magnæ, 5tæ 4tis vix breviores. Antennæ gra-*

*ciliores, 2dæ dimidio corporis non breviores, basi sat longo, fere nudo, flagello longiore, 17-18-articulato, articulis bene oblongis, setis paucis, diametro articularum non longioribus. Antennæ 1mæ longæ, basi inferiorum vix breviores, flagello 7-articulato, articulis longis. Pedes antici fere unguiculati, manu imperfectâ, paulo oblongâ, apice angustiore et non bene truncato, digito paulo longiore quam manus latitudo. Pedes 2di paulo longiores, manu debili subspatulatâ, supra rectâ, digito fere apicali et transverso, articulo 3tio infra gibboso et scabriculo. Pedes sequentes graciles; 3tii 4tique longi; 5ti 4tis non breviores, 5ti 6ti 7mique sensim increscentes, setis articuli 5ti paris 7mi inferis (in paribus sex) et supernis (in paribus septem) longitudine æquis, diametro articuli vix brevioribus. Ramus stylorum 1morum externus supra nudus, spinâ apicali prælongâ.*

*Female*:—Epimerals rather large, fifth hardly shorter than fourth. Antennæ quite slender; inferior pair somewhat longer than half the body, base rather long, flagellum longer than base, seventeen to eighteen-jointed, joints quite oblong, setæ few, not longer than diameter of joint. Superior antennæ long, hardly shorter than base of inferior, flagellum seven-jointed, joints long. Anterior feet almost unguiculate, the hand imperfect, oblong, narrower at apex, and not properly truncate, finger a little longer than the width of the joint. Feet of second pair with the small hand subspatulate, narrow, minute finger subapical, nearly transverse, third joint gibbous and fine scabrous below. Following legs slender; third and fourth pairs long; fifth not shorter than fourth; fifth, sixth, and seventh gradually increasing in length, setæ of fifth joint of seventh pair equally long on both margins, and not longer than the diameter of the joint, six sets below, seven above. Outer branch of first pair of stylets naked, a very long apical seta.

Plate 59, fig. 8 *a*, female, much enlarged; *b*, first pair of antennæ; *c*, part of flagellum of second pair; *d*, extremity of leg of first pair; *e*, ibid. of second pair; *f*, ibid. of seventh pair; *g*, first pair of stylets.

Oahu or Kauai, Hawaiian Islands.

Length, eight or nine lines. Eyes nearly round. The setules of the flagellum of the inferior antennæ spread but little, and the joints

are more than twice their length in breadth; the joints of the flagellum of the superior antennæ are full four times as long as broad. The tarsi of the posterior legs are very slender, nearly straight, and have a seta below near apex. The fourth joint of the second pair of legs is but little broader than the hand. There are no hairs, setæ, or notches on the lateral margin of the three anterior abdominal segments. The first joint of the fifth pair of legs is rather narrow, of the seventh quite broad.

#### ORCHESTIA PICKERINGII.

*Maris*:—*Epimeræ mediocres*, 5tæ 4tis paulo breviores. *Antennæ 2dæ fere dimidii corporis longitudine, basi sat brevi, flagello longiore subnudo, articulis oblongis, setis paucis semidiametro articulorum non longioribus. Antennæ 1mæ dimidio basis inferiorum breviores, flagello 3-articulato. Pedes 1mi parvuli, manu subtriangulatâ, paulo oblongâ, apice truncatâ et latiore, digito brevi. Pedes 2di manu pervalidâ confecti, manu ovatâ, infra et supra bene arcuatâ, palmâ non excavatâ, versus digiti basin parce bilobatâ, lobo 1mo rotundato, 2do subrectangulato. Articulus 5tus pedis 7mi tenuis, setis perbrevibus, inferis (in paribus sex) semidiametro articuli non longioribus, supernis brevioribus.*

*Male*:—Epimerals of moderate size, fifth a little shorter than fourth. Inferior antennæ about half as long as body, base rather short, flagellum longer than base, joints oblong, setæ few, not longer than semidiameter of joints. Superior antennæ not half as long as base of inferior, flagellum three-jointed. Feet of first pair very small, hand subtriangular, oblong, apex truncate, broader, finger short. Hand of second pair very stout, ovate, above and below arcuate, without a tooth or angle below at termination of palm, palm convex and not excavate, naked, having two very low prominences near base of finger, the first rounded and minutely setulous, the second subrectangular. Fifth joint of seventh pair of legs slender, setæ in six sets on under side, not longer than half the diameter of the joint, still shorter on upper side of joint.

Plate 59, fig. 9 a, male, enlarged; b, superior antenna; c, part of

flagellum of inferior antenna; *d*, extremity of leg of first pair; *e*, ibid. of second pair; *f*, ibid. of seventh pair.

Length, five to six lines. The antennæ look naked. The superior antennæ hardly reach to apex of penult joint of base of inferior antennæ; last joint of base of inferior antennæ a little longer than preceding, and whole base but slightly longer than head and first thoracic segment; the joints of the flagellum of this pair are longer than twice their breadth. The hand of the first pair of legs is naked below; the preceding joint is very narrow triangular, being widest at apex, and from this part narrowing backward, at first rather rapidly. The third joint of the legs of the second pair is nearly rectangular at lower apex, but obtuse. There are setules on the basal joints of the legs of the last three pairs. The tarsi are very slender and nearly straight, and have a seta below near apex.

GENUS ALLORCHESTES, *Dana*.

*Antennæ 1mæ elongatæ, basi 2dorum sæpissimè longiores. Maxillipedes apice unguiculati. Pedes 1mi 2dique subchelati. Styli 3tii caudales brevissimi, simplicissimi.*

Superior antennæ longer than base of inferior. Maxillipeds unguiculate at apex. Feet of first and second pairs subchelate. Posterior stylets very short and quite simple, as in *Orchestia*.

The *Allorchestes* differ from the *Orchestiæ*, in the claw or stout spiniform joint terminating the outer maxillipeds; in the longer superior antennæ, this pair usually exceeding in length the base of the inferior; in the fifth epimeral being very short, and never nearly as wide as the fourth; in the carpus of the second pair of legs being sometimes in males produced downward back of the hand, between the hand and the anterior extremity of the third joint (while in *Orchestia*, the third joint is never separated from the hand by a portion of the carpus, and the carpus is always short transverse, and is situated wholly above the third joint); in the female hands of the second pair, although smaller than those of the male, never being as rudimentary a hand, the form not rounded at apex, the finger not exceedingly minute and



articulated with the dorsal margin remote from the apex, the lower part of outer surface of the hand not (?) minute scabrous, but the hand having a more perfect form, and furnished with a stouter finger articulated with the proper apex of the hand. Moreover, the upper side of the fifth and fourth joints of the ten posterior legs is very often naked, the setæ or spinules being confined to the opposite or lower side.

The species differ from the Amphithoe group, in the absence of a mandibular palpus; in the Orchestia-like posterior stylets fitting them well for saltatory habits; in the small and slender one-jointed palpus of the inner maxillæ. They approximate most nearly to the Iphimedia; but these have the posterior stylets much longer and two-branched instead of simple, besides having other characteristics of the Gammarus tribe. *Amphithoe Marionis* (Edwards) is described as having no mandibular palpus unlike other species; but it is far removed from *Allorchestes* in its long two-branched posterior stylets, as well as in other particulars.

The species among the following which have the carpus of the second pair of legs in males produced downward in a process between the hand and the third joint, are the *Gaimardii*, *australis*, and the *novi-zealandicæ*, species from either New Holland or New Zealand. In females this appears to be common, and the specimens obtained of *A. humilis* and *A. brevicornis* are supposed to be females.

1. *Antennarum 2darum basis flagello valde longior. Antennæ 1mæ basi 2darum breviores.*

#### ALLORCHESTES GAIMARDII? (Edw.), D.

*Corpus valde compressum, epimeris permagnis. Antennæ superiores basi inferiorum breviores, flagello 14-articulato, fere duplo longiore quam basis. Antennæ inferiores dimidio corporis paulo breviores, crassiusculæ, subpediformes, basi prælongo, flagello fere quadruplo brevior quam basis, articulis basis tribus ultimis subæquis, flagello 8-10-articulato. Pedes 1mi parvuli, manu vix oblongâ, apice obliquè truncatâ et paulo excavatâ, basi parce angustiore, digito brevi. Pedes 2di validi, manu magnâ subovatâ, palmâ rectiusculâ, fere nudâ, digito longo, carpo infra tenuiter producto inter manum et articulum 3tium. Pedes 5ti 6ti 7mi sensim increscentes, setis sparsis minutissimis diametro articuli 5ti 4plo brevioribus.*

Body much compressed, epimerals very large. Superior antennæ a little shorter than base of inferior, flagellum fourteen-jointed, nearly twice longer than base. Inferior antennæ hardly half as long as the body, rather stout, subpediform, base very long, four times as long as flagellum, its last three joints subequal, flagellum eight to ten-jointed. Hand of first pair of feet but slightly oblong, a little narrower at base, apex somewhat obliquely truncate, and a little excavate. Hand of second pair large subovate, palm on under side straight, nearly naked. Fifth, sixth, and seventh pairs of legs gradually increase in length, setæ sparse and very minute, hardly one-fourth as long as the breadth of the fifth joint.

Plate 60, fig. 1 *a*, animal, enlarged; *b*, mandible; *c*, *d*, first and second pairs of maxillæ; *e*, maxillipeds; *f*, flagellum of inferior pair of antennæ; *g*, part of same of superior; *h*, extremity of leg of sixth pair; *i*, posterior stylet.

Shores of Illawarra, New South Wales.

Length, seven to eight lines. Head oblong, much exceeding in length the first thoracic segment. Eye round. The epimerals very broad, and the anterior usually conceals the mouth in a lateral view; fifth very short. The superior antennæ are three-fourths or two-thirds as long as the inferior, the basal portion is about as long (or nearly) as first two basal joints of inferior pair. The flagellum of the inferior pair is not longer than last joint of base. The finger of the first pair of legs is not longer than apical margin of hand; the inferior margin of the hand is about as long as the breadth of the hand; the preceding joint is subtriangular. The hands of the second pair are equal, the finger extends, when closed, about two-thirds the way to the base of the hand, and there is no proper emargination and but a slight depression where the finger terminates. The tarsi of the following legs have an exceedingly short seta below. The setæ of the joints are confined mostly to the under side of the leg, and wholly so on the fifth joint. The maxillipeds have the terminal joints flattened and broad; the penult joint is very broad at apex, somewhat excavate, and towards the outer side bears a large, stout claw or spine. The posterior stylets have a single very short branch.

*Allorchestes compressa*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 205.

*Amphithoe Gaimardii?* EDWARDS, Crust., iii. 37. The description by Edwards agrees with our specimens in most points, though differing in making the posterior stylets end in two rudimentary branches, instead of one.

2. *Antennarum 2darum flagellum basi longius. Antennæ 1mæ basi 2darum multo longiores.*

#### ALLORCHESTES VERTICILLATA.

*Epimeræ mediocres. Antennæ 2dæ 1mis fere duplo longiores, tertiâ parte corporis non longiores, basi brevi, articulis basis ultimo penultimoque subæquis, flagello fermè duplo longiore quam basis, 14-articulato, articulis parce oblongis, setis densè verticillatis, brevibus, diametro articulorum non longioribus. Antennæ 1mæ nudiusculæ. Pedes 1mi parvuli, carpo infra non producto, manu oblongâ, basi vix angustiore, apice obliquo. Pedes 2di pervalidi, manu subovatâ, palmâ inferiore, rectiusculâ, pubescente, digito longo; carpo inter manum articulumque 3tium infra non producto. Pedes 5ti 6ti 7mique subæqui, breves, setis paucis sparsis, crassis, diametro articuli non longioribus, margine articuli 5ti superno nudo. Tarsus setâ infra instructus.*

Epimerals of moderate size. Inferior antennæ nearly twice longer than superior, about one-third as long as the body, base short, last two joints of base subequal, flagellum about twice longer than base, fourteen-jointed, joints slightly oblong, setæ densely verticillate, short (not longer than breadth of joints). Superior antennæ nearly naked. Feet of first pair quite small, hand oblong, hardly narrower at base, oblique at apex, carpus not produced below. Hand of second pair large subovate, palm along inferior side, nearly straight, pubescent, finger long, carpus not produced downward between hand and third joint. Fifth, sixth, and seventh feet subequal, short, setæ few, stout, short, not longer than diameter of joint, upper margin of fifth joint naked. Tarsus with a seta below.

Plate 60, fig. 2 *a*, animal, enlarged; *b*, part of flagellum of antenna of second pair; *c*, mandible; *d*, second pair of maxillæ; *e*, maxillipeds; *f*, extremity of leg of first pair; *g*, *ibid.* of posterior pair.

Along the shores near Valparaiso.

Length, four lines. The eyes are subrotund. The first thoracic segment is a little longer than the following.

The base of the superior antennæ is but half as long as base of inferior and consists of three subequal joints; the flagellum contains ten to twelve joints, with a few extremely short hairs at the apex of each joint. The flagellum of the inferior antennæ has the joints a little the smallest at base.

The hand of the first pair of legs is sublinear, a little longer than twice the breadth. The short claw shuts against the oblique terminal edge. There are a few short setæ on the inferior surface of the hand. The finger of the second pair is longer than half the length of the hand.

The sixth and seventh pairs of legs are about equal. The maxillipeds have the last joint narrow and the terminal spine small. The abdominal natatory legs are long and slender.

*Allorchestes verticillata*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 205.

*Female of A. verticillata?*—Figures 3 a to k, Plate 60, illustrate a species of *Allorchestes*, which we suspect to be the female of the *A. verticillata*. Still, it is different in some points that appear to be important. The short hairs or setæ of the flagellum of the inferior antennæ are not as dense and hardly as long; the setæ of the legs are stout, as in the *verticillata*, but shorter; on the fifth joint of the last pair, there are four sets of setæ on the under side, none more than half the diameter of the joint in length, excepting the lower, which is but slightly longer. The proportion between the pairs of antennæ is about the same.

The hand of the first pair of legs is similar in form and size to that of the *verticillata*. The hand of the second pair is a little larger than that of the first pair, not twice as long or as broad, and has some resemblance in form to the first pair; it is oblong, rather broad, the upper and under sides nearly parallel, the upper very slightly arcuate, and one-third the longer, the lower with three or four tufts of longish setæ, the apex truncate a little obliquely, forming a nearly transverse palm and somewhat hairy, the finger not longer than the margin against which it is applied, and not half as long as the hand; the carpus is broader than the third joint; the third joint is nearly rectangular. The flagellum of the superior antennæ is ten to twelve-

jointed; of the inferior antennæ about fourteen-jointed, the joints sparingly oblong. Length, four lines.

Among sea-weed, on the shores near Valparaiso.

Fig. 3 *a*, animal, enlarged; *b*, *c*, *d*, *e*, *e'*, parts of the mouth; *f*, part of flagellum of inferior antennæ.—*g*, from another specimen; *h*, *ibid.*, part of flagellum of inferior antennæ; *i*, *ibid.*, hand of second pair; *k*, extremity of seventh pair.

Kröyer has described an *Orchestia* from the beaches of Valparaiso under the name *O. grandicornis* (Tids., [2], i. 283, 1844), which appears to be an *Allorchestes*, and near our species, though still differing from it. The superior antennæ are one-third, and the inferior one-fifth the length of the body. The flagellum of the inferior antennæ has nine oblong joints; of the superior, twelve joints; the former is less naked than the latter. The eyes are large and nearly confluent in front. The hand is large, oval, and “ad basin marginis postici tuberculo armata 2-aculeato, nullis vero unguis validissimi dentibus.”

*A. peruviana*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 206.

#### ALLORCHESTES HIRTIPALMA.

*Antennæ 1mæ tenuissimæ, inferioribus paulo breviores, basi perbrevis. Antennæ 2dæ corpore plus dimidio breviores, flagello plus duplo longiore quam basis, infra densè breviter villosa, articulis non oblongis. Pedes 1mi parvuli, manu magnâ, oblongâ, basi angustiore, infra subtiliter ciliatâ, apice oblique truncatâ. Pedes 2di validi, manu subovatâ, infra subtruncatâ et dense villosâ, palmâ paulo depressâ, rectiusculâ, digito sat longo. Pedes 4 ultimi subæqui, setis paucis minutissimis, semidiametro articuli 5ti brevioribus, apicibus articularum 3tii 4tique paulo productis et setulosis.*

Superior antennæ very slender, a little shorter than inferior, base very short. Inferior pair somewhat shorter than half the body, flagellum more than twice as long as base, lower side densely short

villose, joints not oblong. Hand of first pair of feet oblong, smaller at base, finely ciliate below, obliquely truncate at apex. Hand of second pair large subovate, flattened below and villous, palm a little depressed, nearly straight, finger rather long. Last four feet subequal, setæ few and very minute, not as long as half the diameter of the fifth joint, posterior apices of third and fourth joints prolonged and setulose.

Plate 60, fig. 4 *a*, animal, enlarged; *b*, part of flagellum of inferior antennæ; *c*, inner maxillæ, in different positions; *d*, maxilla of second pair; *e*, maxillipeds; *f*, hand of second pair of legs; *g*, hand of first pair; *h*, part of sixth pair of legs; *i*, posterior stylets.

Sea-shores near Valparaiso; and also, those of the island of San Lorenzo, Peru.

Body smooth, glabrous. Eye nearly round. Front margin of head in lateral view sinuous, and the superior antennæ appearing to arise from a small concavity in the outline. Both pairs of antennæ very slender. Superior antennæ about three-fourths the inferior in length; flagellum terete; three basal joints subequal. Inferior antennæ thickly, but short hairy on under side; last basal joint much longer than preceding; first two quite short; whole base rather short. Maxillipeds with joints somewhat short hairy, penult joint narrow cylindrical; terminal claw or spine moderately long.

*A. hirtipalma*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 205.

#### ALLORCHESTES GRACILIS.

*Antennæ tenuissimæ; 1mæ 2dis dimidio breviores et basi inferiorum paulo longiores; 2dæ vix dimidii corporis longitudine, flagello multo longiore quam basis, articulis oblongis, setis perbrevis (diametro articulorum non longioribus), paucis. Pedes 1mi parvuli, manu parce oblongâ, basi angustiore, apice paulo oblique truncatâ, palmâ rectâ, breviter hirsutâ, carpo triangulato, infra producto et acuminato. Pedes 2di validi, manu magnâ subellipticâ, palmâ rectiusculâ, sparsim brevissimè hirsutiusculâ, carpo inter manum articulumque 3tium infra non*

*producto; articulo tertio, infra acutè producto, digito sat longo. Pedes paris 6ti 7mis breviores, setis sparsis brevissimis.*

Antennæ very slender; superior pair twice shorter than inferior, and a little longer than base of inferior; inferior hardly half as long as the body, flagellum much longer than base, joints oblong, setæ very short, few (not longer than breadth of joints). Hand of first pair of feet but little oblong, narrowest at base, somewhat obliquely truncate at apex, palm straight, short hirsute; carpus triangular, below produced and acuminate. Hand of second pair large suboval, palm nearly straight, a few minute tufts of hairs, third joint of this pair short and acutely prolonged behind, the fourth or carpus not produced below in a process between the hand and third joint. Sixth pair of legs a little shorter than seventh, the setæ few and very short.

Plate 60, fig. 5 *a*, animal, enlarged; *b*, portion of inferior antennæ; *c*, hand of first pair of legs; *d*, hand of second pair.

Tongatabu, Pacific Ocean; in shallow water among delicate seaweeds.

Length, six to eight lines. Body naked. The basal portion of the superior antennæ reaches to apex of penult joint of base of inferior pair. The joints of the flagellum of the inferior antennæ much narrower at base than at apex. Maxillipeds densely hairy at apex. The fifth pair of epimerals is very narrow. The head is vertically short. Finger of second pair of feet much curved, and when closed leaves some space between it and the palm, although the palm is straight or slightly convex. The fourth joint of this pair is narrow and short, and the preceding projects much below it, to an acute point.

*A. gracilis*, DANA, Proc. Amer. Acad. Sci., ii. 205.

#### ALLORCHESTES HUMILIS.

Feminæ?—*Antennæ 1mæ 2dis paulo breviores, flagello 6-8-articulato. Antennæ 2dæ corpore fere triplo breviores, flagello 9-10-articulato,*

*articulis parce oblongis, setis totis brevissimis. Pedes 1mi parvi, manu oblongâ, supra rectiusculâ, apice obliquâ, basi parce angustiore. Pedes 2di validiusculi, manu vix duplo longiore quam 1ma et formâ simili, infra parce emarginatâ, palmâ oblique transversâ, hirsutâ, digito brevi; carpo inter manum articulumque 3tium producto. Pedes 4 ultimi subæqui, 5tis paulo brevioribus, setis paucis brevissimis, articulo 1mo fere rotundato, margine postico obsolete crenulato. Maxillipedes articulo penultimo angusto.*

*Female?*—Superior antennæ a little shorter than the inferior, flagellum six to eight-jointed. Inferior pair about one-third as long as body, flagellum nine to ten-jointed, joints little oblong, setæ all very short. Hand of first pair of feet small, oblong, a little smaller at base, oblique at apex. Hand of second pair of same form, and not twice as long, inferior margin slightly emarginate, palm oblique transverse, hirsute, finger short. Last four feet nearly equal, fifth pair a little shorter, setæ few, very short, first joint nearly orbicular, posterior margin slightly crenulate. Maxillipeds with the penult joint narrow.

Plate 60, fig. 6 *a*, animal, enlarged; *b*, mandible; *c*, first maxillæ; *d*, maxilla of second pair; *e*, maxillipeds.

From shallow pools of water along shores of Port Jackson, New South Wales. Collected, December 25, 1839.

Length, four lines. Eye a little oblong. Base of superior antennæ two-thirds as long as base of inferior, and last two joints of base of inferior subequal. Joints of flagellum of the superior pair very distinct, somewhat moniliform; less distinct in inferior pair. The hand of second pair has a small prominence on the inferior margin near middle, just along side of the emargination, which is hirsute like the oblique apical margin. The finger is curved and short, and shuts close against the oblique apical margin. The third and fourth pairs of legs are nearly equal; the following three pairs have a few short setæ on margins of third joint, and also, at apex of fourth and fifth joints, and on inner margin of fifth; claw curved, with inner seta, as usual. The first pair of stylets extends back beyond apex of second.



The third pair is very short, recurved, and projects but little beyond the extremity of the abdomen.

*A. humilis*, DANA, Proc. Amer. Acad. Sci., Boston, ii. 206.

#### ALLORCHESTES AUSTRALIS.

*Antennæ 1mæ 2dis paulo breviores, flagello longiore quam basis, fermè 14-articulato, articulis versus basin transversis. Antennæ 2dæ corpore plus dimidio breviores, flagello parce longiore quam basis, 12-14-articulato, articulis plerisque oblongis, setis fere obsoletis. Pedes 1mi parvuli, manu paulo oblongâ, basi valde angustiore, apice fere recte truncatâ, digito non longiore quam manus latitudo. Pedes 2di validi, manu subovatâ, palmâ inferiore, depressâ, angulo postico obsoletè setuligero, digito longiusculo, carpo inter manum articulumque 3tium angustè producto. Pedes sex postici sensim incrementos, setis brevissimis, articulo 3tio perlato.*

Superior antennæ a little shorter than inferior, flagellum longer than base, about fourteen-jointed, joints towards base transverse. Inferior antennæ less than half the body in length, flagellum rather longer than base, twelve to fourteen-jointed, joints mostly oblong, setæ nearly obsolete. Hand of first pair of feet quite small, but little oblong, much narrower at base than at apex, nearly direct truncate at apex, finger not longer than breadth of hand. Hand of second pair large subovate, palm depressed, posterior angle with a few minute setæ, carpus produced in a narrow process between the hand and third joint. Posterior six feet gradually increase in length, third joint quite broad, setæ very short.

Plate 60, fig. 7 *a*, animal, enlarged; *b*, mandible; *c*, *d*, maxillæ; *e*, maxillipeds; *f*, lower lip; *g*, inferior antenna; *h*, superior antenna; *i*, part of leg of first pair; *k*, ibid. of second pair; *l*, ibid. of fifth pair; *m*, stylet of first pair; *n*, of second pair; *o*, of third pair.

Shores of Illawarra, New South Wales.

Length, six lines. The head is a little longer than the first thoracic segment. The first three segments of the thorax are shorter than the

following. The epimerals are quite broad to the fifth; and the first covers the mouth in a side view; the fifth is very narrow, and the following still more so.

The inferior antennæ are about one-fourth longer than the superior. The base of the latter scarcely exceeds the first three joints of the base of the former. On the flagellum of the superior antennæ, the setæ are not as long as width of joints, except one or two nearly equalling it on the under side of each joint, and lying in the direction of the joint. The maxillipeds have a broad apex and a very stout spine or claw, with some setæ at apex as long as the spine.

The finger of the anterior hands is nearly straight, and not longer than the apical margin against which it is closely applied. The second hand has the palm a little depressed for its whole length, and very slightly concave; finger two-thirds the length of hand. Feet of third and fourth pairs equal.

*Female*.—Other specimens had the hands of the second pair of feet both small and like those of the first pair; and these are believed to be the females of this species. The antennæ were, however, a little shorter, flagellum of inferior pair about ten-jointed, and these joints a little more oblong.

*A. australis*, DANA, Proc. Amer. Acad. Sci., ii. 206.

#### ALLORCHESTES BREVICORNIS.

*Antennæ breves; 1mæ corpore plus quadruplo breviores; 2dæ corpore plus triplo breviores, basi brevi, flagello longiore quam basis, articulis parce oblongis, setis brevissimis, densè verticillatis. Pedes 1mi parvuli, manu parce oblongâ, subrectangulatâ, infra pubescente, apice rectè truncato, paululo excavato, angulo infero acuto, prominulo. Pedes 2di paulo grandiores, manu angusto-ovatâ, apice angustâ, setarum fascibus parvulis paucis infra instructâ, digito brevi (plus dimidio brevior quam manus), fere longitudinali, palmâ totâ depressâ, rectâ; carpo breviter transverso, infra producto. Pedes 4 postici æqui, setis minutis.*

Antennæ quite short; the superior not one-fourth as long as the body, and the inferior not one-third; inferior pair having the base quite short, flagellum longer than base, joints very slightly oblong,

setæ very short, dense verticillate. Hand of first pair of feet quite small, a little oblong, subrectangular, pubescent below, apex transversely truncate, slightly excavate, lower apex acute and a little prolonged. Hand of second pair narrow ovate, rather small, apex narrow, with a few tufts of short setæ below, finger short, not half as long as hand, nearly longitudinal, whole palm depressed, straight, carpus very short transverse, produced below. Four posterior feet equal, setæ minute.

Plate 60, fig. 8 *a*, animal, enlarged; *b*, mandible; *c*, *d*, maxillæ; *e*, maxillipeds; *f*, part of inferior pair of antennæ; *g*, hand of first pair of feet; *h*, ditto of second pair.

Along shores of the Bay of Islands, New Zealand.

Length, five lines. Flagellum of superior antennæ a little longer than base; of inferior about once and a third the base. Setæ of superior antennæ like those of inferior, scarcely longer than breadth of joints.

Hand of second pair about twice as long as that of first pair, gradually narrows towards apex, and the palm is so much depressed that when the finger is closed, the outline of the hand below it and that of the outer margin of the finger is a continuous line; the closed finger points towards the base of the hand, and is applied close to the palm, leaving no space between; the back of the hand is flattened.

The anterior margin of the first joint of the six posterior legs bears a few minute setæ. The claw has the usual seta on the under side. The maxillipeds have the penult joint narrow, and the last is a stout spine, nearly as long as the penult joint. The epimerals are of moderate width; the posterior three of each side very narrow.

*A. brevicornis*, DANA, Proc. Amer. Acad. Sci., ii. 206.

#### ALLORCHESTES NOVI-ZEALANDIÆ.

Maris:—*Epimeræ permagnæ*. *Antennæ* 1mæ 2dis quartâ parte breviores, *flagello* 16-articulato, plus duplo longiore quam basis; 2dæ vix dimidii corporis longitudine, *articulis* basis duobus ultimis subæquis,

*flagello longiore quam basis, 14-articulato, tenuissimo, articulis oblongis, setis fere obsoletis. Pedes 1mi parvuli, manu oblongâ, basi parce latiore, apice truncato et valde excavato, apice inferiore acuto, digito plus duplo longiore quam manus latitudo, carpo latiore, infra anguste producto et subacuto. Pedes 2di pervalidi, manu subovatâ, palmâ inferiore, rectiusculâ, vix depressâ, minute spinulosâ, digito longo, carpo inter manum articulumque 3tium angustè producto. Pedes 5ti 6ti 7mi sensim increscentes, setis minutissimis, articulo 3tio lato.*

*Feminæ:—Pedes 1mi 2dique parvuli; 1mi parce minores, manu oblongâ, marginibus fere parallelis, apice fere rectè truncato, digito non longiore quam manus latitudo; carpo infra subtriangulate producto; manu 2dâ formâ simili, carpo sub manu elongate producto et obtuso, articulo 3tio infra multum producto.*

*Male:—*Epimerals very large. Antennæ of superior pair about one-fourth shorter than inferior, flagellum sixteen-jointed, more than twice as long as base; second pair hardly half as long as the body, last two joints of the base subequal, flagellum longer than the base, fourteen-jointed, very slender, joints oblong, setæ nearly obsolete. Feet of first pair quite small, hand oblong, sparingly broader at base, truncate and deep excavate at extremity, lower apex acute, finger more than twice as long as breadth of hand, carpus broader, with a narrow, subacute prolongation below. Feet of second pair very stout, hand large ovate, palm along under side nearly straight, hardly depressed, minute spinulous, finger long, carpus with a narrow prolongation below between hand and third joint. Feet of fifth, sixth, and seventh pairs regularly increase in length, setæ very minute, third joint broad.

*Female:—*Hand of first pair oblong, two margins nearly parallel, truncate at apex, finger not longer than breadth of hand, carpus with a short triangular or rounded prolongation below. Hand of second pair a little larger but of similar form, carpus long produced below hand, and obtuse or rounded at the extremity, third joint also much produced.

Plate 61, figs. 1 *a* to *f*, *male*; *g* to *v*, *female*:—fig. 1 *a*, *male*, enlarged; *b*, part of flagellum of superior antennæ; *c*, *ibid.* of inferior; *d*, hand of first pair; *e*, *ibid.* of second pair; *f*, part of fifth pair.—*g*, *female*, enlarged; *h*, *i*, *k*, *l*, *m*, parts of the mouth; *n*, part of leg of first pair; *o*, *ibid.* of second pair; *p*, *ibid.* of fifth pair; *q*, *ibid.* of

seventh pair; *r*, first pair of stylets; *s*, antennæ of a young female; *u*, part of first and second pair of legs, *ibid.*; *v*, fifth pair of legs, *ibid.*

Bay of Islands, New Zealand, on the shores of Parua Harbour. This species was found in holes in wood that had been bored by *Teredos*.

Length, five lines. The setæ of the antennæ are not as long as the breadth of the joints. The species is near the *A. australis*, and like that, the maxillipeds have a broad penult joint. But in the males of the *australis* the finger of the hand of the first pair of legs is not longer than the breadth of the hand, and does not, therefore, project beyond it.

*A. novi-zealandiæ*, DANA, Proc. Amer. Acad. Sci., ii. 207, *female*; *A. intrepida*, *ibid.*, *male*.

#### ALLORCHESTES ORIENTALIS.

*Antennæ 1mæ 2dis paulo breviores, flagello moniliformi, 7-articulato, basi longiore. Antennæ 2dæ dimidii corporis longitudine, articulis 2 ultimis basalibus æquis, flagello fere duplo longiore quam basis, moniliformi, 14-articulato, articulis oblongis, setis brevibus. Pedes 1mi parvuli, manu ellipticâ. Pedes 2di validi, manu subovatâ, palmâ rectiusculâ, parce excavatâ, minutè setulosâ, digito longo; carpo inter manum articulumque 3tium non producto. Pedes 6 postici sensim increscentes, setis paucis minutis.*

Superior antennæ a little shorter than inferior, flagellum moniliform, seven-jointed, longer than base. Inferior pair half as long as body, last two basal joints equal, flagellum nearly twice as long as base, moniliform, fourteen-jointed, joints oblong, setæ short. Hand of first pair of feet quite small, oval. Hand of second pair ovate, palm a little depressed, and bearing a few short setæ, finger long, carpus not produced below between hand and third joint. Six posterior feet gradually increase in length, setæ few, minute.

Plate 61, fig. 2 *a*, animal, enlarged; *b*, mandible; *c*, *d*, maxillæ; *e*, maxilliped; *f*, part of flagellum of superior antennæ; *g*, *ibid.* of inferior antennæ; *h*, hand of second pair of feet.

Island in the Sooloo Sea, off the harbour of Soung.

Length, three lines. The superior antennæ are about one-fourth shorter than the inferior; the first joint of the base is the longest. The whole base is a third shorter than base of inferior pair. Setæ about as long as diameter of joint.

The hand of the second pair of feet has the upper margin a little flattened; the palm is somewhat uneven. There is a very low prominence on the posterior margin of hand, just beyond where the finger reaches when closed. The setæ of the posterior legs are all short, not exceeding the diameter of the joints.

The third and fourth pairs of legs are slender and subequal. The first joint of the last six legs is very broad, as usual.

ALLORCHESTES (?) GRAMINEA.

*Antennæ 1mæ 2dis tertiâ parte breviores, flagello longiore quam basis, fermè 14-articulato; 2dæ corpore plus dimidio breviores, flagello moniliformi, valde longiore quam basis, articulis vix oblongis, setis minutis. Oculi reniformes. Pedes 1mi parvuli, manu angustâ, medio paulo latiore, palmâ inferiore, digito parce brevior quam manus, crasso. Pedes 2di pervalidi, manu elongato-ovatâ, apice angustâ, infra rectiusculâ, palmâ non depressâ, digito longo (longiore quam manus dimidium), carpo inter manum articulumque 3tium infra non producto. Pedes sex postici sensim incrementes, fere nudi.*

Superior antennæ one-third shorter than inferior, flagellum longer than base, about fourteen-jointed; inferior not half as long as body, flagellum moniliform, much longer than base, joints hardly oblong, setæ minute. Eyes reniform. Hand of first pair of feet narrow, a little the broadest at middle, finger long, stout, folding against under side of hand. Hand of second pair quite large, narrow ovate, narrow at apex, lower margin nearly straight, palm not depressed, finger long (longer than half the hand); carpus not produced below between the hand and the third joint. Six posterior feet gradually increasing in length (sixth and seventh pairs nearly equal), almost naked.

Plate 61, fig. 3 *a*, animal, enlarged; *b*, leg of sixth pair.

Rio Janeiro. Collected, January 4, 1839.

Length, six to seven lines. Colour, green, shaded with olive-green and yellow; posterior legs in third and fourth joints, partly carmine.

The reniform eye of this species leads me to doubt the correctness of arranging it with the *Allorchestes*; and as I made no dissection, I am not sure that its mandible has no palpus, or that its posterior stylets are simple. The head is a little longer than the next segment. The last two basal joints of the inferior antennæ are subequal. The flagellum of this pair rather stout; of the superior quite slender.

The claw of the anterior feet is rather longer, and closes against a considerable part of the lower margin of the hand or preceding joint. The same remark applies to the finger of the next pair; when closed it points towards the base of the hand; the palm has a few minute setæ; the hand is about twice as long as its breadth.

The first pair of stylets extends farther back than the second, and the third pair is very short. The branchiæ are narrow oblong; they are attached to the bases of all the legs excepting the first and last pairs.

*Allorchestes? graminea*, DANA, Proc. Amer. Acad. Sci., ii. 208.

#### ALLORCHESTES MEDIA.

*Epimeræ magnæ. Antennæ 1mæ dimidio 2darum longiores, flagello 14-articulato, articulis parce oblongis, setis partim divaricatis et perbrevis, partim infra stricte appressis et brevibus; 2dæ dimidio corporis breviores, flagello longiore quam basis, 16-articulato, articulis parce oblongis, setis numerosis et verticillatis præter in latere externo nudo, latitudine articulorum non longioribus. Pedes antici parvuli, manu oblongâ, marginibus fere parallelis, infra partim hirsutis, apice oblique truncatis, digito brevi, carpo infra rotundato et pilis ornato. Pedes 2di pervalidi, manu subovatâ, supra arcuatâ, palmâ multo oblique transversâ, spinulosâ, versus digiti basin paulo elevatâ, digito dimidio manus parce longiore, carpo inter manum articulumque 3tium infra non producto, articulo 3tio antice triangulato, fere acuto. Pedes 5ti 6ti 7mi sat breves, subæqui, sensim increscentes, setis paucis, articulo 5to*

*paris 5ti unâ setâ crassâ medio infra armato, paris 7mi setis duâbus similibus, supra nudo.*

Epimerals large. Superior antennæ longer than half the inferior, flagellum fourteen-jointed, joints sparingly oblong, setæ partly very short and divaricate, partly close appressed and about as long as the joint. Inferior pair not half as long as the body, flagellum longer than the base, sixteen-jointed, joints sparingly oblong, setæ numerous and verticillate, except on outer side which is naked, setæ hardly as long as breadth of joint. Feet of first pair quite small, hand oblong, margins nearly parallel, below hirsute in part, at apex obliquely truncate, finger short. Hand of second pair quite large, subovate, arcuate above, palm very oblique transverse, spinulous, ending in an angle below, finger a little longer than half the hand, carpus small, not produced below between the hand and the third joint, third joint triangulate anteriorly and nearly acute. Six posterior feet subequal, increase gradually in length, setæ few, one stout one, as long as diameter of joint on fifth joint of fifth pair, and one or two such on same joint of sixth and seventh pairs.

Plate 61, fig. 4 *a*, animal, much enlarged; *b*, part of flagellum of superior antennæ; *c*, same of inferior pair, inner side; *d*, *ibid.*, outer side; *e*, mandible; *f*, outer maxilliped; *g*, part of leg of first pair; *l*, *ibid.* of seventh pair; *m*, posterior stylet; *n*, leg of first pair of a smaller specimen.

Rio Janeiro, dredged in the harbour; also, Cape Verdes, Porto Praya.

Length, five to six lines. The spiniform seta on the under side of the fifth joint of the fifth pair of legs near its middle marks well the species; on the same joint of the following legs there are either one or two such spines. The posterior apex of the third and fourth joints in these legs is somewhat projecting, and set around with strong setæ. The under side of the flagellum of the inferior antennæ is rather closely or crowdedly setulous at the apices of the joints, and the upper side is comparatively bare; but this character fails in the younger specimens, three lines or less in length.

One specimen is probably from Tierra del Fuego.



## ALLORCHESTES HAWAIIENSIS.

*Epimeræ mediocres.* Antennæ 1mæ 2dis multo graciliores, quartâ parte corporis vix breviores, flagello 14-articulato, articulis longis tenuibus, setis paucis, diametro articulorum non longioribus; 2dæ basi duplo longiore quam basis 1marum, articulis flagelli paulo oblongis, setis paucis latitudine articulorum dimidio brevioribus. Pedes 1mi parvuli, manu late subovatâ, supra fere rectâ, infra arcuatâ, palmâ obliquâ fere longitudinale, carpo infra rotundato. Pedes 2di validi, manu crassâ, ovatâ, infra et supra arcuatâ, palmâ obliquâ, fere longitudinali, vix depressâ, parce setulosâ, carpo inter manum articulumque 3tium infra non producto. Pedes 4 antici subæqui, setis paucis, minutis, semilatitudine articuli 5ti non longioribus.

Epimerals of moderate size. Antennæ of superior pair much more slender than those of second, nearly one-fourth the body in length, flagellum fourteen-jointed, joints long and slender, setæ about as long as breadth of joints. Inferior pair with the base twice as long as base of superior, joints of flagellum oblong, setæ few and half as long as breadth of joints. Hand of first pair of legs very small, broad subovate, above nearly straight, below arcuate, palm oblique and nearly longitudinal, carpus rounded below. Hand of second pair stout, ovate, arcuate above and below, palm very oblique so as to be nearly longitudinal, sparingly setulous, carpus not produced below between hand and third joint. Legs of two posterior pairs subequal, setæ few, minute, not longer than half the breadth of the joint.

Plate 61, fig. 5 *a*, animal, enlarged (extremity of inferior antennæ broken off); *b*, part of flagellum of superior antennæ; *c*, ibid. of inferior pair; *d*, part of maxilliped; *e*, part of leg of first pair; *f*, ibid. of second pair; *g*, ibid. of third or fourth pair; *h*, stylet of first pair.

Island of Maui, Hawaiian Group.

Length, four to five lines. The extremity (or penult joint) of the maxillipeds is quite broad and hirsute. There are no setæ on upper

margin of fourth or fifth joints of six posterior legs. The outer branch of the first pair of caudal stylets has two spinules on the upper margin besides the apical, and the inner has three.

ALLORCHESTES PUGETTENSIS.

*Epimeræ sat magnæ. Antennæ 1mæ 2dis dimidio breviores, basi 2darum parce longiores, multo graciliores, flagello 15-articulato, setis fere obsoletis; 2dæ dimidio corporis breviores, flagello parce longiore quam basis, 12-articulato, articulis paulo oblongis, setis minutissimis. Manus 1ma ovata, infra supraque arcuata, palmâ valde obliquâ, non depressâ. Manus 2da pervalida, subovata, infra truncata, palmâ rectiusculâ, spinulosâ, parce depressâ, digito longo, marginis manus angulum attingente, carpo inter manum articulumque 3tium infra non producto, articulo 3tio antice triangulato et subacuto. Pedes 5ti 6ti 7mi sensim increscentes, setis brevissimis, perpaucis.*

Epimerals moderately large. Superior antennæ half shorter than inferior, slightly longer than base of inferior pair and much more slender, flagellum fifteen-jointed, setæ nearly obsolete. Inferior not as long as half the body, flagellum slightly longer than base, joints a little oblong, setæ very minute. Hand of first pair ovate, arcuate above and below, palm very oblique and not excavate. Hand of second pair very stout, subovate, truncate below, so that the palm is straight or nearly so and slightly excavate, finger long and reaching to the angle terminating the palm, carpus not produced below between hand and third joint, third joint triangular and subacute anteriorly. Legs of sixth and seventh pairs subequal, setæ few and very short.

Plate 61, fig. 6 *a*, animal, enlarged; *b*, part of flagellum of inferior antennæ; *c*, mandible; *d*, extremity of maxilliped.

Puget's Sound, Northwest America.

Length of body, nine or ten lines. The setæ of the inferior antennæ are about one-fourth the breadth of the joints in length. The basal joints of the six posterior legs are nearly as broad as long. The

tarsi are much curved and have a seta below. The maxillipeds have the penult joint broad. The eye is oval.

---

#### FAMILY GAMMARIDÆ.

THE characters of the Gammaridæ distinguishing them from the Orchestidæ have been pointed out, and here are only briefly reviewed. Instead of the exceedingly short posterior stylets of the Orchestidæ, these stylets are elongated, and often extend backward beyond the preceding pair; moreover, they are usually two-branched. Instead of having no mandibular palpus, there is a long one- to three-jointed palpus; only in a rare instance is it wholly obsolete. Instead of having the palpus of the inner maxillæ small and one-jointed, it is large and two- or three-jointed, and extends beyond the body of the organ; it is rarely simple. The few species of Gammaridæ that have no mandibular palpus, like the Orchestidæ, are remote from that family in the longer posterior stylets and in the palpus of the inner maxillæ. The maxillipeds terminate in a claw, as in *Allorchestes*, the palpiform part being five-jointed. The epimerals may be as large as in the Orchestidæ; but there is a transition to the small size found in the Corophidæ.

This family includes several subfamilies.

In much the larger part of the genera, the base of the superior antennæ is slender. But there are a few in which it is thick and short; and these species have large epimerals, a very compressed body, a three-jointed mandibular palpus, a pointed, sparingly toothed apex as the extremity of the mandible, quite unlike the denticulate edge and accessory denticulate lobe of other Gammarids. Besides, the inner lamellar process of the maxillipeds is large. The genus *Lysianassa* is of this group, and we name the subfamily *LYSIANASSINÆ*.

There is one Lysianassoid genus, with a short and stout base to the inner antennæ, large epimerals, and large inner lamella of the maxillipeds, in which the mandibular palpus is one-jointed, with a denti-