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 XIII & XIV

DIOSACCIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES

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female, distal joint short and sub-cordate in form, inner expansion of proximal joint slightly produced, and carrying 2 setæ and a short spine outside the latter.

Body in both sexes of a whitish colour, without any obvious pigmentary ornament.

Length of adult female 0.77 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Prof. Brady as *Stenhelia ima*, though the figure he gives of the last pair of legs in the female does not exactly agree with my own drawings. It unquestionably belongs to the present genus, and may easily be recognized by its exceedingly slender and narrow body, the very long rostrum, and the shape of the last pair of legs in the female.

Occurrence.—I have met with this species occasionally both off the south and west coasts of Norway in moderate depths among algæ. The rostrum seems to be more mobile in this species than in any of the others, being often found, in preserved specimens, deflexed to such an extent, that it forms quite a right angle with the axis of the body.

Distribution.—British Isles (Brady).

99. Amphiascus Giesbrechti, G. O. Sars, n. sp.

(Pl. XCVIII).

Syn: *Stenhelia ima*, Giesbrecht (not Brady).

Specific Characters.—Female. Body rather slender and somewhat attenuated behind, with the anterior division considerably broader than the posterior. Cephalic segment of moderate size; rostrum narrow triangular in form, and comparatively shorter than in *A. imus*. Epimeral plates rather small and rounded behind. Urosome not nearly attaining the length of the anterior division, anal segment somewhat shorter than the preceding one. Caudal rami of moderate size and quadrangular in form, being about as long as they are broad, and transversely truncated at the tip; innermost but one of the apical setæ peculiarly dilated at the base, forming outside, immediately behind the articulation, a very conspicuous bag-like swelling protruding over the base of the adjacent seta. Anterior antennæ moderately slender and gradually attenuated distally, 1st and 2nd joints the largest and of about equal size, 4th joint longer than 3rd, terminal part considerably exceeding half the length of the proximal part. Posterior antennæ with the outer ramus rather short, middle joint very small and without any seta. 1st pair of legs with the outer ramus considerably longer than the 1st joint of the

inner, middle joint about the length of the 1st, terminal joint a little longer and armed with 4 spines and a slender geniculated seta inside them; inner ramus with the 1st joint not much longer than the other 2 combined, last joint linear in form and twice as long as the 2nd, carrying a slender claw, a somewhat longer seta, and a small hair-like bristle. Natatory legs resembling in structure those in *A. imus;* middle joint of inner ramus in 3rd pair of legs, however, like that in 2nd pair, with 2 setæ inside. Last pair of legs with the distal joint oblong oval in form, carrying 6 marginal setæ, 3 outside, one inside, and 2 very slender ones at the tip; inner expansion of proximal joint narrow triangular in form and extending almost as far as the distal joint, marginal setæ 5 in number. Ovisacs less narrow than in *A. imus*.

Colour light yellowish grey.

Length of adult female 1.16 mm.

Remarks.—The above-described form is unquestionably that recorded by Dr. Giesbrecht as *Stenhelia ima*. It is, however, most certainly distinct from Brady's species, differing, as it does, both in size and in several of the anatomical details. One character which distinguishes the present species in a marked degree, and which is well described by Dr. Giesbrecht, is the peculiar bag-like dilatation of the largest of the caudal setæ, a feature which ensures the immediate recognition of this species from any of the others known.

Occurrence.—Only a solitary, but well preserved female specimen of this form has hitherto come under my notice. It was taken many years ago off the west coast of Norway, the exact locality not being stated.[1])

Distribution.—Bay of Kiel (Giesbrecht).

100. Amphiascus propinqvus, G. O. Sars, n. sp.

(Pl. XCIX).

Specific Characters.— Female. Body moderately slender and only slightly attenuated behind. Cephalic segment about the length of the 4 succeeding segments combined; rostrum well developed, lanceolate, extending nearly to the end of the 2nd joint of the anterior antennæ. Urosome almost attaining the length of the anterior division, last segment fully as long as the preceding one. Caudal rami short, quadrangular, broader than they are long, the 2 middle apical setæ only slightly dilated at the base. Anterior antennæ slender and attenuated, 8-articulate, the first 2 joints much the largest, 4th joint nearly twice as long as

[1]) Found this summer occasionally at Flekkerö, south coast of Norway.

the 3rd, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus distinctly 3-articulate, middle joint well defined and setiferous. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, terminal joint about as long as the middle one, and armed with 2 spines and 2 geniculated setæ; inner ramus with the 1st joint very slender and almost 3 times as long as the other 2 combined, last joint linear and twice as long as the 2nd, tipped with a slender claw, a rather long seta, and a hair-like bristle. Natatory legs about as in *A. imus*. Last pair of legs also of a rather similar appearance, the distal joint being narrow oblong in form, but with 3 instead of 2 setæ outside; inner expansion of proximal joint comparatively short, triangular, extending scarcely beyond the middle of the distal joint. Ovisacs of moderate size and somewhat more divergent than in *A. imus*.

Male with the 2nd basal joint of the 1st pair of legs produced inside to 3 blunt spiniform projections. Inner ramus of 2nd pair of legs resembling in structure that in the male of *A. imus*. Last pair of legs likewise of a very similar appearance.

Colour whitish, with a faint yellowish tinge.

Length of adult female 0.57 mm.

Remarks.—This species is closely allied to *A. imus*, but is of smaller size and less slender form of body. It moreover differs somewhat in the structure of the 1st and last pairs of legs.

Occurrence.—Some few specimens of this form were found last summer off the south coast of Norway, at Risør and Lillesand.

101. Amphiascus longirostris (Claus).

(Pl. C & CI).

? *Dactylopus longirostris*, Claus, Die freilebenden Copepoden, p. 127. Pl. XVIII, figs. 4—6.

Syn: *Diosaccus longirostris*, Boeck.
„ *Dactylopus longirostris*, var. *arctica*, Scott.

Specific Characters.—Female. Body moderately robust and slightly attenuated behind. Cephalic segment comparatively large and deep, rostrum rather prominent and evenly curved, terminating in an acute point. Urosome shorter than the anterior division, with the hind edge of the segments finely spinulose ventrally and laterally. Caudal rami quadrangular, being about as long as they are broad, innermost but one of the apical setæ exhibiting near the base a conspicuous bulging outside, overlapping the adjacent seta; spine of outer corner

rather strong, innermost seta very small and hair-like. Anterior antennæ slender and attenuated, 8-articulate, 4th joint more than twice as long as the 3rd, terminal part exceeding half the length of the proximal one. Posterior antennæ with the outer ramus very narrow and composed of only 2 joints, the middle one not being defined. Oral parts quite normal. 1st pair of legs with the outer ramus nearly as long as the 1st joint of the inner, last joint scarcely shorter, but narrower than the middle one, and armed with 4 spines and inside them with a geniculated seta; inner ramus with the 1st joint very narrow and more than twice as long as the other 2 combined, last joint linear and about twice as long as the 2nd, apical claw rather strong and distinctly denticulate on the one edge. Natatory legs well developed and of normal structure. Last pair of legs with the distal joint oval in form and provided with 6 marginal setæ, the 2 apical ones very slender; inner expansion of proximal joint rather broad and obliquely truncated at the end, extending beyond the middle of the distal joint, marginal setæ 5 in number, the 2 innermost ones spiniform, minutely bifid at the tip. Ovisacs comparatively large and somewhat diverging.

Male with the 2nd basal joint of the 1st pair of legs produced inside to 2 or 3 strong spiniform projections, in front of which is a small knob-like prominence. 2nd pair of legs with the 2 first joints of the outer ramus considerably produced at the outer corner, and having the spines, especially that of the 2nd joint, much coarser than in female; inner ramus transformed in the usual manner. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint conical in form and carrying 2 rather thick setæ on the tip.

Body of a light yellow colour, with a more or less distinct reddish tinge; intestine generally dark-coloured.

Length of adult female 0.80 mm.

Remarks.—It seems to me rather questionable if the above-described form is in reality that originally recorded by Claus as *Dactylopus longirostris*. It is however beyond doubt that Boeck's *Diosaccus longirostris* is the present species, as also the form recorded by Th. Scott from Finmark as *Dactylopus longirostris*, var. *arctica*. For this reason, and as the description and figures given by Claus are too imperfect to admit of any certain identification, I think that the specific name *longirostris* ought more properly to be applied to the present species. The *Stenhelia longirostris* of Norman & Scott is a very different species; and as it belongs to the same genus as Claus's species, its specific name must be altered.

Occurrence.—I have met with this form in several places both on the south and west coasts of Norway; and Mr. Scott also records it from the Finmark coast. It generally occurs in depths ranging from 20 to 50 fathoms.

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

102. Amphiascus tenuiremis (Brady).

(Pl. CII).

Dactylopus tenuiremis, Brady, Monogr. Brit. Copepoda, p. 115, Pl. LVI, figs. 12—18.

Specific Characters.—Female. Body comparatively short and stout, somewhat depressed in front, and slightly attenuated behind. Rostrum rather large, lanceolate. Urosome much shorter than the anterior division, anal segment not quite as long as the preceding one. Caudal rami short, broader than they are long, middle apical setæ moderately thickened at the base. Anterior antennæ slender and attenuated, 8-articulate, 4th joint twice as long as the 3rd, terminal part very narrow and about half the length of the proximal one. Posterior antennæ with the outer ramus distinctly 3-articulate, middle joint well defined and setiferous. 1st pair of legs comparatively strongly built, outer ramus, however, as usual, small, scarcely attaining half the length of the inner, and having the 3 joints of about equal size, the last one carrying 3 spines and 2 geniculated setæ; 1st joint of inner ramus rather large and slightly curved, being almost 4 times as long as the other 2 combined, last joint not much longer than the 2nd and tipped with an unusually strong and evenly curved claw-like spine, a slender seta and a very small hair-like bristle. Natatory legs rather slender, but otherwise of normal structure. Last pair of legs with the distal joint narrow oblong in form, tapering towards the end, and densely ciliated both outside and inside, marginal setæ rather unequal and 6 in number; inner expansion of proximal joint triangular, extending somewhat beyond the middle of the distal joint, marginal setæ rather elongated.

Male exhibiting the usual sexual differences from the female.

Body whitish, with a more or less distinct reddish tinge.

Length of adult female 0.63 mm.

Remarks.—This species was recorded by Messrs. Brady and Robertson as early as the year 1875, and was subsequently described and figured (though rather imperfectly) by the first-named author in his well-known Monograph. It is a true *Amphiascus*, and may be easily distinguished from most other species of that genus by its comparatively short and stout form, and by the structure of the 1st and last pairs of legs.

Occurrence.—I have found this form in considerable abundance in several places both on the south and west coasts of Norway, in depths ranging from 10 to 30 fathoms. It is also recorded by Mr. Scott from the Finmark coast.

Distribution.—British Isles (Brady), Arctic Ocean, off Spitsbergen and Franz Josef Land (Scott).

103. Amphiascus parvus, G. O. Sars, n. sp.

(Pl. CIII).

Specific Characters.—Female. Body moderately slender, sublinear in form, with the anterior division not much broader than the posterior. Rostrum of moderate size and of the usual form. Caudal rami very short, much broader than they are long, middle apical setæ slightly thickened at the base. Anterior antennæ somewhat less slender than in the preceding species, 4th joint only little longer than 3rd, terminal part not attaining half the length of the proximal one. Posterior antennæ with the outer ramus shorter than the terminal joint of the inner, its middle joint very small and without any seta. 1st pair of legs with the outer ramus extending but little beyond the middle of the 1st joint of the inner, its middle joint of about the same size as the 1st, and having no seta inside, last joint somewhat smaller and armed with 3 strong spines and 2 geniculated setæ; 1st joint of inner ramus very slender, straight, being almost 4 times as long as the other 2 combined, last joint not much longer than the 2nd, apical claw of moderate length and almost straight. Natatory legs rather slender, terminal joint of outer ramus in the 2nd and 3rd pairs with only a single seta inside. Last pair of legs with the distal joint broadly ovate in form and carrying 6 marginal setæ, the 2 apical ones very slender and quite smooth; inner expansion of proximal joint comparatively short, triangular, not extending to the middle of the distal joint. Ovisacs of moderate size, and containing a limited number of rather large ova.

Colour not yet ascertained.

Length of adult female 0.46 mm.

Remarks.—This new species somewhat resembles in its general appearance *A. minutus*, but is of much smaller size, and may moreover be distinguished by the less slender anterior antennæ and by the structure of the legs.

Occurrence.—Some few female specimens of this form were selected from samples taken last summer off the south coast of Norway, at Risør and Lillesand.

104. Amphiascus debilis (Giesbr.).

(Pl. XCIV).

Dactylopus debilis, Giesbrecht, Die freilebenden Copepoden der Kieler Föhrde, p. 122 (numerous figures).

Syn: *Dactylopus parvus*, Scott.

Specific Characters.—Female. Body moderately slender, sublinear in form, being almost of uniform width throughout. Rostrum rather prominent, conically

tapered distally. Urosome with the segments finely spinulose at the hind margin ventrally and laterally, last segment much shorter than the preceding one. Caudal rami exceedingly short, being about twice as broad as they are long, middle apical setæ slightly thickened at the base, seta of outer corner unusually strong, spiniform. Anterior antennæ comparatively short, 8-articulate, 4th joint scarcely longer than 3rd, terminal part not attaining half the length of the proximal one. Outer ramus of posterior antennæ with the middle joint very small and without any seta. Oral parts quite normal. 1st pair of legs with the outer ramus extending somewhat beyond the middle of the 1st joint of the inner, middle joint without any seta inside, last joint of about the same length, and carrying on the tip only 2 spines and 2 geniculated setæ; 1st joint of inner ramus slender, linear, and about twice as long as the other 2 combined, last joint twice as long as the 2nd, apical claw slender and nearly straight. Natatory legs with the rami very narrow and the setæ of the inner edge much reduced in number: 1st joint of outer ramus in all pairs without any seta inside; last joint of same ramus in 2nd pair having the inner edge also quite smooth, and in the 2 succeeding pairs carrying only a single seta inside; last joint of inner ramus in 2nd and 4th pairs with a single seta on the inner edge, in 3rd pair with 2 setæ. Last pair of legs with the distal joint oval in form, and provided with only 5 marginal setæ, that issuing from the tip being very slender and quite smooth; inner expansion of proximal joint rather large, extending about as far as the distal joint, marginal setæ rather coarse and 5 in number. Ovisacs comparatively large, but containing a rather limited number of ova.

Male with the anterior antennæ transformed in the usual manner. 2nd basal joint of 1st pair of legs produced inside to 2 strongly chitinized diverging projections. Inner ramus of 2nd pair fully as long as the outer, distal joint produced at the end to a strong mucroniform projection not defined from the joint. Last pair of legs much smaller than in female, with only 2 setæ on the inner expansion of the proximal joint.

Body of a whitish colour, with a slightly reddish tinge, intestine generally of a dark violaceous hue.

Length of adult female 0.46 mm.

Remarks.—This form has been very minutely described and figured by Dr. Giesbrecht as a species of the gen. *Dactylopus*. It belongs, however, beyond doubt to the genus *Amphiascus*, as here defined, having, like the other species, 2 ovisacs. The species is chiefly characterised by the comparatively short anterior antennæ and the considerable reduction in the number of the natatory setæ on the legs.

Occurrence.—I have met with this small species in several places on the south and west coasts of Norway, from the Christiania Fjord at any rate up to the Trondhjem Fjord. It occurs here and there, together with other species of the genus, in moderate depths among algæ and Hydroida.

Distribution.—Bay of Kiel (Giesbrecht), Scottish coast (Scott).

105. Amphiascus pallidus, G. O. Sars, n. sp.

(Pl. CV).

Specific Characters.—Female. Body comparatively robust, with the anterior division somewhat broader than the posterior, and slightly depressed. Rostrum rather broad at the base, triangular. Urosome much shorter than the anterior division, and having the segments densely spinulose at the hind edge ventrally and laterally. Caudal rami short, a little broader than they are long, the 2 middle apical setæ only slightly thickened at the base. Eye not visible in the living animal. Anterior antennæ rather slender, 4th joint scarcely longer than 3rd, terminal part exceeding half the length of the proximal, and with none of the setæ ciliated. Posterior antennæ with the outer ramus scarcely as long as the terminal joint of the inner, middle joint very small and without any seta. 1st pair of legs rather strongly built, outer ramus extending beyond the 1st joint of the inner, its middle joint somewhat larger than the other 2, and with a well-developed seta inside, last joint armed with 3 spines and 2 geniculated setæ; 1st joint of inner ramus somewhat exceeding the length of the other 2 combined, last joint more than twice as long as the 2nd, apical claw rather strong. Natatory legs well developed, with the full number of setæ. Last pair of legs with the distal joint rounded oval in form, carrying 6 marginal setæ, 2 of which, attached to the tip, are very narrow and quite smooth; inner expansion of proximal joint extending somewhat beyond the middle of the distal joint, and obliquely truncated at the tip, marginal setæ 5 in number. Ovisacs of moderate size, containing numerous ova.

Male with the 2nd basal joint of 1st pair of legs produced inside to 2 blunt spines, in front of which is a small knob-like prominence. 2nd pair of legs with the spines of the outer ramus much coarser than in female, inner ramus much shorter than the outer and transformed in the usual manner, distal joint considerably dilated in the middle, one of its spiniform appendages being exceedingly strong. Last pair of legs much smaller than in female, distal joint rather

narrow, inner expansion of proximal joint triangular and provided with only 2 spiniform setæ at the tip.

Body of a whitish colour, with a very faint yellowish grey tinge.

Length of adult female 0.71 mm.

Remarks.—This new species is especially distinguished by its comparatively robust and pale-coloured body, as also by the apparent total absence of eye. In the anatomical details it on the whole rather resembles the succeeding species, though differing conspicuously in some few points.

Occurrence.—I found this form many years ago at Christiansund, west coast of Norway, in a depth of 50—60 fathoms, muddy bottom.

106. Amphiascus abyssi (Boeck).

(Pl. CVI).

Dactylopus abyssi, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 56.

Specific Characters.—Female. Body rather robust and only slightly attenuated behind, anterior division scarcely at all depressed. Cephalic segment broadly rounded in front, rostrum of moderate size, terminating in an acute point. Epimeral plates of the 3 succeeding segments acutely produced behind; last segment narrower than the preceding one. Urosome much shorter than the anterior division, and having the segments coarsely spinulose at the hind edge ventrally and laterally, last segment shorter than the preceding one. Caudal rami resembling in form those in *A. pallidus*, though armed both inside and outside with small spinules, the 2 middle apical setæ distinctly spinulose and slightly thickened at the base. Eye well developed, with the pigment of a very pale yellowish hue. Anterior antennæ remarkably short and stout, much curved and densely clothed with setæ, some of which are very strong and coarsely ciliated, 4th joint scarcely longer than 3rd, and very obliquely truncated at the end, terminal part about half the length of the proximal one, with the first 2 joints remarkably short and broad. Posterior antennæ with the outer ramus rather large, exceeding in length the terminal joint of the inner, but otherwise of much the same structure as in *A. pallidus*. 1st pair of legs somewhat less strongly built than in that species, outer ramus scarcely longer than the 1st joint of the inner, and densely spinulose outside, its middle joint shorter than both the 1st and last, and provided inside with a rather large ciliated seta, last joint armed with 3 spines and 2 strong ciliated setæ, which are not geniculated; 1st joint of inner ramus about the length of the other 2 combined, last joint very slender, linear

being more than twice as long as the 2nd, apical claw comparatively short. Natatory legs of almost exactly the same structure as in *A. pallidus*. Last pair of legs also of a very similar shape, though the distal joint is more oblique and the inner expansion of the proximal joint comparatively broader, marginal setæ rather short and very distinctly ciliated. Ovisacs unusually small, each containing, as a rule, only 2 ova.

Male with the inner ramus of the mandibular palp peculiarly transformed, vesicular in shape, with only a single small seta on the inner edge. 2nd basal joint of 1st pair of legs produced inside to an obtuse conical prominence, beyond which is a comb-like series of 5 blunt spines. Inner ramus of 2nd pair of legs transformed in the usual manner. Last pair of legs much smaller than in female, distal joint broader than in the male of *A. pallidus*, and the end obliquely truncated.

Colour dark grey.

Length of adult female 1.20 mm.

Remarks.—This form was erroneously referred by Boeck to the genus *Dactylopus*. As proved by the double ovisac and the structure of the several appendages, it is however unquestionably a true *Amphiascus*, nearly related to *A. pallidus*, though easily distinguished from it by its much larger size and the short and stout anterior antennæ, with their coarsely ciliated setæ.

Occurrence.—This is a true deep-water species, and thus fully deserves the specific name given to it by Boeck. I have found it occasionally in the upper part of the Christiania Fjord and also in several places on the west coast of Norway, in depths ranging from 40 to 100 fathoms, muddy bottom. It moves with great dexterity through the loose mud, and very seldom leaves the bottom.

107. Amphiascus hispidus (Norman).

(Pl. CVII & CVIII).

Stenhelia hispida, Brady, Monogr. Brit. Copepoda, p. 32, Pl. XLII, figs. 1—14.

Specific Characters.—Female. Body rather slender, cylindric in form, with the integuments strongly chitinised. Cephalic segment narrowly rounded in front, and not very deep; rostrum rather prominent and somewhat curved. Epimeral plates of the 3 succeeding segments small and rounded behind; last segment scarcely narrower than the preceding one. Urosome nearly as long as the anterior division and having the segments very sharply defined, genital segment distinctly divided in the middle, and, like the 2 succeeding segments,

clothed laterally, at some distance from the hind edge, with an oblique series of small spinules; last segment much shorter than the preceding one. Caudal rami unusually produced, being rather longer than they are broad, and oblong quadrangular in form, apical setæ comparatively short and distinctly spinulose, the outer median seta with a conspicuous bulging on the outer side near the base. Anterior antennæ not much elongated, 8-articulate, 4th joint somewhat longer than 3rd, terminal part scarcely attaining half the length of the proximal. Posterior antennæ with the outer ramus rather small, middle joint exceedingly minute and without any seta. Oral parts quite normal. 1st pair of legs with the outer ramus somewhat longer than the 1st joint of the inner and densely spinulose outside, middle joint without any seta inside, last joint shorter than the middle one and carrying on the tip 2 claw-like spines and 2 geniculated setæ; 1st joint of inner ramus twice the length of the other 2 combined, last joint somewhat longer than the 2nd, apical claw rather strong, nearly straight, and distinctly spinulose on one of the edges. Natatory legs with the setæ much reduced in number, 1st joint of outer ramus in all the pairs without any seta inside, terminal joint of same ramus in 2nd pair likewise without any setæ on the inner edge, and in the 3rd pair with only a single seta; terminal joint of inner ramus in the 2nd and 4th pairs with only one seta inside. Last pair of legs with the distal joint rounded in form and carrying 5 rather slender marginal setæ, inner expansion of proximal joint extending almost as far as the distal joint, marginal setæ 5 in number. Ovisacs narrow oblong and only slightly divergent. Spermatophore attached to the genital segment unusually large, extending to the end of the antepenultimate caudal segment.

Male, as usual, of smaller size than female, and having the urosome distinctly 5-articulate and somewhat thicker than in that sex. Anterior antennæ highly chitinised and distinctly prehensile, with the 4th joint strongly dilated. 1st pair of legs with the 2nd basal joint armed inside with a very strong deflexed tenon-like projection, blunted at the tip and of a very dark colour, 1st joint of inner ramus considerably thicker than in female, and having inside close to the base a darkly-coloured nodiform prominence. Inner ramus of 2nd pair of legs with the distal joint highly chitinised and projecting at the end in a strong bayonet-shaped process, on the inner side of which a more slender spiniform appendage is attached. Last pair of legs much smaller than in female, distal joint rather narrow, with 2 of the outer setæ spiniform, inner expansion of proximal joint very slight, with 2 unequal spines and numerous small spinules.

Colour dark yellowish grey.

Length of adult female 1.15 mm., of male 0.98 mm.

Remarks.—This form was first detected by Canon A. M. Norman, and was subsequently described and figured by Prof. Brady in his well-known Monograph under the name originally proposed by Norman. It is a very distinct and easily recognizable species, being especially distinguishable by the slender cylindrical form of the body, the highly chitinised integuments, and the unusual production of the caudal rami. It is also of rather large size as compared with the other species of this genus.

Occurrence.—I have found this form not unfrequently at Aalesund and Christiansund, on the west coast of Norway, in moderate depths among algæ. It also occurs off the Finmark coast, several specimens having been taken many years ago at Vadsö.

Distribution.—British Isles (Brady).

108. Amphiascus affinis, G. O. Sars, n. sp.

(Pl. CIX).

Specific Characters.—Female. General form of body similar to that of *A. hispidus*, being rather slender, subcylindrical. Rostrum of moderate size and blunted at the tip. Caudal rami short, being considerably broader than they are long, the 2 middle apical setæ remarkably strong, dark-coloured and considerably thickened at the base. Anterior and posterior antennæ of much the same structure as in *A. hispidus*. 1st pair of legs likewise of a very similar appearance, though having the outer 2 joints of the inner ramus shorter and nearly equal in size. Natatory legs exhibiting a reduction in the number of the setæ similar to that found in the above species. Last pair of legs with the inner expansion of the proximal joint comparatively shorter than in *A. hispidus*, extending only slightly beyond the middle of the distal joint, which latter exhibits a rounded form very similar to that in the above-named species. Ovisacs somewhat more divergent.

Colour not yet ascertained.

Length of adult female 0.82 mm.

Remarks.—This form closely resembles *A. hispidus*, both as regards general appearance and structural details. It is however of rather inferior size, and is moreover easily distinguished by the form of the rostrum and the much shorter caudal rami.

Occurrence.—Some few specimens of this form, all of the female sex, were collected from samples taken during the summer of 1905 at Risör and Lillesand, on the south coast of Norway.

109. Amphiascus intermedius (Scott).

(Pl. CX).

Stenhelia intermedia, Th. Scott, Marine Invertebrata of Loch Fyne, 15th Ann. Rep. of the Fishery Board for Scotland, p. 169, Pl. II, figs. 10—21.

Specific Characters.—Female. Body much shorter and stouter than in the 2 preceding species. Cephalic segment rather broad and evenly rounded in front; rostrum distinctly bifid at the tip. Caudal rami much broader than they are long, apical setæ remarkably short and moderately thickened at the base. Anterior antennæ of a structure similar to that in the 2 preceding species, though having the last joint somewhat larger, nearly equal in length to the 3 preceding joints combined. Posterior antennæ scarcely differing in their structure from those in the above-mentioned species. 1st pair of legs likewise of a very similar structure, outer 2 joints of inner ramus rather short, together scarcely attaining half the length of the 1st. Natatory legs almost exactly as in the 2 preceding species. Last pair of legs with the distal joint somewhat tapered distally and the marginal setæ comparatively shorter than in those species; inner expansion of proximal joint triangular, extending slightly beyond the middle of the distal joint. Ovisacs rather large and diverging considerably.

Male with the 2nd basal joint of 1st pair of legs produced inside to a highly chitinized tenon-like projection similar to that found in the male of *A. hispidus*, the tip of the projection, however, being less blunted. Inner ramus of 2nd pair of legs transformed in a manner very similar to that in the male *A. hispidus*, the bayonet-shaped terminal projection being, however, somewhat shorter and having on the outer side 2 strong serrulations not found in that species.

Colour yellowish grey.

Length of adult female 0.74 mm.

Remarks.—This is unquestionably the species recorded by Th. Scott in the above-named paper as *Stenhelia intermedia*. Though closely related to the 2 preceding species, it may be at once distinguished from either of them by its much shorter and stouter body, as also by the distinctly bifid rostrum and the unusually short caudal setæ.

Occurrence.—Some few specimens of this form were taken at Levanger, on the Trondhjem Fjord, and at Kopervik, on the west coast of Norway, in depths ranging from 20 to 30 fathoms.

Distribution.—Scottish coast (Scott).

110. Amphiascus typhlops, G. O. Sars, n. sp.

(Pl. CXI).

Specific Characters.—Female. Body very slender, sublinear in form, with the 2 chief divisions nearly equal in length. Rostrum much attenuated, terminating in an acute point. Caudal rami unusually prolonged, being fully twice as long as they are broad, apical setæ of moderate length and only slightly thickened at the base. Eye wholly absent. Anterior antennæ moderately elongated and less attenuated than in most other species, 8-articulate, 4th joint not much longer than 3rd, terminal part scarcely attaining half the length of the proximal. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, middle joint very small and without any seta. Oral parts normal. 1st pair of legs with the outer ramus about as long as the 1st joint of the inner, middle joint with a well-developed seta inside, last joint somewhat longer than the middle one, oblong oval in form, and armed with 4 slender spines and a still more slender ciliated seta inside the spines; 1st joint of inner ramus about the length of the other 2 combined, last joint very slender, linear, 3 times as long as the 2nd, apical claw very long and evenly curved. Natatory legs with the rami rather narrow and with a larger number of setæ than in the 3 preceding species, outer apical seta of inner ramus spiniform. Last pair of legs with the distal joint very narrow, oblong in form, and carrying 6 rather slender marginal setæ; inner expansion of proximal joint narrow triangular, and extending to about the middle of the distal joint, marginal setæ 5 in number. Ovisacs comparatively small, with a very limited number of ova.

Male with the 2nd basal joint of 1st pair of legs produced inside at the base to a small knob-like prominence, beyond which is a comb-like series of 4 blunt spines. Inner ramus of 2nd pair of legs rather slender, being fully as long as the outer, and transformed in the usual manner, the distal joint carrying outside, at some distance from the tip, 2 spiniform appendages, the outer of which is shorter and thicker than the inner. Last pair of legs, as usual, smaller than in female, with the inner expansion of the proximal joint obtusely conical in form, and carrying on the tip 2 spiniform setæ of somewhat unequal length.

Colour whitish.

Length of adult female 0.93 mm.

Remarks.—This is a very distinct and easily recognizable species, being especially characterised by the very slender linear form of the body, the narrowly tapered rostrum, and the unusually prolonged caudal rami. Not the slightest trace of an eye could be detected in the living animal.

Occurrence.—Only 2 specimens, male and female, of this form have hitherto come under my notice. They were taken at the same time in the upper part of the Christiania Fjord from a depth of 30—40 fathoms, muddy bottom.[1])

111. Amphiascus attenuatus, G. O. Sars, n. sp.

(Pl. CXII).

Specific Characters.—Female. Body moderately robust and very conspicuously attenuated behind, exhibiting in the dorsal view of the animal a somewhat clavate form. Cephalic segment very large and broad, evenly rounded in front; rostrum rather broad, triangular. Urosome much narrower than the anterior division and evenly tapering behind, last segment about the length of the preceding one. Caudal rami quadrangular in form, being a little broader than they are long, the 2 middle apical setæ, but especially the inner one peculiarly expanded near the base. Anterior antennæ rather slender and composed of 9 well-defined joints, the first 4, composing the proximal part, being nearly equal in length, terminal part comparatively short, scarcely exceeding $^1/_3$ of the proximal one. Posterior antennæ likewise of rather slender form, outer ramus very small and composed of only 2, not very distinctly defined joints. Oral parts, on the whole, normal. 1st pair of legs differing somewhat in structure from those in the other species, outer ramus much shorter than the 1st joint of the inner, its largest joint being the middle one, with a comparatively short seta at the end inside, last joint rather small and armed with 3 spines and 2 geniculated setæ; 1st joint of inner ramus very slender, linear, being about 3 times as long as the other 2 combined, last joint not much longer than the 2nd and slightly expanded distally, carrying on the tip 2 strong claws and a small hair-like bristle inside them. Natatory legs rather strongly developed, with the full number of setæ. Last pair of legs with the distal joint oval in form, and carrying 6 comparatively short marginal setæ; inner expansion of proximal joint rather broad, extending to about the middle of the distal joint, marginal setæ 5 in number, spiniform, the outermost one very small. Ovisacs of moderate size.

Colour whitish, with rosy ovaries, and the ovisacs generally of a dark purple hue.

Length of adult female 0.87 mm.

Remarks.—This form differs in some respects rather conspicuously from the other species, especially as regards the structure of the two pairs of antennæ

[1]) Found occasionally this summer at Farsund, south coast of Norway.

and the 1st pair of legs: and it ought perhaps more properly to be referred to the genus *Pseudodiosaccus* recently established by Th. Scott. The oral parts, however, which in this genus are said to be built upon the same type as in *Diosaccus*, are quite normal in the present species, and the inner ramus of the 4th pair of legs is composed of 3 well-defined joints.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were found in a sample taken at Kopervik, on the west coast of Norway.[1])

112. Amphiascus phyllopus, G. O. Sars, n. sp.

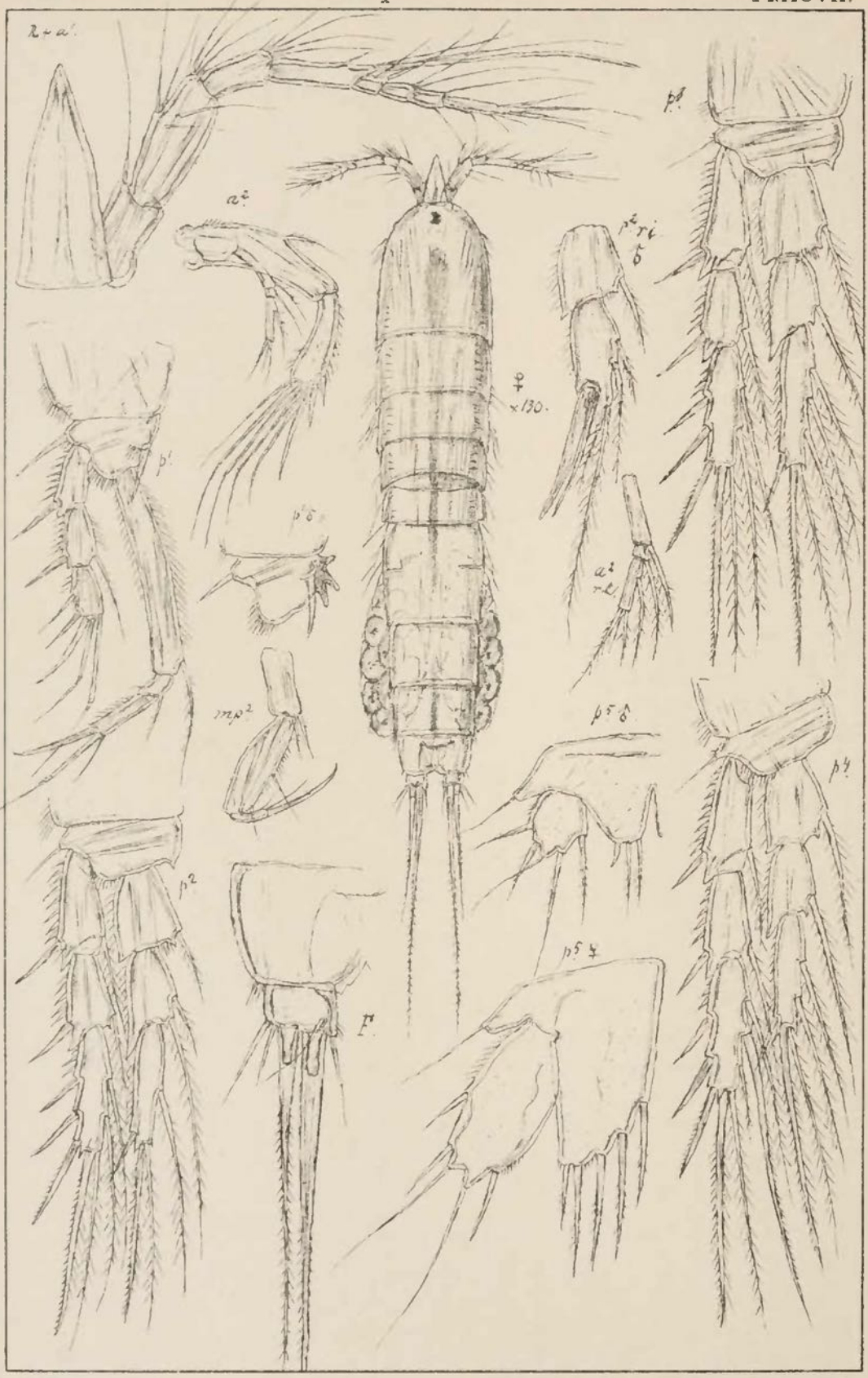
(Pl. CXIII).

Specific Characters.—Female. Body comparatively short and stout, only slightly tapered behind. Cephalic segment rather large, fully as long as the 4 succeeding segments combined, and obtusely rounded in front; rostrum prominent, obtusely acuminate at the tip. Urosome not much shorter than the anterior division, segments sharply defined and coarsely spinulose at the hind edge ventrally and laterally, genital segment large, quadrangular, imperfectly divided in the middle, last segment somewhat shorter than the preceding one. Caudal rami comparatively large, quadrangular in form, being nearly as long as they are broad, middle apical setæ rather elongated and somewhat thickened in their proximal part. Anterior antennæ unusually short, 8-articulate, the first 4 joints gradually diminishing in size, terminal part about half the length of the proximal. Posterior antennæ with the outer ramus about the length of the terminal joint of the inner, middle joint very small and imperfectly defined, without any seta. 1st pair of legs rather strongly built, outer ramus much shorter than the 1st joint of the inner, the middle joint being much the largest, with a small seta at the end inside, last joint small, rounded, with 4 strong claw-like spines and a slender seta on the inner side; outer 2 joints of inner ramus very short, the last one armed at the tip with 2 strong claws of unequal length. Natatory legs well developed, with the rami rather broad and exhibiting the full number of setæ. Last pair of legs very large, foliaceous, distal joint of unusual size, forming a broadly oval lamella fringed with 6 marginal setæ of rather unequal length; inner expansion of proximal joint very broad, but scarcely extending to the middle of the distal joint, marginal setæ 5 in number, the outermost one very small, the 3rd much longer than the others. Ovisacs of moderate size.

[1]) Found this summer rather abundantly at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand.

Copepoda

Diosaccidæ — Harpacticoida — Pl. XCVII.



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

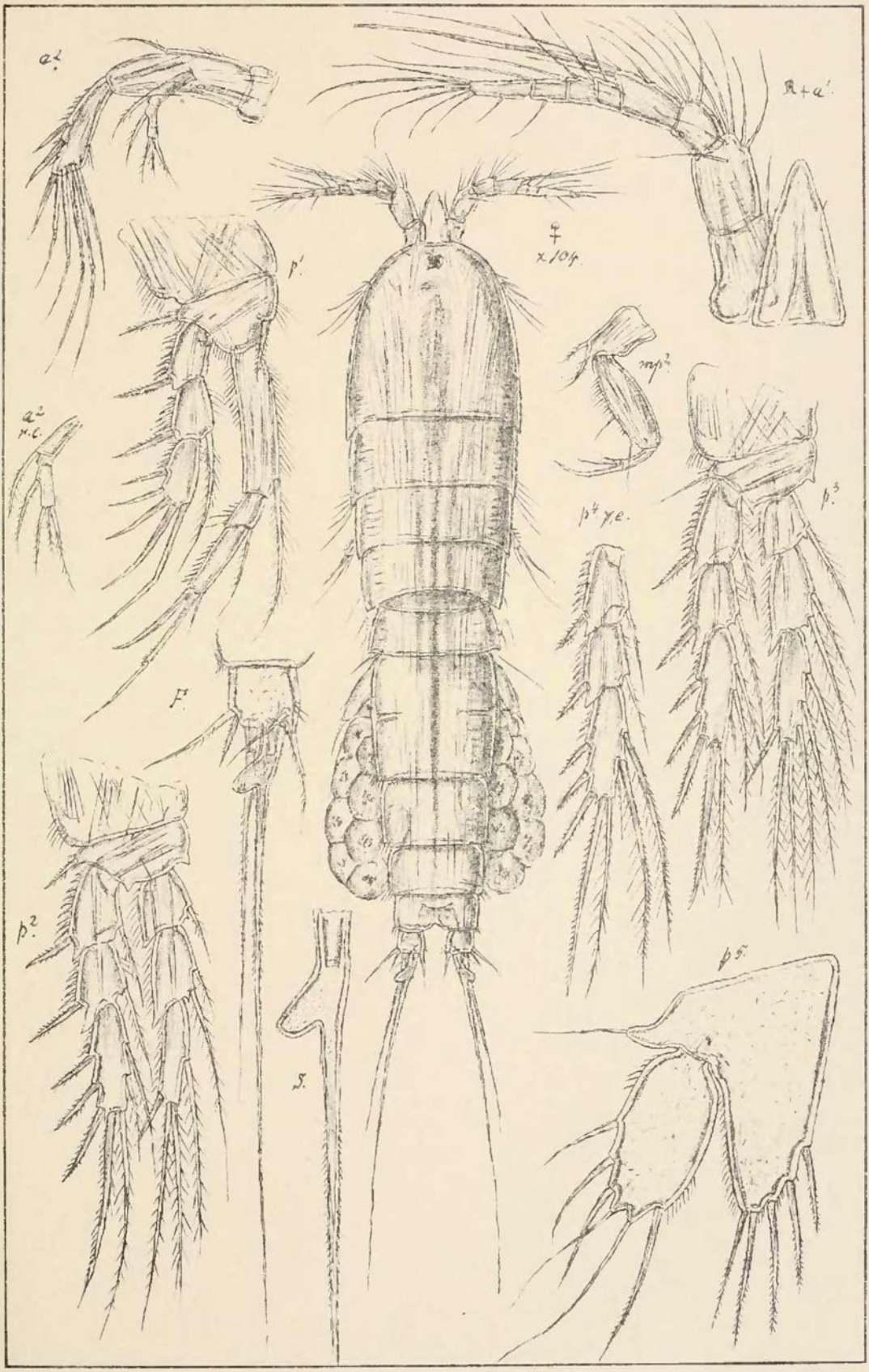
Amphiascus imus (Brady)

Copepoda

Harpacticoida

Diosaccidæ

Pl.XCVIII.



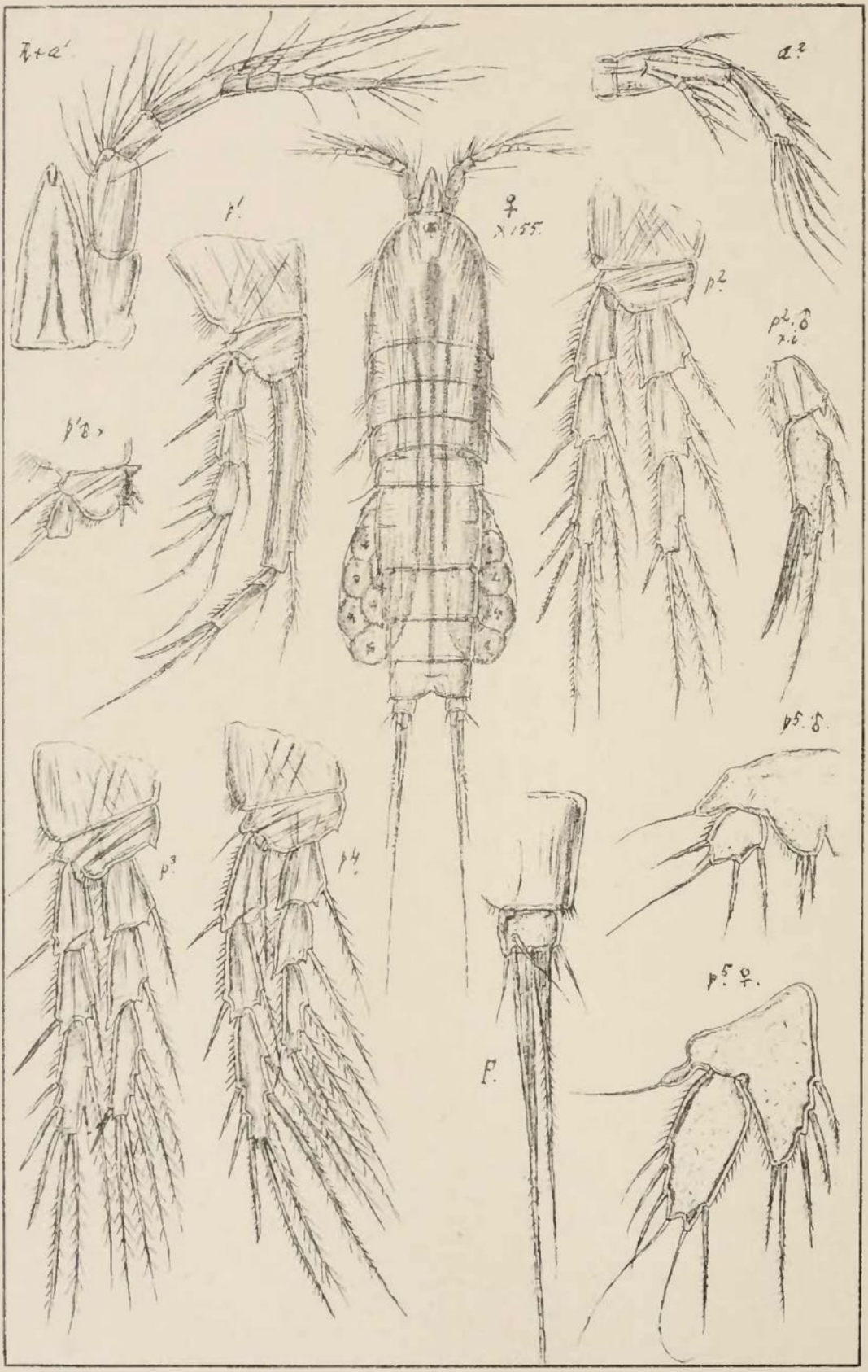
G.O.Sars autogr.

Amphiascus Giesbrechti G.O.Sars.

Norsk lithgr. Officin

Copepoda

Diosaccidæ — Harpacticoida. — Pl. XCIX.

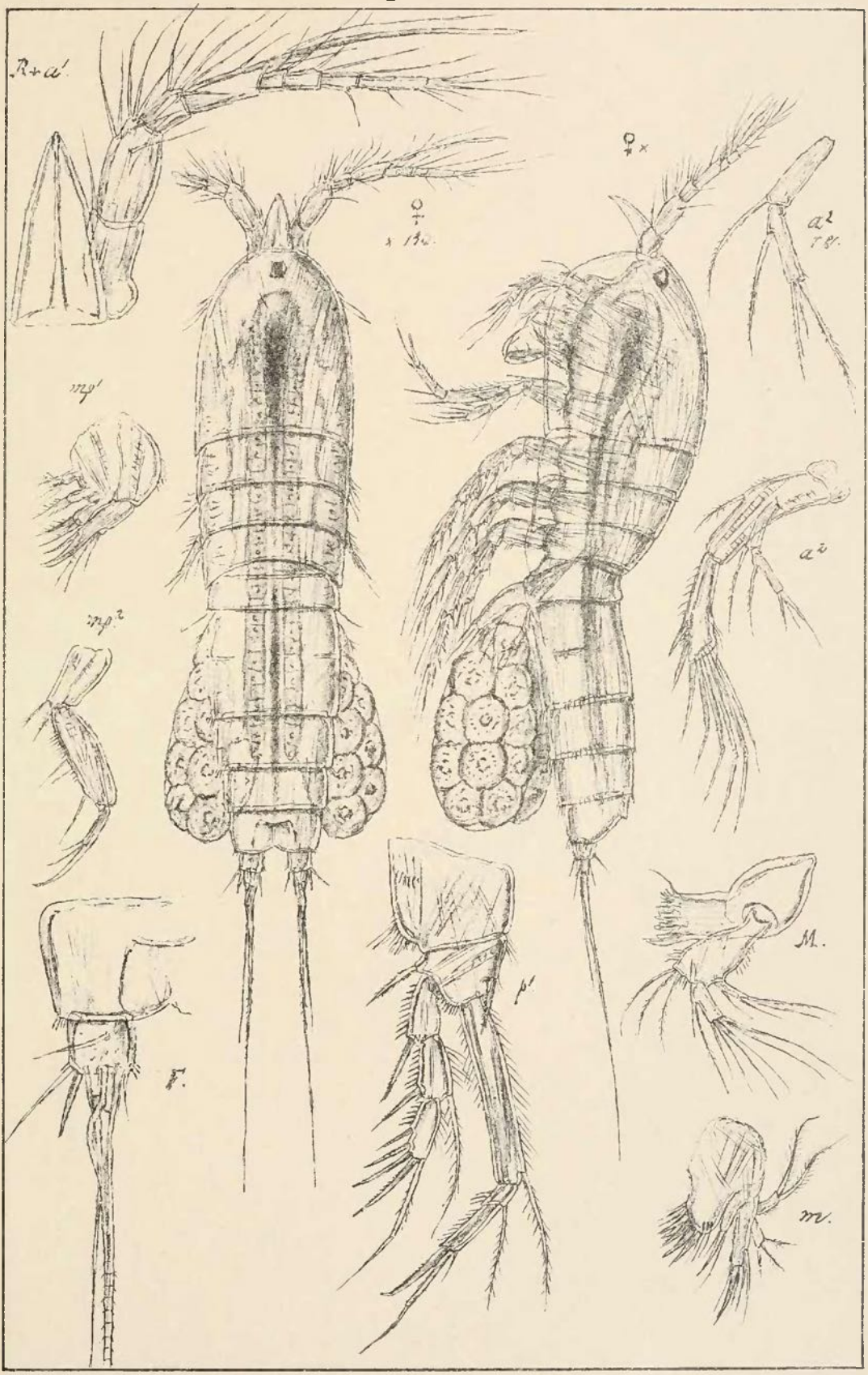


G.O.Sars autogr — Norsk lithgr. Officin

Amphiascus propinqvus G.O.Sars.

Copepoda

Diosaccidæ — Harpacticoida — Pl.C.

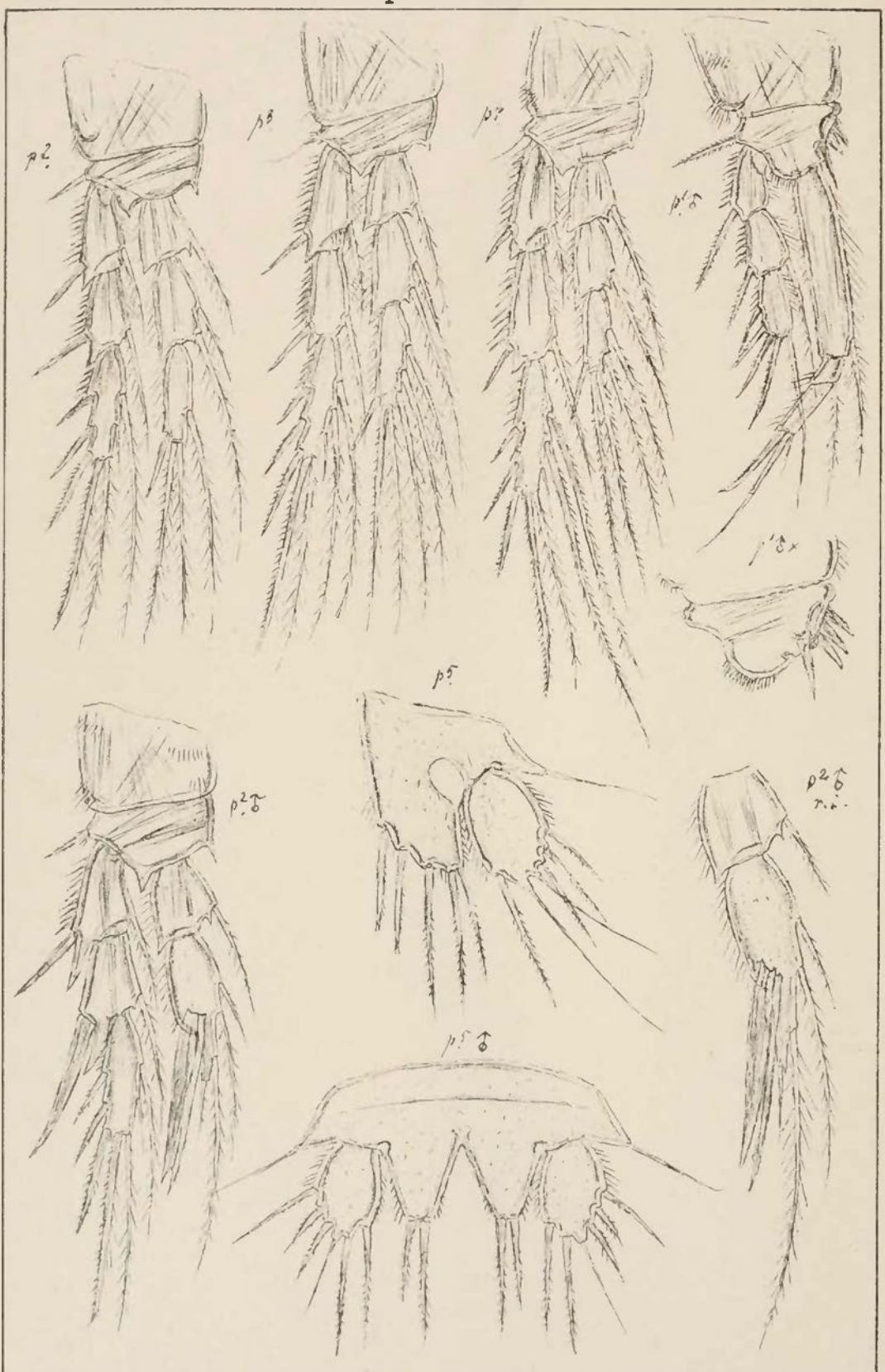


G.O.Sars autogr.

Amphiascus longirostris,(Claus)

Norsk lithgr Officin

Copepoda

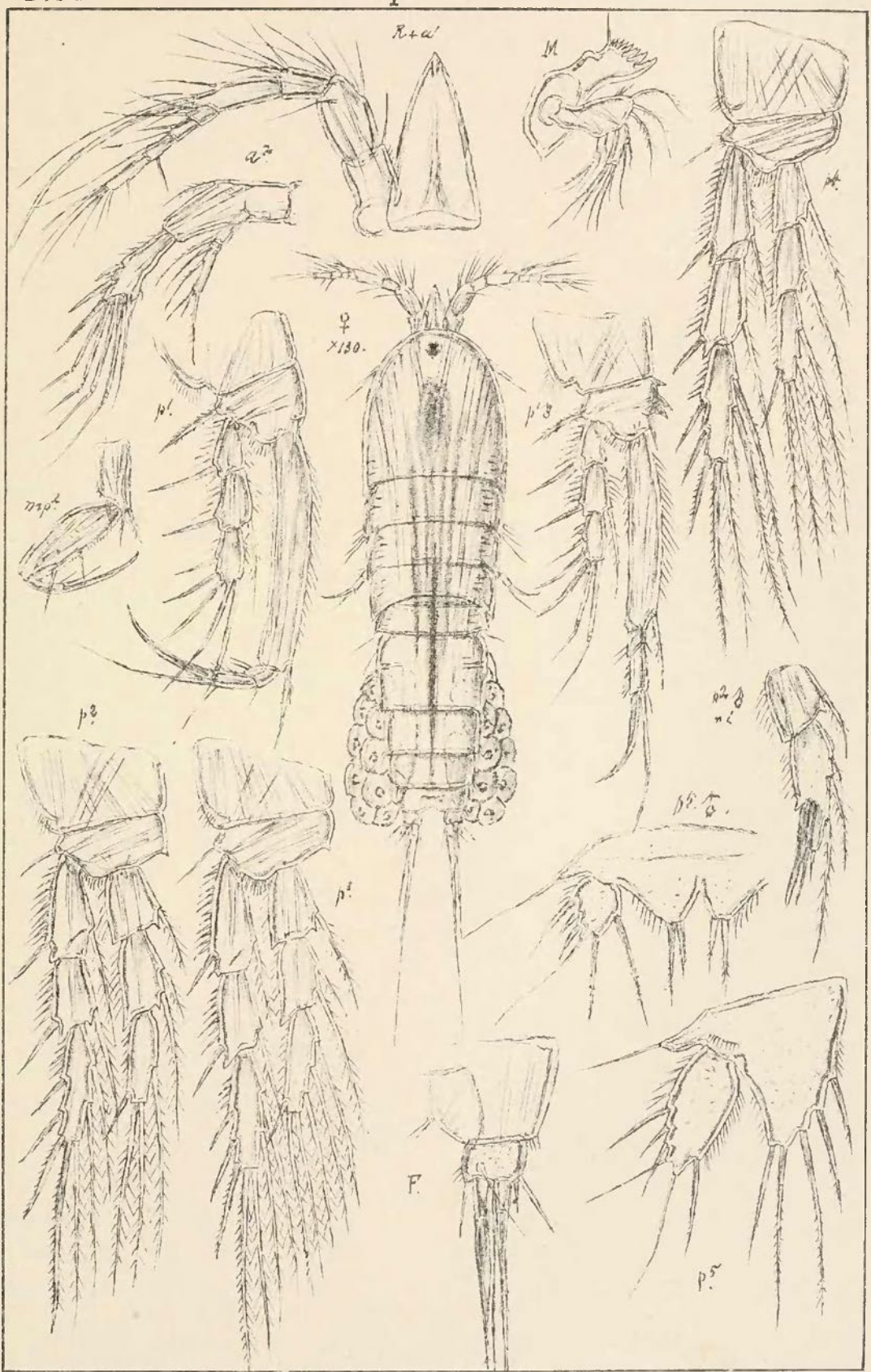


G.O. Sars autogr. Norsk lithgr. Officin

Amphiascus longirostris, (Claus)
(continued)

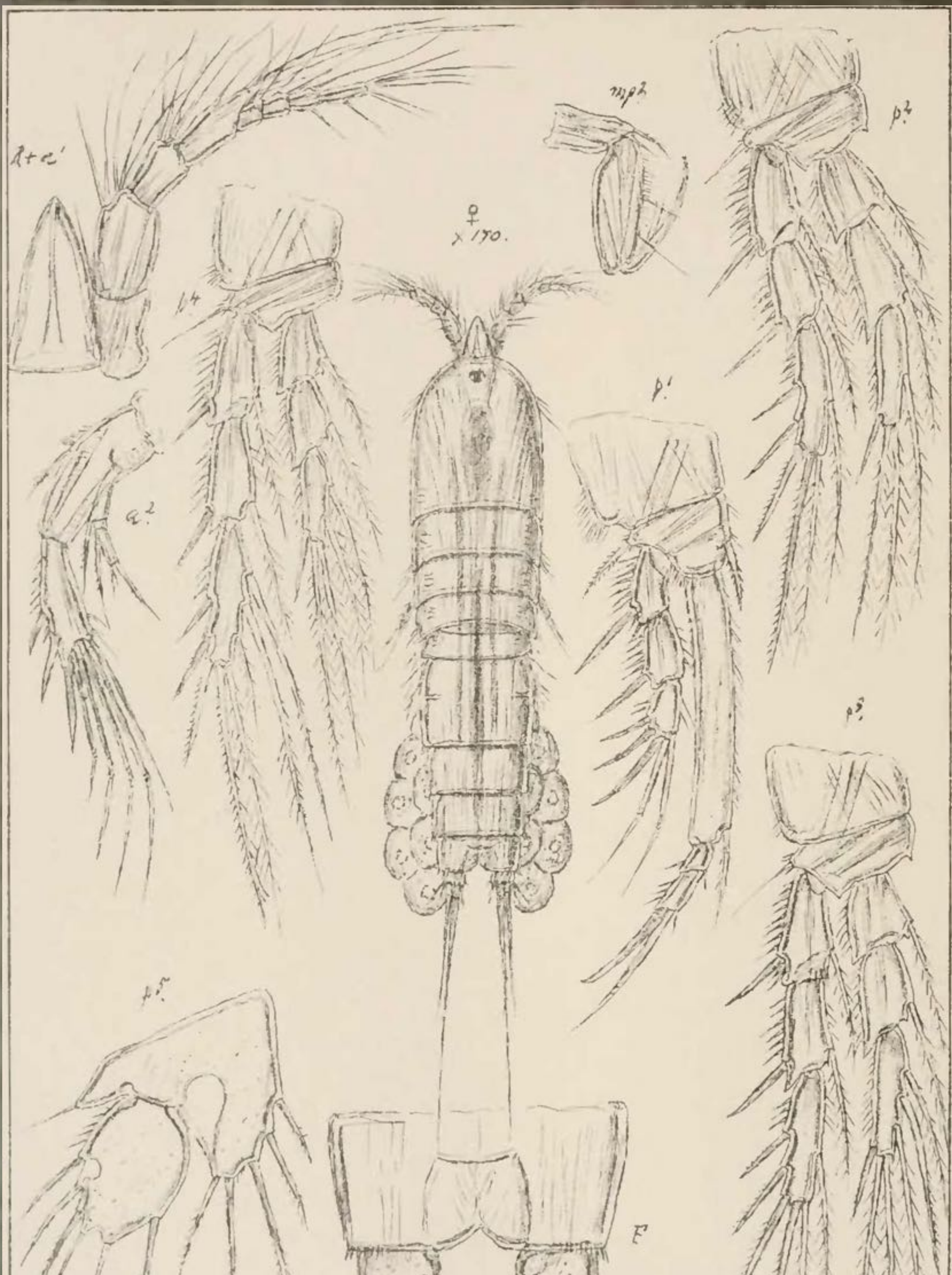
Copepoda

Diosaccidæ — Harpacticoida — Pl. CII



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

Amphiascus tenuiremis, (Brady.)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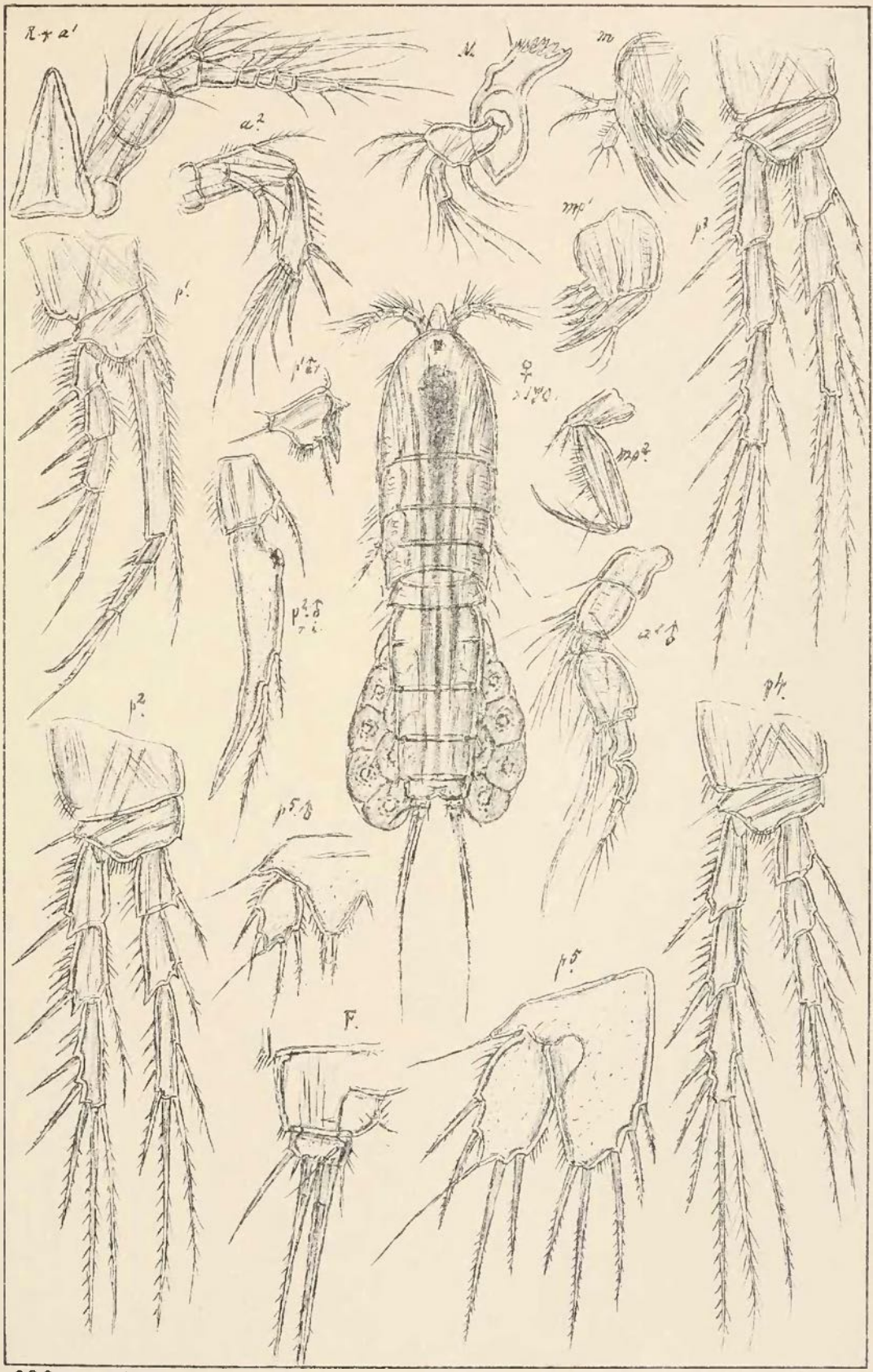
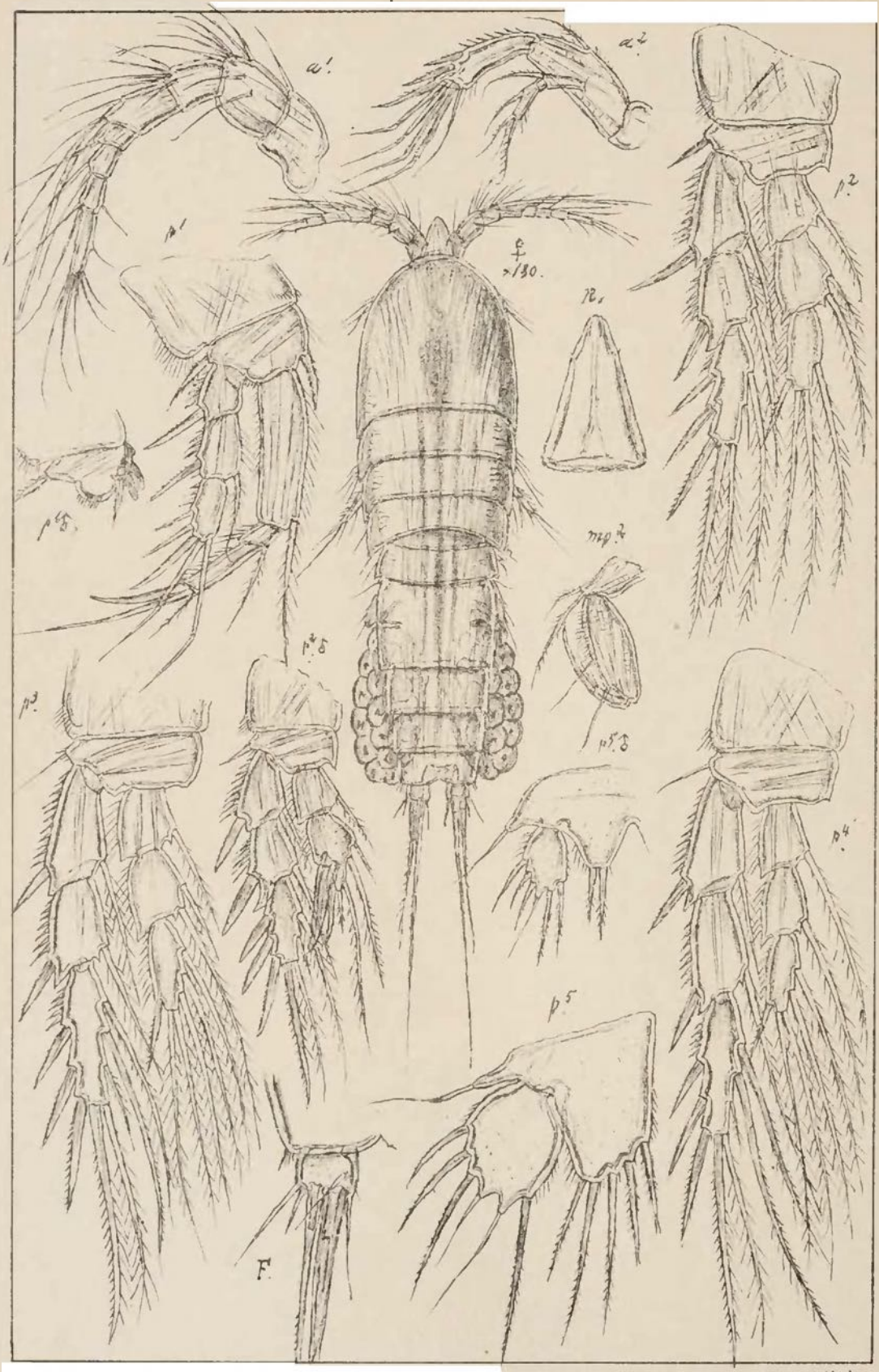


G.O.Sars autogr

Norsk lithgr. Officin

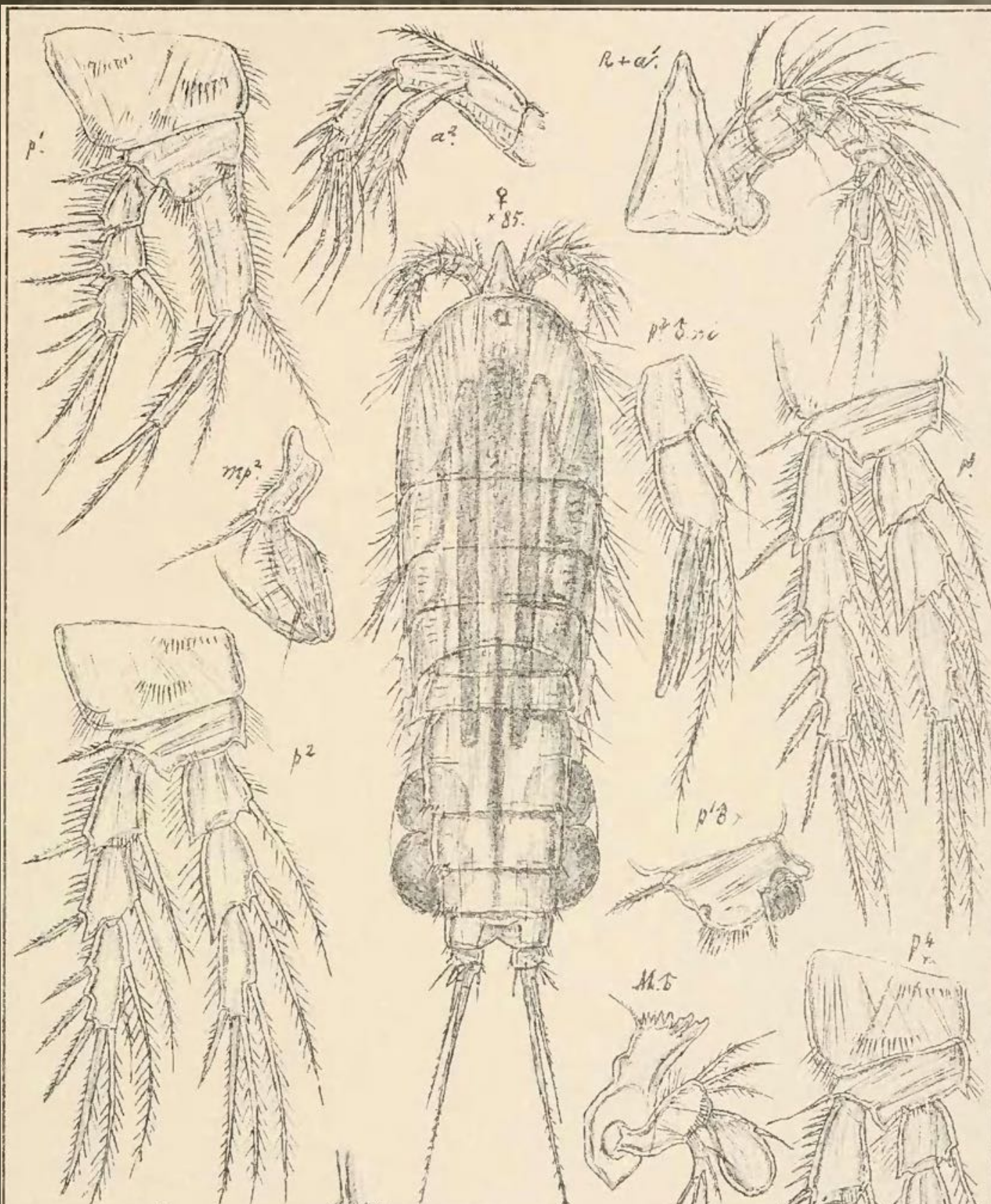
Amphiascus debilis, (Giesbr.)

Copepoda



G.O.Sars autogr. Norsk lithgr Officin

Amphiascus pallidus, G.O.Sars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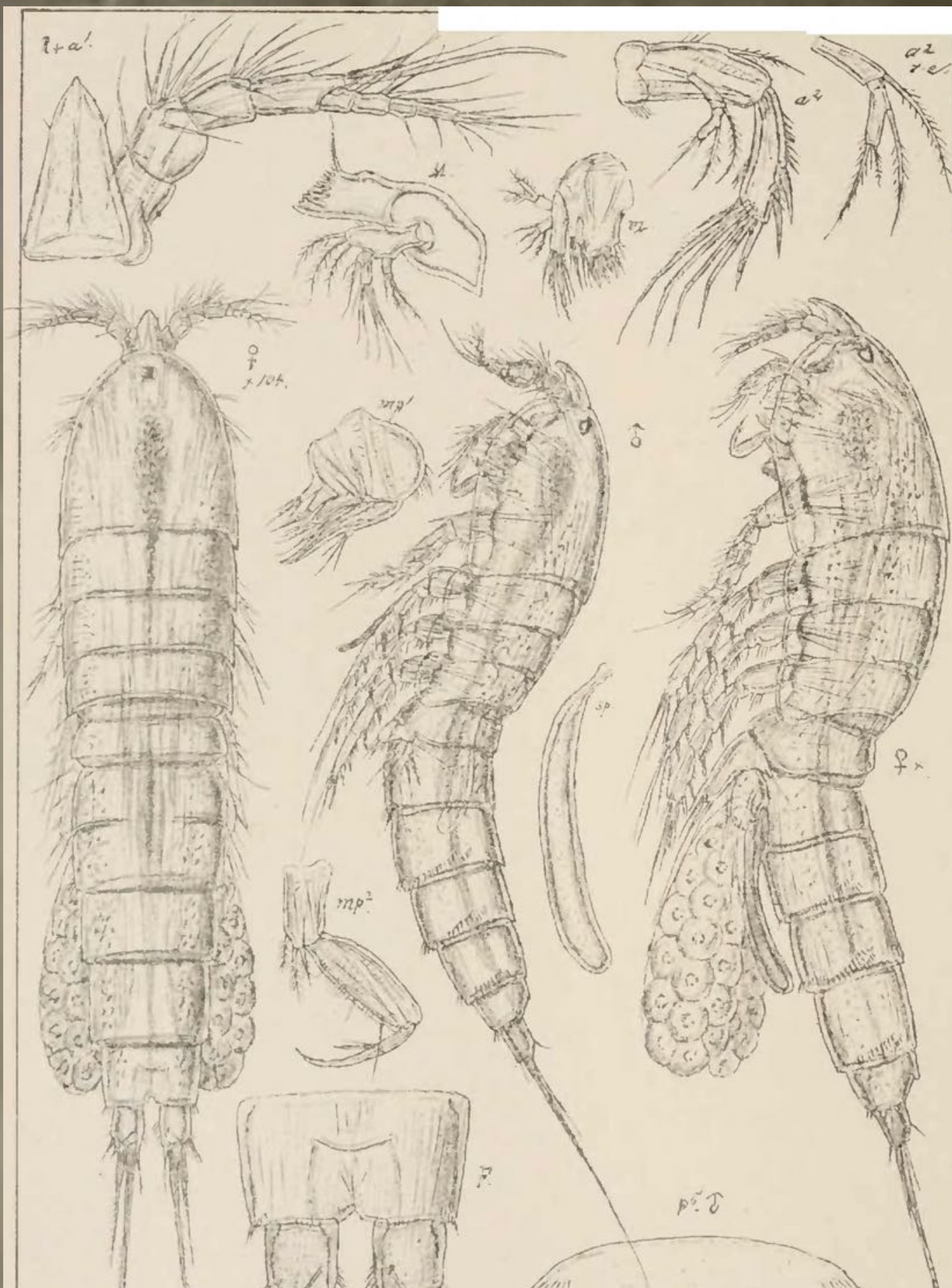
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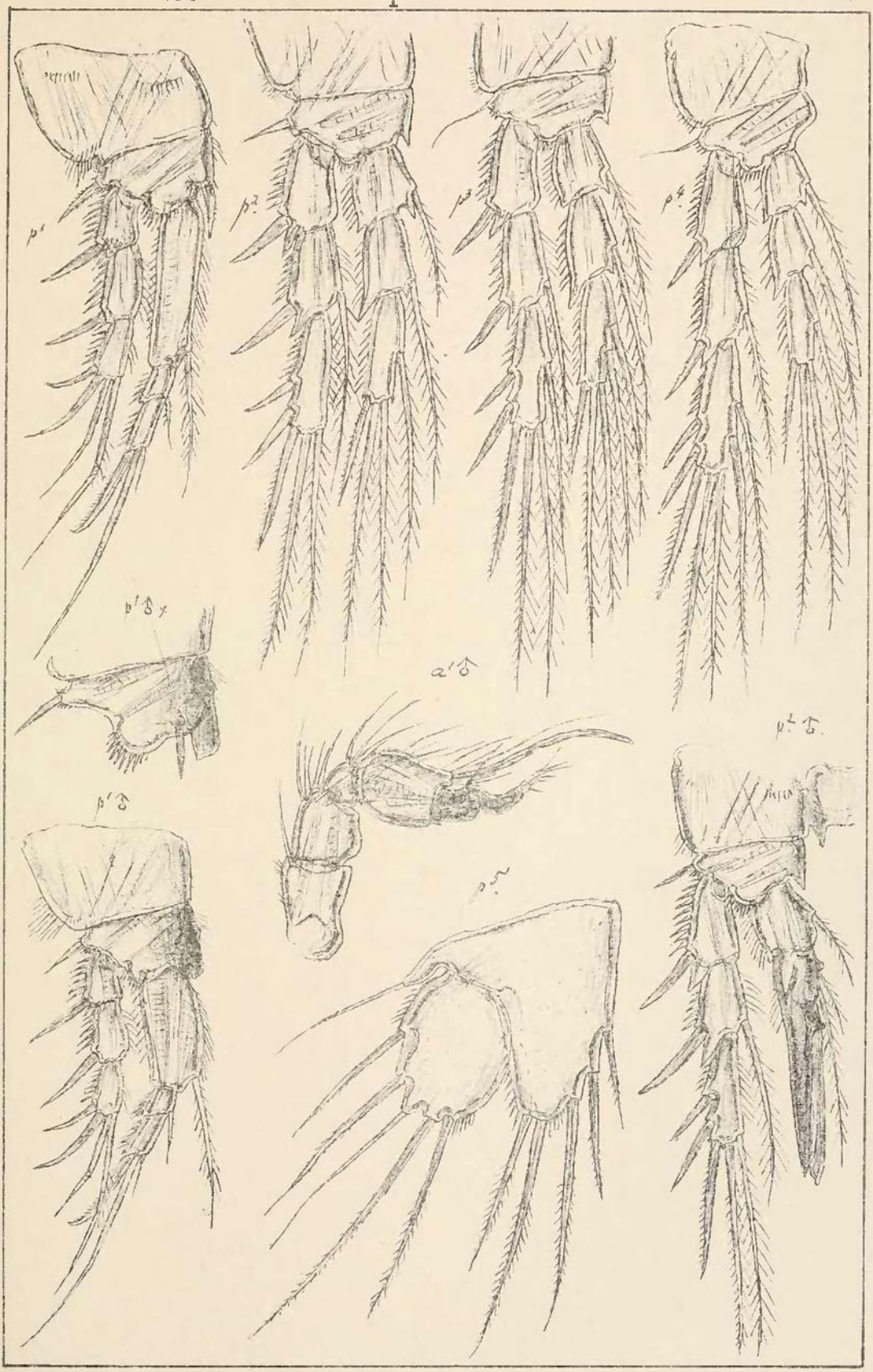
Copepoda



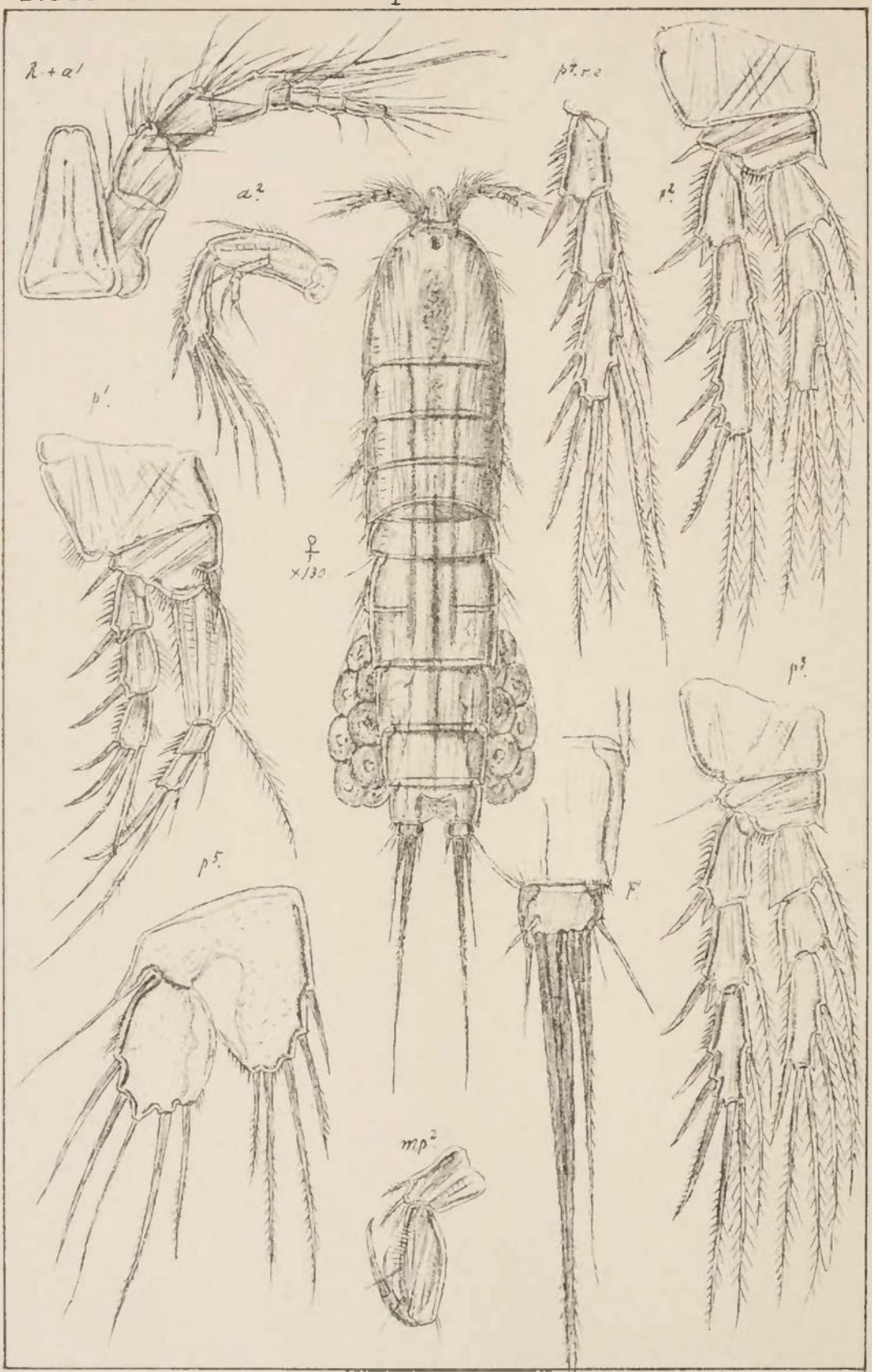
G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus hispidus, (Norm.)

(continued)

Copepoda

Diosaccidæ — Harpacticoida — Pl. CIX.

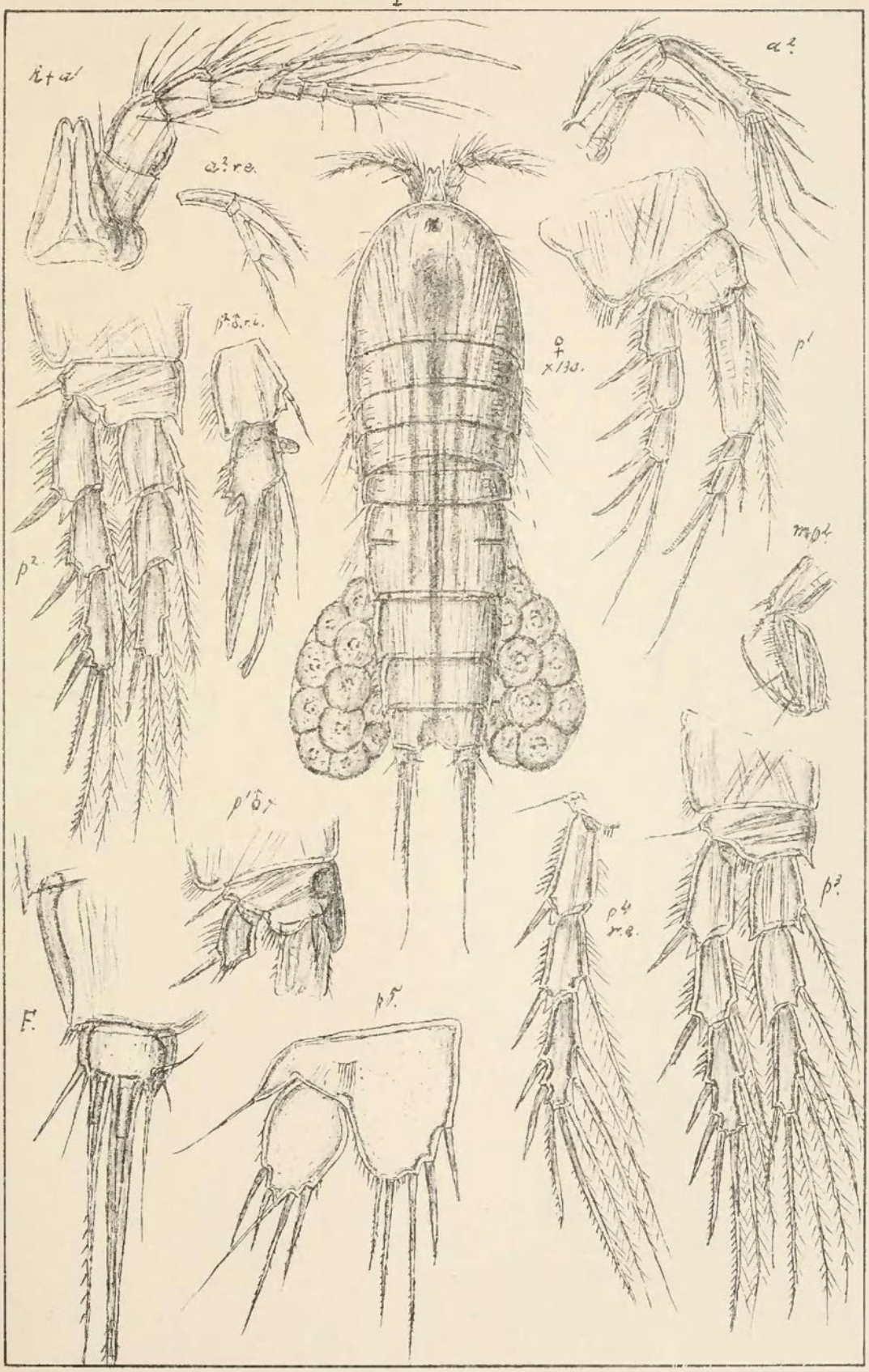


G.O.Sars autogr.

Norsk lithgr. Officin

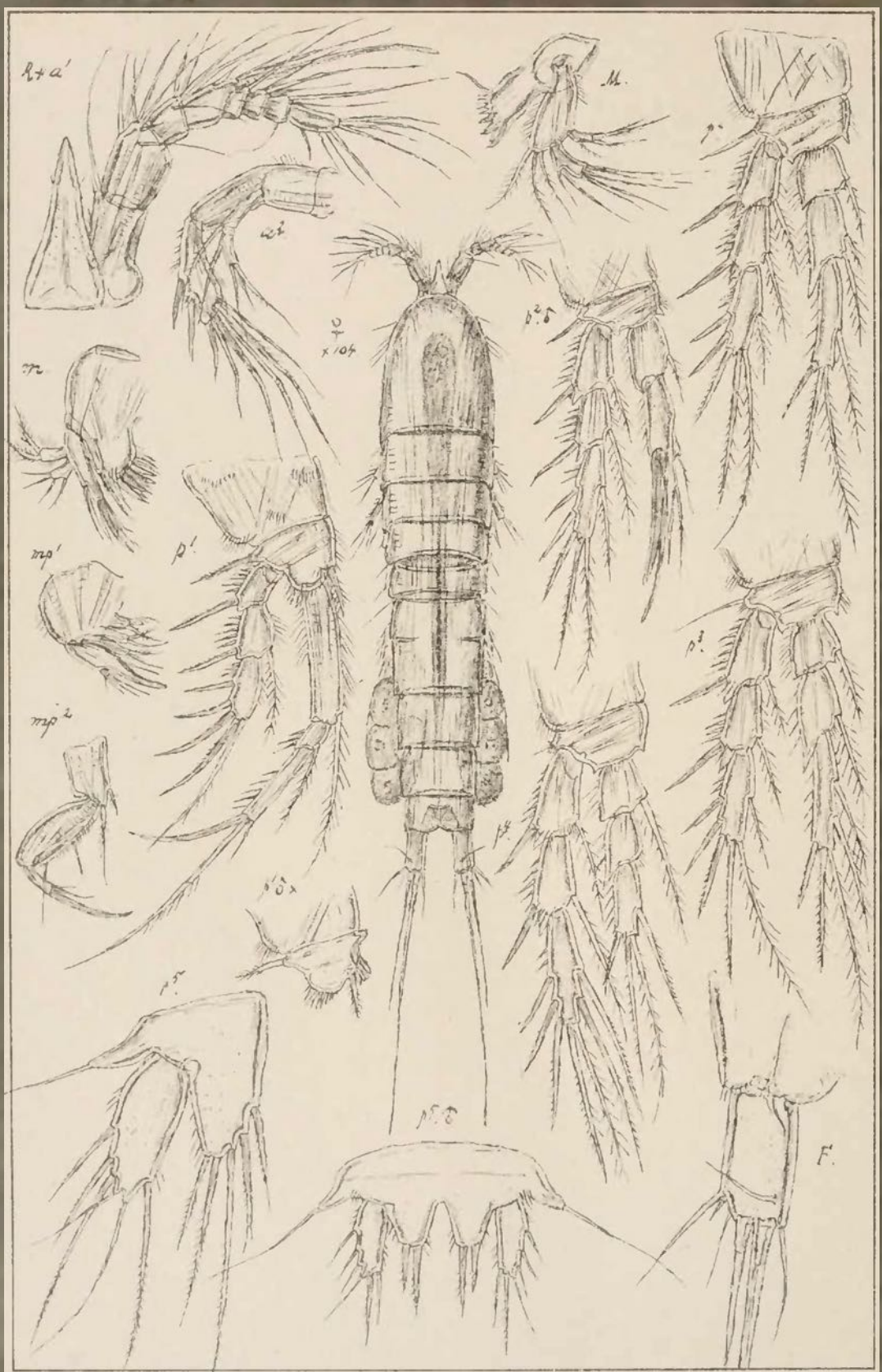
Amphiascus affinis G.O.Sars.

Copepoda



G.O.Sars autogr. Norsk lithgr. Officin

Amphiascus intermedius,(Scott.)



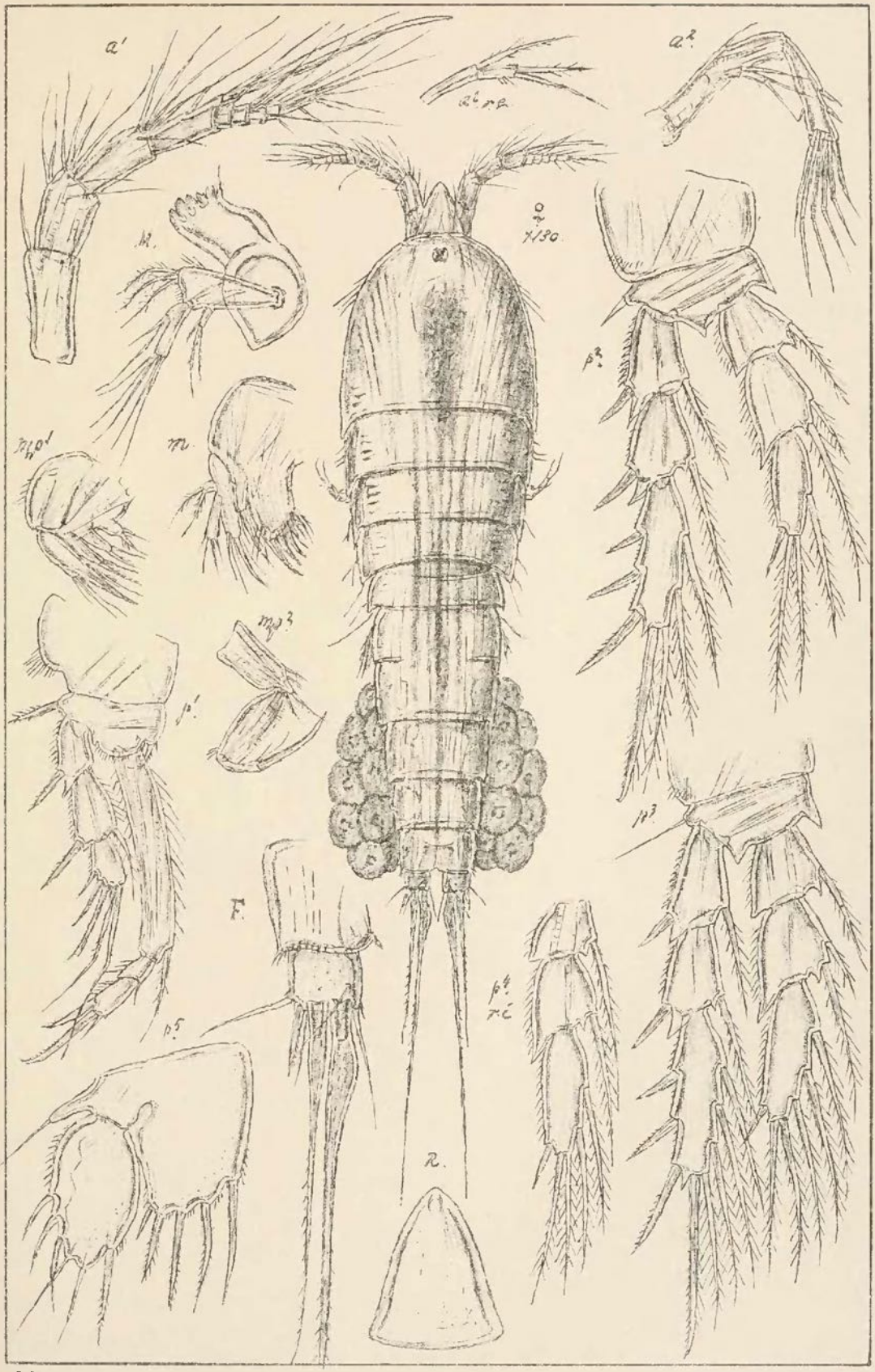
Amphiascus typhlops, G.O.Sars

Copepoda

Harpacticoida

Diosaccidæ

Pl.CXII.



G.O.Sars autogr.

Norsk lithgr. Officin

Amphiascus attenuatus, G.O.Sars