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Art. IV.—*On the New Zealand* Copepoda. By Geo. M. Thomson, F.L.S.

(*Read before the Otago Institute, 9th May*, 1882.)

Plates V. to XI.

In the N.Z. Inst. Trans., Vol. XI., pp. 258–259, I described two species of Entomostraca belonging to the Order Copepoda—viz., *Cyclops novæ-zealandiæ* and *Arpacticus bairdii*. I had numerous other forms in my collection at the time, but, from want of text-books on this little-known order, was unable with any certainty to work them out. This difficulty having been in great measure overcome, I am now enabled to contribute a little information to our knowledge of this interesting group of animals.

The forms described in this paper have been obtained from only a few situations, the marine species being either from rock-pools or shore-kelp along the coast, or taken by the dredge in Otago Harbour at a maximum depth of 6 fathoms. Small as the number of species already identified is, they show a remarkable approximation to European forms. As the literature of the subject is not readily accessible to members of the N.Z. Institute, I make no apology for introducing generic characters. The classification followed is that adopted by Brady in his beautiful "Monograph of the British Copepoda," recently issued by the Ray Society.

Of the 8 families represented in the British fauna, I have only met with representatives from 4—namely, Calanidæ, Cyclopidæ, Harpacticidæ and Artotrogidæ.

(Note.—Four species of Copepoda were obtained by Dana near New Zealand, and are described in the "Crustacea of the U.S. Exploring Expedition (1855);" they are *Pontella valida*, *Pontellina simplex*, *Sapphirina gemma* and *Miracia gracilis*).

Fam. CALANIDÆ.

Sub-fam. Calaninæ, *Dana*.

Eye single, composed of several lenses; thorax and abdomen long and slender; rostrum (if present) slender, and usually fuscate; anterior antennæ 24–25-jointed.

Genus **Boeckia**,* gen. nov.

Body elongated, compressed; head not distinct from thorax. Abdomen consisting of five segments in the male, and of three in the female. Right anterior antennæ of the male geniculated. Posterior antennæ two-branched, the secondary branch having four small intercalated median joints. Mandibles large, with a sharply toothed cutting portion, and a broad palp; the latter bears two branches, one four- and the other three- (or two-) jointed. Maxillæ furnished with numerous strong marginal plumose setæ. Anterior

* In honour of Axel Boeck, author of several works on Copepoda.

footjaws broad, setæ numerous; posterior pair much elongated, terminal portion five-jointed, and furnished with several setæ of moderate length. Five pairs of swimming feet, all two-branched, and each branch of the first four pairs three-jointed and almost similar; fifth pair with both branches three-jointed in the female, but outer branch two-jointed in male, with a long terminal curved (apparently prehensile) claw, inner branch somewhat rudimentary, one-jointed. Ovisac single, borne in front of the abdomen.

It is with some hesitation that I advance this new genus, but as the chief systematists who have studied the *Calanidæ* treat the structure of the inner branches of the swimming feet as of primary importance in the classification of the genera, no other course was open to me. The genus belongs to the same section as *Isias* (Boeck), and *Centropages* (Kröyer). The former is its nearest ally, but differs in having the inner branch of the fifth pair of feet in the female one-jointed, while in the male the outer branch consists of two, and the inner of one or two joints. In *Centropages*, the strong bristles on the anterior footjaws point to its affinity with the sub-family *Pontellinæ*, and the outer branch of the fifth pair of feet in the male is developed into a powerful grasping claw on the right side only, while the inner branch is normally three-jointed.

1. *Boeckia triarticulata*, sp. nov. Pl. VI., fig. 1.

Body elongated, rounded above, last thoracic segment produced into a strong spine on its infero-posterior margin. Anterior antennæ almost as long as the body: that of the male on the right side swollen in the middle, hinged between the 19th and 20th joints, and bearing denticulated plates on the inner face of the 18th and 19th joints above, and on the 20th joint below the hinge; spines and setæ rather few. Fifth pair of feet in the female somewhat similar to preceding pairs, but with the middle joint of the outer branch produced internally into a strong toothed spine (in this respect resembling to some extent *Centropages typicus*), inner branch rather reduced in size; in the male the outer branch is distended and two-jointed, with a long terminal curved claw, which is longer and more slender on the left than on the right side. Caudal segments about as long as last abdominal segments, and bearing five densely plumose rigid setæ, which are shorter than the abdomen.

Length (including caudal setæ) $\frac{1}{10}$ inch; spread of anterior antennæ, $\frac{1}{4}$ inch.

Hab. This interesting species was obtained in shingle-pits (fresh water) at Eyreton, in the North Canterbury District, by Mr. Chas. Chilton. Most of the specimens are reddish in colour, but the colouration is very variable both in intensity and localization.

(*P.S.*—The generic name *Boeckia* was, I find, originally proposed by Dr. Brady for a species of *Lichomolgus* (*L. arenicolus*), but as it has lapsed for that species, it may stand for the above. In suggesting it, I was quite unaware that it had been already employed).

Fam. CYCLOPIDÆ.

Genus **Thorellia**, *Boeck.*

Body expanded in front, tapering posteriorly. Anterior antennæ many-jointed, much shorter than cephalothorax; posterior pair 4-jointed, without a secondary branch. Mandibles dilated at the extremity; palp tubercular, bearing two filaments. Maxillæ bearing several strong apical teeth and marginal setæ. First pair of footjaws 4-jointed, slender, armed with long marginal spines and setæ. Second pair 4-jointed, prehensile, terminating in two hooked claws. First four pairs of feet 2-branched, each branch 3-jointed. Fifth pair rudimentary, reduced to a single branch.

1. *Thorellia brunnea*, Boeck, var. *antarctica*. Pl. V., figs. 15–19.

Cephalothorax as broad as long, rounded in front; rostrum short, obtuse. Segments of thorax rounded at the sides, much broader than long; abdomen very long and narrow. Anterior antennæ about two-thirds as long as cephalothorax, 21-jointed, first joint the largest, as broad as long, next 8 much broader than long, 11th to 19th about as broad as long, 20th longer, and last about twice as long as broad; the first about three times as broad as the last; setæ numerous on the first nine joints. Posterior antennæ 4-jointed, about half as long as the anterior pair. Mandible with numerous teeth on the dilated apex. Anterior footjaws 4-jointed, bearing numerous curved spines and setæ; 3rd joint with a branched appendage. First four pairs of feet furnished with peculiar lancet-shaped spines on the outer margins and extremities; fifth pair with a minute basal joint; second joint elongated, with one lateral and two terminal spines. Caudal setæ densely plumose; middle one as long as the abdomen; outer about three-fourths as long.

Colour—semi-transparent, except the caudal segments which are tinged with dark red. Length (including caudal setæ) $\frac{1}{17}$ inch.

Hab. Dredged in Otago Harbour in 7 fathoms.

This differs from the figure of *Thorellia brunnea* in Brady's Monograph (vol. i., pl. 16) in a few immaterial points. The anterior antenna is not so continuously setose throughout its length, and the fifth pair of feet has three long simple spines, in place of the lancet-shaped spines figured by Brady. In all other respects, except colour (which is a varying feature of no value in this species), our form agrees with the common European one.

Genus **Cyclops**, *Müller.*

Anterior antennæ forming hinged clasping organs in the male. Posterior antennæ 4-jointed, without a secondary branch. Mandible dilated and toothed at the extremity, palp minute bearing two long setæ. Maxillæ strongly toothed. Swimming-feet with both branches 3-jointed.*

α.—Anterior antennæ 17*-jointed.*

1. *Cyclops gigas*, Claus. Pl. IX., figs. 8–10.

C. gigas, Claus. Die freilebenden Copepoden (1863), p. 100.

Anterior antennæ reaching to third segment of the body, tapering in width somewhat uniformly, relative length of joints as follows:—

1,	2,	3,	4,	5,	6,	7,	8,	9,	10,	11,	12,	13,	14,	15,	16,	17,
16.	15.	3.	8.	5.	3.	6.	8.	3.	3.	4.	4.	3.	4.	5.	8.	8.

last joint terminated by about six setæ. Posterior antennæ strongly developed. Mandibles strongly toothed. Setæ of the swimming feet densely plumose; spines pectinately toothed. Fifth foot 2-jointed; basal joint broad, bearing a single long seta at the outer angle; second joint longer, narrow, with a long and a short seta. Abdominal segments pectinately toothed on their posterior margins. Caudal segments about 8 times as long as broad, slightly exceeding in length the three preceding abdominal segments. Central caudal setæ longer than abdomen; outer three-fourths the length of central; inner very short. Length $\frac{1}{10}$ inch.

Hab. Tomahawk Lagoon, near Dunedin.

Our form agrees in all respects with the European species, and the description is almost a reproduction of that in Brady's Monograph, vol i., p. 105.

β.—Anterior antennæ 14*-jointed.*

2. *Cyclops novæ-zealandiæ*, G. M. Thomson. (Trans. N.Z. Inst., vol. xi., p. 258.)

Numerous specimens (all males) were sent to me from Canterbury by Mr. Charles Chilton.

γ.—Anterior antennæ 12*-jointed.*

3. *Cyclops serrulatus*, Fischer. Pl. XI., figs. 19–22.

Cephalothorax oval, not greatly exceeding in length the rather slender abdomen. Anterior antennæ reaching to the middle of third body segment, tapering gradually to the extremity; the relative lengths of the joints being about as follows:—

1,	2,	3,	4,	5,	6,	7,	8,	9,	10,	11,	12,
20.	7.	5.	12.	8.	5.	10.	16.	13.	17.	23.	22

Fifth pair of feet very small, 1-jointed, subtriangular, dilated outwards, bearing 2 setæ and a ciliated lancet-shaped spine. Caudal segments much

* See "Trans. N.Z. Inst.," vol. xi., p. 258.

(4 to 6 times) longer than broad, about as long as two last abdominal segments; outer margin fringed with a row of fine teeth. Innermost tail setæ considerably longer than abdomen.

Length $\frac{1}{20}$ of an inch.

Hab. Tomahawk lagoon, near Dunedin.

My specimens are rather larger than the European form, but in all points of structure agree closely with Dr. Brady's description and figures.

δ.—Anterior antennæ 8-jointed.

4. *Cyclops chiltoni*, n. sp. Pl. IX., figs. 11–19.

Cephalothorax narrow-oblong in form, last segment hardly wider than abdomen; first segment three-fifths of the length of the whole; rostrum very short. Abdomen slender, subequal with cephalothorax in length, segments about as broad as long, surrounded by rings of minute comb-like teeth. Anterior antennæ three-fourths as long as the first segment of the body, rather stout, joints tapering to the extremity, first about four times as broad as the last; relative lengths as follows:—

1,	2,	3,	4,	5,	6,	7,	8,
18.	10.	7.	16.	7.	6.	11.	10.

setæ tolerably numerous on the first four joints, last joint with 4 (sometimes 5 or 6, some very small) terminal setæ. Posterior antennæ large; the long seta on the basal joint almost smooth. Mouth organs very small. First four pairs of legs with strong spines. Fifth foot very small, 1-jointed (?), bearing 8 spines, the lower one of which is plumose. Caudal segments about 3 times as long as broad; central caudal setæ three-fourths as long as abdomen. Length, $\frac{1}{18}$ inch.

Hab. Numerous specimens obtained in gravel pits at Eyreton, by Mr. C. Chilton, after whom I have named it.

Quite distinct from the two other species characterized by the 8-jointed anterior antennæ, viz., *C. crassicornis*, Müller, and *C. magniceps*, Lilljeborg.

ε.—Anterior antennæ 6-jointed.

5. *Cyclops æquoreus*, Fischer. Pl. XI., figs. 16–18.

Body gradually attenuated from before backwards. Anterior antennæ much shorter than first segment of thorax, stout at the base, and only slightly tapering towards the apex; 1st and 2nd joints stout, subequal, 3rd short, 4th the longest, 5th short, 6th about twice as long as 5th; the following represents the relative lengths of the joints in the majority of my specimens (females) $\frac{1,\ 2,\ 3,\ 4,\ 5,\ 6.}{10.\ 10.\ 5.\ 16.\ 7.\ 11.}$ Mandibles dilated at the apex and divided into several slender sharp teeth. Maxillæ strongly toothed. Feet of the 1st pair short, and furnished with rather short setæ. Fifth feet bearing a triangular joint, dilated towards the extremity, and furnished with 3

spines and a short seta. Abdomen slender, first joint about equal in length to the two following: last segment much shorter than preceding; caudal segments nearly as broad as long. Longest caudal seta equalling the abdomen in length; outer and inner very short. Length, $\frac{1}{8\frac{1}{3}}$ of an inch.

Hab. Tomahawk Lagoon, near Dunedin (several specimens).

The above description is almost that of Dr. Brady; my specimens differ from his in hardly any respect but the form of the caudal forks. Any other differences are unimportant.

Fam. HARPACTICIDÆ.

Sub-fam. AMYMOMINÆ.

Genus **Amymome**, *Claus.*

"Body much compressed. Dorsal margin very convex. Head and last thoracic segment very large, produced ventrally and approximating so as to give a more or less circular outline to the animal. Abdomen very short. Head united with the first thoracic segment. First pair of antennæ elongated, 6- or 8-jointed; second pair 3-jointed, and bearing a small 1- or 2-jointed secondary branch, last joint clawed. Mandible palp 1-branched; maxillar palp elongated, 2-jointed. First foot-jaw slender, 3-jointed; second much elongated, 2-jointed, and forming a strong grasping hand. First pair of feet not prehensile, 2-branched, each branch consisting of a single joint; second, third, and fourth pairs with both branches 3-jointed. Fifth foot in the female composed of two, in the male of one, joint. Integument excessively tough and coriaceous, usually cellular or areolated."

The animals forming this genus differ from all others of the family to which they belong in being laterally compressed. In fact their appearance is so remarkable that, until their structure is examined in detail, their affinities would never be suspected. Other prominent characteristics of the genus are the relatively large posterior foot-jaws, and the strongly-marked punctations of the integument. The occurrence of the genus in these seas is very interesting, as hitherto it has not been observed, as Brady remarks, outside the European area.

1. *A. clausii*, n. sp. Pl. V., fig. 1.

First segment of body greatly produced downwards and posteriorly to an almost acute point on each side; four succeeding thoracic segments only about one-fourth the depth of the first, and together hardly exceeding it in length; two anterior abdominal segments large, produced downwards, the first forming a wide expansion, which nearly meets the first body segment, the second ending in an obtuse point; remaining abdominal segments very much abbreviated; caudal setæ minute. Eye large, very difficult to distinguish satisfactorily. Anterior antennæ 6-jointed, about as long as the first segment of the body; first and second joints subequal, third about half

as long, remainder short; all more or less setose. Posterior antennæ about two-thirds as long as the anterior, slender, 3-jointed, terminating in long claw, somewhat like an elongated fourth joint; setæ few. Mandible tout, strongly toothed; palp 2-jointed, with two setæ at the articulation of the second joint, and three at its extremity. Maxillæ (?) not satisfactorily made out. First pair of foot-jaws 3-jointed, rather stout, last joint 2-branched, each branch furnished with several setæ. Second foot-jaws very long, terminating in a powerful chelate hand, which is directed forward; this hand is articulated almost at right-angles with the previous joint, and is furnished at its lower proximal end with 5 comb-like teeth; palm minutely serrated; claw as long as the hand, strongly curved. First pair of thoracic feet shorter than succeeding pairs; branches 1-jointed, furnished with setæ of nearly equal length with themselves; three succeeding pairs long and slender, branches 3-jointed, ciliated on their anterior margins, furnished posteriorly with long somewhat plumose setæ; last pair with the inner branch considerably distended. Fifth pair (?) 1-jointed, conical, terminating in a single seta. Length, $\frac{1}{50}$ inch.

Colour—pale brown; integument closely punctated, particularly on the cephalic and dorsal portions.

Hab. Numerous specimens were obtained by the dredge in Otago Harbour in about 5 fathoms.

This species cannot be mistaken for any other hitherto described; it is nearest *A. spherica*, Claus, but is sufficiently distinguished by the remarkable form of its abdominal segments, by the 6-jointed anterior antennæ, and by the form of the chelate hand of the second pair of foot-jaws.

Sub-family Canthocamptinæ, *Brady*.

Genus **Diarthrodes**, n. gen.

Anterior antennæ 9-jointed; secondary branch of the posterior antennæ 1-jointed. Mandible-palp simple 2-jointed. Second foot-jaw forming a prehensile clawed hand. Outer branch of the first foot very short, 2-jointed; inner branch 3-jointed, the first joint greatly elongated, second and third very short; second, third, and fourth pairs of feet with both branches 3-jointed; fifth pair 2-jointed.

1. *Diarthrodes novæ-zealandiæ*, n. sp. Pl. VIII., figs. 15–22.

Body somewhat tumid; abdomen much narrower than cephalothorax. Anterior antennæ tapering, rather densely setose, the relative lengths of the joints being as follows:—

1.	2.	3.	4.	5.	6.	7.	8.	9.
16.	16.	12.	10.	5.	6.	6.	7.	4.

Posterior antennæ 2-jointed; last joint bearing five terminal and two small lateral setæ; basal joint with a small 1-jointed appendage bearing

three setæ. Mandible rather stout, palp 2-jointed, last joint small with 4 terminal setæ. Anterior foot-jaw terminating in two rather feeble parallel claws. Posterior foot-jaw 2-jointed, terminated by a long, narrow, curved claw. Inner branch of first feet with a long slender basal joint, with a few comb-like spines at the extremity of its outer margin, second and third joints coalescent, short, terminated by a long, straight, slender claw; outer branch with a strong spine on the basal, and four on the terminal joint. Three following pairs of feet somewhat similar, with both branches 3-jointed; outer branch the longest, furnished with stronger spines and setæ than the inner. Fifth pair of feet with the basal joint much dilated, and bearing six setæ on its truncated extremity; second joint small, with five setæ. Caudal segments short and broad; inner tail setæ longer than abdomen; outer about one-fourth shorter than inner. Length, $\frac{1}{30}$ of an inch.

Hab. Otago Harbour, dredged in 7 fathoms among kelp.

Genus **Merope**, n. gen.

Body slender, elongated, posterior margins of the segments fringed with fine teeth; abdomen only slightly narrower than thorax. Anterior antennæ short, few-jointed. Posterior antennæ without a secondary branch. Mouth organs (?). Anterior foot-jaws small, with several digitiform processes; posterior pair forming a slender clawed hand. First pair of feet with both branches 3-jointed; middle joint of inner branch very long, terminal joint bearing two slender claws; next three pairs with the inner branch formed of one joint, bearing two slender setæ. Fifth pair as long as preceding, 2-jointed.

This genus approaches very near *Cletodes* (Brady), but differs in the structure of all the swimming legs. I advance it only provisionally however, as it has been founded on the examination of a single specimen.

1. *Merope hamata*, n. sp. Pl. X., figs. 22–27.

Body about five times as long as broad, much constricted between each segment. First segment (cephalo-thoracic) about three times as long as succeeding ones, front almost truncate, posterior margins produced into hook-like wings. Anterior antennæ 6-jointed, rather stout, not so long as first segment of body, sparingly setose, second joint longest and stoutest; posterior pair rather long and slender. Inner branch of first pair of feet, with the basal joint minute, middle joint very long and unarmed, terminal short and slender; outer branch only about one-third as long as inner, joints subequal, last bearing five geniculate setæ. Outer branch of next three pairs normal, inner very short in second pair, about twice as long in fourth. Fifth pair strongly curved, the basal joint bearing two branches, one normal, foliaceous, bearing about 6 marginal and terminal setæ, the

other rudimentary, 1-jointed, with a single terminal seta. The caudal segments are short, and the setæ single, hardly longer than their segments. The general colour of the animal was a rather deep shade of pink, which was most pronounced at the sides of the segments. Length, $\frac{1}{10}$ of an inch.

Hab. A single specimen taken by the dredge in Dunedin Harbour.

Genus **Laophonte**, *Philippi*.

Body slender, elongated; posterior margins of the segments usually pectinately toothed. Anterior antennæ 4–8-jointed; posterior pair with a small 1-jointed secondary branch. Mandibles with a small 1-jointed palp; maxillæ with a well-developed digitate palp. Anterior foot-jaws strong, with several marginal digitiform processes; posterior pair forming a clawed hand. Feet of 1st pair with the outer branch short, 2- or 3-jointed, and with few, feeble setæ; inner branch 2-jointed, first joint very long, second short and terminating in a long movable claw. Next three pairs with the outer branch 3-, the inner 2-jointed (more rarely 3-jointed). Fifth pair 2-jointed, basal joint largest.

1. *Laophonte australasica*, n. sp. Pl. XI., figs. 1–10.

Female.—Body slender, segment rings showing the characteristic tooth-like margins only faintly. Anterior antennæ short, 4-jointed, furnished with numerous short setæ, and an auditory seta at the extremity of the 3rd joint. Posterior antennæ stout, 2-jointed; basal joint bearing a 1-jointed secondary branch furnished with 4 setæ, terminal joint having 4 stout curved marginal spines and 3 setæ, which are finely annulated towards their extremities. Mandibles, maxillæ, and foot-jaws normally developed. Feet of the 1st pair with the inner branch greatly elongated, second joint short and ciliated on its outer face, claw long and strong; outer branch with three nearly equal joints, each bearing a marginal spine near its distal end, and the last having in addition 3 terminal setæ. Three following pairs of feet with the outer branches stout, 3-jointed, and strongly spined, inner branches much shorter, 2-jointed (probably 3-jointed, but the basal joint is nearly quite anchylosed in the peduncle), last joint with 3 long feeble setæ. Fifth pair of feet with the second joint quadrangular, bearing about 5 terminal setæ. Caudal segments only about half as long as last abdominal segment; setæ not quite half as long as abdomen. Length $\frac{1}{15}$ of an inch.

Hab. Two specimens (both females) taken by the dredge in Dunedin Harbour.

This may be *L.* (*Cleta*) *forcipata*, Claus (Die Copepoden Fauna von Nizza, p. 23, taf. II., figs. 9–11), but Dr. Claus has given so short and incomplete a description, and has besides only described and figured males, that identification is not possible until the male of our species has been obtained.

Sub-fam. HARPACTINEÆ.

Genus **Dactylopus**, *Claus.*

Body elongated, cylindrical. Anterior antennæ 5–9-jointed, geniculate in the male; posterior pair with a rather small 2–3-jointed secondary branch. Mandible-palp composed of a basal joint, with two 1-jointed branches. Posterior foot-jaws forming a clawed hand. Four anterior pairs of legs with both branches 3-jointed; first pair having the inner branch elongated, first joint very long, second and third very short, and ending in two claws, outer branch shorter, ending in four claws; fifth pair 2-jointed, foliaceous.

1. *D. tisboides*, Claus. (Die frei lebenden Copepoden, p. 127; taf. xvi., figs. 24–28.

Rostrum short and conical. Anterior antennæ 8-jointed (9-jointed, *Brady*), tapering from the base in the female, bearing numerous setæ. Inner branch of posterior antennæ 3-jointed. Posterior foot-jaw with an elongate-oval hand, with a single long seta near the middle of its inner margin. Outer margins of both branches of the first pair of feet with pectinate setæ; inner branch with the first joint longer than the whole outer branch, bearing a long plumose seta on the inner margin; outer branch with the middle joint thrice as long as the first or third, ciliated on both margins, and with the cilia of the outer margin usually strong and spinous. Next three pairs of feet have the branches nearly equal, bearing long plumose setæ, and ciliated on the external margins; the second pair in the male has the second and third joints coalescent, the outer margin excavated above and below the middle, and bearing one large crooked spine and several strong short setæ, and at the apex two stunted spines, the inner margin bears three setæ two of them very long and plumose. Fifth foot having both joints subequal, broadly ovate, and bearing several rather long apical setæ. Caudal segments short; inner caudal setæ about two-thirds as long as body. Length, $\frac{1}{25}$ of an inch ($\frac{1}{16}$ *Brady*).

The above description, which is chiefly taken from Brady's Monograph (Brit. Cop., vol. ii., p. 106), agrees very closely with the form commones here, except in size.

I have also got a second form, which for convenience may be termed var. *a*, differing in some respects. The anterior antennæ have the first four joints stout and broad; the foot-jaws with the hand stout, wanting the seta on the inner margin, but bearing a short, curved, plumose spine on the wrist; the inner branch of the first pair of feet destitute of the long seta on its inner margin; and the fifth pair of feet with the outer joint broad, and only bearing five setæ.

Hab. Both forms occur in Dunedin Harbour, the normal type most abundantly; in shore kelp.

Genus **Xouthous**, *n. gen.*

Body conical, rounded in front. Anterior antennæ 7-jointed, geniculate in the male; posterior pair with a small 3-jointed secondary branch. Mandibles with a large 2-branched palp. Anterior foot-jaws small, posterior rather large and bearing an elongated claw. First pair of feet with the inner branch 2-jointed; outer 3-jointed. Next three pairs with both branches 3-jointed; fifth pair 2-jointed.

Perhaps this genus should only rank as a sub-genus of *Dactylopus*, to which it is most nearly allied, but besides being very different in its general appearance, it differs in the structure of the mandibles, and of the first and fifth pairs of feet.

1. *Xouthous novæ-zealandiæ*, n. sp. Pl. X., figs. 8–15.

Body rather short, narrowing posteriorily; abdomen not very distinctly separated from thorax. When seen laterally, the body is flat on the ventral, but convexly arched along the dorsal surface. Head merged with first segment of thorax. The integument is very dense and opaque, except at two spots in the front of the thorax, where it becomes diaphanous, and presents the appearance of two lateral eyes. A red spot at each of these lateral eye-spots probably marks a rudimentary eye, while the median eye appears to be wanting: if present, it would be useless, on account of the opacity of the carapace. The anterior antennæ are much shorter than the cephalothorax and lie in a groove on its under surface; in the *male* they are strongly geniculated and swollen, and the terminal joints act like an opposable thumb or claw; in the *female*, they are stout at the base and taper to the extremity.

The posterior antennæ are strongly developed, as large as the anterior, and bear a small, 3-jointed, secondary branch, which is terminated by two long slender setæ. Mandible-palp forming a two-branched appendage, the larger branch bearing two stout plumose spines and two terminal setæ. Maxillæ small, (?) palp apparently slender, and bearing two long setæ. Anterior foot-jaws small, bearing several marginal setose processes. Posterior pair 2-jointed, terminated by a strong claw; basal joint with a strong spine. First pair of feet with inner branch elongated, 2-jointed, first joint large, broad at the base and bearing a very long seta, second very short and narrow, carrying two long setæ, which are jointed near their apex; outer branch 3-jointed, considerably shorter than first joint of inner. Second and third pairs of feet with both branches 3-jointed, inner branch the longer, the individual joints broader and less setose than those of the outer. Fourth pair of feet with both branches 3-jointed, subequal. Fifth pair 2-branched, outer branch 2-jointed (?), terminal joint bearing five subterminal spine-like setæ; inner branch subquadrate, with five setæ on its lower margin: similar in both sexes. Caudal setæ very short.

Integument very strong, smooth, opaque-brown in colour. Length, $\frac{1}{16}$ of an inch. Ovisac single.

Hab. Dredged in Dunedin Harbour; not rare, but easily overlooked on account of its colour.

Genus **Thalestris**, *Claus.*

Body usually slender and elongated. Anterior antennæ 8- or 9-jointed; inner branch of posterior pair 2- or 3-jointed. Mandible-palp large, 2-branched. Maxillæ strongly toothed, palp usually terminated by a large claw. Anterior foot-jaws ending in a strong claw, and bearing several setiferous marginal processes. Posterior pair forming a strong prehensile hand. First pair of feet with both branches 3-jointed, and furnished at the extremities with strong prehensile claws; first joint of inner branch much elongated, second and third very short; first and third joints of outer branch short, middle greatly elongated. Second pair in the male have the third joint of the inner branch wanting or very much reduced in size, and converted into two or three strong spines. Fifth pair of feet 2-branched, foliaceous; much reduced in size in the males. Ovisac single.

1. *T. forficula*, Claus. Pl. X., figs. 16–21.

(*Thalestris forficula*, Claus. Die frei lebenden Copepoden, p. 131, taf. xvii., figs. 7-11).

Body rather slender; abdomen long, narrowing very gradually, posterior margins of the segments pectinated with rather long teeth; rostrum acute, of moderate length. Anterior antennæ 8-jointed; in the female tapering gradually, and furnished with numerous setæ, the basal joint about four times as broad as the apical, fourth joint bearing a long auditory seta; in the male the joints are irregularly swollen and bent. Posterior antennæ rather strongly spined on the lower margin; secondary branch small, 2-jointed, and bearing 4 setæ. The posterior foot-jaws have a short basal joint, and a rather stout hand, furnished with a single long seta in the middle of the inner margin; terminal claw long and slender. First pair of feet with both branches long and slender; the outer, which is much the longer of the two, has the basal joints greatly elongated, and the second and third very short and apparently anchylosed, the basal joint bears a single rather short seta on the inner margin above the middle, while the terminal joint carries two nearly straight claws of unequal length; inner branch with the middle joint very long, toothed along the outer margin, terminal joint bearing four slightly curved and toothed claws. Feet of fifth pair with the outer joint large and oval in the female, and extending to half the length of the abdomen. Caudal forks short, and somewhat divergent. Central caudal setæ nearly as long as body, swollen just beyond their basal articulation, and marked along the greater part of their length with annular articulations; outer setæ about half as long as inner and lying very close to it. Length, $\frac{1}{12}$ of an inch.

Hab. Taken abundantly with the dredge in Dunedin Harbour.

This species was originally described by Dr. Claus from the Mediterranean (Messina); the specific name refers to the scissor-like appearance of the caudal forks and setæ. The European specimens appear to be smaller than ours, being only 0·8 mm. ($\frac{1}{32}$ of an inch) in length, but in other respects are very similar.

Genus **Harpacticus**, *Milne-Edwards.*

"Body elongated, or broad and depressed. Head united with the first thoracic segment; first and second abdominal rings coalescent in the *female.* Anterior antennæ 8- or 9-jointed; fifth and sixth joints swollen in the *male.* Mandible-palp 2-branched, large. Posterior foot-jaws strongly developed. First pair of feet with outer branch 3-jointed, first and second joints elongated, third rudimentary; inner branch 2-jointed, terminal joint very short. Three following pairs of feet with both branches 3-jointed; in the male, the inner branch of the second pair modified by having the 2nd joint produced into one or more spines, while in the third foot the outer branch is converted into a stout clasping organ, which is bent across the inner branch, and has its last joint armed with several strong spines. Ovisac single.

1. *Harpacticus chelifer*, Müller. Pl. VI., figs. 12–16.

(*Arpacticus bairdii*, mihi, Trans. N.Z. Inst., vol. xi., p. 259.)

In the description already given of this species I have made one or two errors, which in the absence of a clear description of *H. chelifer*, led me to consider my specimens to belong to a new species. The anterior antennæ are 9- (not 10-jointed), and the relative length of the joints (in the female) is as follows:—

1,	2,	3,	4,	5,	6,	7,	8,	9,
11.	18.	20.	20.	7.	8.	4.	3.	4.

In the male, the anterior antennæ are hinged between the fourth and fifth joints, the fifth and sixth being swollen and corrugated. The hand of the posterior foot-jaw is subtriangular, and externally very convex, its inner margin being somewhat abruptly angled, strongly excavate and furnished with numerous spines; its apex bears one (or two) falciform claws.

The first pair of feet have the inner branch 2- (not 3-) jointed, and terminating in two claws. The second foot in the male has the median joint of its inner branch externally produced into a long spine, which greatly exceeds in size the small third joint. The outer branch of the third foot in the male is furnished with three strong spines at its apex, and is bent across the inner branch. In the fifth foot of the male, the basal joint is obsolete.

This species is common in the European seas, and is by far the most abundant of our littoral Copepods.

It occurs in Dunedin Harbour, in rock pools along the beach from Otago Heads to Taieri Mouth; and I have specimens from Paterson Inlet.

Genus **Zaus**, *Goodsir.*

Body broad and depressed; head distinct from cephalothorax; rostrum broad and truncate. Anterior antennæ 9-jointed; posterior 2-jointed, with remarkable comb-like spines at the apex, inner branch slender, 2-jointed. Mandible small, palp slender, 2-branched, second foot-jaws strongly clawed. First pair of feet 2-branched; outer branch indistinctly 3-jointed, the median joint very short; inner branch 2-jointed, short, last joint rudimentary. Ovisac large, single.

1. *Zaus contractus*, n. sp. Pl. X., figs. 1–7.

Body oblong, not much narrowed posteriorly. Cephalothorax nearly half as long as body, rounded in front; rostrum short, blunt. Abdomen less than one-fourth as long as body, broader than long. Anterior antennæ short, tapering gradually; joints having the following relative lengths:—

1,	2,	3,	4,	5,	6,	7,	8,	9,
10.	14.	14.	8.	3.	4.	2.	2.	3.

Posterior antennæ 2-jointed; first joint broad, bearing internally a 2-jointed appendage and a single seta externally; second joint elongated and furnished with two or three curved setæ, and two curved plate-like organs pectinated on their outer margin; (one of the setæ, which is jointed near its apex, appears to act as an opposable clasping organ). Mandibles small, bearing a 2-branched palp. Maxillæ very small. Anterior foot-jaws small, normally formed; posterior with an ovate or somewhat pyriform hand and a strongly curved claw, which impinges against a deep groove in the palm of the hand. First pair of feet with the outer branch elongated, apparently only two-jointed (from the coalescence of two of the joints ?); first joint pectinately setose on its outer margin, terminating in a single seta; second joint ending in four curved blunt claws, furnished with comb-like teeth: inner branch little more than half as long as outer, 2-jointed; first joint pectinate-spinose on the outer margin; second joint very small, bearing a strong curved claw, minutely toothed on its inner margin. Three following pairs of feet 2-branched, each branch 3-jointed, rather slender; outer branches strongly spined on the outer margin and apex, spines furnished with pectinated plates or flanges on their outer (upper) margins. Fifth pair with each branch 1-jointed, inner branch rounded and bearing four marginal (terminal) setæ, outer rather longer, and also furnished with four setæ. Posterior abdominal segments shortly spined at their postero-lateral margins; caudal segments nearly square; caudal setæ short.

Length $\frac{1}{10}$ of an inch.

Hab. Dredged in Otago Harbour; 5 fathoms.

Sub-family Porcellidiinæ.

Genus **Porcellidium**, *Claus*.

"Body oval, depressed, in the female 6-, in the male 7-jointed. Anterior antennæ 6-jointed, in the male obtuse, knotted, and adapted for clasping; posterior 4-jointed, secondary branch of moderate size, 1-jointed, attached to apex of second joint. Mandibular-palp large, forming an irregularly-shaped oblong lamina, beset with numerous stout ciliated filaments. Maxilla composed of a toothed masticatory branch, with a complex 4-digitate palp. Anterior foot-jaw not forming a prehensile hand, divided at the apex into short digits, which bear slender, terminal, claw-like setæ; posterior foot-jaw 3-jointed, elongated, simple, with two small, crooked, apical claws, and a laminar appendage. Outer branch of first pair of feet short, 3-jointed; inner branch composed of one excessively broad triangular joint, which is clawed at the apex, claws bearing delicate laminar expansions. Second third and fourth pairs with both branches 3-jointed, branches subequal, except in the second pair, which has the outer branch very short; fifth pair laminar, subtriangular; caudal segments lamellar."

1. *Porcellidium fulvum*, n. sp. Pl. VI., figs. 10–11; Pl. VII., figs. 8–13.

Female.—Body nearly a perfect oval, hardly more than half as long as broad, rounded both anteriorly and posteriorly. Anterior antennæ very short, in length not equalling half the width of the body, 6-jointed; joints diminishing in size progressively, last very small; setæ numerous. Feet of first pair with the inner branch forming an elongated triangle, the terminal claws long and straight. Fifth pair of feet subtriangular, acute at apex, falcate in outline (when seen from above), with a longitudinal crest or ridge; caudal segments quadrate, ciliated at the extremity. Length $\frac{1}{20}$ inch.

Male.—Body proportionately much broader, nearly square in front, and narrowed posteriorly. Anterior antennæ (apparently 6-jointed) greatly swollen and knotted. Fifth pair of feet subquadrate, curved, widely expanded at the extremity and fringed with (about 6) sharp spines; caudal setæ as in female. Length $\frac{1}{31}$ inch.

The two sexes are so different in general form that they might almost be taken at first for distinct species; the specimens however from which the figures were taken were in the act of copulation when captured. One of the most singular points of difference is their size, the females being in almost all cases half as large again as the males. The integument in this species is thickly marked with circular depressions or pits.

The colour is most commonly a uniform clear yellow, but is sometimes nearly transparent, or banded with red.

Hab. Common on seaweed along the shores of Otago Harbour, and in rock pools, and dredged in the harbour in six fathoms; also collected by Mr. C. Chilton on seaweeds in Lyttelton Harbour.

2. *Porcellidium interruptum*, n. sp. Pl. XI., fig. 15.

Body very broadly oval, width nearly equal to three-fourths of the length; first segment about half as long as body; last thoracic segment produced behind into long pointed lamellæ, which nearly meet posteriorly in the median line behind the caudal segments, the outer margin of each is finely ciliated and produced about the middle into a short spine. Inner branch of the first feet triangular, very broad at the base; outer branch nearly as long as inner. The second pair of feet have the outer branch short, hardly exceeding in length the first joint of the inner branch. Fifth feet form two somewhat curved lamellæ, the inner of which almost extends to the extremity of the caudal segments: these last are rather longer than broad, their sides are nearly parallel, and their posterior margins fringed with a few short teeth. Length, $\frac{1}{18}$ of an inch.

Hab. Two specimens (both females) taken by the dredge in Dunedin Harbour.

This is a very remarkable form and quite different from any hitherto described.

Sub-fam. Idyinæ.

Genus **Idya**, *Philippi.*

Cephalothorax broad and somewhat depressed; abdomen narrow, 5-jointed. Head coalescent with first thoracic segment. Anterior antennæ 7- or 8-jointed, elongated; posterior 8-jointed, with a large 4-jointed secondary branch. Mandible long and strongly toothed; palp 2-branched, basal joint short, branches 1-jointed, long and slender, setiferous at the apices. Maxilla armed with several slender terminal teeth; palp well developed. First and second foot-jaws nearly alike, hooked; first pair 2-, second 3-jointed. Inner branch of the first pair of feet 2-jointed, clawed; outer branch short, 3-jointed; three following pairs with both branches 3-jointed. Fifth pair elongated, 2-jointed. Ovisac single.

1. *Idya furcata*, Baird. Pl. VIII., figs. 1–8.

(For synonymy of this species, see Brady's Mon. Brit. Cop., vol. ii., p. 172.)

Body elongated, somewhat pyriform; rostrum short and obtuse. Anterior antennæ 8-jointed, first four joints much stouter than last four; their comparative length is tabulated by Brady as follows:—

1,	2,	3,	4,	5,	6,	7,	8,
10.	18.	18.	18.	3.	3.	2.	3.

This character is said by Brady, Claus and others to vary considerably, but the following taken from my own specimens shows almost the same relative lengths except in the fourth joint, viz.:—

1,	2,	3,	4,	5,	6,	7,	8,
12.	19.	15.	12.	4.	5.	3.	9.

All the joints are somewhat setose, and the fourth bears a long curved seta (the olfactory appendage?). In the male there is usually a distinct geniculation at the fourth and fifth joints, which are more or less swollen and coalescent. The posterior antennæ are furnished with 5 geniculated setæ at the extremity, and 2 on the inner margin of the terminal joint; the 4-jointed secondary branch is also furnished with a few setæ. Both pairs of foot-jaws slender, second pair the strongest. First pair of feet with the inner branch consisting of two long joints, the first of which is dilated above the middle and bears a plumose seta near its extremity, the second is straight, bears a plumose seta on its inner margin, is pectinately ciliated on its outer margin and terminates in two claws; the outer branch is much shorter, its first joint bears a plumose seta at its apex, the second is furnished with two setæ at the extremity, one of them being similar to the fringed setæ of the terminal joint, third joint very short and bearing six setæ, four of which are somewhat flattened and furnished with terminal fringes of close-set cilia, while the other two are longer and plumose. Three following pairs of feet almost similar, each branch 3-jointed. Fifth pair with a short basal joint, with a seta at each angle of its apex; second joint flattened, ciliated on both margins, and bearing 5 long setæ at its apex. Caudal segments about as long as broad. Brady states that the fourth and fifth abdominal segments are very short, in the specimens examined by me the fourth was very short, but the fifth was very much longer, nearly as long as broad. He also states that "the inner tail-setæ are nearly as long as the body of the animal, outer about half as long, both finely aculeate in their entire length." In the specimen figured by me the inner seta is not much more than half the length of the body, and this proportional length is very general in the individuals examined by me. The animal is usually colourless, or according to Brady also "pale milky-white, often yellowish, and sometimes distinctly banded with pale lilac or purple. Length, $\frac{1}{40}-\frac{1}{30}$ inch ($\frac{1}{25}$ in. Brady).

Hab. Common in shore kelp and rock-pools near Dunedin; also on kelp in Paterson Inlet.

An abundant species in European seas: occurring in the littoral and laminarian zones, and often "taken by the tow-net in the open sea."

Genus **Scutellidium**, *Claus.*

Body depressed, subovate. Anterior antennæ 9-jointed, with very short median joints; posterior 3-jointed, the inner branch short, 1- (? 4-) jointed. Mandible palp large and complex, bearing numerous stout setiferous filaments; maxillary palp provided with two very long and stout ciliated setæ. Both pairs of foot-jaws forming clawed hands. First pair of feet

prehensile; inner branch 2-jointed (or indistinctly 3-jointed), clawed; outer branch short, 3-jointed. Three following pairs have both branches 3-jointed. Fifth pair foliaceous, the outer branch much elongated. Ovisac single.

1. *Scutellidium tisboides*, Claus. Pl. VII., figs. 1–7.

Scutellidium tisboides, Claus. Die Copepoden-fauna von Nizza, p. 21, taf. iv., figs. 8-15.
Scutellidium tisboides, Brady. Monograph of the Brit. Copepoda, vol. ii., p. 175, pl. lxviii., figs. 1-10.

Cephalothorax broad, rounded in front, first segment one-and-a-half times as broad as long; the postero-lateral angles of the succeeding short segments somewhat produced backwards; abdomen narrowed. Anterior antennæ shorter than first segment of body, 9-jointed, and becoming slender towards its apex; first three segments large, next five much shorter, terminal joint longer and very slender. Foot-jaws short and stout; last joint of the first pair slender, and bearing two curved apical claws; hand of the second pair dilated at the base, subpyriform, ending in three strong claws. Both branches of the first pair of feet 3-jointed and thick: the inner branch is much the longest; the first joint dilated near the base, ciliated on both margins, and bearing about the middle of the inner margin a large plumose cilia; second joint with a stout short curved seta; last joint very small, and bearing two flattish blunt appendages, which are thickly fringed on their lower margins with fine cilia: outer branch short; first joint ciliated externally and furnished with two apical spinous setæ; second and third joints much shorter, each with one plumose seta; terminated by four curved obtuse claws. Three following pairs of feet 2-branched, each branch 3-jointed; external margins of the joints furnished with short stout spines, which are pectinately fringed on their upper margins. Fifth pair of feet 2-jointed, the basal joint marginally ciliated, elongated, and 2-cleft, each lobe terminating in one (or more) long setæ; second joint much elongated, marginally ciliated. Inner tail-setæ considerably longer than the abdomen. Ovisac large, circular, extending considerably beyond the extremity of the abdomen. Length, $\frac{1}{25}$ inch, exclusive of the caudal setæ.

The foregoing description, taken in part from Brady's Brit. Copepoda, is verified in all the points indicated by my own examinations. In all my specimens the segments of the abdomen were finely pectinated with short setæ on their posterior margins. The following characters given by Brady, I have not been able to identify: "the first abdominal segment is formed by the almost complete union of two segments, the point of junction being marked by a chitinous line on each side. Eye consisting of one central and two lateral lenses."

The anterior antennæ in the male have the third and fourth joints somewhat swollen and bent, a character specified by Claus, though it is not as distinctly shown in his figures as in the specimens examined by me. The secondary branch of the posterior antennæ is stated by Claus to be 4-jointed, while Brady considers it to be 1-jointed, though he admits that in some specimens it appeared to be very indistinctly 4-jointed. I should say the four joints were present, but they can only be made out by a high-power objective of good definition. The terminal joints of these antennæ are furnished with six setæ (of which four are long and geniculated), and two short pectinate spines. The mandibles terminate in four rather blunt apical teeth. There appears to be no essential difference between the fifth pair of feet in either sex; the figures of this organ in both Claus's and Brady's works are slightly different from mine. The same remark applies to a certain extent to the figures of the entire animal, as well as of the first pair of legs, but the differences are so slight, that I have not the slightest doubt of the correct identification of our species with the European one.

Originally described from specimens found at Nice in the Mediterranean; also found (but sparingly) in tide-pools, among *Laminaria*, etc., on the British coasts.

Hab. It occurs abundantly among seaweed, in rock-pools, etc., both in Otago Harbour and along the ocean beach, Dunedin; also on kelp in Paterson Inlet.

Fam. ARTOTROGIDÆ, *Brady*.

Body broad, depressed, rounded or subovate, composed of 10–12 segments, first segment very large, and composed of the coalescent cephalic and first thoracic somites, abdomen short, distinctly separated from the cephalothorax. Anterior antennæ short, 9–20-jointed, alike, or nearly alike in both sexes; posterior short, 3–4-jointed, secondary branch (when present) 1-jointed. Mouth produced into a siphon composed of the elongated labrum and labium; mandibles stilet-shaped, simple or provided with a slender, filiform palp; maxillæ usually 2-branched and setiferous; first and second pairs of foot-jaws simple, prehensile, 2–4-jointed, usually clawed strongly at the apex. First four pairs of feet usually 2-branched, each branch 2- or 3-jointed. Fifth pair small and 1- or 2-jointed, or altogether wanting.

Genus **Conostoma**, *n. gen.*

Body flattened, broadly ovate; abdomen very short. Anterior antennæ few- (about 9-) jointed; posterior 4-jointed, secondary branch wanting. Mouth siphon rather slender and short. Anterior foot-jaws 2-, posterior 4-jointed. Feet of the first pair with both branches only 2-jointed; next three pairs almost similar. Fifth pair rudimentary.

This genus is nearly allied to *Artotrogus*, but differs completely in the structure of all the swimming feet.

1. *Conostoma elliptica*, n. sp. Pl. V., figs. 9–14.

Body broadly elliptical, rounded in front, width more than two-thirds of the length; first segment short, hardly separated from the second, except by a slight lateral constriction, the two together form a broad cephalothoracic carapace which is more than two-thirds as long as the whole body; two last thoracic segments much curved inwards posteriorly; abdomen greatly abbreviated, only two segments being apparent. Anterior antennæ rather short; eighth joint the longest, and furnished at its extremity with a long (auditory?) seta; posterior antennæ feeble, bearing one or two terminal setæ. Mouth siphon slightly ciliated at its extremity. Anterior foot-jaws with the basal joint broad, and apparently furnished with a hollow groove on its inner margin to receive the subequal second joint which is curved and sharply pointed at its apex: posterior pair 4-jointed, second joint large, third very short, last ending in a sharp claw, and furnished with two sharp teeth on its inner margin. Swimming legs furnished with numerous rather short plumose setæ. Caudal segments rather broader than long, terminated by 4 plumose setæ, the longest being about one-fourth the length of the body. Length, $\frac{1}{28}$ of an inch.

Hab. Only one specimen of this peculiar form was obtained by the dredge in Otago Harbour.

In the figure, two coiled organs are shown near the posterior end of the body; these have been rather prominently brought out by Mr. Buchanan; they are probably cement-glands.

Genus **Artotrogus**, *Boeck.*

Body broad, suborbicular or pyriform; cephalothorax broadly ovate; abdomen of four segments, first and second of which are coalescent in the female. Anterior antennæ 9–20-jointed, shorter than the cephalothorax; posterior 4-jointed, with a strong apical claw, without an appendage or with only a very small one. Mouth produced into a siphon which reaches to about the hinder margin of the first body-segment. Mandibles elongated, filiform, without a palp. Maxillæ 2-branched, setiferous at their apex. Footjaws simple, bearing a strong apical claw on each; first pair 2-jointed; second 4-jointed. First four pairs of feet 2-branched, each branch 8-jointed; fifth pair rudimentary, 1-jointed.

"Animals living in the branchial sacs of simple Ascidians or on the integument of various marine Invertebrata" (Brady).

All my specimens have been obtained by the dredge, apparently swimming freely, or crawling on kelp or on Sertularians.

1. *Artotrogus boeckii*, Brady. Pl. IX., figs. 1–7. (Monogr. Brit. Copepoda, vol. iii., p. 60).

First segment less than a third as long as the whole body; breadth one and a half times its length; succeeding segments very much broader than long. Abdomen short and narrow. Anterior antennæ 20-jointed; first the largest, next eight much broader than long, succeeding joints longer than broad; setæ rather numerous. Posterior antennæ with a small 1-jointed appendage, bearing two small setæ on the second joint. Mandible in the form of a long filiform seta. Siphon lobes very narrow and slender. First four pairs of feet normally formed. Fifth pair ciliated on the margins, furnished with two apical setæ. Caudal segments about as long as broad; middle setæ about as long as abdomen, finely plumose.

Length (including caudal setæ), $\frac{1}{27}$ of an inch.

Hab. Taken (free) with the dredge in Otago Harbour.

Originally taken by M. Thorell from an Ascidian; also obtained, but only two or three specimens, by Dr. Brady, amongst weeds, and by a surface-net in the west of Ireland.

2. *Artotrogus ovatus*, n. sp. Pl. XI., figs. 11–14.

Female.—Body ovoid, first segment twice as long as the three following ones, last thoracic segment very short; abdomen slender, elongated, about half as long as thorax, segments subequal in length. Anterior antennæ short, 8- (? 9-) jointed, furnished with numerous setæ; first and second joints longest, rest subequal; a long auditory seta from extremity of sixth joint. Posterior antennæ with a small 1-jointed secondary branch, terminated by a single long seta; last joint bearing two terminal lance-like spines, and a short sub-terminal seta. Mouth siphon very short, conical. Mandibular seta not reaching to second thoracic segment. Swimming feet with both branches 3-jointed and normally developed. Fifth feet consisting of a very short ovate lobe, with three setæ. Caudal segments nearly as broad as long; setæ all plumose, central rather longer than abdomen, outer about three-fourths as long. Ovisacs two, containing each four rather large ova.

Length, $\frac{1}{25}$ of an inch (exclusive of setæ).

Hab. Two specimens taken on kelp in Paterson Inlet.

Genus **Acontiophorus**, *Brady*.

Body suborbicular or sub-pyriform. Anterior antennæ 11-jointed (or 6-jointed in one species), shorter than the first segment of the cephalothorax; posterior 4-jointed, bearing two lancet-shaped spines at the apex, and with or without a small secondary branch. Mouth produced into a very long slender siphon, which exceeds the cephalothorax in length. Mandible elongated, filiform, without a palp. Maxillæ 2-branched, setiferous at the

apex. First and second pairs of foot-jaws simple, bearing a strong apical claw, first of two, second of four joints. First four pairs of foot having both branches 3-jointed: fifth pair 2-jointed.

1. *Acontiophorus scutatus*, Brady and Robertson. (Monogr. of Brit. Copepoda, vol. iii., p. 69). Pl. VIII., figs 9–14.

The following description is taken from Brady's Monograph, and agrees exactly with our form:—

"Body sub-pyriform; cephalothorax broadly ovate; head united with the first thoracic somite, the segment thus formed being very large and equal to nearly half the entire length of the body; abdomen of the *female* 3-jointed (of the *male* 4-jointed), the first segment large, and composed of two coalescent somites. Posterior angles of all the body-segments rounded off, or only very slightly produced. Anterior antennæ very short, scarcely one-third as long as the first segment of the body, stout at the base, and gradually tapering to the apex, densely clothed on the outer margin and apex with long fine hairs, some of which are plumose; to the seventh joint is attached a long curved olfactory appendage. The relative lengths of the various joints is represented by the following formula:—

1,	2,	3,	4,	5,	6,	7,	8,	9,	10,	11.
9.	7.	2.	1.	2.	5.	2½.	2½.	3.	3.	4.

"Posterior antennæ 4-jointed, with two strong lancet-shaped spines at the apex of the last joint, together with one long and four or five very short setæ; at the base of the external margin are also a few small setæ; the second joint gives origin to a 1-jointed secondary branch, which terminates in a long plumose seta. Mandible simple, consisting of a short stout peduncle bearing a very long plumose seta." (Mr. Brady adds, "Probably also a filiform palp, though I have not seen this." I have not been able to detect any trace of a palp either, but have not had a sufficient number of specimens to examine.) "Maxillæ composed of two stout digits (or digit-formed processes), one of which bears three, the other four stout, curved, and densely plumose setæ." Basal joints of both pairs of foot-jaws stout, terminal claws elongated, curved—"Outer and inner branches of the swimming-feet nearly equal in length, 3-jointed, all the joints much constricted at the base, first and second joints dilated at the apex, third elongated and narrow; the distal margins of the first and second joints are strongly dentated, and in the inner branch are, at the outer angles, produced downwards into sharp spines; the marginal spines of the outer branch are long and dagger-shaped, the last joint of both branches bearing a long subulate and much attenuated apical spine. Fifth pair of feet stout, 2-jointed, first joint shorter than broad, and bearing one long seta, second longer than broad, and furnished with five long, subequal, terminal setæ. Caudal segments

about thrice as long as broad, and nearly equal in length to the last two abdominal somites; terminal setæ five, finely plumose, three short and two of moderate length, the longest being more than equal to the length of the abdomen. Length, $\frac{1}{16}$ of an inch."

Hab. One specimen obtained by the dredge in Otago Habour in 7 fathoms; its length was only $\frac{1}{24}$ of an inch, but in all respects except size it conforms exactly to the above description. This species occurs in the British seas, but has apparently only been recorded by Messrs. Brady and Robertson.

EXPLANATION OF PLATES V.–XI.

(The small figures indicate the number of times the figures have been magnified.)

Plate V.

Figs. 1-8. *Amymome clausii.*
1. Adult animal; 2. anterior antenna; 3. mandible; 4. maxilla; 5. leg of the first pair; 6. leg of the third pair; 7. leg of the fourth pair; 8. integument.

Figs. 9-14. *Conostoma elliptica.*
9. Adult animal; 10. anterior antenna; 11. mouth-siphon; 12. anterior foot-jaw; 13. posterior foot-jaw; 14. leg of the first pair.

Figs. 15-19. *Thorellia brunnea*, var. *antarctica.*
15. Anterior antenna; 16. posterior antenna; 17. posterior foot-jaw; 18. foot of fifth pair; 19. caudal lamellæ and setæ.

Plate VI.

Figs. 1-9. *Boeckia triarticulata.*
1. Adult female; 1. adult male; 2. anterior antenna (male), right side; 3. posterior antenna; 4. mandible and palp; 5. maxilla; 6. anterior foot-jaw; 7. posterior foot-jaw; 8. leg of fifth pair (female); 9. leg of fifth pair (male).

Figs. 10-11. *Porcellidium fulvum.*
10. Leg of first pair; 11. extremity of abdomen and fifth pair of feet (female).

Figs. 12-16. *Harpacticus chelifer.*
12. Anterior antenna (female); 13. anterior antenna (male); 14. posterior foot-jaw; 15. leg of first pair; 16. leg of second pair.

Plate VII.

Figs. 1-7. *Scutellidium tisboides.*
1. Adult female; 2. anterior antenna (female); 3. anterior antenna (male); 4. posterior antenna; 5. foot of first pair; 6. foot of fifth pair (female); 7. posterior foot-jaw.

Figs. 8-13. *Porcellidium fulvum.*
8. Adult female; 9. adult male; 10. anterior antenna (female); 11. anterior antenna (male); 12. posterior antenna; 13. portion of integument.

Plate VII.

Figs. 1-8. *Idya furcata.*
1. Anterior antenna (fem.), (*a*) rostrum; 2. posterior antenna; 3. mandible; 4. anterior foot-jaw; 5. posterior foot-jaw; 6. foot of first pair; 7. foot of fifth pair (fem.); 8. adult male.

Figs. 9-14. *Acontiophorus scutatus.*
9. Adult female, (*a*) mouth-siphon, (*b*) anterior foot-jaw, (*c*) posterior foot-jaw; 10. anterior antenna (fem.); 11. posterior antenna; 12. mandible; 13. anterior foot-jaw; 14. posterior foot-jaw.

Figs. 15-22. *Diarthrodes minuta.*
15. anterior antenna; 16. posterior antenna; 17. mandible; 18. anterior foot-jaw; 19. posterior foot-jaw; 20. foot of first pair; 21. foot of second pair; 22. foot of fifth pair.

Plate IX.

Figs. 1-7. *Artotrogus boeckii.*
1. Adult female; 2. anterior antenna; 3. posterior antenna; 4. mouth siphon; 5. mandible; 6. anterior foot-jaw; 7. posterior foot-jaw.

Figs. 8-10. *Cyclops gigas* (female).
8. anterior antenna; 9. foot of fifth pair; 10. extremity of abdomen and caudal setæ.

Figs. 11-19. *Cyclops chiltoni.*
11. Adult female; 12. anterior antenna of male; 13. posterior antenna; 14. labrum; 15. mandible; 16. anterior foot-jaw; 17. posterior foot-jaw; 18. foot of first pair; 19. foot of fifth pair.

Plate X.

Figs. 1-7. *Zaus contractus.*
1. Adult female (?); 2. anterior antenna; 3. posterior antenna; 4. posterior foot-jaw; 5. foot of first pair; 6. foot of third pair (external branch); 7. foot of fifth pair.

Figs. 8-15. *Xouthous novæ-zealandiæ.*
8. Adult male; 9. anterior antennæ, (*a*) male, (*b*) female; 10. posterior antennæ; 11. mandible; 12. posterior foot-jaw; 13. foot of first pair; 14. foot of third pair; 15. foot of 5th pair.

Figs. 16-21. *Thalestris forficula.*
16. Anterior antenna (male); 17. anterior antenna (female); 18. posterior antenna; 19. posterior foot-jaw; 20. foot of first pair; 21. foot of fifth pair (female).

Figs. 22-27. *Merope hamata.*
22. Adult female; 23. Anterior antenna; 24. posterior foot-jaw; 25. foot of first pair; 26. foot of fourth pair; 27. foot of fifth pair.

Plate XI.

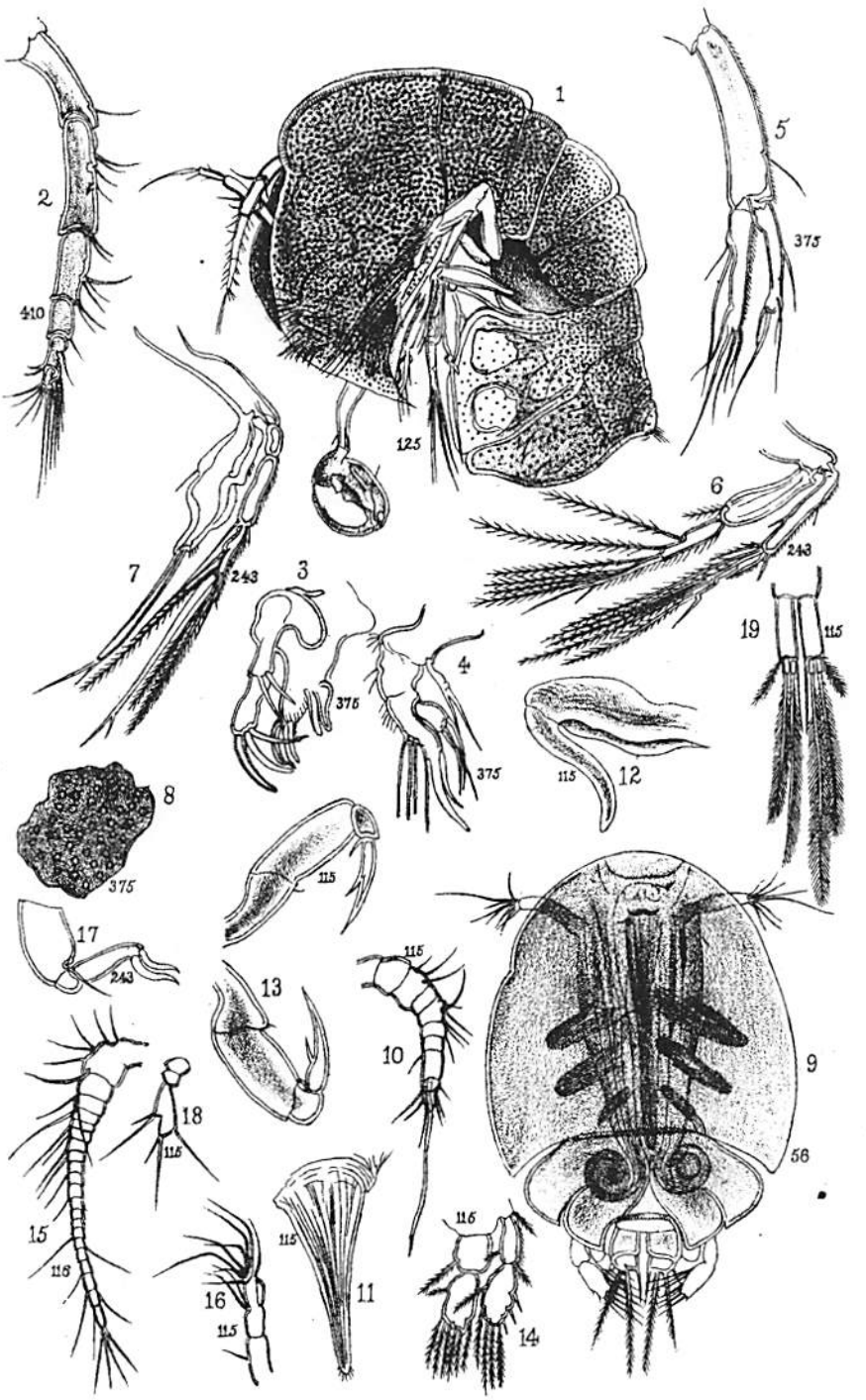
Figs. 1-10. *Laophonte australasica.*
1. Anterior antenna; 2. posterior antenna; 3. mandible; 4. maxilla; 5. anterior foot-jaw; 6. posterior foot-jaw; 7. foot of first pair; 8. foot of fourth pair; 9. foot of fifth pair; 10. abdomen.

Figs. 11-14. *Artotrogus ovatus.*
1. Adult female; 12. posterior antenna; 13. mouth-siphon; 14. foot of fifth pair.

Fig. 15. *Porcellidium interruptum.*

Figs. 16-18. *Cyclops æquoreus.*
16. Anterior antenna (female); 17. foot of fifth pair; 18. abdominal segments.

Figs. 19-22. *Cyclops serrulatus.*
19. Anterior antenna (female); 20. posterior antenna; 21. foot of fifth pair; 22. caudal segments and setæ.



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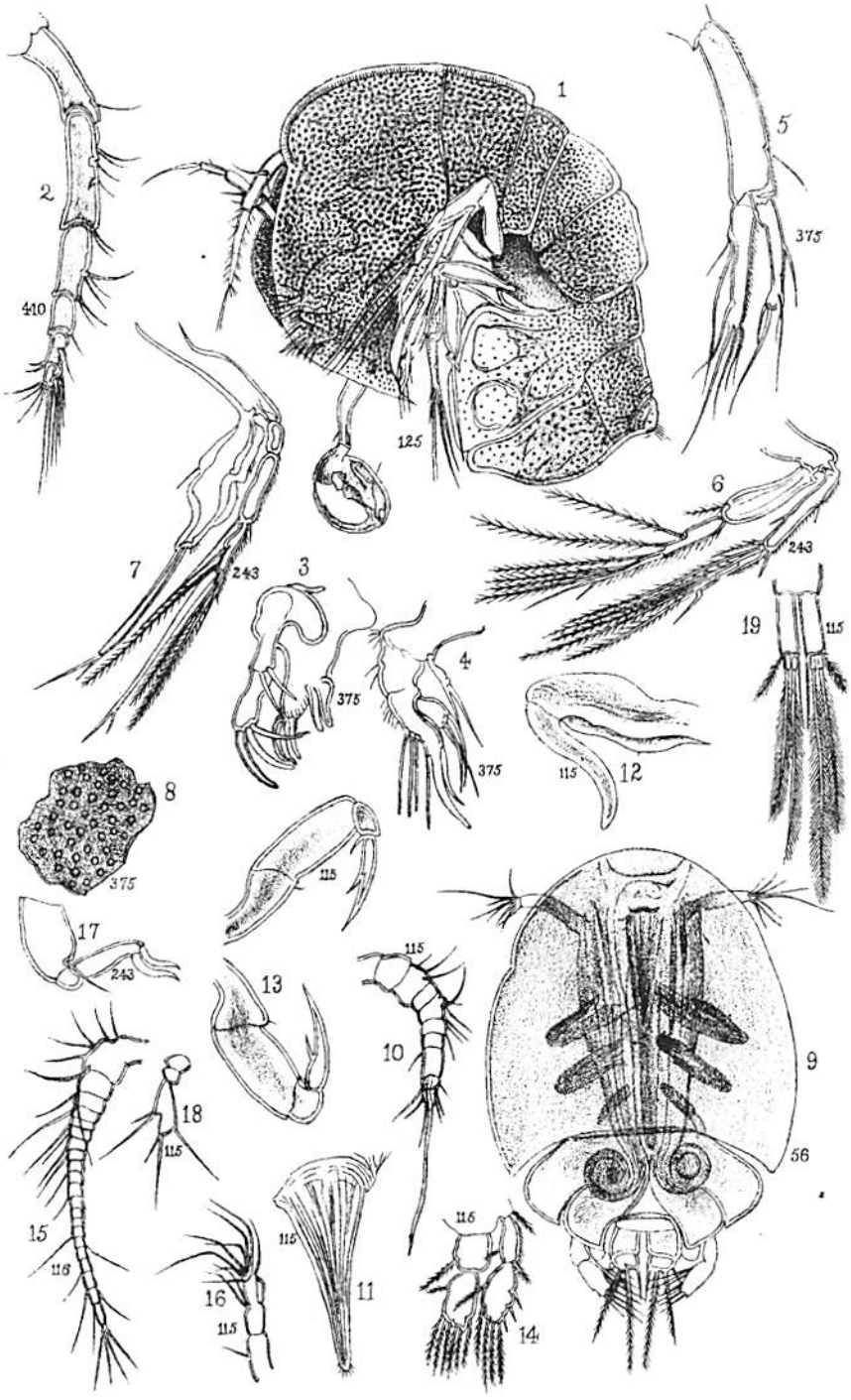

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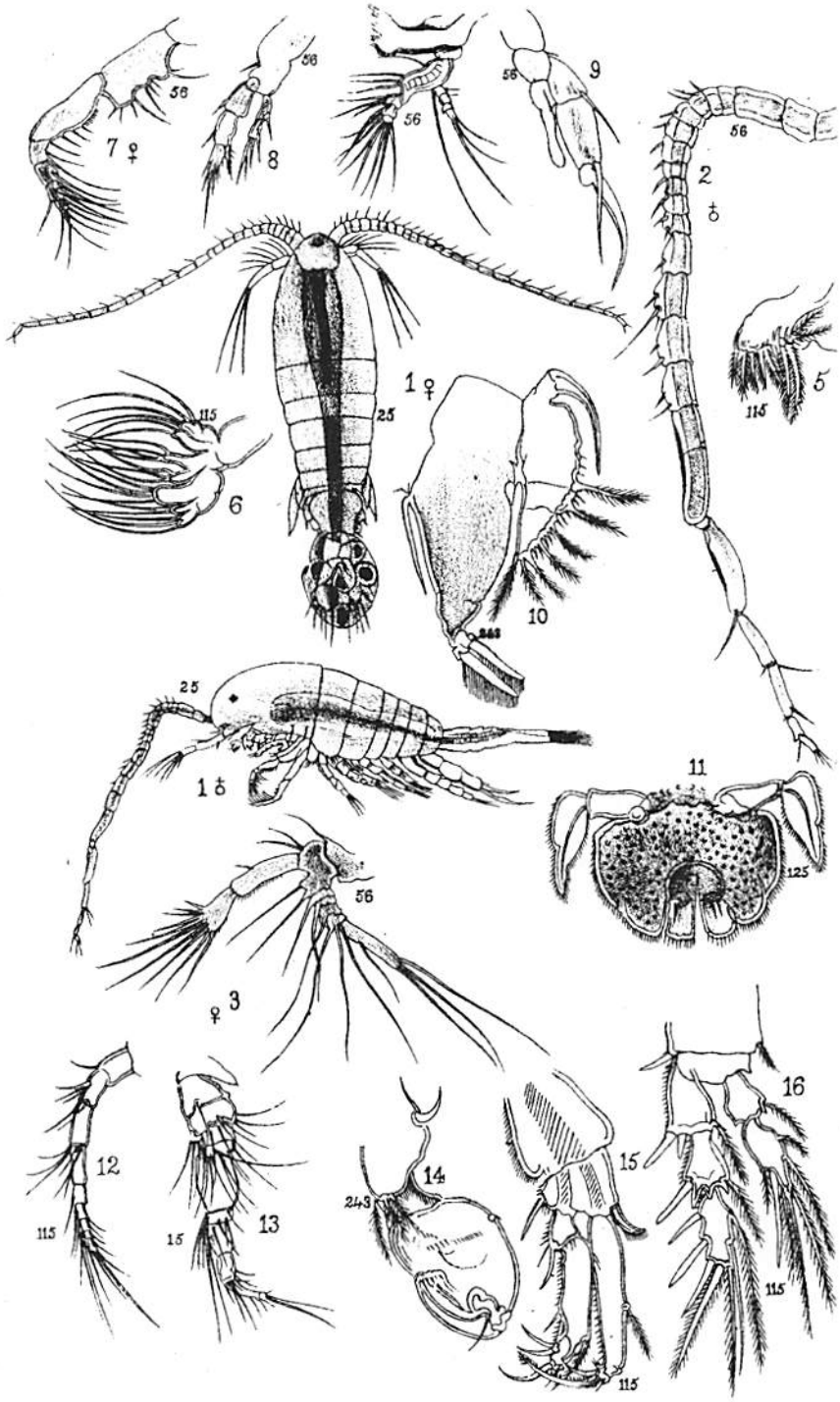

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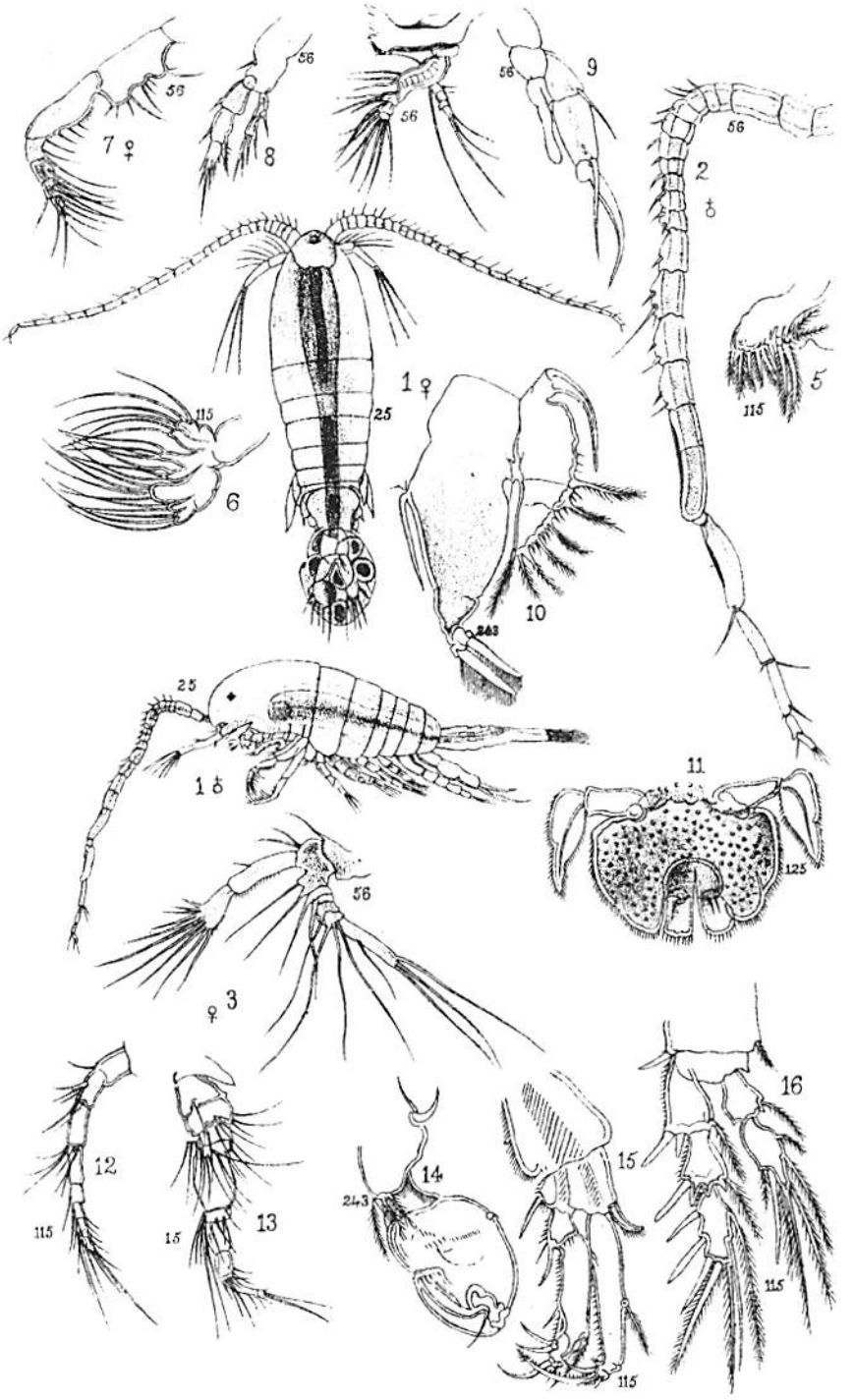

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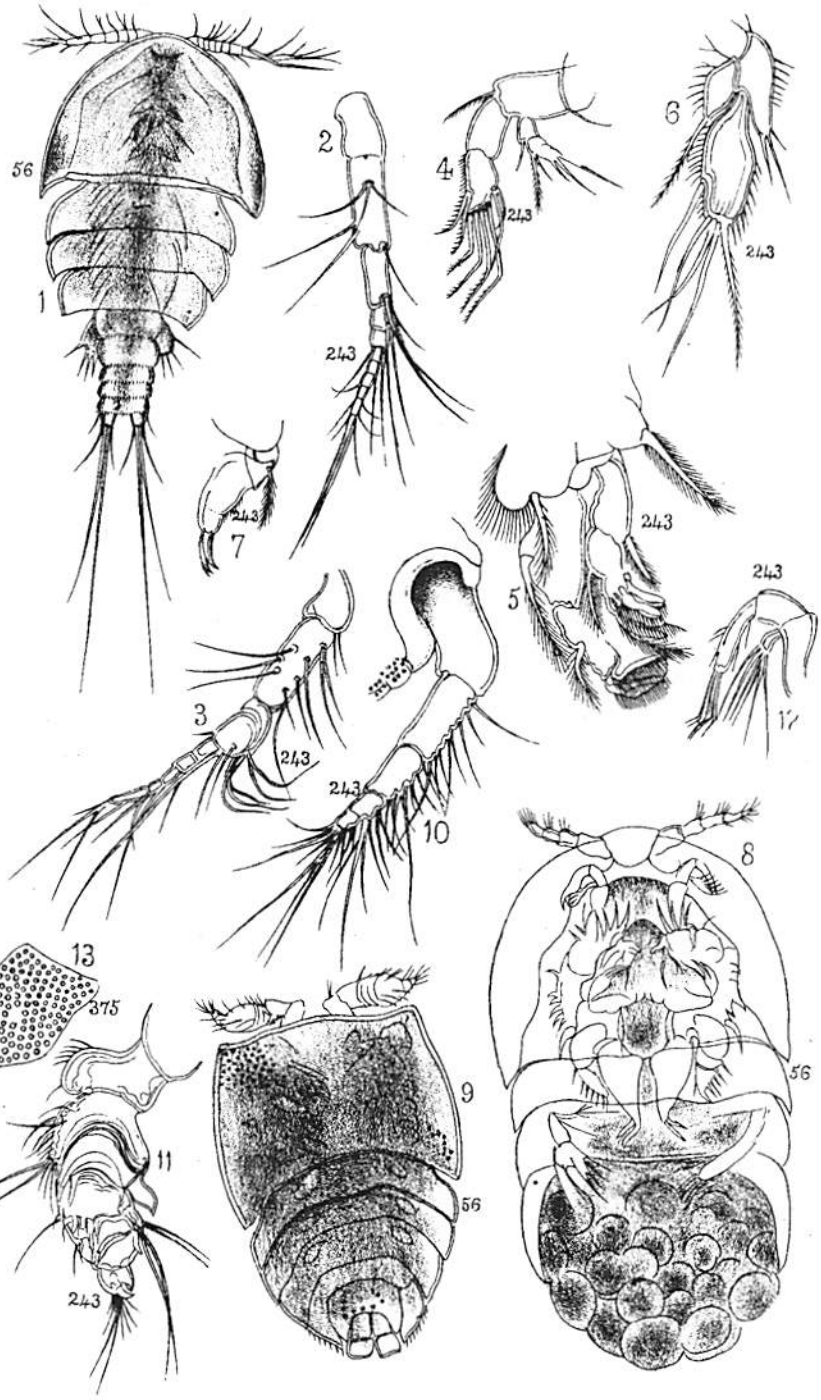

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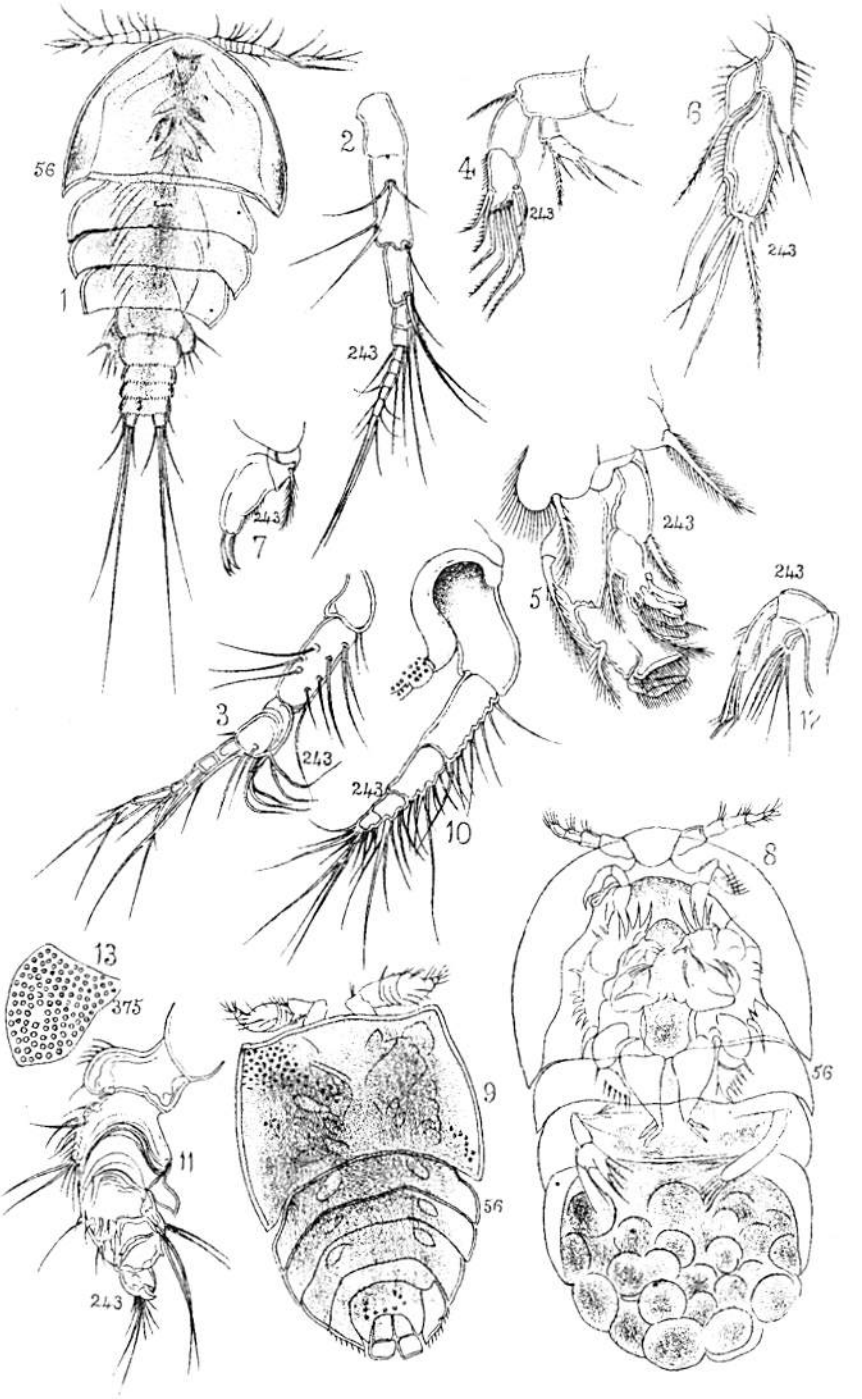

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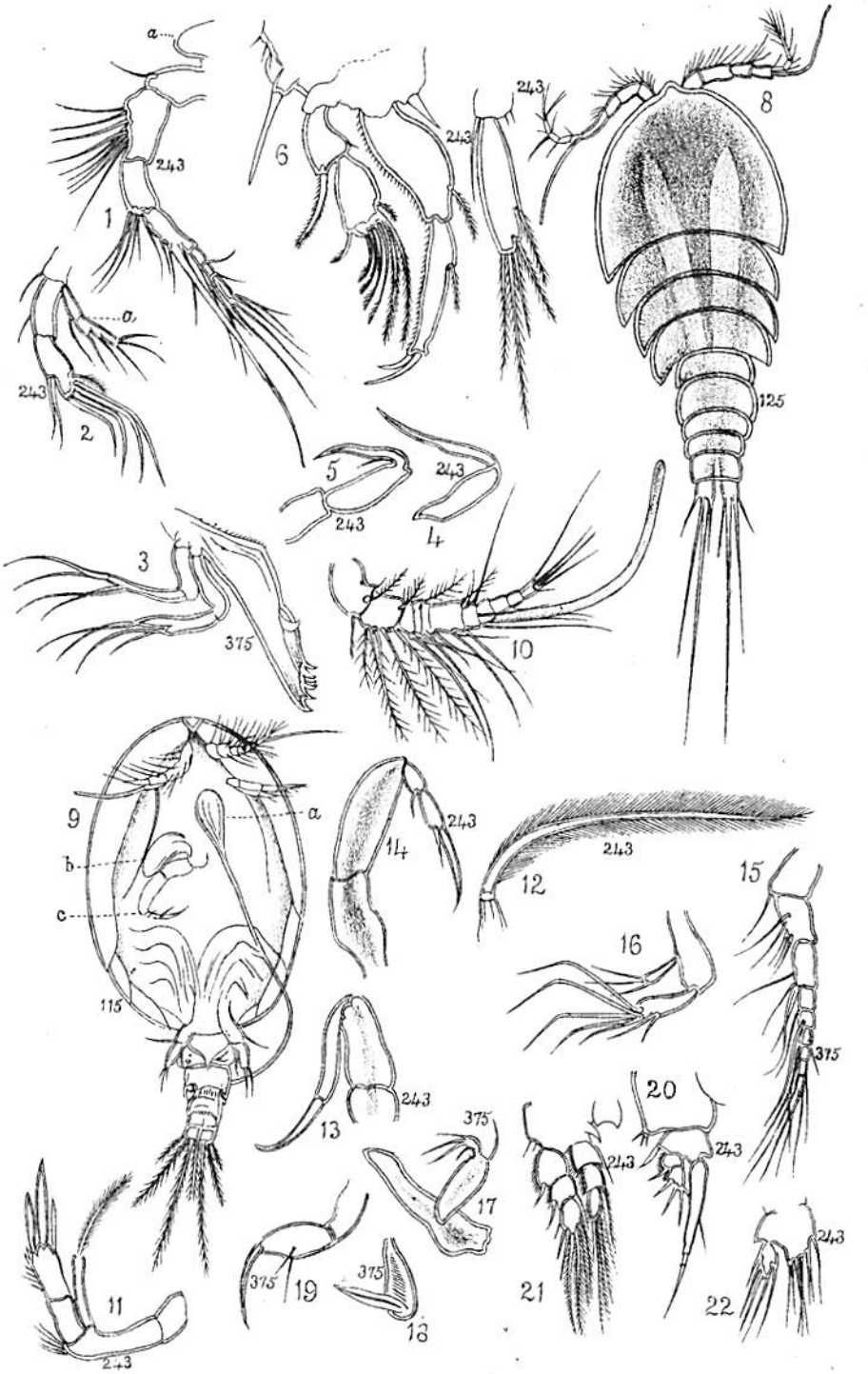

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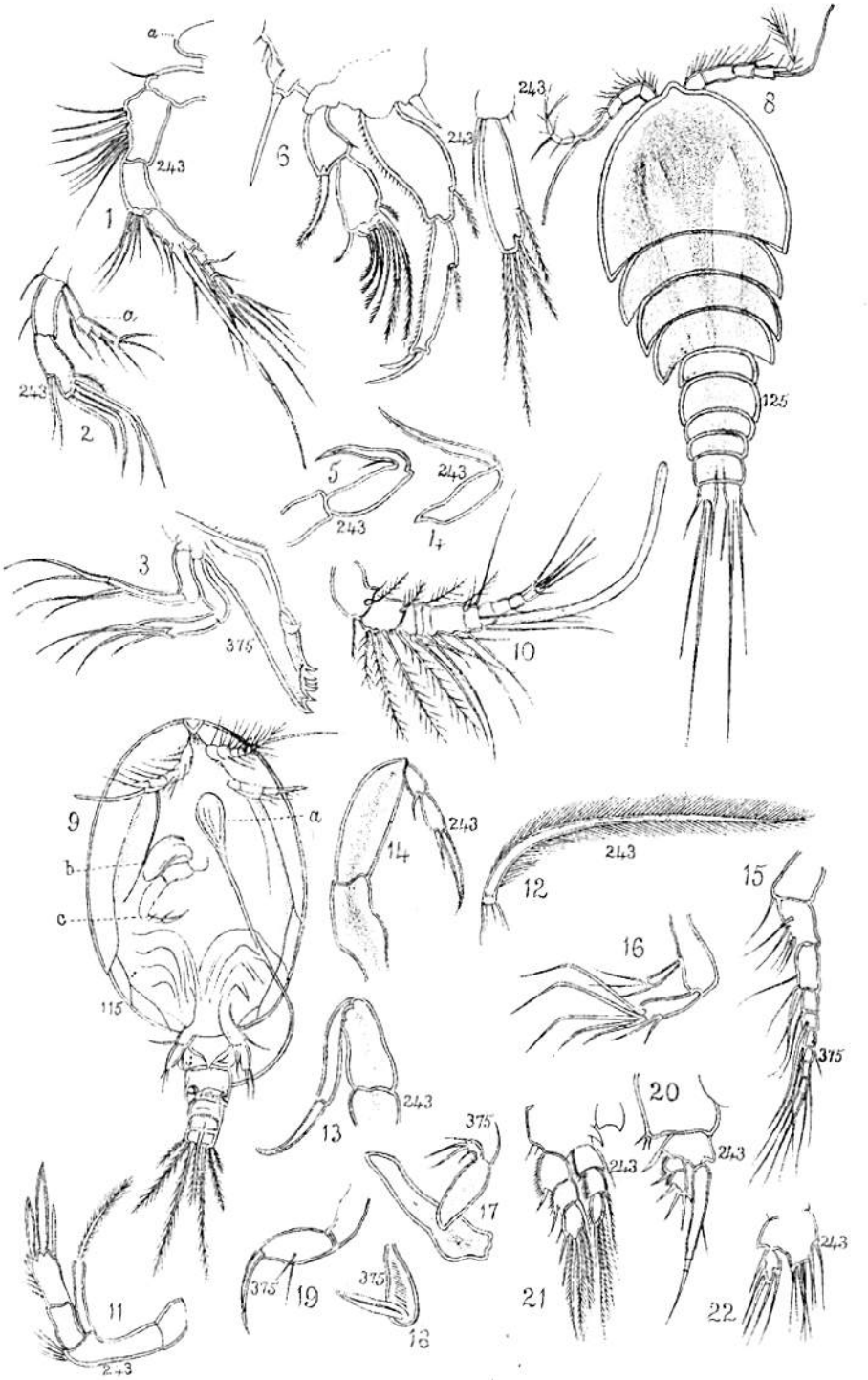

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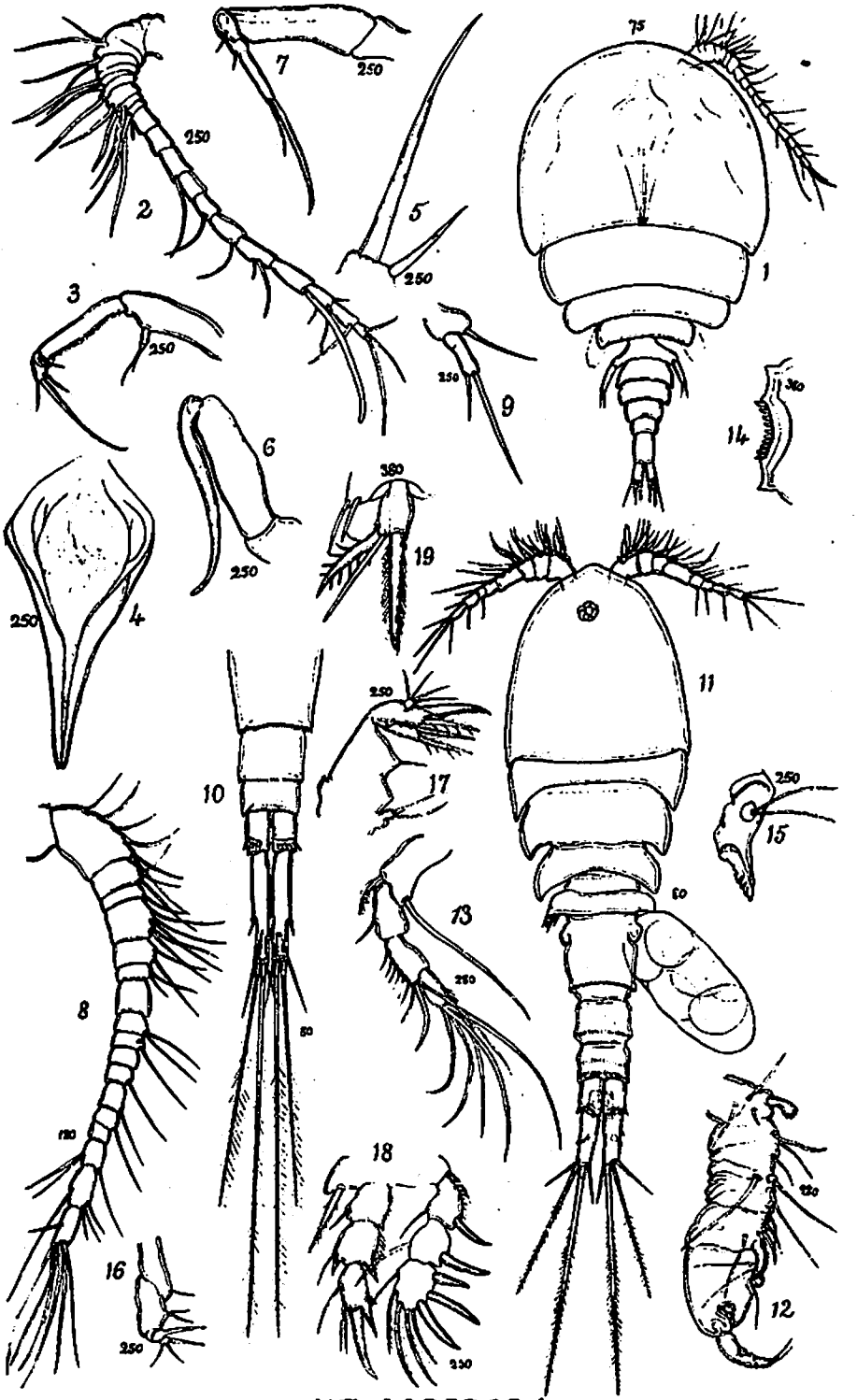

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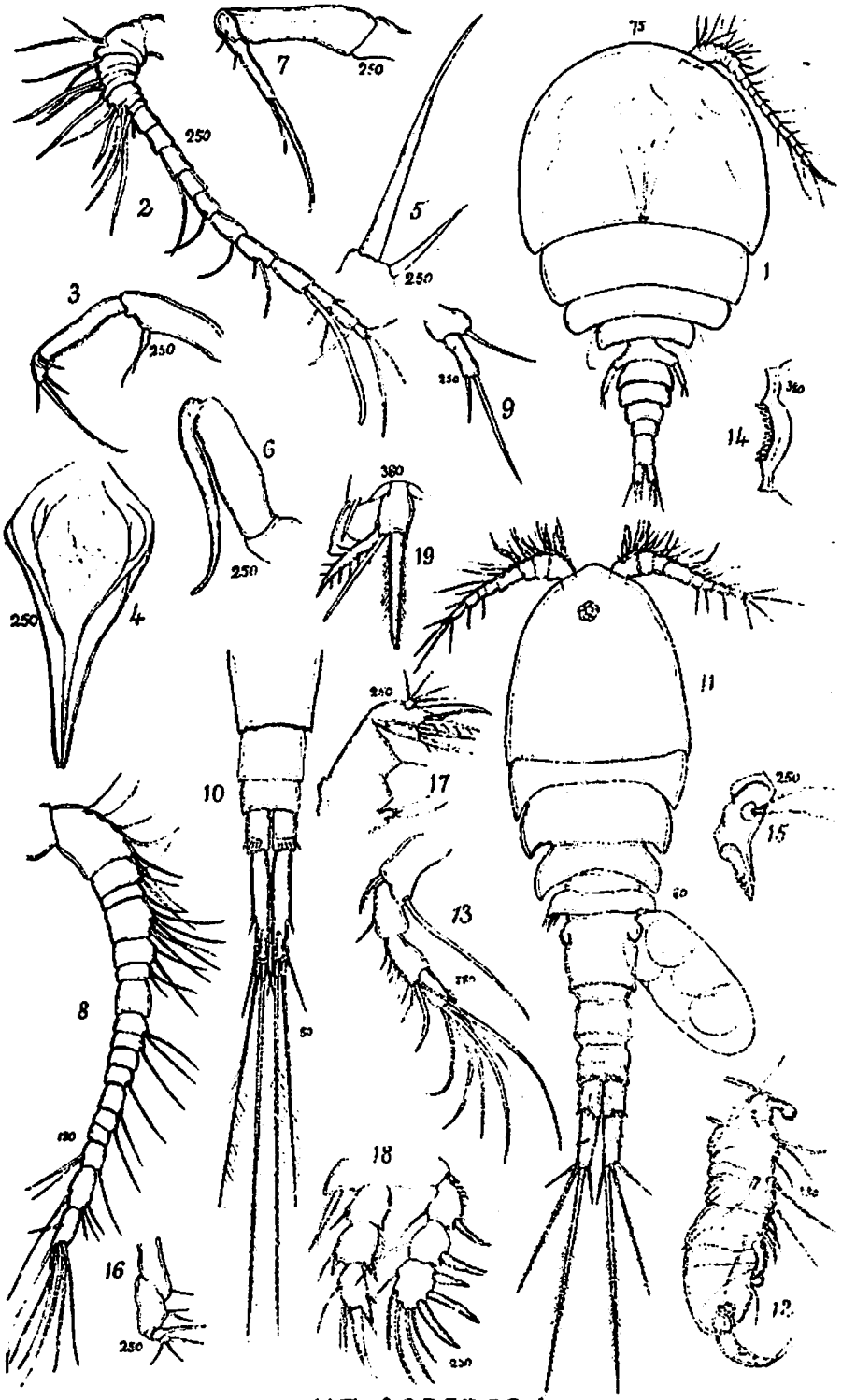

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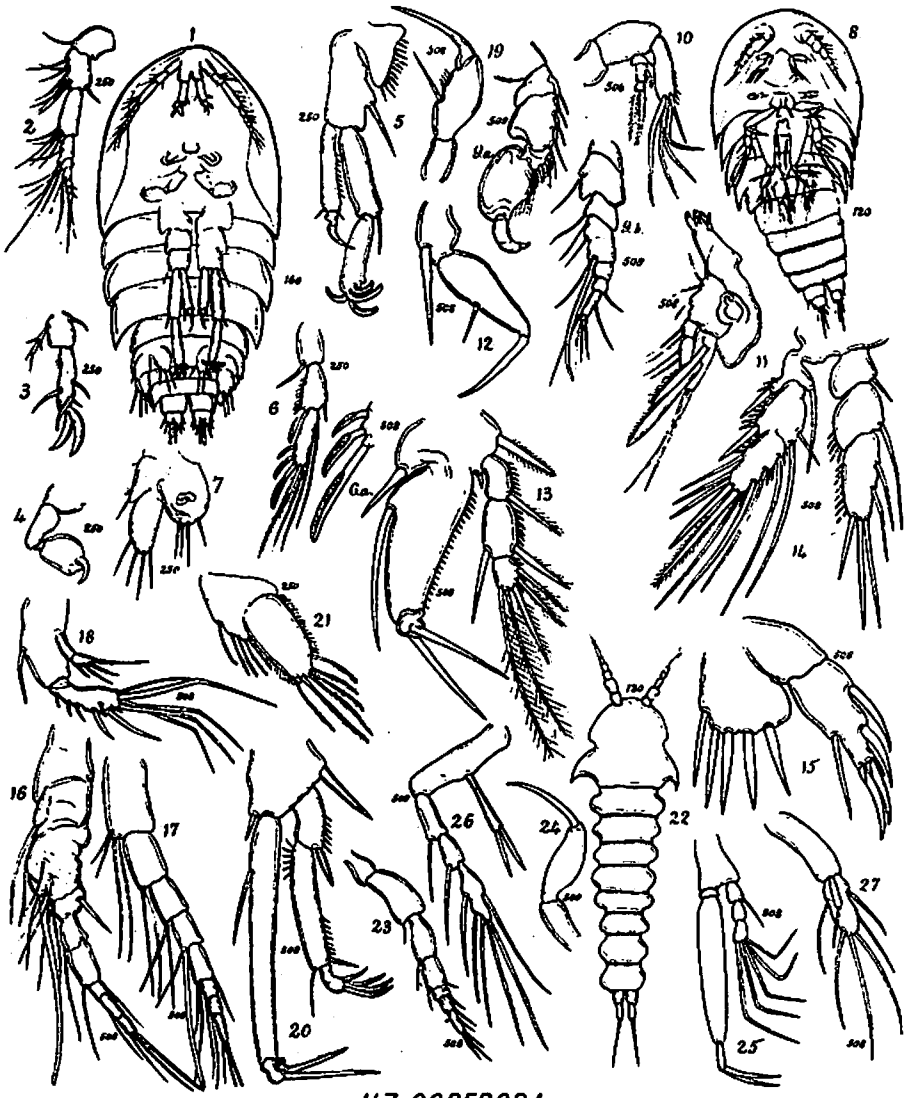

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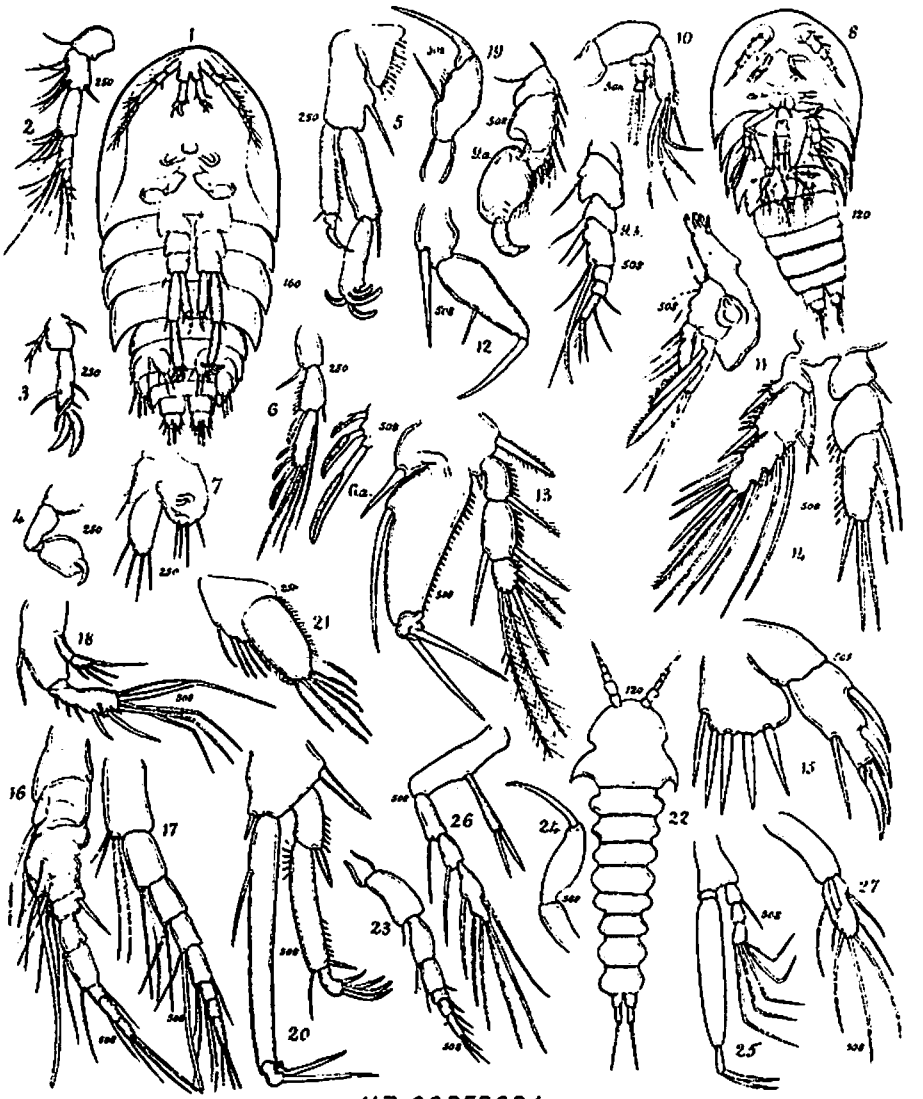

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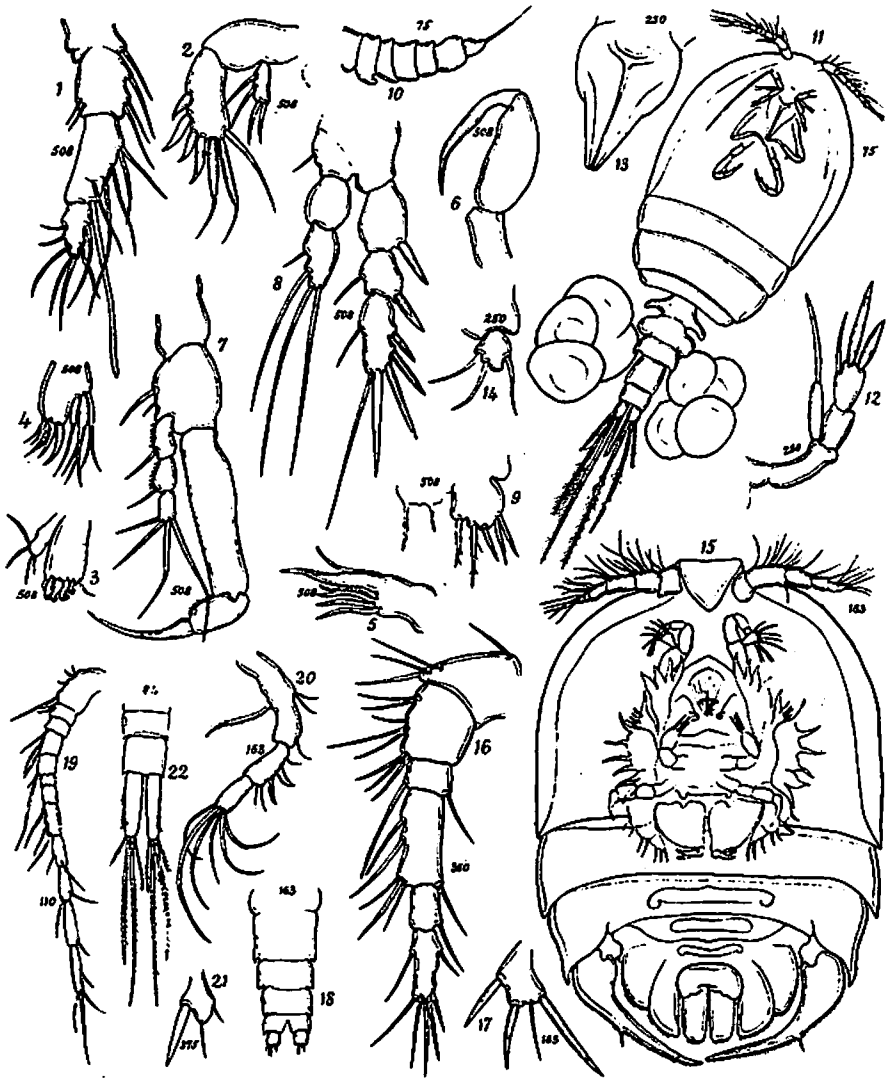

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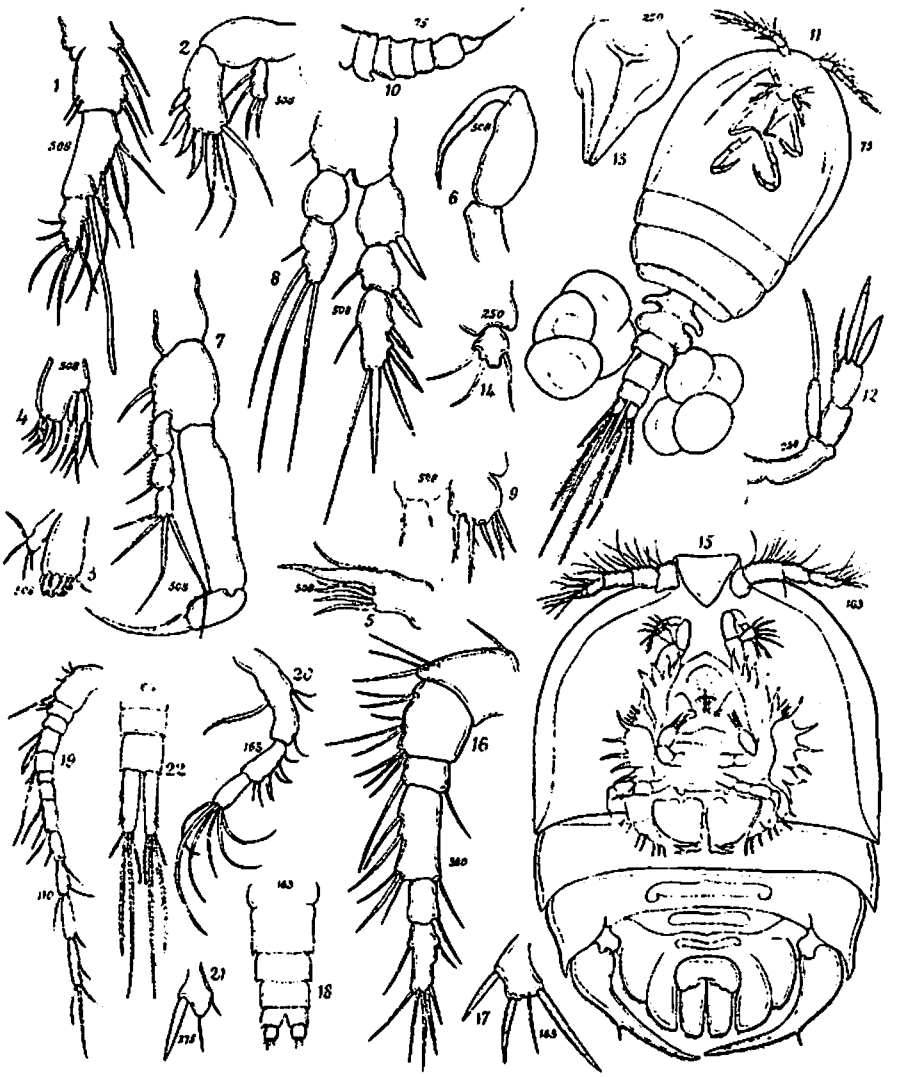

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ADDENDA ET CORRIGENDA.

PAGE

70, line 20, *for* propodos *read* dactylos
73, line 8 from bottom, *for* Philongria *read* Philougria
77, line 12, *for* pleon *read* pereion
79, line 6, *for* ? Montaguana *read* ? Montagua
93, line 11 from bottom, *for* fuscate *read* furcate
140, line 15, *for* mangei *read* maugei
148, line 11 from bottom, *for* small *read* same
149, line 8 ,, and elsewhere, *for* Philongria *read* Philougria
162, line 14 ,, *for* Lezdig *read* Leydig
166, line 7 ,, *after* part *dele* semicolon *and insert* a comma
175, line 1, *for* ascil *read* axil
175, line 4, *for* limbs *read* lines
175, line 7 from bottom, *dele* Theraphosides
176, line 9, *for* ascils *read* axils
177, line 6, *for* clumps *read* culms
177, line 11, *for* Thomisides *read* Salticus
188 and 190, in title, *for* 6th April *read* 30th November
194, line 13, *for* interior *read* exterior
198, line 12 from bottom, *for* ansonii *read* ausonii
200, line 6 ,, *for* Saprolignia *read* Saprolegnia
209, line 4 ,, *for* here *read* where
221, line 5, *for* vasculan *read* vascular
221, line 18 from bottom, *for* nitrata *read* nitrate
221, line 8 ,, *for* this *read* their
224, line 19, *after* being *insert* eleven
226, line 2 from bottom, *after* loc. cit., p. *insert* 58 and 60
227, line 11 ,, *for* epidymis *read* epididymis
228, line 7, *for* cœlum *read* cœlome
228, line 21, *for* on *read* as
228, line 7 from bottom, *for* cerebellan *read* cerebellar
230, line 3, *for* like *read* between
231, line 4, *for* Mechelian *read* Meckelian
233, line 3, *for* as *read* in
235, line 4 from bottom, *for* the *read* two
235, line 3 ,, *for* this *read* their
273, line 6, *before* plants *insert* naturalized
277, line 8 from bottom, *for* larva *read* lava
282, line 19, *for* E. and L. *read* E. and Z.
283, line 18, *for* ceptophyllum *read* leptophyllum
283, line 24, *for* Larum *read* Carum
284, line 18, *for* Pakari *read* Pakiri