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## ON A TUBICOLOUS AMPHIPOD FROM PORT JACKSON.

By CHAS. CHILTON, M.A., B.Sc.

[With Plate I.]

AMONG some Australian Crustacea sent me as exchanges by the Trustees of the Australian Museum was a tube-dwelling Amphipod collected in Port Jackson. There was a plentiful supply both of specimens and of the tubes formed by them and after a full examination and comparison of them with Mr. Stebbing's description and figures I have no doubt that they belong to *Cerapus flindersi*, Stebbing,\* a species described from a single female specimen taken in Flinder's Passage during the voyage of the "Challenger." Mr. Stebbing says nothing of the tube in his description, and I presume therefore, that he has not seen it. I am now able to supplement his description in this respect and also to describe the male of the species, and to give the points in which it differs from the female, and also some interesting facts on the changes in form that occur during the growth of the male.

The genus *Cerapus* was originally established in 1817 by Say, and the species *Cerapus tubularis* was afterwards fully redescribed in 1880 by S. I. Smith who established for it a new sub-family *Cerapinae* in the family *Corophiidae*.† He thus describes the new sub-family:—

"The single known genus differs from the *Podocercinae* and allied groups in the following characters. There are only three pairs of branchial lamellæ, which are borne on the third, fourth and fifth segments of the peræon, and only three pairs of ovigerous lamellæ, which are borne on the second, third, and fourth segments. The second and third pleopods are much smaller than the first, and their inner lamellæ are rudimentary or very small. The second and third uropods are uniramous and nearly alike, the distal extremity in each being short and terminating in a hooked joint.

"The only known species inhabits unattached, portable tubes, and, as in many allied genera, has large cement glands in the bases of the first and second peræopods."

The above quotation has been taken from Stebbing's "Report on the "Challenger" Amphipoda," as I am unable to consult Professor Smith's original paper. I am therefore unable, also, to compare the present species in detail with *Cerapus tubularis*, Say. The "cement glands" in the first and second pereopods have been

\* Report on the "Challenger" Amphipoda, p. 1163, plate cxxv.

† See Stebbing's Report of the "Challenger" Amphipoda, p. 522.

very fully investigated by Nebeski,\* but for this reference again I am indebted to Stebbing's report.

In addition to our present species Stebbing has described another new species *Cerapus sismithi*, taken during the Challenger Expedition at Kerguelen Island.†

In the following detailed description of the various parts of the animal I have omitted all those parts where I had nothing to add to Mr. Stebbing's description.

*Head and body.*—The head is produced anteriorly into a subacute rostrum between the bases of the antennæ, much in the same way as is shown in Mr. Stebbing's figure of *Cerapus sismithi*, but in none of my specimens have I noticed the rostrum to be "carinate" as it is drawn and described by Mr. Stebbing in *C. flindersi*. (See figures A and B.)

The relative lengths of the various segments of the pereion of the female agree well with Stebbing's description, but in the male they are quite different. In this (see fig. B.) the first segment is about as long as the head, the second is slightly longer, anteriorly it is slightly narrower than the first segment, but about the middle it suddenly widens to twice this width thus giving attachment to the large and powerful second gnathopoda; the third segment is considerably shorter than the second and is also narrower anteriorly but it widens posteriorly; the fourth is shorter again than the third, as wide anteriorly, but narrowing posteriorly; the fifth segment which is so long in the female, is only a little longer than the fourth and not so long as the third; the sixth is subequal to the fifth in length and breadth; the seventh is as broad but shorter.

*Upper Antennæ.*—These agree on the whole with Stebbing's description, but the first joint of the peduncle is not "much longer than the second joint"; it is usually about the same length and in large specimens may even be somewhat shorter. The flagellum may contain as many as seven joints, usually there are more than four, the number given in Stebbing's description. (See fig. a. s.)

*Lower Antennæ.*—These also differ in a few details. The fourth joint is not "dilated at the base," nor "abruptly broader than the preceding joint" in any of the specimens that I have examined, indeed the fourth joint is usually narrowed a little at the base and it articulates with only a portion of the end of the third joint so that the articulation is not very strong and the fourth joint is very freely movable upon the third. (See fig. a. i.)

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\* "Beiträge zur Kenntniss der Amphipoden der Adria"—*Arb. Zool. Inst. Wien.* Bd. III. (See Stebbing's Report on the "Challenger" Amphipoda, p. 518.)

† Report on the "Challenger" Amphipoda, p. 1158, Pl. cxxiv.

In large sized males the lower antennæ are stouter and more pediform than in younger specimens, and the long setæ are by no means so conspicuous.

*The mouth parts* appear to correspond closely with Stebbing's description, but I have not examined them in great detail.

*The first gnathopoda* are the same in both sexes and agree with Stebbing's description as closely as can be expected when allowance is made for individual variation.

*The second gnathopoda* differ very much in the two sexes. In the female they do not differ very greatly from the first gnathopoda and agree very closely with the description already given by Mr. Stebbing. I give a drawing for the sake of comparison with the second gnathopoda of the male, (see fig. *gn. 2 ♀*). In the male the second gnathopoda differ considerably from those of the female and also differ very much at different stages in the development of the same individual. The form most commonly met with is that shown in fig. *gn. 2 ♂ B*, which represents the second gnathopod of a moderate sized male; it will be convenient to describe this first.

The first free joint, the *basos*, is narrow at the base where it articulates with the moderate sized side-plate but rapidly widens until at the widest part it is more than half as broad as long; the anterior edge is straight except near the base and is fringed with about ten spinules, the posterior margin is strongly convex and bears two or three setæ at the apex; the *ischios* and the *meros* are of the usual shape and not unlike those of the female; the *meros* has the distal extremity produced, rounded and tipped with a few setæ; the carpus is very large and broad, its anterior margin very convex especially towards the base, a small group of setæ\* at its distal extremity, the posterior margin is indistinctly serrate and bears five groups of long setæ in the serrations, other shorter setæ are situated between the serrations and a few on the surface of the joint; the postero-distal corner is produced acutely and reaches about half way along the inner margin of the propodos, and between this corner and the inner articulation of the propodos is a short rounded lobe reaching only about half as far. The *propodos* is considerably shorter than the carpus, rather more than twice as long as broad, the anterior margin curved and bearing about six spinules, that at the apex the longest; the posterior margin with the basal half smooth, but the distal half minutely serrate or more strictly speaking crenate, the whole margin fringed with abundant long setæ, a few others being situated along the surface of the joint; the dactylos is like that of the female and has the inner margin denticulate towards the distal end, but the inner margin of the terminal tooth again is smooth.

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\* These serrations are not shown very distinctly in the plate.

In one large and evidently old male, about  $\frac{1}{3}$  inch in length, the second gnathopod was much elongated and at first sight appeared very different. A close comparison shows however that it is simply a more developed form of the gnathopod just described, and that the two are not dimorphic forms. The whole limb is much elongated and the setæ are fewer and much smaller in proportion; this loss of setæ was also noticeable in the antennæ and I have noticed examples in several other species which seem to show that it is a change that very generally accompanies age and increase of growth.

The side-plates (*epimera*), (see fig. *gn. 2 ♂ A*) are small and are produced anteriorly into a moderately acute process which bears two or three setæ; the basos is of the same general shape as that found in the younger male but is much narrower, the ischios and meros are also similar but more elongated and the setæ at the end of the meros are very few and small; the carpus is immensely elongated and consequently much narrower in proportion, it is narrow towards the base and widens again distally, the anterior margin is quite free from setæ except one or two very small ones at the apex, the posterior margin is straight with five distinct serrations, in each of which are two or three short setæ; the extremity is produced into two long processes about half as long as the propodos, the process formed of the postero-distal corner having the sides parallel and the end truncate, the other, corresponding to the small rounded lobe in the younger male, with the outer margin straight, inner margin slightly concave, extremity rounded, quite free from setæ; the propodos is very long and narrow, the breadth not more than one-fifth the total length, the whole joint is much curved inwards, the inner margin being very concave and fringed with a row of scattered setæ; the finger is stouter and blunter than in the younger male and has the inner margin smooth. The propodos is not movable quite in the same plane as that of the carpus, but bends back on one side of it so as to lie obliquely along its surface.

I have seen only one very large male with the second gnathopoda like that shown in fig. *gn. 2 ♂ A*. Most of them were more like the one represented in fig. *gn. 2 ♂ B*, but in some the two processes at the end of the carpus were a little more developed, in others a little less developed than those shown in this figure. Forms younger still than that represented in fig. *gn. 2 ♂ B* would no doubt approximate more closely to the female in the form of second gnathopoda.

*The first pereopoda* agree closely with the description given by Stebbing, but I have not observed the "long transverse slit" across the surface of the basos that he mentions.

*The second pereopoda* also closely resemble Stebbing's description. In both this and the preceding pair the side plates are

produced anteriorly into a small rounded lobe tipped with setæ, that of the first pair being considerably larger than that of the second.

*The third pereopoda* have the side plates very large, delicate and membranaceous. Those of the female are very much larger than those of the male, a fact which tends to confirm Mr. Stebbing's supposition that they fulfil the function of marsupial plates. The side plates extend along the whole segment forming a small lobe in the rear and are of about uniform depth, the two lower corners being broadly rounded, the lower margin being usually slightly concave in the middle. The margin is somewhat uneven, entire or irregularly crenate, and is irregularly fringed with setæ. The rest of the limb is attached to the side plate at the rear and usually projects directly backwards. The relative sizes of the side plates as compared with the rest of the limb in the two sexes can be seen by comparing figures *ppp.* 3 ♂ and *ppp.* 3 ♀. The other joints of the limb are practically identical in the two sexes and agree closely with Stebbing's description.

*The fourth pereopoda* have the branchial vesicles very small, narrow and bent at the base. The whole limb is much as described by Stebbing, but is usually provided with fewer setæ; the lower margin of the side plates is thickly fringed with cilia in the male, but these are very delicate and I have failed to find them in some other specimens.

*The fifth pereopoda* and the *pleopoda* agree with Stebbing's description and do not call for special remark.

*The uropoda* which are represented in the figure as seen from above, agree with Stebbing's description, the third pair however being very much broader in proportion to the length than the second pair. (See fig. *ur.* 1 &c.)

*The telson* when seen from above proves to be bi-lobed as in *Cerapus sismithi*, the dividing cleft extending about half way towards the base, each lobe rounded and bearing on the surface two rows of sharp upturned teeth.

*Locality.*—Port Jackson, New South Wales.

*Remarks.*—The whole integument of the hinder portion of the body with the appendages is very thin and delicate, membranaceous. The animal rests in the tube with the head and first segment of the pereion and usually the ends of the second gnathopoda projecting out at the end (see fig. A) and the pleon is bent back upon the body as shown in figure B. Doubtless the sharp teeth, setæ, and serrations on the uropoda and the telson enable the animal to fix this portion of the body to the inner surface of the tube,

and by extending the body and again bringing up the pleon to its reflexed position to push its way along the tube.\*

The tube (see fig. A) is cylindrical, of the same diameter throughout except at each end where it is somewhat widened; the two ends are quite similar and appear to be equally and indifferently used by the animal. The tube is quite free and unattached and is no doubt carried about by the animal when it moves. The material of which it is made is fairly tough, the surface is smooth and the whole appears to be formed from the secretion produced by the glands in the first and second pereopoda, no sand grains being used as in *Cerapus sismithi*.

The tubes that I have seen are all of the same shape, but they vary much in size, the largest being about .46 inches long and .03 inches in diameter, others being of only half these dimensions. Many of the tubes and especially of the smaller ones were empty and I presume that when the animal has grown too large for its tube it leaves it and secretes another and larger one.

From the description which has now been given of the male of this species it appears that *C. hindersi* is not very different from *C. sismithi* described by Stebbing from Kerguelen Island; it differs from that species however in the antennæ, to some extent in the second gnathopoda and also in the armature of the uropoda.

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## DESCRIPTIONS OF THREE NEW AUSTRALIAN LIZARDS.

By J. DOUGLAS OGILBY.

### 1. GYMNOACTYLUS SPHYRURUS, *sp. nov.*

Head rather large; a strong transverse ridge crosses the occiput immediately behind the eyes, ending on either side in a blunt point placed at the postero-superior angle of the orbit; from this runs forward an inwardly curved, elevated, supraciliary ridge which is continued on the snout by a conversely curved angular canthus rostralis; these ridges form the margin on the forehead of an oval, and between the orbits of a subtriangular, depression; loreal region concave; the length of the snout is one and two-fifths

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\* Some very interesting remarks on *Cerapus abditus* were given many years ago by Templeton, see Stebbing's "Report on the 'Challenger' Amphipoda," p. 168.

EXPLANATION OF PLATE I.

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All the figures refer to *Cerapus flindersi*.

A.—View of a portion of one end of the tube with the animal (a large male) in it,  $\times 9\cdot5$ .

B.—Dorsal view of the same animal when extracted from the tube,  $\times 9\cdot5$ .  
The bases of the antennæ are shown, also a portion of the second gnathopoda and the last pair of pereopoda; the other limbs being concealed from view. The pleon is bent back under the body. (The front of the head in figures A. and B. has been drawn much too broad.)

a. s.—Upper antenna  $\times 22\cdot5$ .

a. i.—Lower antenna  $\times 22\cdot5$ .

gn. 2 ♂ A.—Second gnathopod of large male,  $\times 22\cdot5$ .

gn. 2 ♂ B.—Second gnathopod of younger male,  $\times 52$ .

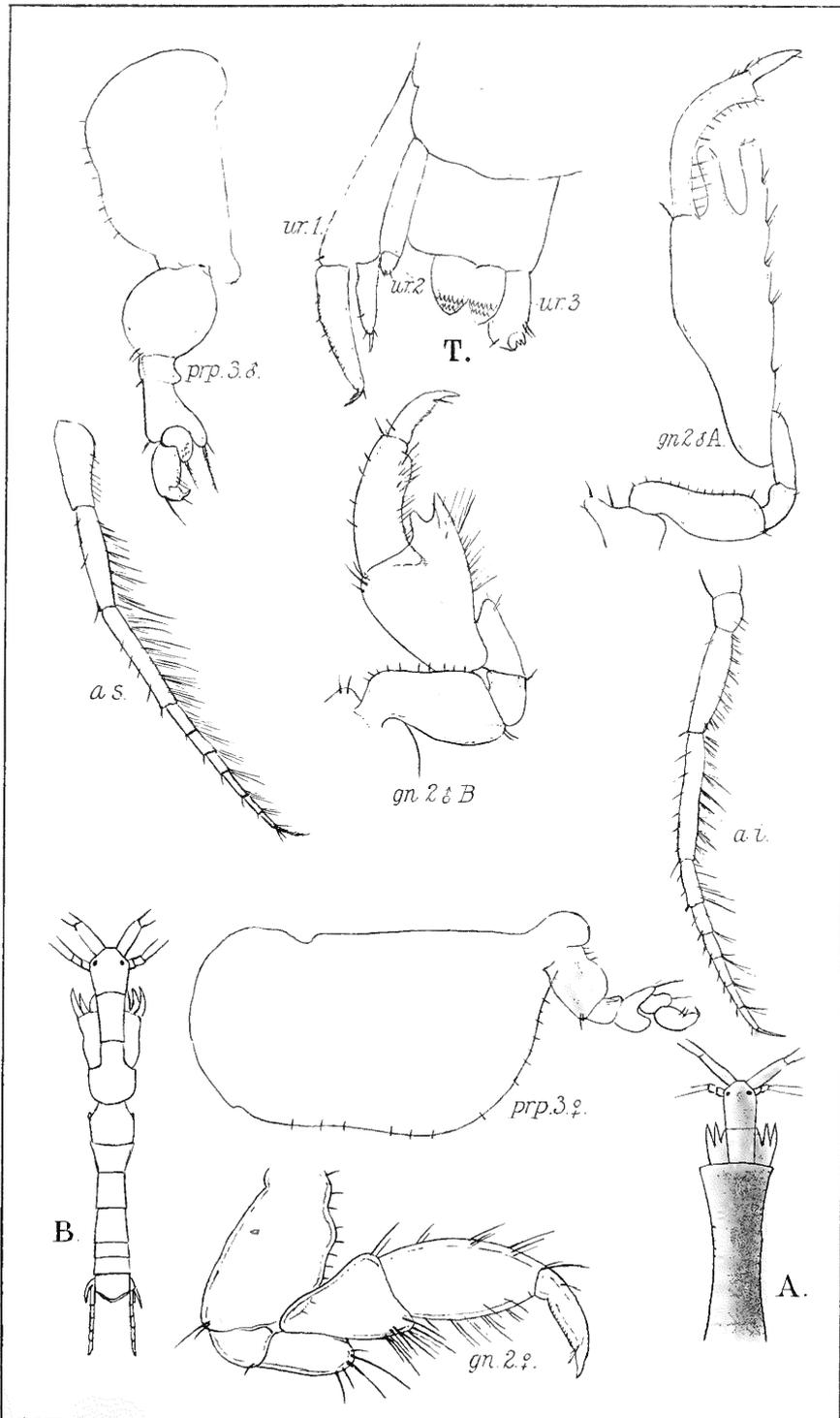
gn. 2 ♀.—Second gnathopod of female,  $\times 90$ .

prp. 3 ♂.—Third pereopod of large male,  $\times 52$ .

prp. 3 ♀.—Third pereopod of female,  $\times 52$ .

ur. 1.—First uropod  
ur. 2.—Second uropod  
ur. 3.—Third uropod  
T.—Telson

} Seen from above, all  $\times 90$ .



CHAS. CHILTON, del. ad nat.

G. H. BARROW, lith.