

AUSTRALIAN CUMACEA.

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(Contribution from the South Australian Museum.)

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This paper deals, in the main, with Cumaceans taken by Sir Joseph Verco, Dr. Robt. Pulleine, the late Mr. Edgar R. Waite, and the writer; these are now in the South Australian Museum collection. Few species of the order have been recorded from Australia. G. O. Sars⁽¹⁾ described three members of the genus *Cyclaspis* taken by the "Challenger," and C. Zimmer⁽²⁾ named thirteen species secured by the Hamburg Expedition to South-western Australia, and by Dr. Mjoberg's Swedish Expedition. With the few additions now made only twenty-five identified species may be listed from our waters; all but one of the new species were dredged off the coast of South Australia.

In his invaluable review of the Cumacea of the world Stebbing⁽³⁾ recognized twenty-six families, no fewer than sixteen of which were erected by him; thirteen of the last include only one genus, and the same number less than half a dozen species. Stebbing⁽⁴⁾ himself admits the weakness of some of the families, and I agree with Calman⁽⁵⁾ that the establishing of these new divisions is undesirable for the present. There is no doubt that a great number of new species must be still undescribed, and as these become known there is a probability that, under Stebbing's artificial arrangement, there will be a tendency to further isolate closely linked genera in different families. If, on the other hand, newly discovered forms, with their attendant complications, are distributed amongst the already erected families, there is indication that it will be exceedingly difficult to retain worthy and distinctive differences between certain of the last-named.

The species at present known from Australian seas are as follow:—

Family BODOTRIIDAE.

- Cyclaspis australis*, Sars. Port Philip, Victoria.
- C. pusilla*, Sars. Flinders Passage, North Australia.
- C. exsculpta*, Sars. Flinders Passage, North Australia.
- C. supersculpta*, Zimmer. Off Cape Jaubert, North-western Australia.
- C. candida*, Zimmer. Off Cape Jaubert, North-western Australia.
- C. mjobergi*, Zimmer. Off Cape Jaubert, North-western Australia.
- C. bovis*, n. sp. South Australia.
- C. tribulis*, n. sp. South Australia.
- C. spilotes*, n. sp. Gulf St. Vincent, South Australia.
- Eucoma agrion*, Zimmer. Fremantle, Western Australia.
- Vaunthomsonia* (?) *australiae*, Zimmer. Off Cape Jaubert, North-western Australia.
- Leptocuma pulleini*, n. sp. Encounter Bay, South Australia.
- Symphodomma africanum*, Stebbing. Gulf St. Vincent, South Australia.

(1) Sars, Rep. Voy. "Challenger," xix., 1887, pp. 12-20, pl. i.

(2) Zimmer, Fauna Südwest Austr., v., 1914, pp. 175-195, figs. 1-18, and Kungl. Svenska Vet.-Akad. Hand., lxi., 1921, pp. 4-13, figs. 1-16.

(3) Stebbing, Das Tierreich. Lief., xxxix., 1913.

(4) Stebbing, Ann. S. Afr. Mus., x., 1912, p. 134.

(5) Calman, Proc. U.S. Nat. Mus., xli., 1912, p. 608.

Family NANNASTACIDAE.

- Cumella hispida*, Calman. Sharks Bay and off Fremantle, Western Australia.
C. michaelsoni, Zimmer. Sharks Bay, Western Australia.
C. gibba, Zimmer. Sharks Bay, Western Australia.
C. cyclaspoides, Zimmer. Sharks Bay, Western Australia.
Nannastacus nasutus, Zimmer. Sharks Bay and off Albany, Western Australia.
N. nasutus var. *camelus*, Zimmer. Off Albany, Western Australia.

Family DIASTYLIDAE.

- Dic lasiodactylum*, Zimmer. Off Geraldton, Western Australia.
Gynodiastylis hartmeyeri, Zimmer. Sharks Bay, Western Australia.
G. similis, Zimmer. Sharks Bay, Western Australia.
G. truncatifrons, n. sp. Gulf St. Vincent, South Australia.
G. turgidus, n. sp. Robe, South Australia. ..
Anchicolurus waitei, n. sp. Robe, South Australia.
Leptostylis vercoi, n. sp. Geographe Bay, Western Australia.

Family BODOTRIIDAE.

CYCLASPIS, Sars.

The listed Australian species may be separated by the character of the carapace alone, but it should be noted that both sexes are not known in all of them.

- a. Carapace sculptured.
 - b. Carapace with two transverse carinae on back; with very strong ridges and projections, so that the dorsal outline (as seen from the side) is elevated and uneven.
 - c. Carapace with second dorsal carina elevated to form a pair of large spines behind middle of length; ridges not enclosing a quadrangular or subtriangular depressed area on sides .. *bovis*
 - cc. Carapace with second dorsal carina elevated but not forming acute, thorn-like projections; ridges enclosing a quadrangular or subtriangular depressed area on sides.
 - d. Carapace with a distinct median dorsal carina connecting the two large transverse ridges.
 - e. Sides of carapace with two ridges running forward from anterior crest; dorsum with a median posterior projection and a smaller dorso-lateral projection on each side *exsculpta*
 - ee. Sides of carapace without ridges running forward from anterior crest; dorsum with a median posterior projection but no dorso-lateral elevations *tribulis*
 - dd. Carapace without distinct median carina connecting the large transverse ridges *supersculpta*
 - bb. Carapace with ridges moderate or feeble, the dorsal outline in side view almost evenly curved.
 - f. Sides of carapace with more than one ridge.
 - g. Carapace gibbous posteriorly, its greatest depth two-thirds the length *australis*
 - gg. Carapace not gibbous posteriorly, its greatest depth one-half the length *candida*
 - ff. Sides of carapace with one low and very oblique ridge .. *spilotes*
 - aa. Carapace smooth.
 - h. Carapace with a median dorsal keel *pusilla*
 - hh. Carapace without median dorsal keel *mjobergi*

Cyclaspis bovis, n. sp.

Immature female. Integument hard and firm, with finely imbricate surface. Carapace deep, more than one-fourth the total length, and strongly sculptured. Pseudorostral lobes just reaching to apex of narrow ocular lobe, each truncate

and slightly oblique in front. Antennal notch moderately wide and antennal tooth subacute. Behind the eyeclobe is a short and abruptly elevated transverse carina, almost in line with a ridge which crosses the base of each lateral plate and forms the dorsal edge of a deep, flattened projection on each side. Viewed from the front the lateral edges of each of these projections are tridentate, the upper tooth the most prominent, the others small. A little behind middle of length of carapace is a pair of large dorsal spines, each leaning slightly outwards and forwards; a deep, median dorsal carina runs from the middle of the anterior transverse ridge to the base of these teeth, and behind them is a small median dorsal tooth or tubercle. On each side (in addition to the large anterior projection) are two low elevations on the posterior portion; the upper of these forms the termination

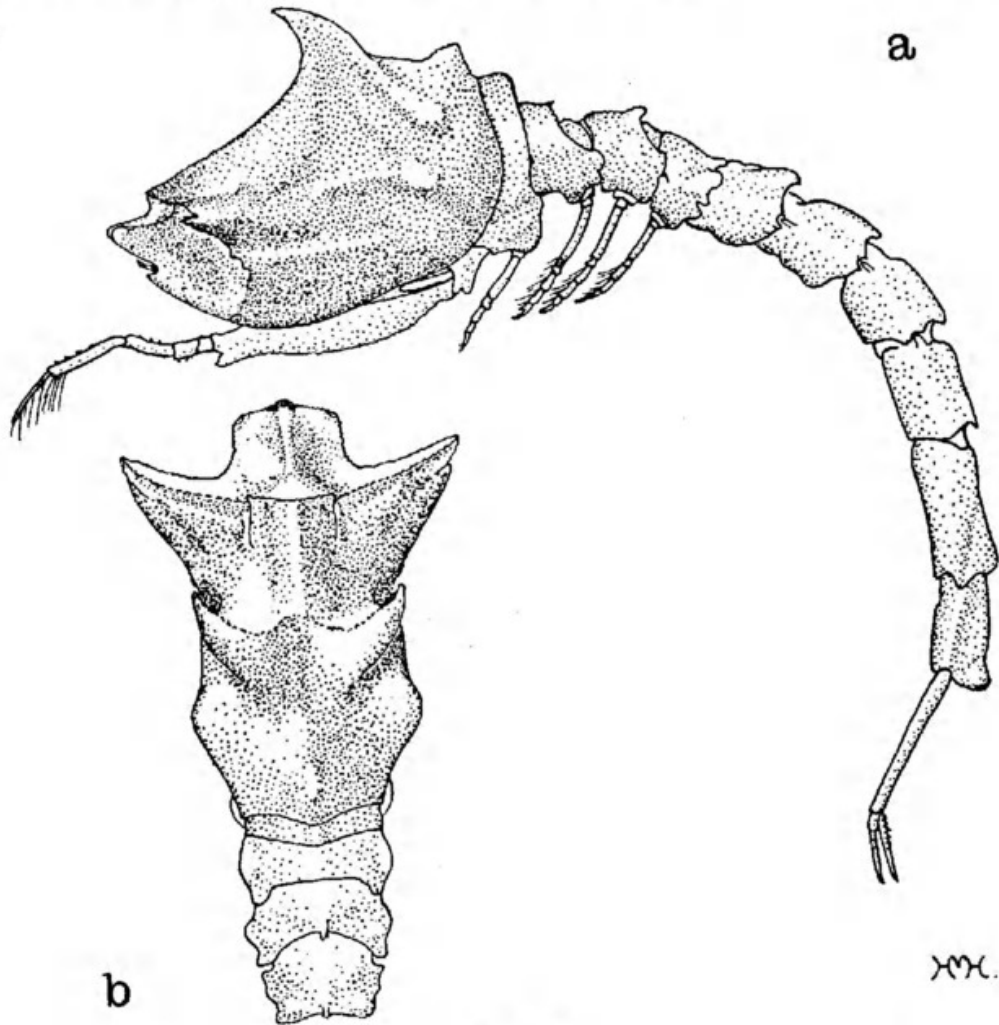


Fig. 1.

Cyclopsis bovis, type female. a, Lateral view; b, dorsal view of cephalothorax (x 8).

of a rather obsolete ridge running up the back of each dorsal tooth; from the lower elevation radiate two faint ridges, one of which forms an angle with a carina which leads up to the antero-lateral edge of each dorsal tooth. A ridge runs back from the second tooth of the great anterior projection. Second pedigerous somite fixed to carapace, large, with side-plates expanded, and with a short, elevated dorsal carina. Third leg-bearing somite tumid dorso-laterally; fourth and fifth each with a median posterior tooth and a pair of dorso-lateral projections. First four abdominal segments somewhat square in section, each with a pair of dorso-lateral carinae, the hinder ends of which are slightly concave; last two somites with a median ridge and an oblique carina on each side; second

to fourth with small lateral articular processes. Basis of third maxillipeds increasing in width distally, with a serrated ridge on outer face, and produced apically into a lobe which reaches to level of apex of ischium; ischium longer than carpus and shorter than merus, which is produced distally into a lobe which reaches nearly to apex of carpus; dactylus little longer than propodus and subequal in length to carpus. First legs about one and one-fourth times as long as the carapace; basis furnished with a serrated ridge on inner face, narrowed distally and with a subacute apical process, and about as long as the remaining joints together; ischium two-thirds as long as merus, which is three-fourths as long as carpus and about two-thirds as long as propodus. Ischium distinct in all other legs, one-half or less than half length of merus; propodus as long as dactylus in third to fifth legs, barely half as long in second. Peduncle of uropods slender, finely serrated on inner edge, as long as fifth pleon somite and more than twice as long as rami, which are subequal in length; proximal parts of edges of single-jointed endopod serrated, and basal joint of exopod one-third as long as second joint. Colour pure white.

Length, 18 mm.

Loc.—South Australia (Sir J. Verco). Type, female, in South Australian Museum, Reg. No. C. 1772.

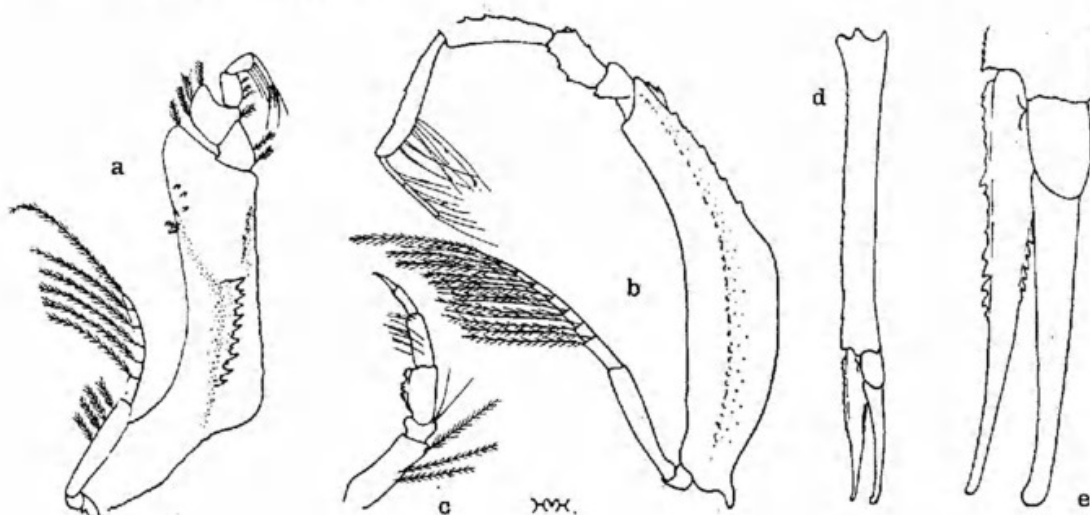


Fig. 2.

Cyclaspis bovis, paratype female. a, Third maxilliped (x 14); b, first leg (x 14); c, fifth leg (x 14); d, uropod (x 14), e, rami of uropod (x 36).

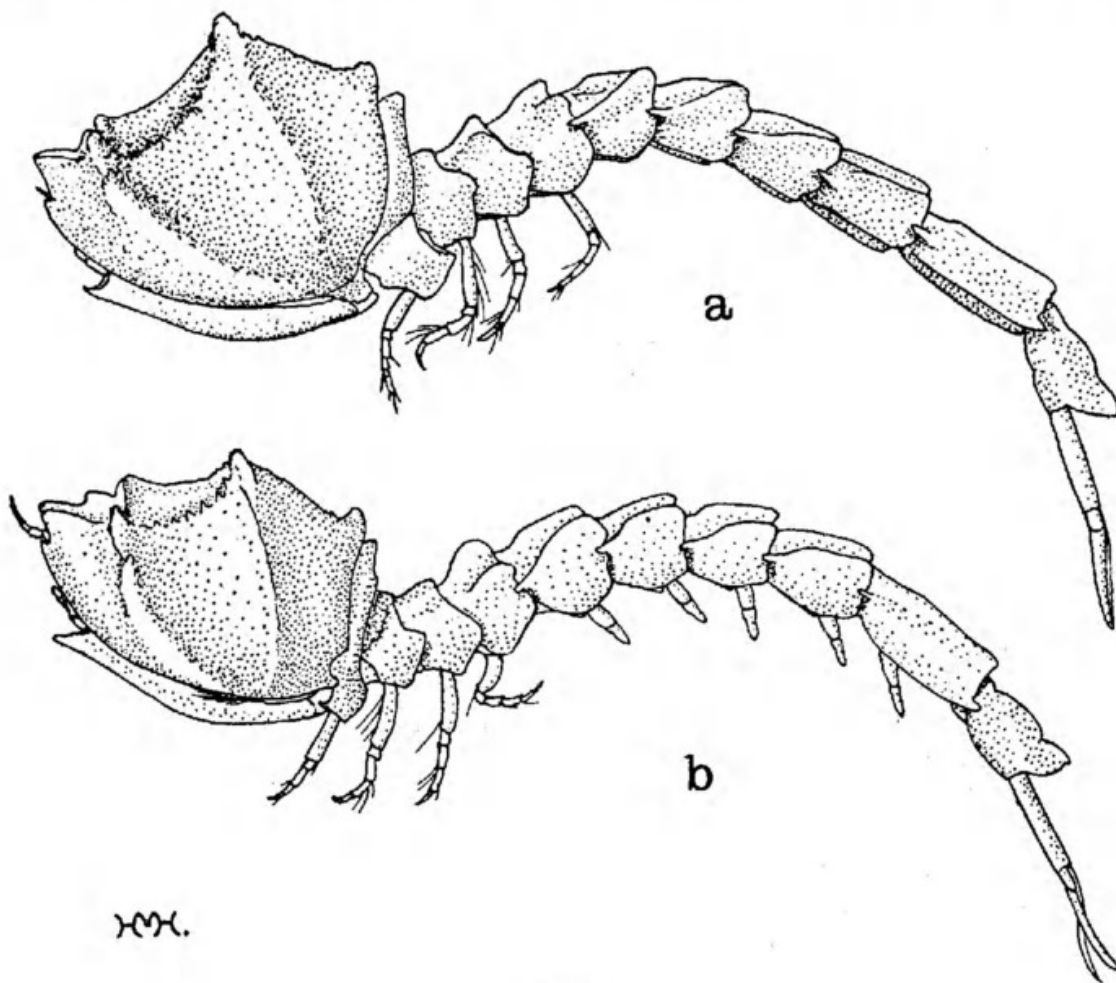
A second female 19.5 mm. in length differs in having the pair of dorsal spines not divergent one from the other; as shown by the illustrations, these spines are much more prominent than the lateral projections when the animal is seen from the side, but the condition is reversed when it is viewed from above.

This species is allied to *C. persculpta*, Calman, *C. exsculpta*, Sars, and *C. supersculpta*, Zimmer, etc.

Cyclaspis tribulis, n. sp.

Immature female. Integument hard. Carapace about one-fourth total length, with two strong transverse ridges; surface somewhat reticulate owing to numerous pits, the edges of some of which form acute tubercular projections, especially near edges of ridges. Pseudorostral lobes not quite reaching to apex of narrow overlying ocular lobe, which bears a few silvery apical lenses. Antennal notch distinct, and antennal tooth subacute. At base of eyeclobe is a short elevated carina, or flat compound tubercle; immediately behind this is the first large ridge,

crossing the dorsum transversely and running obliquely downwards and backwards on the side to meet the second transverse carina near the infero-posterior angle of the carapace. Anterior ridge deep, and cut into five flattened, rounded teeth or lobes, one on the dorsum and two on each side; viewed from the front this carina resembles a rosette enfolding the dorsal and lateral parts of the animal. Second carina strongly elevated dorso-laterally, forming a pair of rather flattened lobes; the two transverse ridges are connected by an obtuse, median longitudinal carina, and by a pair of far less distinct dorso-lateral crests. Posterior end of carapace with a median dorsal conical elevation. Fourth and fifth pedigerous segments each with a median dorsal ridge and rather feeble dorso-lateral elevations. Pleon segments each with a median dorsal carina and infero-lateral and dorso-lateral carinae; last-named most distinct on anterior segments and almost



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Fig. 3.

Cyclopsis tribulis. a, Type female; b, paratype male (x 11½).

obsolete on last two; first five somites with lateral articular processes. Basis of third maxillipeds slightly widened distally and produced beyond level of apex of ischium, which is shorter than carpus and about as long as propodus; merus produced to slightly beyond apex of carpus; both carpus and propodus are widest distally. Basis of first legs narrowed on distal half and with a small apical process. Ischium of second legs one-third as long as merus, which is longer than carpus. Merus much longer than ischium, and shorter than carpus in third to fifth legs. Uropods nearly as long as fifth and sixth pleon segments together and with the peduncle about as long as the subequal rami. Colour pure white.

Length, 11.5 mm.

Immature male. The sculpturing of the carapace is a little less marked than in the female, but in the main differs very little.

Length, 12 mm.

Loc.—South Australia (Sir J. Verco). Type, female, in South Australian Museum, Reg. No. C. 1770.

Only two slightly mutilated specimens are available; as in the type of *C. exsculpta*, Sars, both examples have the terminal joints of the first legs missing. They are so exceedingly close to *C. supersculpta*, Zimmer,⁽⁶⁾ that it is with much hesitation that I propose a name for them. They apparently differ from Zimmer's type immature female in having more strongly developed projections from the first large transverse ridge, and a short elevation on the dorsum in front of this ridge in having a median dorsal carina connecting the transverse ridges and only one projection at the hinder end of the carapace, and in the proportions of the uropods. Zimmer states that the peduncle of the last-named is only half

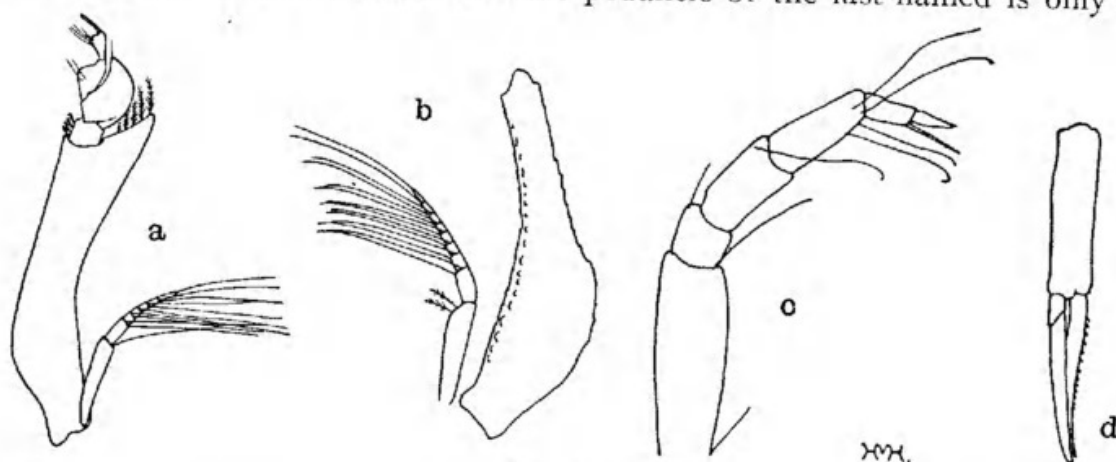


Fig. 4.

Cyclopsis tribulis, type female. a, Third maxilliped (x 16); b, basis of first leg (x 16); c, fourth leg (x 42); d, uropod (x 16).

as long as the rami in *C. supersculpta*; it is shown thus in his fig. 11, but in his fig. 8 appears as long as the rami.

It is evident that examination of more material of Australian species of the *exsculpta* group is most desirable.

Cyclopsis spilotes, n. sp.

Male. Form slender and integument moderately indurated. Carapace rather small, only about one-fifth total length, with a well-developed, sharp, median dorsal carina for whole length, and with a fine oblique ridge on each side, curving from the median carina forwards and downwards to the antero-inferior margin and fading into the margin near antennal tooth; surface very finely imbricate and with numerous shallow pits. Pseudorostral lobes slightly obliquely truncate and not extending beyond ocular lobe, which is moderately wide and bears large lenses. Antennal notch wide and antennal tooth subacute. Fourth and fifth pedigerous segments with low dorso-lateral carinae. Each pleon segment with a low median carina, and infero-lateral and dorsal-lateral carinae; the last are oblique and ill-defined on the sixth somite; first five pleon segments with lateral articular processes. Second and third joints of first antennae subequal in length, each barely more than one-third the length of first segment; flagellum short and two-jointed. First legs only about one-eighth longer than carapace, the carpus not reaching to antennal notch; basis much narrowed

(6) Zimmer, Kungl. Sv. Vet.-Akad. Hand., lxi., No. 7, 1921, p. 7, figs. 8-11.

distally with an acute apical process and slightly longer than the remaining joints together; ischium much shorter than merus, which is stouter and a little shorter than carpus; dactylus about as long as carpus and not much more than half as long as propodus. Basis of remaining legs long (as long as other joints together in third legs); ischium less than half as long as merus in all but fourth pair; merus longer than carpus in second legs, shorter than carpus in third to fifth. Uropods longer than last two pleon segments together; peduncle a little longer than exopod,

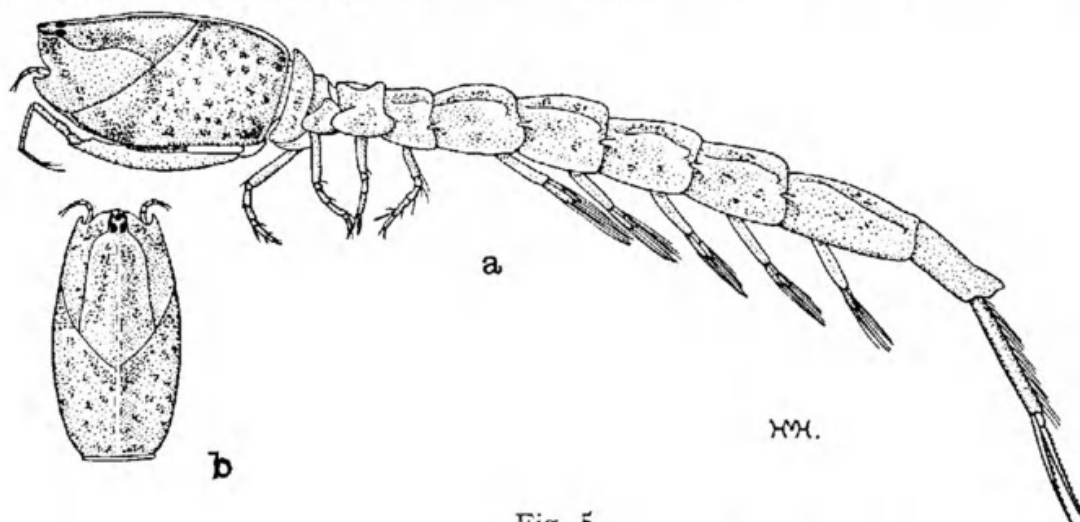


Fig. 5.

Cyclaspis spilotes, type male. a, Lateral view; b, dorsal view of carapace (x 10).

its inner margin fringed with rather long hairs; both rami lanceolate; exopod slightly longer than endopod and armed with a dozen spines on inner edge; inner edge of endopod finely serrate, furnished with about eleven spines and (near the base) with a few long hairs. Colour pale brown, with splashings and mottlings of dark brown.

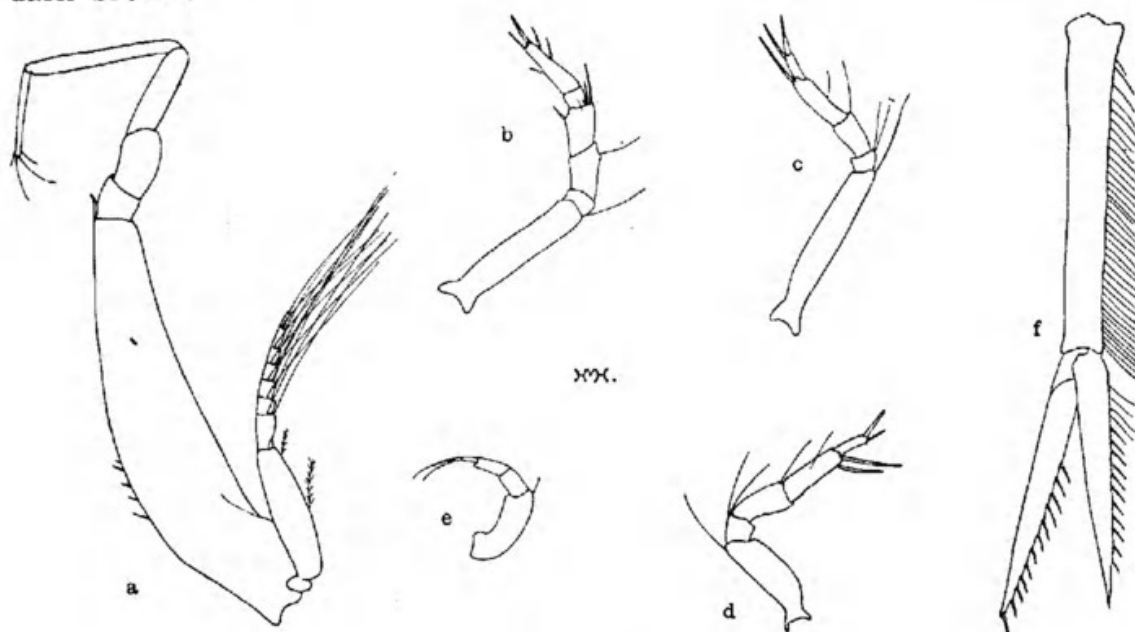


Fig. 6.

Cyclaspis spilotes, type male. a, First leg; b, second leg; c, third leg; d, fifth leg; e, first antenna; f, uropod (x 29).

Length, 11 mm.

Loc.—South Australia: Gulf St. Vincent, five miles off Semaphore, 5 faths. (H. M. Hale). Type, male, in South Australian Museum, Reg. No. C. 1753.

Resembles *C. australis*, Sars, in some respects, but is readily separated by the shape of the carapace, which lacks the curved lateral prominence passing down to the rear, the different proportions and clothing of the uropods, the sculpture of the pleon, etc.; also, the second pedigerous segment is not firmly attached to the carapace. The single male described above was dredged on a white sand bottom.

LEPTOCUMA, Sars.

Leptocuma pulleini, n. sp.

Ovigerous female. Body subcylindrical, a little compressed, very slender, and tapering evenly and gradually from head to end of pleon. Carapace only about one-seventh the total length, its vertical height one-half its length; smooth excepting for a very low median dorsal carina (which has an impressed line down the

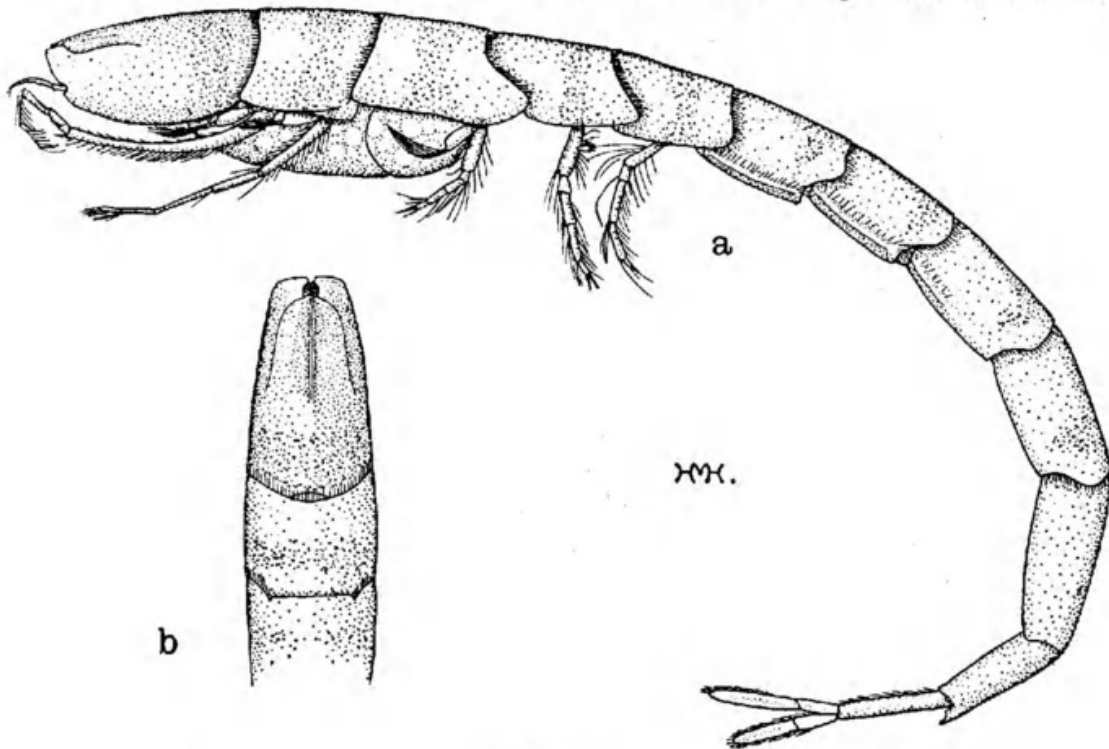


Fig. 7.

Leptocuma pulleini, type female. a, Lateral view; b, dorsal view of anterior part of thorax ($\times 7$).

middle) on anterior half. Pseudorostral lobes short and obliquely truncate, produced in advance of the ocular lobe for a distance equal to half length of last-named, but not quite meeting in front. Ocular lobe semicircular and eye pigmented. Antennal notch moderately wide and antennal angle rounded. Second to fifth pedigerous segments subequal in dorsal length, but only a tiny dorsal portion of first somite exposed, and this only visible from above. Second somite with side plates expanded and overlapping first segment and base of carapace; pleural plates of third segment greatly expanded, overlapping second and fourth segments. First, second, and sixth pleon somites subequal in length, each shorter than third; fourth segment a little longer than third and slightly shorter than fifth; first two segments with low infero-lateral carinae, and third segment with indistinct infero-lateral ridges; pleon otherwise quite smooth. Margins of second to fifth pedigerous segments, and of first to fourth pleon segments, fringed with short adpressed bristles. First antennae with basal joint nearly as long as second and third together; second scarcely longer, but stouter, than third; flagellum four-jointed and accessory flagellum rudimentary, composed of a single joint. Palp

of first maxillipeds four-jointed, the first two joints broad and lamellate; the three terminal segments are furnished with numerous plumose setae. Second maxillipeds much more slender than first, with the terminal joints of the palp bristled; basis margined with plumose setae, and with two long feathered bristles at apex; ischium very short and merus slightly longer than propodus, which is only half as long as carpus. Third maxillipeds fringed with plumose setae, those on basis forming a dense fringe; ischium short, and merus and propodus subequal in length, each more than half as long as carpus. Basis of first legs reaching forwards nearly to antennal notch, nearly half as long again as remaining joints, very narrow, edged with plumose setae and bearing two inferior spines, one, at

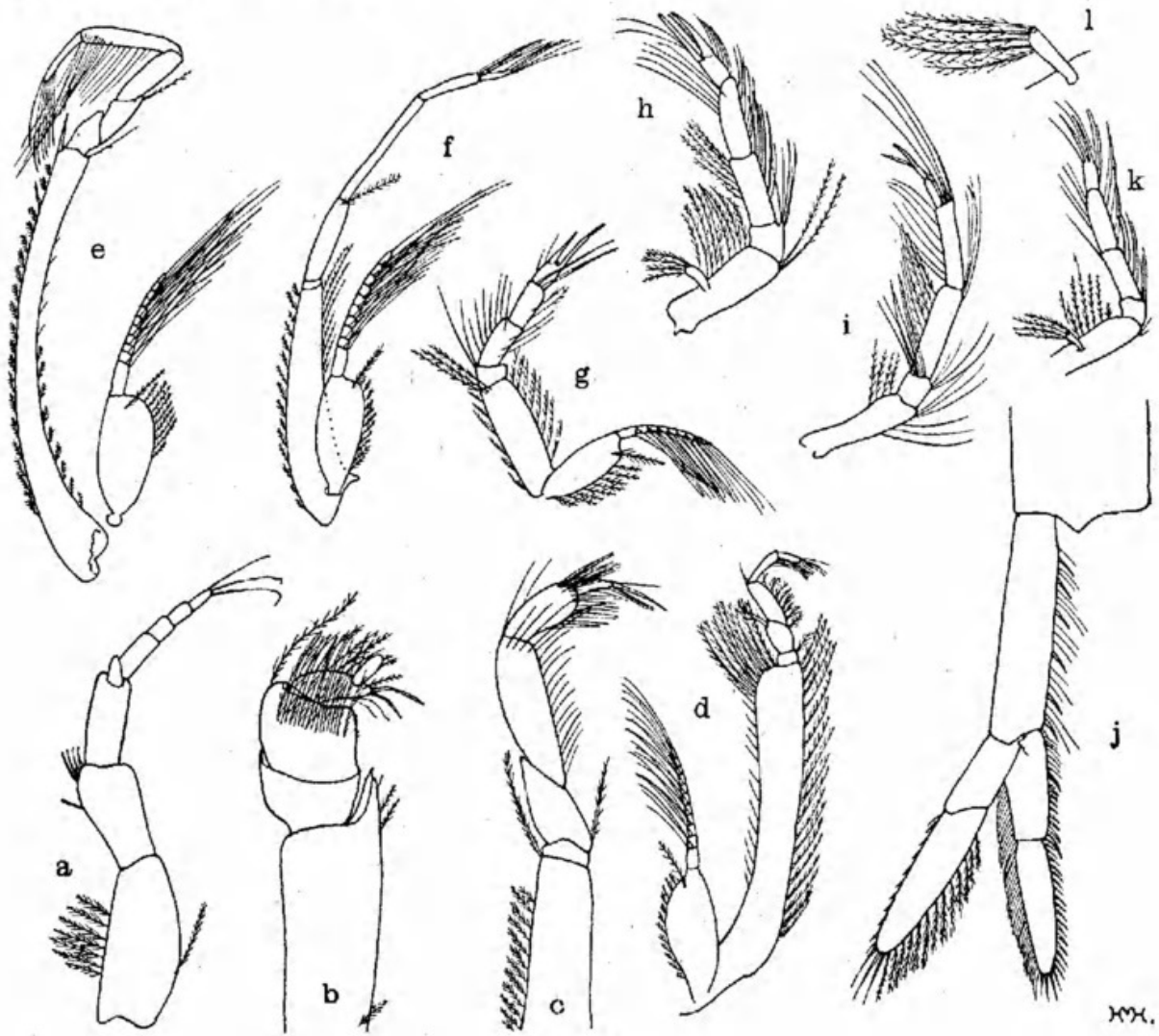


Fig. 8.

Leptocuma pulleini, type female. a, First antenna (x 40); b, first maxilliped (x 40); c, second maxilliped (x 40); d, third maxilliped (x 15); e, first leg (x 15); f, second leg (x 15); g, third leg (x 15); h, fourth leg (x 15); i, fifth leg (x 15); j, uropod (x 15). k, Fourth leg of paratype male (x 15); l, exopod of fourth leg of male (x 40).

the distal apex, being nearly as long as ischium; propodus longer than dactylus and a little shorter than merus and carpus together; the two terminal joints with numerous long setae. Second legs long and narrow, reaching as far forward as basis of first pair; basis tapering from base to apex and fully three-fourths as long as terminal joints together; ischium very short and carpus longer than merus or propodus. Third to fifth legs densely fringed with setae and plumose bristles; each with ischium short and merus and carpus subequal in length;

fourth and fifth pairs of about equal length, about one-third as long again as third legs. An exopod is well developed in the first three pairs of legs; in the fourth pair it is rudimentary and two-jointed, the second joint very minute, and in the fifth absent. Peduncle of uropods nearly as long as last pleon segment, with half a dozen spines and a fringe of setae on inner edge; endopod slightly longer than peduncle, with second joint one-fourth as long again as first, and with inner edge armed with slender spines and two stout spines, one at apex of proximal joint and one near middle of length of that joint; outer edge of endopod fringed with setae; exopod subequal in length to endopod, with distal joint three-fourths as long again as proximal; inner edge of second joint fringed with plumose setae, apex with plain bristles and outer margin with short, slender spines. Colour cream, with a faint bar of brown on each segment.

Length, 24 mm.

Immature male. Has all the general facies of the female, but the body is a little more slender. Exopods are well developed on the first three pairs of legs, but on the fourth pair only a rudimentary exopod, similar to that of the female, is apparent. Five pairs of pleopods each with exo- and endopod, are developed.

Length, 19 mm.

Loc.—South Australia: Encounter Bay (R. Pulleine). Type, female, in South Australian Museum, Reg. No. C. 1745.

In addition to the two examples described above two immature and two adult females, ranging from 17 to 24 mm. in length, were taken. The species is close to the genotype, *L. kinbergii*, Sars,⁽⁷⁾ but differs in the even more slender form, in the proportions of the uropods, the presence of a slight dorsal carina on the carapace, etc. The first pedigerous segment is wholly concealed in some specimens.

From the examination of females alone one would certainly presume that *L. minor*, Calman,⁽⁸⁾ and *L. pulleini*, are both congeneric with *L. kinbergii*. The male of Calman's species, however, has a well-developed exopod on the fourth legs and only three pairs of pleopods, whereas, as noted above, the male of the Australian species has only a rudimentary exopod on the fourth legs and five pairs of pleopods. Apparently the genotype is known only from females, so it is necessary, for the present at any rate, to refer the Australian form to *Leptocuma*.

SYMPDOMMA, Stebbing.

SYMPDOMMA AFRICANUM, Stebbing.

Sympdomma africanus, Stebb., Ann. South Afr. Mus., x., 1912, p. 138, pl. i.

Sympdomma africanum, Stebb., Das Tierreich., xxxix., 1913, p. 17, fig. 11.

Two young females from South Australia agree on the whole with Stebbing's descriptions and figures of a young male, but differ in the following characters, which are doubtless due to age and sex. The carapace is slightly deeper, and in dorsal view is rather more narrowed towards the front; the last of the three teeth into which the frontal part of the dorsal carina is cut has a smaller tooth on its posterior slope. Eye lenses are far less numerous, a pair of black lenses and one unpigmented lens being made out. The second to fifth pedigerous segments, as seen from above, are wider, and each has only one median carina, which is strongly elevated anteriorly on the second to fourth somites, less strongly in the fifth. The sculpture of the pleon somites is more marked; each segment has dorso-lateral, lateral, and infero-lateral carinae, as well as a distinct median dorsal carina; on the telsonic segment the lateral carinae are obsolete. The third maxillipeds have the merus less strongly produced distally, and the apex of the basis

(7) Sars, Kongl. Svenska Vet.-Akad. Hand., xi., No. 2, 1873, p. 24, pl. vi., figs. 29-33.

(8) Calman, Proc. U.S. Nat. Mus., xli., 1912, p. 616, figs. 14-20.

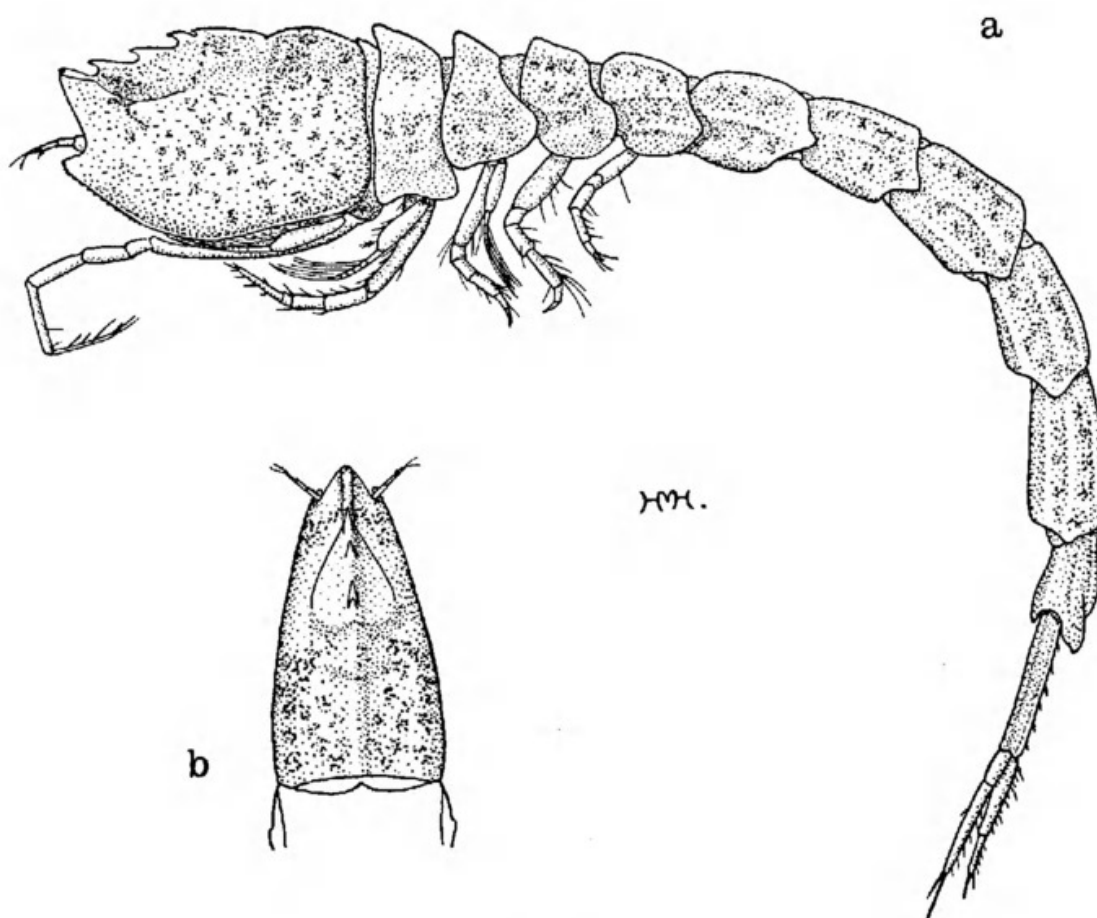


Fig. 9.
Sympodomma africanum, immature female. a, Lateral view; b, dorsal view of carapace (x 12).

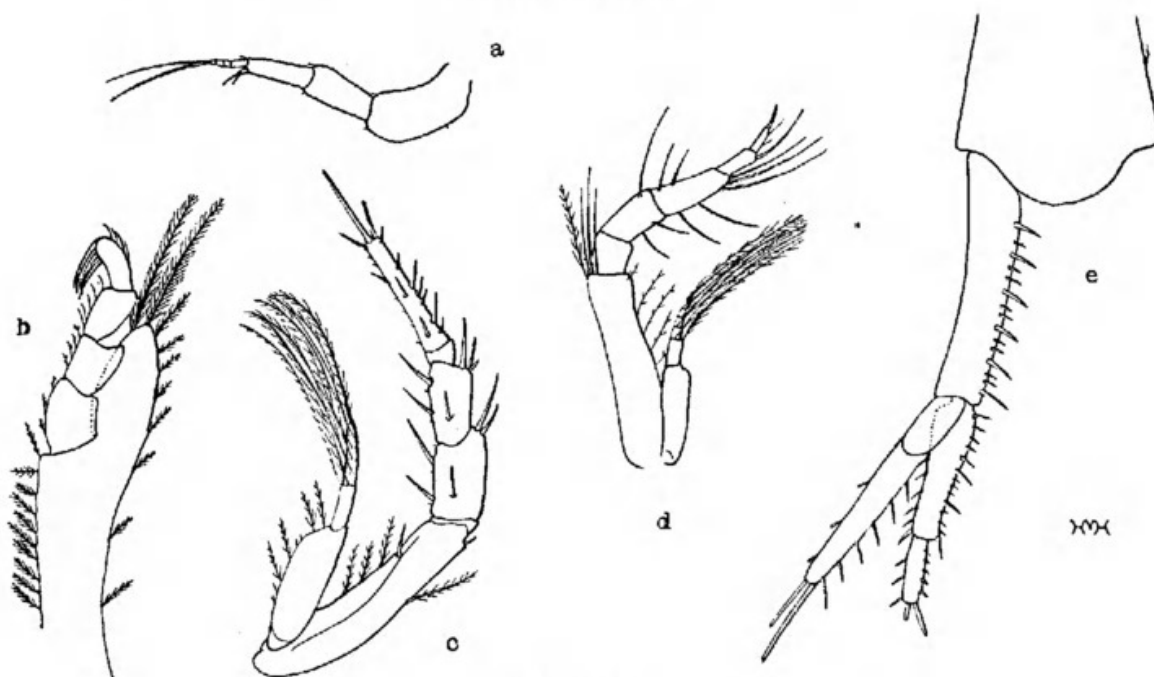


Fig. 10.
Sympodomma africanum, immature female. a, First antenna (x 33); b, terminal part of third maxilliped (x 33); c, second leg (x 25); d, third leg (x 25); e, telsonic segment and uropod (x 20).

much more produced, reaching well beyond the distal end of the merus. The legs are as shown by Stebbing; the peduncle of the uropods is carinate (so that in section it is triangular) and is scarcely longer than the exopod; the endopod is shorter than the exopod, with the first joint about twice as long as the second. It may be added that the integument is hard and the colour is light biscuit-brown, mottled and spotted with dark brown.

Length, 12.5 mm.

Loc.—South Australia: Gulf St. Vincent, off Outer Harbour, 6 fath. (H. M. Hale).

Hab.—South Africa and Southern Australia.

Family DIASTYLIDAE.

GYNODIASTYLIS, Calman.

Calman⁽⁹⁾ described four species of the genus, Zimmer added two Western Australian forms, and two are recorded below; the members of the genus may be separated as follows:—

- a. Uropods simple *laevis*
- aa. Uropods with more than one joint.
- b. Uropods three-jointed *hartmeyeri*
- bb. Uropods two-jointed.
- c. Carapace with at least five longitudinal ridges on each side.
- d. First joint of endopod of uropods longer than second.
- Carapace with five or six longitudinal ridges on each side .. *carinatus*
- dd. First joint of endopod of uropods not longer than second.
- Carapace with numerous longitudinal ridges on each side.
- e. Exopod of uropods not or little shorter than endopod.
- First legs rather elongate *costatus*
- ee. Exopod of uropods only three-fifths as long as endopod.
- First legs short and stout *turgidus*
- cc. Carapace smooth, or with only one longitudinal ridge on each side.
- f. Uropods with first joint of endopod shorter than second .. *bicristatus*
- ff. Uropods with first joint of endopod longer than second.
- g. Carapace with a curved ridge on each side. Endopod of uropods with first joint one-fourth as long again as second *truncatifrons*
- gg. Carapace without ridges. Endopod of uropods with first joint twice as long as second *similis*

Gynodiastylis turgidus, n. sp.

Ovigerous female. Carapace more than one-third total length, plump, with its vertical height about two-thirds greatest length; dorsal margin considerably curved; sides with numerous longitudinal ridges, the uppermost dorso-lateral ridge crenulate, longer and more prominent than the others; anterior portion of dorsal margin and inferior margin crenulate. Pseudorostral lobes acutely pointed, projecting in front of ocular lobe for a distance equal to two-ninths of length of carapace; margins crenulate. Antennal notch wide and antennal tooth acute. The five free pedigerous segments are together shorter than carapace; pleural parts of second somite produced in front, those of the third in front and behind. Pleon six-sevenths of total length of thorax; the four anterior somites subequal in length, fifth longer and sixth shorter; telson scarcely more than half as long as sixth segment. First legs stout and not extending much beyond apices of pseudorostral lobes, with merus reaching to level of antennal angle; basis as long as the three following joints together, merus much longer than ischium and carpus twice as long as merus. Basis of second legs stout and about as long as

(9) Calman, Trans. Zool. Soc., xviii., 1911, pp. 367-374, pl. xxxv., figs. 6-39, and pl. xxxvi., figs. 1-22.

the other joints together. Remaining legs short and stout, with ischium short, merus approximately three-fourths as long as basis, and the three terminal joints very short. Third legs articulated at posterior end of their thoracic somite, leaving a wide gap between second and third legs; fifth legs articulated dorso-laterally. Peduncle of uropods twice as long as telson, and as long as fifth pleon segment; exopod only three-fifths as long as endopod, with one long and one

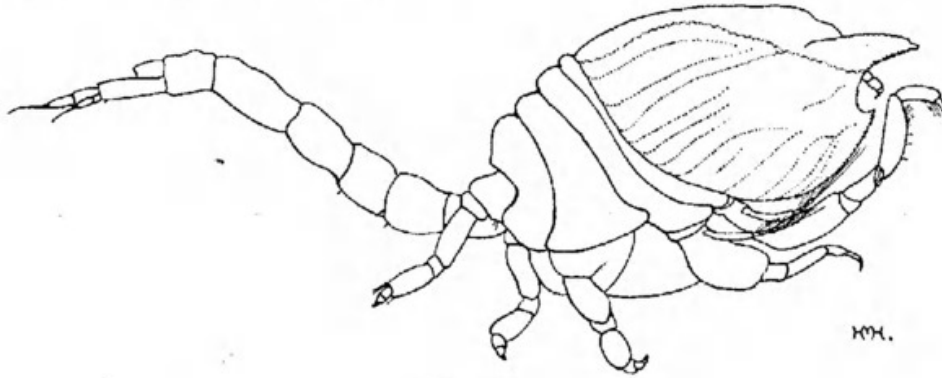


Fig. 11.

Gynodiastylis turgidus, type female (x 36).

short, curved stout seta at apex; endopod two-thirds as long as peduncle, two-jointed, with the first segment slightly shorter than distal and with two stout apical setae, one long and one very short.

Length, 2.7 mm.

Loc.—South Australia: Robe, 3 fath. (Edgar R. Waite). Type, female, in South Australian Museum, Reg. No. C. 1750.

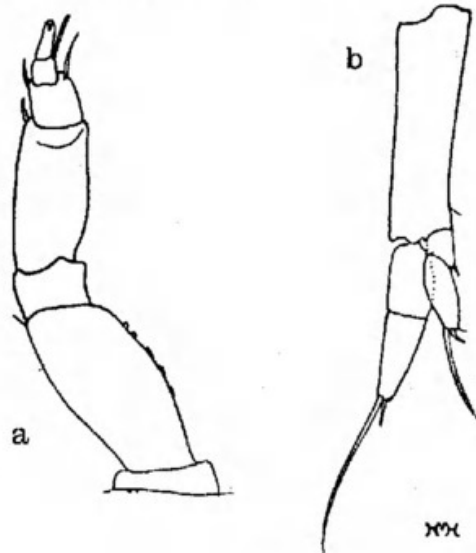


Fig. 12.

Gynodiastylis turgidus, type female. a, Fifth leg; b, uropod (x 120).

The single available female, which is mounted in balsam, has about half a dozen relatively very large eggs in the brood pouch. As in *G. costatus*, Calman, the carapace is marked with numerous ridges, but the form is stouter and the legs wider than in that species; also the first legs are considerably shorter, with the joints of different proportions, and the uropods are very different.

***Gynodiastylis truncatifrons*, n. sp.**

Female with young. Carapace one-third of total length, subcylindrical, its vertical height rather more than half dorsal length; dorsal margin nearly straight;

each side with a low ridge, curving backwards and upwards from antennal notch, and back with a pair of shallow longitudinal grooves on posterior half; carapace otherwise smooth excepting for a few shallow pits. Pseudorostral lobes acutely pointed, deep, meeting in front of ocular lobe for a distance equal to nearly one-third of rest of carapace, oblique and slightly concave in front and fringed with fine short hairs. Antennal notch defined by a rounded, slightly projecting angle. Eyelobe about twice as wide as long, with three corneal lenses. The five free pedigerous segments together three-fourths as long as carapace, each in dorsal view as wide as the last-named. Pleural plates of second free somite produced in front, those of third slightly in front and greatly posteriorly. Pleon only about two-thirds the length of thorax; third and fourth segments with three tiny spines on each side; fifth somite not much longer than sixth, which is depressed. Telson as long as, but much narrower than, sixth segment, depressed, rounded

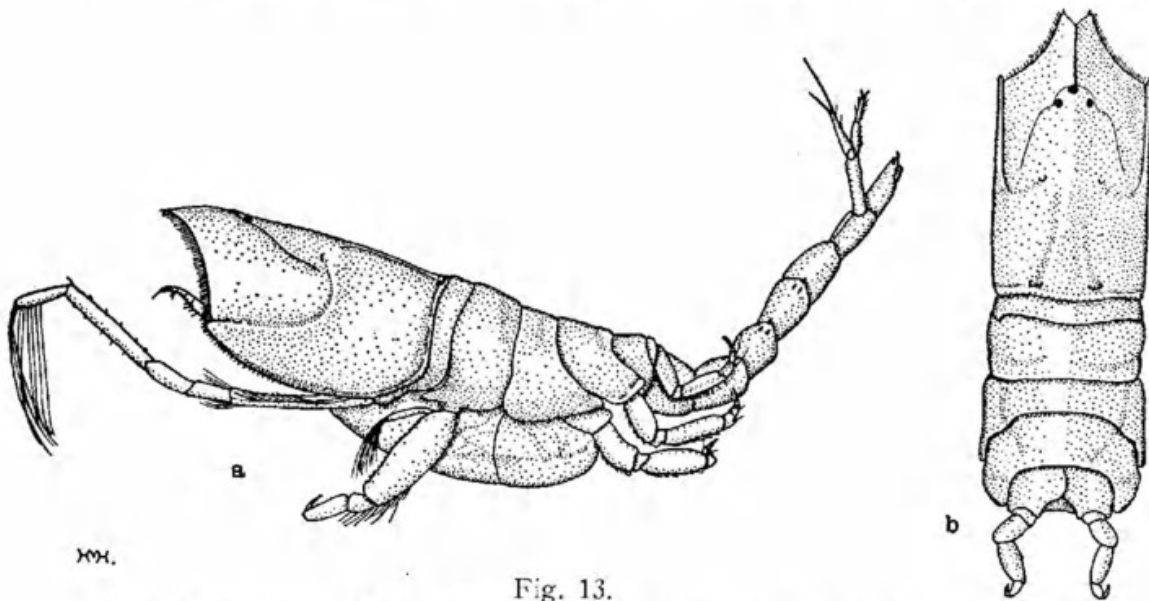


Fig. 13.

Gynodiastylis truncatifrons, type female. a, Lateral view; b, dorsal view of cephalothorax (x 12).

apically, and armed with two apical and two subapical tiny hooked spines. First antennae with basal joint as long as second and third joints together, and with second joint two-thirds as long as third. Dactylus of third maxillipeds a little shorter than either of the three preceding joints, which are subequal in length. First legs stout and extending well beyond pseudorostrum, the ischium reaching to level of antennal notch; basis shorter than remaining joints together, with setae and a few spines on inner edge, and with a plumose seta and a spine at distal end; ischium and merus subequal in length, each with a spine at distal end of inner edge; carpus nearly three times as long as merus, and two and one-third times as long as propodus, which has the distal part of inner edge oblique and furnished with long setae; dactylus short. Basis of second legs distinctly longer than remaining joints together, less than three times as long as broad, furnished with short, stout spines on inner edge, and plumose setae on outer margin; ischium not distinct and merus nearly half as long as carpus. Third to fifth legs stout, with basis shorter than remaining joints together. Third legs articulated near posterior end of their somite, with the attachment directed almost backwards, so that there is a wide gap between second and third legs. Attachment similar in last two pairs of legs, the fifth being articulated dorso-laterally. Uropods with peduncle little longer than telson and nearly one-third as long again as endopod; exopod about five-sixths as long as endopod, with two long unequal apical

bristles and a few bristles and hairs on each edge; proximal joint of two-segmented endopod longer than distal, which is furnished with two short, stout, curved apical bristles and some hairs and a subapical spine on inner edge; inner margin of first joint of endopod with a sparse fringe of hairs and two spines, one apical and the other at the middle of length. Colour white.

Length, 7.2 mm.

Loc.—South Australia: Gulf St. Vincent, five miles off Semaphore, 5 fath. (H. M. Hale). Type, female, in South Australian Museum, Reg. No. C. 1754.

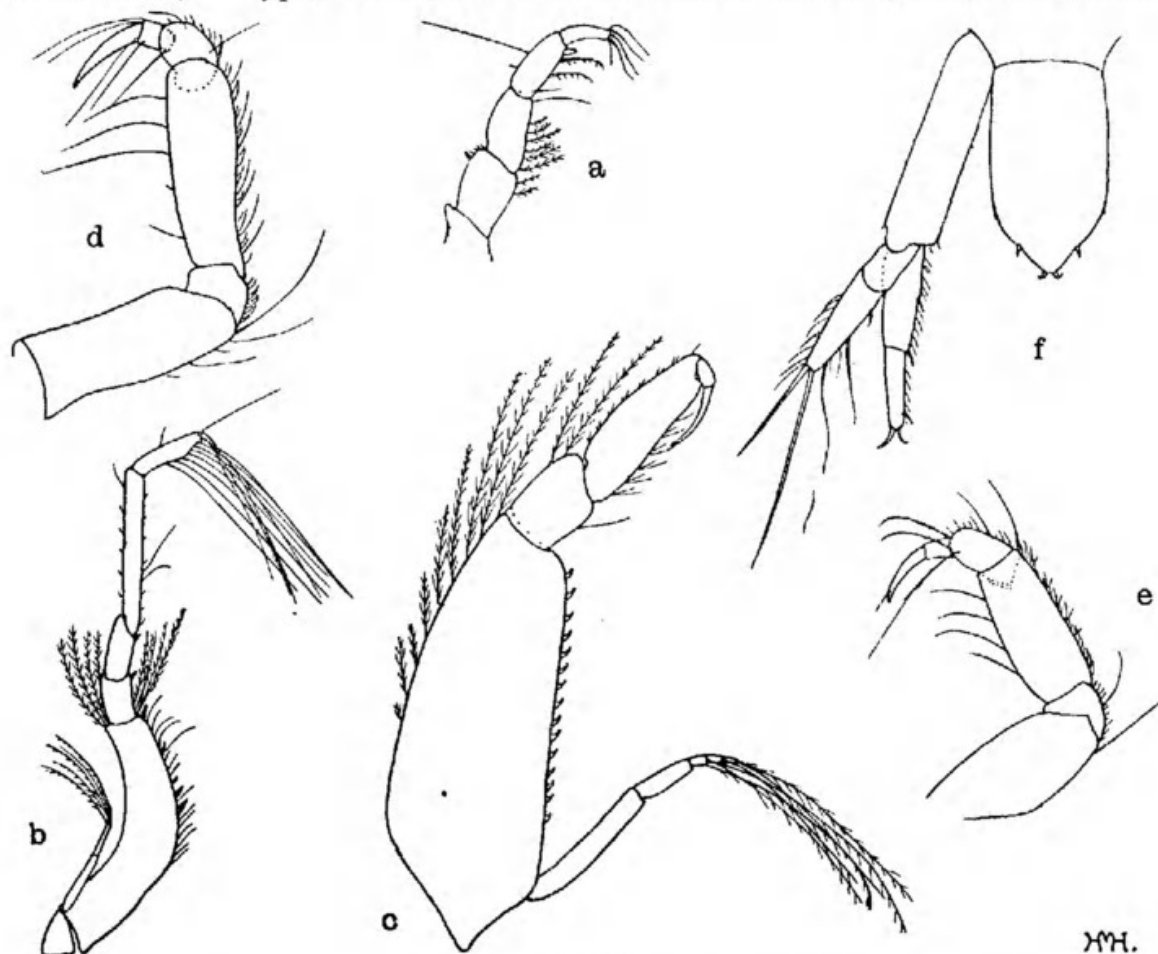


Fig. 14.

Gynodiastylis truncatifrons, type female. a, Terminal part of third maxilliped (x 42); b, first leg (x 17); c, second leg (x 42); d, fourth leg (x 42); e, fifth leg (x 42); f, telson and uropod (x 42).

A single adult female with a few advanced young in the brood pouch was taken in a bottom dredge; the juveniles are representatives of at least two stages. This species may be distinguished at a glance from the preceding, and from the two aforementioned Western Australian species by the longer first legs and abdomen, by the shape of the carapace, the presence of a single ridge on each side of the carapace, the character of the uropods, etc.

ANCHICOLURUS, Stebbing.

Anchicolurus waitei, n. sp.

Adult female. Carapace pitted, less than one-third the total length, and as long as the five free pedigerous segments together; its vertical height two-thirds dorsal length; sides with a depression at the antennal border, and with a low ridge, curving backward and upward to the dorsum, from the edge of the anterior depression. Pseudorostral lobes not very long, subacute. Antennal notch wide

and shallow, and antennal tooth acute. Ocular lobe short, wider than long. First and second pedigerous segments short; pleural parts of third greatly produced behind, and overlapping second segment in front. Dorsal length of fourth segment greater than that of the three preceding somites together; fifth segment about three-fourths as long as fourth. Pleon four-fifths as long as thorax; sixth somite two-thirds as long as fifth, and slightly longer than telson, which is rounded, without spines or setae, and with the tip not extending beyond the anal valves. First antennae with second segment stouter than, but subequal in length to, third, and shorter than first; outer flagellum three-jointed, and accessory flagellum very tiny and two-jointed. Third maxillipeds with well-developed exopods; basis slightly expanded and produced to level of apex of ischium at distal end, which bears a series of plumose setae. First two pairs of legs with large exopods, third and fourth pairs with rudimentary, two-jointed exopods. Carpus of first legs reaching forward to antennal angle; basis about one-fifth as long again as rest of limb; carpus distinctly longer than propodus, which is longer than dactylus. Basis of second legs somewhat expanded, about four-fifths as long as distal joints together; ischium short and merus a little longer than carpus; propodus and dactylus subequal in length, each shorter than carpus. Third to fifth legs stout, with merus as long as, or longer than, basis, and ischium and the three distal joints short; third legs widely separated from second.

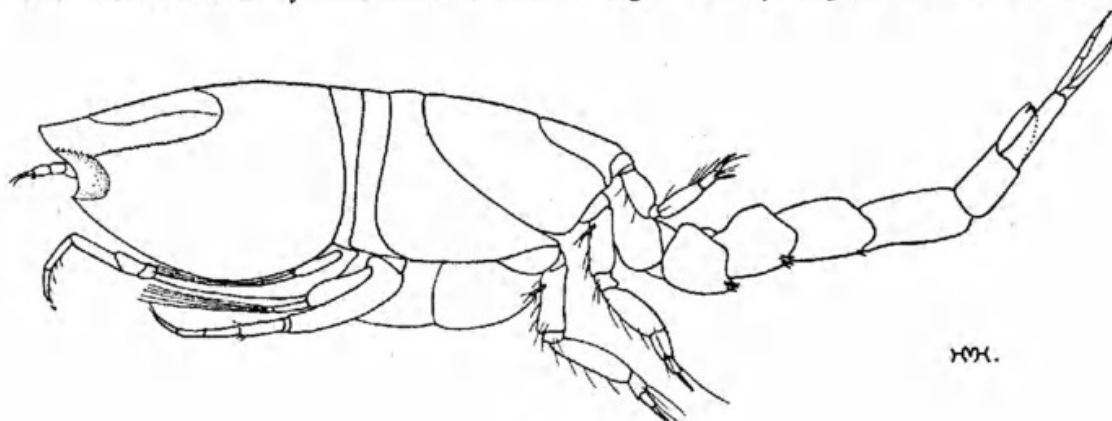


Fig. 15.

Anchicolurus waitci, type female (x 30).

Peduncle of uropods less than twice as long as telson, with slender spines on inner margin; endopod about as long as peduncle and slightly longer than exopod, three-jointed, the first joint scarcely twice as long as second, which is not quite twice as long as distal joint; apex of endopod with one spine, and inner margin with about eleven spines; exopod with two long and two short apical spines. Colour white.

Length, 3.7 mm.

Adult male. Differs from the female in having the form a little more slender, the third legs not widely separated from the second, and the exopods of the legs stouter, those of the third and fourth pairs being well developed, with the peduncle almost as wide as long. The telson is very slightly longer than in the female, with the rather narrowly rounded apex projecting beyond the anal valves and tipped with two short setae. The marginal spines of the uropods are more distinct and the peduncle is one-fourth as long again as the endopod; the inner border of the peduncle bears nine spines and the inner edge of the endopod fourteen, ten on the first joint, three on the second, and one on the distal segment; the last joint also bears a long apical spine and two smaller spines on the outer margin, while the outer edge of the second joint is furnished with two spines; the exopod has two long and two short apical spines, and spines on the outer margin. The

first antennae have the outer flagellum five-jointed and the accessory flagellum three- (? four) jointed, and as long as the first two joints of the outer lash together; the base of the proximal joint of the last-named bears a brush of thick sensory "hairs." The lash of the second antennae is fully as long as the body.

Length, 3.7 mm.

Loc.—South Australia: Robe, 3 fath. (Edgar R. Waite). Type, female, in South Australian Museum, Reg. No. C. 1751.

This species falls into the family Colurostylidae of Stebbing, and, apparently, is referable to *Anchicolurus* on account of the three-jointed endopod of the uropoda; its inclusion in *Anchicolurus*, however, narrows the definition of that

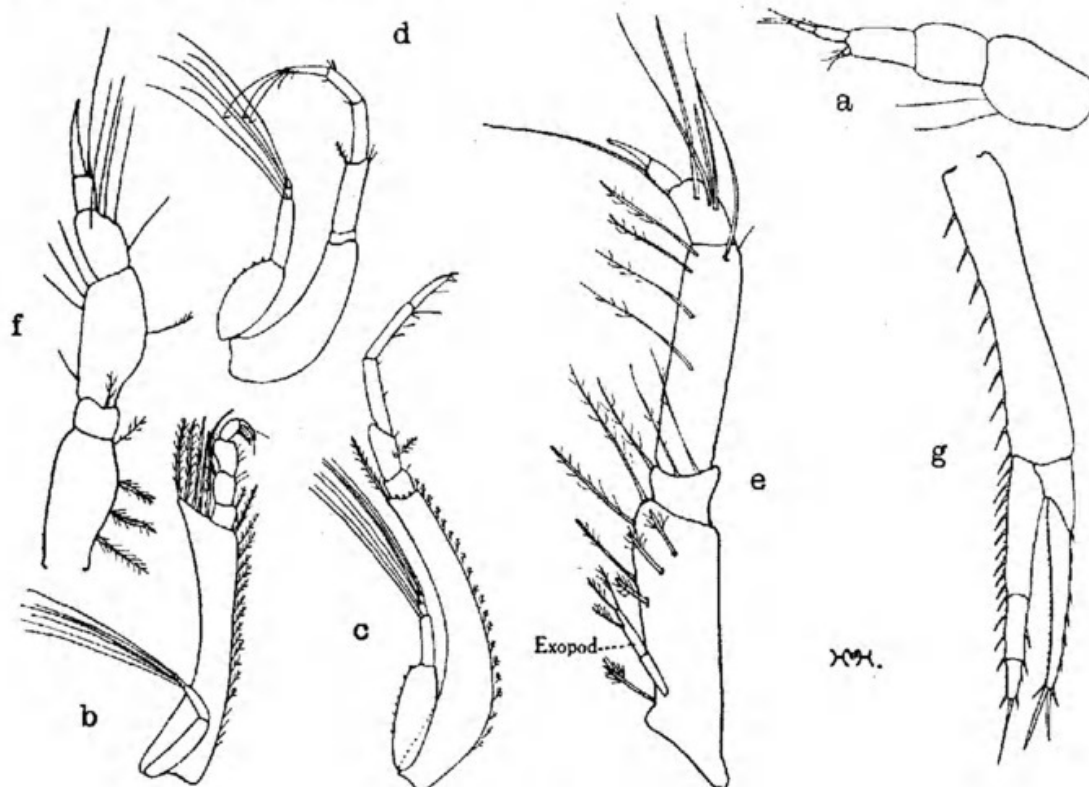


Fig. 16.

Anchicolurus waitei, paratype female. a, First antenna (x 100); b, third maxilliped (x 42); c, first leg (x 42); d, second leg (x 42); e, third leg (x 100); f, fifth leg (x 100). g, Uropod of paratype male (x 100).

genus. In the form of the pedigerous somites and in the character of the third maxillipeds, *A. waitei* resembles *Colurostylis pseudocoma*, Calman, rather than the genotype of *Anchicolurus*, while the propodus of the second leg is not longer than the dactylus, but, as mentioned, approximately equal to it in length.

LEPTOSTYLIS, Sars.

Leptostylis vercoi, n. sp.

Ovigerous female. Carapace more than one-third total length and twice as long as the five pedigerous somites together, its vertical height about two-thirds the dorsal length; back subcarinate owing to a longitudinal depression on each side of the mid-line, and with dorsal margin (as seen from the side) curved; surface spinulose and antero-inferior margins serrulate. Pseudorostral lobes short, apically acute. No distinct antennal angle. First two pedigerous segments short; third, fourth, and fifth each with pleural parts produced slightly backwards. Pleon a little longer than cephalothorax. Telson as long as sixth pleon segment, with one pair of apical spines, but no lateral armature. Third joint of first

antennae very much longer than second, accessory flagellum tiny. Third maxillipeds with well-developed exopod; basis widened distally but not produced, the lateral margins and rounded apex with plumose bristles, the apical setae stouter and longer than the others. First legs long and slender, projecting for half their length beyond the pseudorostral lobes when horizontally extended; basis narrow, curved, more than half as long as remaining joints together, somewhat triangular in section, the lower edge armed with numerous stout spines and lateral margins with plumose setae; ischium shorter than merus; carpus abruptly narrower than preceding joints, more than twice as long as merus and three-fourths as long as the slender propodus; dactylus two-thirds as long as propodus, with a few apical setae; apart from the last the distal joints bear a few inconspicuous short hairs but no long setae. Basis of second legs stout, armed with spines on inner edge and setae on outer; ischium short and carpus narrower than merus, and about

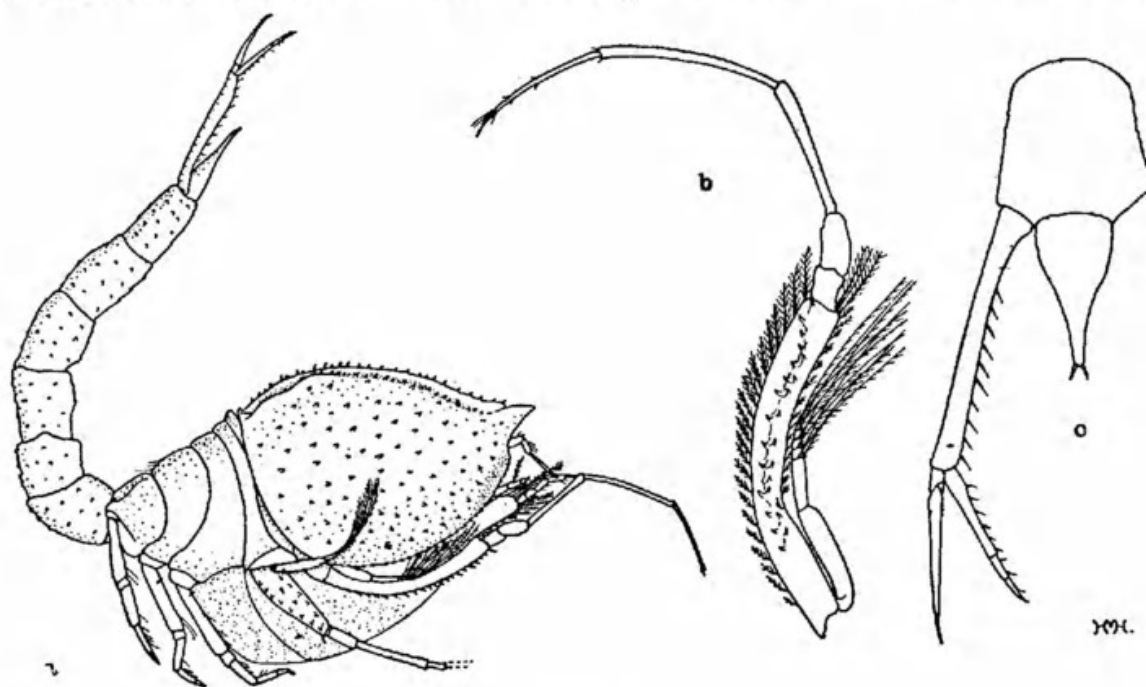


Fig. 17.

Leptostylis vercoi, type female. a, Lateral view (x 13); b, first leg (x 26); c, sixth pleon somite, telson, and uropod (x 26).

twice as long as ischium and merus together; propodus about as long as merus. Remaining legs moderately stout, with basis long and (excepting in fifth legs) much longer than merus; third legs separated from second, but not greatly. Peduncle of uropods one and three-fourths times as long as telson, armed with about ten spines on inner edge; rami of equal length, each slightly shorter than telson; exopod with a single apical spine and no other armature excepting for a feeble serration near the base of distal joint; endopod three-jointed, the first joint twice as long as the other two together; distal joint three-fourths as long as second; inner edge of endopod with nine slender spines (six on first joint, two on second, and one on third), and apex with one short, stouter spine. Colour white.

Length, 8 mm.

Loc.—Western Australia: Geographe Bay, 15-16 fath. (Sir J. Verco). Type, female, in South Australian Museum, Reg. No. C. 1768.

A single specimen was dredged fourteen years ago. The species is apparently close to *L. mancus*, Sars; as in the last-named, the rami of the uropods do not differ in length, but the legs of the new species are different and the telson has no lateral spines.



1928. "Australian Cumacea." *Transactions and proceedings of the Royal Society of South Australia (Incorporated)* 52, 31–48.

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