AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

VOL. V

COPEPODA
HARPACTICOIDA

PARTS XI & XII

THALESTRIDÆ (concluded), DIOSACCIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

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Colour yellowish.

Length of adult female 0.50 mm.

Remarks.—The above-described form is unquestionably that originally recorded by Claus as *Dactylopus flavus*. Prof. Brady has confounded this species with another very different form, to be described below as *Idomene forficata* Philippi, only the female being referable to the present species, whereas the male belongs to the Philippian species.

Occurrence.—I have only met with this form very occasionally, though in several localities off both the south and west coasts of Norway. It occurs in moderate depths, ranging from 6 to 20 fathoms, among algæ and Hydroida.

Distribution.—British Isles (Brady), Mediterranean off Nice (Claus).

Gen. 35. **Idomene**, Philippi, 1843.

Generic Characters.—Body pronouncedly depressed throughout, with the anterior division broad and flattened. Cephalic segment rounded in front, without any true rostrum. Urosome much narrower than the anterior division, though distinctly depressed, last segment deeply cleft behind. Caudal rami produced, divergent, inner apical seta spiniform. Eye absent. Anterior antennæ in female comparatively small, 6- or 7-articulate, in male much larger and very subchelate. Posterior antennæ with the outer ramus well developed, biarticulate. Mandibular palp largely developed, with the basal part very broad, and both rami of unusual size, the outer one armed outside with a number of strong falciform spines. Maxillæ and maxillipeds normal. 1st pair of legs with the basal part very broad and flattened, both rami 3-articulate, the outer one shorter than the inner, and armed outside with strong denticulated spines, inner ramus with the 1st joint large and dilated, carrying inside a strong plumose setæ, last joint armed at the tip with 2 slender claws and a ciliated seta inside them. Natatory legs with the rami nearly equal-sized; inner ramus of 2nd pair of legs in male only slightly transformed. Last pair of legs not very large, distal joint armed outside with strong spines.

Remarks.—This genus was established in the year 1843 by Philippi, to include a small Copepod found by him in the Mediterranean at Naples. As only a solitary specimen was observed, the exact structure of the appendages could of course not be made out, and the detail-figures given merely represent some parts

of the limbs as occasionally seen extended beyond the edges of the body. The genus is chiefly characterised by the flat clypeiform body, the absence of an eye and of a true rostrum, the great development of the mandibular palps, and the structure of the 1st pair of legs. In addition to the typical species described below, the 2 forms recorded by A. Scott from Ceylon as *Dactylopusia laticaudata* and *D. æmula*, seem to be referable to the present genus.

85. Idomene forficata, Philippi.

(Pl. LXXXII).

Idomene forficata, Philippi, Fernere Beobachtungen über die Copepoden des Mittelmeeres. Archiv f. Naturgeschichte 1843, p. 65, Pl. III, fig. 4.

Syn: *Dactylopus flavus* Brady, male (not Claus).

Specific Characters.—Female. Body comparatively short, clypeiform, attenuated behind. Cephalic segment large and expanded, evenly rounded in front, lateral corners acutely produced. Epimeral plates of the 3 succeeding segments laterally extended and terminating behind in an acute point. Last segment of metasome much narrower than the preceding ones, and without distinct epimeral plates. Urosome scarcely more than half the length of the anterior division, genital segment nearly twice as broad as it is long, and imperfectly divided in the middle, last segment cleft almost to the base. Caudal rami considerably longer than they are broad, and slightly tapering distally, apical setæ comparatively short, the innermost one transformed to a strong mucroniform spine. Anterior antennæ narrow and gradually tapering distally, 7-articulate, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, and provided with 6 setæ, 4 lateral and 2 apical. Mandibular palp with the basal part very broad and expanded, having a transverse row of delicate spinules across the middle, and 4 marginal setæ; rami of about equal size, the outer one armed outside with 3 remarkably strong spines, finely ciliated along one of the edges. 1st pair of legs with the inner corner of the 2nd basal joint considerably projecting and armed with a strong deflexed spine; outer ramus a little shorter than the 1st joint of the inner, exterior margin, as also the spines, coarsely spinulose, last joint short and obliquely truncated at the tip, carrying 3 spines and 2 geniculate setæ; 1st joint of inner ramus oblong trigonal in form, inner edge angularly bent in the middle, the outer 2 joints comparatively short, each with a ciliated seta inside, apical claws strong and slightly unequal in length. Last pair of legs with the distal joint comparatively small and armed with 5 marginal spines, the 3 outer ones very

strong, inner expansion of proximal joint not very prominent, and broadly rounded at the end, with 5 subequal setæ, none of which are spiniform.

Male, as usual, somewhat smaller than female, and having the urosome distinctly 5-articulate. Anterior antennæ very strongly built, with the 4th joint bulbously inflated, and the terminal part claw-like. First pair of legs of exactly the same structure as in the female. Inner ramus of 2nd pair, as in the female, distinctly 3-articulate, only differing in having the apical setæ shortened and spiniform. Last pair of legs with the distal joint more oblong in form, and armed outside with 4 very strong spines, inner expansion of proximal joint very slight, and provided with only 2 marginal setæ.

Colour yellowish, changing to a light chestnut-brown.

Length of adult female 0.54 mm.

Remarks.—I think I am right in considering the present form to be identical with that recorded by Philippi under the above name. The general form of the body, at any rate, agrees fairly well with the rough figure given by Philippi. As stated above, Prof. Brady has confounded this form with *Dactylopus flavus* of Claus, only the female described being referable to Claus's species, whereas the male unquestionably belongs to the form here treated of.

Occurrence.—I have found this form occasionally in several localities off both the south and west coasts of Norway, from the Christiania Fjord at least to the Trondhjem Fjord. It occurs in moderate depths, ranging from 6 to 20 fathoms, among algæ and Hydroida. As is the case with the species of the genera *Aspidiscus* and *Porcellidium*, the animal has the power of applying its flat body so firmly to any object that it can only with considerable difficulty be detached when alive. On coming in contact with the surface of the water, it remains floating upon it, like some other Copepoda, and may thus easily be picked up from any freshly taken sample.

Distribution.—British Isles (Brady), Mediterranean at Naples (Philippi).

Gen. 36. **Amenophia**, Boeck, 1865.

Generic Characters.—Body flat, shield-like, recalling in general appearance that found in the species of the genus *Zaus:* rostrum, however, obsolete. Eye quite normal. Anterior antennæ of the usual structure, 9-articulate, in male only slightly dilated, though distinctly prehensile. Posterior antennæ with the outer

ramus rather small, biarticulate. Oral parts on the whole normal. 1st pair of legs somewhat resembling in structure those in *Thalestris*, both rami being distinctly prehensile and subequal in length, armed at the tips with strong claw-like spines. Natatory legs comparatively slender, with both rami 3-articulate, the outer one being the longer: inner ramus of 2nd pair of legs in male transformed in a similar manner to that in *Thalestris*. Last pair of legs with the inner expansion of the proximal joint very broad but only slightly projecting, distal joint narrow, sub-falciform in shape, and extended laterally.

Remarks.—This genus was established in the year 1865 by Boeck, to include a species found by him off the west coast of Norway. It was however not accepted by Prof. Brady, who in his Monograph referred the species described by Boeck to the genus *Thalestris*: and all subsequent British authors have followed him in this view. True, one of the characters on which Boeck based his genus, viz, the supposed duplicity of the eye, must be wholly cancelled, being due to a miscomprehension; but there still remain several peculiarities which seem to warrant the maintenance of this genus. In no other Thalestridæ does the body exhibit such a pronounced shield-like form, and indeed, for this reason, Claus would certainly have referred the genus to his family *Peltidiidæ*. Moreover the structure of the 1st and last pair of legs is somewhat different from that in other Thalestridæ. Two closely-related species of this genus occur off the Norwegian coast.

86. Amenophia peltata, Boeck.

(Pl. LXXXIII, Pl. LXXXIV, fig. 1).

Amenophia peltata, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder, Chr. Vid. Selsk. Forhandl. 1864, p. 269.

Syn: *Thalestris peltata*, Brady.

Specific Characters.—Female. Body oblong oval in outline, about twice as long as it is broad, the greatest width occurring somewhat in front of the middle. Cephalic segment very large and expanded, slightly contracted, anteriorly, front obtusely produced, lateral corners acuminate. Epimeral plates of the 3 succeeding segments extended laterally, and terminating behind in an acute point. Last segment of metasome much narrower than the preceding ones. Urosome about half the length of the anterior division, and, like the latter, distinctly depressed, genital segment twice as broad as it is long, and imperfectly divided in the middle, lateral edges of this and the 2 succeeding segments densely ciliated.

Caudal rami short, quadrangular, apical setæ of moderate length. Anterior antennæ scarcely more than half the length of the cephalic segment, and only slightly attenuated, distal part about half as long as the proximal one. Posterior antennæ with the outer ramus considerably shorter than the terminal joint of the inner, and provided with 5 setæ, 3 lateral and 2 apical. 1st pair of legs comparatively strongly built, outer ramus fully as long as the inner, and having the middle joint rather elongated, spine of this and the preceding joint coarsely pectinate on the one edge, last joint short, lamelliform, and armed with 2 small, and 2 very strong claws, inside which a slender ciliated seta is attached; inner ramus with the seta of the 1st joint attached about in the middle, the 2 outer joints short and thick, apical claws rather unequal, the inner one very strong, the outer shorter and much narrower. Last pair of legs with the distal joint rather narrow and densely hairy outside, inner edge straight, outer convex and carrying in its distal part one large, and 2 very short setæ, tip provided with 3 setæ, the 2 outer of which are very thin and unciliated; inner expansion of proximal joint broadly rounded at the end, and carrying 5 unequal setæ. Ovisac large, rounded and distinctly applanated.

Male somewhat smaller than female, and having the urosome comparatively less broad and distinctly 5-articulate. Anterior antennæ more strongly built and distinctly prehensile, the hinge occurring between the first 2 joints of the terminal part. Spine inside the 2nd basal joint of the 1st pair of legs transformed into a strong hook. Inner ramus of 2nd pair of legs with the 2 outer joints confluent, and at their junction, outside, provided with 2 closely juxtaposed slender spiniform appendages, tip produced in 2 short and somewhat unequal spines. Last pair of legs with the distal joint comparatively shorter than in female, and having the 3 setæ of the outer edge of equal size; inner expansion of proximal joints very slight, with only 3 marginal setæ.

Body in both sexes of a light yellowish colour, with 2 or 3 dark violaceous transverse bands across the anterior division, and several less distinctly defined bands of a similar hue across the urosome.

Length of adult female 0.74 mm.

Remarks.—This form was recorded by Boeck as early as in the year 1865, and was subsequently also found off the British Isles by Prof. Brady, who, as stated above, referred it to the genus *Thalestris*. In its external appearance it somewhat resembles *Zaus spinatus*, though, on a closer inspection, easily distinguished by the want of a true rostrum and by the peculiar colour of the body when alive.

Occurrence.—I have met with this form occasionally in several localities both on the south and west coasts of Norway, from the Christiania Fjord up to the Trondhjem Fjord. It is not, like *Zuus spinatus*, a strictly littoral species, but only occurs in moderate depths ranging from 6 to 20 fathoms.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve).

87. Amenophia pulchella, G. O. Sars, n. sp.

(Pl. LXXXIV, fig. 2).

Specific Characters.—Female. Body comparatively shorter and stouter than in the preceding species, rounded oval in outline, with the greatest width considerably exceeding half the length, and occurring about in the middle. Cephalic segment very large and only slightly constricted in front. Epimeral plates of the 3 succeeding segments closely imbricate and greatly exstant laterally. Urosome comparatively short and broad, scarcely half as long as the anterior division, the first 3 segments considerably produced at the lateral corners, and densely fimbriate at the edges. Caudal rami about as in *A. peltata*. Anterior antennæ somewhat more attenuated distally, terminal part very slender. Posterior antennæ and oral parts scarcely different from those in *A. peltata*. 1st pair of legs likewise of a very similar structure, differing, however, in the somewhat greater length of the inner ramus as compared with the outer, and having the seta of the 1st joint attached beyond the middle. Last pair of legs with the terminal joint of the same structure as in *A. peltata:* inner expansion of proximal joint however slightly different, being narrowly produced in the middle.

Body of a clear yellowish colour, with a bright pink band across the middle, occupying the whole of the first 3 free segments of metasome, and bordered in front by a light orange shade.

Length of adult female 0·50 mm.

Remarks.—This new species is closely allied to *A. peltata*, but is of smaller size and considerably more robust form of body, differing also slightly in the structure of the 1st and last pairs of legs. In the living state, it is moreover at once distinguished by its peculiar and beautiful colour.

Occurrence.—Some few specimens of this form, all of the female sex, were taken many years ago at Christiansund, on the west coast of Norway.

Gen. 37. **Westwoodia**, Dana, 1855.

Syn: *Pseudothalestris*, Brady.
„ *Pseudowestwoodia*, Scott.

Generic Characters.—Body short and stout, sub-pyriform in shape, with the anterior segments more or less imbricate dorsally. Cephalic segment very large and boldly vaulted above, rostral projection deflexed, not defined at the base. Urosome comparatively small, attenuated. Caudal rami short and broad. Eye well developed. Anterior antennæ with the articulations more or less reduced in number. Posterior antennæ with the outer ramus of moderate size, 3-articulate. Oral parts differing somewhat in structure from those in the other Thalestridæ. Anterior lip very prominent. Mandibles with the masticatory part narrowly produced, palp well developed, with the basal part oblong in form, and both rami short, the outer one abruptly reflexed and carrying long plumose setæ. Maxillæ with the masticatory lobe likewise considerably produced, and terminating in a claw-like projection. Anterior maxillipeds short and stout, with a strong incurved claw at the end, lateral lobes comparatively simple. Posterior maxillipeds powerfully developed and of normal structure. 1st pair of legs with the rami very unequal, the outer one being quite short and composed of only 2 joints, which in some cases are confluent in one, inner ramus elongated, 3-articulate, resembling in structure that in the genus *Thalestris*. Natatory legs normally developed, having the proximal joints of the rami rather broad; inner ramus of 2nd pair of legs in male transformed, being only composed of 2 joints, the last one more or less lamellar, with 2 unequal spines at the tip, and another issuing near the base outside. Last pair of legs with the distal joint comparatively small, proximal joint more or less lamellarly expanded inside; marginal setæ generally much elongated.

Remarks.—This genus was established by Dana as early as the year 1855, to include the form described by Baird as *Arpacticus nobilis*. The genus *Pseudothalestris* of Brady cannot in my opinion be supported, as the only distinguishing character, the biarticulated structure of the outer ramus of the 1st pair of legs, is also found in a species — to be described below — which so closely resembles the type of the genus *Westwoodia*, that it may easily be confounded with it. As to the systematic position of the present genus, the opinions of carcinologists have been somewhat at variance. Boeck associated this genus with *Idya* in his subfamily *Idyinæ*, on account of the narrowly-produced mandibles, whereas Prof. Brady rightly removed it from that place, and included it in his subfamily *Harpacticinæ*, which, however, contains forms referred in the present account to 4

different families. I think the genus ought more properly to be placed within the family *Thalestridæ* as here defined, though in some respects it certainly differs conspicuously from the other genera. Off the Norwegian coast occur 4 species referable to this genus.

88. Westwoodia nobilis (Baird).

(Pl. LXXXV & LXXXVI).

Arpacticus nobilis, Baird, British Entomostraca, p. 214, Pl. 28, figs. 2, 2 a—e.

Specific Characters.—Female. Body very robust, somewhat compressed in front, attenuated behind. Cephalic segment occupying almost half the length of the entire body, and rather deep; dorsal face strongly vaulted, rostral projection triangular, acute at the tip and pointing straight down. Epimeral plates of the 3 succeeding segments of moderate size, deflexed and rounded behind. Last segment of metasome much narrower than the preceding ones. Urosome scarcely more than $^1/_3$ as long as the anterior division, and gradually tapering behind, genital segment about the length of the 2 succeeding ones combined, and imperfectly divided in the middle. Caudal rami broader than they are long, and transversely truncated at the tip, apical setæ rather elongated and divergent. Anterior antennæ comparatively short and stout, composed of only 5 articulations, 2 of which belong to the terminal part; middle joint much the largest and formed by the fusion of 2 joints. Posterior antennæ with the outer ramus shorter than the terminal joint of the inner, 1st joint about the length of the other 2 combined. 1st pair of legs with the outer ramus scarcely $^1/_3$ as long as the inner, and consisting of only a single joint, no trace of any subdivision being visible; inner ramus with the seta of 1st joint attached considerably in front of the middle, apical claws finely pectinate on the one edge and rather unequal, the inner one being more than twice as long as the outer. Last pair of legs with the distal joint small and rounded in shape, carrying 5 slender setæ; inner expansion of proximal joint extending as far as the distal joint, and edged with 5 very slender and elongated setæ. Ovisac large, pyriform, extending considerably beyond the end of the urosome.

Male differing only slightly, in its external appearance, from the female. Anterior antennæ transformed in the usual manner, and consisting of 7 well-defined joints, the 2 sensory appendages of moderate length. 1st pair of legs differing from those in female only as regards the spine attached to the inner corner of the 2nd basal joint, which is quite short, tap-shaped, and terminating in an

obtuse point. Inner ramus of 2nd pair of legs scarcely more than half as long as the outer, distal joint obliquely oval in form, basal spine slender setiform, inner apical spine much coarser than the outer, which terminates in a setiform point. Last pair of legs considerably smaller than in female, inner expansion of proximal joint less prominent and provided with only 3 setæ.

Body variously ornamented with a more or less deep brownish red pigment.

Length of adult female 0.87 mm.

Remarks.—This form was recorded by Baird as early as the year 1845,[1]) and was subsequently described and figured by the same author in his well-known work on the British Entomostraca. Since that time it has been noted by several authors, being an easily recognizable form, owing both to its unusually robust body and to its gorgeous colour.

Occurrence.—I have met with this form in several localities both on the south and west coasts of Norway, but nowhere in any abundance. It occurs in the littoral and sublittoral zones among algæ, and is sometimes even left in tidal pools. Th. Scott records this form also from Svolvær, in the Lofoten Islands.

Distribution.—British Isles (Baird), Heligoland (Claus), coast of France (Canu), coast of Bohuslän (coll. Cleve).

89. Westwoodia assimilis, G. O. Sars, n. sp.

(Pl. LXXXVII).

Specific Characters.—Female. Very like the preceding species both as to size and general appearance. Rostrum, however, somewhat shorter and less acute at the tip. Segments of anterior division distinctly imbricate dorsally, and more evenly vaulted than in the type species. Anterior antennæ still shorter and stouter than in that species, but exhibiting the same number of articulations. Posterior antennæ and oral parts almost exactly as in *W. nobilis*. 1st pair of legs, however, differing conspicuously in the structure of the outer ramus, which is distinctly biarticulate and about half as long as the 1st joint of the inner; seta of this joint attached nearly in the middle. Last pair of legs likewise differing slightly from those in the type species, the distal joint being comparatively larger and more oval in form, with 6 marginal setæ; inner expansion of proximal joint comparatively narrower, and not extendin, quite as far as the distal joint.

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[1]) Transact. Berw. Nat. Club, Vol. II, p. 155.

Male exhibiting the usual sexual differences from the female. Anterior antennæ of a structure similar to that in the male of *W. nobilis*, being, however, clearly distinguished by the enormous development of the 2 sensory filaments. First pair of legs, as in the female, with the outer ramus distinctly biarticulate. Inner ramus of 2nd pair of legs differing slightly from that in the male of *W. nobilis* in the form and armature of the distal joint, the basal spine being quite short, whereas the inner apical spine is rather strong and peculiarly transformed, falciform and finely denticulated along the concave edge. Last pair of legs very like those of the male of *W. nobilis*, differing, however, in the comparatively larger size of the distal joint, which is moreover provided with 6, instead of 5, setæ.

Colour not yet determined.

Length of adult female 0.82 mm.

Remarks.—According to the structure of the 1st pair of legs, this form should really have been referred to the genus *Pseudothalestris* of Brady; but it is evident that such an arrangement would be quite unreasonable, since in all other respects the present species agrees so closely with the type of the genus *Westwoodia*, that a very close examination is needed in order to distinguish the two species from one another. I think that the present species clearly shows that the genus *Pseudothalestris* ought to be cancelled.

Occurrence.—I have hitherto only seen 2 females and one male specimen of this form. They were recently found among a number of specimens of *W. nobilis* collected at different times and from different places, and I am therefore at present unable to state the locality in which the specimens occurred.

90. Westwoodia minuta, Claus.

(Pl. LXXXVIII, fig. 1).

Westwoodia minuta, Claus, Die freilebenden Copepoden, p. 118, Pl. XXI, figs. 10—14.

Syn: *Pseudothalestris monensis*, Brady.
„ — *major*, Scott.

Specific Characters.—Female. Body very short and stout, pronouncedly pyriform in shape, with the segments of the anterior division deeply imbricate dorsally. Cephalic segment very large and deep, occupying rather more than half the length of the entire body; rostral projection quite short, triangular. Eye very conspicuous in the living animal. Anterior antennæ comparatively slender and attenuated, composed of 6 well-defined articulations, 2 of which belong to the terminal part, 3rd and 4th joints the largest and nearly equal in length. Posterior

antennæ more slender than in the 2 preceding species, but otherwise of a similar structure. Oral parts likewise constructed upon the very same type. 1st pair of legs with the outer ramus distinctly biarticulate and about half the length of the 1st joint of the inner ramus; seta of this joint attached considerably in front of the middle, apical claws of the same ramus very slender. Last pair of legs with the distal joint very small, carrying 5 slender setæ; inner expansion of proximal joint considerably produced, extending far beyond the distal joint.

Male of about the same size as female, and not very different in external appearance. Anterior antennæ transformed in the usual manner. Inner ramus of 2nd pair of legs with the distal joint oblong oval in form, apical spines about as in *W. nobilis*, basal spine, however, much stronger. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint less prominent, and provided with only 3 setæ.

Colour light chestnut-brown, with a very dark shade on each side of the cephalic segment behind.

Length of adult female 0.50 mm.

Remarks.—There cannot, in my opinion, be any doubt that the above-described form is that originally recorded by Claus as *Westwoodia minuta*, and that both *Pseudothalestris monensis* of Brady and *P. major* of Scott belong to the very same species. In its structural details it shows a near relationship to the 2 preceding species, and cannot by any means be generically separated from them.

Occurrence.—I have found this form occasionally in several localities on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths among algæ; and Th. Scott also records it from the Finmark coast. A peculiarity of this species is that in the living state, when disturbed, the animal secretes a clear viscid fluid in considerable quantity. From which organ this matter is derived, I have not yet been enabled to determine.

Distribution.—British Isles (Brady, Scott), Heligoland (Claus).

91. Westwoodia pygmæa (Scott).

(Pl. LXXXVIII, fig. 2).

Pseudowestwoodia pygmæa, Scott, Ann. & Mag. Nat. Hist. for January, 1895, p. 55, Pl. VI. figs. 8—16.

Syn: *Pseudothalestris pygmæa*, Scott.

Specific Characters.—Female. Body still shorter and stouter than in *W. minuta*, with the segments of the anterior division very pronouncedly imbricate dorsally. Cephalic segment of quite an extraordinary size, almost twice as long

as the remainder of the body, and dorsally overlapping the greater part of the succeeding segment; rostral projection rather short. Anterior antennæ comparatively shorter than in *W. minuta*, though composed of 7 well-defined articulations, 3 of which belong to the terminal part. Posterior antennæ and oral parts scarcely different from those in the said species. 1st pair of legs likewise of a very similar structure, only differing in having the seta of the 1st joint of the inner ramus attached about in the middle. Last pair of legs, on the other hand, of a rather different appearance, the inner expansion of the proximal joint being very slight, whereas the distal joint is considerably exserted at the tip.

Male differing from that of *W. minuta* chiefly in the structure of the inner ramus of the 2nd pair of legs, the distal joint of which is rather broad and angular in form, projecting both at the outer edge and at the tip in a dentiform projection, inner apical spine very strong and curved, outer feeble, setiform.

Colour yellowish with light brown shading.

Length of adult female 0.35 mm.

Remarks.—This form bears a general resemblance to *W. minuta*, but is of much smaller size and shorter form of body. It also differs conspicuously in the structure of the anterior antennæ and the last pair of legs.

Occurrence.—I have met with this dwarf form not unfrequently in several localities both on the south and west coasts of Norway, in moderate depths among algæ. It moves in a peculiar, tremulous manner, much as do the species of the genus *Tegastes*.

Distribution.—Scottish coast (Scott).

Fam. 11. Diosaccidæ.

Characters.—Body of somewhat varying form in the different genera, but never depressed as in some of the *Thalestridæ;* body-segments, as a rule, not very sharply marked off from each other. Rostrum well defined at the base, more or less mobile. Anterior antennæ short or of moderate length, generally 8-articulate, in male distinctly prehensile. Posterior antennæ with the basal joint not divided, outer ramus comparatively small. Oral parts of somewhat different structure in the different genera. 1st pair of legs with the rami, as a rule, very unequal, the outer one being generally much shorter than the inner, and less distinctly prehensile than in the *Thalestridæ*. Natatory legs more or less slender,

with both rami in female 3-articulate. Inner ramus of 2nd pair of legs in male transformed. Last pair of legs foliaceous, much larger in female than in male. Ovisac double.

Remarks.—The chief character distinguishing this family is the duality of the ovisac, a feature otherwise very rarely met with in the Harpacticoida. In other respects this family exhibits a certain resemblance both to the *Thalestridæ* and to the *Canthocamptidæ*. To the Norwegian fauna belong 3 well defined genera, to be treated of below.

Gen. 38. **Diosaccus**, Boeck, 1872.

Syn: *Dactylopus*, Claus (part).

Generic Characters.—Body pronouncedly compressed in front, attenuated hind, with the cephalic segment very large and deep, and the rostrum very prominent. Anterior antennæ comparatively slender, 8-articulate. Posterior antennæ with the outer ramus very small, uniarticulate. Mandibles with the masticatory part considerably dilated, cutting edge undivided, palp apparently simple, with only a slight rudiment of an outer ramus. Maxillæ distinguished by the shortness of the masticatory lobe and the spines with which it is armed. palp well developed. Anterior maxillipeds comparatively small, with only 3 lateral lobes carrying short and thick digitiform spines. Posterior maxillipeds powerfully developed, and of normal structure. 1st pair of legs with the outer ramus small, not prehensile, inner much elongated and resembling in structure that in *Thalestris*. though having the seta of the 1st joint attached close to the end. 2nd pair of legs with the terminal joint of the outer ramus comparatively smaller than in the succeeding pairs, and provided with only 2 spines outside; inner ramus of same pair in the male very short, biarticulate, terminating in a strong spine. Last pair of legs not very large, with short, partly spiniform setæ; in male still smaller, and having the 2 joints confluent.

Remarks.—This genus was established by Boeck in the year 1872, to include 2 of the species referred by Claus to his genus *Dactylopus*. viz.. *D. tenuicornis* and *D. longirostris*. These 2 forms, though alike in having 2 ovisacs. are however evidently generically different, and the Boeckian genus must of course be confined to one of them. This has indeed been done by Prof. Brady. who describes the first-named species as the type of the genus *Diosaccus*. The other

form, which was unknown to Prof. Brady, as also the form named by Boeck *Diosaccus abyssi*, belongs to the genus *Amphiascus*, recently established by the present author. The genus *Diosaccus*, in the restriction here adopted, differs conspicuously from the other 2 genera included in the present family, both in external appearance and in several of the anatomical characters. In addition to the typical form, another nearly-allied, though evidently distinct species has been described by Th. Scott as *Diosaccus propinquus*. Only the type species has as yet been found off the Norwegian coast.

92. Diosaccus tenuicornis (Claus).

(Pl. LXXXIX & XC).

Dactylopus tenuicornis, Claus, Die freilebenden Copepoden, p. 127, Pl. XVI, figs. 17—23.

Specific Characters.—Female. Body moderately robust, with the anterior division considerably broader than the posterior. Cephalic segment more than twice as long as all the free segments of metasome combined, and evenly vaulted above; epimeral parts very fully developed and much curved in the middle, embracing between them the oral parts, only the posterior maxillipeds projecting beyond their edges. Rostrum somewhat lamellar and very prominent, being slightly curved. Epimeral plates of the 3 succeeding segments of moderate size, deflexed and angular behind. Last segment of metasome narrower than the preceding ones, and without distinct epimeral plates. Urosome scarcely more than half the length of the anterior division, and rapidly tapering behind; genital segment considerably dilated in front, and divided in the middle by a somewhat curved transverse line; last caudal segment longer than the preceding one. Caudal rami closely juxtaposed and somewhat applanated, being slightly longer than they are broad at the base, outer edge armed with a short spine beyond the middle, apical setæ scarcely diverging at all, the innermost but one much the longest. Anterior antennæ unusually slender, with the joints of the proximal part considerably prolonged, the 2nd joint being the largest, terminal part not nearly attaining half the length of the proximal part. Posterior antennæ likewise rather slender, with the terminal joint long and narrow, outer ramus not nearly half as long as the latter, and provided with 4 setæ, 2 apical and 2 lateral. Posterior maxillipeds with the hand very large and deeply concaved inside, dactylus strong and curved. 1st pair of legs rather slender, rami very unequal, the outer one scarcely more than half as long as the inner, last joint somewhat shorter than the other 2, and provided with 3 spines successively increasing in length, and a

moderately long seta at the inner corner; inner ramus with the outer 2 joints short, apical claws slender and very unequal, the inner one fully twice as long as the outer. Last pair of legs with the distal joint oblong in form and provided in its outermost part with 6 rather unequal setæ, inner expansion of proximal joint considerably produced, narrow linguiform in shape, and extending beyond the distal joint, marginal setæ 5 in number, the middle one very thin, the others thick, spiniform and coarsely denticulated. Ovisacs large, pyriform, and somewhat divergent.

Male smaller than female, and exhibiting the usual sexual differences. Anterior antennæ transformed into strong prehensile organs composed of the same number of joints as in the female. 1st pair of legs exhibiting inside the 2nd basal joint a small linguiform lappet, not found in the female. Inner ramus of 2nd pair of legs scarcely as long as the 1st joint of the outer, distal joint rounded and carrying a slender setiform spine outside, inside a long plumose seta, tip produced to a strong, somewhat flexuous spiniform projection. Last pair of legs rather unlike those in female, distal joint very short and imperfectly defined at the base, carrying 3 denticulated spines and a small seta, inner expansion of proximal joint almost obsolete, and only provided with 2 short setæ. Genital lobes each with a strong denticulated spine and 2 slender setæ.

Colour generally a golden yellow, ventral face and bases of legs tinged with dark indigo-blue.

Length of adult female 0.80 mm.

Remarks.—This is an easily recognizable form, being especially distinguished by the large and deep cephalic segment, and the unusually slender anterior antennæ.

Occurrence.—It is one of our commonest Harpacticoida, occurring rather abundantly along the whole Norwegian coast in the littoral zone among algæ, and not infrequently left in tidal pools together with other littoral forms.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve), Mediterranean (Claus).

Gen. 39. Amphiascus, G. O. Sars, 1905.

Syn: *Dactylopus*. Claus (part.
„ *Diosaccus*, Boeck (part).
„ *Stenhelia*, Brady, Scott (not Boeck).
„ *Schizopera*, G. O. Sars.

Generic Characters.—Body more or less slender, cylindrical in form, with the anterior and posterior divisions not sharply marked off from each other. Cephalic segment of moderate size and not very deep, rostrum well defined and very mobile. Urosome with the genital segment in female imperfectly divided in the middle, and scarcely dilated in front, posterior edge of all the caudal segments finely spinulose on the ventral and lateral faces. Caudal rami generally short, apical setæ slender. Anterior antennæ of usual structure, and as a rule composed of 8 articulations, 4 of which belong to the terminal part. Posterior antennæ with the terminal joint more or less dilated distally, and armed outside with strong spines, at the tip with slender geniculate setæ; outer ramus very narrow, generally 3-articulate, middle joint quite short and in some cases imperfectly defined. Oral parts normal. 1st pair of legs with both rami triarticulate, the outer one much shorter than the inner, and in some cases resembling in structure that in the genus *Dactylopusia*, inner ramus with the 1st joint slender and elongated, seta of inner edge attached close to the end. Inner ramus of 2nd pair of legs in male more or less conspicuously transformed, outer 2 joints confluent. Last pair of legs foliaceous, with the proximal joint more or less expanded inside; those in male much smaller than in female.

Remarks.—This genus was established by the present author in a recently published paper on Pacific Crustacea[1]), and on that occasion he called attention to the fact that the genus *Stenhelia* of British authors does not by any means answer to that genus as defined by Boeck, the latter being in reality very different, and closely related to, if not identical with, the genus *Delavalia* of Brady. It therefore appeared necessary to substitute another generic name, to include the species erroneously referred to Boeck's genus. The genus *Schizopera* established by the present author to include a Pacific species, I am now disposed to withdraw, as some of the characters upon which this genus was founded have proved to occur also in certain species unquestionably belonging to the genus *Amphiascus*. It may here be noted that several of the species referred by Claus, and also by recent British authors, to the genus *Dactylopusia* ought likewise to be included in the present genus, which seems to be very abundantly represented in

[1]) "Pacifische Plankton Crustaceen" II, in Zool. Jahrbucher 1905, p. 380.

different parts of the Oceans. I have been enabled to distinguish off the Norwegian coast rather a large number of species, to be described in the following pages. They all exhibit a very uniform external appearance, and of course are not easy to distinguish when preserved, though in the living state they may in most cases be at once recognized by differences in the colouring of the body.

93. Amphiascus cinctus (Claus).

(Pl. XCI & XCII).

Dactylopus cinctus, Claus, Die Copepodenfauna von Nizza, p. 27, Pl. III, figs. 8—12.

Specific Characters.—Female. Body moderately slender, with the anterior division but little broader than the posterior. Cephalic segment about the length of the 4 succeeding segments combined, epimeral parts not very deep, and evenly rounded in front. Rostrum strongly prominent, lanceolate and slightly curved at the tip. Epimeral plates of the 3 succeeding segments of moderate size and slightly angular behind. Last segment of metasome scarcely narrower than the preceding one. Urosome about $^2/_3$ as long as the anterior division, and tapering only very slightly behind, genital segment equalling in length the 2 succeeding ones combined, anal segment somewhat shorter than the preceding one. Caudal rami quadrangular in form, broader than they are long, the 2 middle apical setæ rather strong, spine of outer corner shorter than the corresponding ramus. Anterior antennæ moderately slender and densely setiferous, 8-articulate, the first 2 joints much larger than the others, 3rd and 4th of about equal size, terminal part about half the length of the proximal. Posterior antennæ rather strongly built, outer ramus with the middle joint well defined, setiferous. 1st pair of legs with the outer ramus about half the length of the inner, middle joint much the largest, terminal joint small, lamelliform and armed with 4 claw-like spines, inside which a slender seta is attached; inner ramus with the 2 outer joints short, the last one armed on the tip with 2 very strong claws, the inner one the longer. Natatory legs moderately slender and of normal structure. Last pair of legs very large and foliaceous, distal joint of considerable size, rounded quadrangular in form, and provided with 6 marginal setæ, the outermost one the shortest and attached at rather a long distance from the base; inner expansion of proximal joint triangular, scarcely extending beyond the middle of the distal joint, and carrying 5 setæ, the outermost one much the shortest. Ovisacs of moderate size, oblong pyriform in shape.

Male somewhat smaller than female, and having the urosome distinctly 5-articulate. Anterior antennæ more strongly built, and transformed in the usual manner. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs of extraordinary size and somewhat sigmoid in form. Inner ramus of 2nd pair of legs nearly as long as the outer, distal joint carrying 2 closely juxtaposed spiniform appendages outside, of which the proximal is very strong, tip armed with another somewhat more slender appendage curving outwards. Last pair of legs much smaller than in female, distal joint oval in form, inner expansion of proximal joint with only 2 marginal setæ.

Body in both sexes of a whitish colour, with a broad transverse band of a deep pink hue across the middle, occupying the whole of the first 3 free segments of metasome; dorsal face moreover exhibiting along the middle a narrow longitudinal band of a light orange colour.

Length of adult female 0.84 mm.

Remarks.—This form was originally described by Claus from the Mediterranean as a species of his genus *Dactylopus*, the specific name apparently referring to the peculiar colouring of the animal. It does not seem to have been observed by subsequent authors; for the suggestion put forward by Prof. Brady, that it might only be a variety of *Dactylopus Strömi* Cls. (= *D. vulgaris* G. O. Sars), is so extremely unreasonable, that it is impossible to believe that the true Clausian species has been observed by that author.

Occurrence.—Some few specimens of this pretty form were found many years ago off the west coast of Norway. Last summer, I found it again not unfrequently in 2 different localities on the south coast, viz., Risör and Lillesand. It occurs in moderate depths among algæ, and in the living state is at once recognizable, even with the naked eye, from any other species of this genus, by the peculiar and beautiful colour of the body, which seems to be perfectly constant in all specimens, both male and female.

Distribution.—Mediterranean off Nice (Claus).

94. Amphiascus obscurus, G. O. Sars, n. sp.

(Pl. XCIII).

Specific Characters.—Female. Body of comparatively more robust form than in the preceding species, otherwise of a very similar appearance. Urosome with the segments coarsely spinulose along the ventral and lateral edges. Caudal rami comparatively more massive than in *A. cinctus*, with the spine of the outer

corner more elongate, somewhat exceeding in length the corresponding ramus. Anterior antennæ comparatively shorter and stouter, 8-articulate, distal part exceeding half the length of the proximal one. Posterior antennæ and oral parts almost exactly as in the preceding species. 1st pair of legs likewise of a very similar structure, though having the outer ramus a little longer in proportion to the inner. Last pair of legs with the distal joint very large and expanded, of a broadly rounded form, and carrying 7 marginal setæ, the outermost one somewhat longer than the next, and occurring not far from the base; inner expansion of proximal joint extending somewhat beyond the middle of the distal joint, and having the outermost seta longer than the 2 innermost ones. Ovisacs about as in the preceding species.

Male resembling that of *A. cinctus* in its external appearance, as also in the structure of the anterior antennæ and the inner ramus of 2nd pair of legs. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs comparatively smaller than in the male of *A. cinctus*, and almost straight. Last pair of legs with the distal joint comparatively shorter and broader, and the inner expansion of proximal joint less prominent.

Body all over, except on the dorsal face of the cephalic segment, of a very dark chocholate-brown colour, changing to a deep indigo-blue on the caudal rami and ventral appendages.

Length of adult female about 1 mm.

Remarks.—This new species is closely allied to *A. cinctus*, Claus, but is of considerably larger size and more robust form of body, differing also slightly in the structure of the anterior antennæ and of the 1st and last pairs of legs. In the living state it is moreover at once distinguished by the very different colour of the body.

Occurrence.—I found this form last summer at Risör and Lillesand, on the south coast of Norway, in moderate depths among algæ. On account of the relatively large size of the specimens and their very dark colour, it was a comparatively easy task to select them from the freshly-taken bottom-samples, even without the aid of a magnifying lens.

95. Amphiascus similis (Claus).

(Pl. XCIV).

Dactylopus similis, Claus, Die Copepoden-Fauna von Nizza, p. 25, Pl. II, figs. 29, 30.

Specific Characters.—Female. Body very slender and pronouncedly cylindric in form, the anterior and posterior divisions being of almost uniform width

throughout. Cephalic segment scarcely longer than the 3 succeeding segments combined; rostrum very long and evenly curved. Urosome nearly as long as the anterior division, and tapering only very slightly behind, last segment about the length of the preceding one, and having the anal opercle finely spinulose. Caudal rami quadrate in form and slightly instricted at the base, each having, somewhat beyond the middle of the outer edge, a notch carrying a slender seta and a short spine, middle apical setæ of moderate length. Anterior antennæ comparatively short and gradually attenuated distally, 8-articulate, 1st joint much the largest, terminal part not attaining half the length of the proximal. Posterior antennæ comparatively less robust than in the 2 preceding species, outer ramus very narrow, with the middle joint extremely minute and without any seta. 1st pair of legs rather slender, outer ramus considerably exceeding half the length of the inner, middle joint much the longest, terminal joint small, with only 3 claw-like spines and a slender seta at the inner corner; inner ramus with the 2 outer joints very short and subequal, apical claws rather unequal, the outer one being scarcely half as long as the inner and nearly straight. Last pair of legs with the distal joint large, oval in form, carrying 6 rather unequal setæ, 4 of which issue from the somewhat exserted and obliquely-truncated extremity; inner expansion of proximal joint comparatively short, triangular, not nearly extending to the middle of the distal joint, marginal setæ 5 in number, the outermost one very small. Ovisacs rather short, extending, as a rule, only slightly beyond the middle of the urosome.

Male of still more slender form than female. Anterior antennæ considerably more elongated, and transformed in the usual manner. Spine attached to the inner corner of the 2nd basal joint in the 1st pair of legs falciform, incurved and obliquely cut off at the tip. Inner ramus of 2nd pair of legs with the distal spiniform appendage of the outer edge peculiarly transformed, terminating in a broad securiform lamella, apical spine replaced by an ordinary plumose seta. Last pair of legs very small, distal joint cordate in shape, with only 4 marginal setæ, the outermost but one very small, hair-like; inner expansion of proximal joint very slight, with only 2 unequal setæ.

Body of a light yellowish colour with some of the segments bordered with reddish brown.

Length of adult female about 1 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Claus as *Dactylopus similis*, and subsequently mentioned by Prof. Brady under the same name in his well-known Monograph. The suggestion of the latter author, that this form, being so nearly related to *Dactylopus Stromi* (= *D.*

vulgaris G. O. Sars), ought perhaps more properly to be considered as merely a variety of that species, is quite unintelligible to me. I consider, on the contrary, that the present form is so very different, both as regards its general appearance and structural details, that it cannot even be placed in the same genus.

Occurrence.—This is one of our commonest Harpacticoida, occurring rather abundantly along the whole south and west coasts of Norway, from the Christiania Fjord at least to the Trondhjem Fjord. It is not, however, a strictly littoral form, but is only found in moderate depths among algæ.

Distribution.—British Isles (Brady), coast of Bohuslän (coll. Cleve), Mediterranean at Nice (Claus).

96. Amphiascus nasutus (Boeck).

(Pl. XCV).

Dactylopus nasutus, Boeck, M. S.

Syn: *Dactylopus Strömi*, var. *arctica*, Scott.

Specific Characters.—Female. Body resembling somewhat in its general appearance that of *A. similis*, though comparatively more strongly built and less pronouncedly cylindrical in form. Cephalic segment comparatively larger and broader. Rostrum likewise broader and less acute at the tip, which is abruptly curved downwards. Urosome slightly tapering distally, with all the segments coarsely spinulose at the hind edge ventrally and laterally, last segment shorter than the preceding one. Caudal rami scarcely instricted at the base, quadrangular in form, notch of the outer edge occurring close to the tip. Anterior antennæ still shorter and stouter than in *A. similis*, but composed of 9 well-defined articulations, of which the first 2 are much larger than the others. Posterior antennæ more strongly built, but otherwise of the very same structure as in the above-mentioned species. 1st pair of legs likewise rather similar, but less slender in form, differing moreover in having the terminal joint of the outer ramus more expanded and armed with 4 strong claw-like spines in addition to the seta of the inner corner. Last pair of legs resembling in shape those of *A. similis*, though having the distal joint comparatively broader, and the outermost seta of the inner expansion of the proximal joint more fully developed. Ovisacs comparatively larger, extending considerably beyond the middle of the urosome.

Male agreeing with that of *A. similis* in most of the anatomical details, but differing very conspicuously in the structure of the inner ramus of 2nd pair of legs. The distal joint of this ramus is considerably dilated at the base, and

armed outside with an exceedingly strong spiniform appendage; while another peculiarly transformed appendage projects from near the tip, and is connected with the base of the former by a narrow chitinous strip running along the under surface of the joint, the freely projecting part of the appendage being folded abruptly upon itself in a peculiar manner, and terminating in a very narrow upturned point.

Body in both sexes of a pale yellowish green colour, and generally filled with numerous refracting oil-globules.

Length of adult female about 1 mm.

Remarks.—The above-described species is unquestionably identical with a form recorded by Th. Scott from the Arctic Ocean under the name of *Dactylopus Strömi*, var. *arctica*. As this form in reality is very different from *Dactylopus Strömi* Cls. (= *D. vulgaris* G. O. Sars), I have felt justified in reviving for it a MSname given to this form by the late Dr. A. Boeck. Its nearest ally is evidently *A. similis*, from which species it may be easily distinguished, however, by its more robust body, the distinctly 9-articulated anterior antennæ, and the structure of the 1st pair of legs and that of the inner ramus of the 2nd pair in the male.

Occurrence.—I have found this form occasionally off the west coast of Norway at Christiansund and Aalesund in moderate depths among algæ. Off the Finmark coast, this species is much more frequently met with. I have myself taken it at Hammerfest and Vadsö, and in some samples taken by Mr. Nordgaard at Repvaag in the Porsanger Fjord, and kindly sent to me for examination, this form occurred rather abundantly.

Distribution.—Arctic Ocean, off Franz Josef Land (Scott), and polar islands north of Grinnell Land (2nd Fram Exped.).

97. Amphiascus minutus (Claus).

(Pl. XCVI).

Dactylopus minutus, Claus, Die freilebenden Copepoden, p. 126, Pl. XVI, figs. 14, 15.

Syn: *Diosaccus abyssi*, Boeck.
„ *Dactylopus longirostris*, Scott (not Claus).

Specific Characters.—Female. Body moderately slender and slightly attenuated behind. Cephalic segment about the length of the 3 succeeding segments combined; rostrum well developed and of usual appearance. Urosome about $^2/_3$ the length of the anterior division of the body, last segment much shorter than the preceding one. Caudal rami very short, being almost twice as broad as they are

long, and somewhat obliquely truncated at the tip, setæ normal. Anterior antennæ rather slender and attenuated, 8-articulate, 4th joint considerably longer than 3rd, and about equal in length to the 2nd, terminal part nearly half as long as the proximal one. Posterior antennæ with the outer ramus of moderate size, middle joint well defined and setiferous. 1st pair of legs rather slender, outer ramus slightly exceeding half the length of the inner, and, as in the 4 preceding species, having the middle joint much larger than the others, last joint small and armed with 3 claw-like spines and 2 geniculate setæ inside the latter; inner ramus with the 1st joint very slender, the other 2 quite short, subequal, and as a rule bent outwards at nearly a right angle with the 1st, last joint armed with a strong, distinctly pectinate claw and a slender geniculate seta inside it. Natatory legs very slender, otherwise of normal structure. Last pair of legs with the distal joint of moderate size and broadly ovate in form, with 6 not very elongated marginal setæ; inner expansion of proximal joint rather large, extending considerably beyond the middle of the distal joint, marginal setæ 5 in number and rather strong. Ovisacs comparatively large, extending to the end of the urosome.

Male having the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs forming, inside, 2 strongly chitinized dentiform projections in addition to the usual spine, which latter does not exhibit any difference from that in the female. Inner ramus of 2nd pair of legs with 2 closely juxtaposed spiniform appendages outside near the tip, the latter unarmed. Last pair of legs with the distal joint much smaller than in female, and sub-cordate in form; inner expansion of proximal joint with only 2 unequal marginal setæ.

Colour whitish, with a slight rosy tinge.

Length of adult female 0.64 mm.

Remarks.—The above-described form is unquestionably identical with that recorded by Prof. Brady as *Dactylopus minutus*, Claus. The description and figures given by Claus are certainly very scanty; but I believe that there is no reason to doubt the correctness of Prof. Brady's identification. The form recorded by Boeck as *Diosaccus abyssi* is this species, and this is also evidently the case with the form described by Th. Scott from Franz Josef Land as *Dactylopus longirostris* Claus. The present species is easily distinguished from any of the 4 preceding ones, both by its much inferior size and by the structure of the anterior antennæ and 1st pair of legs.

Occurrence.—I have found this form occasionally in the Christiania Fjord, as also off the south and west coasts of Norway in moderate depths among algæ.

Distribution.—British Isles (Brady), Heligoland (Claus), Franz Josef Land (Scott).

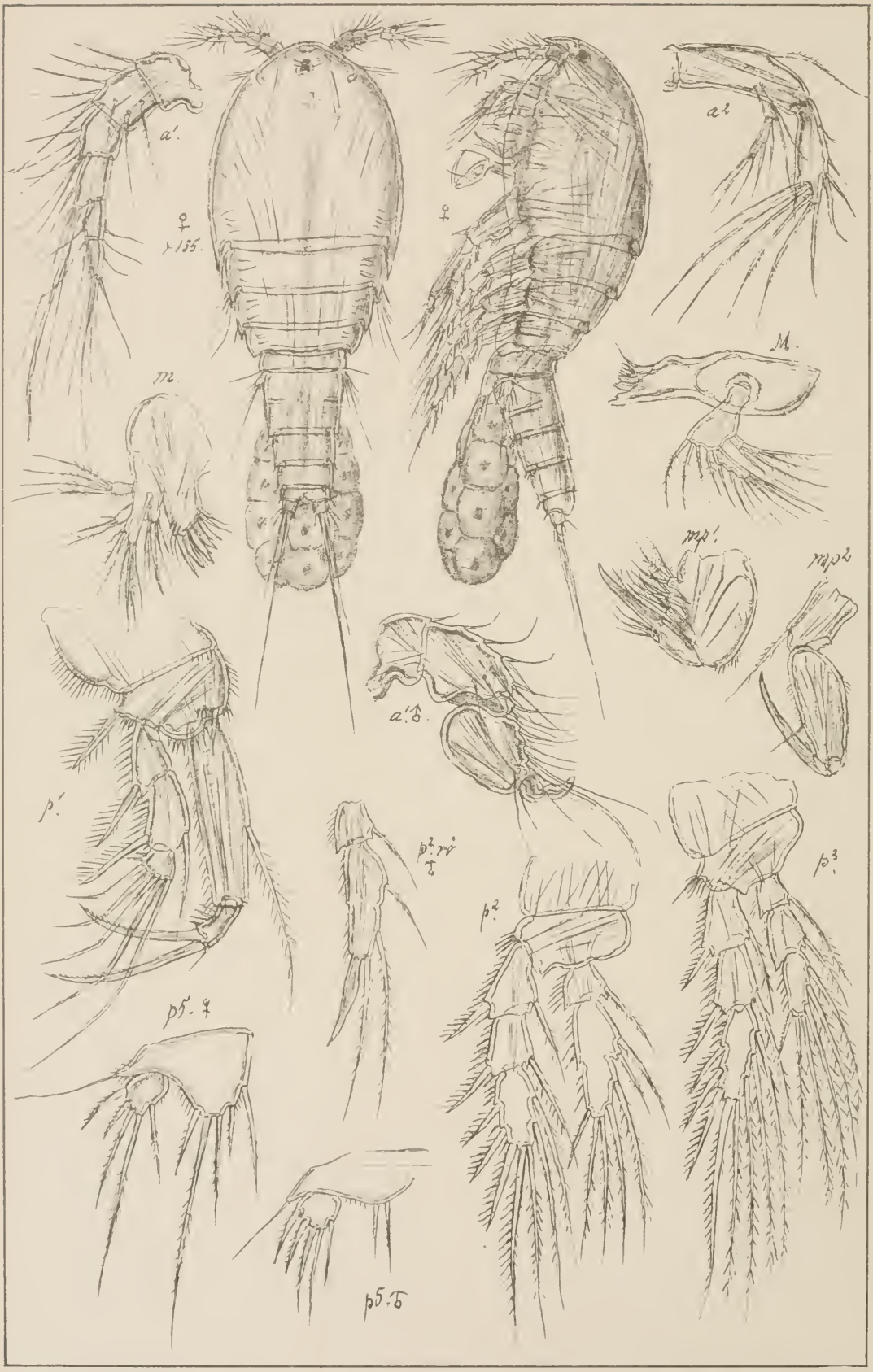
98. Amphiascus imus (Brady).

(Pl. XCVII).

Stenhelia ima, Brady, Monograph of British Copepoda, vol. II, p. 35, Pl. XLIII, figs. 1—14.

Specific Characters.—Female. Body exceedingly slender and elongated, sub-linear in form, with the anterior division scarcely broader than the posterior. Cephalic segment about the length of the 3 succeeding segments combined; rostrum very long, lanceolate in form, with the tip acutely produced. Urosome a little shorter than the anterior division, last segment about the length of the preceding one. Caudal rami very short, being almost twice as broad as they are long, and obliquely truncated at the tip, inner corner more prominent than outer, the 2 middle apical setæ considerably thickened at the base, and distinctly spinulose in their outer part. Anterior antennæ very slender, 8-articulate, 2nd joint the largest, 4th joint considerably longer and narrower than 3rd, terminal part not nearly attaining half the length of the proximal one. Posterior antennæ with the outer ramus rather slender and elongated, middle joint well defined and setiferous. 1st pair of legs comparatively slender, with the outer ramus about half as long as the inner, middle joint scarcely longer than the 1st, terminal joint but little smaller, and armed with 3 spines and 2 geniculate setæ; inner ramus with the 1st joint long and narrow, more than twice as long as the other 2 combined, last joint considerably longer than the 2nd, and linear in form, finely spinulose outside, and carrying on the tip a slender claw, a somewhat longer seta, and a small hair-like bristle inside the latter. Natatory legs rather slender and of normal structure. Last pair of legs with the distal joint comparatively narrow, oblong in form, with only 5 marginal setæ, the 2 apical ones slender, hair-like, the other 3 rather small; inner expansion of proximal joint large, triangular, extending considerably beyond the middle of the distal joint, marginal setæ 5 in number, and all well developed. Ovisacs very narrow and only slightly divergent.

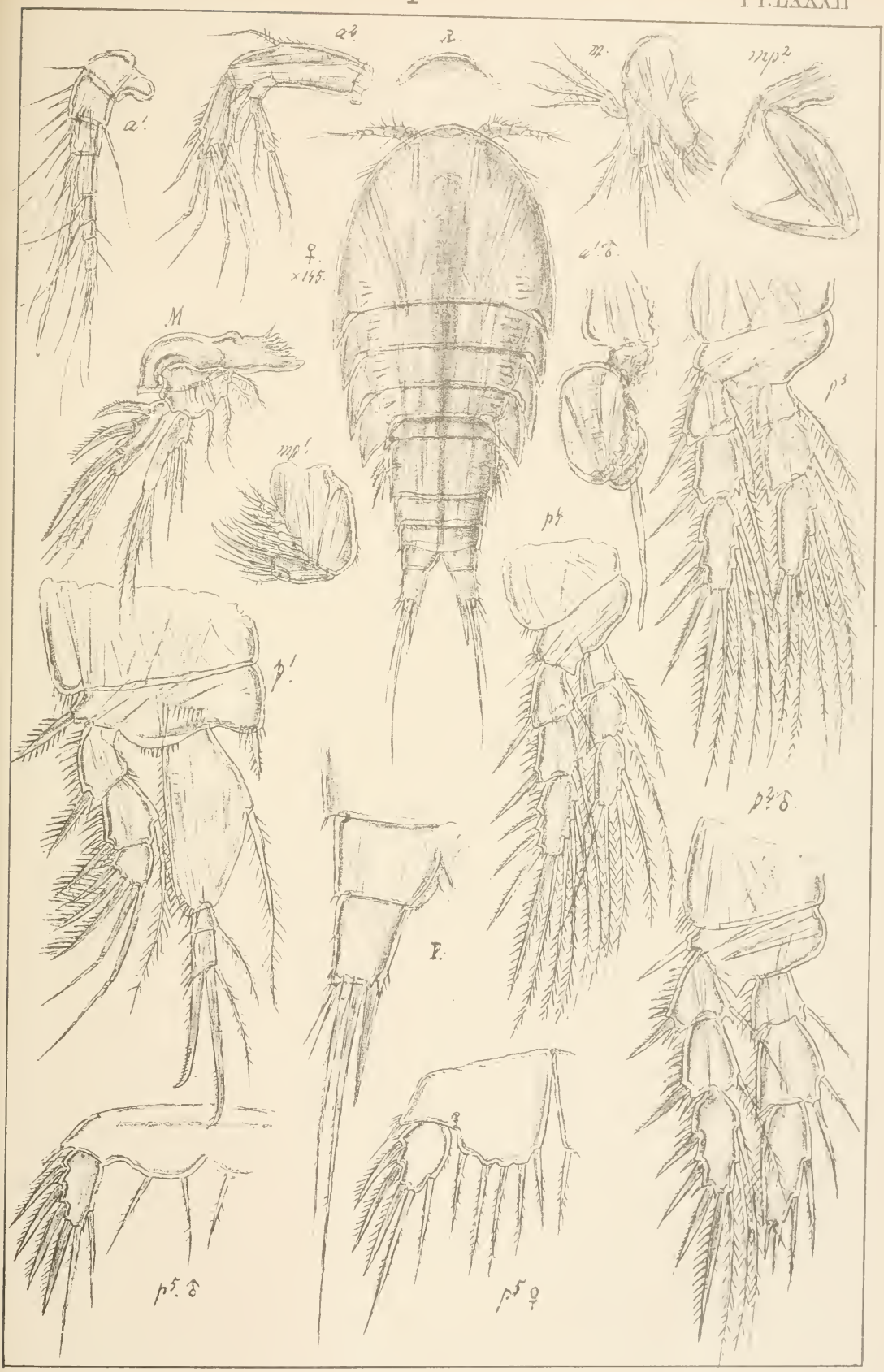
Male of a narrow and slender form similar to that of the female, and having the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs forming, inside, 3 strongly chitinised dentiform projections in addition to the usual spine. Inner ramus of 2nd pair of legs considerably shorter than the outer, distal joint only slightly longer than the proximal one, and carrying outside near the tip 2 closely juxtaposed spiniform appendages of unequal size, the proximal one being much the stronger. Last pair of legs rather unlike those in



G.O. Sars, autogr.

Norsk Lithgr. Officin.

Dactylopodella flava (Claus)

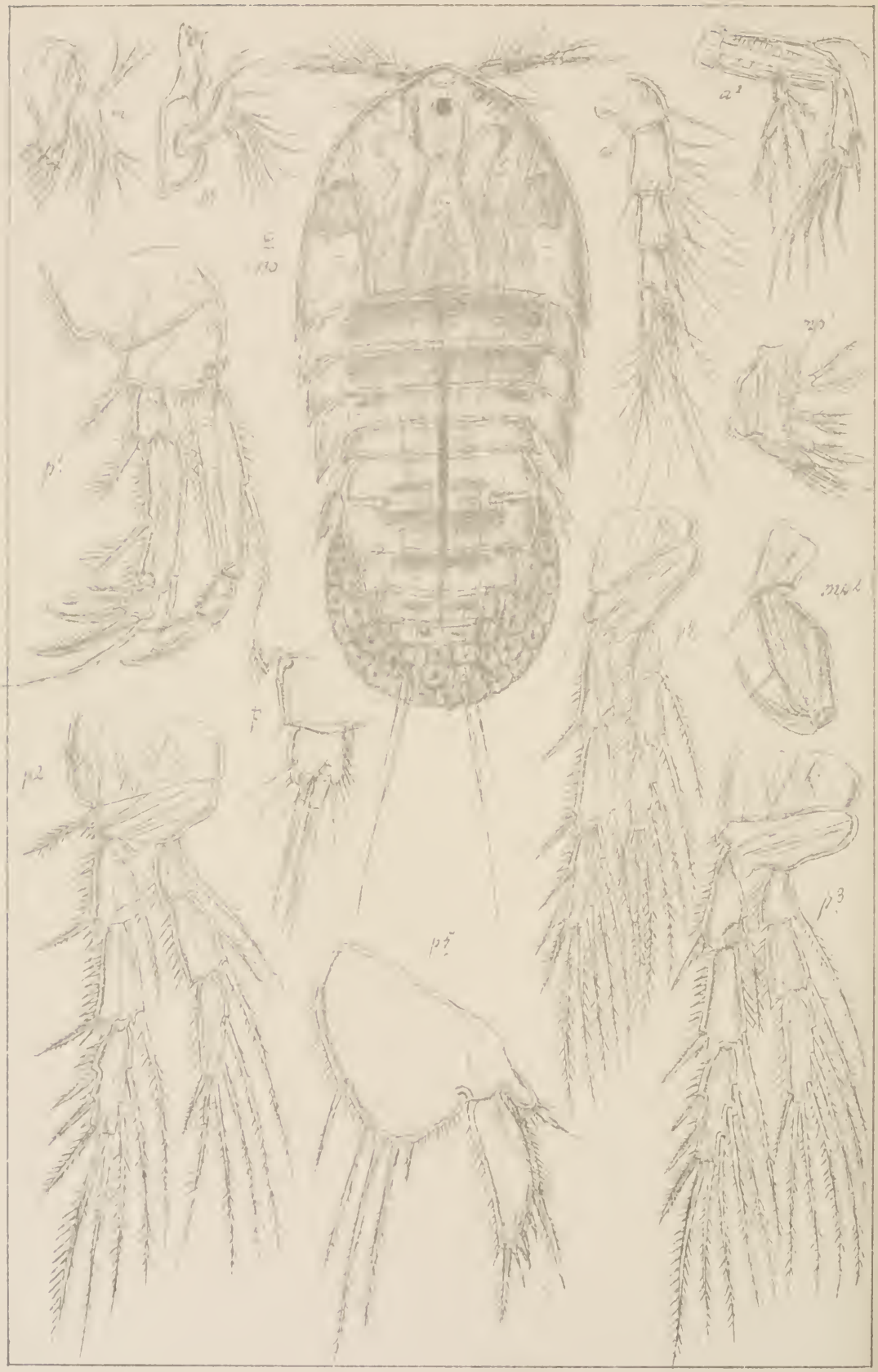


G.O. Sars, autogr. Norsk Lithgr. Officin.

Idomene forficata, Philippi

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXIII

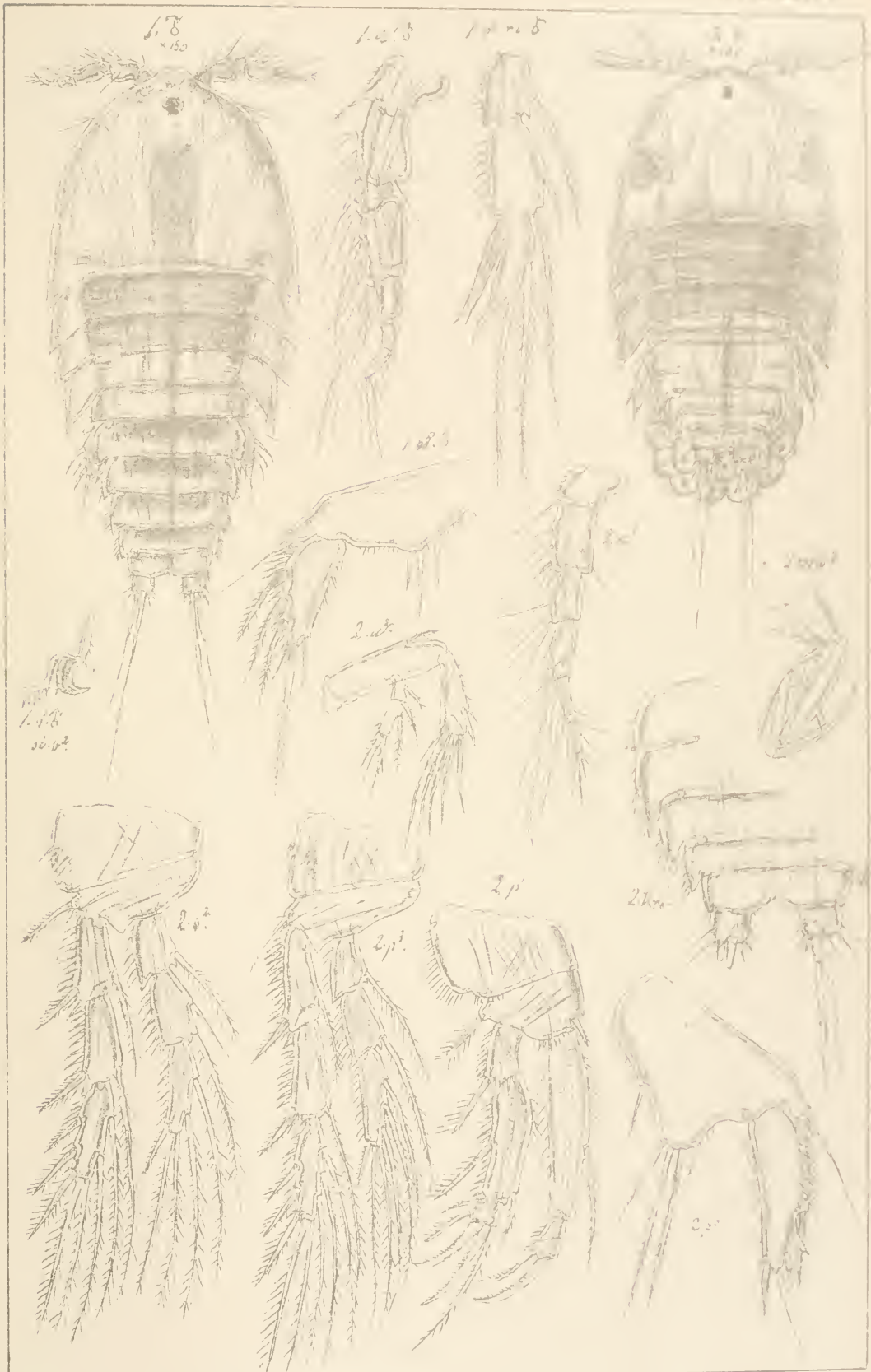


G. O. Sars autogr. — Norsk Lithgr. Officin.

Amenophia peltata, Boeck

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXIV



G.O. Sars. autogr. — Norsk Lithgr. Officin

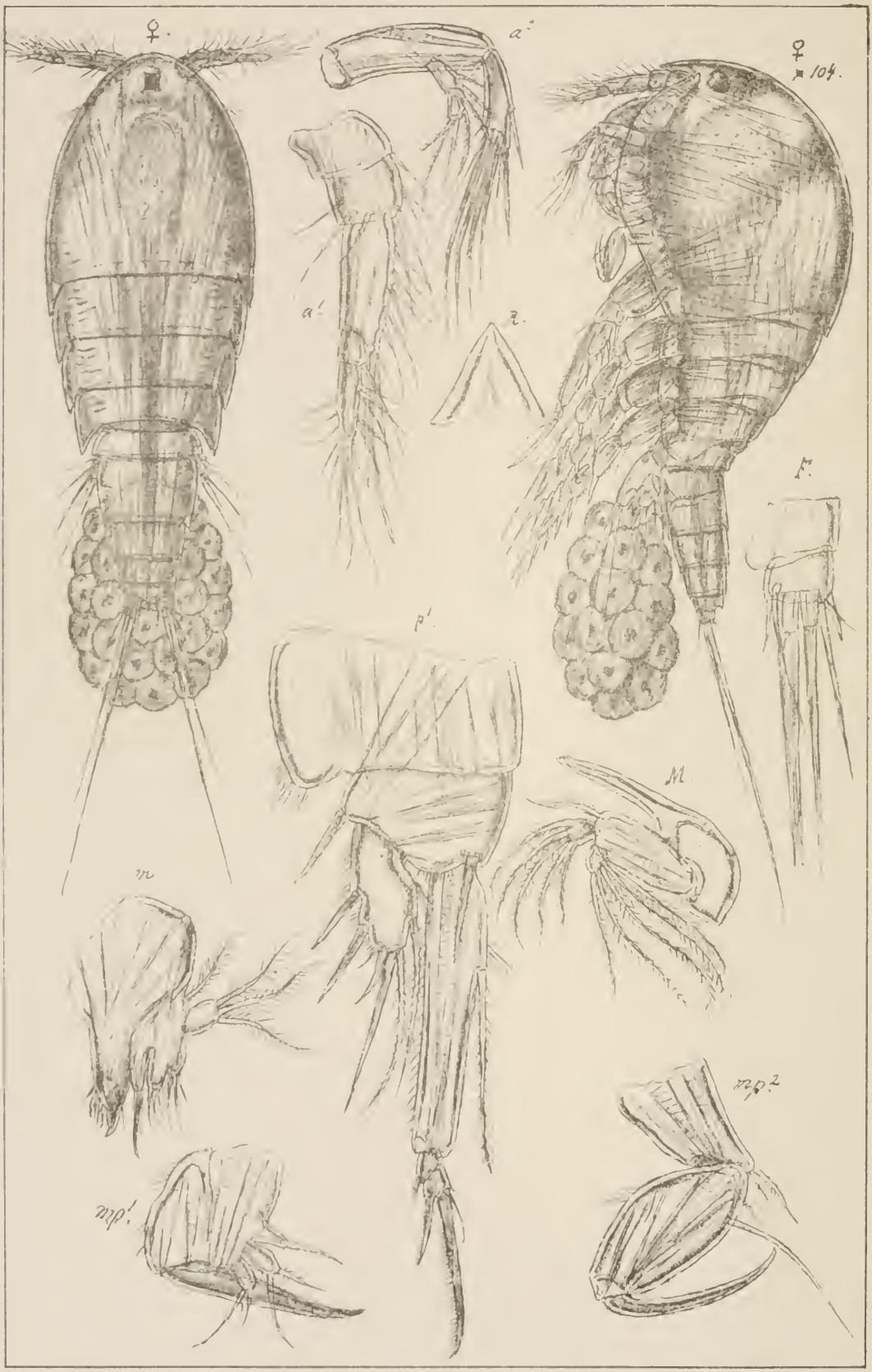
1 Amenophia peltata, Boeck
(continued)
2 Amenophia pulchella, G.O. Sars

Copepoda

Harpacticoida

Thalestridæ

Pl. LXXXV



G. O. Sars, autogr.

Norsk Lithgr. Officin.

Westwoodia nobilis (Baird)

Copepoda

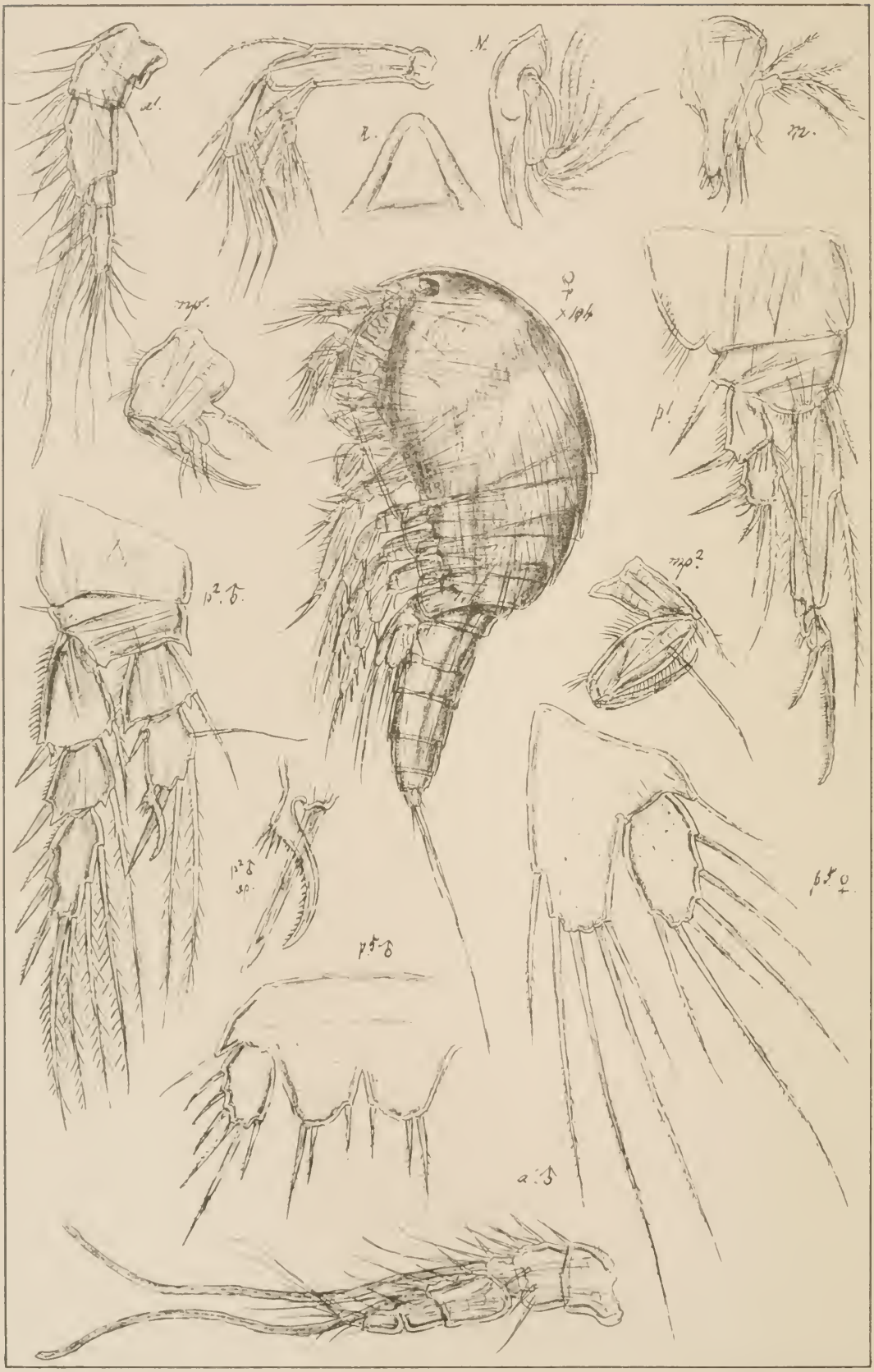
Thalestridæ — Harpacticoida — Pl. LXXXVI

G.O. Sars. autogr. — Norsk Lithgr. Officin.

Westwoodia nobilis (Baird)
(continued)

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXVII

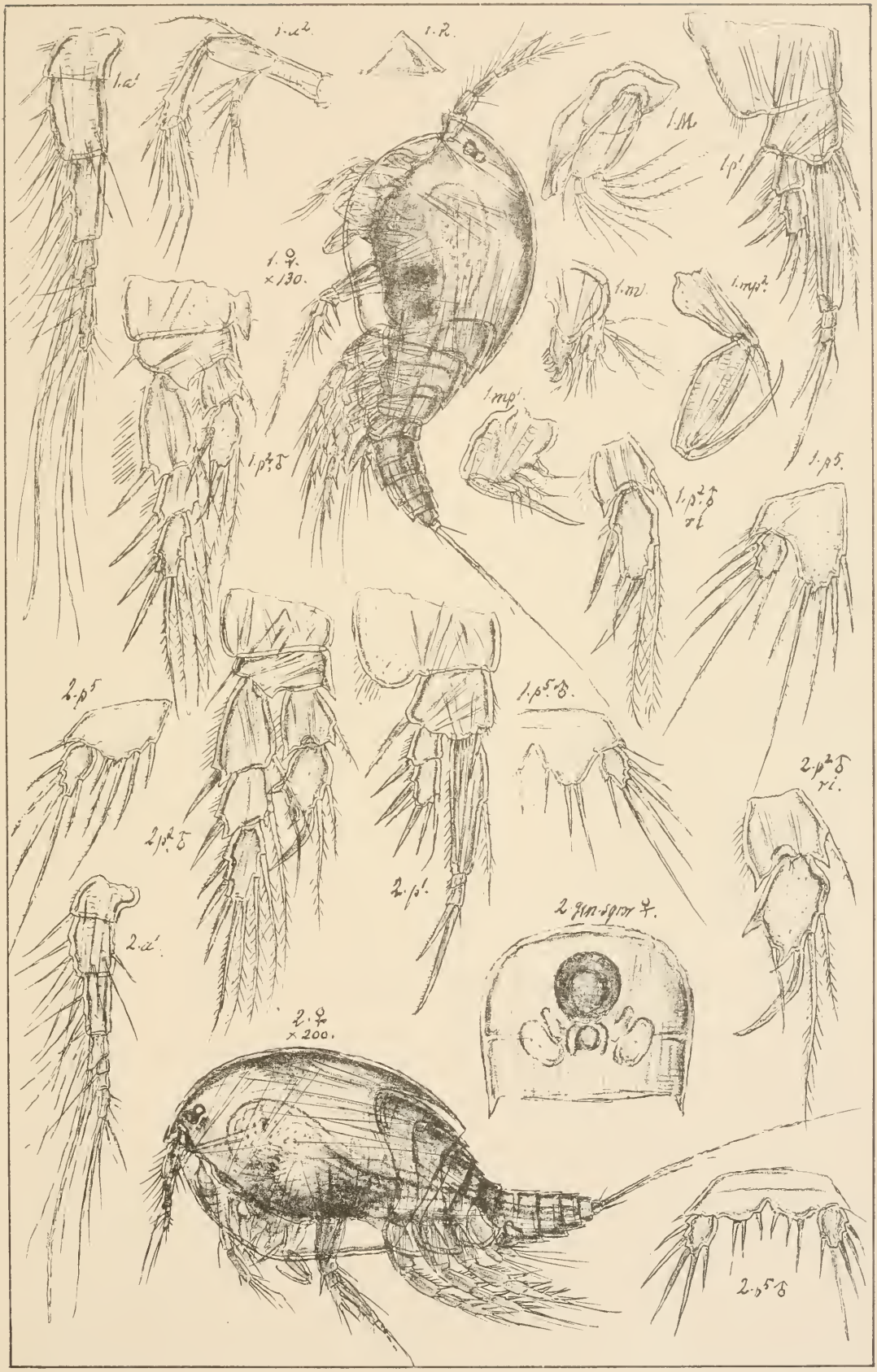


G.O. Sars, autogr. — Norsk Lithgr. Officin.

Westwoodia assimilis, G.O. Sars.

Copepoda

Thalestridæ — Harpacticoida — Pl. LXXXVIII



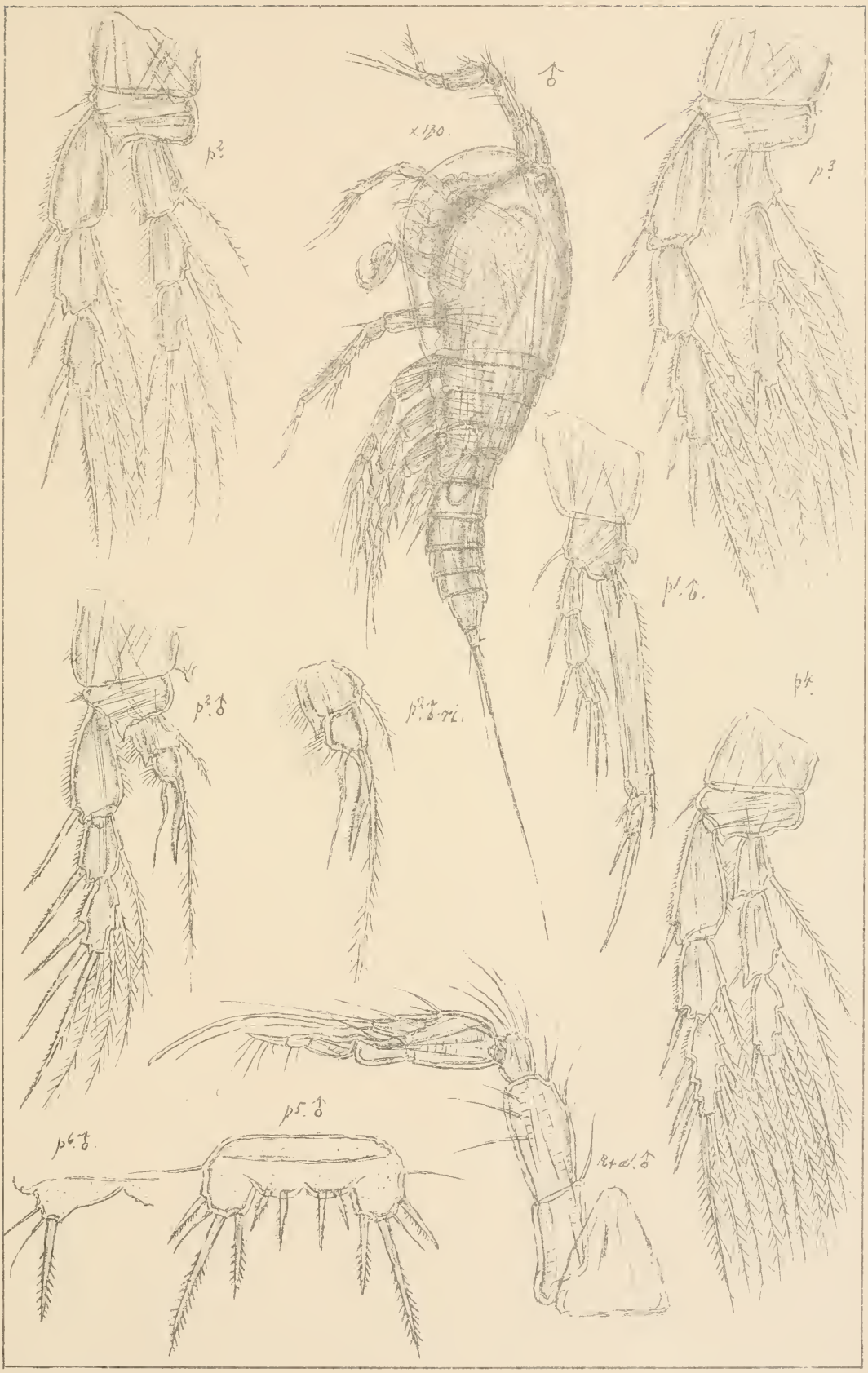
G.O. Sars, autogr. — Norsk Lithgr. Officin.

Westwoodia minuta (Claus)

Westwoodia pygmæa (Scott)

G.O. Sars. autogr. Norsk Lithgr. Otficin.

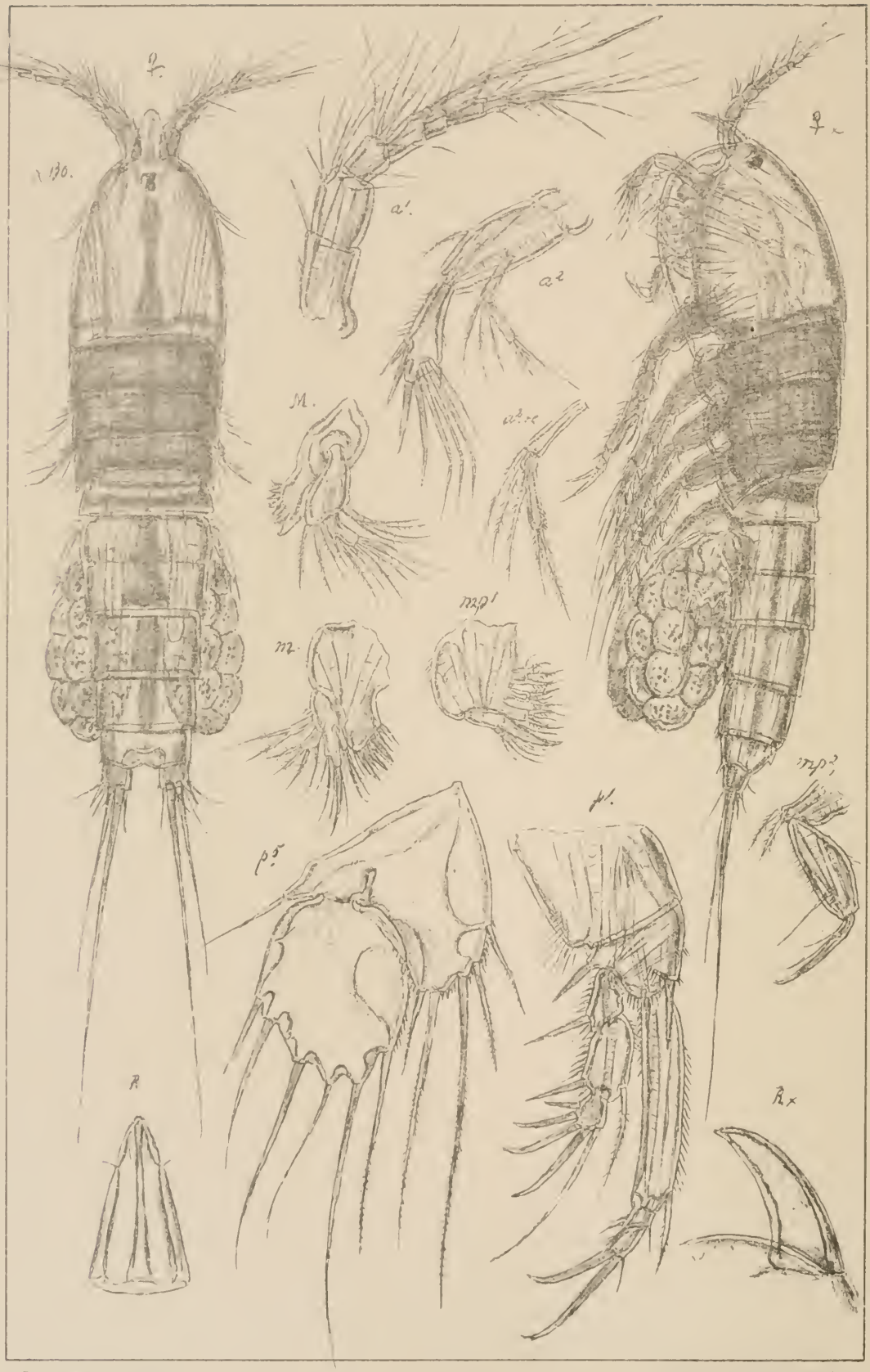
Diosaccus tenuicornis, (Claus)



G.O. Sars, autogr. Norsk Lithgr Officin.

Diosaccus tenuicornis, (Claus)
(continued)

Copepoda



G.O. Sars. autogr. Norsk Lithgr. Officin

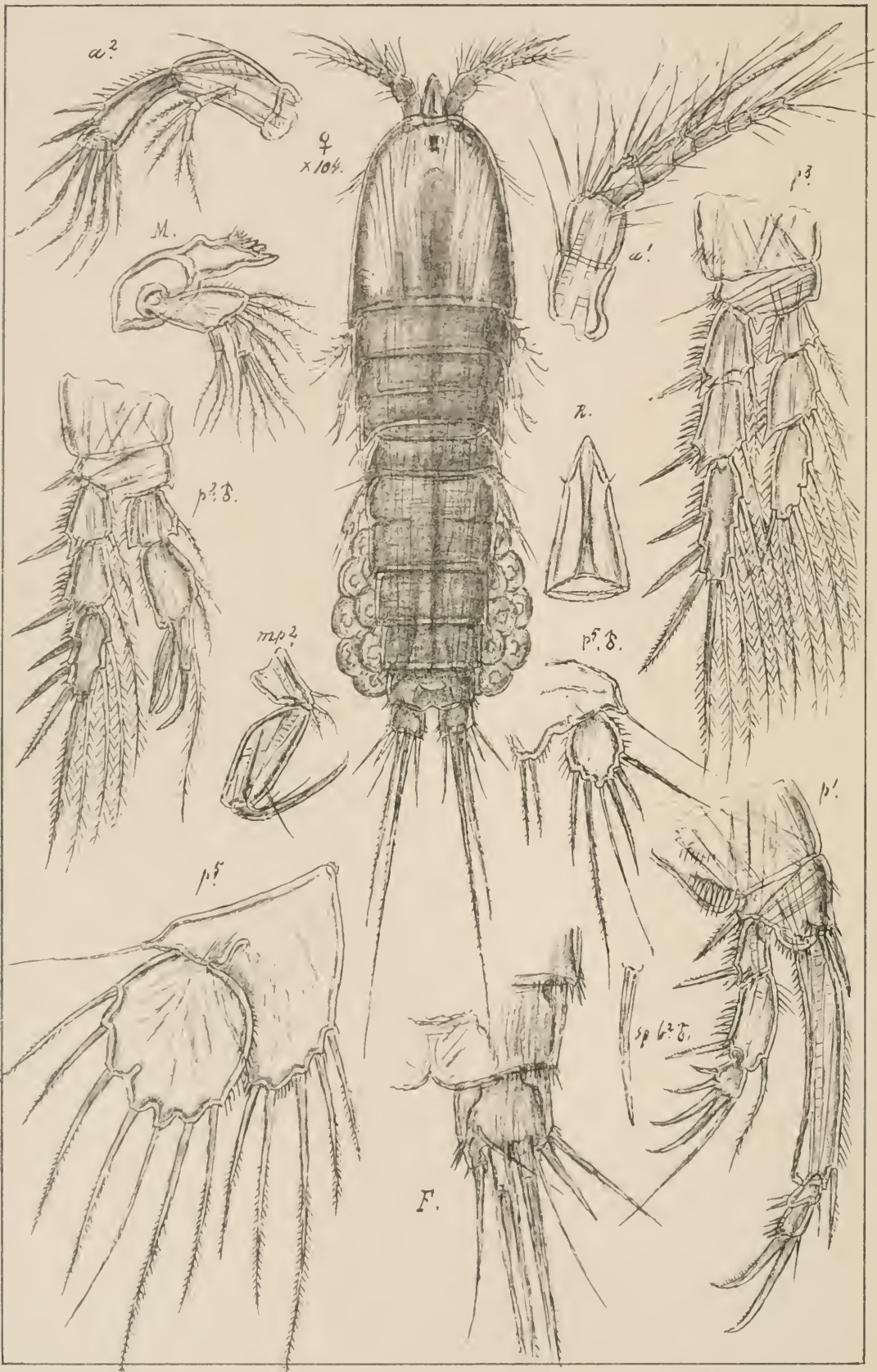
Amphiascus cinctus (Claus)

G.O. Sars, autogr. Norsk Lithgr. Officin.

Amphiascus cinctus (Claus)
(continued)

Copepoda

Harpacticoida

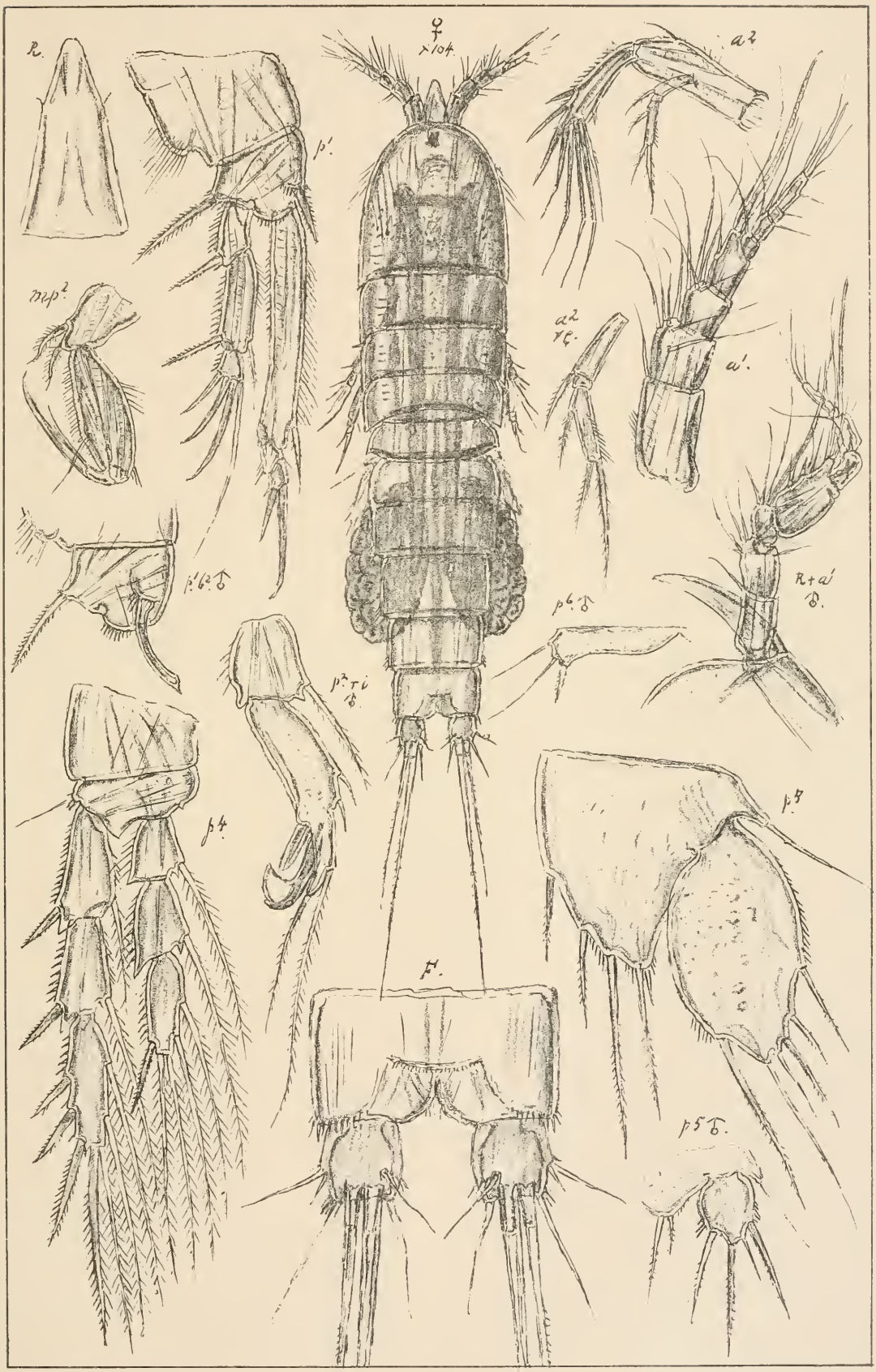


G.O. Sars. autogr. Norsk Lithgr. Officin

Amphiascus obscurus, G.O.Sars

Copepoda

Harpacticoida

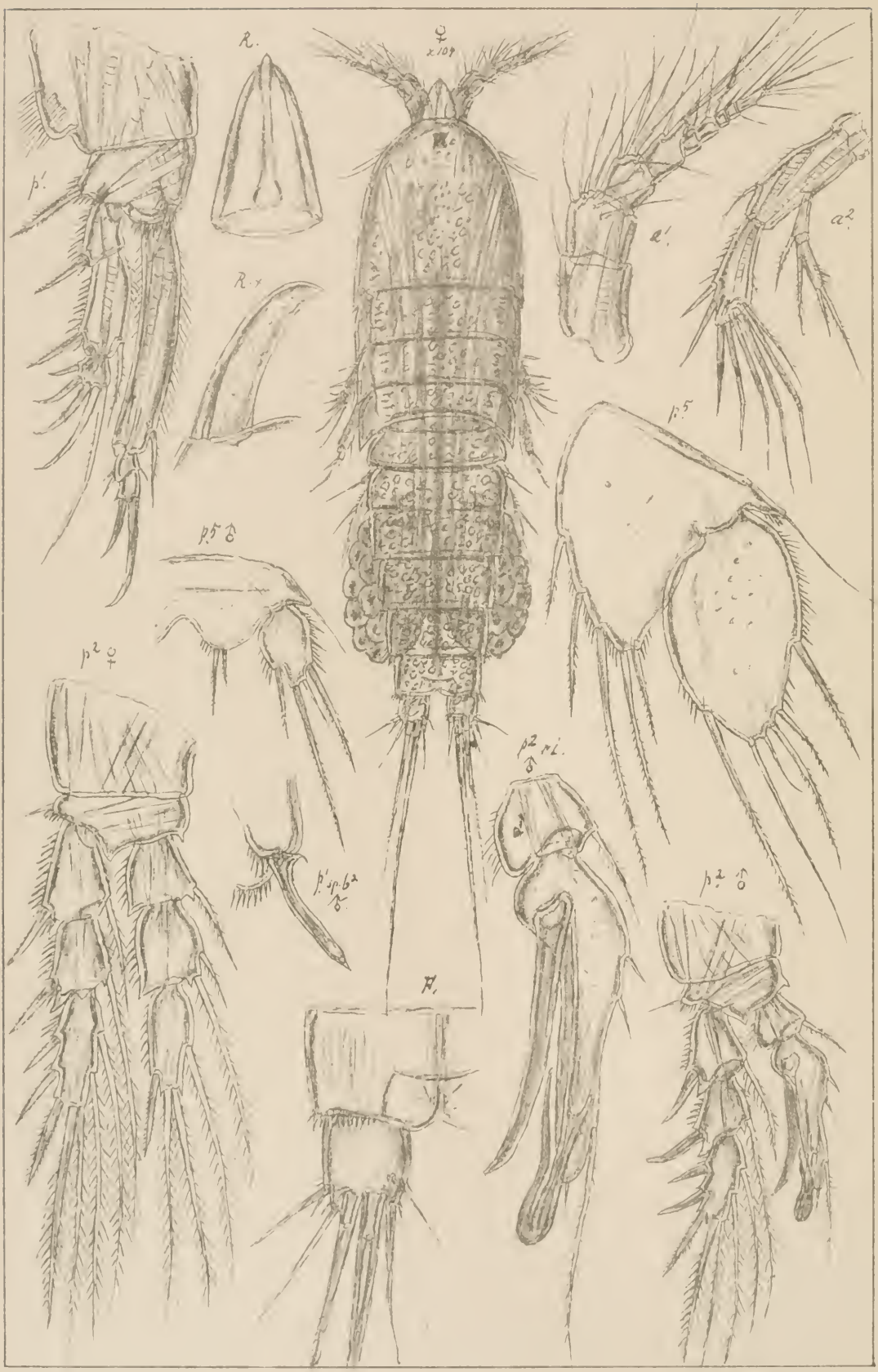


G.O. Sars, autogr. Norsk Lithgr. Officin.

Amphiascus similis. (Claus)

Copepoda

Harpacticoida

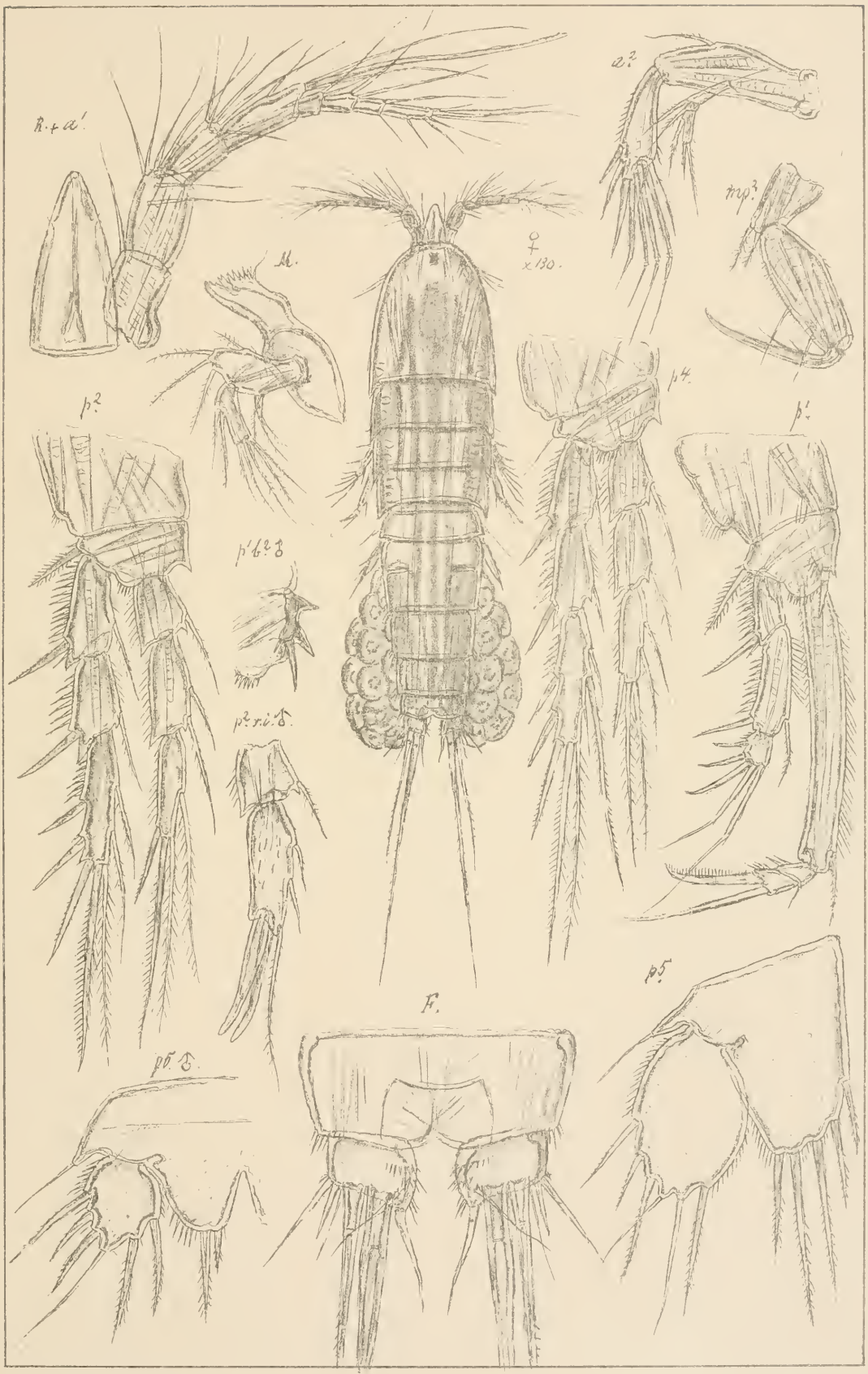


G.O. Sars. autogr. Norsk Lithgr. Officin.

Amphiascus nasutus (Boeck)

Copepoda

Harpacticoida



G.O. Sars. autogr.

Norsk Lithgr. Officin.

Amphiascus minutus, (Claus)