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CRUSTACEA.

PART II.

By THOMAS WHITELEGGE,
Zoologist, Australian Museum.

ISOPODA.

Part I.

CRUSTACEA.

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ISOPODA.

Part I.

The present contribution deals with a portion of the Isopoda, and embraces representatives of seven families, eleven genera and eighteen species; of these, two genera and nine species are herein described as new to science and are as follows :—

Apseudes multicarinatus.

Pagurapseudes spinipes.

Paranthura ciliata.

„ *involuta.*

Calathura gigas.

Æga australis.

„ *angustata.*

Cassidina laticauda.

Cassidinella incisa.

The species previously known are :—

Anthura affinis, Chilton. (*Hab.*—New Zealand).

Nerocila laticauda, Schiöedte and Meinert. (*Hab.*—Port Western, Vict.).

Livonecta raynaudii, H. Milne-Edwards. (*Hab.*—New Zealand and Tasmania).

Serolis tuberculata, Grube. (*Hab.*—Bass' Strait).

„ *australiensis*, Beddard. (*Hab.*—Coast of Victoria).

„ *elongata*, Beddard. (*Hab.*—Port Jackson).

„ *pallida*, Beddard. (*Hab.*—Off Port Jackson).

„ *longicaudata*, Beddard. (*Hab.*—Coast of Victoria).

„ *minuta*, Beddard. (*Hab.*—Off Port Phillip, Victoria).

The figures in the text have been reproduced by zincography from the author's drawings.

ISOPODA.

Tribe I.—CHELIFERA.

Family APSEUDIDÆ.

APSEUDES, *Leach*.

APSEUDES MULTICARINATUS, sp. nov.

(Figs. 15*a-g*.)

Stations 35, 37, 38, 57.

Body slender, strongly calcified, gradually tapering from the third to the terminal segment. Front of the cephalon but little prominent, rostral spine triangulate, as long as broad, the base occupies the median third of the front, the apex is slightly deflexed and the margins are finely denticulated, the denticles are continued beyond the base and cease at a short distance from the obtuse, elevated lateral angles of the front.

Ocular lobes well defined; an oblique ridge is present superiorly and the outer distal border is obtusely rounded.

Eyes conspicuous, with six or seven distinct, pigmented ocellæ.

Upper surface of cephalon strongly areolate, and carinate; the posterior sides are tumid, evenly rounded, and exhibit numerous low, reticulated ridges; one is more strongly marked, and extends obliquely from beneath the ocular lobe to the upper lateral aspect of the posterior border.

A longitudinal submedian pair of carinæ commence on the rostral spine and are continued to the cephalic suture; at this point they unite and form a single median keel, which ceases at a short distance from the acutely ridged hinder margin.

There is a low longitudinal ridge on each side, commencing at the antero-lateral angle of the front and terminating near the sutural depression; the latter marks the limits of four short longitudinal ridges, of which the posterior pair subtends the median and the anterior pair the submedian carinæ.

Second (first free) segment as wide as the first, but a little shorter, third segment shorter than the fourth and about one-third longer than the seventh, the fifth and sixth are subequal in length and breadth.

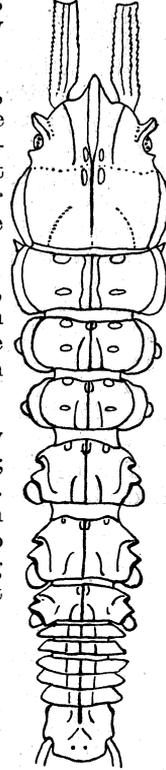
All the free segments are marked superiorly by a well defined median keel and a submedian pair; the latter varies in length on the different segments. On the second they extend along the whole length of the segment, on the third they are confined to the posterior two-thirds, and on the remaining segments of the peraeon they commence about the middle and terminate at the posterior border.

The submedian ridges are bounded on each side by a pair of short transverse ridge-like tubercles; the larger one is seated on the anterior border and the smaller about the middle of the segment; they are separated by a narrow transverse depression.

The second, third and fourth segments of the peraeon are widest in the middle; the sides when viewed from above have an evenly curved outline; fifth, sixth and seventh segments wider behind than in front, the marginal outline being oblique and bidentate.

Each epimeral process bears a pair of strongly marked ridges.

Coxal joints of the second pair of legs, with a small angular spine-tipped process, directed outwards and forwards; each succeeding coxa bears a broad incisor-like lobe; the lobes of the third and fourth are overhung and almost concealed by the epimeral processes, but those of the succeeding segments are very



BODY VIEWED FROM ABOVE.

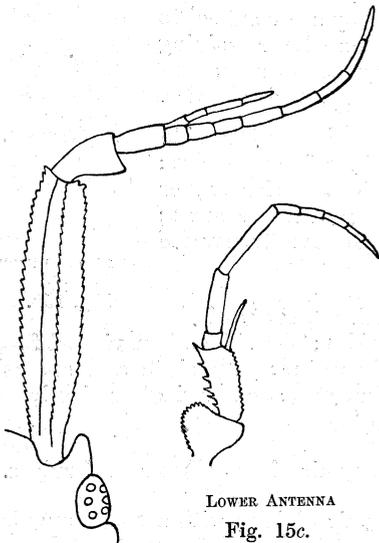
Fig. 15a.

prominent and project considerably beyond the second epimeral denticle and give each lateral margin a tridentate outline.

There is a spine on the epistome, and a triangular denticle between it and the inferior base of the rostrum. The second, third, fourth and fifth segments have a central longitudinal ridge on the inferior surface; the first three have a spiniform process anteriorly; the ridges are absent on the sixth and seventh segments.

An ill-defined central, compressed denticle is present on the under surface of five of the pleon segments, and there is also a pair of prominent, submedian, truncated processes to which the pleopoda are articulated. Segments and epimeral processes of the pleon subequal, sides obtuse, with the anterior margin oblique and the posterior nearly straight. Terminal segment truncated, as long as the three preceding combined. Upper aspect with a submedian pair of short spines posteriorly and a strong, short, median ridge on the anterior half of its surface. Sides sloping, becoming wider to the insertion of the uropods, beyond which the margins are keel-like and minutely denticulate.

The upper antennæ have the basal joint tapering, triangular, and about three times as long as broad, the angles are rather strongly denticulated and the superior surface carries a low smooth longitudinal ridge; the lower distal extremity bears a small spinule. The second joint is wider above than below and is a little longer and much stouter than the third. The larger flagellum consists of eight articulations; the first three are equal; the succeeding joints are about one-third longer and of nearly equal length; all except the first pair bear two or more setæ at their extremities. Smaller flagellum with four articulations, the first two of which are equal; the third is much the longest; distally each joint carries two or three setæ.



UPPER ANTENNA.
Fig. 15b.

LOWER ANTENNA
Fig. 15c.

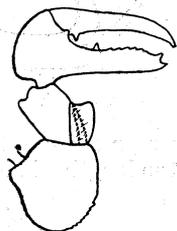
Lower antennæ having the peduncle shorter than the basal joint of the upper; first joint short, broad, with a denticulated

lobe on its inner margin; second twice as long as broad, inner margin armed with five or six spinules, outer denticulated.

Antennal scale cylindric, three times as long as broad and twice as long as the third joint; there is a pair of setæ at the summit and one at the side. Fourth joint one-third shorter than the fifth, the latter being about equal to the second. Flagellum with five subequal articulations.

The first legs have the basos as broad as long; the outer surface is convex, the inner is flattened and bears an oblong transverse depression; the inferior border is angular and denticulated, the denticles being most strongly marked posteriorly.

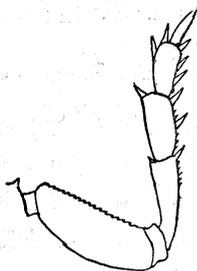
Hand oblong, its length exceeding the preceding joints combined. Palm short, as deep as long, and about half the length of the mobile finger, outer surface a little convex, inner with a longitudinal angle terminating in a prominent, broad, compressed lobe which marks the boundary of a deep, inter-digital excavation. Immobile finger horizontally dilated; the inner border is rounded, nearly straight and terminates in a short, curved, horny spine; the outer border is strongly curved thin, produced and indistinctly denticulated in the middle, and bears a strong calcareous spine distally. A faint longitudinal ridge is present on the inner surface of the finger, and frequently a large blunt cylindrical tooth which is situated about the proximal third. Mobile finger rounded, tapering, distally curved, with a strong, inwardly directed tooth on its inner base and a corneous spine at its extremity.



RIGHT CHELIPEDA OF
MALE.

Fig. 15d.

The second pair of legs has the basos joint about one-third as wide as long; the anterior border is straight and denticulated throughout. Merus angular; its width distally is about twice that of its base; the lower border is minutely denticulate, the upper is smooth, and the external surface bears an ill-defined longitudinal granular ridge; there is a small spine at the distal extremity above and a large one below. Carpus twice as long as broad and about two-thirds as long as the merus; the lower border bears a few small denticles, a pair of large spines and two unequal setæ; there is a spine at the superior distal extremity and one or two granular ridges on the external surface.

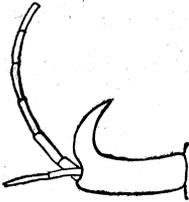


SECOND RIGHT LEG.
FIG. 15e.

Propodus one-third longer than broad, upper border armed with two and the lower with three spines and three setæ; the distal

spines are large and about half the length of the dactylus ; the lower border of the latter is beset in its proximal half with denticles, similar to those existing on the three preceding joints.

The third and fourth legs have the anterior border of the basos denticulated, and the lower borders of the carpal and propodal joints are armed with about twelve or more long, equidistant spinules. The propodus joint of the fifth leg is abbreviated and thickened at the extremity, which bears two transverse rows of setæ ; each seta has numerous short branches arranged along its concave surface ; the dactylus is much shorter than in any of the preceding or following legs.



UROPOD.
Fig. 15f.

A few plumose hairs are present on the proximal parts of all the legs and on the various angles of the body.

Uropods stoutish, equal in length to the external margin of the supporting segment ; each terminates superiorly in a strong, acute, curved spine, directed upwards and forwards. Outer ramus short, with two articulations ; inner about twice the length of the pleon and consisting of sixteen articulations.

The female differs from the male in having the first pair of legs much less robust in character ; the hand has the palm longer than the fingers.



LEFT CHELIPEDS
OF FEMALE.
Fig. 15g.

The expodites, if present, are minute and not distinguishable from some of the stouter setæ.

Colour, in spirit, body reddish-cream, sides of cephalon and central carinæ light terra-cotta.

About one hundred and twenty examples, obtained off Port Hacking, Jibbon, Botany, and Wata Mooli, in 20-59 fathoms.

Total length of body ...	...	...	...	6.8 mm.
Length of cephalon ...	...	...	...	1.7 "
" " peraeon ...	...	...	...	3.7 "
" " pleon ...	...	...	...	1.4 "
" " left chelipede ...	...	...	...	3 "
" " second left leg ...	...	...	...	4 "
" " third left leg ...	...	...	...	2.3 "
" " seventh left leg ...	...	...	...	1.5 "

PAGURAPSEUDES, gen. nov.

Body slender, tapering and dorso-ventrally compressed, with the free peraeon segments sharply defined, and the small coxal joints visible at the sides.

Second (first free) segment short, somewhat firmly connected with the first.

Pleon narrow, subcylindric, with five equal hoop-like somites and a short terminal segment.

Ocular lobes distinct, eyes present, pigmented but ill defined.

First antennæ widely separated, stout, with three joints and a pair of multiarticulate flagellæ.

Second antennæ inserted, at the inner inferior base of the first, small and four-jointed, with a rudimentary flagellum, but without an antennal appendage.

Mandibles robust, with a stout three-jointed palp, a well developed molar tubercle and a pair of dentate blades; the lower is subtended inferiorly by a tuft of spines.

First maxillæ bilobed; the outer is spinose and the inner setose at the apex; the external base carries a two-jointed, backward-directed palp.

Second maxillæ three-lobed and strongly setose at the apices.

First pair of legs chelate, the chelæ rather small, subequal, and similar in shape in the two sexes; inner edges of fingers of larger hand of male with small tubercles.

Second pair of legs elongate, slender, with a two-jointed exopod (in the male); the fifth and sixth joints are subcylindrical and narrower than the fourth; the seventh joint is long, curved and tapering.

Third to seventh pairs of legs short; each leg has the fourth, fifth and sixth joints armed inferiorly with a broadish band of rasp-like teeth. The dactyli of all the legs—except the first—exhibit an imperfect joint near the extremity.

Pleopods rudimentary, each with a pair of equal, sparsely setiferous rami.

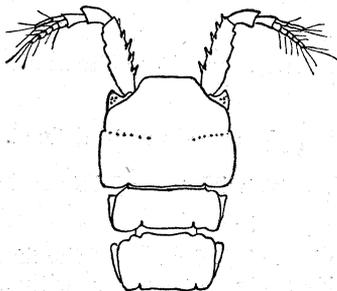
Uropods of moderate length, the rami short and composed of few articulations.

PAGURAPSEUDES SPINIPES, sp. nov.

(Figs. 16a-h.)

Stations 13, 35, 37, 38, 57.

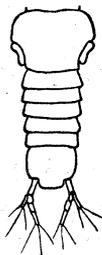
Adult female. Body slightly tapering, upper surface without well defined sculpture. Cephalon as long as broad, sides a little sloping, narrowed anteriorly, with a faint groove, which extends to the point of articulation with the succeeding segment.



Upper surface with a pair of very shallow submedian depressions and a low, broad median elevation; the latter commences on the rostrum and is continued beyond the sutural line; the depressions mark the inner limits of the suture and cease opposite to, but at a short distance from, a pair of shallow pits, situated anterior to the straight posterior border.

Rostrum wide, depressed, truncated and minutely spinulose.

Ocular lobes sharply defined, outlines when viewed from above triangular, with an inner ridge-like process, which extends over the base of the first antenna to the external base of the rostrum.



ANTERIOR AND POSTERIOR REGIONS OF BODY.

Fig. 16a.

Eyes indistinct, with several dark pigment spots.

Second (first free) segment about half the length of the third. Anterior margin straight, sides slightly convex, marked superiorly with a narrow groove, bounded by a ridge which gradually increases in width posteriorly; hinder border interrupted by a pair of submedian incisions.

Third segment with the anterior border arcuate, exhibiting six indistinct depressions, and laterally spinulose; sides and posterior border straight, the latter with a pair of widely separated notches.

Fourth segment similar to the third, but longer.

Fifth segment nearly equal in length to the second and third combined.

Sixth and seventh segments subequal in length; both have the anterior border strongly arched; the sides posteriorly exhibit a slight excavation, which is adapted to the coxal plates; the posterior borders are straight and furnished with minute notches externally.

Pleon when viewed from above cylindric, without projecting side processes, its width being rather more than half that of the last segment of the peraeon.

First segment rather longer than the four following.

Telson a little tapering at the sides and obtuse at the extremity.

The body and limbs are more or less beset with branched setæ; on the prominent angles they are stout, and when broken the bases of the setæ resemble small spines. Superior antennæ having the peduncle as long as the cephalon, basal joint more than three times as long as broad, outer border with three equidistant double pointed denticles confined to the distal half, inner border armed with eight spines arranged in pairs; the largest pair is situated at about the proximal third, the remainder forms a gradually diminishing series; the inferior distal extremity terminates in a subacute prolongation.

Second joint as long as the width of the first, becoming wider distally; third joint equal in length, but narrower than the second.

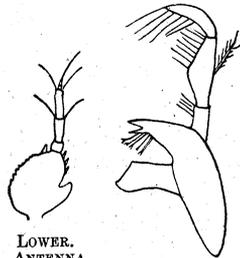
Inner flagellum two-jointed, the second slender and a little longer than the first; each is tipped by three or four short simple setæ. Outer flagellum with five joints subequal in length, each bearing from two to six longish setæ.

Inferior antennæ small, about equal to the length of the palp of the mandible; first joint dilated, as long as the three following, oval in outline, about one-sixth longer than wide; outer border evenly curved and minutely spinulose about and above the middle, with a large spinule at distal extremity; inner border with three spinules on the distal fourth and a large denticle below the middle, bounded superiorly by a well defined sinus.

Second joint as long as broad and about half the length of the third; fourth joint a little shorter than the second and third



UPPER ANTENNA.
Fig. 16b.



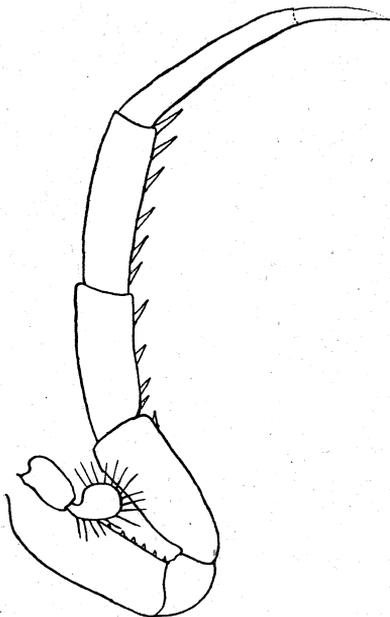
LOWER
ANTENNA
Fig. 16c.

MANDIBLE.
Fig. 16d.

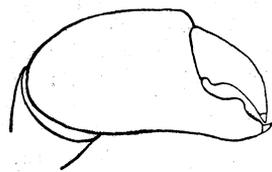
combined ; flagellum rudimentary, two-jointed, terminating in a pair of setæ, of which one is very long.

First pair of legs having the basos joint as long as broad, scarcely exceeding the joint following in bulk ; fifth joint much the largest, twice as long as broad, becoming wider distally ; there is a slight transverse subdistal ridge on the external aspect, and a longitudinal ridge on the inner ; each bears a few short spinules.

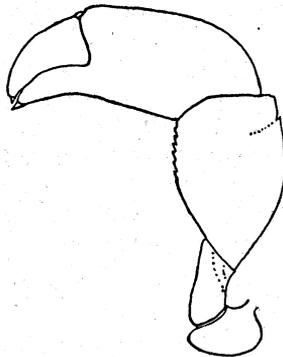
Hand small, curved, more than twice as long as deep, strongly convex externally, and bent downwards at right angles to its



SECOND LEG OF MALE.
Fig. 16f.



RIGHT CHELIPEDA OF MALE.
Fig. 16e.



RIGHT CHELIPEDA OF MALE.
Fig. 16g.

supporting joint. Fingers moving in a horizontal plane, the lower straight, upper slightly curved, as long as the palm, inner edges of both denticulate, with the tips acute and corneous.

Second pair of legs elongate, slender, coxal joint visible from above, wide in front and narrow behind, tipped with a small spine externally, but without a forwardly directed process. The coxæ of the third and fourth pairs are similar to those of the second, whilst those of the succeeding legs are as wide behind as in front when seen from the dorsal aspect. Basos twice as long

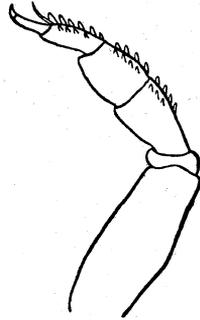
as the ischium and equal to the merus in length and breadth, with a few small denticles on the anterior border. Merus as long as the carpus, inferior border of the former with about six strong branched setæ, and that of the latter armed with four or five short mobile spines. Propodus longer and narrower than the carpus, equal to the dactylus; the inferior border carries six mobile spines, which slightly increase in size distally.

Dactylus slender, tapering, with a horny claw occupying the distal fourth and preceded by an imperfect joint.

Third to seventh pairs of legs, and also each sixth and seventh joint, gradually diminishing in size as the posterior end of the peraeon is approached.

Third pair of legs having the basos joint stout and nearly equal in length to the three following joints combined; merus and carpus equal, shorter than the propodus; the latter is narrow, subcylindric and not equal in length to the slender but little curved dactylus.

In the remaining pairs of legs the basos is less than twice as long as broad and equal to or exceeding the combined length of the three succeeding joints. The propodal joint is about as long as the ischium and one-third shorter than the dactylus. There are some branched setæ on the anterior borders of the second joints, and a rather wide band of rasp-like spines on the inferior surfaces of the fourth, fifth, and sixth; the latter bears a short, simple, spine-like seta on the superior distal extremity, and a curved pectinated spine inferiorly.



THIRD LEG OF MALE.
Fig. 16h.

The pleopods are subject to great variation; there are never more than three pairs, often only one, and frequently they are wholly absent, especially in the female; they are very small and consist of a short pedicle and two narrow equal setæ tipped rami.

Uropods about equal in length to the telson; outer ramus with one joint, twice as long as broad, and surmounted apically by three setæ; inner ramus three-jointed, the first a little longer than broad, the second and third subequal and about twice as long as broad; the middle joint bears two, and the terminal one three simple stoutish setæ.

The male differs from the female in having the joints of the larger flagellum of the first antennæ longer, the chelipedes slightly larger, particularly the right. The rasp-like teeth are better developed, more especially on the terminal joints of the posterior

legs. The second pair of legs has each a well developed two-jointed exopod. The latter appendages, if present on the first legs of the male or on both first and second in the female, are so small that they have eluded all my efforts to isolate them and distinguish them from the stout branched setæ.

Incubatory pouches occur in pairs on the second to fifth segments.

The young when ready to leave the marsupium have the eyes conspicuously pigmented; the first joint of the first antennæ possesses only one spine, situated about the middle on the inner border. The larger flagellum has but three joints and exceeds the smaller in length by about one-fifth. The second to the sixth pairs of legs have the imperfect joint of the dactylus well defined and the rasp-like spines of full size, but not so numerous as in the adult. The seventh pair of legs and the pleopods are wanting in all the specimens examined.

The predominating features of this most curious and interesting form indicate its close relationship to the family Apseudidæ. The ocular lobes, antennæ and mouth parts are very similar in structure, yet there are certain differences, such as the absence of the antennal scale and the small size of the second antennæ, which are scarcely equal to the stout, well developed palp of the mandible. The slightly tapering body and the presence of a conspicuous exopod on the second pair of legs afford further evidence. Here I may state that after examining very many specimens I failed to find the exopods except in one male, in which they are very conspicuous on the anterior bases of the second legs, but I could not detect any trace of them on the first pair.

Many of the remaining characters display an affinity with the family Tanaidæ, such as the almost smooth body, the second pair of legs not having the distal joints dilated, the small size of the coxal plates and the absence of a forward process on the first pair, the semi-coalesced condition of the first five segments of the pleon, which consists of hoop-like rings, without side processes and devoid of visible nodes of articulation, the frequent absence and rudimental character of the pleopods, and the short, few-jointed rami of the uropods.

Colour, of body and limbs, creamy-white.

About one hundred specimens, obtained off Cape Three Points, Port Hacking, Botany to Jibbon, and Wata Mooli, in 20-59 fathoms,

Total length of body	...	...	...	6.25 mm.
Length of cephalon	...	...	...	1.2 "
" " peraeon	...	...	...	3.8 "
" " pleon	...	...	...	1.25 "
" " first antenna	...	...	...	1.5 "
" " second antenna	...	...	...	0.4 "
" " palp of mandible	...	...	...	0.45 "
" " first chelipede	...	...	...	2.5 "
" " second leg	...	...	...	2.7 "
" " third leg	...	...	...	1.25 "
" " seventh leg	...	..	...	0.8 "
" " first pleopods, with the setæ	...		...	2.0 "
" " third " " "	...		...	1.5 "

In habit as well as in structure this species is equally remarkable, and affords a striking instance of adaptation to a mode of life quite different from that of other members of its tribe. It is distinctly paguroid in habit, living in small univalve shells and in company with young hermit crabs. The resemblance to the latter is so complete that it requires close inspection to separate the two forms. This mimicry of external appearance and the similarity of the habitat are of extreme interest from a homoplastic point of view, showing how habit and environment tend to induce the development or degradation of a number of important homogenetic characters in widely separated organisms. The paguroid features presented by this singular Isopod may be enumerated as follows:—The body is strongly curved and adapted to the shape of the columella of the shell, as are also the chelipedes, neither of which can be straightened without breaking. The hands are distinctly curved and very similar to those of the young of many species of *Clibanarius*, the fingers moving in a horizontal plane. The second pair of legs is long and ambulatory, not dilated and fossorial as in its nearest allies. The succeeding five pairs of legs are greatly reduced in size and the inferior surfaces of the fourth, fifth and sixth joints are clothed with numerous short, rasp-like teeth, identical in form, origin and structure with the pad or rasp present on the reduced legs of the pagurids. The pleon is symmetrical, but together with its appendages exhibits evidences of degradation. The segments do not display any points of articulation; inferiorly they are very short, interrupted and only partially calcified. The pleopoda are frequently absent; when present they are small and rudimental. The uropods with their rami do not exceed the telson in length.

Tribe II.—FLABELLIFERA.

Family ANTHURIDÆ.ANTHURA, *Leach*.ANTHURA AFFINIS, *Chilton*.

Anthura affinis, Chilton, Trans. New Zeal. Institute, xv., 1882,
p. 72, pl. 1, fig. 4.

Station 37.

One example of this species was obtained off Botany Bay in 50-52 fathoms.

Total length of body, 10 mm. The specimen agrees exactly with Chilton's description and figures. The eyes are subreniform and of a dark brown colour; the body and limbs exhibit very numerous discoidal bodies under the integument.

PARANTHURA, *Bate and Westwood*.

PARANTHURA CILIATA, sp. nov.

(Figs. 17a-f.)

Station 57.

Body elongate, very slender; cephalon one-fifth longer than broad; sides straight, narrowed and rounded in advance of the eyes. Front with a short distinct rostriform process. First segment of the peraeon one-fourth longer than the cephalon, and twice as long as broad in the middle. Second segment much longer than the first, very narrow posteriorly; third, fourth and fifth segments subequal in length, each slightly increasing in width; sixth segment equal in length to the first, and nearly as broad as the cephalon is long; seventh segment broader than long; upper surface of cephalon and two following segments convex from side to side; the remaining five segments are somewhat flattened and bounded at the sides by a raised marginal pigmented line. Inferior surface of second peraeon segment

strongly keeled, the succeeding ones more or less flattened with a pigmented marginal line on each side. Pleon distinctly segmented, shorter—telson excluded—than the width of the preceding segment; the lateral margins of each segment are closely applied to the sides and indistinctly defined.

Telson longer than the pleon, three times as long as broad, equal in breadth to the terminal fourth; at this point the sides gradually curve inwards to the evenly rounded setose and slightly crenated extremity.

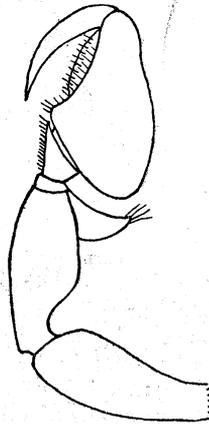
Eyes distinct, large, yellowish-brown.

Superior antennæ slender, a little shorter than the inferior; first joint stout, twice as long as broad; second joint about half the length and slightly narrower than the first; third joint twice as long as broad, longer than the second; flagellum equal in length to the two preceding joints, consisting of four articulations, of which three are subequal in length but gradually diminishing in diameter to the fourth, which is very small.

Inferior antennæ having the basal joint as long as broad constricted in the middle, with the distal border oblique and slightly dilated; second joint stouter and longer than the first, about one-eighth longer than broad, and much broader than the two following joints which are subequal in size; fifth joint the longest, tapering, twice as long as broad.

Flagellum consisting of five or six joints, two of which are stoutish and distinct, the rest are minute and scarcely distinguishable. The joints of both pairs of antennæ exhibit a few scattered hairs on their apical borders, and each terminates in a small tuft as long or longer than the flagellum.

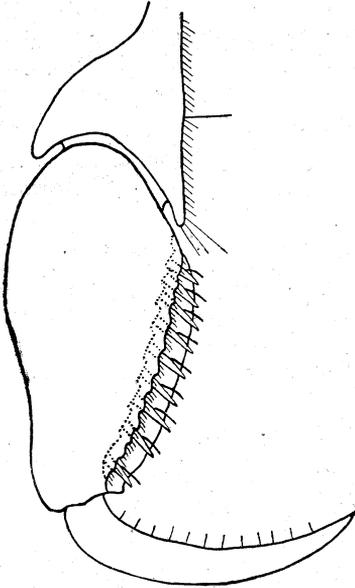
First pair of legs moderately stout, about one-fifth shorter than the succeeding pair, basos and ischium subequal, merus transversely sublunate, distal border concave with a few setæ on the superior extremity, carpus subtriangular in outline, inferior border minutely ciliate with a few long setæ at the distal end. Propodus ovate-elongate, palmar border double, the inner convex with a row of ten or twelve smooth setæ, the outer slightly concave and produced proximally into a small lobe; the edge carries a row of eight or nine smooth setæ, which are scarcely half the length of those on the inner aspect.



FIRST LEG.
Fig. 17a.

Dactylus curved a little longer than the outer border of the palm; the inferior surface bears nine or ten short equidistant hairs.

Second and third pairs of legs subchelate, basos joint as long as the two following combined; the inferior border is straight, the superior curved, each with a few widely separated hairs; merus subtriangular; inferior border straight, ciliate; superior border oblique and a little curved towards its setose extremity;



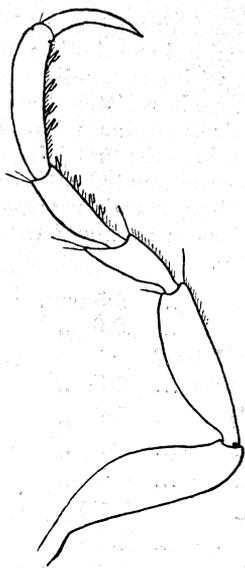
CHELIPIDE OF SECOND LEG.
Fig. 17b.



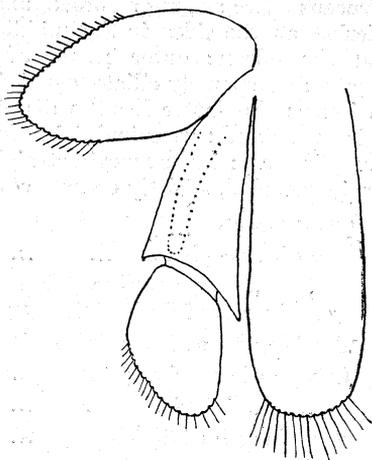
THIRD LEG.
Fig. 17c.

distal margin oblique on its lower half and concave on the upper. Carpus longer than wide, its lower border ciliate and nearly equal in length to the preceding joint. Propodus ovate-oblong; superior border convex proximally, tending to become concave at the distal two-thirds. Palmar border two-edged; the outer is convex, smooth and glabrous; the inner is thin, regularly sinuated and minutely ciliate throughout; the intermediate space carries a row of nine stout spines, which arise from bracket-like processes, and are in close contact with the ciliated inner border for about one-fourth of their length. Each spine has the anterior edge finely serrate, and the posterior bears about the middle a slender accessory spinule, which extends to or beyond

the apex of the spine. Fourth to seventh pairs of legs subequal in length, a little more slender than the second and third; the basos joint in the sixth pair is equal in length to the ischium;



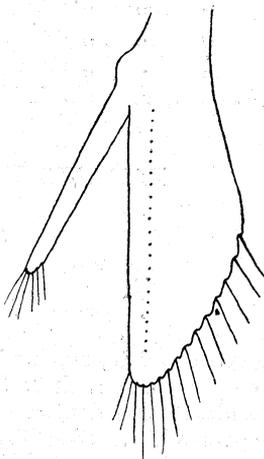
SIXTH LEG.
Fig. 17d.



TELSON AND UROPOD.
Fig. 17e.

merus very narrow proximally, gradually widening to beyond the middle; the distal border is somewhat oblique. Carpus as long but not quite so broad as the merus. Propodus one-third longer than the carpus, of equal breadth throughout, or slightly broader distally. Dactylus gradually tapering, curved and equal to the carpus in length. The third to sixth joints have their inferior borders closely and very finely ciliate; the distal extremities both above and below bear one or more setæ; the fifth and sixth are each armed inferiorly with four spines, structurally like those on the palm of the second and third legs, but not quite so stout.

First pair of pleopods large, concealing the succeeding pairs. Outer ramus sublanceolate, as long as the



FIRST PLEPOD.
Fig. 17f.

telson, the outer distal half of the margin and the extremity with numerous long setæ, each of which arises from a small notch; inner ramus very narrow, about eight times as long as broad at the base, of nearly equal width to near the blunt apex, which bears six long setæ. The succeeding pairs have both rami foliaceous twice as long as broad, and each with a notch-like constriction at the sides in the middle. Uropods a little shorter than the telson; outer ramus ovate; the margins minutely crenate and sparsely ciliate, equal in length to the first joint of the inner; the latter has the distal border excavated and the angles produced; terminal joint longer than broad, narrower than the first; inner margin straight glabrous; apex and outer margin rounded, slightly crenate and ciliate.

Total length	9.5 mm.
Length of cephalon	0.6 "
" " peraeon (breadth between lateral pigmented lines of five segments 0.5) ...	7.5 "
Total length of pleon (telson included) ...	1.6 "
Length of superior antennæ	0.6 "
" " inferior " 	0.7 "
Total length of first leg	1.85 "
" " " third " 	2.15 "
" " " sixth " 	2.5 "
" " " pleopod 	1 "
" " " telson 	1 "
" " " uropod 	0.9 "
" " " outer ramus	0.7 "

Four examples obtained off Wata Mooli, in 54-59 fathoms.

PARANTHURA INVOLUTA, sp. nov.

(Figs. 18a-g.)

Station 37.

Body elongate, much wider in the middle than at the extremities. Cephalon a little longer than broad, front bisinuate and tridentate; the denticles are equal and their apices are in a transverse line. Sides convex, converging towards the rounded and somewhat produced lateral angles of the front. First segment nearly twice as long as broad, equal in width throughout and to the length of the cephalon. Second longer, slightly

narrowed posteriorly. Third subequal to the second in length, but wider behind than in front. Fourth and fifth subequal, broader and longer than those preceding or following; seventh broader than long, narrower than the sixth.

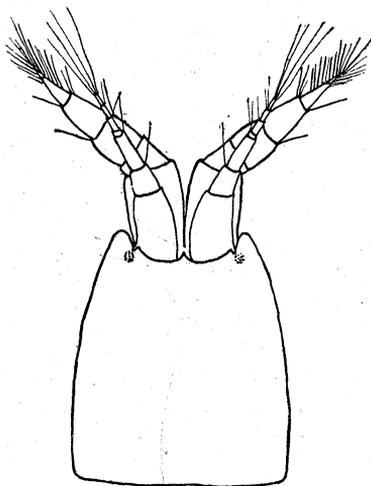
Upper surfaces of peraeon segments slightly convex from side to side; each dorso-lateral margin has a very faint and somewhat indistinct line; the cephalon is depressed and also exhibits faint marginal lines. Inferior surface of first segment acutely keeled; the under surfaces of the succeeding segments are smooth, convex and without distinctive marks.

Pleon one-fifth narrower than the last segment of the peraeon and three-tenths longer than broad with the telson.

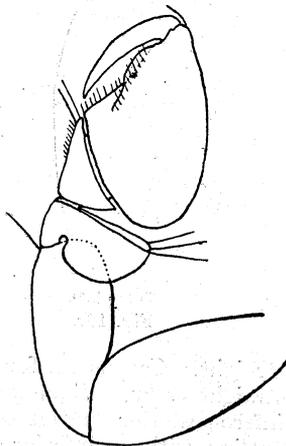
First segment as long as the second and third combined; second to sixth segments subequal in length. Sides of each segment adherent and indistinctly defined.

First antennæ having the basal joint twice as long as broad and longer than the second and third combined; third joint nearly twice as long as the second but narrower; flagellum with five articulations, the first and last very short, the three intervening subequal and tapering; each joint bears a few short setæ and the apex two or three long ones.

Second antennæ very stout, somewhat longer than the first; basal joint short, slightly constricted in the middle, second joint about two-fifths longer than broad, third and fourth subequal, fifth longer than broad, sixth narrow, tapering, as long as the fourth and terminating in a dense tuft of short setæ.

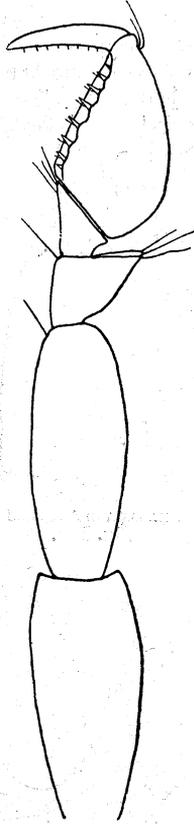


CEPHALON AND ANTENNÆ.
Fig. 18a.

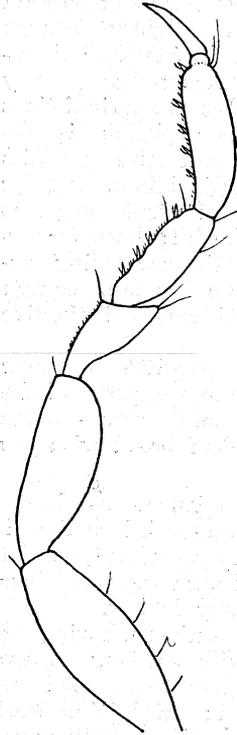


FIRST LEG.
Fig. 18b.

First pair of legs moderately short and stout; basos and ischium joints equal in length, but the first named is one-fifth broader. Merus two-fifths longer than broad, with the distal margin



THIRD LEG.
Fig. 18c.



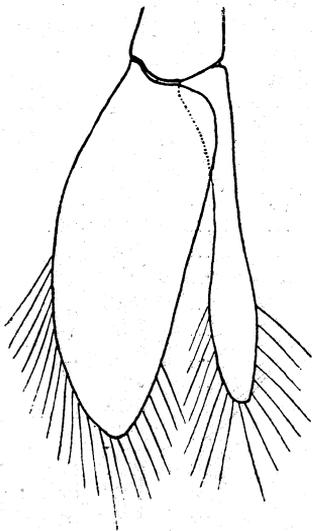
SIXTH LEG.
Fig. 18d.

straight. Carpus one-fourth longer than broad, the distal margin straight, very oblique and closely applied throughout to the infero-posterior surface of the propodus; the latter is ovate in outline, with an inferior lobe against which the tip of the finger impinges when closed. Palmar border two-edged, one short and convex, the other long and concave; the latter bears about fourteen setæ; there are also a few between the ridges. Finger shorter than the palm, curved, with a few short setæ on the inner edge.

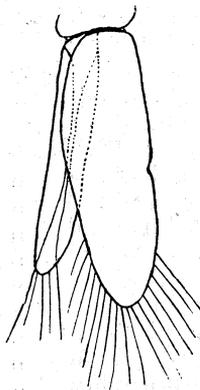
Second and third pairs of legs similar, having the basos joint one-fifth longer than the ischium and about the same broader. Merus one-fourth shorter than the carpus, inferior border straight, superior oblique and evenly curved, distal margin concave, with a few distally situated setæ. Carpus and propodus similar in shape to that of the first, but a little less in size, and the lobe on the palm is wanting. Palmar border armed with eight or nine spines, each of which is indistinctly serrated anteriorly and bears an accessory spinule posteriorly.

Fourth to seventh pairs of legs differing little except in length, the last pair being shorter; all the joints are very similar and subequal in length; the inferior margin of the carpus is armed with four and the propodus with five spines, which are structurally like those on the second and third legs.

First pair of pleopoda large, partially concealing the rest; outer ramus less than three times as long as broad, almost of equal width in the basal two-thirds, thence converging rapidly on the outer margin to a point which bears numerous setæ; inner ramus narrow, a little shorter than the outer, broader at the apex and base than in the middle, the distal third margined with setæ.



FIRST PLEPOD.
Fig. 18e.

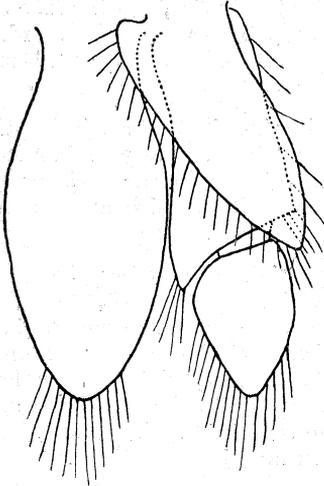


SECOND PLEPOD.
Fig. 18f.

Second and succeeding pairs of pleopoda one-fourth to one-fifth shorter than the first; outer ramus three times as long as broad, slightly tapering, margined with a few setæ; inner ramus shorter than the outer, involute and tube-like; the sides almost in contact

in the middle, but separate at the base and apex. The latter is tipped by four or five setae.

Uropods as long or a little longer than the telson; outer ramus three times as long as broad; outer margin slightly convex, glabrous except at the tip; inner nearly straight, crenate and setose throughout. Basal joint of inner ramus two-fifths longer than broad; margins straight, the inner glabrous, the outer setose; distal border oblique, slightly produced at the inner angle. Terminal joint twice as long as broad, outer margin evenly curved, inner strongly convex, especially at the base, both bearing numerous setae.



TELSON AND UROPOD.
Fig. 18g.

Telson lanceolate, constricted near the base, widening out at the middle, and thence gradually converging to the rather narrow, rounded, sparsely setose extremity.

Colour, pale creamy-white.

One example, obtained off Botany Bay, in 50-52 fathoms.

Total length of body	...	...	...	11 mm.
Length of cephalon	...	...	...	0.75 mm.
Breadth of "	...	...	...	0.6 "
Length of 1st segment of peraeon	...	...	...	1 "
Breadth of 1st "	"	"	...	0.55 "
Length of 2nd "	"	"	...	1.3 "
Breadth of 2nd "	"	"	...	0.6 "
Length of 3rd "	"	"	...	1.2 "
Breadth of 3rd "	"	"	...	0.75 "
Length of 4th "	"	"	...	1.5 "
Breadth of 4th "	"	"	...	0.9 "
Length of 5th "	"	"	...	1.55 "
Breadth of 5th "	"	"	...	1.0 "
Length of 6th "	"	"	...	1.2 "
Breadth of 6th "	"	"	...	1.0 "
Length of 7th "	"	"	...	0.6 "
Breadth of 7th "	"	"	...	0.8 "
Length of pleon	...	...	...	0.8 "
Breadth of "	...	...	...	0.6 "
Telson and seventh segment	...	...	...	1.0 "
Length of outer ramus of uropod...	...	...	...	0.55 "

CALATHURA, *Norman and Stebbing.*

CALATHURA GIGAS, sp. nov.

(Figs. 19a-e.)

Station 34.

Body moderately stout, elongate. Cephalon a little broader than long; front bisinuate with a short, median rostriform process; the antero-lateral angles are rounded and project on each side so as to embrace the outer bases of both pairs of antennæ; sides rounded, faintly concave about the middle.

First peraeon segment closely united to the cephalon; it exceeds the latter in breadth and is twice as long; the anterior margin is straight, the sides concave, laterally arched, and somewhat angular, especially anteriorly.

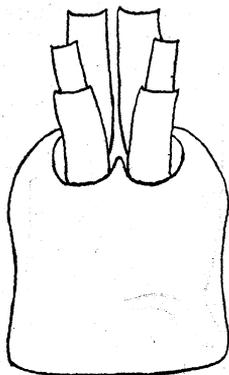
Second to sixth segments agreeing closely with the same segments in *Calathura brachiata*, Stimpson, the median depressions being, perhaps, a little less marked.

Seventh segment broader than long, with a prominent lobe on each postero-lateral angle. The lobes extend over and beyond the first segment of the pleon.

Superior surface of cephalon and first three segments of peraeon more or less convex, succeeding segments somewhat flattened. Inferior surface of first peraeon segment with a blunt longitudinal keel, the second strongly but roundly convex; the five segments following have the lower surface flattened; the sides are defined by a distinct ridge; mesially there is a narrow longitudinal groove which marks the inner limits of a series of transverse corrugations; the latter are much more distinct in the male than in the female.

Pleon less than twice as long as the last segment of the peraeon. Segments well defined, becoming wider posteriorly; first longer than the second, third and fourth, but shorter than the fifth. Lateral margins obliquely truncated, rather pointed posteriorly.

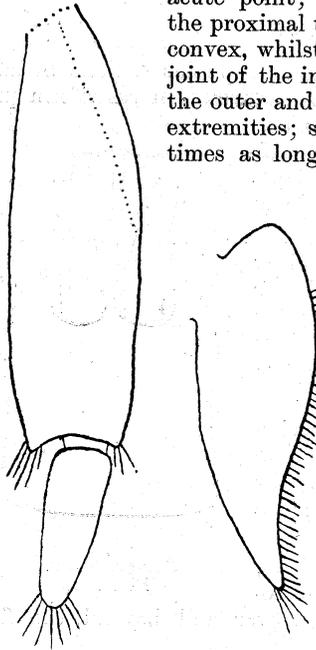
First pair of pleopods nearly equal in length to the pleon and telson combined; the outer ramus is narrow, oblong and becomes



FRONTAL REGION.
Fig. 19a.

slightly wider beyond the middle; the inner margin is straight and the outer curved; the apex is obtusely rounded and strongly ciliated.

Uropods as long or longer than the pleon; outer ramus more than three times as long as broad, gradually tapering to a subacute point; in outline the inner margin and the proximal two-thirds of the outer is slightly convex, whilst the distal third is concave; first joint of the inner ramus one-fourth longer than the outer and four times as long as broad at the extremities; second joint a little less than three times as long as broad at the base, gradually tapering to half its basal width at the obtusely rounded, setose extremity.



OUTER RAMUS OF
UROPOD.
Fig. 19b.

INNER RAMUS OF
UROPOD.
Fig. 19c.

Telson equal in length to the pleon, lanceolate, suddenly narrowed distally to a subacute point.

Eyes undistinguishable, destitute of pigment.

Superior antennæ having the peduncle (in situ) equal in length to the first two joints of the inferior antennæ; when detached and placed side by side the peduncle exceeds the two joints by about 0.5 mm. Basal joint stout, two and a half times as long as broad, longer than the two following subequal joints combined. Flagellum more than twice as

long as the peduncle, consisting of twenty-eight articulations, first joint* broader than long, second one-fourth longer than broad, third to sixth broader than long; the remaining joints gradually increase in length, and the distal ones are two or three times as long as broad; there are a few long setæ on the terminal joint of the peduncle and the flagellum bears one or two short hairs on the inner apical angle of each articulation.

Inferior antennæ having the peduncle equal in length to the flagellum of the superior. Basal joint as broad as long, constricted in the middle and dilated distally, second stout, twice as long as broad, third a little longer than broad, with distal border

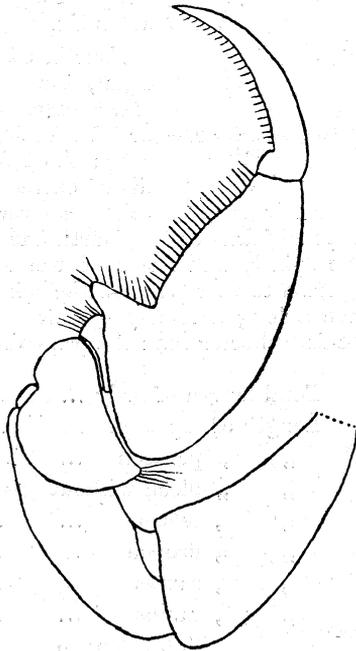
* Structurally this joint appears to be like a fourth joint of the peduncle.

oblique and produced on the inner side, fifth longer than the fourth and three times as long as broad. Flagellum equal in length to the first four joints of the peduncle, consisting of thirty-four stoutish, subequal joints, each of which is furnished at its apex on one side with a row of from six to twelve, or more, strong setæ; a few scattered weaker ones are present here and there on the opposite side.

The flagellum of the superior antennæ in the male consists of thirty-six articulations, the first three of which are normal and bear a few stiff setæ inferiorly; the succeeding twelve joints are greatly swollen and covered below and at the sides with a dense coating of woolly hairs; the remaining twenty-one joints are from twice to thrice as long as broad, and each bears at the distal extremity one or two short setæ.

The mouth organs do not differ materially from those of *Calathura norvegica*, as figured by G. O. Sars. The mandibles, however, seem relatively larger and the palps somewhat smaller; the first maxillæ do not exhibit any trace of hairs below the serrations, and the second maxillæ appear to be absent. The lower lip is keeled externally on the proximal half and exhibits a tuft of hairs on either side internally which arise from near the base and reach almost to the apex.

First pair of legs stout, the right slightly the larger, having the basos joint a little shorter than the ischium, and more than twice as wide distally as proximally; merus dilated, much broader than long, and adapted to the posterior base of the hand; the latter is sublanceolate in shape, and three times as long as broad; the inferior edge of the palm is slightly convex, and has a conical lobe at the base; the edge, lobe and



RIGHT CHELIFEDE.
Fig. 19d.

inferior border of the carpus bear numerous stout spine-like setæ, each of which is covered distally with exceedingly minute hairs.

Superior palmar border evenly convex, and about one-third longer than the lower; dactylus slender, distally curved, its tip reaches to the base of the conical lobe when closed; the inferior border bears a line of short but scarcely tapering setæ.

The second and third pairs of legs differ from the first in being comparatively slender, and in having the meral joint subtriangular in outline and longer than broad; the inferior border and the superior distal extremity bear a few long setæ; the distal margin is excavated and adapted to the base of the hand and the carpus. The shape of the palm is much like that of the first pair, but the basal lobe is wanting, the setæ are longer, and the inferior edge bears about ten stoutish spines, the distal two or three have on each side one or two accessory spinules, the remainder have one only, which is situated on the posterior border, arising about the middle and continued beyond the apex of its support. The dactylus is scantily hairy throughout its length, and has a tuft at its tip.



SPINES ON BORDER OF PALM
OF SECOND LEG.
Fig. 19e.

Fourth, fifth and sixth pairs of legs subequal, the seventh pair somewhat shorter. Each carpal joint is armed below with four or five equidistant spines, and some long setæ; the spines increase in length as the distal extremity is approached, where they are nearly as long as the transverse diameter of the joint. The propodal joints of the fourth and fifth pairs of legs bear eight or nine spines, and those of the sixth and seventh pairs from eighteen to twenty. All the spines of the carpo-propodal joints have a long accessory spinule. Dactyli slender, curved, about one-fifth shorter than the preceding joint.

Total length of body ...	...	...	...	42	mm.
Length of cephalon ...	...	...	...	2.5	„
„ „ peraeon ...	...	...	...	31	„
„ „ pleon without telson ...	...	...	...	3.5	„
„ „ telson ...	...	...	...	4.5	„
„ „ uropod ...	...	...	...	6	„
„ „ ramus ...	...	...	...	4	„
„ „ ramus ...	...	...	...	5.5	„
„ „ first antennæ ...	...	...	...	6	„
„ „ peduncle first antennæ ...	...	...	...	2	„
„ „ second antennæ ...	...	...	...	6.5	„
„ „ peduncle second antennæ...	...	...	...	3.8	„

Length of first leg (finger excluded)...	... 9 mm.
„ „ second leg (finger excluded)	... 8·5 „
„ „ fourth „ „ „	... 10·5 „
„ „ seventh „ „ „	... 9 „

Four examples, including one male, obtained off Port Jackson in 36-39 fathoms.

Family ÆGIDÆ.

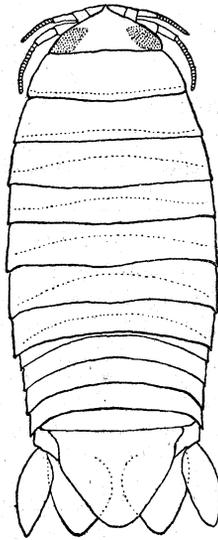
ÆGA, *Leach*.

ÆGA AUSTRALIS, sp. nov.

(Fig. 20a-f.)

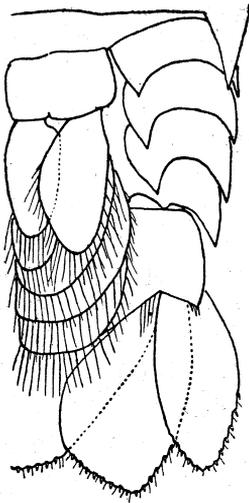
Station 44.

Body somewhat elongate, about two and a half times as long as broad, slightly tapering from the middle towards both extremities, the pleon a little narrower than the peraeon. Cephalon twice as broad as long, with a well defined rostral process, which is as long as broad at the base, and completely separating the inner bases of the first antennæ; inner frontal margins oblique, outer slightly convex. Peraeon segments subequal in length, shorter than the cephalon, with the rostrum included, the first and fifth slightly longer than the others; surface strongly convex from side to side; the usual transverse grooves are distinctly defined on all the segments; on the first and second the grooves are situated near the posterior margin, whilst those on the remaining five are near to or in advance of the centre. The epimera in all the examples except one—a gravid female—are invisible from above; the curved ridges are somewhat ill defined. The posterior epimeral border of the second and third segments is obliquely truncated, with rounded

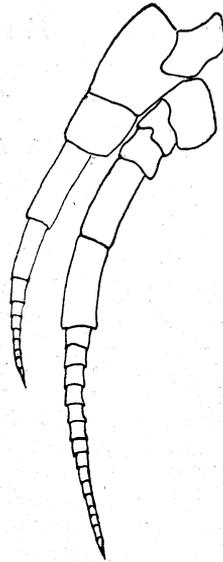


BODY VIEWED FROM ABOVE.
Fig. 20a.

corners, the upper corner being slightly longer than the lower; the posterior border of the fourth is transverse, with the lower angle subacute; in the two following the lower angle becomes more produced and the upper obliquely curved; the seventh is very acute, and one-third longer than broad. Pleon segments subequal in length, with the posterolateral angles of the first four acutely produced, the fifth being somewhat rounded.



POSTERIOR REGION OF BODY
VIEWED FROM BELOW.
Fig. 20b.



RIGHT ANTENNAE.
Fig. 20c.

Telson more than one-fifth wider at the base than long, sides converging to the obtusely rounded extremity; surface very slightly convex; distal margin uneven, with a few small spines and setae. Eyes small, subtriangular, longer than broad, with their inner acute angles separated by a space about equal to the length of the cephalon without the rostrum.

First antennae having the first two joints very broad, with their anterior margins produced into thin acute edges, flagellum consisting of nine or ten articulations and about equal in length to the peduncle; second antennae one-third longer than the first, with the peduncle as long or longer than the flagellum; the latter consists of about sixteen articulations.

The mandible is strikingly like that of *Rocinela danmonensis*, as figured by G. O. Sars.* The remaining appendages of the

* Sars—Crust. of Norway, ii., 1897, p. 65, pl. 27, M.

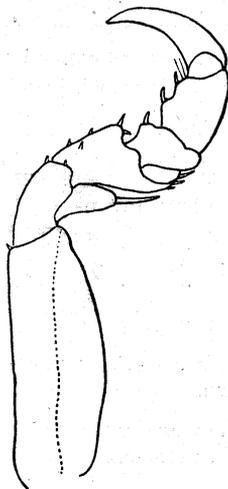
mouth closely agree with those of *Aga psora*, as figured by Sars on pl. 24. The maxillipedes have six well defined joints; the seventh if present is very small.

First pair of legs the shortest, and somewhat less robust than the two following pairs; basos joint of the first a little more than twice as long as broad, with a sharply defined ridge on the external surface, terminating distally in a prominent rounded lobe. Ischium joint with a small superior distal lobe tipped by a spine; both the lobe and the spine are greatly developed on the same joint of the second and third legs. Merus of the first leg unarmed, the second and third with two or more spines on both upper and lower distal extremities, and three or four on the middle portion of the lower border. Carpus armed with one spine inferiorly and the propodus with two.

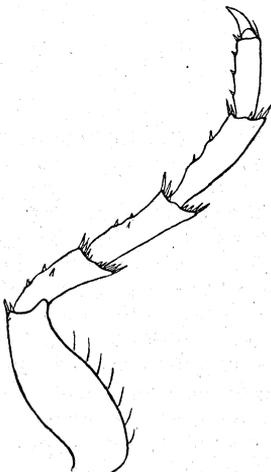
Fourth to seventh pairs of legs very similar. The superior and inferior distal extremities of the ischium, merus and carpus of the sixth are armed with a fringe of from six to twelve spines; the lower borders also carry two or more moderate spines, with one or two small accessory spinules on either side in the same transverse line. A row of similar spines and spinules occurs on the lower border of the propodus. Pleopods densely fringed with longish hairs. Outer ramus of the first pair longer and broader than the inner. Uropods projecting slightly beyond the telson. Outer ramus shorter and much narrower than the inner;



MANDIBLE.
Fig. 20d.



SECOND LEG.
Fig. 20e.



SIXTH LEG.
Fig. 20f.

both rami have their distal borders crenate, spinose and sparsely ciliated.

Total length of body	12	mm.
Length of cephalon	1.5	"
Breadth of cephalon	2.3	"
Length of peraeon	6.5	"
Greatest breadth at the fifth segment ...	4.5	"
Length of pleon	2.3	"
" " telson	2.1	"
" " first leg	3	"
" " sixth leg	6	"

Colour.—Body yellowish-white, uniformly spotted with dark brown.

Four examples were obtained at Station 44 off Coogee Bay, in 49-50 fathoms.

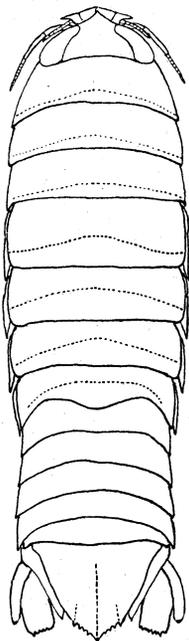
ÆGA ANGUSTATA, sp. nov.

(Fig. 21a-f.)

Station 57.

Body evenly punctate, narrow, elongate, nearly three times as long as broad without the telson. Cephalon more than twice as broad as long, acutely pointed in the middle and evenly rounded at the sides. First segment a little shorter than the cephalon, slightly longer than the second and third, which are equal, and are each as long as the fifth and the sixth; fourth segment much the longest, twice as long as the seventh. Epimera of the first three segments evenly rounded posteriorly, the lower border of each bears a small subterminal lobe; fourth, fifth and sixth subacute; the lower border convex in the anterior half, and straight posteriorly; seventh somewhat obtuse, with the upper and lower terminal borders oblique. Pleon segments subequal in length, the fourth and fifth slightly wider than the first and second; posterior lateral angles short and subacute. Telson broader than long, equal in length to the first four segments of the pleon; the upper surface bears an ill-defined median and a pair of lateral ridges; the latter are confined to the distal fourth, and rather indistinct;

distal border dentate, spinose and sparsely setose. Eyes oblong, separated mesially by a space equal to their width; the ocellæ are visible on the inferior margins of the cephalon.



BODY VIEWED FROM ABOVE.
Fig. 21a.

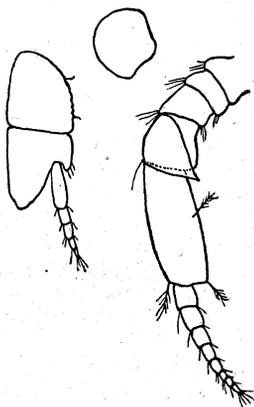
palmar border of hand with a slight setiferous tubercle; dactylus very stout and strongly curved.

Basos joint of third pair of legs more than twice as long as broad; ischium with two spines at the lower distal angle; merus slightly longer than broad, with four spines on the lower border and two at the upper distal angle. Carpus equal in length but a little broader than the propodus; the inferior distal extremity of the latter carries a large finger-like process; the dactylus is curved and somewhat twisted in its distal half, the lower edge

Superior antennæ with the peduncle strongly compressed; the second joint equal in length to the first, produced superiorly into a prominent subacute lobe; third joint very narrow, its length not equal to the width of the second; flagellum subequal to the preceding joint, and consisting of four articulations. Peduncles of second antennæ compressed; first and second joints equal; fourth a little longer than third, with a superior acute lobe directed outwards and backwards; fifth joint equal in length to the four preceding, and as long as the eight-jointed flagellum.

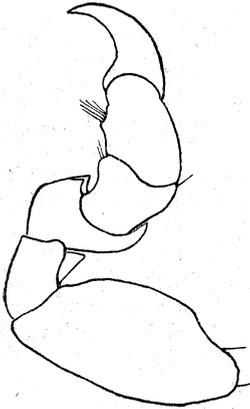
Second joint of the palp of the mandible twice as long as the first.

First pair of legs stout, shorter than the second or third; basos joint twice as long as broad; merus much broader than long;

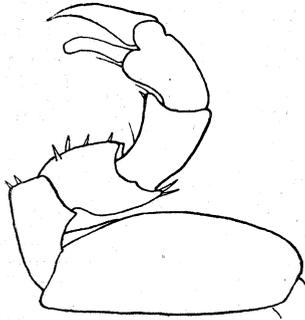


ANTENNAE AND EPISTOMIAL PLATE.
Fig. 21b.

being adapted to the upper border of the process. Structurally the process is similar to that found in *Ega crenulata*, Luken*, but it is much more strongly developed in the species under notice. Fourth to seventh pairs of legs very similar; the sixth has



FIRST LEG.
Fig. 21c.



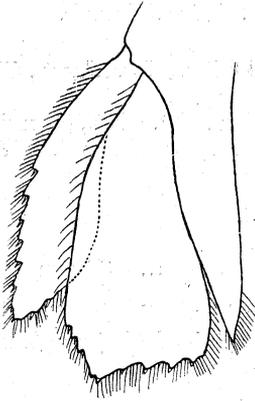
THIRD LEG.
Fig. 21d.

the basos joint a little less than three times as long as broad, with a single spine at the lower distal extremity; ischium joint narrow at the base, and more than twice as long as broad at the summit; lower border with four equidistant spines, the one in the middle being very much larger than the others; upper and lower distal margins fringed with long spines. Merus twice as long as broad, and one-third shorter than the preceding joint; lower border and distal margins armed with spines, some of which are longer than the joint is wide. Carpus longer and much narrower than the merus, armed like the latter, but the spines are fewer and somewhat smaller. Propodus longer than the carpus, its greatest breadth is at the distal extremity, and is about one-sixth of its length; the lower border carries three spines, two near the middle, and one distal. Dactylus slender, curved thrice as long as the breadth of propodus.

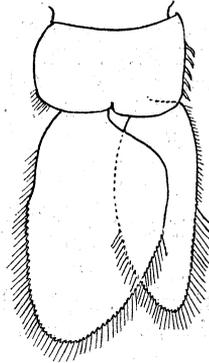
Inner border of peduncle of first pleopods armed with four or five strong curved spines. Outer ramus very broad towards the base; lateral margins slightly converging from about the middle to the obtusely rounded apex; inner ramus shorter than the outer, more than twice as long as broad, truncated at the inner base, and subacute at the apex.

* Sars.—Crust. Norway, ii., 1897, p. 61, pl. 25, f. 3.

Uropods shorter than the telson ; outer ramus narrow, subacute, serrate, spinose and ciliate ; inner ramus becoming wider towards the truncate-serrate extremity.



LEFT UROPOD.
Fig. 21e.



FIRST PLEPOD.
Fig. 21f.

Total length of body	...	...	...	15 mm.
Breadth	...	...	...	4.5 "

A single example was obtained off Wata Mooli, in from 54-59 fathoms.

Family CYMOTHOIDÆ.

NEROCILA, *Leach*.

NEROCILA LATICAUDA, *Schiodte and Meinert*.

Nerocila laticauda, Schiodte and Meinert, Monogr. Cymothoarum, 1879, p. 81, pl. vi., figs. 14-15.

Stations 13, 37 and 42.

Five examples of this well marked species are in the collection.

The first antennæ are longer and stouter than the second ; the latter have nine joints and the former eight.

The body exhibits three longitudinal brown bands, one median and two lateral.

Off Cape Three Points, Wata Mooli and Botany, in 41-78 fathoms.

LIVONECA, *Leach.*LIVONECA RAYNAUDII, *H. Milne-Edwards.*

Livoneca raynaudii, H. Milne-Edwards, Hist. Nat. Crust., iii., 1837, p. 262.

Livoneca novæ-zealandicæ, Miers, Ann. Mag. Nat. Hist., (4) xvii., 1876, p. 228. Miers, Crustacea of New Zealand, 1876, p. 106.

Stations 2, 38, 42.

Total length of large specimen	...	...	38 mm.
" " small "	...	...	17 "

Seven examples of this species were obtained off Cape Three Points, Jibbon, and Wata Mooli, in 32-78 fathoms.

Family SEROLIDÆ.SEROLIS, *Leach.*SEROLIS TUBERCULATA, *Grube.*

Serolis tuberculata, Grube, Archiv. f. Naturgesch., 1875, p. 227, pl. v. Beddard, Chall. Report, Zool., xi., 1884, p. 67, pl. vi., figs. 1-2.

Station 33.

The specimen is about one-third less than the "Challenger" example from Bass' Strait, and differs considerably in the surface sculpture. This, however, may be due to age. The cephalic shield exhibits thirteen tubercles; five form a transverse row between the anterior margin of the eyes, and there are two longitudinal submedian rows of four each, arranged in curved lines, the first and last pairs being wider apart than those in the centre. A median dentiform tubercle is present on the posterior border of the shield; in size it is equal to the largest of the median processes of the peraeon. The mesial pleon tubercles bear several smaller tubercles on each side. The epimeral processes and the inner rami of the uropods carry three or four small tubercles. The telson exhibits numerous flat, scale-like bodies; the central keel has six or more on each side, and there is a very distinct series of about fourteen arranged transversely

in a line with the insertion of the uropods; posterior to this line the telson is thickly studded with scales, and towards the sides they are subimbricate.

The postero-lateral angles of the first, second, third and fifth epimera are in close contact with the antero-external surface of the next following.

The flagellum of the first antenna consists of fifty-six articulations and the flagellum of the second of seventeen.

Length of specimen	...	...	...	...	14 mm.
Breadth	„	...	...	...	11 „

A single male example was obtained in the Newcastle Bight at a depth of 24-27 fathoms.

SEROLIS AUSTRALIENSIS, *Beddard*.

Serolis australiensis, Beddard, Chall. Rep., Zool., xi., 1884, p. 69, pl. vi., figs. 3-8.

Station 36.

The incubatory pouch contains numerous young in various stages of development, varying from 2 to 3 mm. in length. The cephalon is quite distinct, and the forwardly directed lateral processes of the first peraeon segment are situated at some distance from sides of the cephalon. The eyes are marginal and exhibit a sharp posterior inward curve marking the juncture of the cephalon with the peraeon.

Total length of adult female	...	...	...	18 mm.
Breadth	„	„	...	13 „

A solitary female example of this species was procured off Botany Bay, in 20-23 fathoms.

SEROLIS ELONGATA, *Beddard*.

Serolis elongata, Beddard, Chall. Rep., Zool., xi., 1884, p. 71.

Station 13.

A single much damaged male of this species is in the collection. It was obtained off Cape Three Points in 41-50 fathoms. The specimen is 8 mm. in length and 5 mm. in breadth. It fully agrees with the description and bears a striking resemblance to *Serolis australiensis*, but is much smaller, less granulose, and longer in proportion to its width.

SEROLIS PALLIDA, *Beddard*.

Serolis pallida, Beddard, Chall. Rep., Zool., xi., 1884, p. 75, pl. vii., fig. 1; pl. viii., figs. 6-16.

Station 13.

One adult male of this species was obtained off Cape Three Points, in 41-50 fathoms.

Total length	...	...	...	...	...	11 mm.
Breadth	...	...	...	...	...	8 ,,

SEROLIS LONGICAUDATA, *Beddard*.

Serolis longicaudata, Beddard, Chall. Rep., Zool., xi., 1884, p. 72, pl. vii., figs. 8-10; pl. viii., figs. 1-2.

Station 38.

A single female example was obtained off Jibbon, in 46-55 fathoms.

Total length	...	...	...	...	...	4.2 mm.
Breadth	...	...	...	...	...	3.9 ,,

SEROLIS MINUTA, *Beddard*.

Serolis minuta, Beddard, Chall. Rep., Zool., xi., 1884, p. 72, pl. vii., figs. 2-6.

Station 38.

Of this species a single male example was obtained off Jibbon, at a depth of 44 to 55 fathoms.

Total length	...	...	...	...	...	4.5 mm.
Breadth	...	...	...	...	...	4 ,,

Family SPHÆROMIDÆ.CASSIDINA, *H. Milnes-Edwards*.

CASSIDINA LATICAUDA, sp. nov.

(Figs. 22a-e.)

Stations 44, 48, 55.

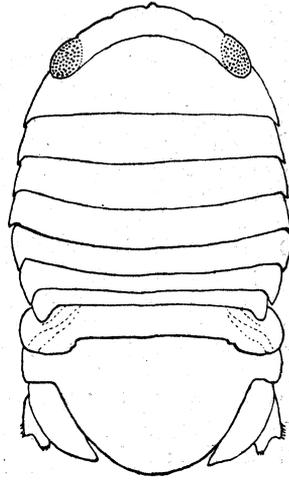
Body moderately convex from side to side, closely and minutely punctate, glabrous, smooth and glossy. Very broad in proportion.

to its length, the ratio being 6·7 : 11. Cephalon strongly deflexed in front, three times as broad as long. Frontal margin bisinuate, with a short median rostriform process, apically rounded, and a little longer than broad. First peraeon segment equal in length to the cephalon and basal antennal joints combined. Second and third a little more than half the length of the first; the fourth, fifth, sixth and seventh gradually decreasing in length; the fourth is half and the seventh one-sixth the length of the first. Epimeral processes of the first three segments directed slightly backwards with thickened margins, oblique sides and somewhat obtuse extremities. Epimera of the fourth segment gradually narrowing to a subacute point; the posterior border is straight, the anterior oblique; the epimera of the three remaining segments are broader distally and less inclined backwards than the three preceding, and the extremities are more obtusely rounded. First pleon segment a little shorter than the fourth segment of the peraeon, lateral margins broad and evenly rounded; the lines of the coalesced segments are very faintly indicated. Telson nearly twice as broad as long, upper surface strongly convex and smooth, the distal border wide and evenly rounded. Inferiorly the sides are folded and longitudinally ridged.

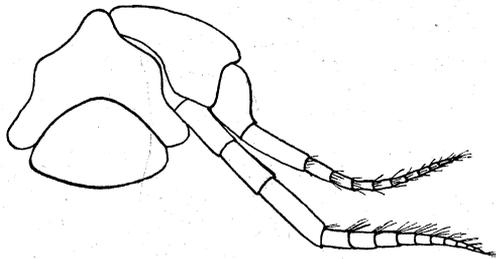
Eyes oval, very dark brown in colour.

Superior antennae having their inner bases separated above by the frontal process and below by

the apex of the epistomial plate, basal joint equal in length to the two following combined. Flagellum with ten articulations,



BODY VIEWED FROM ABOVE.
Fig. 22a.



FRONTAL REGION AND ANTENNAE.
Fig. 22b.

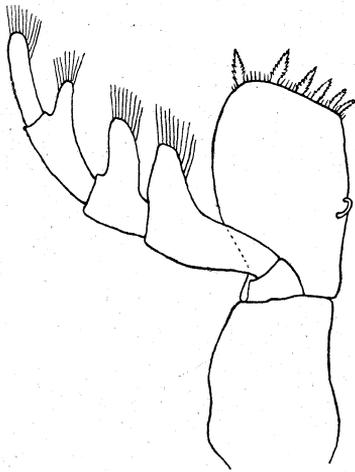
much shorter than the peduncle, each joint distally encircled with short setæ.

Inferior antennæ having the first three joints subequal, the fourth much the longest. Flagellum consisting of ten joints, about equal in length to the first three joints of the peduncle; the summits of the joints are furnished with numerous long tufted hairs.

Body of mandible stout, bent inwards at about the upper third, cutting edge strongly dentate, subtended below with twelve or more curved denticulated spines, molar tubercle well developed, with a subterminal fringe of short spines. Palp short, with three subequal joints.

Outer lobe of first maxillæ armed at the apex with about ten strong, curved, denticulated spines, which are longer than the width of the lobe. Inner lobe about half the size of the outer, furnished at the obliquely truncated summit with four stout, pectinated spines.

Second maxillæ with three lobes, each about twice as long as broad, nearly equal in length and breadth; apices truncated, the outer pair



RIGHT MAXILLIPEDE.
Fig. 22c.



FOURTH LEG.
Fig. 22d.

surmounted with smooth, flat, cultrate spines, whilst the odd inner lobe bears numerous minutely serrated spines and one large pectinated spine.

Maxillipedes with the first joint shorter than the second; the latter is rather broad, truncated distally, and armed with six flat pectinated spines and numerous shorter simple ones; the infolded inner border bears a blunt hook-like process about the middle and four flat spines at the summit.

Superior distal extremities of the second, third, and fourth joints of the palp strongly lobate; the tip of each lobe and of the cylindrical fifth joint is furnished with a number of long simple setæ.

Legs rather slender, the posterior pairs longer than the anterior; basos joint of the first pair as long as the three joints following combined; ischium rather longer than the merus and carpus; propodus equal in length to the two preceding joints and twice as long as the bispinose dactylus; each inferior propodal border of all the legs with four more or less pectinated spines; meral and carpal joints with three or fewer spines on the lower border, and a fringe of large strongly pectinated spines on the distal margin above.

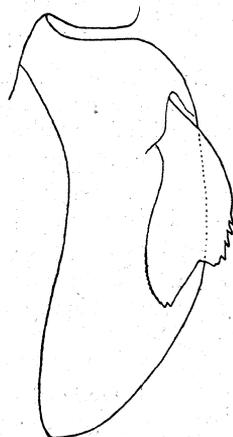
Rami of the first pair of pleopods foliaceous, subequal in size, nearly twice as long as broad; distal and external borders with long plumose setæ; inner ramus rather acutely produced at the outer base.

Uropods not reaching to the end of the telson; fixed joint subfalcate, twice as long and broad as the mobile ramus; the latter has four denticles on its outer border and two at the distal extremity.

Colour in spirits pale cream.

Fourteen examples obtained off Coogee, Wollongong, and Crookhaven River, at depths varying from 11 to 56 fathoms.

Total length of larger example	...	...	11 mm.
Breadth	„	„	6.5 „



UROPOD.
Fig. 22c.

CASSIDINELLA, gen. nov.

Body oblong, convex, less than twice as long as broad, with the segments laterally incised, some of which are quite distinct and separated from each other. Cephalon dorsally short and produced vertically downwards in front. Segments of the

peraeon unequal, the first much the longest. Epimera acute, widely separated from each other, and their union with the lateral tergal margins indistinct. Pleon much narrower than the peraeon, consisting of two segments, with well developed epimera on the first of the coalesced segments. Terminal segment large, with a lateral pair of epimera-like processes and a tridentate distal border.

Eyes round, widely separated, lateral and prominent.

Superior antennæ with the basal joints dilated; the flagellum shorter than the peduncle.

Inferior antennæ with a slender cylindrical peduncle, a little shorter than the flagellum.

Mandibles stout, cutting edge terminating in two or three blunt denticles, subtended below with a tuft of simple spines. Molar tubercle broad, short, with a few subterminal spines.

Palp three-jointed.

Anterior maxillæ with the masticatory lobe somewhat narrow, tipped with curved simple spines; basal lobe furnished at the apex with four unbranched filaments.

Posterior maxillæ three-lobed, the masticatory lobe rather broad and carrying numerous pectinated spines at the summit; paired lobes narrow, surmounted apically with simple spines.

Maxillipedes slender, basal part rather narrow; masticatory lobe with a blunt curved filament on its inner border and a series of pectinated spines at the summit; palp consisting of five joints, the first short, second to fourth each with a large superior setiferous lobe, fifth subcylindrical and apically setose.

Anterior pair of legs shorter and stouter than the posterior; dactylus of all the pairs with a small secondary subterminal claw.

Pleopoda foliate; all except the last pair densely ciliate.

Uropods short, with the mobile ramus minute.

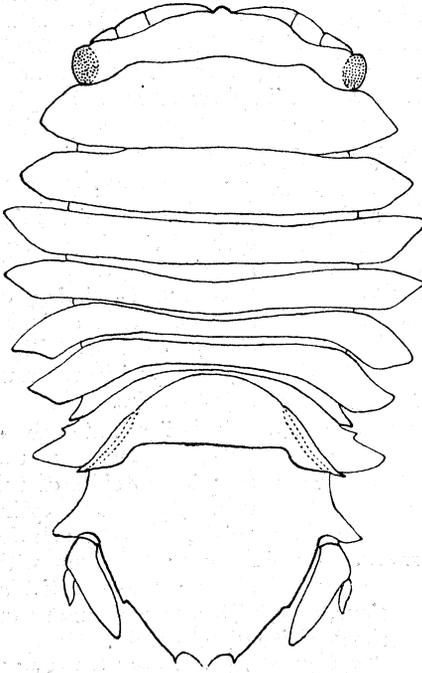
CASSIDINELLA INCISA, sp. nov.

(Figs. 23*a-g*.)

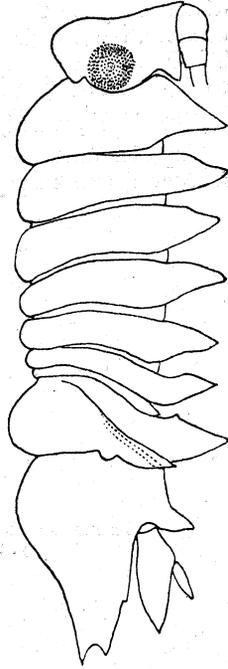
Station 55.

Body less than twice as long as broad, narrowing rather rapidly from the fifth peraeon segment to the end of the telson. Central region of segments transversely and longitudinally convex.

Cephalon from the dorsal aspect about five times broader than long; viewed from the side the front is nearly vertical, as long



BODY VIEWED FROM ABOVE.
Fig. 23a.



BODY VIEWED FROM THE SIDE.
Fig. 23b.

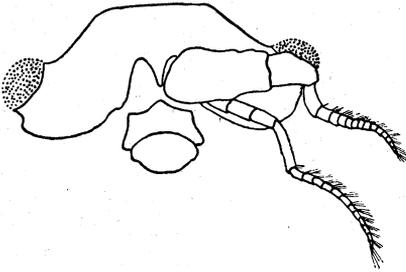
as the succeeding segment, and is slightly concave in front of the eyes. A small frontal median process separates the inner bases of the first antennæ; it is bounded on each side by a deep sinus; the lateral frontal borders are evenly rounded. First segment of the peraeon nearly as long as the two following; second to sixth gradually becoming shorter, seventh segment very short. Third, fourth and fifth segments more or less separated from each other throughout their breadth; first and second separated at the sides; the sixth and seventh have their opposed borders of the terga in contact throughout their breadth. Epimera widely separated from each other, all more or less acute. The lines of union between the terga and epimera are very ill-defined.

The anterior portion of the pleon exhibits slight lateral traces of three segments, the first having a large epimeral process with a small denticle on the base of the anterior border.

Telson strongly convex above superiorly and about one-third the length of the body, with a projecting bracket-like lobe on each side, at about the anterior third; posteriorly the sides are converging and bear a pair of small denticles and three somewhat larger at the extremity; the median denticle extends a short distance beyond the lateral ones. Inferiorly the telson is strongly concave, the margin is slightly thickened but not folded inwards. The last pair of pleopods is operculate in character and adapted to the walls of the telson.

Eyes black, round, and very prominent.

Superior antennæ with the first two joints dilated; the first is curved and nearly twice as long as the second; third joint cylindrical, geniculate and shorter than the second; flagellum consisting of about thirteen articulations, each furnished superiorly with numerous slender hairs.



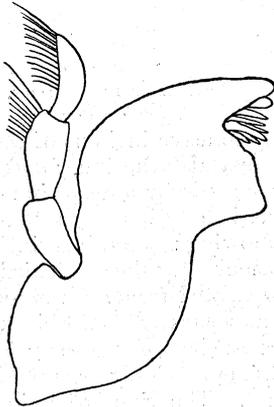
FRONTAL REGION AND ANTENNAE.
Fig. 23c.

Inferior antennæ a little longer than the superior. Joints of the peduncle narrow, cylindrical, the last much the longest; flagellum with about twelve articulations, each with a few short setæ on the superior distal border.

Mandibles stout, cutting edge with two or three obtuse teeth, and a tuft of simple spines at the base; molar tubercle large, but not well defined, with a few indistinct subterminal spines. Palp consisting of three subequal joints.

First maxillæ as long as the mandible; outer lobe about five times as long as broad, tipped with ten stoutish curved spines; inner lobe very narrow, nearly equal in length to the outer, furnished at the summit with four blunt spines, the inner pair being longer and stouter than the outer.

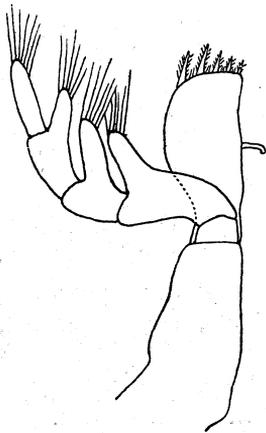
The second maxillæ have the paired lobes narrow, about four times as



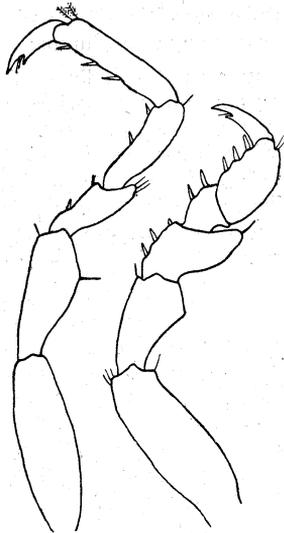
MANDIBLE.
Fig. 23d.

long as broad, their apices carry a few simple acute setæ; the odd lobe is proportionately broad, and has a few marginal hairs and many stoutish pectinated setæ at the oblique distal extremity.

Maxillipedes slender, the basal portion about equal in length but slightly narrower than the distal lobe; the latter has a strongly recurved inner margin, which bears about the middle a single curved blunt seta; the apex of the lobe carries eight stout pectinated setæ, of which three are on



MAXILLIPEDE.
Fig. 23e.



FIRST AND FIFTH LEGS.
Fig. 20f.

the recurved portion of the distal margin; basal joint of palp short; second to fourth joints with a long superior seta tipped lobe; fifth joint cylindrical, surmounted with setæ, longer than the fourth, and about two-thirds as long as the second.

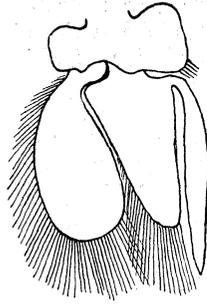
First pair of legs stout, shorter than those succeeding; basos joint as long as the two following joints combined; ischium longer than the merus, the superior border angulated above the middle. Merus broader than long, with three stout spines on the inferior border. Carpus very short, equal in length and breadth, with two spines on the lower border. Propodus nearly twice as long as broad, and almost equal in length to the ischium; upper border evenly curved, lower with three spines. Dactylus slightly curved, shorter than its supporting joint, with a short subterminal spine, and one or two setæ.

Second to seventh pairs of legs very similar. The fifth pair of legs has the second to the fourth joints proportionately like those of the first, except that they are more slender, and the ischium has a stout seta on the superior angles, and two instead of three spines on the inferior border.

Carpus a little shorter than the ischium, and much shorter than the propodus; the latter joint bears three spines on the lower border and the former two; the distal extremities of the joints frequently bear one or more plumose setæ.

Inner ramus of first pair of pleopods elongate and subtriangular. Outer ramus narrowly obovate. Rami of succeeding three pairs slightly larger and broader. The inner rami of the second pair are each furnished with a fusiform stylet, about one-third longer than the ramus.

Uropods rather small, arising from bracket-like processes, situated at about the upper third of the lateral margins of the telson. Fixed ramus three and a half times as long as broad, and half as long as the telson, equally tapering from the distal third to the acute extremity. Mobile ramus minute, slightly curved, narrow and acutely pointed, its length equal to the breadth of the fixed branch.



SECOND PLEPOD.
Fig. 23g.

Total length	...	...	...	...	...	8 mm.
Breadth	...	...	...	...	...	4 „

One specimen obtained off Crookhaven River, in 43-66 fathoms.

[These corrections were printed 5 September 1914 in Part 18 of Memoir IV at p.[xiii], they relate to other Parts of Australian Museum Memoir IV as follows:
"Page 245" refers to p. 245 in Part 3. Whitelegge. Crustacea. Part II. Isopoda. Part I
"Page 305" refers to p. 305 in Part 5. Hedley. Mollusca. Part I. Brachiopoda and Pelecypoda
"Page 441" refers to p. 441 in Part 8. Leighton Kesteven. The anatomy of Megalatractus
"Page 480" refers to p. 480 in Part 9. Whitelegge. Sponges. Part I (note that Plate xlv is printed in Part 10)—Sub-Editor, April 2009]

CORRECTIONS.

Page 480—*DENDORYX PUMICEA*—*after* Plate xlv., fig. 15, *read*
and Plate xlv., fig. 24.

Page 245—*for* fig. 20*f*, *read* 23*f*.

Page 441, line 16—*for* pericardial, *read* nephridial.