

The appendages on 7th sternum of thorax are stout, blunt, but becoming attenuated in older specimens.

The 1st pleopod has a narrow endopod not quite twice as long as broad with a strong ridge on the inner margin, the exopod is about as long as the endopod with a small proximal outstanding spine. Peduncle with 3 coupling spines on inner side and furry hairs on the outer.

The endopod of the 3rd pleopod has 3 or 4 distinct branchial folds; the exopod has a very oblique division ending inwardly with a small emargination.

Exopod of 4th pleopod carries 16 long plumose setae on the distal margin; the endopod carries 6 similar setae.

The uropods are robust; the inner ramus truncate at the end with a slight insinuation of the margin, the outer ramus is a little shorter with distal and inner margins serrate.

The female resembles the male with an end of abdomen slightly broadly rounded. The mouth parts are unmodified with the brood in the body. In another specimen there were marsupial plates meeting medianly.

Some specimens were presented by Mr. M. Ward, Sydney, to the South Australian Museum. Others in the collection of the Australian Museum are from Nelson's Bay, Port Stephens, New South Wales.

#### *Neosphaeroma* (?) *pentaspina*, n. sp.

Pl. li., figs. 1-5.

The body is rather broad and rather flat, glabrous, integument obscurely areolate like sand grains. Head narrow and short, first 4 segments of thorax not differing much in length, 3 remaining ones becoming shorter; all the epimera reaching downwards to about the same level, as also do the side plates of the anterior division of abdomen. Anterior division of abdomen short, the coalesced segments almost becoming free at their lateral extremities. The posterior division also is rather short, evenly arched, or domed; the posterior margin is rounded obtuse.

The antennule is short, its 1st joint scarcely produced at the posterior distal angle, 2nd joint about half the length of the 1st, 3rd joint a little longer than the 2nd, flagellum of 14 very short joints. In the antenna the peduncular joints are short, the 5th bears a small longitudinal row of setules, flagellum of 15 short joints.

Epistome much shorter than in many species of *Exosphaeroma*, its apical portion retiring towards the rostral region, its lateral limbs retiring and becoming attenuate.

The left mandible has the incisory plate rather short, robust, 4-toothed, the secondary plate is tridentate, the spine row is represented by a brush of setae united at the base. The molar and palp are strong.

The inner branch of 1st maxilla has 4 feather-form curved setae, the outer branch with 6 or 7 curved teeth, the outer ones pectinate. The three plates of the second maxilla are well marked, setose, and reach the same level. The maxilliped has a rather broad distal plate to the second joint, it is distally well spined, and has a row of feather setae on the inner fold. The palp is large, the lobes of joints well supplied with setae, there are no conspicuous setae on the distal ends of posterior margins of 3rd and 4th joints.

1st leg short, robust, basos with tuft of setules behind near proximal end, ischium with long setae, some of which are feather-form, merus with posterior process bearing long setae, also setose distally, carpus and propodus also provided with long fine setae, dactylus short, 2-clawed. 7th leg long, sparsely spined on setose. The pleopods are broad and large, the 1st has a rather narrow endopod with slight fold on inner margin, exopod broad with 5 conspicuous outstanding

spines near the outer proximal angle, peduncle with 4 slender coupling spines. 2nd pleopod with rather thick *appendix* reaching beyond the end of endopod. In the 3rd pleopod both exopod and endopod are broad, the exopod has the distal division occupying about one-third of the whole lamina. The 4th pleopod has well-developed plumose setae on both exopod and endopod. The exopod of 5th pleopod broadly rounded distally with one outstanding shagreenate apical lobe, another not outstanding lower down on the distal division, while just below is a smaller lobe on the proximal division.

The uropods are lamellar, the inner ramus reaching to end of abdomen, the endopod is shorter, distally rounded.

The specimens (2 males) were received dry, consequently the branchial folds of the pleopods were destroyed. My reason for placing the species in *Neosphaeroma* (?) is on account of the fringed state of the 4th pleopod rami.

Length, 10 mm.; breadth, 7 mm.

Locality, off coast of New South Wales. Presented by Mr. M. Ward, of Sydney.

Type in South Austr. Mus., Reg. No. C. 1054.

### *Isocladus howensis*, n. sp.

Pl. 1., figs. 7, 8.

The body is short, glabrous, obscurely granular on the abdomen. Head short. 1st segment of thorax a little longer than those which follow, except the last, which has a long process reaching to the extremity of the abdomen; there is a small tubercle on each side of this. The eyes are of moderate size. The epimera are abruptly turned in the vertical direction, the last being a little deeper than those preceding. The anterior division of the abdomen is hidden by the 7th segment of thorax, the posterior division is moderately domed and tapers to an obtuse point, while below there is a shallow exit or channel to the cavity of the abdomen.

The epistome is long, rounded anteriorly, and rather tumid, the upper lip is large and distally squared or truncate. The 1st antennular joint is short, the 2nd a little longer than usual, the 3rd subequal to it in length, the flagellum has 10 joints. The antenna is robust with a flagellum of 10 joints. The mandibles have incisory plates entire, the left has a secondary plate bifid and as large as the primary, the molar process is large. The legs are robust, sparsely spined, but with furry pads on the usual joints.

The 2nd pleopod has an *appendix* reaching beyond the lamina of the endopod; this is not much longer than broad, and is very convex on its outer margin. The exopod is about the same length, is very narrow at base, with the distal fringe of setae long. The 3rd pleopod has a broad endopod exceeding the exopod slightly in length, the exopod is also broad, the division being nearer the middle than the distal end. The exopod of the 4th pleopod has a few distal setae and some setules on the outer margin; the endopod has a distal shallow insinuation and an apical setum. The exopod of the 5th pleopod has 2 distal outstanding lobes, the others obscure.

The uropods are moderate in size, rather thick, reaching further than the end of abdomen; the rami are subequal, the outer rather sigmoid in shape.

Length of male, 5 mm.

The female is without dorsal process, has a more domed and less produced posterior division of abdomen, with 2 small submedian tubercles. The uropods are much smaller than in the male.

The two specimens are from Lord Howe Island, found under stones, collected by G. P. Whitley. The type is in the Australian Museum, Sydney.

This species is very near to *I. armatus*, Ml. Edw. (see Tattersall, Brit. Ant. Exp., p. 217, pl. vi., figs. 9-17).

## ISOCLADUS (?) LAEVIS, Haswell.

Pl. 1., figs. 9-12.

*Sphaeroma laevis*, Proc. Linn. Soc. N.S. Wales, vol. 5, pl. 16, p. 473.This is probably the female of a species of *Zuzara* or *Isocladus*.

The posterior end of abdomen is somewhat produced; there is an insinuation in the vertical direction below, but no notch or channel of any definiteness.

The mandibles are normal (though the female examined seemed post ovigerous), incisory plates entire, molar large.

The 2nd joint of the antennular peduncle is rather large, about half as long as the 1st, the 3rd is equal to the 2nd in length. The flagellum has 9 joints. The peduncular joints of the antennae are laterally compressed with 2 stiff bristles at the distal end of the 5th. The flagellum has 9 or 10 joints, which are long. The epistome is elongate.

The maxilliped has the lobes of 2nd, 3rd, and 4th joints of palp rather short, and a long setum is situated at the posterior angle of the 2nd and 3rd joints, as seen in *Z. venosa*, Stebbing.

The legs are strongly spined.

The pleopods have short rami as a whole. In the 1st the endopod is broader than long, the exopod with rather long outstanding spine; there are 3 or 4 coupling spines on the inner angle of peduncle. In the 2nd pleopod the endopod is rather longer than broad and very convex on the outer margin. The 3rd pleopod has a similar endopod, distally obtuse; the division on the exopod is quite near the middle. The exopod of the 4th pleopod has the division near the end, and a few plumose setae. Exopod of 5th pleopod also with a division.

The rami of uropods are laminate, narrow, obtuse distally, subequal, not reaching quite to end of abdomen.

Two examples from Bondi beach, New South Wales.

Length, 6 mm., of larger specimen.

## CYMODOCE GAIMARDII, Ml. Edw.

Pl. xlii., fig. 2.

*Sphaeroma gaimardii*, Ml. Edw., Hist. Nat. Crust., t. iii., p. 209.

There are several representatives of this fine species in the collection. As it does not seem to have been figured, I have illustrated an example which is probably a young male.

The first 3 pairs of legs are somewhat more robust than those which follow. The epistome is tumid anteriorly; the two basal antennular joints almost touch at its apex, but further forward are separated by the small pointed rostrum.

The female (non-ovigerous) is like the male, but the posterior notch is not so deeply cut either in transverse or vertical direction, and the median process is distally rounded instead of square cut as in the male.

Length of male, 25 mm.; breadth, 14 mm.

This seems to be a southern species, it has been collected at Port Phillip (F. E. Grant) and by Professor Cleland at Encounter Bay, South Australia. It has been also reported from Tasmania and Gulf St. Vincent, South Australia. There is a small variety of this species.

## CYMODOCE ASPERA, Haswell.

Pl. xlii., fig. 1; pl. xl., figs. 9-11.

*Sphaeroma aspera*, Proc. Linn. Soc. N.S. Wales, vol. v., pl. 16, p. 472.*S. aspera*, Richardson, Proc. U.S. Nat. Mus., 1909, vol. 37, p. 94.

The body is thick-set and broad. The head is short, steeply declivous in front, with a dorsal slight prominence and a few small tubercles. The eyes are

moderately large. The segments of thorax are also obscurely tuberculate on posterior margins; these segments become much shorter behind the 1st. The epimera have a downward direction, the more anterior ones more acute. The anterior division of abdomen has two submedian tubercles or prominences behind. The posterior division has two bosses, which are clear cut on the sides; there are two small tubercles below each, then it tapers to an obtusely pointed end with a slight incision on each side, below there is a deep channel in the vertical direction.

The epistome is prominent at its middle third, recedes anteriorly, the upper lip is large.

The 1st antennular joint is broad with a small sulcus near the distal end; the flagellum has 10-12 joints, as also has the flagellum of the antenna.

The mandibles have the incisory plates entire and strongly chitinised. On the left mandible the secondary plate is well developed, the molar process is strong.

The maxillipeds have a rather narrow basal portion, the palp has long lobes.

The legs are slender, of usual pattern, and sparsely spined.

The endopod of the 1st pleopod is at base a little shorter than its length. The exopod has a projecting spine at its outer proximal angle. The endopod of the 2nd pleopod is slightly insinuate on its outer margin; this feature is more pronounced on the endopod of the 3rd pleopod. Two small plumose setae are at the distal end of exopod of the 4th pleopod, and its much thickened endopod has distally a semicircular notch. The exopod of the 5th pleopod has two projecting setuliferous lobes on the proximal division and three on the distal, and is ciliate on its outer margin.

The uropod is slightly fringed with hair, the rami do not reach nearly to the end of abdomen, the inner ramus is rather broad and distally truncate, the outer is much smaller and is umbonate at the end.

There is in the collection a specimen of 6 mm. and another of 11 mm. by 7 mm.; the larger is not nearly so tuberculate.

The male is unknown.

The specimens are from Shell Harbour, New South Wales, collected by G. McAndrew, July, 1923.

#### CYMODOCE ACULEATA, Haswell.

Pl. xl., figs. 7, 8.

*Cymodoce aculeata*, Haswell, Cat. Austr. Crust., p. 291.

The body of the male is minutely granular with a thick pubescence towards the posterior end. There is a well-defined ridge across the forehead. The abdomen is highly sculptured, on the anterior division a 1st segment is distinct, as also are the lines indicating the other coalesced segments. There is a transverse row of 6 rather obscure tubercles in the median region, and the hinder margin has two submedian projections. The posterior division of the abdomen has 6 transversely arranged tubercles, and at the end the median process is elevated above the sides of the deep notch; the 3 distal ends here are obtuse and reach the same level.

The 1st joint of the antennular peduncle is short and broad, its hinder distal process not reaching the end of the 2nd joint, which also is short; the flagellum has 15 joints. The antenna is longer, its flagellum has 17 joints.

The epistome is anteriorly rounded and tumid.

The incisory plate of the right mandible is strong and is obscurely bifid or trifid, a spine row is present, and the molar is rather weak.

The legs are well spined and provided with the furry pads on meri, carpi and propodi in each.

The endopod of the 1st pleopod is rather longer than broad, its inner margin has a partial fold forming an open channel, the exopod has a strong outstanding spine, the peduncle has 3 coupling spines on the inner margin and fine hairs on the outer.

On the 2nd pleopod the appendix is straight, slender, and reaches beyond the fringe of the endopod; its base is scarcely bulbous and does not project below over the peduncle.

The 3rd pleopod is large with the exopod divided rather near the end.

The uropod has subequal rami, the inner is obliquely truncated, with a small tubercle near the distal end. The outer ramus is distally acute, its outer margin straight and strongly ridged; there are small teeth on the inner margin. There is a small tubercle on the peduncle.

Length of male, 19 mm.

The female has a much less sculptured abdomen. On the posterior division there are two obscure submedian bosses, and the posterior notch is very much less cut, but with the median lobe projecting a little beyond the sides of notch.

In a tube containing 64 specimens there were no ovigerous females, but young of both sexes were plentiful.

From Jervis Bay, New South Wales.

#### CYMODOCE BIDENTATA, Haswell.

Pl. xl., figs. 4-6.

*Cymodoce bidentata*, Proc. Linn. Soc. N.S. Wales, vol. vi., p. 189.

*C. bidentata*, Cat. Austr. Crust., p. 291.

The sides of the body in the regions of the thorax and abdomen are nearly straight, granulate, and with a rather scanty coarse pubescence, both of which are more pronounced posteriorly.

The head is long, rounded anteriorly where it shows from above parts of the antennules and rostrum when extended. The eyes are moderate, and there is a small oblong indentation on the vertex. The 1st segment of thorax is not much longer than those which follow. The epimera project downwards, the last 3 being wider than the others.

The anterior division of the abdomen has on its posterior border 2 submedian projections, flanked by 2 lateral tubercles, with 2 or 3 on each side more lateral and more obscure, from which spring tufts of longer setae. The posterior division which descends rather abruptly bears 2 tubercles, each nearly under the projections of the anterior portion; below these are two submedian spiniform tubercles turned upwards at their tips, and below these a median spiniform tubercle also upturned. The posterior notch is wide, its median process is lingulate, slightly bifid at the tip, and projects a little beyond the sides of the notch.

The epistome is rather broad, a little tumid anteriorly, with acute apex.

The 1st antennular joint is of moderate length, the 2nd small and partially embraced by the 1st, the 3rd joint is long, the 1st joint of the flagellum is half as long as it; the remaining joints are short and number 18, as also does the flagellum of the antenna.

The mandibles are normal, incisory plates entire, as also is the secondary plate on the left; spine row is well developed.

Maxilliped is rather small, the lobes of palp of moderate length.

The legs are rather sparsely spined, the spines being stronger on 1st pair.

The 1st pleopod has endopod slightly longer than broad, a little insinuate on its inner margin towards the end, with the more proximal part of margin folded inwards. Exopod with proximal outstanding spine turned up at tip, 4 coupling spines are on the inner angle of the peduncle, and the usual furry mass of hair

on the outer side. 2nd pleopod with the *appendix* exceeding the endopod by about half. Exopod of 3rd pleopod with division rather near the end.

The uropods are indurated and thickened, very setose and granular to spinuliform. The inner ramus is large and somewhat sigmoid, terminating in two acute teeth, one of which is subterminal and below. The outer ramus is small and much shorter, also with a terminal and subterminal tooth. There is a small tubercle on the peduncle above.

One male specimen from 100 faths. off Tasmania was collected by Mr. C. Hedley, and is in the Australian Museum, Sydney.

#### CYMODOCE UNGUICULATA, Barnard.

*Cymodoce unguiculata*, Barnard, Ann. S. Afr. Mus., vol. x., pt. xi., p. 394, pl. xxxiv.B.

There are in the collection three immature specimens which appear to belong to this species. They were taken by Mr. H. M. Hale in 5 faths. at Beachport, South Australia, accompanied by a species so close to *Exosphaeroma varicolor*, Barnard, that I hesitate to separate it. It is interesting to note that these two species are from the same locality in South Africa.

#### CILICAEA CRASSA, Haswell.

Pl. xliii., figs. 1, 2.

*Cilicæa crassa*, Proc. Linn. Soc., N.S. Wales, vi., p. 186.

The posterior division of abdomen, including the space between the two bosses, is so steep that it projects beyond the end, and between the two bosses the process of the anterior portion is seen on an inferior view. The end of the abdomen itself is trilobed, the notch widening inwardly; the median process of this is lingulate and directed downwards.

The exopod of uropod is best shown by the figures in two positions.

The legs are robust, the basal (basos) joints of the more posterior ones carry small strong teeth on their posterior margins.

The epistome is short and small.

#### CILICAEA SPINULOSA, Haswell.

Pl. xlii., fig. 4.

*Cilicæa spinulosa*, Haswell, Proc. Linn. Soc. N.S. Wales, vi., 1882, p. 184, pl. iii., fig. 3; *id.*, Cat. Austr. Crust., 1882, p. 297.

*C. spinulosa*, Whitelegge, "Thetis" Scientific Results Isopoda, pt. ii., p. 265.

This species has a very deep posterior notch visible from above with two denticles in it; a median process in this notch is very small.

The epistome is short, small, slightly tumid medianly, with a large labrum.

The body is covered with a coarse pubescence which becomes thicker behind.

The eyes are large and ovate.

The legs are very spinose.

#### CILICAEOPSIS STYLIFERA, Whitelegge.

Pl. xlii., fig. 7.

*Cilicæa stylifera*, Whitelegge, "Thetis" Scientific Results Isopoda, pt. ii., p. 267.

The end of abdomen has a deep exit channel (of a type very common, as will be seen), a median lobe is perhaps very obscurely indicated.

The epistome is short and rather broad with a small obtusely pointed knob on its anterior part which projects obliquely downwards.

The eyes are small, rounded, and prominent.

## CILICAEOPSIS ORNATA, Whitelegge.

Pl. xlii., figs. 3-5.

*Cilicaca ornata*, "Thetis" Scientific Results Isopoda, pt. ii., p. 269.

The end of abdomen has a deep and narrow channel which at its exit is roofed over by the acutely pointed end.

The epistome is similar to that of *C. stylifera*, except that the pointed knob is more evident and projects forward. The spiniform tubercles are well disposed in transverse rows.

The eyes are small and rounded.

***Cilicaeopsis obesa*, n. sp.**

Pl. xlii., figs. 8-11.

The body is ovate, glabrous except on uropods, and very convex in both directions. The segments of thorax are about the same length, except the 1st. Viewed from above when the animal is stretched out the head shows a slight rostral prominence; this is excavated and wide, separating the two basal joints of the antennules. There is a transverse ridge on the forehead. The eyes are moderately large.

The anterior division of abdomen is long and shows the sutures of suppressed segments plainly; the posterior margin is broadly arched. The posterior division is dome-shaped, has a very faint prominence medianly, and a steep descent to near the posterior end, which again shelves off a little, the margin having a small  $\Delta$ -shaped notch visible from above and also a broad and similar shape in the vertical direction. The epimera are marked off by distinct sutures; that of the last segment is shorter than the rest.

The epistome is short and broad.

The basal antennular joint is scarcely excavate distally to receive the 2nd joint, the 3rd joint is rather long. Flagellum of 6-8 joints. Antenna with flagellum of 10 joints.

Mandible—right—with incisory plate rather slender; there are 6 curved spines, a molar strong and prominent, and small palp.

The maxilliped has the palpal joints with long lobes nearly as in *Cymodoce tuberculosa*, Stebbing.

The legs are strong and well spined in the 1st pair, the dactyli are stronger than in those following.

The pleopods are broad. The 1st has the endopod broader than long. The exopod, which is narrow, has the inner distal angle almost a right angle, and it has an external projecting spine at the base. Peduncle with 3 obscure coupling spines and the usual dense hairs on the outer side. The 3rd pleopod has a broad endopod a little insinuate on the inner margin and distally truncate. The exopod also is broad with division not so near the end as in *Paracilicaca stebbingi* and others. The exopod of the 4th is also broad, that of the 5th much narrower; this is mostly covered with setules at the distal end with one lobe projecting more, the lobe on the proximal division also projects.

The uropod is much reduced with short inner ramus as in most species of *Cilicaca*. The exopod is expanded, thickened, short, and covered with small teeth which become spiniform on the margin with small hairs between them.

This description is taken from a non-ovigerous female; in an ovigerous female the mouth parts are modified and the marsupial laminae overlap.

Length, about 9 mm.

Several females from Shell Beach, New South Wales; the type <sup>couplings</sup> are in the Australian Museum, Sydney. <sup>curly mass of hair</sup>