

ART. XVII.—*A New Genus of Phreatoicidae.*

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(With Plates XVIII., XIX.).

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Through the kindness of Professor W. A. Haswell, of Sydney, I recently received a few specimens of a new blind Isopod of the interesting and peculiarly Australian family Phreatoicidae. They were lately received by him from Tasmania, and were found in the burrows of the land crayfish *Engaeus cunicularius*.

In all fundamental characters this new species agrees with the genus *Phreatoicus*, but has differences in degree sufficiently marked to prohibit its inclusion in that genus; nor can it be considered congeneric with either of the other two genera of this family (*Phreatoicopsis* and *Phreatoicoides*), so that it is necessary to establish another one to receive it.

The family characters are defined by Dr. Chilton, of New Zealand, as follows:—

“Body subcylindrical, more or less laterally compressed. Mandibles with a well developed appendage. Legs distinctly divided into an anterior series of four and a posterior series of three. Pleopoda broad and foliaceous and branchial in function, but not protected by an operculum. Pleon large, of six distinct segments. Uropoda, styliform.”

The representatives of the family are mostly blind. Some inhabit subterranean waters, others surface waters, often on the summits of our highest mountains, and one species beside the present one is terrestrial. None are known of marine habit. They appear to be a very ancient family, and structurally widely separated from other known forms, and so far are only recorded from Australia, Tasmania, and New Zealand. It would be of interest to know if they exist in South America, for one is justified in thinking that they might be found there.

Gen. *Hypsimetopus*, gen. nov.

Generic Characters.—Very like *Phreatoicus* as to the general form of the body and the structure of the mouth-parts and several appendages. The cephalon, however, is relatively larger, being higher in front, and also deeper than the succeeding segment, to which it is freely articulated; the infero-lateral corners are produced forwards as an angular projection along the sides of the first joint of the lower antennae; the inferior margins, at about two-thirds of the length of the head from the front, curve upwards and slightly forwards to mark off on each side a large area (cheek), which, however, does not project outwards. The epistome forms a conspicuous transverse ridge below the base of the lower antennae.

First segment of pereion about as long as the succeeding segment, with its antero-lateral corners produced forwards. Pleon relatively rather shorter than in *Phreatoicus*, but not so short as in *Phreatoicoides*, the side-plates only slightly produced, and the vertically suspended pleopods almost entirely exposed.

First appendage of pereion in the male with enormous subchelate hand.

Remarks.—This new genus may easily be distinguished from *Phreatoicus* and *Phreatoicopsis* by the shape of the head, and also by the longer first segment of the trunk, with which it is very movably connected; this is not the case in the other two genera. In these characters, except in the relative length of the first segment of the trunk, it is in close agreement with *Phreatoicoides*, but, besides other differences, it fundamentally differs from that genus by the possession of an epipodite on each of the last three pairs of pleopoda, agreeing in this respect with the two first-mentioned genera. The name is suggested by the relatively high forehead in comparison with *Phreatoicus*.

Hypsimetopus intrusor, sp. nov.

Specific Characters.—Form of body rather slender, surface smooth. Eyes not formed. First four segments of pereion of subequal length. Pleon only a little deeper than the pereion, its length measuring 45 as compared with the cephalon and pereion combined as 100; terminal segment with which the telson is

amalgamated a little longer than the preceding one, narrowing somewhat distally and constricted above into a small truncated telson, which, however, does not project beyond the extremity, and is almost hidden in lateral view; this bears on its upper surface two transversely placed stout spines and many long setae; below this piece on each side is a stout marginal spine, and the margins thence curve downwards and forwards to the base of the uropoda, and are fringed by a single rather stout spine, and several spinules and setae.

The inferior margin in front of the uropoda, curves evenly upwards and bears a series of two stout and about four finer simple spines. Uropoda with rami shorter than the basal joint, inner one slightly the longer, its upper surface swollen at the middle area and bearing two stout spines, outer ramus with one spine on the upper surface.

Upper antennae not reaching to the extremity of the fourth joint of the lower antennae, peduncle short, flagellum of about seven joints. Peduncle of lower antennae long, possessing few setae, the fifth joint longer than the fourth; flagellum multi-articulate (length unknown).

Gnathopoda of male with hand very large and powerful, sub-triangular, narrow at the insertion of the finger, palm oblique, concave, margin entire, and fringed with long spineform setae, meeting the posterior border in a clearly defined obtuse angle; anterior and posterior margins evenly convex. Finger a little shorter than the palm, impinging against the inner side of the hand beyond the palmar edge, its inner surface near the middle tumified.

Colour.—Spirit specimens, creamy white.

Length.—Male, 15·5 mm.

Habitat.—Near Zeehan, Tasmania, in burrows of *Engaeus cunicularius*. (Received from Professor W. A. Haswell.)

SUPPLEMENTARY DESCRIPTION.

I received three specimens, and each appears to be a male, in consequence of having a large hand agreeing precisely with each other. The largest one measured 15·5 mm. in length, and the other two about 12 mm.; one of these latter I dissected; it was a male, and the following description is taken from it.

Body.—The surface of the body has very few setae upon it, except the terminal segment, which possesses a fair number on the back as well as on the hind margin, which also possesses some spines and spinules. The side-plates of the pleon are fringed on the inferior and posterior margins with a few long filamentous setae, and the epimera of the last three segments of the pereion have the posterior angle of each tufted with a few spinules. The front margin of the head has also a few setae just above the base of the lower antennae, in front of the place where the eyes in allied forms are situated.

Upper Antennae.—The first three joints which form the peduncle are of subequal length, and conjointly scarcely reach beyond the second joint of the lower antennae, the basal joint is somewhat stouter than the succeeding one, the others become a little narrower. The flagellum has seven joints, and, as in *Phreatoicus*, towards the end is slightly swollen; the first joint is half the length of the preceding one (third joint of peduncle), but scarcely any narrower.

Lower Antennae.—None of the specimens possessed any that were unbroken at the ends, so that their length is unknown. The peduncle is relatively rather long and has very few setae; the first joint transverse, its lower margin longer than the upper, the second almost square, third as long as the two basal joints combined, proximally narrow and bent a little upwards, fourth a little longer, fifth considerably longer than the fourth. In the longest, but broken flagellum I counted 33 articuli.

Mouth parts.—The mouth parts are of normal form.

Anterior Lip.—Much broader than long, very thick at the base, evenly rounded distally with the centre slightly produced. Near the base of the lip (epistome) there is a distinct transverse ridge projecting outwards and thickly furred.

Mandibles.—The mandibles have no marked difference in shape from the other allied forms. The most noticeable characteristic is a rather stouter palp, the terminal joint being fully half as broad as its length. The *left* mandible has the outer cutting edge divided into four, and the inner into three teeth; between these and the molar expansion there is a secondary process (spine row) and this bears on its summit about 14 pectinated spines which are disposed in two parallel rows, which diverge from one

another on each side. The molar expansion is large and its end broad and concave.

The *right* mandible has but a single cutting edge which is divided into four teeth; between the base of this plate and the molar expansion there is a secondary process which bears a single row of about six slightly pectinated spines, and between this process and the cutting-edge there is a single stouter simple spine. The molar expansion is longer than the left-hand one, and its surface is larger and convex.

The mandibular palp has the first joint short, being as broad as it is long, the second fully three times as long, and the third fully half as broad as its length, which is less than the second; each bears many long setae, those at the apex of the terminal joint being curved, and faintly feathered.

Posterior Lip.—The posterior lip is very thick at the base, and divided into two rather broad lobes which are irregularly rounded distally and fringed with long setae.

First Maxillae.—The outer lobe of the first maxillae has the end obliquely truncated and crowded with 10 spines, some of which are more or less pectinated. The inner lobe is considerably shorter than the outer one, the end set very obliquely and clothed as follows:—A single spine at the outer extremity, at the base of which arises a long plumose setae of identical form to those so-called auditory, then follow a row of five stout setae, which are slightly curved and a little pectinated near the ends on their outer face, and ciliated along the same face lower down.

Second Maxillae.—In the allied forms, except *Phreatoicopsis*, there is a pretty close agreement in this organ. The present form presents no peculiarities of its own. The inner lobe is relatively long and extends to the level of the two outer twin lobes.

Maxillipedes.—These are comparatively rather slender. The epipodite is somewhat small and narrow, and the distal margin angular, with the apex rounded off. The basis, ichium, and merus are without any special differences to other forms; the plate of the basis extends to the distal extremity of the merus, and bears three curved coupling spines on the right and two on the left-hand sides. The carpus is rather long and slender, and the outer distal angle is not produced. The propodus is of equal

length to its breadth, and of almost circular outline; the dactylus is longer than the preceding joint and narrower, and the extremity rounded.

First Appendage of Pereion.—Not having seen a female I can only speak of the male form. The basis is short, being only a little longer than its greatest breadth, narrow at the neck, front margin almost straight and hind margin deeply convex. Ichium rather broader than long, posterior margin converging outwards from each end to meet in the middle length of the joint as a sharply defined angle; opposite margin convex. Merus very short, twice as wide as long; anterior margin squarely produced forward. Carpus rather narrowly jointed to the merus; hind margin convex; front margin abruptly curving outwards to form a wide union with the propodus. The remainder of the appendage has been sufficiently described.

Second, Third and Fourth Appendages of Pereion.—These agree in general shape with *Phreatoicus australis*, but do not bear nearly so many spines and setae, only the penultimate and antipenultimate joints bear any spines, and these are along the posterior margin. The last joint has beside the terminal nail a tooth on the inner margin, which agrees with each of the known members of the family, but is very small in *Phreatoicopsis*. (In my remarks following *P. shephardi*, I stated that the dactyli of the legs did not have a secondary unguis; this only applies to the three last pairs, for the second, third and fourth have a secondary nail or tooth.) The merus of the second pair is rather more expanded than the third and fourth. The fourth is shorter than the third and exhibits no sexual differentiation in the two last joints as in *Phreatoicus*.

Fifth, Sixth, and Seventh Appendages of Pereion.—These are similar to each other in form, and each succeeding pair gradually increase in length, the fifth being equal to the fourth. The dactyli of each is long with the margin entire.

Pleopoda.—These possess all the characteristics of *Phreatoicus*; relatively they are broader, and the exopodite which the last three pairs possess is larger and fringed with long setae.

First pair with protopodite narrow; exopodite twice as long as broad, jointed to protopodite near its inner margin; outer margin entire, curving upwards and outwards, then down-

wards in an even curve to the inner distal margin. Inner margin almost straight. Outer margin fringed with setae, those at the distal extremity being plumose. The inner margin is unclothed in this pair, but is thickly fringed with setae in each of the others. The endopodite is as long as the exopodite, but narrower, and except for two or three plumose setae at the extremity is unclothed. The *second pair* is of the same shape as the first pair, except that the inner margin near the end is excavated to receive a small triangular secondary joint, which is narrowly articulated close to the inner margin, and hangs only a very little below the extremity of the primary joint. The endopodite is broader than the first pair, and the "penial filament," which is borne by this joint, is short, elbowed at the base, and pointing upwards. The *third pair* is of similar length to the second, but the exopodite and epipodite are each broader, and the protopodite has a long, narrow-ovoid lobe (epipodite) jointed to its outer face. The structure of this lobe is thicker than the exopodite and very vesicular, being similar to the endopodite except that margin is fringed with long simple setae set some distance apart. The *fourth* and *fifth pairs* agree in all respects with the third, except in size, the fourth being a little shorter and the fifth much shorter, so much so as to be almost as broad as long, and the hind margin forming a full half circle.

DESCRIPTION OF PLATES.

- A.—*Hypsimetopus intrusor*—Side view of the whole animal, a male of 15.5 mm.
 B.—Cephalon and adjacent parts except buccal mass.
 C.—Extremity of body with uropod attached.
 L¹.—Anterior lip.
 M^R and M^L.—Right and left mandibles.
 L².—Posterior lip.
 Mx¹ and Mx².—First and second maxilla.
 M.P.—Maxillipedes.
 P_R, 1, 2, 4, 7.—Pereiopods, numbered respectively.