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XLVI.—On two new Isopods (Arcturus, sp., and Tanais, sp.) from New Zealand

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lateralia brachiorum simulantibus maxime prolatis. Brachia incipientia ab angulis disci producta, series radiales continuantia. In superficie actinali os medium, decem magnis ossiculis oralibus cinctum, prostantibus scutellis adoralibus. Unum scutum buccale adest; dentes, scutella oralia et tori angulares absunt. Papillæ orales ternæ aut quaternæ, cum unâ magnâ, ad angulos oris appositâ.

Series scutorum quadratorum a rimis oris per radios procedunt, scutellis ventralibus prostantibus, et per brachia inchoata producuntur.

Foramina pedum ambulacralium septis angustis disjuncta, permagna, protecta singulâ longâ papillâ ambulacrali ad margines interbrachiales, lanceolatâ et squamæformi, alterâ minore ad partem interiorem radii juxta scutella brachiorum ventralia positâ. Aræ interbrachiales squamis parvis hexagonalibus obtectæ; marginem appropinquantes decrescunt, relinquentes limbum angustum expositum; disci margine cincto densis spinis brevibus et compressis.

Hab. in mari ad oras insulæ Madagascar.

EXPLANATION OF PLATE XX.

- Fig. 1.* *Astrophium permira*, nobis, abactinal aspect. $\times 6.5$.
Fig. 2. Actinal aspect of the same specimen. $\times 6.5$.
Fig. 3. Brachial series of radius ii, abactinal aspect. $\times 10$.
Fig. 4. Brachial series of radius v, abactinal aspect. $\times 10$.
Fig. 5. Actinostome: mouth-armature. $\times 10$.
Fig. 6. Pore-area and actinal aspect of radius iii. $\times 10$.
Fig. 6 a. Terminal portion of pore-area and actinal aspect of radius ii. $\times 10$.
Fig. 7. Transverse section, showing the proximal extremity of the fifth segment in the brachial disk-series of radius iv. $\times 10$.
Fig. 8. Transverse section, showing the distal extremity of the fourth segment in the brachial disk-series of radius iv. $\times 10$.
Fig. 9. Distal extremity of the first free segment of the rudimentary free arm of radius iv. $\times 20$.
Fig. 10. Distal extremity of the fourth segment of the rudimentary free arm of radius v. $\times 20$.

XLVI.—On two new Isopods (*Arcturus*, *sp.*, and *Tanais*, *sp.*) from New Zealand. By GEORGE M. THOMSON.

[Plate XIX. figs. 1-6.]

THE two new species of Isopods described in this paper represent genera not hitherto found in New Zealand; and they are both somewhat remarkable for their resemblance to, and dissimilarities from, already known species. Both forms were

obtained by the dredge in from 4-5 fathoms in Dunedin Harbour; and I have reason to believe that they are somewhat rare species.

The first belongs to the genus *Arcturus*, and approximates very closely to *A. corniger*, Stebbing*, a species found at Algoa Bay. After reading Mr. Stebbing's description of this species, and comparing it with that found here, I am inclined to think that he has only seen females. It is very similar to the female of the new species, but differs considerably from the male.

The species found here, which I propose to call *A. tuberculatus*, differs in the following general respects from *A. corniger*:—The superior antennæ are four-jointed, having a large broad basal joint, and they extend considerably beyond the extremity of the second joint of the inferior antennæ. At the extremity of the terminal joint there occur several minute jointed appendages, regarding the function of which I am quite ignorant. The fourth segment of the body, which in *A. corniger* is produced upwards into six cone-like swellings, bears in the male of the local species one stout conical tubercle near each extremity (the anterior one being trifid), while in the female it has ten pointed tubercles. The branchial opercula are very long, and extend to the extremity of the abdomen. The following is a specific description of this interesting form.

Arcturus tuberculatus, sp. nov.

Male. Body rather robust. Head very indistinctly separated from first segment of body, its antero-lateral margin produced forward, apex crowned with a two-lobed tubercle. Three anterior segments also produced upwards into acute tubercles. Fourth segment smooth, bearing a single stout spine at each end on the median line, the anterior one being trifid. Superior antennæ reaching beyond the extremity of second joint of inferior; basal joint stout; second and third short; fourth as long as the two preceding, and bearing several jointed appendages, each consisting of a minute basal joint and a slender narrow lamella. Inferior antennæ rather longer than first four body-segments; first and second joints short; third and fourth long, not ciliated, but with rows of minute tubercles on the under margin; flagellum three-jointed, sparingly ciliated, with a row of acute spines or serrations on its inner margin.

These sharp teeth are present on the antennæ of both sexes, and must materially assist the animal in grasping its prey;

* Ann. & Mag. Nat. Hist. 4th ser. vol. xii. p. 97 (1873).

but the tubercles are found only on the male. They are very characteristic, each being a well-marked denticle with four or five rounded and roughened crowns.

The *female* differs from the male in having the whole body, except the lower antennæ, more or less tuberculate. The head and three posterior segments of the body bear a row of tubercles on each side, and have their inferior margins laterally extended. The fourth segment is flattened on its postero-lateral margins; it bears on the median line at its anterior extremity a large three-pointed tubercle; behind this are three smaller tubercles placed transversely, the middle one being the smallest; and on each side of the anterior margin are two tubercles, the lower of which is the largest. The oviferous pouch does not extend the whole length of this segment. The fifth segment of the body is extended downwards as if to form a supplementary pouch; but I do not know at all what the function of this enlargement can be. Length 0.2 of an inch, exclusive of the antennæ.

Hab. Dredged in Dunedin Harbour, in 4-5 fathoms.

The second species described in this paper is a *Tunais*, of which I have hitherto only obtained a single specimen, and of which consequently the description is somewhat meagre. It approximates rather closely to *T. vittatus*, Lilljeborg, of Europe, and is probably its representative in these seas, but at the same time is sufficiently distinct. The following are the chief points of difference. The antennæ are not so setose. The first gnathopoda are well developed; but the immovable finger is destitute of tubercles on its inner margin, while it is much thicker than the movable finger. The posterior pereopoda are terminated by sickle-shaped fingers, but wanting the denticulations which are found in *T. vittatus*. The fascicles of hairs on the pleon are composed of rather dense furry hairs, not slender cilia. Lastly the terminal uropoda have five instead of three articulations. The following is the specific character:—

Tunais novæ-zealandiæ, sp. nov.

Body broader than deep, with transverse fascicles of rough hairs on the three anterior segments of the pleon. Eye very small, black, and circular, placed on a prominent lateral lobe of the anterior margin of the head. Superior antennæ three-jointed, setose at the extremity; first joint longer than the two succeeding. Inferior antennæ rather shorter than superior. First gnathopoda very stout, the immobile finger of the hand

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smooth on its inner margin, or only slightly denticulated. Second gnathopoda very slender. Posterior pleopoda bearing a smooth sickle-shaped finger, with a few long cilia at its base. Terminal uropoda almost as long as antennæ, five-jointed, and with numerous setæ. Length 0·18 inch.

Hab. Dredged along with the previous species in Dunedin Harbour, in 4-5 fathoms.

EXPLANATION OF PLATE XIX. FIGS. 1-6.

Fig. 1. *Arcturus tuberculatus* (male). × 13.

Fig. 2. The same (female), head and part of body. × 13.

Fig. 3. The same, superior antennæ. × 56.

Fig. 4. The same, lamellar plate of abdomen. × 23.

Fig. 5. *Tanais novæ-zealandiæ*. × 13.

Fig. 6. The same, extremity of last pair of legs. × 23.

XLVII.—*On a new Species of Nebalia from New Zealand.*

By GEORGE M. THOMSON.

[Plate XIX. figs. 7-9.]

IN dredging during the past summer in Dunedin Harbour I obtained a single specimen of a *Nebalia* differing from any species hitherto described, and which, from the great length of its inferior antennæ, I have named *N. longicornis*.

In a paper in the Linnean Society's Transactions for 1875 (ser. ii. vol. i.), "On some Atlantic Crustacea of the 'Challenger' Expedition," Dr. Willemoes-Suhm described a new species of *Nebalia* from Bermuda (*N. longipes*), in which the phyllopodal character of the legs has been entirely lost, and the schizopodal character approached more than in any other species of the genus. Taking this fact in conjunction with the characters of several new deep-sea genera of Schizopods examined by him, he reopened the whole question of the position which *Nebalia* occupies in reference to other groups of Crustacea, and proposed to unite it with these new forms, the Mysidæ, &c., in the enlarged group of the Schizopoda. Seeing, however, that it differs from all others of the family in the number of its segments, in the well-developed phyllopodal character of the thoracic appendages in the majority of the species, and also in its development, it seems a better plan to adopt the proposition made by Dr. A. S. Packard, Jun. (in the 'American Naturalist,' vol. xiii. p. 128), viz. to make it the type of a new order, the Phyllocarida. As he points out, *Nebalia* probably represents a persistent form of a very

