AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

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COPEPODA
HARPACTICOIDA

PARTS XXV & XXVI

LAOPHONTIDÆ (concluded), CLETODIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

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small setæ in addition to the spines; inner ramus in all pairs distinctly developed, biarticulate, that of the anterior pair having 2, and that of the other 2 pairs 3 apical setæ. Last pair of legs somewhat more fully developed than in *P. littoralis*, distal joint comparatively larger and rounded oval in form, inner expansion of proximal joint triangularly produced at the end, and not extending quite as far as the distal joint, number of setæ in both joints as in the type species. Ovisac oval in form

Male differing from female very much as in the type species.

Colour pale yellow.

Length of adult female 0.80 mm.

Remarks.—In its external appearance this form exhibits a perplexing resemblance to certain species of *Laophonte*, especially that described above as *Laophonte minuta* Boeck, and may, indeed, at first sight be easily confounded with that species. The anatomical examination proves it, however, to be unquestionably referable to the present genus and not to *Laophonte*, though clearly showing the near relationship of these two genera. The specific name here proposed is intended to indicate this relationship as regards the present species.

Occurrence.—I have found this form not infrequently in the upper part of the Christiania Fjord in a depth of 3—10 fathoms, muddy bottom. It occurred here in company with the above-mentioned species of *Laophonte*, to which it bears so close a resemblance as regards its external appearance.

Gen. 57. **Normanella** Brady, 1880.

Generic Characters.—Body comparatively short and stout, somewhat resembling in shape that in *Laophonte*, all the segments being sharply marked off from each other, and bordered behind with delicate spinules. Cephalic segment large, with the rostral plate triangular and defined at the base by a well-marked transversal suture, as in the genus *Laophontopsis*. Genital segment in female distinctly divided in the middle. Caudal rami somewhat distant and sub-linear in form. Anterior antennæ comparatively short, and composed of only 5 articulations, the 1st joint of the terminal part being coalesced at the base with the preceding joint, which is produced at the end anteriorly and provided with the usual sensory filament. These antennæ are strongly hinged in the male. Posterior antennæ with the outer ramus uniarticulate, carrying 2 lateral and 2 apical setæ. Mandibles well developed, with the palp distinctly biramous, being composed of

a broad basal part and 2 small uniarticulate rami. Maxillæ with the exopodal and epipodal lobes distinctly defined. Anterior maxillipeds with 2 setiferous lobes inside the claw-bearing joint. Posterior maxillipeds moderately strong and of usual structure. 1st pair of legs somewhat resembling those in *Laophonte*, but less strongly built, outer ramus very small, 3-articulate, and abruptly bent at the base, inner ramus biarticulate and distinctly prehensile, proximal joint long and slender with a well-developed seta inside at some distance from the end, distal joint incurved and armed at the tip with a slender claw and a still more slender seta, its outer edge carrying moreover a small bristle. Natatory legs with the inner ramus more fully developed than in *Laophonte*, though consisting of only 2 joints, the proximal one somewhat expanded, the distal one narrow, with 5 or 6 slender setæ. None of these legs are transformed in male. Last pair of legs with the distal joint long and narrow, proximal joint narrowly produced inside; those in male, as usual, much smaller than those in female.

Remarks.—Though the systematic position of this genus appears somewhat doubtful, I think that it should more properly be placed in the family *Laophontidæ*, with which it agrees both in the external appearance of the body and in most of the anatomical details. The most conspicuous difference is found in the structure of the mandibular palp, which, unlike that in the other genera, is distinctly biramous. The separation of the rostral plate from the cephalic segment by a transversal suture, and the presence of a ciliated seta inside the proximal joint of the inner ramus in the 1st pair of legs, are both characters which it shares with another genus evidently belonging to the present family, viz., *Laophontopsis*. The form recorded by Th. Scott as *Normanella attenuata* cannot by any means be referred to the present genus. In addition to the type species, 2 new, nearly-allied species will be described below.

183. Normanella minuta (Boeck).

(Pl. CXCIII).

Mesochra minuta, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 50.

Syn: *Normanella dubia*, Brady.

Specific Characters.—Female. Body sub-cylindrical in shape, though not very slender, and slightly constricted in the middle. Cephalic segment about the length of the 3 succeeding segments combined, and somewhat contracted in front, rostral plate triangular, with the tip obtusely acuminate. Urosome nearly as long

as the anterior division, and having the lateral parts of the segments slightly projecting; last segment about the length of the preceding one, anal opercle somewhat prominent and finely denticulate. Caudal rami comparatively short, not attaining the length of the anal segment, being about twice as long as they are broad; middle apical seta normal and distinctly jointed at the base. Anterior antennæ scarcely half as long as the cephalic segment, and clothed with partly ciliated setæ, 3rd joint the largest, terminal part about the length of this joint. Posterior antennæ with the outer ramus rather small, scarcely half as long as the basal joint. 1st pair of legs with the outer ramus about half as long as the inner, its last joint longer than the middle one, and armed with 3 spines and 2 geniculate setæ; inner ramus very slender, with the distal joint about $^1/_4$ the length of the proximal one. Natatory legs of moderate size, with the outer ramus rather narrow, inner ramus of 2nd pair extending almost to the middle of the terminal joint of the outer, that of 4th pair much shorter. Last pair of legs with the distal joint very narrow, sub-linear in form and densely ciliated on both edges, marginal setæ 6 in number, some of them rather slender and elongated; inner expansion of proximal joint extending considerably beyond the middle of the distal joint, and carrying 5 setæ, 3 of them very long and issuing from the tip. Ovisac of moderate size and oval in form.

Male with the anterior antennæ very strong, sub-clavate in form, 4th joint globularly dilated, terminal part claw-like, incurved. Last pair of legs much smaller than in female, distal joint rather small and provided with only 4 setæ; inner expansion of proximal joint tipped with 2 subequal setæ.

Colour light reddish yellow.

Length of adult female 0.55 mm.

Remarks.—This form was very imperfectly characterised by Boeck and erroneously referred by him to the genus *Mesochra,* apparently owing to a certain similarity in the structure of the inner rami of the natatory legs. Prof. Brady did not recognise the Boeckian species, and described it as the type of a new genus under the name of *Normanella dubia,* placing it next to the genus *Laophonte.*

Occurrence.—I have met with this form occasionally in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths among algæ. Boeck records it also from the Christiania Fjord.

Distribution.—British Isles (Brady).

184. Normanella tenuifurca, G. O. Sars, n. sp.

(Pl. CXCIV, fig. 1).

Specific Characters.—Female. Body comparatively more slender than in the type species and more evenly attenuated behind. Cephalic segment large, attaining about the length of the 4 succeeding segments combined, rostral plate, however, smaller than in *N. minuta*, and obtuse at the tip. Caudal rami much narrower and more produced than in that species, exceeding in length the anal segment, and more than 3 times as long as they are broad, outer edge finely ciliated in its proximal half, apical setæ normal. Antennæ and oral parts about as in *N. minuta*. 1st pair of legs likewise of a very similar structure, though having the terminal joint of the outer ramus comparatively shorter, scarcely longer than the middle joint. Natatory legs scarcely different from those in the type species. Last pair of legs, however, comparatively smaller, with the distal joint less produced and somewhat tapering towards the end.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present form is closely allied to *N. minuta*, but is of smaller size, and moreover differs conspicuously in the shape of the rostral plate and in the much narrower and more produced caudal rami.

Occurrence.—Some few specimens of this form were picked up from a sample taken at Bukken, south-west coast of Norway, from a depth of about 20 fathoms.

185. Normanella mucronata, G. O. Sars, n. sp.

(Pl. CXCIV, fig. 2).

Specific Characters.—Female. Body on the whole more strongly built than in the 2 preceding species, though of a very similar appearance. Rostral plate very prominent, terminating in a sharp mucroniform point. Last caudal segment much shorter than the preceding one, anal opercle prominent, semilunar, and coarsely denticulate. Caudal rami about twice as long as they are broad, and exhibiting dorsally a well-marked longitudinal keel, middle apical seta exceedingly strong, spiniform, not jointed at the base. Antennæ, oral parts and 1st pair of legs very similar to those appendages in the 2 preceding species. Natatory legs comparatively larger. Last pair of legs likewise more fully developed, with the inner expansion of proximal joint more produced, extending almost as far as the distal joint.

Colour not yet ascertained.

Length of adult female 0.56 mm.

Remarks.—This species, though closely allied to the 2 preceding ones, is at once distinguished by its more robust body, the acutely produced rostral plate, the structure of the caudal rami, and more particularly by the unusually strong development of the middle apical seta.

Occurrence.—A few female specimens of this form were found in samples taken off the south coast of Norway, some at Flekkerø, some at Farsund, from moderate depths.

Fam. 14. Cletodidæ.

Characters.—General habitus somewhat resembling that in the *Laophontidæ*, the segments being, as a rule, sharply marked off from each other, giving the body a more or less scalariform appearance. Cephalic segment generally produced in front to a lamellar projection, which however is not defined at the base by any suture. Genital segment in female distinctly subdivided in the middle. Anterior antennæ with the number of articulations reduced; those in male strongly hinged. Posterior antennæ with the outer ramus small or quite rudimentary. Oral parts on the whole resembling in structure those in the *Laophontidæ*. Posterior maxillipeds, however, less powerfully developed. 1st pair of legs scarcely larger than the succeeding ones, and not prehensile, outer ramus 3-articulate, inner generally biarticulate and shorter than the outer. The 3 succeeding pairs of legs with the number of natatory setæ generally much reduced, inner ramus always much shorter than the outer, and never composed of more than 2 joints. Last pair of legs, as a rule, less conspicuously foliaceous than in the *Laophontidæ*. Ovisac single, or in some cases double.

Remarks.—In this family I propose to include a number of genera, which show, as regards both the outward appearance of the species and their habits, an evident resemblance to the *Laophontidæ*, and yet differ materially in the structure of the 1st pair of legs. These are not prehensile, and are generally smaller than the succeeding pairs, from which they do not in most cases differ materially, thus deserving, like those pairs, the name of natatory legs. In this respect this family was more properly entitled to be referred to the sub-section of the *Chirognata* proposed in the Introduction to this works with the name *C. pleopoda*, as opposed

to the sub-section *C. dactylopoda*, which has already been treated of. I am now of opinion, however, that the structure of the 1st pair of legs, being subjected to great variation even in nearly-related forms, cannot properly be taken as a more general systematic character.

Gen. 58. Cletodes, Brady, 1872.

Generic Characters.—Body more or less slender, cylindrical or tapering behind, with the segments sharply marked off from each other and armed at the hind edge with scattered, somewhat scale-like denticles. Integuments rather coarse. Cephalic segment produced in front to a broadly triangular rostral plate. Caudal rami more or less produced, each carrying outside, in front of the middle, 2 closely juxtaposed bristles, apical setæ comparatively short. Eye distinct. Anterior antennæ (in female) 5-articulate, and clothed with strong, partly ciliated setæ, terminal part biarticulate, with the last joint much the larger. Posterior antennæ rather strongly built, but with the outer ramus rudimentary, being replaced by a single ciliated seta. Mandibles well developed, palp uniarticulate, resembling that in *Laophonte*. Maxillæ with the masticatory part divided into 3 very coarse teeth, exopodal and epipodal lobes generally distinct. Anterior maxillipeds very strongly built; the posterior ones, on the other hand, rather feeble. 1st pair of legs only slightly differing in structure from the succeeding ones, inner ramus shorter than the outer, and biarticulate, distal joint much the longer. Last pair of legs with the distal joint long and narrow, inner expansion of proximal joint, however, as a rule quite short, setæ of both joints generally long and plumose. Ovisac single.

Remarks.—This genus was established by Prof. Brady in the year 1872, to include a species, *C. limicola*, found by him off the British coast. In recent time several new species have been added, but some of these in my opinion ought to be discarded and referred to other nearly-allied genera. In the restriction here adopted, the genus is chiefly characterised by the rudimentary condition of the outer ramus of the posterior antennæ, by the strong development of the oral parts, and partly also by the structure of the legs. 5 distinct species referable to this genus will be described below.

186. Cletodes limicola, Brady.

(Pl. CXCV).

Cletodes limicola, Brady, Monogr. of British Copepoda, Vol. II, p. 90, Pl. LXXIX, figs. 1—12.

Specific Characters.—Female. Body not very slender, but gradually tapering behind, with the segments somewhat raised dorsally. Cephalic segment rather large and deep, with the lower edges abruptly curved in the middle; rostral plate broadly triangular, with the tip slightly bilobed. Urosome nearly as long as the anterior division, and having the anterior segments acutely produced at the lateral corners; last segment about the length of the preceding one, anal opercle distinctly denticulate. Caudal rami scarcely longer than the anal segment, and exhibiting a somewhat peculiar shape, being considerably thickened at the base, with a rounded dorsal elevation, extremity narrowly exserted, middle apical seta only slightly exceeding the length of the ramus itself, dorsal seta issuing from about the middle. Anterior antennæ of moderate size, with the 3rd joint about the length of the 2nd, terminal part half as long as the proximal. Posterior antennæ of the structure characteristic of the genus. Anterior maxillipeds exceedingly strong, and armed with 3 claw-like spines in addition to the bristles. Posterior maxillipeds feeble in structure, with the hand narrow oblong in form, and clothed inside with delicate cilia, dactylus thin and likewise ciliated inside. 1st pair of legs only differing from the succeeding ones in the presence of a slender spine inside the 2nd basal joint, and in the absence of a seta inside the middle joint of the outer ramus. Inner ramus of 2nd pair of legs with only 2 setæ on the tip, in the 2 succeeding pairs with an additional spine outside. Last pair of legs rather fully developed, distal joint narrow, sub-linear in shape, and densely ciliated on both edges, with 5 slender plumose setæ, 2 issuing from the tip, 2 from the outer edge, and 1 from the inner edge; inner expansion of proximal joint rather short, with 5 similar setæ. Ovisac comparatively small, rounded, with a very limited number of ova.

Colour whitish grey.

Length of adult female 0.62 mm.

Remarks.—This is the type of the present genus, having already been recorded by Prof. Brady under the above name in the year 1872. The comparatively stout form of the body and the peculiar shape of the caudal rami will serve for easily recognising this species.

Occurrence.—I have met with this form occasionally at Grimstad and Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy bottom. Only female specimens were found.

Distribution.—British Isles (Brady).

187. Cletodes tenuipes, Scott.

(Pl. CXCVI, fig. 1).

Cletodes tenuipes, Th. Scott, Marine Invertebrata of Loch Fyne. 15th Ann. Report of the Fishery Board for Scotland, Appendix, p. 170, Pl. I, figs. 19—27.

Specific Characters.—Female. Body considerably more slender than in the type species, and slightly tapering behind. Cephalic segment scarcely as long as the 3 succeeding segments combined, rostral projection narrowly truncated at the tip. Urosome shorter than the anterior division, and having the segments less produced at the lateral corners; last segment somewhat widening distally, and about the length of the preceding one. Caudal rami narrow and produced, considerably exceeding in length the anal segment, and slightly bent near the base, dorsal seta issuing far in front of the middle, apical seta longer than in the preceding species. Anterior antennæ with the 3rd joint much smaller than the 2nd. Posterior antennæ resembling in structure those in the type species. Posterior maxillipeds comparatively more strongly built, with the hand oblong oval in form. 1st pair of legs apparently wanting the spine at the inner corner of the 2nd basal joint, otherwise resembling those in *C. limicola*. The 3 succeeding pairs without any seta inside the middle joint of the outer ramus; inner ramus with the distal joint very narrow and produced, carrying only a single apical seta. Last pair of legs much smaller than in the type species, distal joint narrow oblong in form, with the outer apical seta somewhat removed from the tip and rather small; inner expansion of proximal joint nodiform, with only a single seta.

Colour not yet ascertained.

Length of adult female 0.61 mm.

Remarks.—This form, described by Th. Scott in the above-mentioned paper, is nearly allied to *C. limicola*, but is easily distinguishable by its more slender body and the narrower and more produced caudal rami. The very narrow form of the inner ramus in the 2nd to 4th pairs of legs is another character by which this species is distinguished, and which indeed has given rise to the specific name proposed by Th. Scott.

Occurrence.—Some few female specimens of this form were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms. A variety of this species is also recorded by Th. Scott from the Finmark coast.

Distribution.—Scottish coast (Scott), Franz Josef Land (Scott).

188. Cletodes curvirostris, Scott.

(Pl. CXCVI, fig. 2).

Cletodes curvirostris, Th. Scott, Additions to the Fauna of the Firth of Forth. 12th Ann. Rep. of the Fishery Board for Scotland, p. 250, Pl. VIII, figs. 18—26.

Specific Characters.—Female. Body slender, cylindrical in form, being only very slightly tapered behind. Cephalic segment fully as long as the 3 succeeding segments combined, rostral projection rather prominent and terminating in an acute recurved point. Urosome much shorter than the anterior division, and having the 3 anterior segments slightly produced at the lateral corners, penultimate segment very short. Caudal rami rather produced, being almost twice as long as the anal segment, dorsal seta issuing far in front of the middle, apical seta of moderate length. Anterior antennæ comparatively short, with the 3rd joint scarcely more than half as long as the 2nd. Posterior antennæ with the outer ramus, as in the other species, rudimentary, being replaced by a single ciliated seta. Mandibular palp comparatively small, with 2 lateral and 3 apical setæ. Posterior maxillipeds likewise smaller than usual, hand oval in form, seta of basal joint much elongated. Natatory legs shorter and stouter than in the other species, with no setæ inside the outer ramus; inner ramus with the distal joint less produced. Last pair of legs with the distal joint narrow oblong in form, carrying 5 setæ, the apical one very strong and elongated, the other 4 comparatively small; inner expansion of proximal joint conically produced, and extending almost to the middle of the distal joint, marginal setæ 3 in number, one at the tip and 2 on the inner edge, the distal one very thick, spiniform.

Male with the anterior antenna very strongly built, terminal part claw-like. Inner ramus of 3rd pair of legs conspicuously transformed, 3-articulate, middle joint produced at the end inside to a long, somewhat curved spiniform projection, terminal joint small, with a single slender seta at the tip. Last pair of legs smaller than in female, with the inner expansion of proximal joint less produced and provided with only 2 apical setæ.

Colour not yet ascertained.

Length of adult female 0.68 mm.

Remarks.—This is a somewhat anomalous species, exhibiting in some characters a certain approximation to the genus *Enhydrosoma* Boeck. The structure of the antennæ, however, is that characteristic of the present genus.

Occurrence.—Two specimens only of this form, a female and a male, have hitherto come under my notice. They were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand. Th. Scott records this form also from the Finmark coast.

Distribution.—Scottish coast (Scott).

189. Cletodes longicaudatus (Boeck).

(Pl. CXCVII).

Enhydrosoma longicaudata, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 54.

Syn: *Cletodes neglecta*, Scott.

Specific Characters.—Female. Body slender, cylindric in form, or very slightly tapering behind. Cephalic segment comparatively short and broad, scarcely attaining the length of the 3 succeeding segments combined, rostral projection triangular, narrowly blunted at the tip. Urosome (including the caudal rami) fully as long as the anterior division, the 3 anterior segments acutely produced at the lateral corners, last segment about the length of the preceding one. Caudal rami very narrow and produced, linear in form and slightly diverging, nearly attaining the length of the last 2 segments combined; dorsal seta issuing about in the middle, apical seta scarcely longer than the ramus itself. Anterior antennæ of moderate size, with the 3rd joint about the length of the 2nd, but narrower. Posterior antennæ of exactly the same structure as in the other species. Oral parts and legs likewise agreeing closely with those in the type species. Last pair of legs only differing from those in *C. limicola* in the distal joint being somewhat less produced.

Male, as usual, smaller than female, and having the anterior antennæ strongly hinged. Inner ramus of 3rd pair of legs not transformed. Last pair of legs much smaller than in female, distal joint with only 2 comparatively short apical setæ; inner expansion of proximal joint obsolete, without any setæ.

Colour whitish grey, with a slightly yellow tinge.

Length of adult female 0·78 mm.

Remarks.—This form has been erroneously referred by Boeck to his genus *Enhydrosoma*. It is in reality a genuine *Cletodes*, and closely allied to the type species, *Cletodes limicola* Brady, from which it is readily distinguished, however, by its more slender body and especially by the narrow and produced caudal rami. Prof. Brady has described under the name of *Cletodes longicaudata* a very different form, which perhaps does not belong to the present genus at all. The form recorded by Th. Scott as *Cletodes neglecta* is unquestionably identical with Boeck's species.

Occurrence.—I have found this form in considerable abundance at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand. It also occurs occasionally in the upper part of the Christiania Fjord.

Distribution.—Scottish coast (Scott).

190. Cletodes Buchholtzi, Boeck.

(Pl. CXCVIII).

Cletodes Buchholtzi, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 53.

Specific Characters.—Female. Body moderately slender and gradually tapering behind. Cephalic segment about the length of the 3 succeeding segments combined and having the lower edges evenly curved, rostral projection rather broad, lamellar, with a distinct longitudinal keel on each side terminating in a well-defined notch, tip broadly rounded and clothed with a dense fringe of delicate cilia. Urosome shorter than the anterior division, all the segments (also the last) acutely produced at the lateral corners. Caudal rami about the length of the last segment and extending straight behind, outer edge exhibiting near the base a well-marked notch carrying 2 somewhat unequal setæ, and having near the end another stronger seta, dorsal seta issuing close to the base, middle apical seta rather strong, being more than 3 times as long as the ramus itself; innermost seta longer than the outermost. Eye very large and conspicuous in the living animal. Anterior antennæ very short and stout, though composed of the normal number of joints, 3rd joint scarcely half as large as the 2nd, terminal part about the length of the latter joint. Posterior antennæ very strongly built, with the basal joint somewhat flexuous, distal joint of about the same length, and armed with 6 claw-like spines; outer ramus, as in the other species, replaced by a single ciliated seta. Oral parts of normal structure. Natatory legs comparatively more fully developed than in the other species, and better adapted for swimming, both rami coarsely spinulose and carrying at the tip long plumose setæ; 1st pair resembling in structure the 3 succeeding ones, though having the usual spine at the inner corner of the 2nd basal joint. Last pair of legs with the distal joint comparatively small, narrow oblong in form, and provided with only 3 marginal setæ, the apical one much elongated; inner expansion of proximal joint linguiform in shape, and extending far beyond the middle of the distal joint, being provided at the end with 3 strong, somewhat curved setæ increasing in length outwards. Ovisac rather large, rounded oval in form.

Body of a yellow colour, with dark translucent intestine.

Length of adult female 0.71 mm.

Remarks.—This is a very distinct and easily recognisable form, being especially distinguished by the peculiar shape of the rostral projection, the short and thick anterior antennæ, the form of the caudal rami, and the structure of the last pair of legs.

Occurrence.—This form was observed, many years ago, by both Boeck and

myself in a single place near Christiania. It occurred here rather plentifully in a depth of about 10 fathoms, on a muddy bottom covered with decaying algæ. On revisiting this place, I found the bottom quite altered and almost devoid of animal life; nor did I succeed in finding this form in any neighbouring place. A single female specimen taken recently at Risor, south coast of Norway, has however enabled me to subject the species to a renewed examination. Out of Norway this form has not been recorded.

Gen. 59. **Orthopsyllus**, Brady, 1873.

Syn: *Lilljeborgia*, Claus (not Sp. Bate).

Generic Characters.—Body elongated, sub-cylindric in form, and almost straight, with the segments sharply marked off from each other and coarsely denticulated behind. Rostral projection very prominent. Caudal rami comparatively short and thick. Anterior antennæ with the number of joints much reduced, terminal part (in female) consisting of only a single joint; those of male strongly hinged. Posterior antennæ with the outer ramus distinctly defined and resembling in structure that in *Laophonte*. Mandibles well developed, with the palp imperfectly biarticulate. Maxillæ and maxillipeds of normal structure. 1st pair of legs differing conspicuously from the succeeding pairs, both rami having the apical appendages remarkably dilated in their proximal part, inner ramus exceeding in length the outer, and biarticulate. The 3 succeeding pairs of legs comparatively short, with no natatory setæ on the outer ramus, inner ramus small, biarticulate, that of 3rd pair conspicuously transformed in the male. Last pair of legs with both joints produced in lamellar setiferous lappets Ovisac single.

Remarks.—This genus was established as early as the year 1860 by Claus, to include a species found by him in the Mediterranean, at Nice. As however the generic name *Lilljeborgia* proposed by that author had been previously given by Sp. Bate to an Amphipod, Prof. Brady substituted for it in the year 1873 that of *Orthopsyllus*. He subsequently withdrew this name, believing that Claus's species was referable to the genus *Clelodes* established by him in the preceding year. I think however that the genus *Orthopsyllus* ought to be retained for Claus's species, because this form differs very materially in several characters both from the species of *Clelodes* and from those of the other genera included in the present family. We do not at present know more than a single species, to be described below.

191. Orthopsyllus linearis (Claus).

(Pl. CXCIX).

Lilljeborgia linearis, Claus, Die Copepoden-Fauna von Nizza, p. 22, Pl. II, figs. 1—8.

Syn: *Cletodes linearis*, Brady.

Specific Characters.—Female. Body slender, linear in form, being almost of equal width throughout, all segments, except the last two, bordered behind with a regular row of strong denticles. Cephalic segment comparatively large, about equalling in length the 4 succeeding segments combined, rostral projection considerably produced and somewhat lamellar, with a very distinct notch on each side of the blunted tip. Urosome about the length of the anterior division, none of the segments produced at the lateral corners, penultimate segment very small and imperfectly defined from the last, which is about twice as large; anal opercle distinctly denticulate. Caudal rami somewhat divergent and rapidly tapering distally, with 2 somewhat distant setæ on the outer edge, dorsal seta issuing at a short distance from the end, middle apical seta rather strong and not jointed at the base. Anterior antennæ very coarsely built, and composed of only 4 joints, the 2nd produced behind to a strong claw-like projection, 3rd joint longer than 2nd, terminal joint considerably smaller; none of the setæ on these antennæ ciliated. Posterior antennæ likewise strong, with the terminal joint fully as long as the basal one, outer ramus carrying 4 sub-equal ciliated setæ, 2 apical and 2 lateral. Mandibular palp with the terminal joint very small and imperfectly defined from the basal one. Posterior maxillipeds moderately strong. 1st pair of legs with the outer ramus about the length of the proximal joint of the inner, 1st joint fully as long as the other 2 combined, last joint with 4 apical appendages, the outer 2 spiniform, the inner 2 terminating in a thin seta carrying at the end delicate cilia; inner ramus with a well-defined seta inside the proximal joint, distal joint scarcely more than half as long as the latter, and carrying at the tip 2 unequal appendages, the outer one somewhat claw-like, the inner much longer and of a similar structure to that of the 2 inner apical appendages of the outer ramus. The 3 succeeding pairs of legs with the outer ramus rather stout, and having at the inner corner of the terminal joint a slight rudiment of a seta, inner ramus very short, with 3 partly spiniform setæ at the tip. Last pair of legs with the distal joint confluent at the base with the proximal one, and carrying 6 comparatively short ciliated setæ; inner expansion of proximal joint extending almost as far as the distal one, and provided with 5 marginal setæ.

Male with the anterior antennæ exceedingly strong, and composed of 6 well-defined joints, the 4th greatly inflated, terminal part distinctly biarticulate,

with both joints terminating in a claw-like projection. Inner ramus of 2nd pair of legs somewhat more produced than in female, and having the setæ more elongated; that of 3rd pair distinctly triarticulate, with the middle joint produced at the end outside to a long deflexed spiniform process. Last pair of legs much smaller than in female, with the distal joint more distinctly defined; inner expansion of proximal joint very slight, with only 2 setæ.

Colour not yet ascertained.

Length of adult female 0.89 mm.

Remarks.—This form, as stated above, was first described by Claus under the name of *Lilljeborgia linearis*, and was subsequently redescribed by Prof. Brady. It is an easily recognisable species, which cannot be confounded with any other form belonging to the present family.

Occurrence.—Only 2 specimens of this form, a female and a male, have hitherto come under my notice. They were both found in a sample kindly sent to me by Mr. Nordgaard, who took it in the Skjærstad Fjord, just within the polar circle.

Distribution.—Mediterranean, at Nice (Claus), British Isles (Brady), Gulf of Guinea (Scott).

Gen. 60. **Mesocletodes**, G. O. Sars, n.

Generic Characters.—Body sub-cylindric in form, with the segments densely spinulose at the hind edge. Integuments rather thin and flexible. Cephalic segment comparatively short, with the rostral projection almost obsolete. Urosome scarcely attenuated behind, and having the last segment rather large. Caudal rami slender and narrow. Anterior antennæ with the number of joints less reduced than in the 2 preceding genera. Posterior antennæ less strongly built, with the basal joint distinctly divided in the middle, outer ramus small but well defined. Mandibular palp distinctly biarticulate. Maxillæ without any distinct exopodal and epipodal lobes. Maxillipeds comparatively small. Natatory legs with the inner ramus of essentially the same structure in all pairs and rather small, biarticulate, outer ramus in 1st pair of moderate size, in the 3 succeeding pairs very slender, with the setæ of the inner edge rudimentary. Last pair of legs with the distal joint well defined and very narrow; inner expansion of proximal joint short and broad. Ovisac single.

Remarks.—This new genus is based upon the form recorded by Th. Scott under the name of *Cletodes irrasa*. A closer examination of this form has proved it to differ in some points very materially from the other Cletodidæ, and it should thus more properly be regarded as the type of a particular genus. The general outward appearance somewhat resembles that in the species of the succeeding genus, *Eurycletodes;* but the structure of the appendages is rather different. Only a single species of this genus is as yet known.

192. Mesocletodes irrasus (Scott).

(Pl. CC).

Cletodes irrasa,[1]) Th. Scott, On some new and rare Crustacea from Scotland. Ann. Mag. Nat. Hist., ser. 6, Vol. XIII, p. 141, Pl. VIII, figs. 13—17.

Specific Characters.—Female. Body moderately slender and rather flexible, with the segments well marked off from each other and edged behind with dense rows of delicate spinules, giving it a somewhat hirsute appearance. Cephalic segment sub-triangular in form, and scarcely longer than the 3 succeeding segments combined, rostral projection very small, almost obsolete. Urosome (including the caudal rami) fully as long as the anterior division, last segment large and thick, with 2 interrupted transversal rows of spinules on each side, anal opercle broad, semilunar and perfectly smooth. Caudal rami rather distant and narrow linear in form, being about as long as the anal segment, and extending straight behind, each with a whorl of 4 diverging setæ in the middle, apical setæ rather slender. Anterior antennæ nearly as long as the cephalic segment, and composed of 7 well defined joints, clothed with strong, but not ciliated setæ, 3 of them belonging to the terminal part. Posterior antennæ with the terminal joint scarcely dilated distally, apical spines comparatively short, outer ramus consisting of a narrow linear joint carrying at the end 2 unequal setæ. 1st pair of legs smaller than the succeeding ones, and having the usual spine inside the 2nd basal joint, outer ramus about twice as long as the inner; that of the 3 succeeding pairs almost twice as long as that of the 1st pair. Last pair of legs with the distal joint comparatively small and very narrow, though widening slightly at the end, marginal setæ rather unequal and 5 in number, one of them issuing from the proximal part of the outer edge, the others from the end; inner expansion of proximal joint confluent with that of the other side, both forming together a broad plate slightly incised in the middle, and carrying on each side of the incision 2 long ciliated setæ, outside which is another much shorter seta. Ovisac comparatively small.

[1]) *Cletodes* is apparently not a feminine, but a masculine name, like *Laophontodes*.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.60 mm.

Remarks.—This form, as stated above, was described by Th. Scott as a species of the genus *Cletodes*, the specific name alluding to the somewhat hirsute appearance of the body, caused by the dense rows of spinules fringing the segments behind.

Occurrence.—Only 2 female specimens of this form have as yet come under my notice. They were found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand.

Distribution.—Scottish coast (Scott).

Gen. 61. **Eurycletodes,** G. O. Sars. n.

Generic Characters.—Body short and stout, scarcely attenuated behind, with the segments well marked off from each other. Integuments remarkably soft and flexible. Cephalic segment comparatively short and more or less produced in front. Urosome scarcely narrower than the anterior division, and having the last segment remarkably large and thick, with the anal opercle broad and semilunar in form. Caudal rami rather distant and, as a rule, not much produced, dorsal seta arising from a thick bulbous base. Eye wholly absent. Anterior antennæ moderately slender, and composed of 6 joints clothed with strong non-ciliated setæ, 3 of the joints belonging to the terminal part; those in male less strongly hinged than in the preceding genera. Posterior antennæ comparatively small and of feeble structure, outer ramus absent or only replaced by a small bristle. Oral parts poorly developed. Mandibles with the masticatory part narrowly exserted and only divided into a few small teeth, palp extremely small, bisetose. Maxillæ and anterior maxillipeds more or less imperfectly developed. Posterior maxillipeds of more normal appearance. 1st pair of legs smaller than the succeeding ones, and of a structure similar to that in the genus *Cletodes*. The 3 succeeding pairs, however, more fully developed, with the setæ of the outer ramus long and densely ciliated; inner ramus much shorter than the outer, and biarticulate, or in some cases rudimentary in the 2 posterior pairs. None of these legs transformed in male. Last pair of legs more or less foliaceous. Two closely juxtaposed ovisacs present in female.

Remarks.—In this new genus I propose to include some species formerly referred to the genus *Cletodes*, but differing very materially from the type of that genus, both as regards the outward appearance and several of the structural details, thus forming together a very natural generic group. Among the distinguishing characters may be noted: the total absence of eye, as proved by the examination of living specimens, the feeble structure of the posterior antennæ and oral parts, and finally the presence in the female of 2 ovisacs. 4 Norwegian species will be described below.

193. Eurycletodes laticaudatus (Boeck).

(Pl. CCI).

Cletodes laticauda, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 52.

Specific Characters.—Female. Body short and compact, with the segments scarcely denticulate at the hind edge. Cephalic segment about the length of the 3 succeeding segments combined, and produced in front to a rather prominent conical rostrum acutely pointed at the tip. Urosome remarkably broad, even broader than the anterior division, with none of the segments produced at the lateral corners, last segment exceeding in length the 2 preceding ones combined; anal opercle, as also the ridges leading to it from behind, armed with very coarse obtuse denticles. Caudal rami rather narrow, tapering somewhat distally, and more than twice as long as they are broad at the base, dorsal seta issuing at a short distance from the end, middle apical seta scarcely more than twice as long as the ramus itself. Anterior antennæ about the length of the cephalic segment, and having the 2nd joint fully as long as the 3rd, terminal part about the length of those joints combined. Posterior antennæ with no trace of an outer ramus, terminal joint considerably shorter than the basal one, and scarcely widening distally. Posterior maxillipeds with the dactylus very slender and elongated. 1st pair of legs with the terminal joint of the outer ramus larger than the middle one, and armed with 3 spines and 2 curved setæ; inner ramus almost as long as the outer and biarticulate, distal joint with a small seta inside and carrying at the tip a short spine and 2 unequal setæ. The 3 succeeding pairs with the inner ramus distinctly biarticulate and of a structure similar to that of the 1st pair. Last pair of legs with the distal joint obovate in form, tapering gradually towards the end, and provided with 5 rather slender sub-equal setæ; inner expansion of proximal joint very short, with 3 slender setæ. Ovisacs well defined,

though so closely juxtaposed as scarcely to extend beyond the lateral edges of the urosome.

Colour whitish grey.

Length of adult female 0.75 mm.

Remarks.—This species, being the first recorded, may be regarded as the type of the present genus. It is easily recognised from the other species by the conically produced rostrum, and the unusually broad urosome, thus fully deserving the specific name given to it by Boeck.

Occurrence.—I have only met with this form in the upper part of the Christiania Fjord, at Nordstrand, east of the town. It occurred here occasionally in a depth of 30—40 fathoms, muddy bottom. Out of Norway this form has not yet been recorded.

194. Eurycletodes latus (Scott).

(Pl. CCII).

Cletodes lata, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Report of the Fishery Board for Scotland, p. 257, Pl. X, figs. 10—18.

Specific Characters.— Female. Body of a short, stout form similar to that in the preceding species, though somewhat constricted in the middle, posterior edge of the segments fringed with delicate spinules. Cephalic segment gradually contracted in front, and somewhat exceeding in length the 3 succeeding segments combined, rostral projection broadly triangular in form, with the tip slightly exserted. Urosome about the length of the anterior division and rather thick, all the segments, except the last, produced laterally to short, but well defined, somewhat recurved acute projections; last segment very large, with the anal opercle broad and prominent, coarsely denticulated at the edge. Caudal rami comparatively short, not nearly twice as long as they are broad, and only slightly tapering distally, dorsal seta issuing in front of the middle, apical setæ rather slender, the middle one nearly attaining the length of the urosome. Anterior antennæ with the 2nd joint much shorter than the 3rd. Posterior antennæ very small, with the terminal joint nearly as long as the basal one, outer ramus replaced by a minute simple bristle. Posterior maxillipeds with the dactylus comparatively shorter than in the type species, about equalling the hand in length. 1st pair of legs with the terminal joint of the outer ramus scarcely larger than the middle one, and armed with only 2 spines and 2 slender setæ; inner ramus comparatively small, though distinctly biarticulate, distal joint without any seta inside, middle apical seta very small, hair-like. Inner ramus of 2nd pair of legs, as in 1st pair, biarticulate;

that of the 2 posterior pairs, however, much reduced in size, and consisting of only a single joint tipped with 2 subequal setæ. Last pair of legs more pronouncedly foliaceous than in the type species, distal joint regularly oblong oval in form, and provided with 5 rather small setæ, the 2 apical ones very unequal in length; inner expansion of proximal joint conically produced, and extending about to the middle of the distal joint, tip narrowly truncated and carrying 2 slender subequal setæ. Ovisacs well defined, but as in the preceding species, closely juxtaposed.

Colour dark grey.

Length of adult female 0.60 mm.

Remarks.—This form, first described by Th. Scott as a species of the genus *Cletodes*, is easily distinguished from the preceding species by the broader rostral projection, the acutely produced lateral parts of the caudal segments, and the shorter and broader caudal rami. In the structure of the appendages also, some well-marked differences are found, as indicated in the above diagnosis.

Occurrence.—I have found this form occasionally at Farsund, south coast of Norway, in a depth of about 20 fathoms, muddy sand; and Th. Scott also records it from the Finmark coast.

Distribution.—Scottish coast (Scott).

195. Eurycletodes similis (Scott).

(Pl. CCIII).

Cletodes similis, Th. Scott, Additions to the Fauna of the Firth of Forth. 13th Ann. Rep. of the Fishery Board for Scotland, p. 168, Pl. III, figs. 22—26, Pl. IV, figs. 1—3.

Specific Characters.—Female. Body somewhat more slender than in the 2 preceding species, with the posterior division less broad. Cephalic segment about the length of the 3 succeeding segments combined, rostral projection short and broad, blunted at the tip. Urosome with the anterior segments densely spinulose at the hind edge, their lateral parts however not acutely produced; last segment, as usual very large, with the anal opercle minutely denticulate. Caudal rami narrower and more produced than in *E. latus*, tapering considerably distally, dorsal seta issuing close to the base, middle apical seta slender and almost as long as the urosome. Anterior antennæ resembling in structure those in *E. latus*. Posterior antennæ likewise rather similar, though comparatively larger. Posterior maxillipeds rather stout, with the hand oval in form and densely ciliated inside. 1st pair of legs comparatively larger than in *E. latus*, and having the terminal joint of the outer ramus armed with 3 curved spines and 2 setæ; inner ramus extending to the end of the middle joint of the outer, and having the middle

apical seta very slender and elongated. Inner rami of the 3 succeeding pairs well developed and, like that of the 1st pair, distinctly biarticulate. Last pair of legs with the distal joint narrowly produced and carrying 4 strong marginal setæ, 3 on the outer edge and one at the tip; inner expansion of proximal joint very short, with 2 slender ciliated setæ.

Male with the anterior antennæ distinctly hinged, though having the last joint of the proximal part only slightly dilated. Natatory legs of exactly the same structure as in the female. Last pair of legs, however, smaller, with only 3 setæ on the distal joint, and a single one inside the proximal joint.

Colour dark yellowish grey.

Length of adult female 0.65 mm.

Remarks.—This form, first described by Th. Scott, looks very like *E. latus*, but on a closer examination may be readily distinguished by the non-produced lateral parts of the caudal segments, and by the longer and narrower caudal rami. It also differs, as shown by the above diagnosis, in some of the structural details.

Occurrence.—I have found this form not unfrequently in several localities of the south coast of Norway, for instance at Risør, Lillesand and Farsund, in moderate depths, and Th. Scott also records it from the Lofoten Islands.

Distribution.—Scottish coast (Scott), Spitsbergen and Franz Josef Land (Scott).

196. Eurycletodes major, G. O. Sars, n. sp.

(Pl. CCIV).

Specific Characters.—Female. Body more slender than in any of the 3 preceding species, sublinear in form, being of about equal width throughout; all the segments sharply marked off from each other, and without any visible armature. Cephalic segment rather short, scarcely longer than the 2 succeeding segments combined, and produced in front to a moderately prominent triangular rostral projection. Urosome somewhat shorter than the anterior division, and having none of the segments produced laterally; last segment very large, exceeding in length the 2 preceding segments combined, anal opercle very minutely denticulate. Caudal rami comparatively small and far apart, gradually tapered distally, dorsal seta issuing near their base; middle apical seta scarcely exceeding in length the last segment. Anterior antennæ of a structure similar to that in the 2 preceding species. Posterior antennæ resembling those in the type species, and without any trace of an outer ramus. Posterior maxillipeds of moderate size,

with the hand oblong in form, dactylus slender and finely ciliated inside. 1st pair of legs with the terminal joint of outer ramus about as large as the middle one, and armed with 2 spines and 2 somewhat unequal setæ; inner ramus scarcely longer than the 1st joint of the outer, and consisting of only a single joint carrying 3 comparatively short apical setæ and a minute lateral bristle. Inner ramus of 2nd pair of a structure similar to that of 1st pair; that of the 2 succeeding pairs extremely small and rudimentary, knob-like, with a very long ciliated seta accompanied by a small bristle. Last pair of legs with the distal joint long and narrow, linear in form, and carrying 4 moderately long setæ, 2 apical and 2 lateral; inner expansion of proximal joint somewhat produced, though not extending to the middle of the distal joint, and provided at the narrowly truncated end with 2 subequal ciliated setæ.

Colour dark grey.

Length of adult female 0.95 mm.

Remarks.—This form is of considerably larger size than any of the other species, and is moreover easily recognised by its more slender, almost linear body and the short caudal rami. It also differs rather conspicuously in some of the structural details, especially as regards the imperfect development of the inner rami of the natatory legs.

Occurrence.—I have only met with this form in a single locality, viz., at Hvalør, outside the Christiania Fjord. It occurred here not unfrequently in a depth of about 6 fathoms, on a muddy bottom covered with decaying algæ.

Gen. 62. **Enhydrosoma,** Boeck, 1872 (not Brady).

Generic Characters.—Body somewhat resembling in shape that in the species of *Cletodes,* being more or less slender and attenuated behind, with the segments sharply marked off from each other, and connected in such a manner that the body is capable of rolling up into an almost perfect ball by a strong ventral flexure. Integuments very coarse. Cephalic segment comparatively large, with a short somewhat deflexed rostral projection. Caudal rami of different shape in the different species. Eye distinct, though of small size. Anterior antennæ (in female) composed of only 5 joints clothed with partly ciliated setæ, 2 of the joints belonging to the terminal part; those of male very strongly hinged. Posterior antennæ well developed, with a small, but distinctly defined outer ramus

carrying one apical and one lateral seta. Mandibles with the masticatory part divided into a number of delicate flattened teeth, palp uniarticulate, but exhibiting one or 2 small lateral lobes. Maxillæ and maxillipeds of normal structure. Natatory legs comparatively short, with both rami densely spinulose at the edges, and more or less incurved, carrying at the tip long and slender setæ, outer ramus with the spines of the outer edge very long, but without any setæ inside, inner ramus biarticulate; 1st pair only slightly differing from the 3 succeeding ones. Last pair of legs with the distal joint rather coarse and, like the inner expansion of proximal joint, armed with strong spiniform setæ; those of male not much reduced in size. Ovisac single.

Remarks.—This genus was rather insufficiently characterised by Boeck, and for this reason was not recognised by succeeding authors. Boeck himself referred to this genus 2 species which are evidently not congeneric, the one, *E. longicaudata*, having indeed turned out to be a true *Cletodes*, described above as *Cletodes longicaudatus*. The other species, *E. curticauda*, which of course must be regarded as the type of the present genus, has recently been redescribed by Th. Scott under another name as a species of the same genus. On the other hand, Prof. Brady describes, under the name of *Cletodes propinqua*, a species which is evidently congeneric with the type of Boeck's genus *Enhydrosoma*. Finally, the form referred by the same author to the latter genus, *E. curvatum*, is very different from both these genera, constituting the type of a particular genus. It appears from this, that great confusion prevails among authors as regards the present genus, the exact characters of which I have tried to draw up in the above diagnosis. 3 well-defined species referable to this genus will be described below.

197. Enhydrosoma curticaudatum, Boeck.

(Pl. CCV).

Enhydrosoma curticauda,[1]) Boeck Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 54.

Syn: *Cletodes hirsutipes*, Scott.

Specific Characters.—*Female.* Body somewhat robust, rapidly tapering from front to back, with the segments somewhat raised dorsally, and, viewed dorsally, quadrangular in form. Cephalic segment large and tumid, equalling in length the 3 succeeding segments combined, rostral projection terminating in 2 recurved points. Urosome much shorter than the anterior division, last segment

[1]) *Enhydrosoma* being a neuter, the specific name must be spelt as above.

about the length of the preceding one, and widening somewhat distally, with the lateral corners conically produced, anal opercle smooth. Caudal rami of a somewhat unusual shape, being sub-lamellar and, as it were, distorted, with the inner edge boldly curved, and the tip pointing obliquely outwards, lateral setæ closely juxtaposed and rather small, dorsal seta issuing from behind the middle, apical setæ short. Anterior antennæ not very strong, and scarcely more than half as long as the cephalic segment, 3rd joint about the length of the 2nd, terminal part half as long as the proximal one. Posterior antennæ with the terminal joint shorter than the basal one, and widening considerably distally, outer ramus small, but well defined. Mandibular palp with 2 small lateral lobules, each tipped with a short ciliated seta, the tip itself carrying 2 somewhat larger setæ. Posterior maxillipeds not very strong, hand oblong oval in form and finely ciliated inside, dactylus very thin, with a slender bristle issuing from the base outside. Natatory legs with the rami somewhat robust, the inner one in the 3 anterior pairs being about $^2/_3$ as long as the outer, in the 4th pair considerably shorter. Last pair of legs with the distal joint rather large, oblong in form, and clothed on the outer edge with a very dense fringe of stiff hairs, marginal setæ 4 in number and rather strong, spiniform, 3 of them issuing from the transversely truncated end, the 4th at some distance from the tip outside; inner expansion of proximal joint conically produced, and extending to the middle of the distal joint, carrying 3 spiniform setæ, one at the tip, the other 2 at the inner edge, near the base.

Male of about same size as female, and having the caudal rami of a somewhat different shape, being narrower and less distorted. Anterior antennæ very strongly built, 7-articulate, with the 4th joint greatly dilated at the base, terminal part slender, 3-articulate. Inner ramus of 3rd pair of legs with the apical spine much coarser than in female, and not defined at the base. Last pair of legs scarcely smaller than in female, but differing somewhat in the shape of the inner expansion of the proximal joint, and in the absence of one of the spines on the distal joint.

Colour dark yellowish brown.

Length of adult female 0.62 mm.

Remarks.—This form, as stated above, ought to be considered as the type of the present genus. It is easily distinguished from the other 2 species here recorded by its more robust body and by the peculiar shape of the rostral projection and of the caudal rami. The densely hairy clothing of the distal joint of the last pair of legs is another character by which the present species is distinguished, and which has given rise to the specific name *hirsutipes* given to this form by Th. Scott. In the living state it is also at once recognised by its yel-

lowish brown colour. The swimming movements of the animal are rather clumsy, and are effected in an abrupt jerking manner. When disturbed, it immediately sinks to the bottom, and rolls its body up almost into a ball by a strong ventral flexure, remaining in this attitude for some time. Exactly the same behaviour may also be observed in the succeeding species.

Occurrence.—I have met with this form not unfrequently in the upper part of the Christiania Fjord in a depth of about 6 fathoms, muddy bottom. It also occurs occasionally at Skutesnæs, south-west coast of Norway, and is moreover recorded by Th. Scott from the Finmark coast.

Distribution.—Scottish coast (Scott).

198. Enhydrosoma propinqvum (Brady).

(Pl. CCVI).

Cletodes propinqva, Brady, Monogr. Brit. Copepoda, Vol. III, p. 94, Pl. LXXVII, figs. 9—17.

Specific Characters.—Female. Body considerably more slender than in the type species and tapering more gradually behind. Cephalic segment less tumid, with the rostral projection broader and terminating in a blunt, somewhat recurved point. Urosome much shorter than the anterior division, last segment larger than the preceding one and scarcely widening distally. Caudal rami comparatively small, blade-like, with the lateral setæ rather distant, dorsal seta issuing close to the base, middle apical seta scarcely longer than the ramus itself. Anterior antennæ short and stout, with the 2nd joint much larger than the 3rd, terminal part scarcely half as long as the proximal one. Posterior antennæ with the terminal joint fully as long as the basal one, and less dilated distally than in the type species: outer ramus somewhat larger than in that species, but of a very similar structure. Mandibular palp comparatively smaller, with only a single lateral lobule. Natatory legs resembling in structure those in *E. curticaudatum*, though having the rami somewhat less robust. Last pair of legs likewise built upon the same type, distal joint however wanting the dense clothing of hairs on the outer edge, which is only finely ciliated in its proximal half, marginal setæ 4 in number, one very strong at the tip, and 3 much shorter ones on the outer edge; inner expansion of proximal joint not extending to the middle of the distal joint, and carrying on the tip a strong lancet-shaped spine, inside 2 more slender setæ.

Male with the caudal rami somewhat narrower than in female. Anterior antennæ hinged in the same manner as in the preceding species. None of the

natatory legs transformed. Last pair of legs differing somewhat from those in female, distal joint comparatively shorter, and only provided with one apical and one small lateral seta; inner expansion of proximal joint scarcely at all produced, and carrying 2 unequal setæ.

Colour whitish grey.

Length of adult female 0.64 mm.

Remarks.—This form, in spite of its external resemblance to certain species of the genus *Cletodes,* ought evidently to be referred to the present genus, agreeing, as it does, in all essential anatomical details with the type of that genus, *E. curticaudatum,* from which it chiefly differs in the more slender form of the body and in the shape of the caudal rami and the last pair of legs.

Occurrence.—I have found this form rather abundantly at Skutesnæs, south-west coast of Norway in a few fathoms' depth, muddy bottom. It also occurs occasionally off the south coast, as also in the upper part of the Christiania Fjord.

Distribution.—British Isles (Brady).

199. Enhydrosoma longifurcatum, G. O. Sars, n. sp.

(Pl. CCVII).

Specific Characters.—Female. Body somewhat less slender than in *E. propinquum.* Cephalic segment rather large, about equalling in length the 3 succeeding segments combined, rostral projection broadly triangular and slightly recurved at the tip. Urosome (including the caudal rami) almost as long as the anterior division, last segment a little larger than the preceding one, and broadly emarginated behind, lateral edges convex and exhibiting at a short distance from the end a knob-like projection tipped with a delicate bristle. Caudal rami remarkably produced, being about twice as long as the anal segment, very narrow linear in form and somewhat divergent, lateral setæ far apart, the one attached to a distinct ledge close to the base, the other nearer the end, dorsal seta issuing in front of the middle, apical seta rather slender, considerably exceeding in length the ramus itself. Anterior antennæ short and stout resembling those in *E. propinquum.* Posterior antennæ and oral parts likewise of a very similar structure. Natatory legs comparatively less fully developed, though on the whole exhibiting the structure characteristic of the genus. Last pair of legs with the distal joint comparatively short, conical in form, with the marginal setæ less strong than in the 2 preceding species; inner expansion of proximal joint rather small, but armed

with 3 strong spiniform setæ. Ovisac oblong in form and rather large, extending beyond the caudal rami, number of ova, however, rather limited.

Male with the anterior antennæ transformed in exactly the same manner as in the 2 preceding species. Last pair of legs somewhat imperfectly developed, the distal joint not being defined at the base, and being only provided with 2 unequal setæ; inner expansion of proximal joint very small, knob-like, with a spine and a slender seta.

Colour not yet ascertained.

Length of adult female 0.52 mm.

Remarks.—This form is undoubtedly congeneric with the 2 preceding species, from which it is at once distinguished, however, by the very long and narrow caudal rami. It is also rather inferior in size.

Occurrence.—Only 2 specimens of this form, a female and a male, have hitherto come under my notice. They were both found in a sample taken at Farsund, south coast of Norway, from a depth of about 20 fathoms, muddy sand.

Gen. 63. **Rhizothrix**, Brady & Robertson, 1875.

Syn: *Enhydrosoma*, Brady (not Boeck).

Generic Characters.—Body sub-cylindrical, smooth, with the segments less sharply marked off from each other than in the preceding genera. Cephalic segment comparatively large, with the rostral projection obsolete. Caudal rami short and broad. Anterior antennæ with the number of joints much reduced and clothed with partly ciliated setæ. Posterior antennæ with the outer ramus small, though well defined. Mandibles strongly developed, with the masticatory part very coarse and the palp distinctly biarticulate. Maxillæ and maxillipeds of normal structure. Natatory legs very small, but with long apical setæ, inner ramus in all of them biarticulate; 1st pair differing conspicuously from the others, apical setæ of both rami terminating in a tuft of delicate hairs. Last pair of legs with the inner parts of the proximal joints coalesced. Ovisac single.

Remarks.—This genus was established in the year 1875 by Messrs. Brady and Robertson, to include a species, *R. curvata*, found by them off the British coast. In his Monograph, Prof. Brady withdrew this genus, believing it to be identical with *Enhydrosoma* Boeck. On a closer examination, I have however felt justified in restoring this genus, as the species upon which it was originally founded,

in reality differs very materially both from *Enhydrosoma* and from the other genera included in the present family.

200. Rhizothrix curvata, Brady & Robertson.

(Pl. CCVIII).

Rhizothrix curvata, Brady & Robertson in Brit. Assoc. Report 1875, p. 197.

Syn: *Enhydrosoma curvatum*, Brady.

Specific Characters.—Female. Body comparatively robust, more or less curved, maggot-shaped, slightly attenuated behind, with the segments rounded off laterally and crowded closely together. Cephalic segment large and tumid, exceeding in length the 3 succeeding segments combined, rostrum replaced by 2 small juxtaposed nodiform prominences. Last pedigerous segment fully as large as the preceding one. Urosome a little narrower than the anterior division, and much shorter, last segment very small, with the anal opercle almost obsolete. Caudal rami arising close together from a broad base, being rounded oval in outline and somewhat divergent, lateral and dorsal setæ issuing near the end, middle apical seta about half the length of the urosome. Anterior antennæ short and stout, scarcely more than half as long as the cephalic segment, and consisting of only 4 joints gradually diminishing in size, 2 or 3 of the setæ attached to the 2nd joint remarkably strong and edged with long cilia. Posterior antennæ moderately strong, terminal joint not attaining the length of the basal one, and having the apical appendages unusually short, outer ramus armed at the tip with a stout curved seta, coarsely spinulose on the one edge, and with a thin lateral bristle. 1st pair of legs very small, with both rami narrow and not very unequal in length, each carrying on the tip 2 slender setæ terminating in a tuft of fine spreading cilia, outer ramus a little longer than the inner, with the 1st joint equalling in length the other 2 combined, and armed at the end outside with a long deflexed spine coarsely ciliated on the outer edge; middle and terminal joints without any spines. The 3 succeeding pairs of equal structure, outer ramus without any setæ inside, spines of outer edge gradually increasing in length and coarsely spinulose outside; inner ramus very short, with 3 unequal setæ at the tip. Last pair of legs with the distal joint comparatively small and obovate in form, marginal setæ 5 in number, some of them very small; inner expansion of proximal joint forming together with that of the other side a broad plate, slightly incised in the middle, and carrying on each side of the incision a dense row of 5 ciliated setæ, the 3 innermost ones somewhat longer than the 2 outermost. Ovisac comparatively small, rounded oval in form.

Colour not yet ascertained.

Length of adult female 0.57 mm.

Remarks.—This is the only as yet known species of the genus, and is easily recognised from any of the other *Cletodidæ*, both as regards its outward appearance and the structure of the several appendages.

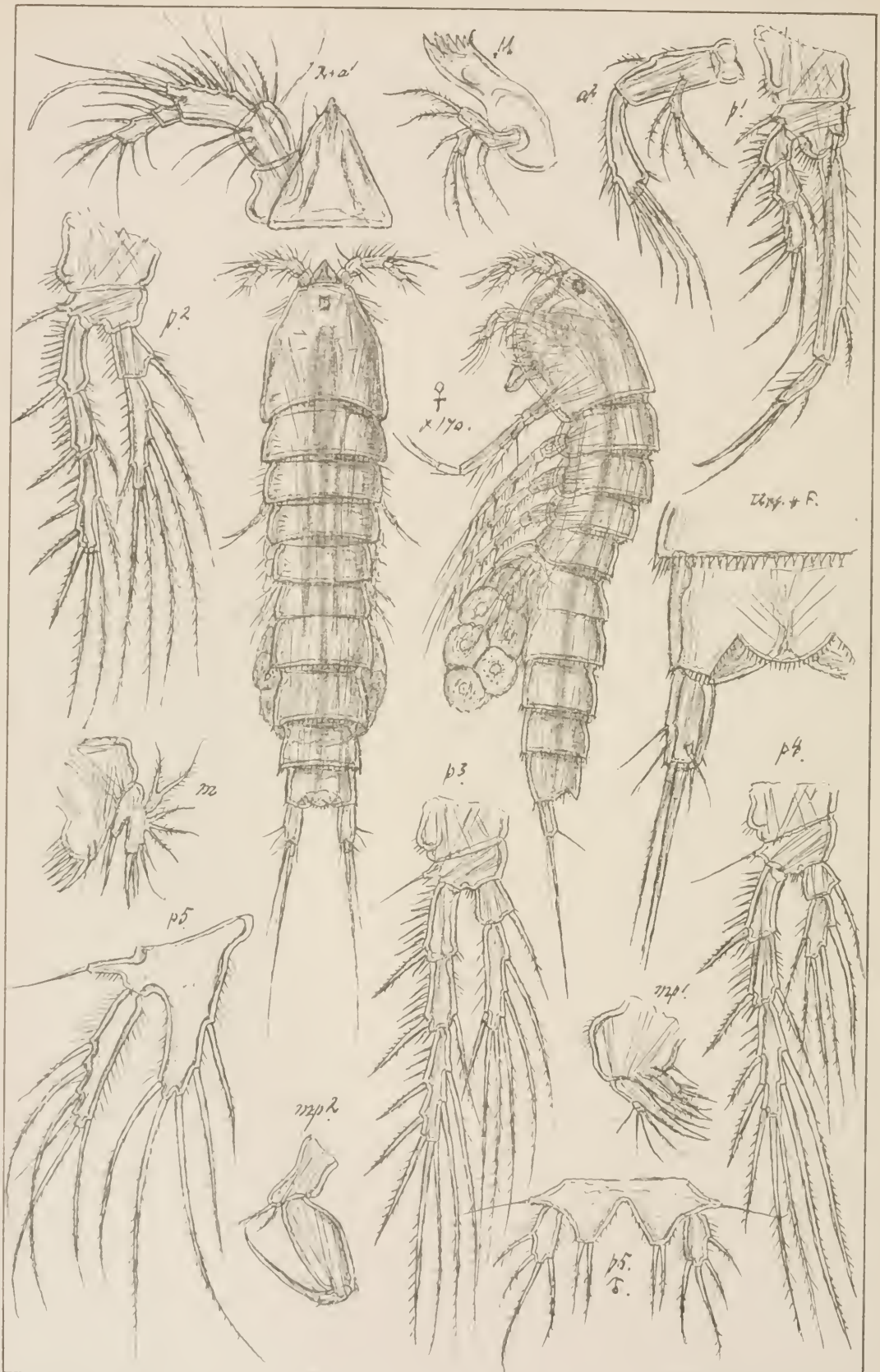
Occurrence. – I have found this form in 3 different localities of the south coast of Norway, viz., at Grimstad, Lillesand and Farsund. In all 3 places it occurred very sparingly in a depth of 10—20 fathoms, muddy bottom. Only female specimens were found.

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

Gen. 64. **Huntemannia,** Poppe, 1885.

Generic Characters.—Body stout, attenuated behind, with the segments crowded closely together and rounded laterally. Cephalic segment large and produced in front to a strongly prominent rostrum. Urosome comparatively short, with the caudal rami each terminating in a strong flattened spine. Anterior antennæ short and stout, with the number of joints reduced, and clothed with short, spiniform setæ; those in male strongly hinged. Posterior antennæ coarsely built, with the spines of the terminal joint short and stout, outer ramus small, lamelliform. Mandibles strong, with the palp well developed, though uniarticulate. Maxillæ and maxillipeds on the whole of normal structure. Legs, however, of a rather anomalous appearance; 1st pair differing conspicuously from the succeeding ones and very coarsely built, outer ramus 3-articulate, inner uniarticulate. The 3 succeeding pairs with the outer ramus consisting of only 2 joints, inner ramus rudimentary, knob-like. Last pair of legs well separated in the middle, and rather small. 2 well-defined divergent ovisacs present in female.

Remarks.—This genus, established in the year 1885 by Poppe, is a very distinct one, exhibiting some rather perplexing features that deviate from the usual Harpacticoid type. Yet in the more general anatomical characters it presents an evident affinity to some genera comprised within the present family, especially to the genus *Nannopus* of Brady. It is as yet only represented by a single species, to be described below.

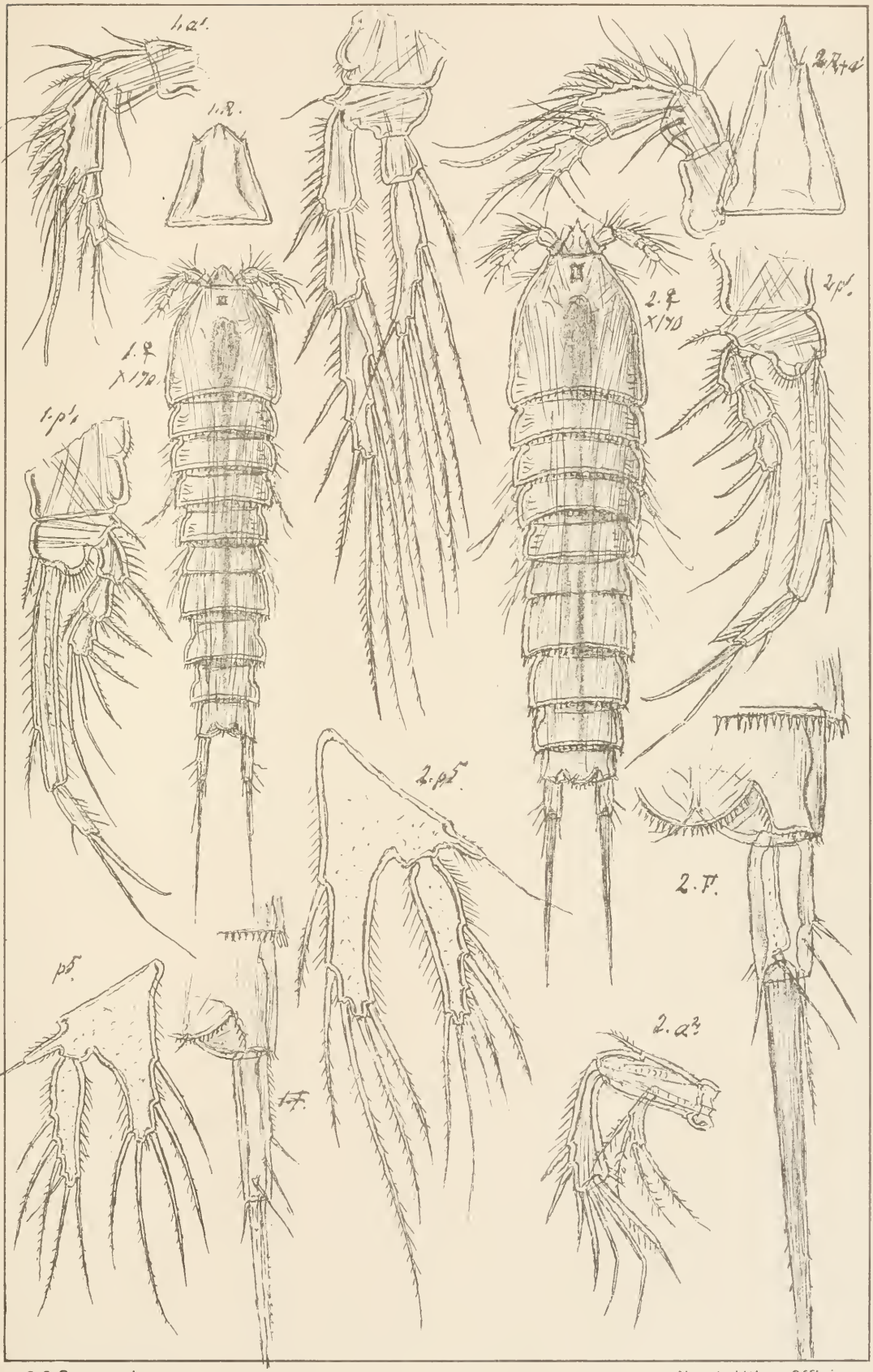


G.O.Sars, autogr. Norsk Lithgr. Officin

Normanella minuta (Boeck).

Copepoda

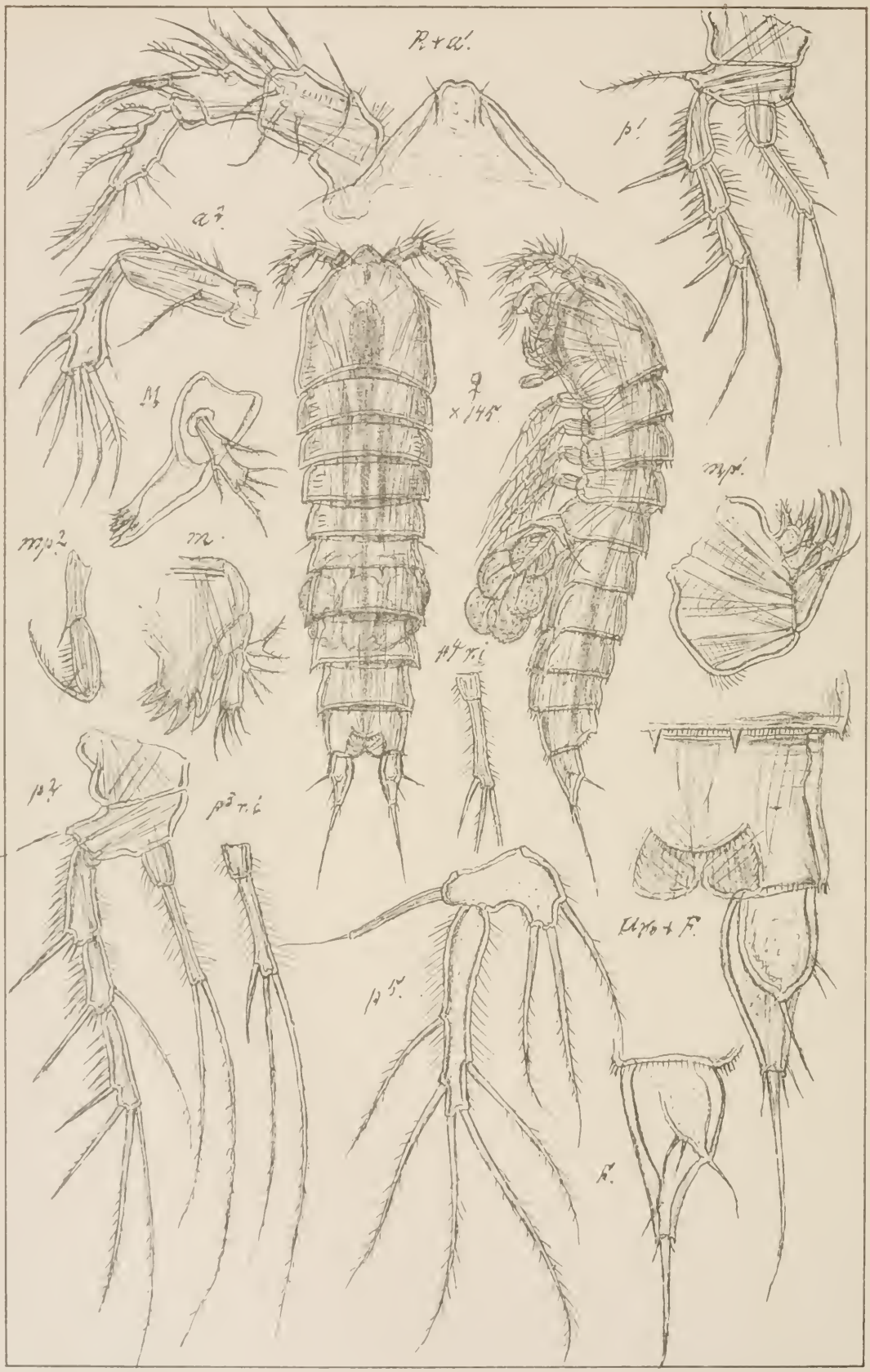
Laophontidæ. Harpacticoida Pl.CXCIV.



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

1. Normanella tenuifurca, G.O.Sars.
2. " mucronata, G.O.Sars.

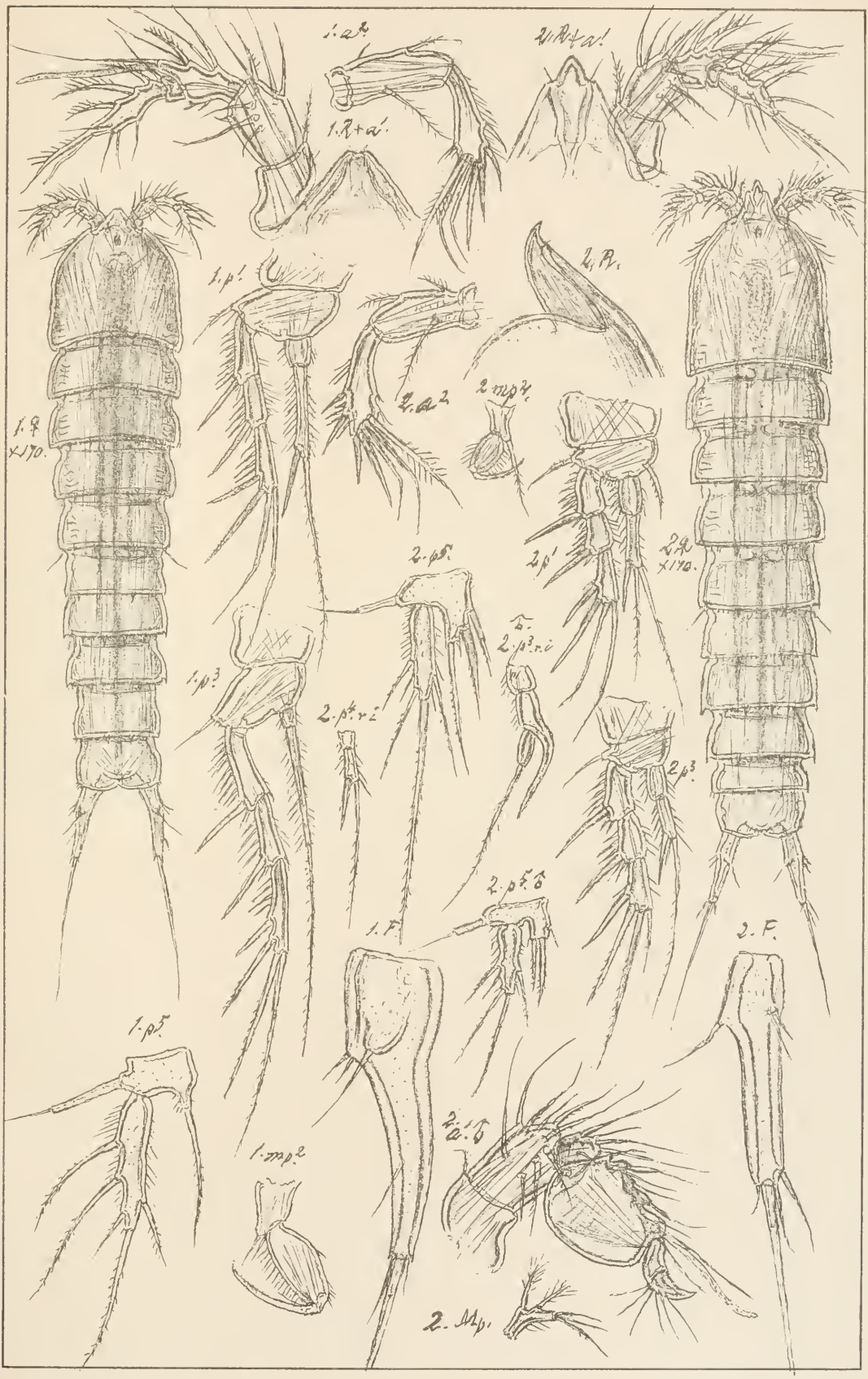
Copepoda



G C Sars, autogr. Norsk Lithgr. Officin.

Cletodes limicola, Brady.

Copepoda



G.O Sars, autogr

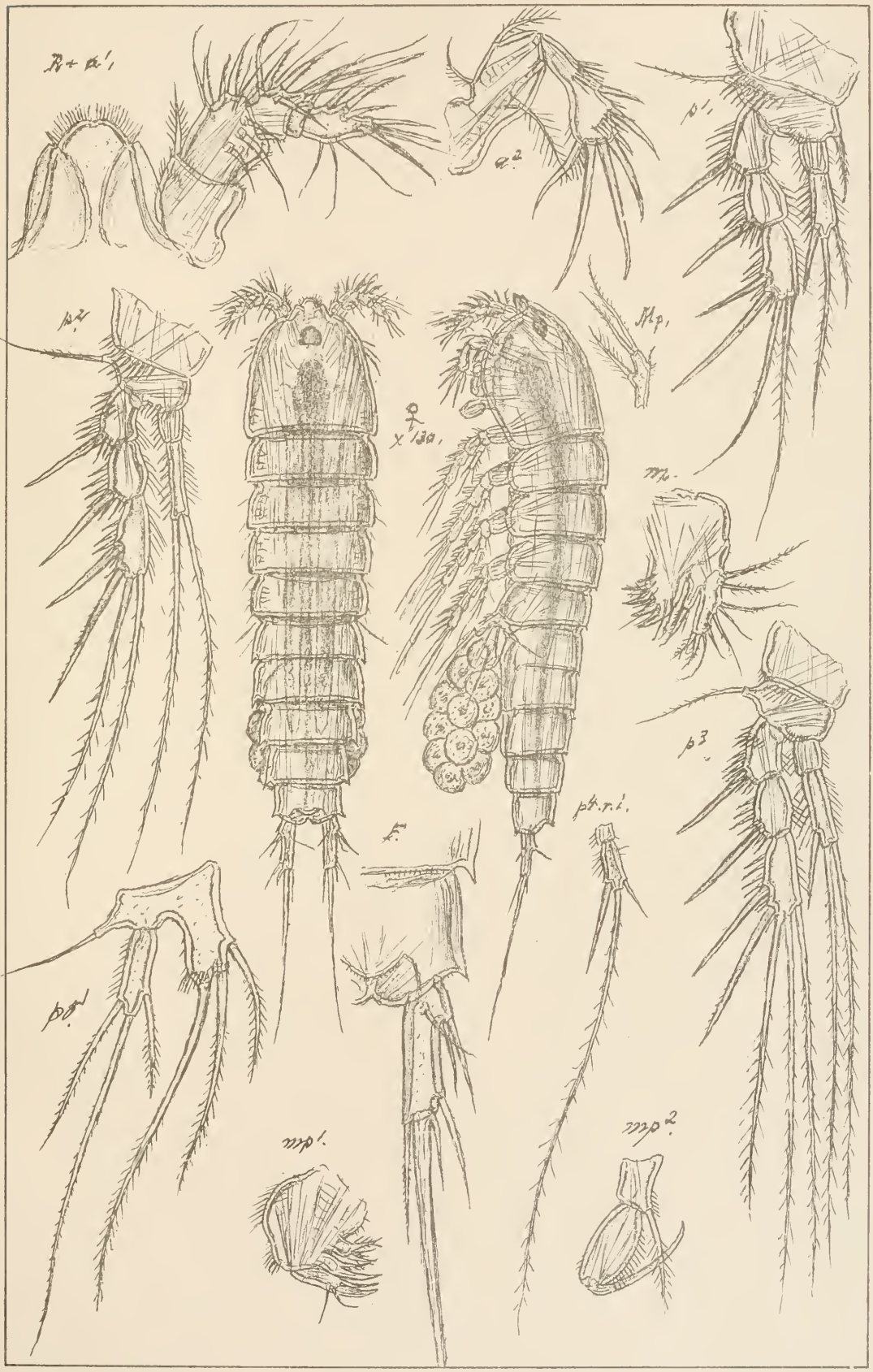
Norsk Lithgr. Officin

1. Cletodes tenuipes, Scott
2. " curvirostris, Scott

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

Cletodes longicaudatus (Boeck)

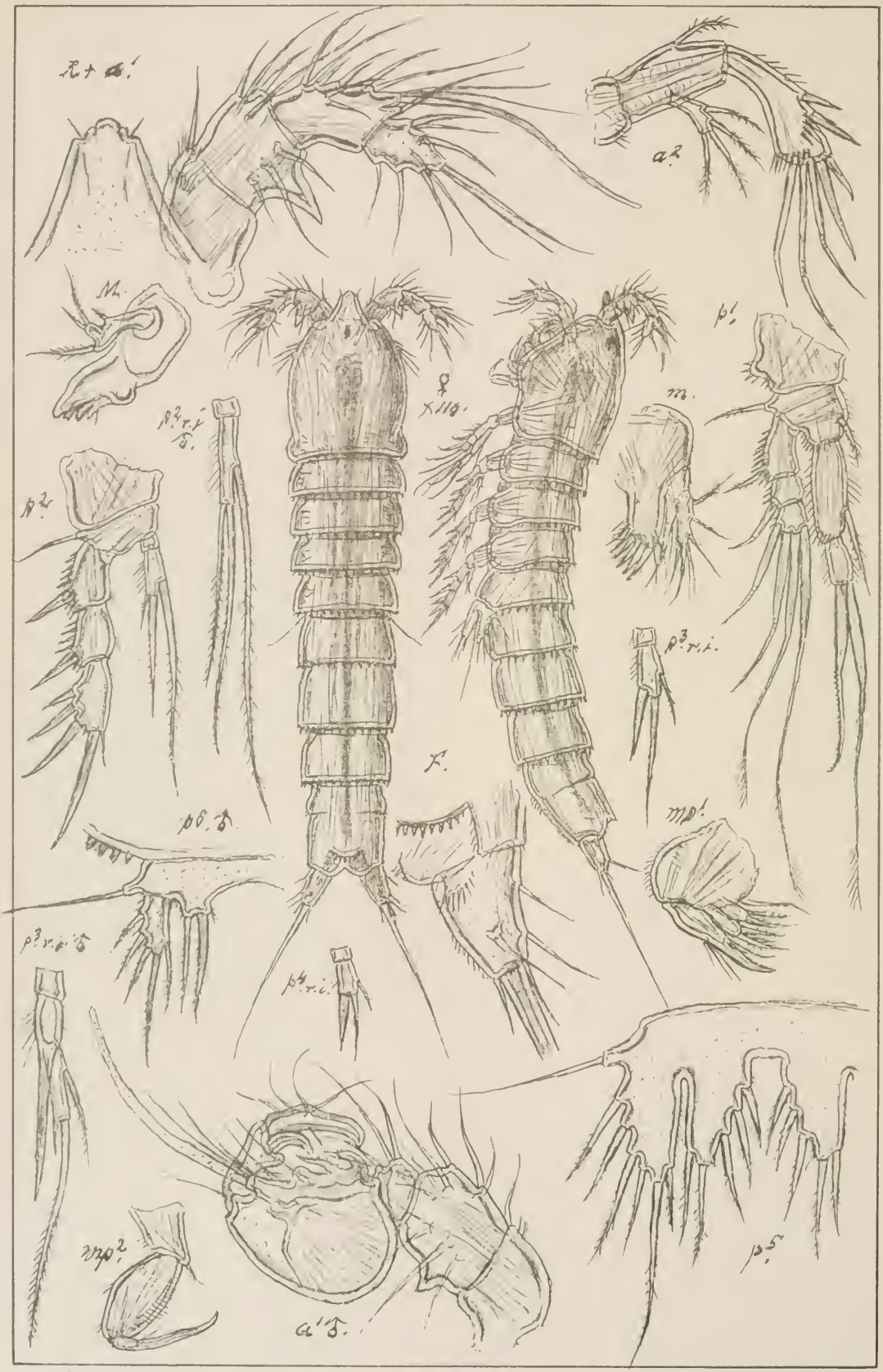
Copepoda



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

Cletodes Buchholtzi, Boeck.

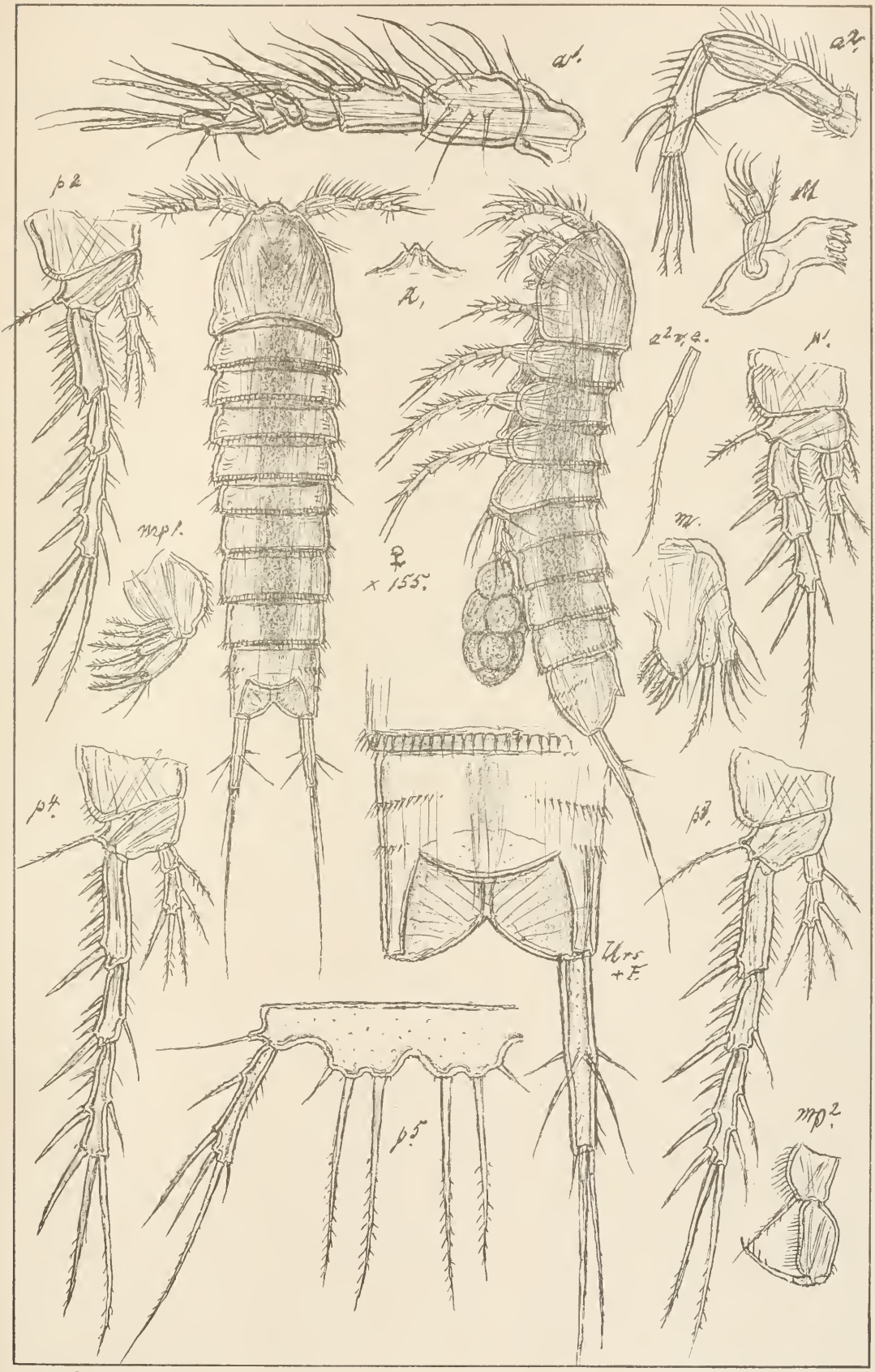
Copepoda



G.O.Sars, autogr

Norsk Lithgr. Officin

Orthopsyllus linearis (Claus)

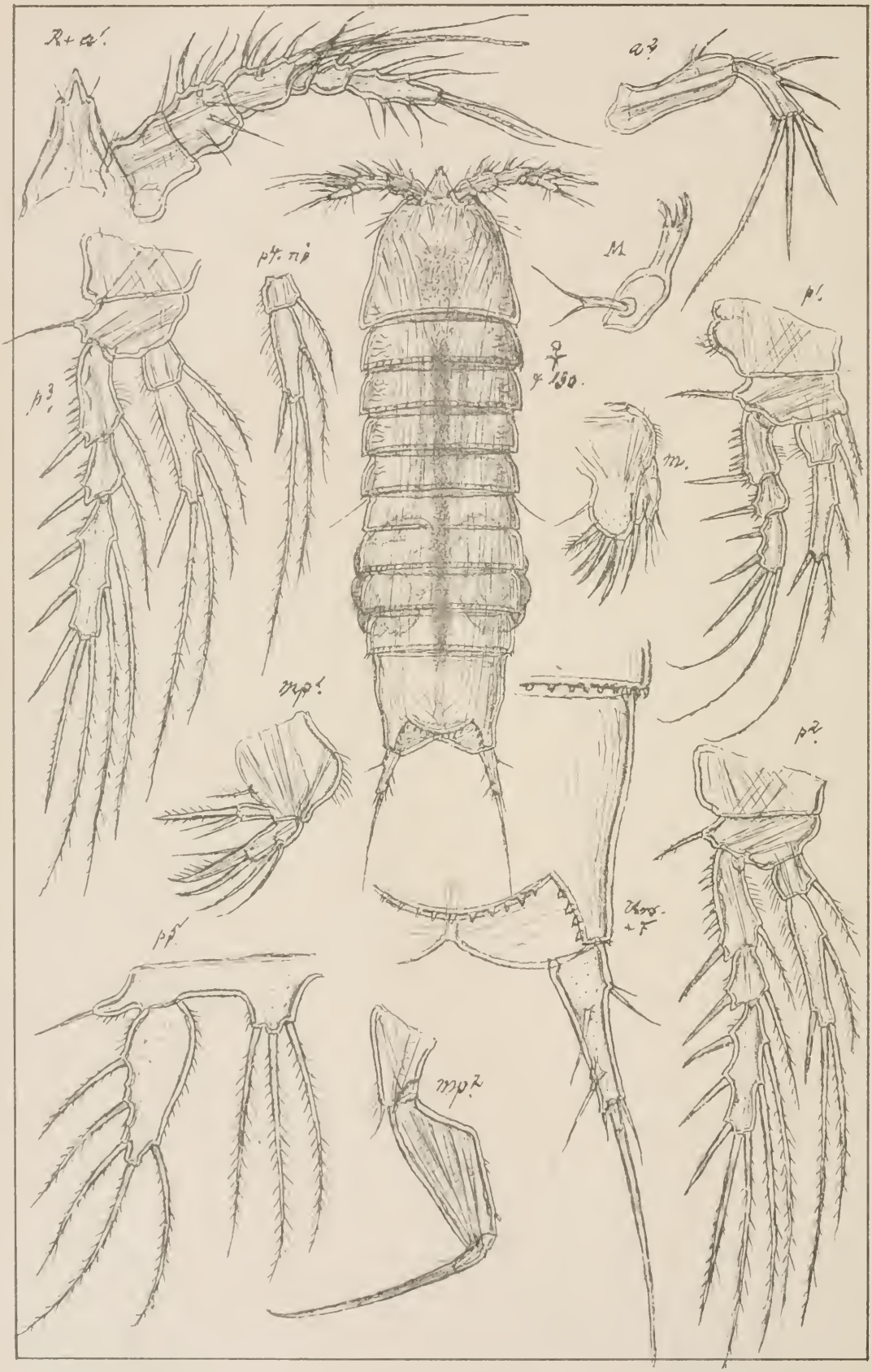


G.O.Sars, autogr

Norsk Lithgr. Officin

Mesocletodes irrasus (Scott)

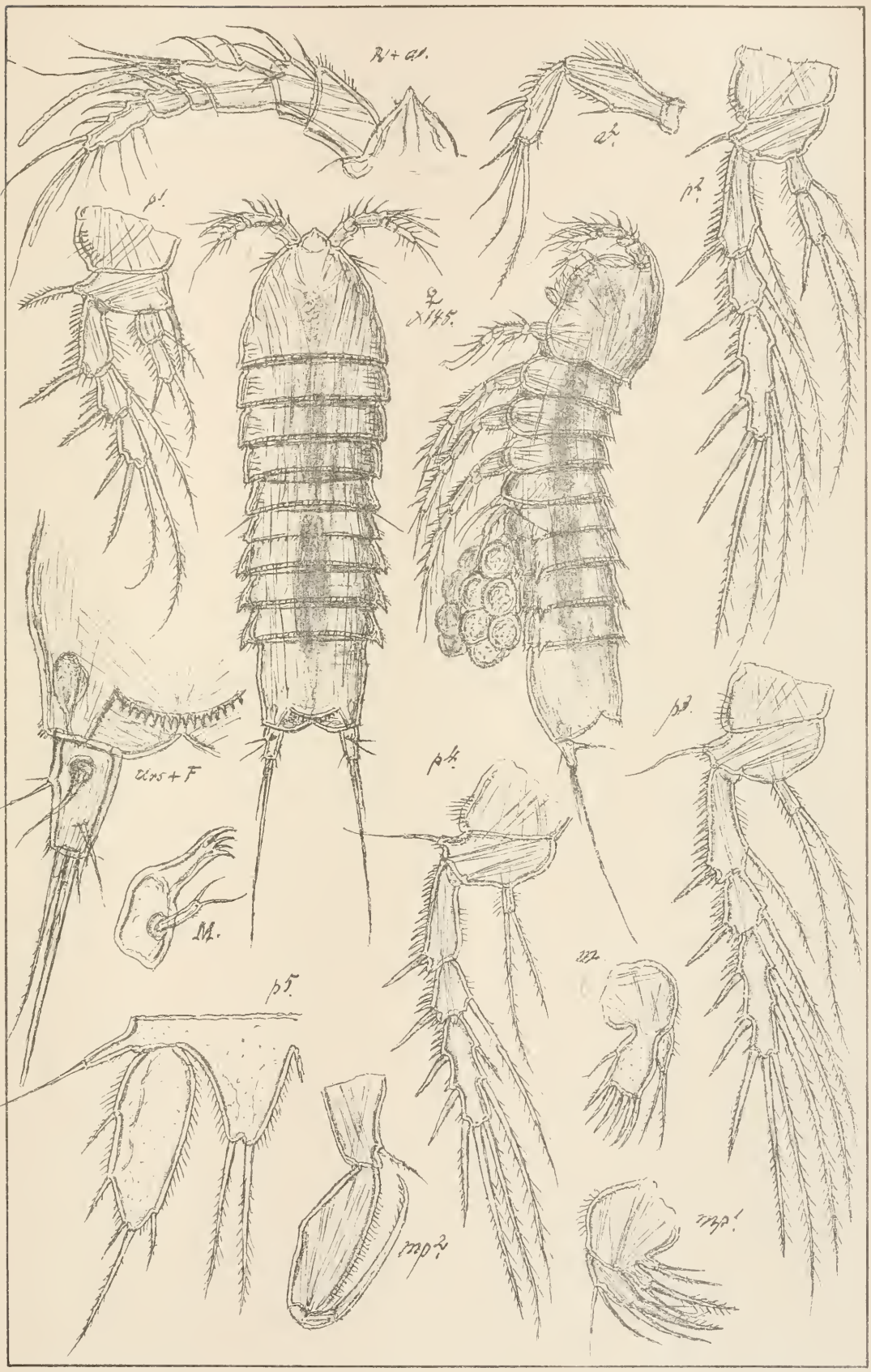
Copepoda



G.O. Sars, autogr

Norsk Lithgr. Officin

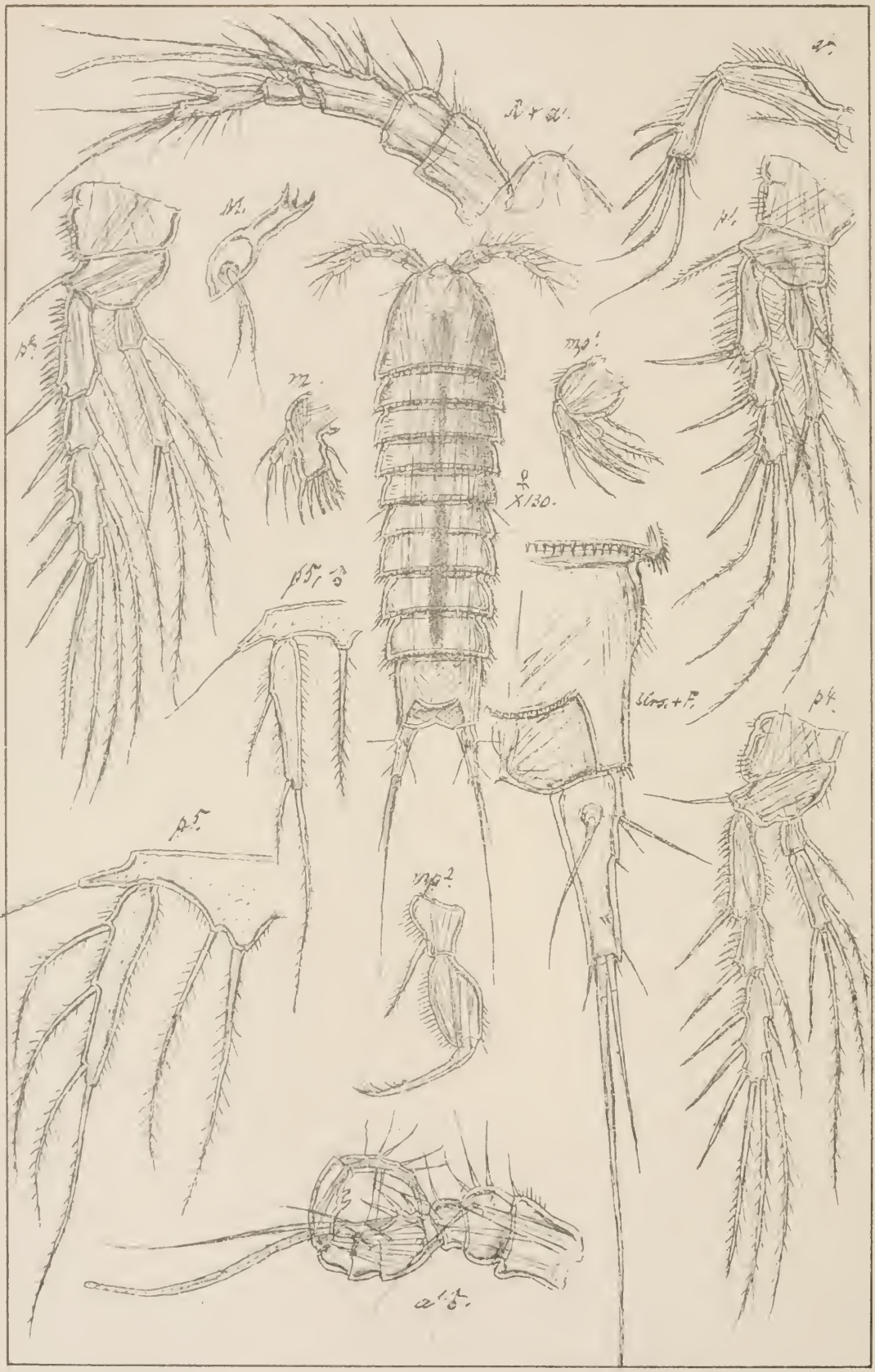
Eurycletodes laticaudatus (Boeck)



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

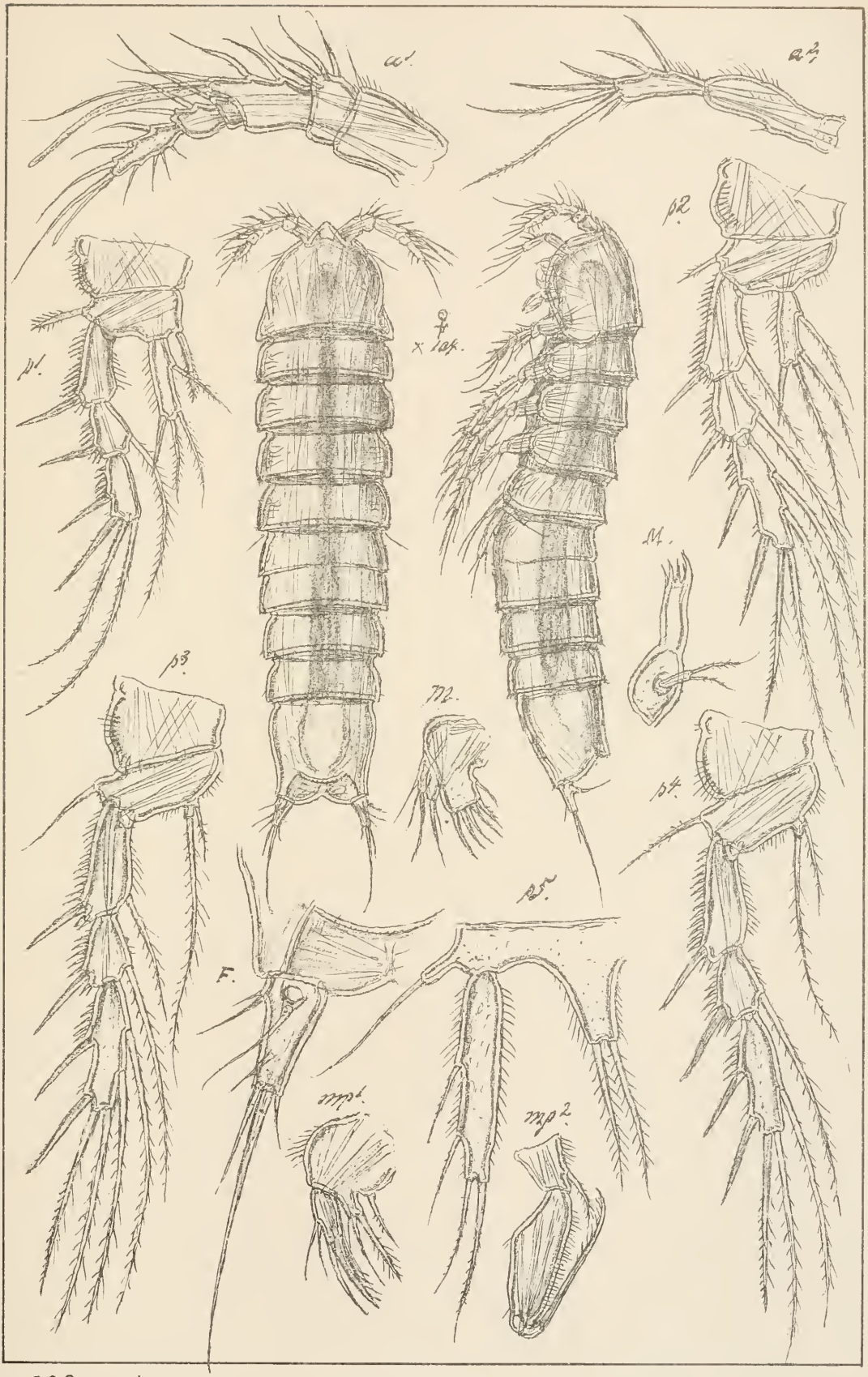
Eurycletodes latus (Scott)

Copepoda



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

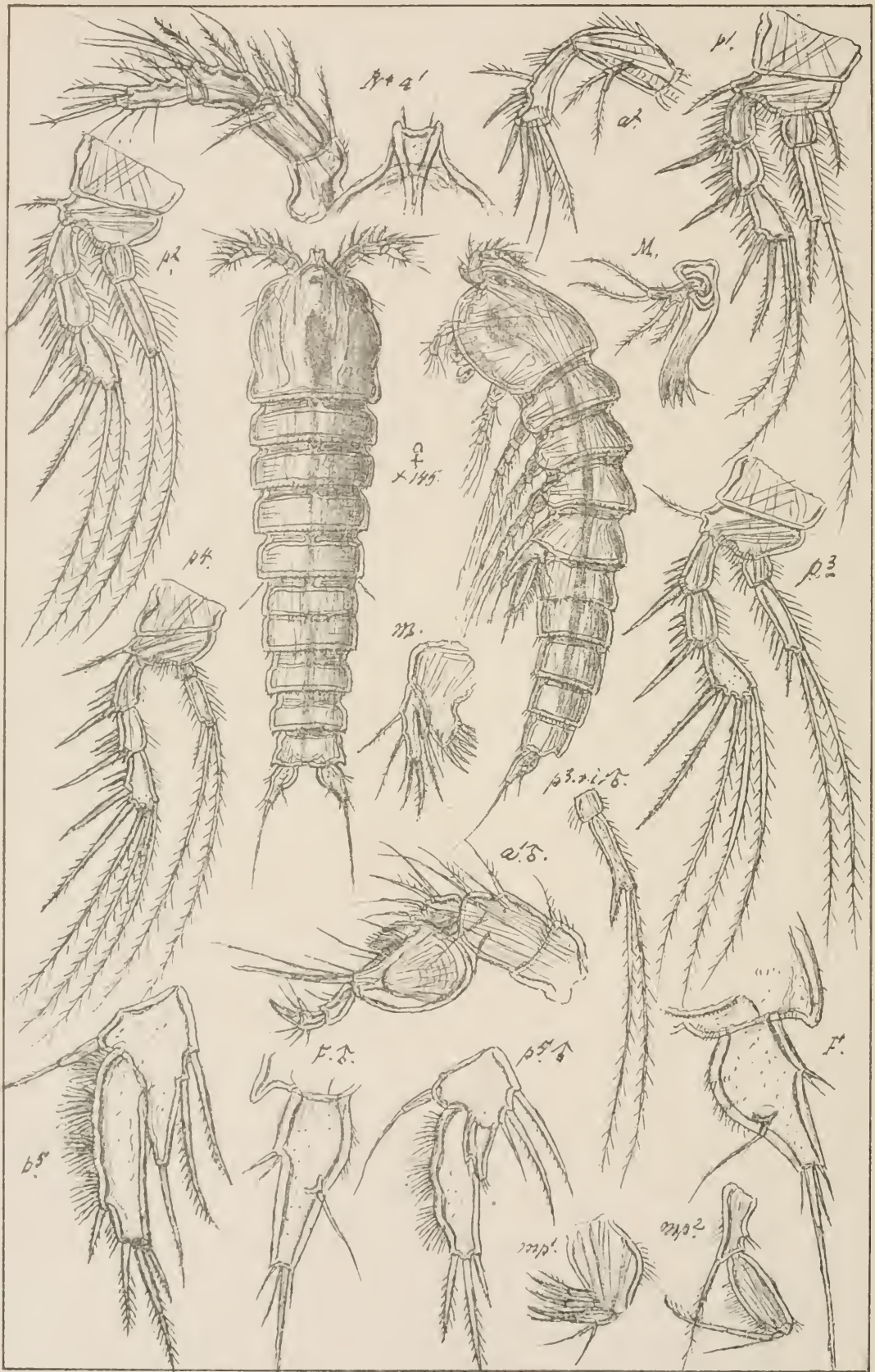
Eurycletodes similis (Scott)



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

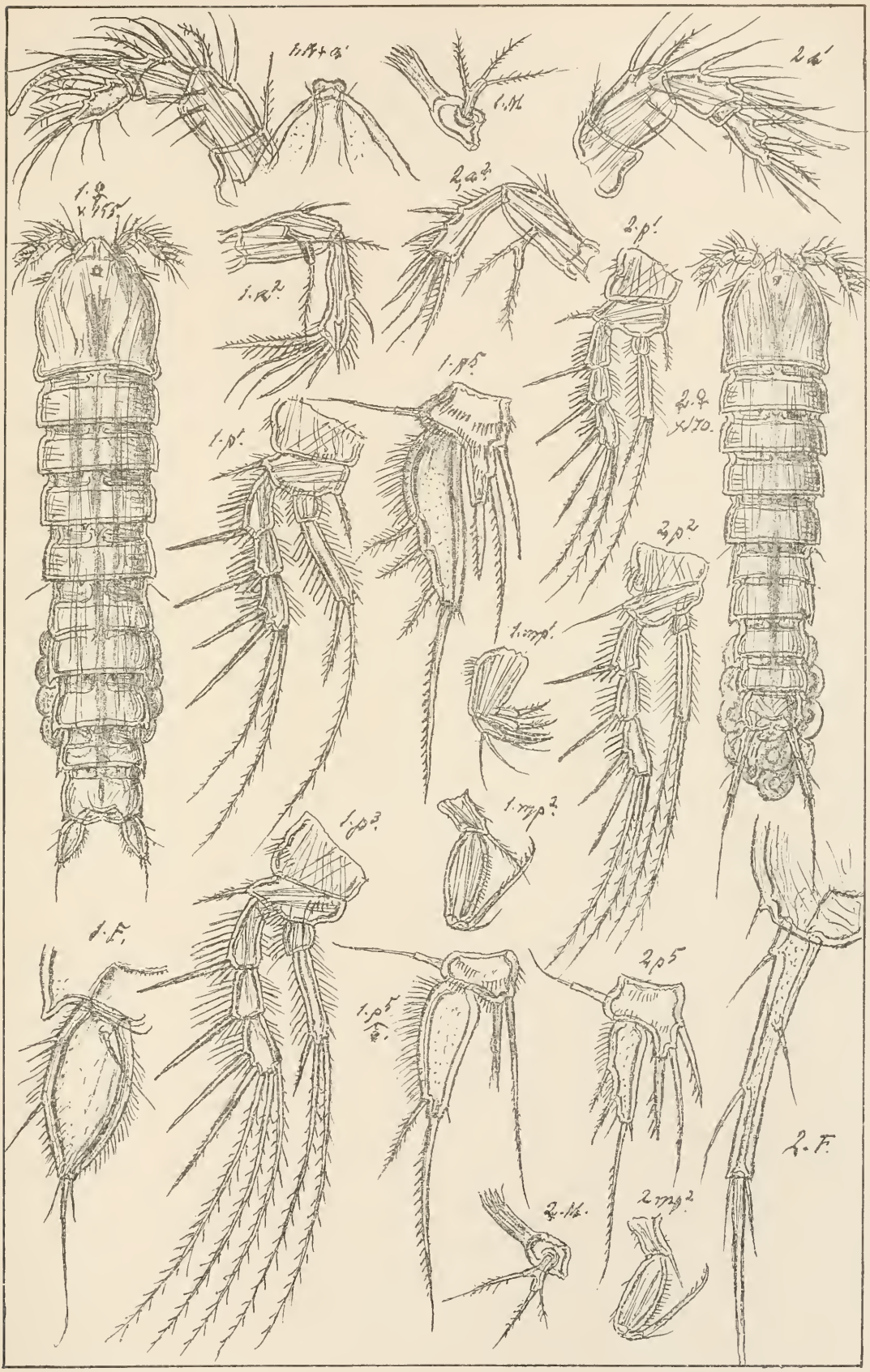
Eurycletodes major, G.O.Sars

Copepoda



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

Enhydrosoma curticaudatum Boeck

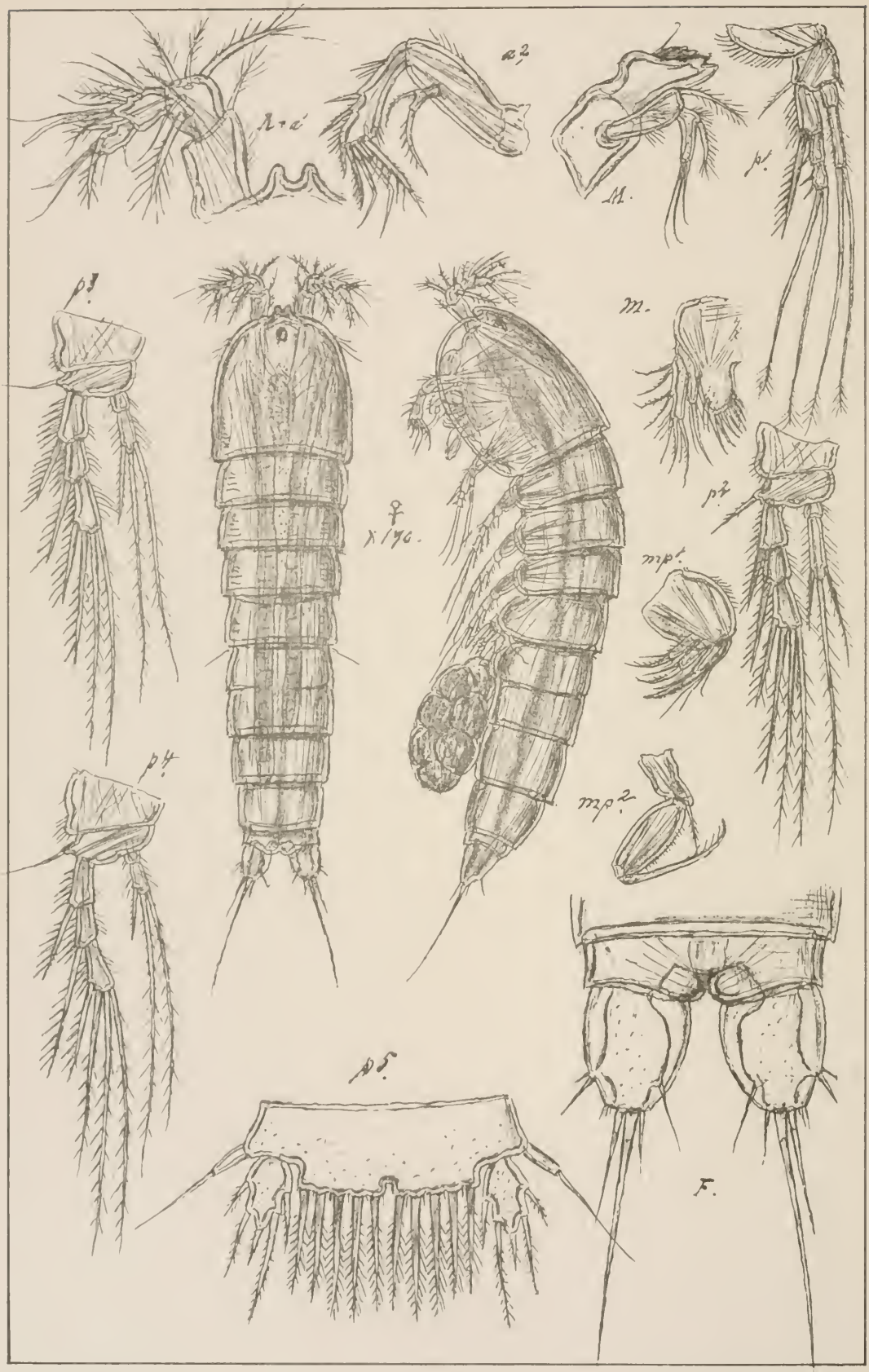


G.O.Sars, autogr. Norsk Lithgr. Officin.

1 Enhydrosoma propinqvum Brady
2 " longifurcatum, G.O.Sars

Copepoda

Cletodidæ — Harpacticoida — Pl. CCVII.

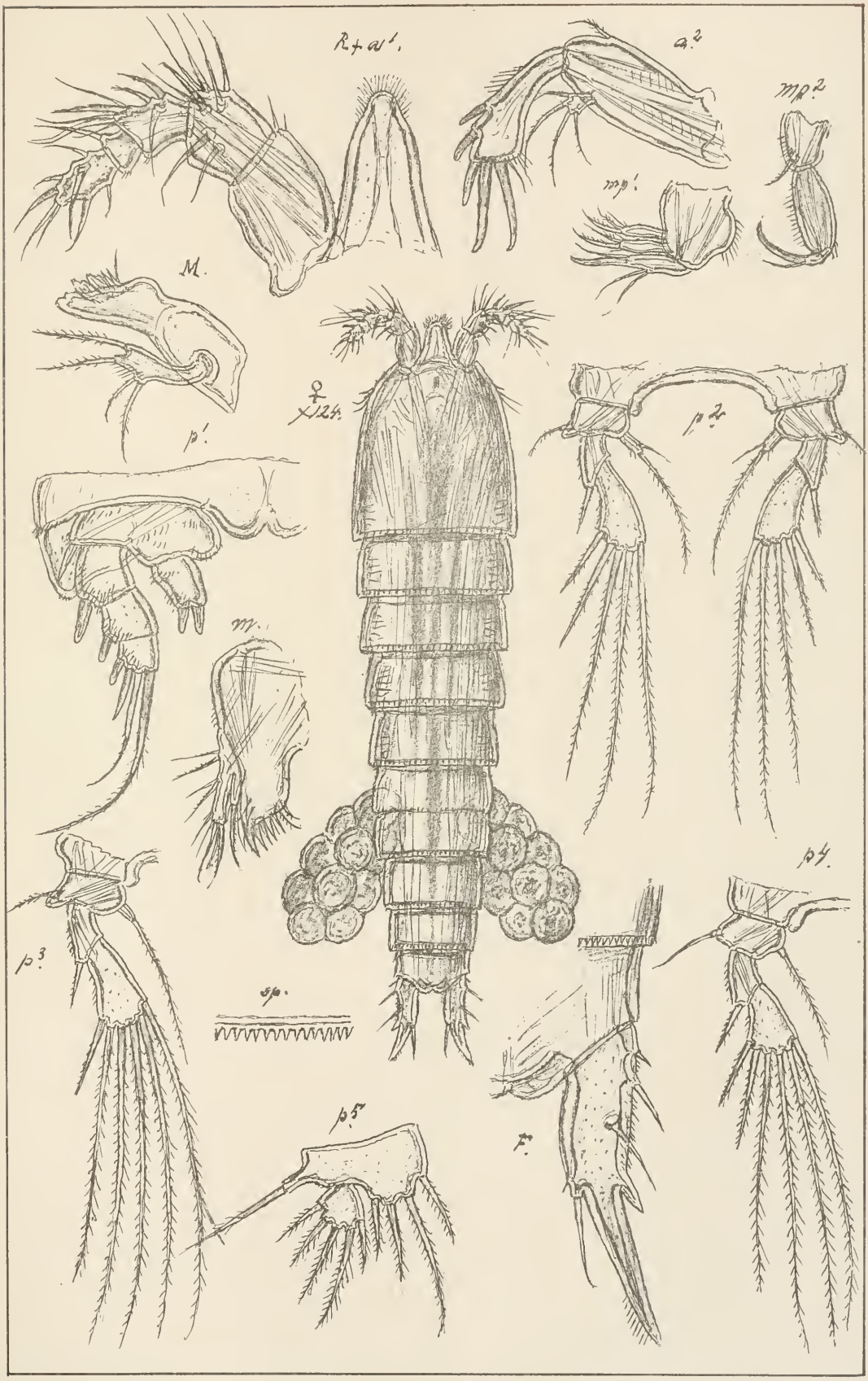


G.O.Sars, autogr. — Norsk Lithgr. Officin

Rhizothrix curvata, Brady & Roberts

Copepoda

Cletodidæ — Harpacticoida — Pl. CCVIII.



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

Huntemannia jadensis, Poppe