

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 XXIII & XXIV
LAOPHONTIDÆ (continued)

WITH 16 AUTOGRAPHIC PLATES



BERGEN
PUBLISHED BY THE BERGEN MUSEUM

SOLD BY
ALB. CAMMERMEYER'S FORLAG, CHRISTIANIA
1908

legs, as usual, very small, but with the distal joint well defined, and having the same number of setæ as in the female; inner expansion of proximal joint very slight, with a single seta only.

Colour yellowish.

Length of adult female 0.54 mm.

Remarks.—I think I am right in identifying the present form with *Cleta brevirostris* of Claus. It was at first very imperfectly characterised by that author, and for this reason Mr. A. Scott did not recognise the species, but described it under another name, viz., *L. Herdmani*. In his account of the Copepoda of Nice, Claus gives, however, 2 detail-figures, which do not seem to leave any doubt as to the identity of his form with the present species. The peculiar short spatulate form of the distal joint of the last pair of legs in the female will suffice for distinguishing this form from any of the other species.

Occurrence.—I have met with this form not infrequently off both the south and west coasts of Norway in moderate depths among algæ.

Distribution.—British Isles (Scott), Mediterranean, at Messina and Nice (Claus), the Red Sea (A. Scott).

168. *Laophonte congenera*, G. O. Sars, n. sp.

(Pl. CLXXVII).

Specific Characters.—*Female.* Very like the preceding species (*L. brevirostris*), but somewhat more strongly built, with rather coarse integuments. Rostral projection more prominent, with the tip distinctly bilobular. Urosome with the lateral expansions of the segments well defined and densely fringed with spinules. Caudal rami about the length of the anal segment, and of uniform width throughout, both edges fringed with short hairs. Anterior antennæ distinctly 7-articulate, the last 2 joints being well defined, 2nd joint without any projection behind, and scarcely longer than the 3rd. Posterior antennæ, oral parts and legs of a structure very similar to that in *L. brevirostris*. Last pair of legs, however, slightly different in shape, distal joint comparatively narrower, rounded oval in form (not transversely truncated at the tip); inner expansion of proximal joint shorter, scarcely extending beyond the middle of the distal joint.

Male with the inner ramus of 2nd pair of legs transformed in a manner analogous to that in *L. brevirostris*, distal seta of inner edge, however, more fully developed, with the thickened proximal part very large and coarsely spinulose in its outer half. 3rd pair of legs resembling in structure those in *L. brevirostris*.

Last pair of legs with the distal joint narrower, proximal joint with 2 unequal setæ inside.

Colour not yet ascertained.

Length of adult female 0.53 mm.

Remarks.—This form is closely allied to *L. brevirostris*, and may easily be confounded with it. On a closer examination, however, it is found to differ in its more prominent rostral projection, its distinctly 7-articulate anterior antennæ, and the shape of the last pair of legs.

Occurrence.—Some few specimens of this form were found in samples taken at Kopervik and Skutesnæs, south-west coast of Norway, from a depth of 10—20 fathoms.

169. *Laophonte perplexa*, Scott.

(Pl. CLXXVIII).

Laophonte perplexa, Th. Scott, Marine and fresh-water Crustacea from Franz Josef Land. Linn. Soc. Journ. Zool. Vol. XXVII, p. 103, Pl. 7, figs. 1—7.

Specific Characters.—*Female.* General form of body about as in *L. congenera*. Rostral projection, however, less prominent, and with the tip entire. Lateral expansions of caudal segments well developed and densely spinulose. Caudal rami about the length of the anal segment and slightly narrowed distally. Anterior antennæ distinctly 7-articulate, 2nd joint longer than 3rd, and without any projection behind. Posterior antennæ and oral parts scarcely differing in structure from those in the 2 preceding species. 1st pair of legs, however, with the outer ramus consisting of only 2 joints, the last one twice the length of the 1st. Natatory legs of a similar structure to that in the 2 preceding species. Last pair of legs with the distal joint comparatively small and obtusely truncated at the end, inner expansion of proximal joint short and broad, not extending to the middle of the distal joint. Ovisac comparatively large, rounded oval in form.

Male with the 2nd pair of legs much larger than in female, distal joint of inner ramus shorter than the proximal one, and produced inside to a narrow cylindrical process, finely ciliated on both edges and tipped with a slender bristle; seta in front of this process very small and not ciliated. 3rd pair of legs with the inner ramus not transformed, outer ramus, however, very coarse and incurved, with the spines, especially of the terminal joint, strongly developed. 4th pair of legs likewise comparatively larger than in female, with the spines of the outer ramus stronger and more coarsely denticulated. Last pair of legs much reduced in size, and without any expansion of the proximal joint inside.

Colour of female pale orange, ovisac dark bluish.

Length of adult female 0.64 mm.

Remarks.—This form was first recorded from the Arctic Ocean by Th. Scott, who considers it to be most nearly allied to the 2 species *L. curticauda* Boeck and *L. similis* Claus. It is however undoubtedly much more closely related to *L. brevirostris* Claus (= *L. Herdmani* Scott), though differing both from that species and the nearly-allied *L. congenera* G. O. Sars, in the structure of the 1st pair of legs, the outer ramus of which is only biarticulate. It is also of rather larger size than either of these 2 species. A remarkable feature in the present species is that the inner ramus of the 3rd pair of legs in the male does not exhibit any trace of the conspicuous transformation found in all other species of the genus *Laophonte*.

Occurrence.—I found this form, many years ago, not infrequently off the Finmark coast, at Hammerfest and Vadsø, and it has also been recorded by Th. Scott from that part of our country. It moreover occurs in the Trondhjem Fjord, at Selven, and occasionally also at Kopervik and Bukken on the south-west coast of Norway, in moderate depths.

Distribution.—Franz Josef Land (Scott), Polar islands north of Grinnell Land (2nd Fram-Expedition)

170. *Laophonte macera*, G. O. Sars, n. sp.

(Pl. CLXXIX).

Specific Characters.—*Female.* Body slender and narrow, with the segments sharply marked off from each other, and the integuments of very coarse consistency. Cephalic segment comparatively large and deep, with the rostral projection not very prominent, and blunted at the tip. The 4 succeeding segments much narrower and rounded laterally. Urosome almost as long as the anterior division, and having the lateral expansions of the segments rather prominent. Caudal rami considerably produced, being about 4 times as long as they are broad, and narrow linear in form; apical setæ of moderate length. Anterior antennæ 7-articulate, with the 2nd joint simple and about the length of the 3rd. Posterior antennæ with the outer ramus comparatively small, but of normal structure. Posterior maxillipeds largely developed. 1st pair of legs with the outer ramus biarticulate, and scarcely exceeding half the length of the proximal joint of the inner. Natatory legs of normal structure. Last pair of legs with the distal joint of moderate size and oval in form, inner expansion of proximal joint comparatively short, not extending to the middle of the distal joint. Ovisac small, rounded.

Male with the 2nd pair of legs scarcely larger than in female, but having one of the marginal setæ of the inner ramus remarkably transformed, consisting of a thickish and somewhat nodulose basal part and a thin apical bristle. 3rd pair of legs with the inner ramus transformed in the usual manner, outer ramus nearly as in the female. Last pair of legs very small, with no expansion inside the proximal joint.

Colour yellowish.

Length of adult female 0.50 mm.

Remarks.—This form is nearly allied to the 3 preceding species, but is of smaller size than any of them, and moreover distinguished by its very narrow body, the unusually coarse integuments, and above all by the much more produced caudal rami.

Occurrence.—I have occasionally met with this small species off the south coast of Norway, at Risør, Lillesand and Farsund, in moderate depths among algæ. A single specimen was also found in a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle.

Distribution.—Polar islands north of Grinnell Land (2nd Fram-Expedition).

171. *Laophonte Nordgaardi*, G. O. Sars, n. sp.

(Pl. CLXXX).

Specific Characters.—*Female.* Body comparatively short and stout, tapering only slightly behind. Integuments not very coarse. Cephalic segment comparatively large, exceeding in length the 4 succeeding segments combined; rostral projection rather prominent and obtusely pointed at the tip. Urosome much shorter than the anterior division and having the lateral expansions of the segments rather prominent. Caudal rami short, being scarcely twice as long as they are broad, and considerably divergent, apical setæ of moderate length. Anterior antennæ rather large, but composed of only 6 articulations, the last 2 being confluent; 2nd joint much the largest, and without any projection behind. Posterior antennæ with the outer ramus normally developed. Posterior maxillipeds very powerful. 1st pair of legs with the outer ramus distinctly 3-articulate, and somewhat exceeding half the length of the proximal joint of the inner. Natatory legs with the number of setæ on both rami somewhat reduced. Last pair of legs with the distal joint comparatively small, narrow oval in form, and provided with only 4 setæ, the apical one much the longest; inner expansion of proximal joint triangular in form, and extending to about the middle of the distal joint, marginal setæ 4 in number, all of nearly equal length.

Male with the 2nd pair of legs of exactly the same structure as in female. 3rd pair of legs with the inner ramus transformed in the usual manner, spiniform projection of middle joint sigmoid, terminal joint comparatively short, and provided with only 3 setæ. Last pair of legs much smaller than in female, distal joint gradually widening towards the end, and provided with 5 setæ.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present species is easily distinguishable from any of the 4 preceding ones, both as regards its external appearance and the structure of some of the appendages, especially that of the last pair of legs. It is one of the smallest species known.

Occurrence.—Some few specimens of this distinct form were found in a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle, and kindly sent to me for examination. I have much pleasure in naming it in honour of that distinguished naturalist, to whom I am indebted for the examination of this and many other interesting species of Copepoda.

172. *Laophonte parvula*, G. O. Sars, n. sp.

(Pl. CLXXXI).

Specific Characters.—*Female.* Body rather short and stout, gradually tapering behind, with the segments sharply marked off from each other. Rostral projection of moderate size and obtusely pointed at the tip. Urosome almost as long as the anterior division, lateral expansions of the segments not very prominent. Caudal rami short, only slightly longer than they are broad, and scarcely at all divergent, apical setæ of moderate length. Anterior antennæ distinctly 7-articulate, 2nd joint produced behind to a triangular projection. Posterior antennæ with the outer ramus normally developed. Posterior maxillipeds not very strong. 1st pair of legs with the outer ramus distinctly 3-articulate, and exceeding half the length of the proximal joint of the inner. Natatory legs of normal structure. Last pair of legs with the distal joint narrow oblong in form, and provided with 7 marginal setæ, the 2 proximal ones of the outer edge closely juxtaposed, one of the apical setæ very slender; inner expansion of proximal joint triangular, and extending somewhat beyond the middle of the distal joint, marginal setæ 5 in number, all of nearly equal length. Ovisac of moderate size, rounded oval in form.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.48 mm.

Remarks.—The present form is of about the same size as *L. Nordgaardi*, but is easily distinguished from that species by the distinctly 7-articulate anterior antennæ and the peculiar shape of the last pair of legs. The general form of the body is also somewhat different.

Occurrence.—Some few specimens of this form, all of the female sex, were picked up from samples taken at Risør and Lillesand, south coast of Norway.

173. *Laophonte nana*, G. O. Sars, n. sp.

(PL CLXXXII).

Specific Characters.—*Female.* Body very short and stout, somewhat depressed in front and rapidly tapering behind, almost pyriform in shape. Cephalic segment large and broad, with the rostral projection obtusely triangular in shape. Eye very large and light red. Urosome much shorter than the anterior division, and having the lateral expansions of the segments rather slight. Caudal rami short, not much longer than they are broad, and scarcely at all divergent, middle apical seta about half the length of the body. Anterior antennæ rather stout and gradually tapering distally, being only composed of 6 articulations, 2nd joint the largest and without any projection behind. Posterior antennæ with the outer ramus extremely small and rudimentary, conical in form, with a single apical seta and a minute lateral hair. 1st pair of legs less slender than usual, outer ramus biarticulate and about half the length of the proximal joint of the inner. Natatory legs well developed and of normal structure, except that the terminal joint of the outer ramus in the 4th pair is shortened and armed with only 3 spines. Last pair of legs with the distal joint small, sub-truncate at the tip, and provided with 5 setæ, the 2 outermost ones closely juxtaposed; inner expansion of proximal joint rather large and somewhat curved, extending nearly as far as the distal joint, marginal setæ 4 in number, the outermost but one the longest, digitiform process outside this joint short and broad. Ovisac large, rounded oval in form.

Male with the 2nd pair of legs considerably larger than in female, inner ramus very slender, with only 3 setæ on the distal joint, the innermost one short, spiniform. 3rd pair of legs very unlike those in female, outer ramus exceedingly strong, with the setæ of the inner edge spiniform, inner ramus distinctly 3-articulate, spiniform projection of middle joint of a rather peculiar appearance, being sigmoid in form and abruptly bent outwards. Last pair of legs extremely small, distal joint with only 3 setæ, proximal joint without any expansion inside.

Colour of female pale yellow, with dark green ovaria.

Length of adult female 0.42 mm.

Remarks.—This is perhaps the smallest of all the known species of the present genus, and is moreover easily recognised by its short pyriform body, as also by the structure of some of the appendages in both sexes.

Occurrence.—I have only met with this form in the upper part of the Christiania Fjord. It occurred there occasionally on a muddy bottom in shallow bays near the town.

174. *Laophonte inopinata*, Scott.

(Pl. CLXXXIII).

Laophonte inopinata. Th. Scott, Additions to the Fauna of the Firth of Forth. Tenth Annual Report of the Fishery Board for Scotland, Part III, p. 256, Pl. XI, figs. 1—12.

Specific Characters.—*Female.* Body slender, sub-cylindric in form, with the segments sharply marked off from each other, and clothed at the hind edge with scattered spinules with a dense fringe of small denticles between them. Rostral projection triangular. Urosome much shorter than the anterior division, and having the lateral expansions of the segments well defined and densely hairy; last segment exceeding in length the preceding one. Caudal rami comparatively short and of uniform width throughout, somewhat divergent and clothed both at the edges and on the upper face with short hairs; middle apical seta much elongated, exceeding half the length of the body, and having its distal part densely clothed with woolly cilia, tip naked and turned up in a hamiform manner. Anterior antennæ composed of only 6 articulations, the last 2 being confluent, 2nd joint simple and exceeding in length the 3rd. Posterior antennæ rather strong, with the outer ramus normally developed. 1st pair of legs not much elongated, outer ramus biarticulate, and scarcely half as long as the proximal joint of the inner. Natatory legs poorly developed, with the setæ much reduced both in size and number, inner ramus in the 2 anterior pairs biarticulate, in 4th pair quite rudimentary, uniarticulate. Last pair of legs well developed, distal joint somewhat fusiform in outline, and provided with 5 setæ arising from digitiform projections of the edge; inner expansion of proximal joint short and broad, not nearly extending to the middle of the distal joint, marginal setæ 4 in number, the outermost but one much the longest. Ovisac small, rounded.

Male not examined.

Colour light yellow.

Length of adult female 0.55 mm.

Remarks.—This form, described by Th. Scott in the above-mentioned paper, is at once distinguished from any of the other known species by the peculiar structure of the middle apical seta of the caudal rami. It also differs from most other species in the poor development of the natatory legs, which would seem to make it quite unable to move freely in the water.

Occurrence.—Only a very limited number of specimens of this form, all of the female sex, have hitherto come under my notice. Some of them were found off the south coast of Norway, at Risør and Lillesand, and some off the south-west coast, at Skutesnæs. Th. Scott also records this species from the Finnmark coast.

Distribution.—Scottish coast (Scott).

175: *Laophonte denticornis*, Scott.

(Pl. CLXXXIV).

Laophonte denticornis, Th. Scott, Additions to the Fauna of the Firth of Forth. Twelfth Annual Report of the Fishery Board for Scotland, Part III, p. 246, Pl. VII, figs. 13—23.

Specific Characters.—*Female.* Body very slender, cylindric in form, with all the segments sharply marked off from each other, and more or less angular. Rostral projection broadly triangular, with the tip narrowly produced. Urosome fully as long as the anterior division, lateral expansions of the anterior segments well defined and densely spinulose, last segment about the length of the preceding one, and having the anal opercle triangularly produced. Caudal rami nearly 4 times as long as they are broad, linear in form, and somewhat divergent, each with a well-marked keel running along the dorsal face; apical setae of moderate length and distinctly spinulose. Anterior antenna rather large, but composed of only 6 articulations, the last 2 being confluent; 2nd joint produced behind to a remarkably strong claw-like projection. Posterior antennae and oral parts of normal structure. 1st pair of legs with the outer ramus very small, biarticulate, scarcely more than $\frac{1}{3}$ as long as the proximal joint of the inner. Natatory legs poorly developed, with the setae much reduced, inner ramus in all pairs biarticulate and finely ciliated on both edges. Last pair of legs with the distal joint narrow oblong in form, and somewhat obliquely truncated at the end, which carries 5 somewhat unequal setae; inner expansion of proximal joint rather large, extending about as far as the distal joint, marginal setae 4 in number, all of nearly equal length.

Male not examined.

Colour whitish grey.

Length of adult female 0.80 mm.

Remarks.—The above-described form agrees on the whole so closely with the species recorded by Th. Scott, that I cannot doubt that it is the same. Yet there is one apparent difference to be noted as regards the structure of the 1st pair of legs, the outer ramus of which is said by that author to be 3-articulate; but I think this statement must be due to some mistake. The present form is a very distinct one, easily recognisable from any of the other known species.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were taken at Farsund, south coast of Norway, from a depth of about 30 fathoms.

Distribution.—Scottish coast (Scott).

Gen. 53. **Laophontopsis**, G. O. Sars, n.

Generic Characters.—Body slender, cylindric in form, with deep instriations between the segments. Integuments unusually hard, and exhibiting a pitted sculpturing. Rostral projection broad, lamellar, and distinctly defined at the base by a transverse suture. Caudal rami pronouncedly lamellar, with the apical setæ very short and rudimentary. Anterior antennæ short and stout with the articulations much reduced in number. Posterior antennæ and oral parts differing only slightly in structure from those in *Laophonte*. 1st pair of legs likewise of a very similar appearance, though differing in the presence of a plumose seta inside the proximal joint of the inner ramus. Natatory legs well developed, with the outer ramus very slender and provided inside with long ciliated setæ, inner ramus bi-articulate, with the number of setæ somewhat reduced. Last pair of legs in female with both the distal joint and the inner expansion of the proximal joint narrowly produced.

Remarks.—The present new genus is founded upon the anomalous species *Laophonte lamellifera* of Claus, which seems to me to be entitled to form a distinct generic type, exhibiting, as it does, some rather striking differences from the other species of *Laophonte*. The most conspicuous of these differences is shown in the peculiar structure of the caudal rami, from which the name of the species has been derived. There are however 2 other less conspicuous characters by which the present genus differs very markedly from most other *Laophontidæ*, and which are only found in one other very distinct genus referable to that family, viz., the genus *Normanella* Brady, to be described farther on. The first of those

characters refers to the rostral plate, which does not as usual form the immediate continuation of the cephalic segment, but, as in *Normanella*, is sharply defined from it at the base by a well-marked transverse suture. The second character is found in the structure of the 1st pair of legs, the inner ramus of which has attached inside the proximal joint a short, though well defined plumose seta, of which no trace is found in other *Laophontida*, except in the genus *Normanella*. We only know as yet a single species of the present genus.

176. *Laophontopsis lamellifera* (Claus).

(Pl. CLXXXV).

Cleta lamellifera, Claus, Die freilebenden Copepoden, p. 123, Pl. XV, figs. 21—24.

Specific Characters.—*Female.* Body narrow and elongated, slightly tapered behind, with the segments somewhat raised dorsally and fringed at the hind edge with distant spinules. Rostral plate broadly triangular in form, tip obtusely rounded. Urosome about the length of the anterior division, lateral expansions obsolete, last segment fully as long as the preceding one, anal opercle finely denticulate. Caudal rami twice the length of the anal segment and closely juxtaposed, tapering somewhat distally, outer edge with 2 distant bristles, dorsal seta issuing close to the base, middle apical seta scarcely half the length of the ramus, the other 2 still smaller. Anterior antennæ short and stout, composed of 4 joints only, the last 2 of the proximal part, and all of the terminal part, being confluent; setæ of the anterior edge comparatively short, partly spiniform. Posterior antennæ of quite normal structure. 1st pair of legs with the outer ramus 3-articulate and about half the length of the proximal joint of the inner, plumose seta of the latter very small, and attached about in the middle. Natatory legs with the terminal joint of the outer ramus very narrow, and provided in the anterior pair with one, in the other 2 pairs with 2 setæ inside; inner ramus in 2nd pair of legs with only 3 setæ, in the other 2 pairs with 4. Last pair of legs with the distal joint narrow linear in form, and provided with 6 partly spiniform setæ, 4 of which are attached to the outer edge, apical seta much the longest; inner expansion of proximal joint narrow linguiform, and extending considerably beyond the middle of the distal joint, marginal setæ 5 in number, the innermost one somewhat remote from the others. Ovisac of moderate size and oval in form.

Male not examined.

Colour whitish grey.

Length of adult female 0.88 mm

Remarks.—This form was first briefly described by Claus as *Cletu lamellifera*, and subsequently more closely examined by Prof. Brady, who referred it to the genus *Laophonte* of Philippi. It is an easily recognisable species, which cannot be confounded with any of the other *Laophontidæ*.

Occurrence.—I have only met with this form in a single locality, viz., at Hvalor, in the outer part of the Christiania Fjord, where some few female specimens were taken from a depth of about 6 fathoms, muddy bottom.

Distribution.—Mediterranean (Claus), British Isles (Brady), coast of France (Cannu).

Gen. 54. **Asellopsis**, Brady, 1873.

Generic Characters.—Body pronouncedly depressed, with all the segments lamellarly expanded laterally. Rostral projection triangular, not defined behind by any suture. Caudal rami lamelliform, with the apical setæ rudimentary. Anterior antennæ in female with the number of joints reduced; those of male strongly hinged. Posterior antennæ about as in *Laophonte*. Oral parts also of a somewhat similar structure. 1st pair of legs with the outer ramus small, biarticulate, proximal joint the larger; inner ramus strong, resembling in structure that in *Laophonte*. Natatory legs well developed, with the full number of setæ, outer ramus coarsely spinulose outside; inner ramus of 3rd pair in male transformed in the usual manner. Last pair of legs in female with both joints lamellar and provided with comparatively short setæ; those in male without any expansion inside the proximal joint.

Remarks.—This genus was established in the year 1873 by Prof. Brady, to include a species, *A. hispida*, which, as regarded its external appearance, differed very markedly from the other *Laophontidæ*, as indicated by the generic name. Subsequently, however, he withdrew this genus, believing that the form upon which it was founded did not differ sufficiently in its anatomical details from *Laophonte*. As of recent years several genera closely related to that genus have been established and comprised within a particular family, *Laophontidæ*, I think that the present genus may also be acceptable, the more so as, in addition to the typical form, there is another well-defined species, which is evidently referable to that genus, viz., the form recently described by Th. Scott as *Laophonte intermedia*. In the structure of the caudal rami and the rudimentary condition of their apical setæ, the present genus agrees with *Laophontopsis*; but the form of the body is very different, and there are also several differences to be found in the structural details, which preclude a combination of these 2 genera.

177. *Asellopsis hispida*, Brady.

(Pl. CLXXXVII).

Asellopsis hispida, Brady & Robertson, Ann. & Mag. Nat. Hist. Vol. XII, p. 137, Pl. IX, figs. 6—10.

Specific Characters.—*Female.* Body comparatively broad, flattened, with the lateral expansions of the anterior segments truncated at the end. Cephalic segment very large, almost quadrangular in outline, rostral projection rather prominent, with the tip blunted. Urosome much shorter than the anterior division and having all the segments produced laterally to triangular imbricated expansions. Caudal rami short and broad, forming rounded lamellæ densely clothed with short hairs both at the edges and on the upper face, setæ of outer edge closely juxtaposed and not far from the end, dorsal seta issuing from about the middle, medial apical seta scarcely longer than the ramus, the other 2 still smaller. Eye well developed and of light red colour. Anterior antennæ of moderate size, and composed of 5 articulations, the last 2 of the proximal part being confluent; last joint transversely truncated at the tip. Posterior antennæ with the apical spines and setæ comparatively short and thick, outer ramus rather small and provided with 4 short ciliated setæ. 1st pair of legs with the outer ramus scarcely half as long as the proximal joint of the inner, distal joint of nearly the same length as the proximal one, but considerably narrower, and carrying outside a thin flexuous bristle, at the tip a single spine and 2 geniculated setæ. Natatory legs with the proximal joints of the rami somewhat dilated, especially in the anterior pairs, the 2 first joints of outer ramus armed with a double row of coarse spinules. Last pair of legs comparatively large, distal joint oblong oval in form with the outer edge minutely spinulose and carrying 5 rather short setæ arising from digitiform prominences, the penultimate one very thin, hair-like, inner edge of the joint quite smooth; inner expansion of proximal joint considerably produced and of narrow linguiform shape, extending about as far as the distal joint, marginal setæ 4 in number, the 2 innermost ones much shorter than the other 2.

Male with the anterior antennæ very strongly built and distinctly 6-articulate, last joint of proximal part globularly dilated, terminal part biarticulate, claw-like. Inner ramus of 3rd pair of legs distinctly triarticulate, middle joint produced at the end outside to a spiniform projection. Last pair of legs very small, with no trace of an inner expansion of the proximal joint.

Colour light yellow, with orange shading.

Length of adult female 0.58 mm.

Remarks.—The present form, first described by Messrs. Brady and Robertson under the above name, is easily recognisable by its flat expanded body and the

densely hispid lamelliform caudal rami. From the nearly allied species, *A. intermedia* (Scott), it may be distinguished by the somewhat different form of these rami, as also by some differences in the structure of the 1st pair of legs, as shown by the figures given by that author.

Occurrence.—I have found this form occasionally off the south coast of Norway, at Risør and Lillesand, in moderate depths, but more frequently off the south-west coast, at Skutesnæs and Haugesund. In the last-named locality it also occurred in tidal pools together with other littoral forms.

Distribution.—British Isles (Brady).

Gen. 55. **Laophontodes**, Scott, 1894.

Generic Characters.—Body more or less slender, with all the segments sharply marked off from each other by conspicuous constrictions. Cephalic segment comparatively broad and projecting in front to a triangular rostral plate not defined at the base. Urosome with the postero-lateral corners of the segments more or less produced. Caudal rami long and narrow, with one of the apical setæ rather strong. Anterior antennæ in female comparatively slender, with the 2 outer joints of the proximal part confluent; those in male hinged in the usual manner. Posterior antennæ with no trace of an outer ramus. Mandibular palp comparatively small, club-shaped. Maxillæ with the exopodal and epipodal lobes imperfectly developed. Anterior maxillipeds comparatively small, with only 2 digitiform lobes inside the claw-bearing joint. Posterior maxillipeds of normal structure. 1st pair of legs with the outer ramus much smaller than the inner, though composed of 3 well-defined joints, the last of which is rather short and obliquely truncated at the tip, spine of 1st joint of normal appearance, all the other 5 spines slender, geniculate, and gradually increasing in length distally; inner ramus, as in *Laophonte*, distinctly prehensile, biarticulate, with the proximal joint long and slender, distal joint armed at the tip with a curved claw and a slender seta. Natatory legs more or less extended laterally, the 2nd basal joint being considerably produced and bent upon the 1st in an elbow-like manner, rami very unequal and attached at rather a long distance from each other, the outer one slender, 3-articulate, with the spines rather elongated, inner ramus much smaller than the outer, narrow linear in form, and composed of only 2 joints, the 1st very small and in some cases imperfectly defined; inner ramus of 3rd pair of legs in male

slightly transformed. Last pair of legs forming each a slender curved stem extending laterally, its 2 joints imperfectly defined, the proximal one without any distinct expansion inside, but produced outside to a slender digitiform process tipped with a delicate bristle; those in male comparatively smaller than in female, with the 2 joints completely confluent, and the number of setæ reduced.

Remarks.—This genus was established by Th. Scott in the year 1894, and was at first merely regarded as a subgenus of *Laophonte*. In my opinion it is a fairly well defined genus, differing very markedly from the other genera comprised within the present family in several of the structural details, for instance, in the total absence of an outer ramus on the posterior antennæ, and in the rather peculiar structure of the legs. Off the coasts of Norway, there occur 3 well defined species belonging to this genus.

178. *Laophontodes typicus*, Scott.

(Pl. CLXXXVII).

Laophontodes typicus, Th. Scott, Additions to the Fauna of the Firth of Forth. Twelfth Annual Report of the Fishery Board for Scotland, Part III, p. 249, Pl. VIII, figs. 2–8.

Specific Characters.—*Female.* Body narrow, elongate, tapering behind, with the segments more or less angular in form. Cephalic segment sub-quadrangular in outline, postero-lateral corners only slightly produced. Rostral projection not very prominent, and obtuse at the tip. Urosome very narrow and (including the caudal rami) almost as long as the anterior division, lateral expansions of the segments well defined and minutely spinulose at the edges; last segment almost as long as the preceding one, and having the anal opercle finely denticulate, caudal rami narrow linear in form and rather divergent, being nearly twice as long as the anal segment, setæ of outer edge somewhat distant, dorsal seta well developed and issuing near the end of the ramus; middle apical seta rather strong, the other 2 very small, the outermost one being the longer, and connected at the base with the middle one. Anterior antennæ rather slender, almost attaining the length of the cephalic segment, and composed of 5 articulations, 2nd joint about the length of the 3rd, and exhibiting behind a slight ciliated expansion; terminal part fully as long as the 3rd joint. Posterior antennæ with the distal joint long and narrow, exhibiting the usual armature. Posterior maxillipeds not very strong, hand narrow fusiform in shape. 1st pair of legs with the outer ramus about half as long as the proximal joint of the inner, geniculate spines of the last joint rapidly increasing in length, the innermost one being 3 times as long as the whole ramus, apical claw of inner ramus of moderate size and much curved at the end,

accompanying seta rather longer than the claw. Natatory legs without any setae inside the outer ramus. Last pair of legs with the proximal part shorter than the distal one, and provided inside with 2 closely juxtaposed setae, distal part carrying 5 strong setae, 2 outside and 3 at the tip, inner edge smooth. Ovisacs small, rounded, with a very limited number of ova.

Male with the anterior antennae rather strongly built, proximal part consisting of 4 well-defined joints, the last globularly dilated, terminal part uniaarticulate, claw-like. Inner ramus of 3rd pair of legs 3-articulate, with the middle joint much the longest and produced at the end outside to a spiniform projection. Last pair of legs with only a single strong seta opposite the outer digitiform process, terminal part with one lateral and 2 somewhat unequal apical setae.

Colour not yet ascertained.

Length of adult female 0.45 mm.

Remarks.—This is the first species described, and thus deserves its specific name as the type of the present genus. It is easily distinguished from the other 2 species by its long and narrow body, the form of the cephalic segment, and the angular shape of the succeeding segments.

Occurrence.—A solitary female specimen of this interesting form was taken some years ago, at Bukken, south-west coast of Norway, from a depth of about 20 fathoms. Some few specimens of both sexes were moreover picked up from a sample taken by Mr. Nordgaard in the Salten Fjord, north of the Arctic Circle, and kindly sent to me for examination.

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

179. *Laophontodes bicornis*, A. Scott.

(Pl. CLXXXVIII).

Laophontodes bicornis, A. Scott, Description and Notes of some new and rare Copepoda from Liverpool Bay. Report for 1985 on the Lancashire Sea Fisheries Laboratory, p. 14, Pl. III, figs. 24 & 25, Pl. IV, figs. 1—7.

Specific Characters.—*Female.* Body of a narrow and elongated form somewhat similar to that of the preceding species. Cephalic segment, however, very different in shape, exhibiting behind the middle a conspicuous constriction, anterior part triangularly expanded laterally, posterior part sending off to each side a remarkable horn-like process pointing obliquely backwards; rostral projection broadly triangular, with the tip slightly produced and obtusely pointed. The 3 succeeding segments very narrow and rounded laterally; last pedigerous segment somewhat broader. Urosome slender, though somewhat shorter than the anterior division,

lateral expansions of the segments only slightly produced and obtuse at the tip; last segment rather small, scarcely half as long as the preceding one, and having the anal opercle considerably prominent. Caudal rami narrow linear in form and slightly divergent, about equalling in length the last 2 segments combined, setæ of outer edge small and attached near the end, dorsal seta well developed, middle apical seta about twice the length of the ramus. Eye very conspicuous in the living animal. Anterior antennæ resembling in structure those in *L. typicus*; 3rd joint however comparatively longer. Posterior antennæ and oral parts almost exactly as in that species. 1st pair of legs likewise of a very similar structure. Natatory legs differing in the presence of well-developed setæ inside the outer ramus. Last pair of legs with the proximal part considerably longer than the distal one, and finely ciliated on both edges, carrying inside at the end 2 closely juxtaposed setæ, distal part with 5 marginal setæ, 3 at the tip and one on each side. Ovisac rounded.

Male with the anterior antennæ somewhat less strongly hinged than in the preceding species. Inner ramus of 3rd pair of legs with the projection of the middle joint very small. Last pair of legs comparatively smaller than in female, with no boundary between the proximal and the distal parts; number of setæ as in the male of *L. typicus*.

Body of a beautiful violaceous colour, with the ova in the ovisac light green. Length of adult female 0.44 mm.

Remarks.—This form, first described by Mr. A. Scott from a solitary female specimen, is at once distinguished from the type species by the peculiar shape of the cephalic segment, and still more by the very prominent lateral processes issuing from its posterior part. It moreover differs conspicuously in the presence of well-developed setæ inside the outer ramus of the natatory legs, and the shape of the last pair of legs is also somewhat different.

Occurrence.—I have met with this peculiar Copepod not infrequently in several localities both on the south and west coasts of Norway in depths ranging from 10 to 30 fathoms. It is however easily overlooked on account of its small size.

Distribution.—British Isles (Scott).

180. *Laophontodes expansus*, G. O. Sars, n. sp.

(Pl. CLXXXIX).

Specific Characters.—*Female.* Body comparatively short and stout, flattened, with the lateral parts of the segments lamellarly expanded. Cephalic segment very large, with the lateral edged evenly curved and densely clothed with long cilia; rostral projection rather prominent, terminating in a spiniform point. Lateral parts of the succeeding segments produced to narrow linguiform plates densely ciliated at the end. Urosome much shorter than the anterior division, and having all the segments, except the last, expanded laterally in a manner similar to those of the anterior division, last segment short and broad, with the anal opercle prominent and finely spinulose at the edge. Caudal rami long and slender, linear in form, and considerably divergent, inner edge ciliated in the middle, outer edge exhibiting in front of the middle two small tufts of cilia, setæ of this edge rather distant, dorsal and apical setæ about as in *L. bicornis*. Anterior antennæ comparatively slender, but composed of only 4 joints, the terminal part being uniarticulate. Posterior antennæ and oral parts about as in the 2 preceding species. 1st pair of legs also rather similar, though comparatively more strongly built, with the apical claw of the inner ramus rather strong, and the accompanying seta much elongated. Natatory legs without any setæ inside the outer ramus, apical seta of this ramus very small and rudimentary; inner ramus of 4th pair of legs likewise much reduced, and only provided with a single apical seta. Last pair of legs with the proximal part much shorter than the distal one, and without any seta inside, distal part, like the proximal one, clothed at the edges with irregular tufts of hairs, setæ 5 in number, 2 of them issuing from the upper face.

Male unknown.

Colour not yet ascertained.

Length of adult female 0.41 mm.

Remarks.—In its external appearance this form differs considerably from the 2 preceding species. It is however undoubtedly congeneric with them, exhibiting in the structural details all the chief features of the present genus.

Occurrence.—Only 2 female specimens of this remarkable form have as yet come under my notice. They were found in a sample taken by Mr. Nordgaard in the Salten Fjord, and kindly sent to me for examination.

Gen. 56. **Platychelipus**, Brady, 1880.

Generic Characters.—Body sub-cylindrical in form, resembling that in *Laophonte*, all the segments being very sharply marked off from each other. Cephalic segment of moderate size, and projecting in front in a triangular rostral plate, not defined at the base. Urosome with the lateral expansions of the segments only slightly marked. Caudal rami of moderate size, with the apical setæ comparatively short, the middle one very coarse, spiniform. Anterior antennæ in female 6-articulate, 2 of the joints belonging to the terminal part; those in male very strongly hinged. Posterior antennæ rather powerful, with the innermost apical seta spiniform and coarsely denticulated, outer ramus very small. Oral parts nearly as in *Laophonte*; posterior maxillipeds, however, less powerful, with the dactylus very slender and clothed inside with thin spinules. 1st pair of legs with both rami biarticulate, the outer one rather coarsely built, though shorter than the inner, the latter far less fully developed than in *Laophonte* and less pronouncedly prehensile, the apical claw being very thin, almost setiform. Natatory legs with the outer ramus strongly built, having the spines very coarse, whereas the setæ are much reduced, or in some cases wholly wanting, inner ramus poorly developed; those in male much larger than in female, with the outer ramus very powerful, inner ramus of 3rd pair of legs transformed in a manner similar to that in the male of *Laophonte*. Last pair of legs with the distal joint comparatively short, lamelliform, inner expansion of proximal joint well developed; those in male very much reduced.

Remarks.—This genus was established in the year 1880 by Prof. Brady, to include a species, *P. littoralis*, found by him off the British coast. It was referred by that author to his sub-family *Nannopinae*, though in reality it only exhibits a very remote affinity to the gen. *Nannopus*, on which this sub-family was founded. In my opinion the present genus ought unquestionably to be included in the family *Laophontidae*, exhibiting, as it does, all the chief features of that family. Off the Norwegian coast, 2 well-defined species referable to this genus occur.

181. **Platychelipus littoralis**, Brady.

(Pl. CXC & CXCI).

Platychelipus littoralis, Brady, Monograph on British Copepoda, Vol. II, p. 103, Pl. LXXIX, figs. 20—23, Pl. LXXX, figs. 15—19.

Specific Characters.—*Female*. Body moderately slender, slightly tapering behind, with well-marked constrictions between the segments. Cephalic segment

scarcely as long as the 3 succeeding segments combined, rostral plate obtusely pointed at the tip. Urosome much shorter than the anterior division, last segment not attaining the length of the preceding one. Caudal rami comparatively short and of uniform width throughout, setæ of outer edge closely juxtaposed, and, like the dorsal seta, issuing in front of the middle, medial apical seta distinctly jointed at the base, and not attaining half the length of the urosome. Anterior antennæ rather stout, with the setæ of the anterior edge short and thick, last joint about the length of the 3rd. Posterior antennæ with the outer ramus somewhat dilated in the middle and carrying 3 comparatively short setæ, one apical and one on each side. Mandibular palp comparatively large and densely hairy, with 5 thickish setæ, the innermost arising from a digitiform process. 1st pair of legs with the outer ramus about half the length of the inner, and rather coarsely built, last joint armed with 4 spines, but without any setæ; apical claw of inner ramus almost attaining the length of the whole ramus and turned up at the tip in a hamiform manner. Natatory legs remarkably short and stout, with no setæ on the outer ramus, the latter coarsely built, with the spines exceedingly strong; inner ramus in 2nd pair of legs normally developed though only carrying a single apical seta, in the 2 succeeding pairs quite rudimentary. Last pair of legs rather small, distal joint short, with 5 thickish setæ; inner expansion of proximal joint extending beyond the distal joint, and subtruncate at the end, which carries 4 strong setæ. Ovisac of moderate size and oval in form.

Male differing considerably from the female in its external appearance, having the anterior division of the body somewhat dilated in the middle, whereas the posterior is very slender and narrow. Rostral projection rather small and conical in form. Anterior antennæ strongly built, with the last joint of the proximal part globularly dilated, and the terminal part unguiform. 1st pair of legs slightly differing from those of the female as regards the outer ramus, the distal joint of which is comparatively larger, with an additional short seta inside the tip. Natatory legs remarkably strong, with the outer ramus much larger than in female, inner ramus in all of them well developed, though much smaller than the outer. Last pair of legs each reduced to a narrow rim carrying 4 setæ, inside which is another very small bristle.

Colour dark reddish brown.

Length of adult female 0.97 mm, of male 0.84 mm.

Remarks.—The present species is the type of the genus *Platychelipus*, and in some characters seems, indeed, to differ conspicuously from the typical species of *Laophonte*, especially as regards the female. The male, however, ex-

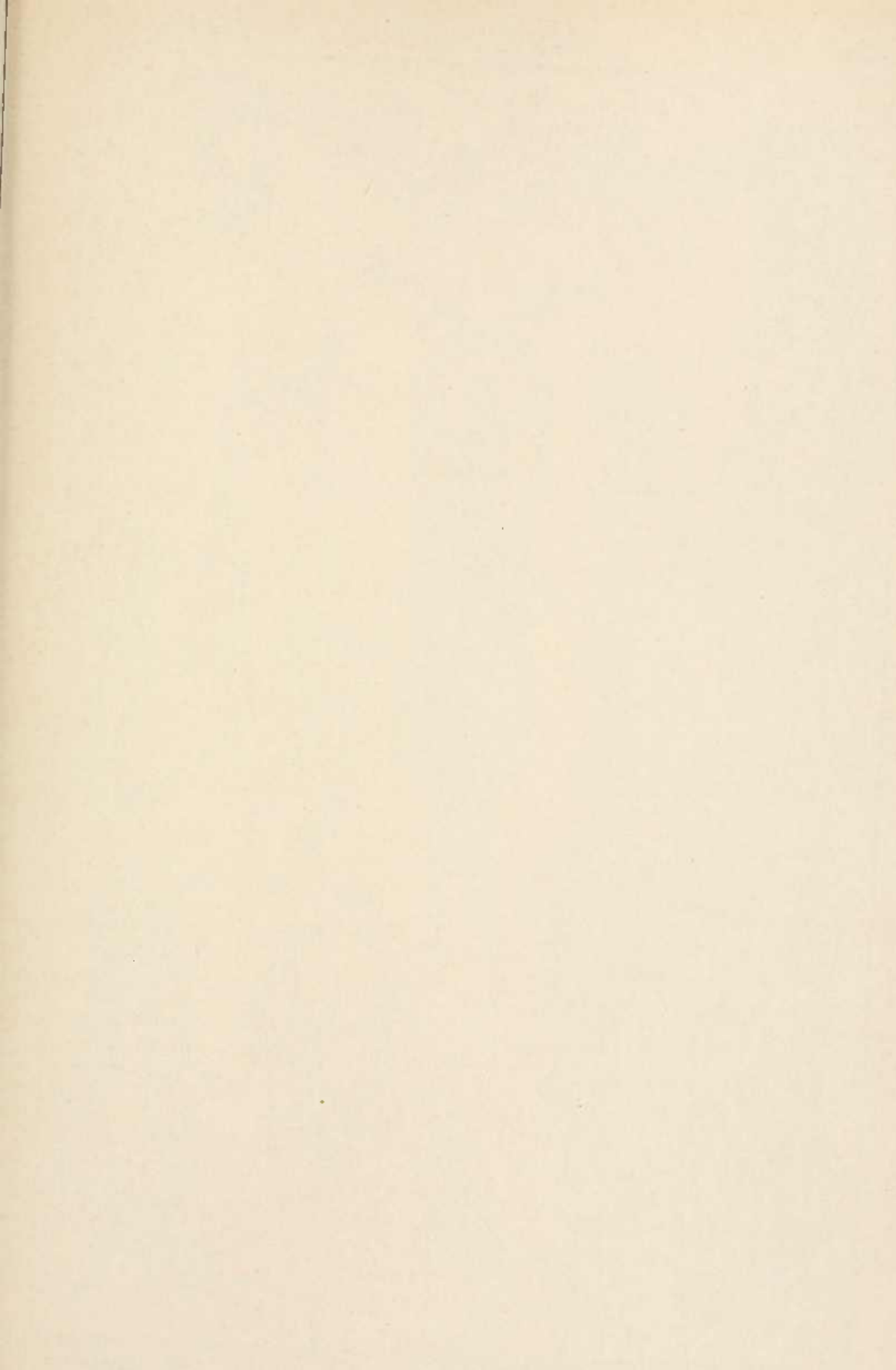
hibits sexual characters quite analogous to those found in some species of that genus, for instance *L. Stromi* and allied forms.

Occurrence.—I have only met with this form in a single locality, viz., in a shallow bay near Christiania. It occurred here not infrequently close to the shore, on a muddy bottom, males and females being present in about equal number and often seen tied together in copulation. Th. Scott also records this form from the Finmark coast. The movements of the animal consist chiefly in a slow creeping through the loose mud in which it dwells, and with which the surface of the body is often thickly covered. During these movements the very flexible body is twisted in various ways, and both the antennæ and the legs swing to and fro. At times the animal is seen slowly climbing up the walls of the vessel in which it is observed; but I have never seen it make even the slightest attempt to swim, and, indeed, the structure of the natatory legs, at any rate in the female, seems to render the animal quite unfit for such a movement.

Distribution.—British Isles (Brady), Novaja Zemlja (Scott).

182. *Platychelipus laophontoides*, G. O. Sars, n. sp.
(Pl. CXCII).

Specific Characters.—*Female.* Body somewhat less robust than in the preceding species, though otherwise of rather a similar appearance, tapering gradually behind. Cephalic segment exceeding in length the 3 succeeding ones combined, rostral projection minutely bilobular at the tip. Urosome comparatively more elongated, with the last segment fully as large as the preceding one. Caudal rami about twice as long as they are broad, and somewhat tapered distally; setæ of outer edge, like the dorsal one, issuing a little behind the middle, medial apical seta somewhat exceeding half the length of the urosome, and not jointed at the base. Anterior antennæ comparatively more slender than in the type species, with the setæ of the anterior edge less strong, terminal joint considerably longer than the 3rd. Posterior antennæ with the outer ramus extremely small, and having one of the setæ much longer than the others. Mandibular palp comparatively smaller than in *P. littoralis*, though of a very similar structure. 1st pair of legs likewise exhibiting the structure characteristic of the genus, outer ramus, however, comparatively narrower than in the type species, with the last joint longer than the 1st, and carrying 3 spines and 2 minutely ciliated setæ; apical claw of inner ramus very slender, and evenly curved at the tip. Natatory legs with the outer ramus less strongly built than in *P. littoralis*, and provided inside with a few

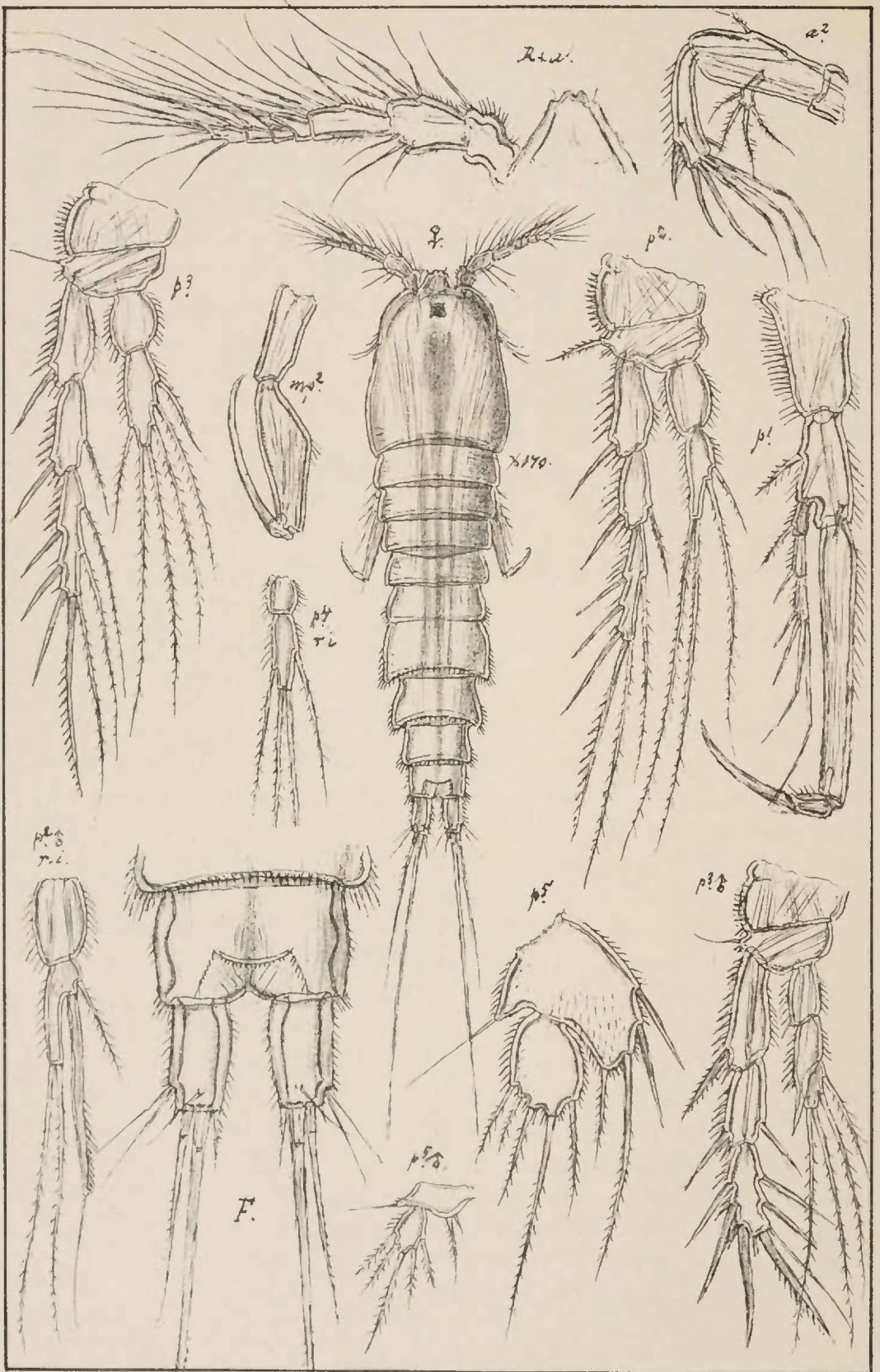


Copepoda

Laophontidæ

Harpacticoida

PL. CLXXVII



G.O. Sars autogr.

Norsk lithogr. Officin

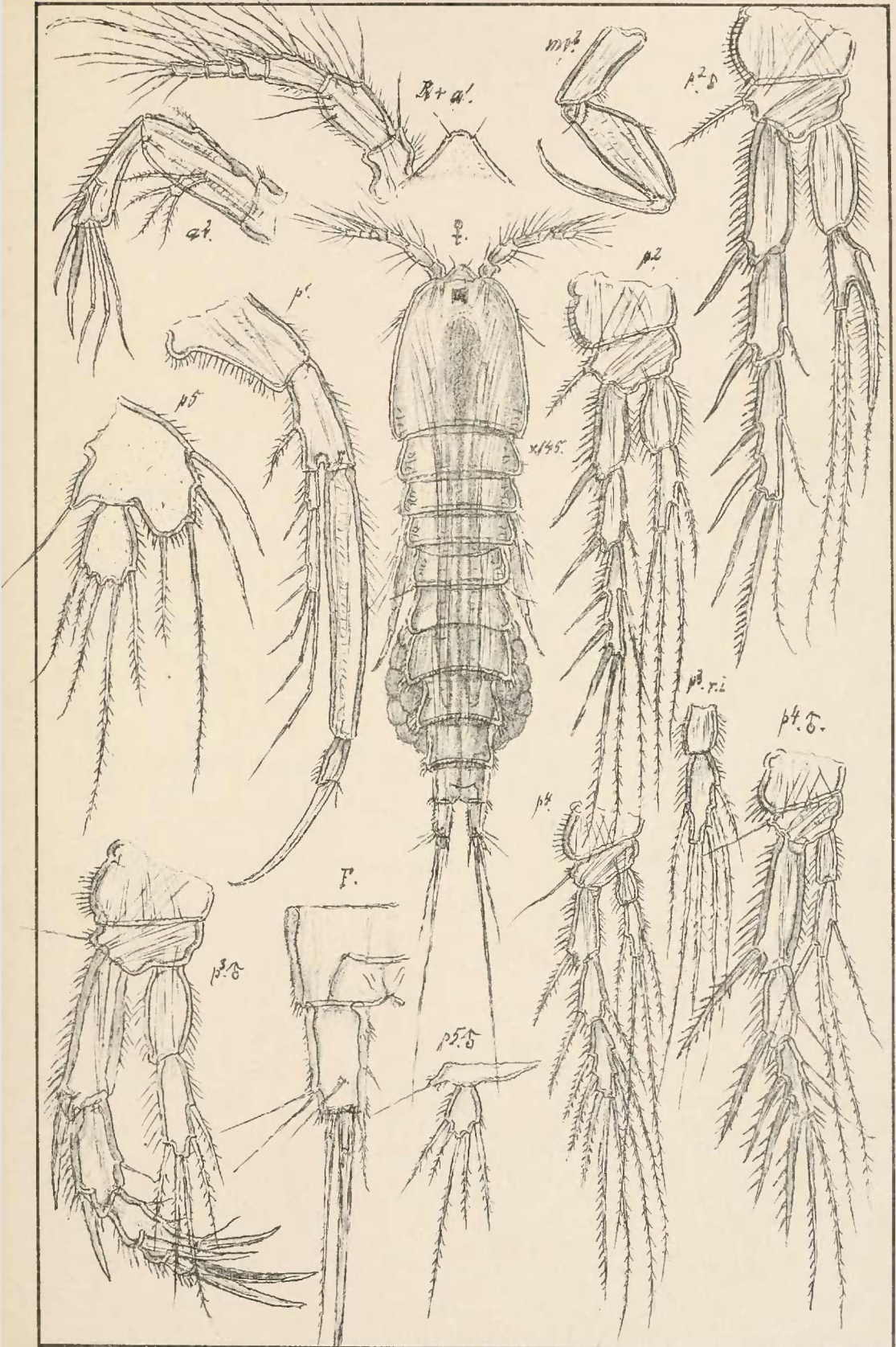
Laophonte congenera, G.O. Sars

Copepoda

Laophontidœ

Harpacticoida

PL. CLXXVIII.



G.O. Sars autogr.

Norsk lithgr. Officin.

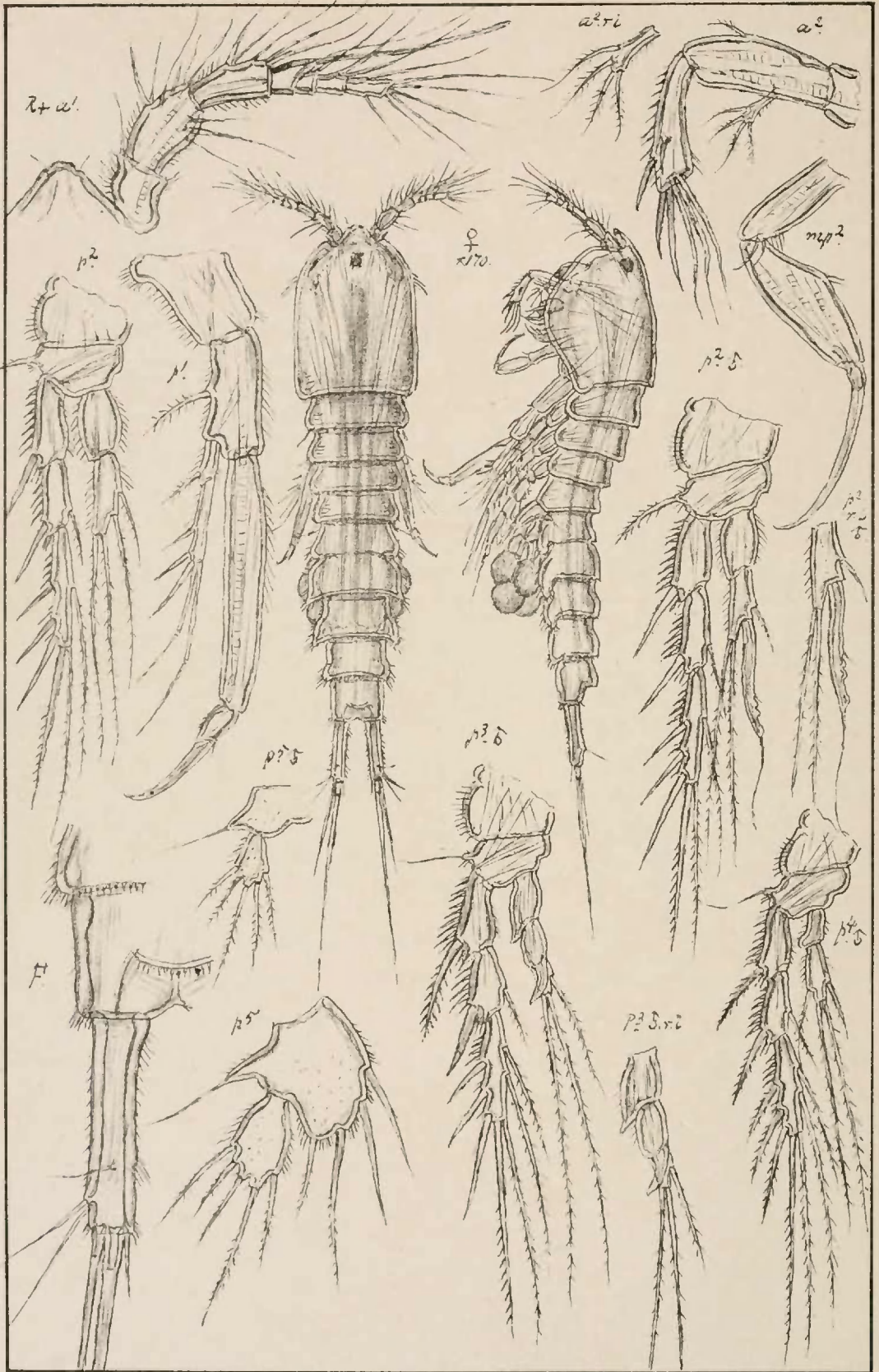
Laophonte perplexa, Scott

Copepoda

Laophontidæ

Harpacticoida

PL. CLXXIX



G.O. Sars autogr.

Norsk lithogr. Officin.

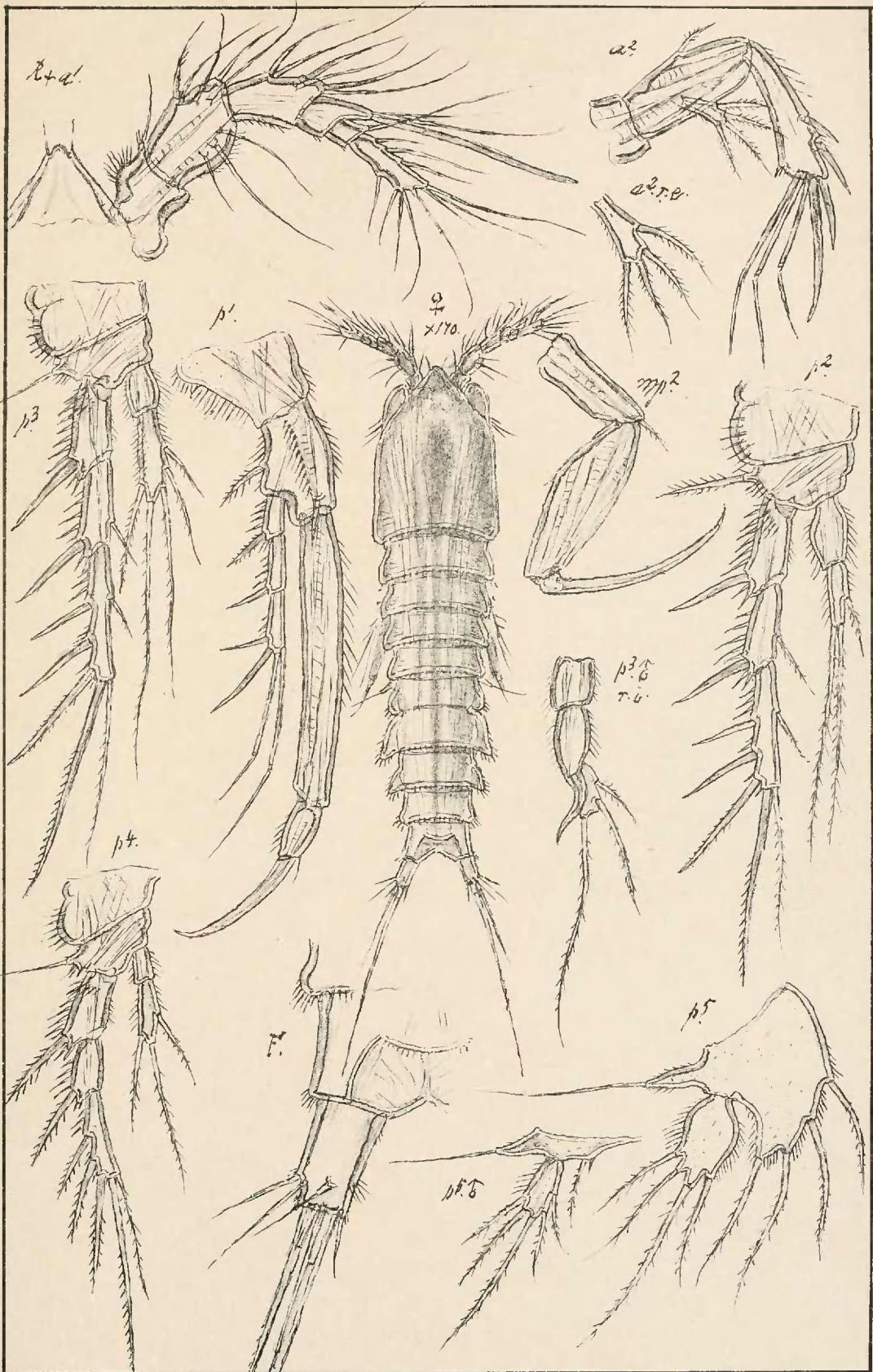
Laophonte macera, G.O. Sars

Copepoda

Laophontidæ

Harpacticoida

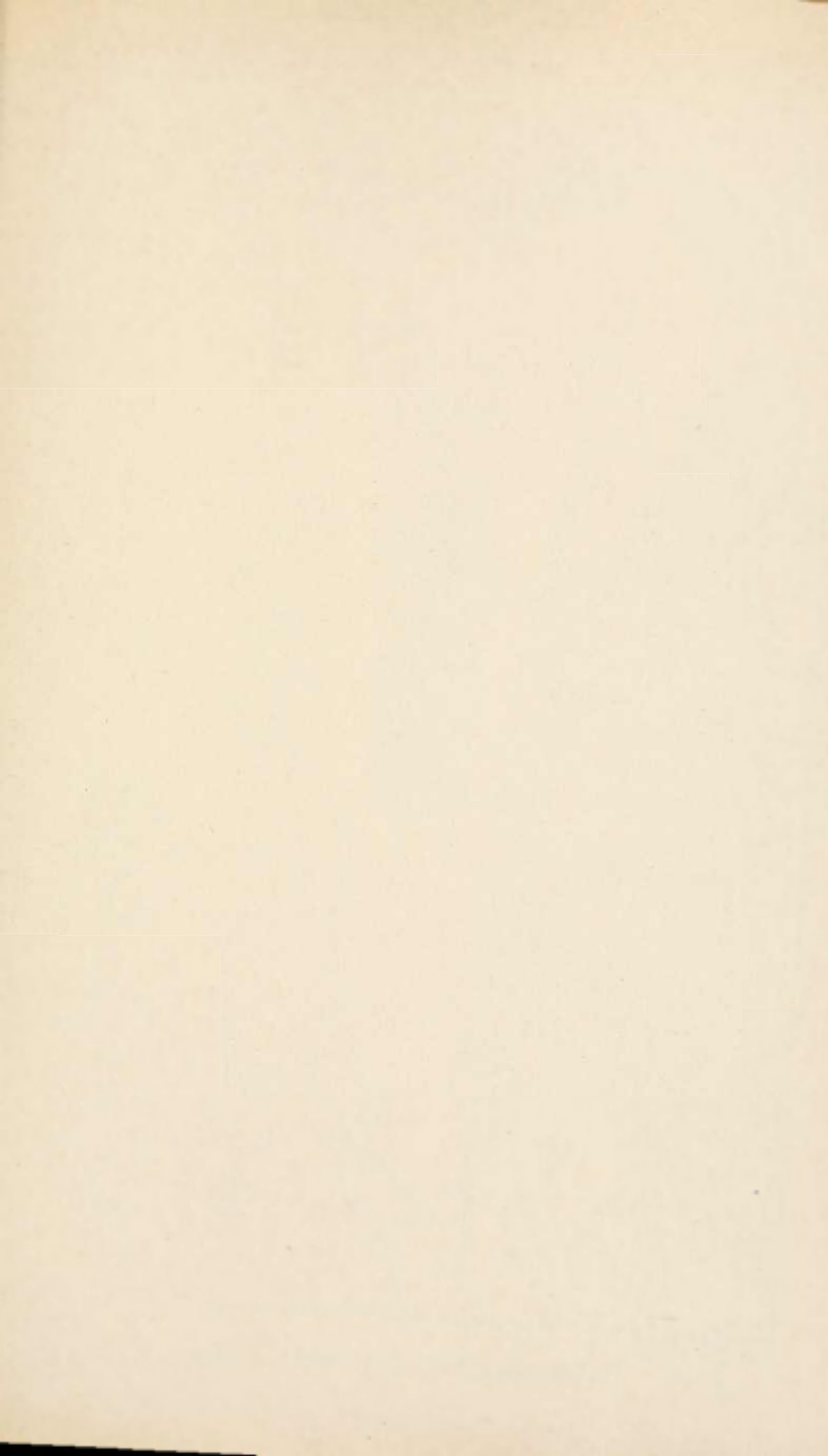
PL.CLXXX



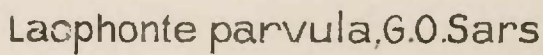
G.O.Sars autogr.

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Laophonte Nordgaardi, G.O.Sars



PL. CLXXXI

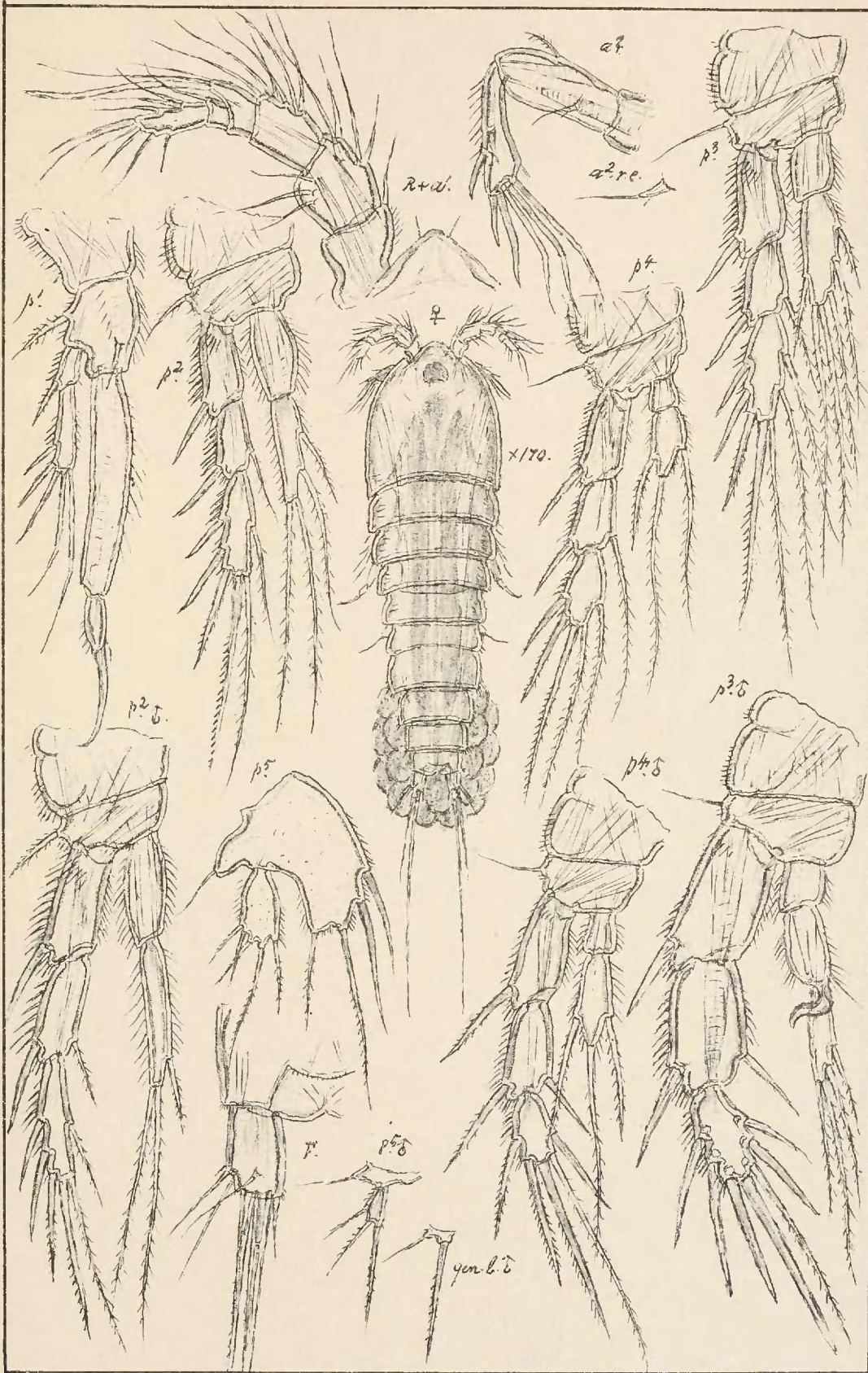


Copepoda

Laophontidae

Harpacticoida

PL. CLXXXII



G.O. Sars autogr.

Norsk lithogr. Officin.

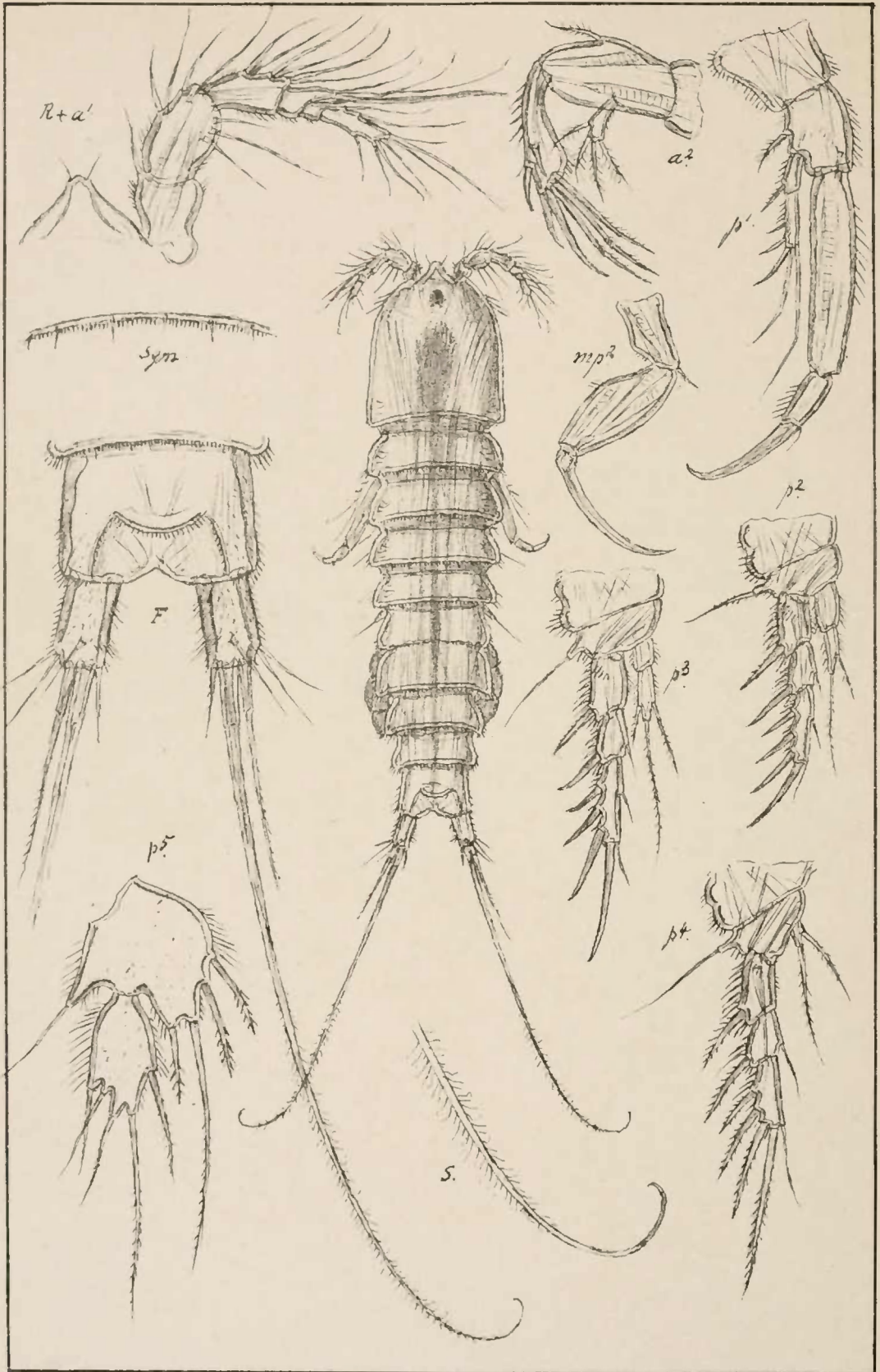
Laophonte nana, G.O. Sars

Copepoda

Laophontidæ

Harpacticoida

PL. CLXXXIII



G.O. Sars autogr.

Norsk lithogr. Officin.

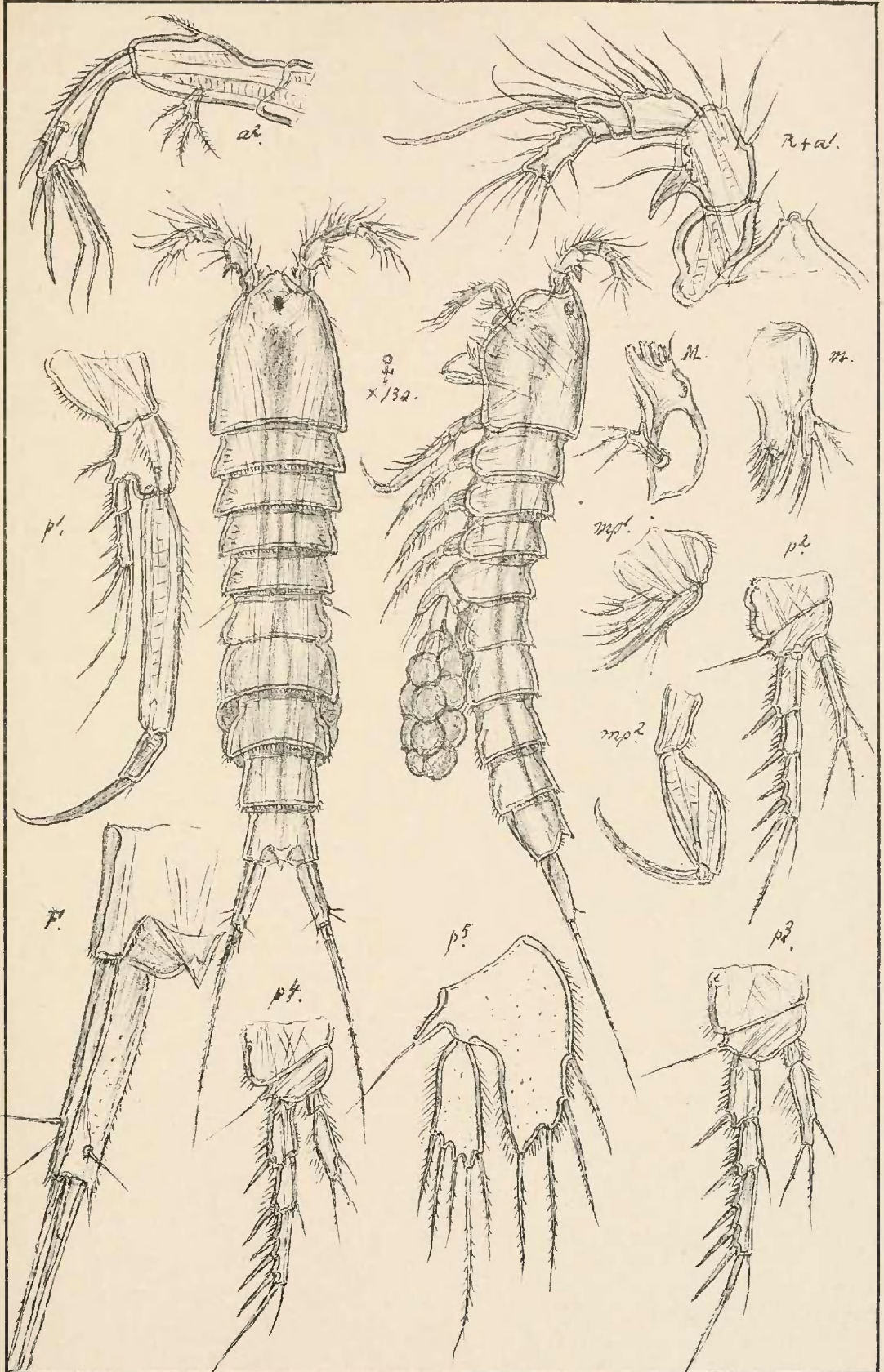
Lacphonte inopinata Scott

Copepoda

Laophontidœ

Harpacticoida

PL. CLXXXIV



G.O. Sars autogr.

Norsk lithogr. Officin.

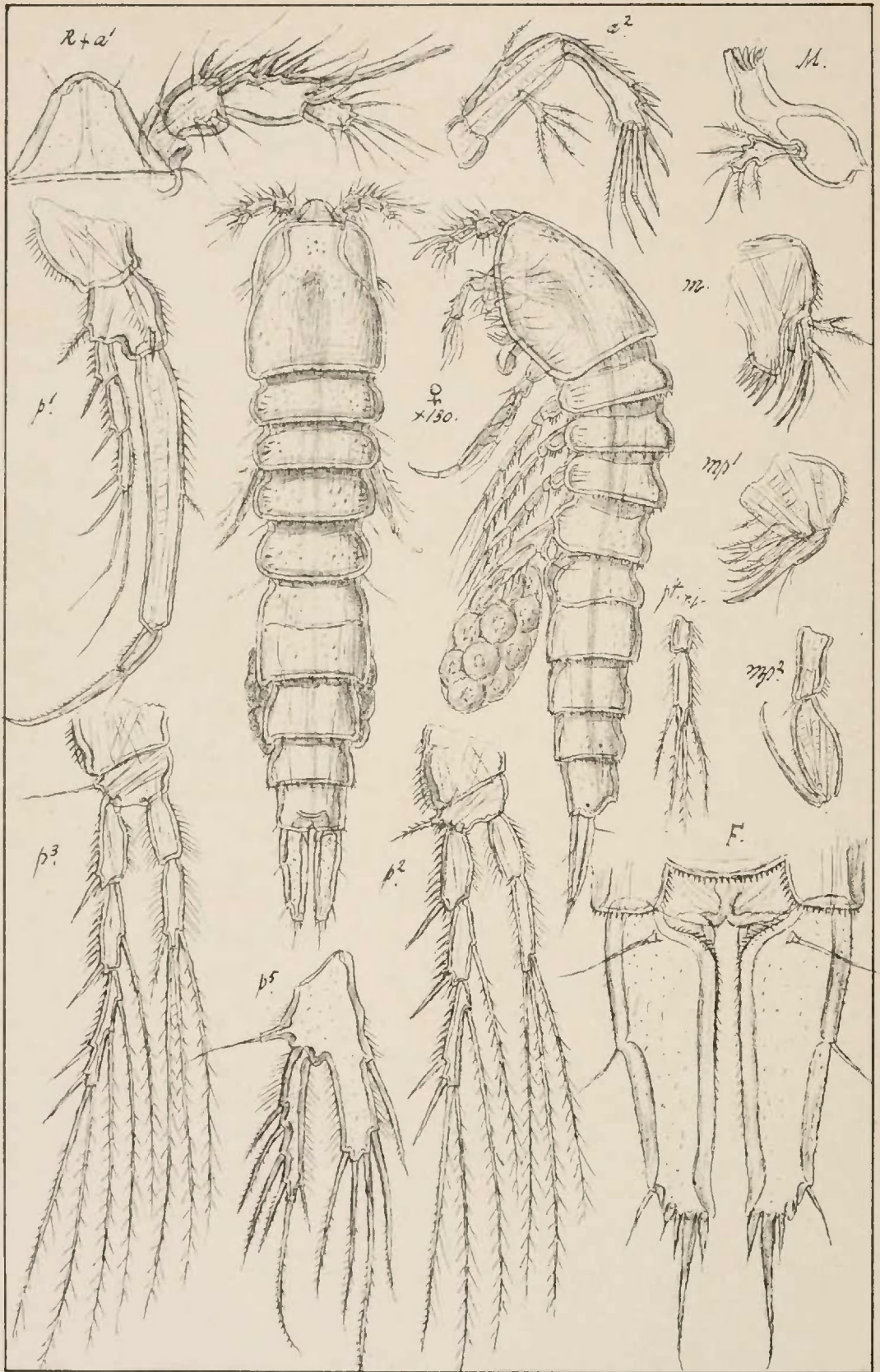
Lacphonte denticornis, Scott

Copepoda

Laophontidœ

Harpacticoida

Pl. CLXXXV.



G.O. Sars autogr.

Norsk lithgr. Officin.

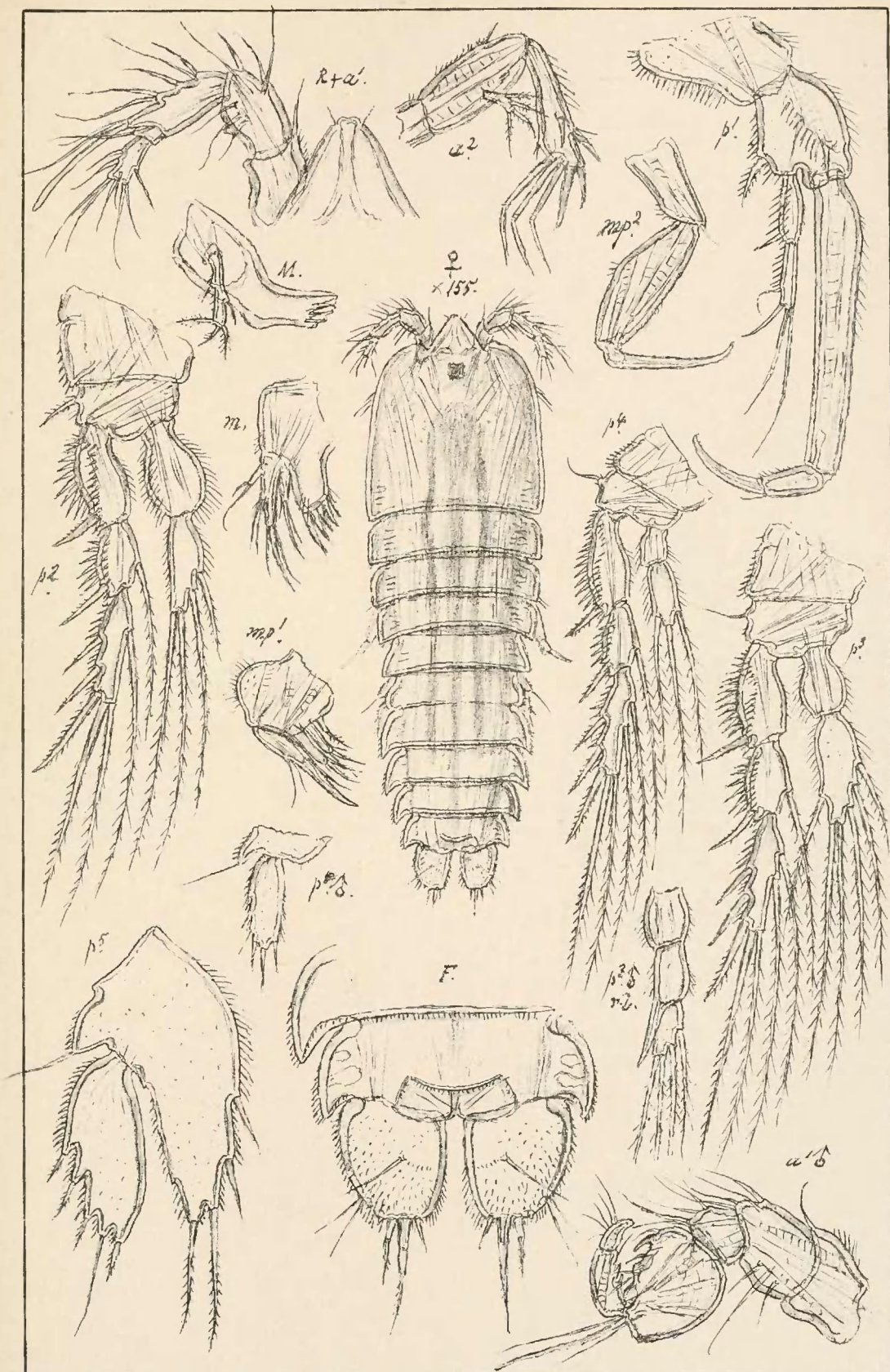
Laophontopsis lamellifera, (Claus)

Copepoda

Laophontidæ

Harpacticoida

Pl. CLXXXVI.



G.O.Sars autogr.

Norsk lithogr. Officin.

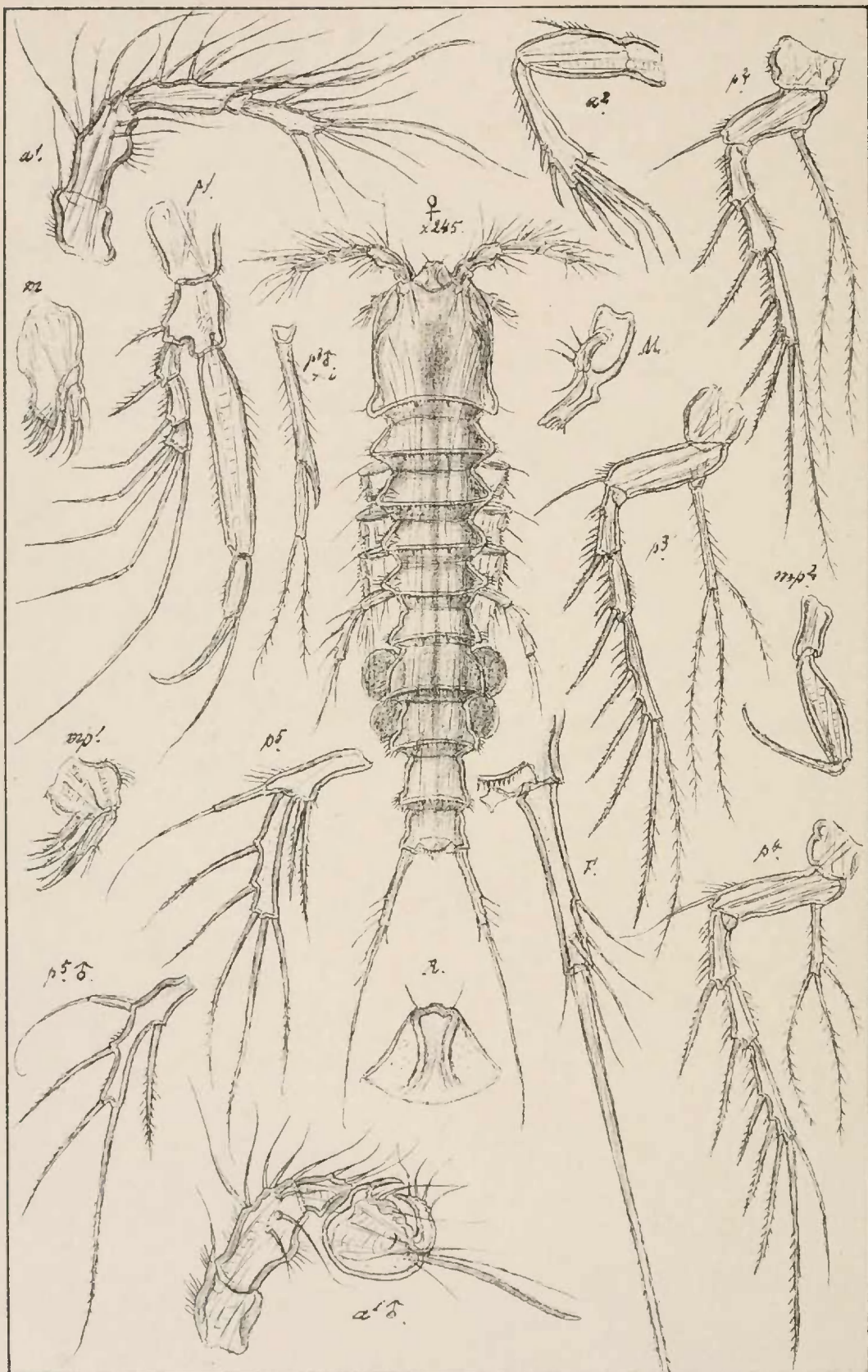
Asellopsis hispida, Brady.

Copepoda

Laophontidæ

Harpacticoida

Pl. CLXXXVII.



G.O. Sars autogr.

Norsk lithogr. Officin.

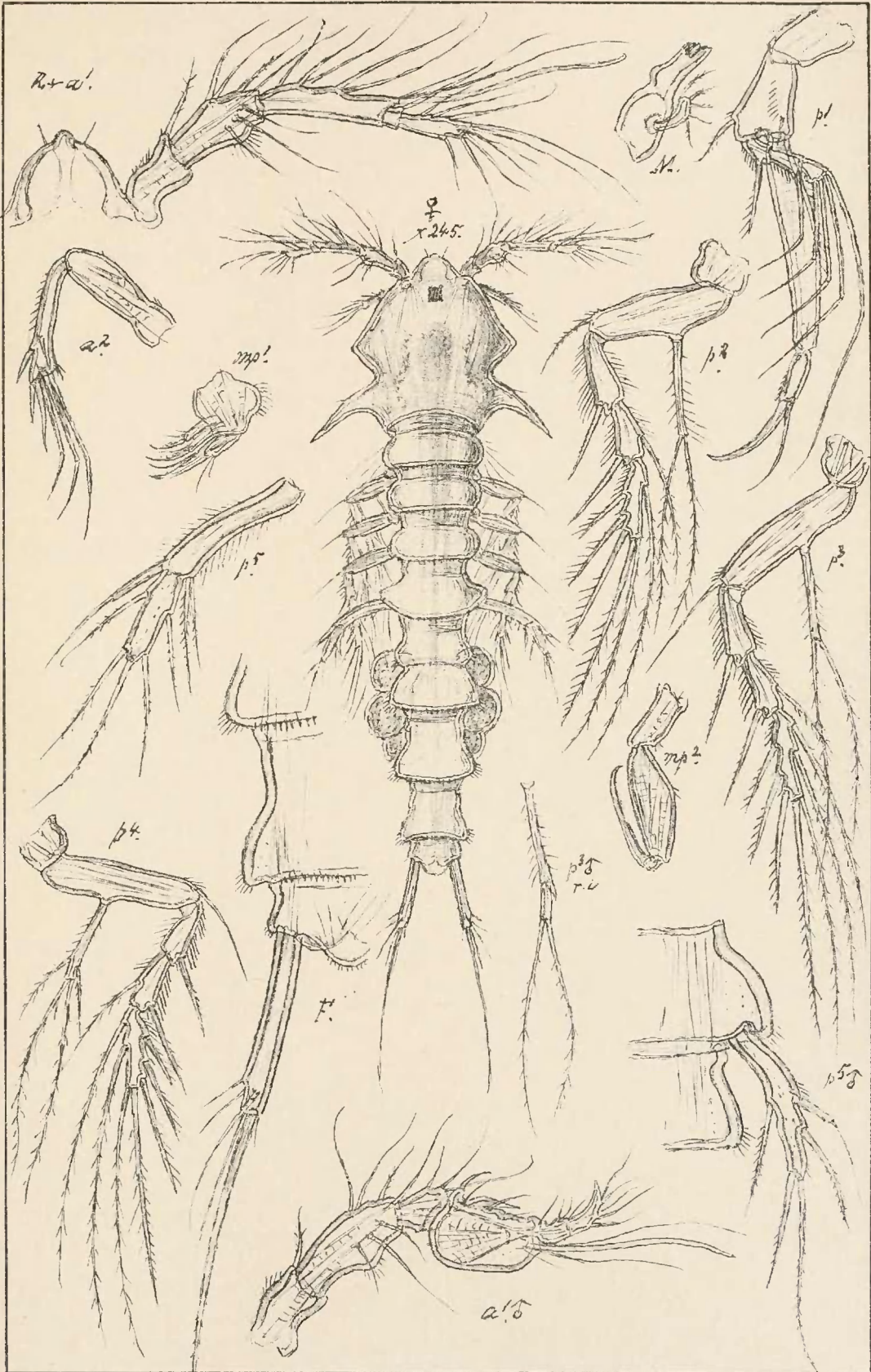
Laophontodes typicus, Scott.

Copepoda

Laophontidœ

Harpacticoida

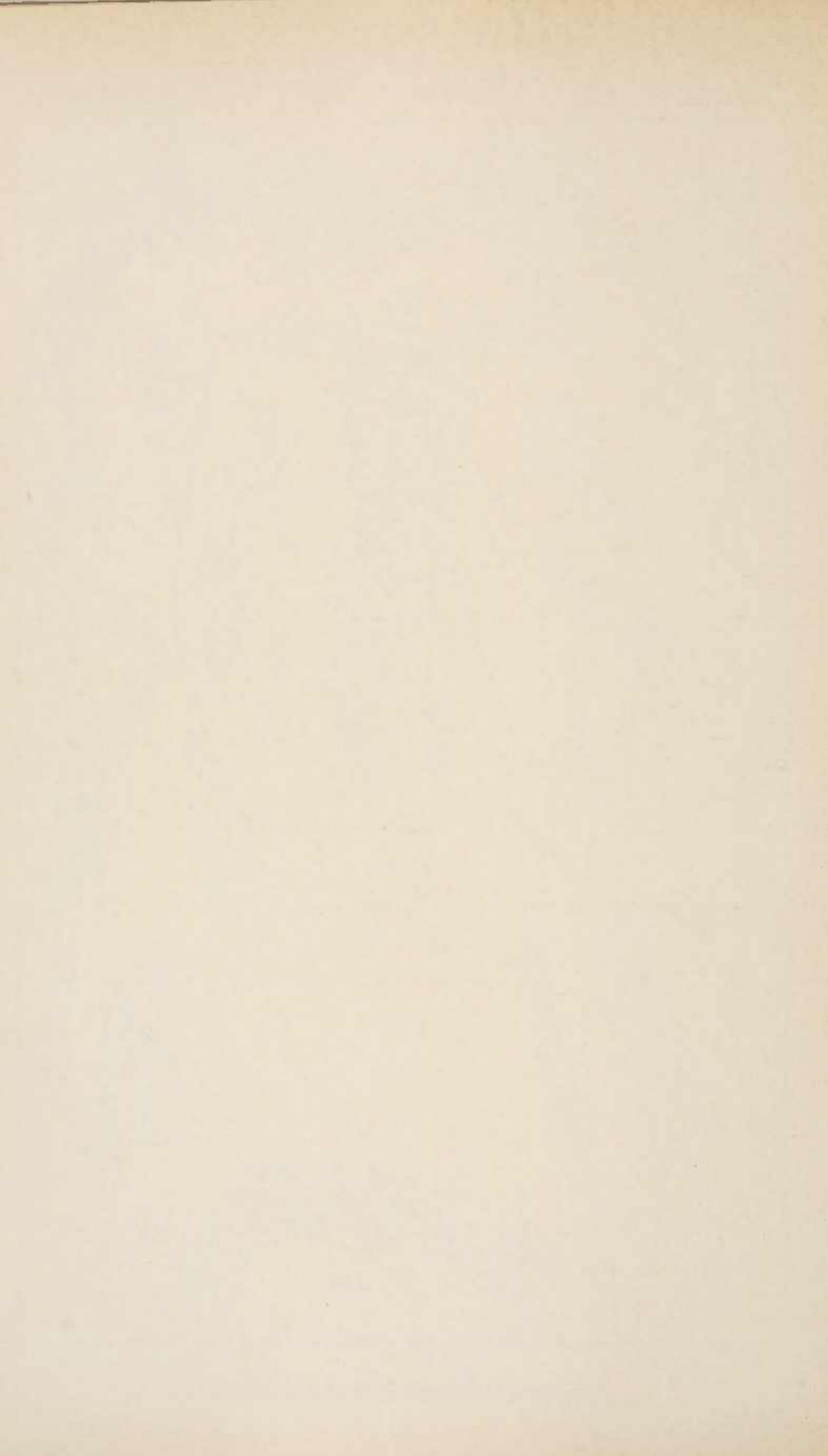
Pl. CLXXXVIII.



G.O. Sars autogr.

Norsk lithogr. Officin

Laophontodes bicornis, Scott.

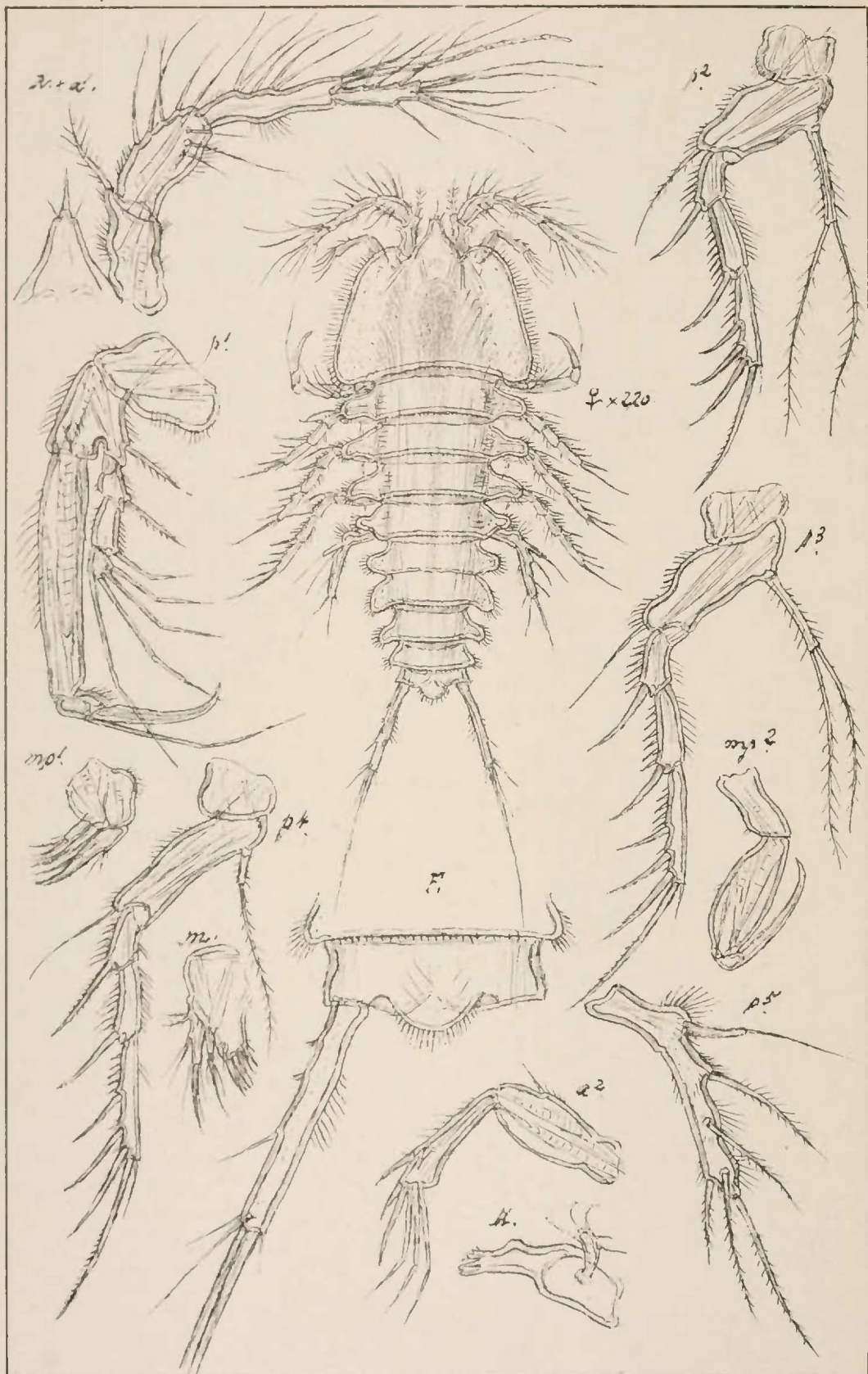


Copepoda

Laophontidæ

Harpacticoida

Pl. CLXXXIX.



G.O. Sars autogr.

Norsk lithogr. Officin.

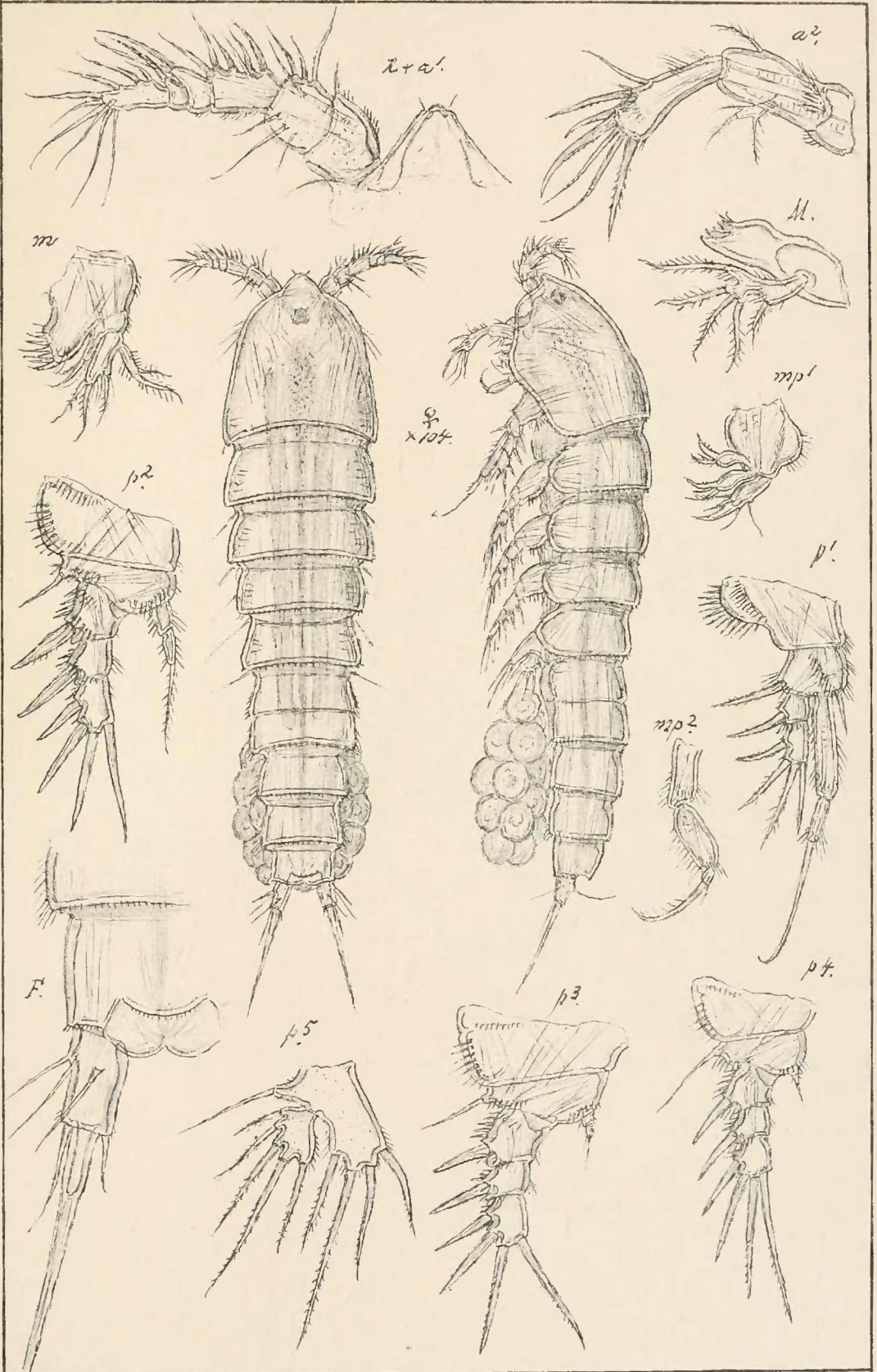
Laophontodes expansus, G.O. Sars.

Copepoda

Laophontidæ

Harpacticoida

Pl. CXC.



G.O. Sars autogr.

Norsk lithogr. Officin.

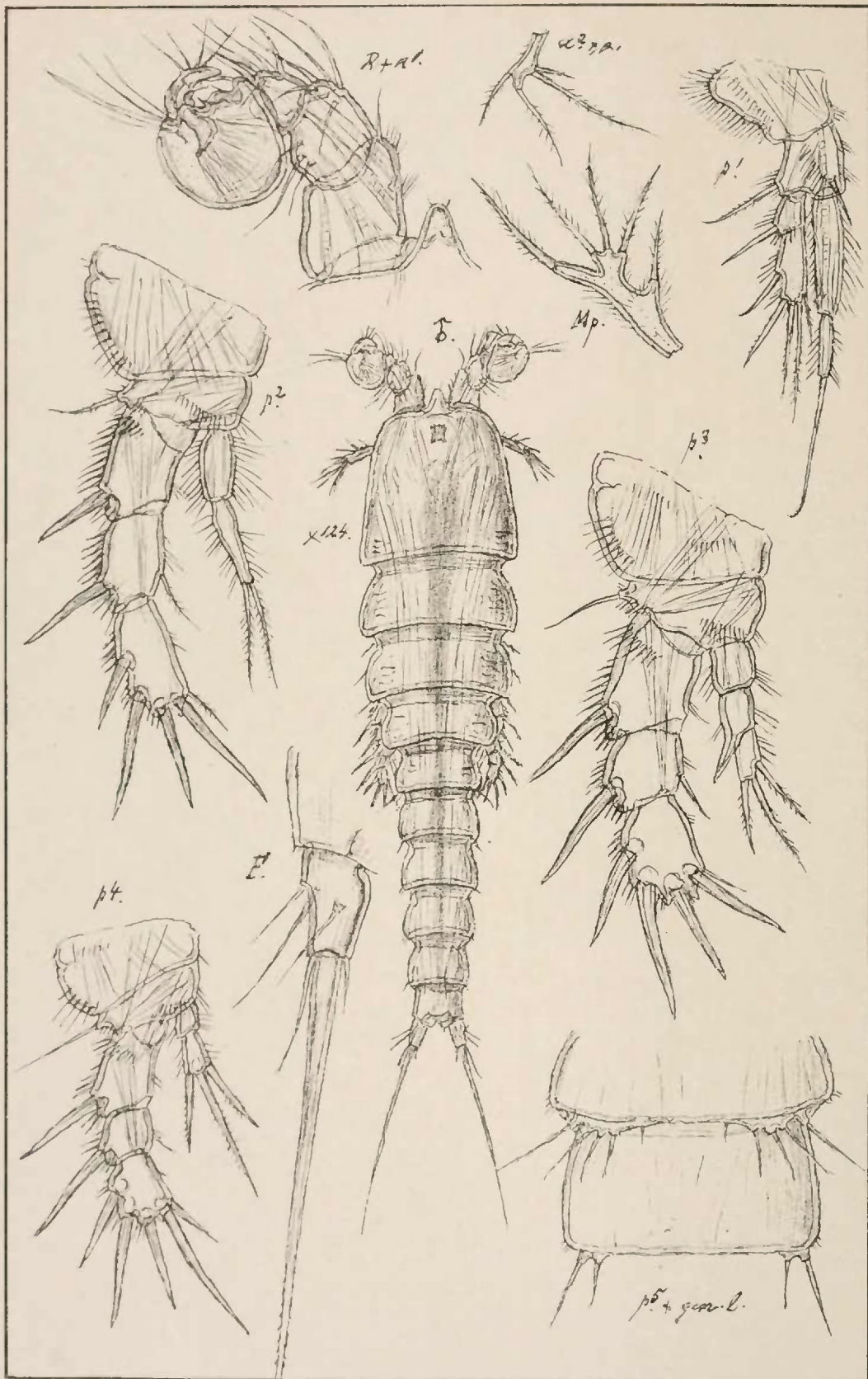
Platychelipus littoralis, Brady.

Copepoda

Laophontidœ

Harpacticoida

Pl. CXCI.



G.O. Sars autogr.

Norsk lithogr. Officin.

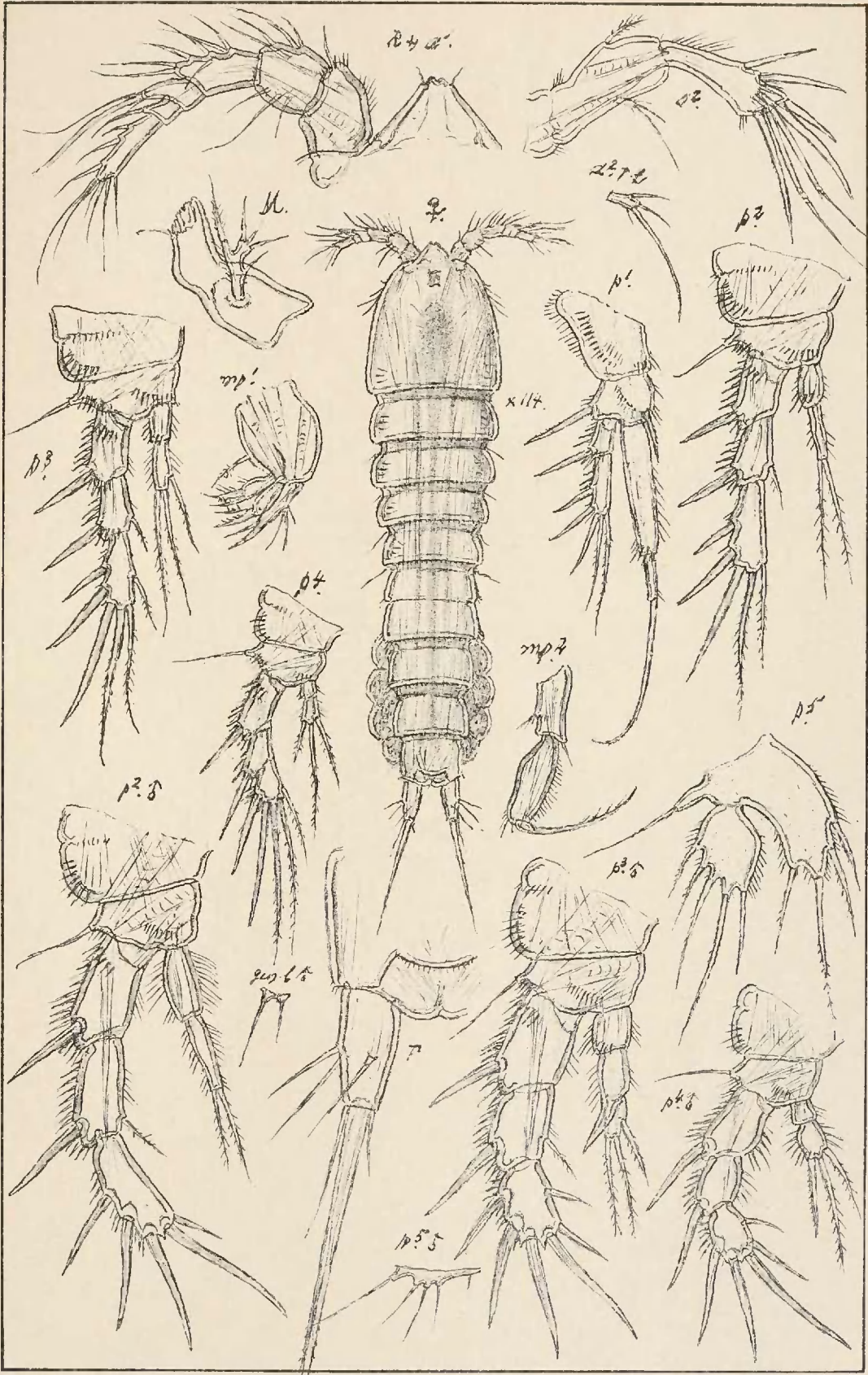
Platychelipus littoralis, Brady.
male

Copepoda

Laophontidœ

Harpacticoida

PL CXCH.



G.O.Sars autogr.

Norsk lithogr. Officin.

Platychelipus laophontoides G.O.Sars.

