

IX.—NOTES ON NEW AND RARE COPEPODA FROM THE  
SCOTTISH SEAS.

By THOMAS SCOTT, LL.D., F.L.S., Mem. Soc. Zool. de France.

(Plate XIV.)

PRELIMINARY NOTE.

The following are a few notes and drawings of rare Entomostraca that have been held over from previous papers on Scottish Crustacea, published from time to time in the Reports of the Fishery Board for Scotland.

I am indebted to my son, Mr. Andrew Scott, A.L.S., for the drawings with which these notes are illustrated.

Genus *Amphiascus*, G. O. Sars (1895).

*Amphiascus Cutharine*, T. Scott, sp. n. Pl. xiv., figs. 1–9.

Description of the female:—Body robust, somewhat similar to *Amphiascus minutus* (Claus); Rostrum moderately elongated (fig. 1); length, .74mm. ( $\frac{1}{3}$  of an inch).

Anterior antennæ slender, reaching to about the end of the cephalothoracic segment, and composed of eight joints; the first, fourth, and last joints of moderate length, the others small, as shown by the formula (see also fig. 2).

Proportional length of the joints,	16	18	9	14	4	7	6	1
Numbers of the joints,	1	2	3	4	5	6	7	8

Posterior antennæ stout, two-jointed, and furnished with a moderately elongated and three-jointed outer ramus (fig. 3).

Mandibles tolerably stout, apex truncated and armed with several teeth of unequal length; palp well developed, basal part moderately stout and setiferous, and provided with two small branches, as shown in the drawing (fig. 4).

Second maxillipeds small, second joint moderately narrow and fringed with minute setæ; the end joint very small but armed with a tolerably large terminal claw (fig. 5).

First pair of thoracic legs slender, both branches triarticulate, inner branch with first joint narrow, considerably elongated, and apparently with only a few minute setæ near the proximal end of the inner margin and a small hair near its distal extremity; the two end joints very short and armed with a stout terminal claw and a tolerably large seta; there are also a few smaller setæ, as shown in the drawing. Outer branch about two-thirds the length of the first joint of the inner, the middle joint is rather longer than the first and fully twice as long as the third; these joints have the outer margin setiferous and are also furnished with long spines on the outer distal angles (fig. 6).

Both branches of the other three pairs are also three-jointed, elongated and slender, the inner branches being rather shorter than the outer, as shown in the drawing which represents the fourth pair (fig. 7).

Fifth pair tolerably large and foliaceous; basal joint somewhat triangular in outline, the distal half of the inner margin which slopes towards the apex is provided with three stout setæ, the inner margin is nearly straight and terminates in an angle, and immediately posterior to this angular tooth are two apical setæ, which are separated from the lowermost of the three on the inner margin by a *distinct hiatus*, as in the drawing. Secondary joint subquadrangular, its width being equal to nearly two-thirds of the length, the outer and inner margins are *nearly parallel at the proximal end*, but they taper from about the middle of the joint towards the apex and there are three setæ on the outer margin, one on the lower inner margin and two on the apex, as shown in the drawing (fig. 8).

Furcal joints very short (fig. 9). Principal tail setæ slender. Two ovisacs. Male unknown.

*Habitat*.—Granton, Firth of Forth; dredged in an old quarry to which the tide has access. Apparently rare.

Remarks.—In some respects *Amphiascus Catherinæ* comes very near *Amphiascus (Dactylopus) minutus*, Claus., as described and figured by G. O. Sars,\* but the form and armature of the fifth pair of thoracic feet are totally different. Other but less obvious differences are also noticeable, as, for example, in the form and armature of the mandible-palp, the armature of the outer and inner branches of the fourth pair of thoracic legs and in the hirsute character of the first two abdominal segments. Unfortunately I have been unable to obtain the male of this form, but owing to the differences mentioned I prefer meantime to regard this as a distinct form from *A. minutus*.

Genus *Dactylopusia*, A. M. Norman (1903).

*Dactylopusia brevicornis* (Claus). Pl. xiv., figs. 10–18.

1866. *Dactylopus brevicornis*, Claus., Die Copepoden-fauna von Nizza, p. 29, Taf. iii., figs. 20–25.

1905. *Dactylopusia brevicornis*, G. O. Sars, Crust. of Norway, vol. v., p. 130, pl. lxxx.

The female of this species, like that of some others of the same group, has the cephalothorax depressed and broadly ovate, but the abdomen is comparatively narrow (fig. 10). Rostrum short, with a broadly rounded apex. Length .77 mm. ( $\frac{1}{3\frac{1}{2}}$  of an inch).

Anterior antennæ composed of five joints, very short and stout; the first three are more robust than the remaining two joints, the end joint is fully twice as long as the penultimate one (fig. 11). The formula shows the proportional lengths of the various joints as follows:—

Proportional lengths of the joints,	-	18	·	12	·	16	·	6	·	17
Numbers of the joints,	-	1	2	3	4	5				

Posterior antennæ stout, two-jointed, with a short three-jointed outer ramus (fig. 12).

Mandibles stout, with an obliquely truncate apex, which is armed with a few large and several small teeth. Mandible palp with a dilated basal part bearing two very short uniaarticulate branches (fig. 13).

\* Crustacea of Norway, vol. v., p. 154, pl. xvi. (March 1906).

Second maxillipeds short, stout, with a strong terminal claw (fig. 14).

The first pair of thoracic legs stout, both branches three-jointed; the first joint of the inner branch is as long as the entire outer branch, while the second and third joints are very short; a long plumose seta springs from near the middle of the inner margin of the first joint, but the outer margin is fringed with small spines, the inner branch bears two strong, but unequal, terminal claws; the first and second joints of the outer branch are subequal, and are each furnished with a stout elongated spine near the outer distal angle, the second joint being also provided with a long plumose seta on the inner margin, the end joint is tolerably short and is armed as shown in the drawing; a stout spine also springs from both the outer and inner angles of the second basal joint (fig. 15).

The next three pairs of thoracic legs have also both branches three-jointed, the inner being the shorter one; both branches have their outer margins fringed with spines. In the fourth pair (fig. 16.) the inner margin of the first joint of the inner branch carries one seta. The second two setæ, and the end joint four setæ. A short spine also springs from the outer distal angle of the third joint.

The fifth pair foliaceous, basal joint broadly triangular, with a truncated and broadly but irregularly rounded apex which bears five stout setæ of various lengths. Secondary joint broadly subquadrangular, proximal half of the outer margin nearly parallel with the inner, but the distal half tapers towards the apex and carries three setæ, other three setæ spring from the apex and lower part of the inner margin (fig. 17).

Furcal joints very short; the inner of the two principal tail setæ with the base slightly dilated (fig. 18).

*Habitat.*—Collected in an old quarry, open to the sea, at Granton, Firth of Forth.

*Remarks.*—The form described here under the name of *Dactylopusia brevicornis*, Claus, undoubtedly belongs to that species. The drawings, though only now published, were prepared a number of years ago from specimens collected in an old quarry at Granton, Firth of Forth, to which the tide has access.

The abbreviated length and massive structure of the antennules; the structure of the mandibles, the stout first pair of thoracic feet, and the form of the fifth pair are sufficiently characteristic of this particular species.

The following list of some of the rare and interesting species that have been obtained in the old quarry at Granton just referred to may be of interest, as indicating the remarkable variety of organisms present in this small body of water. The species are arranged alphabetically:—

- Acartia bifilosa*, Giesb.
- Ameira longicaudata*, T. Scott.
- Beatricea mimica*, T. Scott.
- Canthocamptus parvus*, T. Scott.
- Canuella perplexa*, T. and A. Scott.
- Cletodes similis*, T. Scott.
- Dactylopusia brevicornis*, (Claus).
- „ *finmarchicus*, (T. Scott).
- „ *vulgaris*, G. O. Sars.
- Ectinosoma curticorne*, Boeck.
- Enhydrosoma incurvatum* (B. & R.).
- Euryte longicauda*, Philippi.
- Halicyclops æquoreus* (Fischer).
- Harpacticus obscurus*, T. Scott.
- Idya furcata*, Baird.
- „ *gracilis*, T. Scott.



- Idya minor*, T. Scott.  
*Laophonte curticauda*, Boeck.  
 „ *gracilis*, T. Scott.  
 „ *hispida*, B. & R.  
 „ *inopinata*, T. Scott.  
 „ *intermedia*, T. Scott.  
 „ *littorale*, T. and A. Scott.  
 „ *longiremis*, T. Scott.  
 „ *thoracica*, Boeck.  
*Longipedia Scotti*, G. O. Sars.  
*Nannopus palustris*, G. S. Brady.  
*Parathalestris hibernica* (Brady & Robertson)  
*Platychelipus littoralis*, G. S. Brady.  
*Pontopolites typicus*, T. Scott.  
 \**Pseudothalestris major*, T. and A. Scott.  
*Stephos Scotti*, G. O. Sars.  
 2/ *Tachidius dikipes*, Giesb.  
 „ *littoralis*, Poppe.  
*Zaus spinatus*, Goodsir.

Genus *Pseudodiosaccus*, T. Scott (1906).

*Pseudodiosaccus propinquus* (T. and A. Scott). Pl. xiv., figs. 19–29.

1893. *Diosaccus propinquus*, T. and A. Scott. Ann. and Mag. Nat. Hist., sev. 6, vol. xii. (Oct., 1893), p. 237, pl. xi., figs. 1–6.

1906. *Pseudodiosaccus propinquus*, T. Scott. Ann. and Mag., May, 1906, p. 465.

This species was obtained in the Moray Firth, a few miles to the northward of Kinnaird Head, where the water is very deep; the particular part where this species was obtained gave a sounding of 130 fathoms (240 metres), the dredge line hanging free, and straight up and down. As the species appears to be rare, and as the number of drawings used to illustrate the description were only sufficient for its identification, I propose to supplement the original description with some additional remarks and drawings, especially as it has been considered necessary to remove the species from the genus to which it was first ascribed.

\* Professor G. O. Sars, in Vol. V. of his great work on the Crustacea of Norway, at present in course of publication, deals with what is probably the most difficult as well as the most interesting group of the Copepoda, viz.:—the Harpacticoida. In this volume, at p. 142, the learned author is inclined to regard *Pseudothalestris major*, T. and A. Scott, as identical with *Westwoodia minuta*, Claus. The description and figures of this form given by Dr. Claus are meagre—they are not only limited and indefinite, but it is only the male that he describes. On the other hand, Professor Sars' description and figures of what he believes to be the female of Claus' species are full and clear, like all that author's work, and they no doubt show a certain close resemblance to the female of *Pseudothalestris major*. But there is at least one point where an important difference occurs. The author describes the antennules of the female as composed of six joints, whereas those of the female of *Pseudothalestris major* are eight-jointed, the first four being moderately elongated and the other four shorter. There appears also to be some difference in the structure of the posterior antennæ.

It may also be noted that the same author makes *Pseudothalestris* Brady, a synonym of *Westwoodia*, Baird, but as the small group of species that have been arranged under the genus name *Pseudothalestris* are clearly distinguishable from *Westwoodia* by the difference in the structure of the first pair of thoracic feet, I prefer to keep them separate under the genus instituted by Dr. Brady. The fact that all the species belonging to the group hitherto arranged together under *Pseudothalestris* are similarly characterised by the peculiarity in the structure of the first pair of feet that distinguishes them from the typical *Westwoodia* is, I think, a valid reason for keeping them separate from that genus.

The female of this species, as already described, resembles to some extent that of *Diosaccus tenuicornis*, Claus, in its general appearance, but is probably somewhat larger. It measures about 1mm. (or  $\frac{1}{25}$  of an inch) in length, exclusive of the tail setæ (fig. 19).

The antennules (anterior antennæ) are moderately elongated, and composed of eight joints; the first four joints are moderately large, and are together considerably longer than the entire length of the last four. The fifth joint is little more than half the length of the preceding one and about two-thirds of the length of the sixth joint. The end joint is about equal in length to the fifth, but the penultimate one is considerably shorter, as shown in the drawing (fig. 20).

The outer and inner rami of the posterior antennæ are both of them biarticulate. The outer ramus, which has the joints subequal, is short, and furnished with about three short setæ. The inner ramus is moderately stout (fig. 21).

The mandibles are stout, and possess a broad and somewhat obliquely truncated biting edge, which is irregularly but distinctly dentated. Mandible palp of moderate size, and provided with a single terminal unarticulate branch (fig. 22).

The maxillæ are moderately stout and compact, and the masticatory lobe, which is short, and obliquely truncated, is armed with a number of tolerably strong spines of varying lengths; the palp is fairly well developed (fig. 23), and consists of several lobe-like processes as shown.

Second maxillipeds robust, and armed with a stout elongated terminal claw (fig. 24).

The first pair of thoracic legs have both branches three-jointed; the first joint of the inner branch is considerably elongated, but the second and third are very short and subequal, and the end one is armed with two terminal claw-like spines, one being moderately long and one short; a small seta also springs from near the distal end of the inner margin of the first joint. The outer branch is little more than half the length of the inner one; the first two joints are subequal, but the third is short, and furnished with several spiniform setæ, as shown in the drawing (fig. 25).

The second and third pairs, which have also both branches three-jointed, are moderately stout, and the outer and inner branches are of nearly equal length. In the second pair the first joint of the inner branch is rather shorter than the second, and it carries a single seta on the inner margin; the second joint carries three setæ, and the end joint one seta, on the inner margin; the end joint is also provided with three terminal setæ, but the outer one is short. The outer branch has the end joint rather longer than the preceding one, and furnished with two elongated setæ on the inner margin, two moderately long spines on the outer margin, and three apical setæ of different lengths; the first and second joints are each furnished with a moderately long spine on the outer distal angle, and an elongated seta on the inner margin (fig. 26).

In the fourth pair the outer branch resembles that of the second pair in stoutness and armature, but the inner branch is slender and short, and composed of only two joints; the first joint, which is narrow and shorter than the second, bears a seta on the inner margin; the second joint scarcely reaches beyond the end of the middle joint of the outer branch, and carries five setæ round its distal extremity (fig. 27).

In the fifth pair the outer and inner margins of the basal joint are nearly parallel; the distal end is obliquely truncated and slightly convex, and bears four moderately long marginal setæ, so arranged as to be nearly equidistant from each other. The secondary joint is broadly oval in outline, and extends considerably beyond the end of the basal joint; it

is provided with six setæ, which are arranged as follows:—One small seta on the upper half and another on the lower half of the outer margin and situated considerably apart, and four setæ round the distal extremity; the outermost and innermost seta is moderately large and plumose, but the two intermediate ones are small and close together (fig. 28)

Furcal joints as long as the last abdominal segment (fig. 29). Ovisacs two. Only three specimens—all females—were obtained.

Remarks.—This species, as already stated, has some resemblance to *Diosaccus tenuicornis*, Claus, but the structure and armature of the mandibles, maxillæ, and fourth pair of thoracic legs are so distinctly different that though the species was at first ascribed to that genus it cannot be retained there, and a new genus, *Pseudodiosaccus*, has therefore been instituted for its reception, as indicated above. This genus appears to partake of the characters of both *Diosaccus* and *Amphiascus*, but in the structure of the fourth pair of thoracic legs it agrees with neither of these two genera.

It resembles *Diosaccus* in the structure of the posterior antennæ, of the mandible palp, and to some extent in the structure of the first and fifth pairs of thoracic legs; while in the maxillæ, second maxillipeds, and the second and third pairs of legs it resembles *Amphiascus*.

## PLATE XIV.

*Amphiascus Catharina*, T. Scott.

- Fig. 1. Female, side view.
- Fig. 2. Antennule.
- Fig. 3. Antenna.
- Fig. 4. Mandible.
- Fig. 5. Posterior foot jaw.
- Fig. 6. Foot of first pair.
- Fig. 7. Foot of fourth pair.
- Fig. 8. Foot of fifth pair.
- Fig. 9. Abdomen and furcal joints.

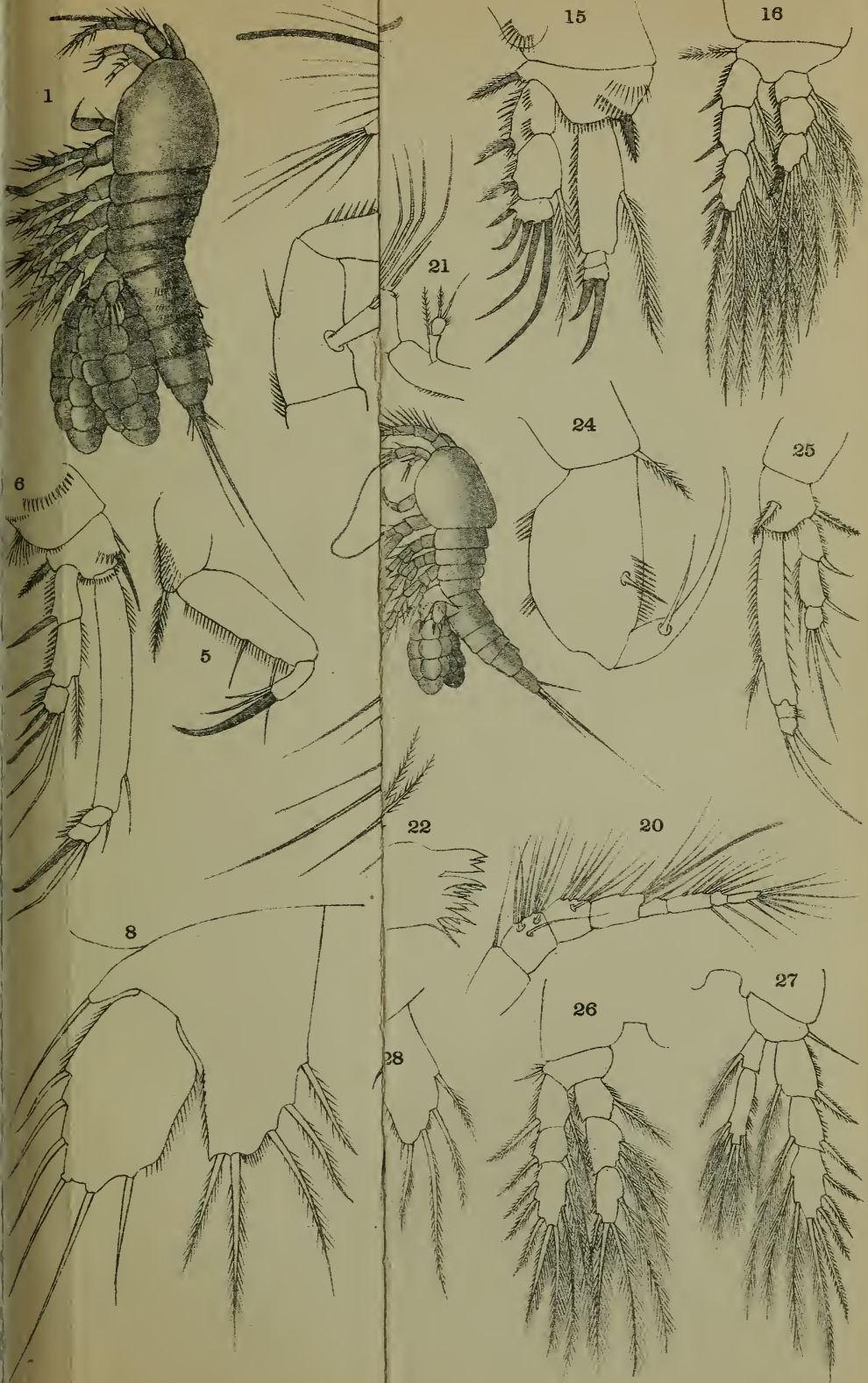
*Dactylopusia brevicornis*, Claus.

- Fig. 10. Female, dorsal view.
- Fig. 11. Antennule.
- Fig. 12. Antenna.
- Fig. 13. Mandible.
- Fig. 14. Posterior foot-jaw.
- Fig. 15. Foot of first pair.
- Fig. 16. Foot of fourth pair.
- Fig. 17. Foot of fifth pair.
- Fig. 18. Abdomen and furcal joints.

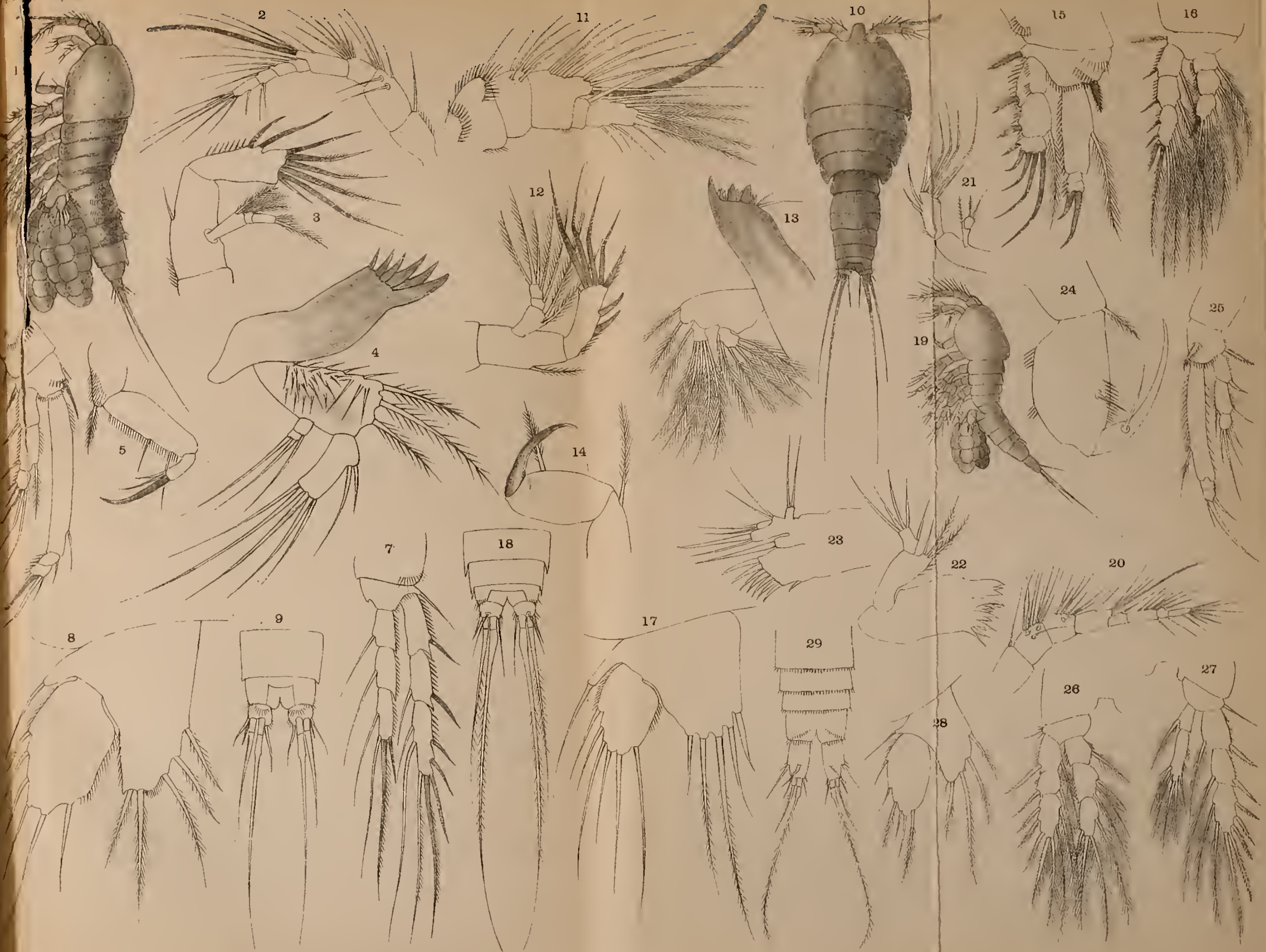
*Pseudodiosaccus propinquus*, T. Scott.

- Fig. 19. Female, side view.
- Fig. 20. Antennule.
- Fig. 21. Antenna.
- Fig. 22. Mandible.
- Fig. 23. Maxilla.
- Fig. 24. Posterior foot-jaw.
- Fig. 25. Foot of first pair.
- Fig. 26. Foot of second pair.
- Fig. 27. Foot of fourth pair.
- Fig. 28. Foot of fifth pair.
- Fig. 29. Abdomen and caudal furca.









A. SCOTT, del ad nat.

FIGS. 1-9. *Amphiscus Catharinæ*.

FIGS. 10-18. *Dactylopsis brevicornis*.

FIGS. 19-29. *Pseudoliosaccus propinquus*.