

# THE DANISH INGOLF-EXPEDITION

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VOLUME III.

11.

## CRUSTACEA MALACOSTRACA. VII. (AMPHIPODA. III.)

BY

K. STEPHENSEN.

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WITH 28 FIGURES AND 20 CHARTS IN THE TEXT, AND A LIST OF STATIONS.

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THE DANISH MEDICAL EXPEDITION

1900-1906

II

REPORT OF THE DANISH MEDICAL EXPEDITION  
TO GREENLAND

BY  
DR. H. H. H. H.

THE DANISH MEDICAL EXPEDITION

1906

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(\* indicates that the species is new to the area).

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## Crustacea Malacostraca. VII.

By

K. Stephensen.

### VII. The order *Amphipoda*, part 3.

#### *Gammaridea*.

#### Fam. *Stenothoidæ* (Boeck) Stebbing.

(incl. fam. *Metopidæ* Stebbing)

*Stenothoidæ* G. O. Sars 1895, p. 234.

— Stebbing 1906, p. 192.

— Chevreux & Fage 1925, p. 129.

*Metopidæ* Stebbing 1906, p. 171.

— Chevreux & Fage 1925, p. 125.

The family *Metopidæ* was established by Stebbing 1899 (Ann. Mag. Nat. Hist., ser. 7, vol. 4, p. 210); the fam. disagrees with the fam. *Stenothoidæ* in only very small characteristics, especially in the oral parts, and Stebbing himself says (1906, p. 171) that "the adjustment of this family is involved in much difficulty". This is no doubt right; and as the two families are at all events extremely closely allied, and as, besides, the line of separation does not seem to me to be a natural one, I propose to cancel the fam. *Metopidæ* and unite its genera with the ancient fam. *Stenothoidæ*, as was the case before 1899.

Upon the whole the family greatly needs revision; many of the species are badly known and only found a single time. Without making any attempt to elucidate the possible synonymy of the species, not found in the "Ingolf"-area, I take the opportunity to emphasize that *Metopa sarniensis* Norman 1907 (Ann. Mag. Nat. Hist., ser. 7, vol. 20, p. 367, figs., from St. Peter's Port, Guernsey) is probably synonymous with *Parametopa kervillei* Chevreux 1901 (Bull. Soc. Rouen, vol. 36, p. 233, pl. 3; Chevreux & Fage 1925, p. 139, figs; from Northern France, 8—55 m.). —

4 genera with at least 26 species are found in the area; 19 of these species are new to the area, 4 of them new to science.

#### Genus *Metopa* Boeck.

*Metopa* G. O. Sars 1895, p. 248.

— Stebbing 1906, p. 172.

— Chevreux & Fage 1925, p. 126.

Of this genus 16 (19?) species have been found in the area; two of these (*M. nordmanni*, no. 189, and *M. abyssalis*, no. 193) are new to science, and 7 additional species are new to the area.



*M. borealis* G. O. Sars is not found in the area, as *M. borealis*? H. J. Hansen 1887 is *M. sölsbergi* (see under this species, no. 192, p. 190). *M. leptocarpa* K. Stephensen 1913 is wrongly determined; see under *M. nordmanni* (no. 189, p. 187).

178. **Metopa robusta** G. O. Sars.

*Metopa robusta* G. O. Sars 1895, p. 270, pl. 96 fig. 1.

— — Stebbing 1906, p. 173.

Occurrence. The "Ingolf" has secured this species at a few stations in the area.

W. Greenland: 65°16' N., 55°05' W. 682 m., temp. 3.6°. 5 spec. ("Ingolf" St. 35).

— 65°17' N., 54°17' W. 104 m. Abt. 10 spec. ("Ingolf" St. 34).

S. of Greenland: 59°12' N., 51°05' W. 3521 m., temp. 1.3°. 1 spec. ("Ingolf" St. 38).

W. of the Faroes: 61°42' N., 9°36' W. 1026 m., temp. 4.8°. 2 spec. ("Ingolf" St. 44).

The species is known from the Faroes: 7 miles N. by E. of the east point of Myggenæs, 108 m. (specimen in the Copenhagen Zool. Museum).

Distribution. Norway: near Tromsö; Hammerfest and at Bejan in the mouth of the Trondhjemsfjord, 60—100 m., among Hydroids (G. O. Sars, l. c.). — Skagerak 57°17' N., 7°47' E., 62 m., sand (Reibisch 1906, p. 177). — 57°04' N., 2°30' E., 65 m., on a cable (specimen in the Copenhagen Zool. Museum). — Moray Firth, Firth of Forth (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 45).

179. **Metopa sinuata** G. O. Sars.

*Metopa bruzelii* (partim) H. J. Hansen, Vid. Medd., ser. 4, vol. 9, 1887, p. 97, pl. 4, fig. 2, 2a, 2b.

— *sinuata* G. O. Sars 1895, p. 263, pl. 92, fig. 2.

— — Stebbing 1906, p. 174.

Occurrence. This species has been recorded from a great number of localities in the area, especially at W. Greenland.

W. of the Faroes: 61°42' N., 9°36' W. 1026 m., temp. 4.8°. Abt. 10 spec. ("Ingolf" St. 44).

W. Greenland: 65°16' N., 55°05' W. 682 m., temp. 3.6°. 2 spec. ("Ingolf" St. 35).

E. Greenland: Cape Tobin (abt. 70°23' N.), 108 m. 1 spec. (E. Greenland Exped. 21.-8.-1900, Søren Jensen leg.).

— Hurry Inlet (abt. 70°50' N.), 40 m. 3 spec. (E. Greenland Exped. 21-7-1900, Søren Jensen leg.).

?<sup>1)</sup> W. Iceland: Skälènes (in Breiðifjörðr?), 8 m., 1 spec. (H. Jónsson leg. 14-6-1898).

S.E. of Iceland: 64°17' N., 14°44' W. 85 m. Several spec. ("Michael Sars" 25-8-1902, Ad. Jensen leg.).

As the species has been confounded with *M. bruzelii* (see Sars l. c.), it is impossible to give an exact list of localities. The Copenhagen Zool. Museum possesses the species from the following localities at W. Greenland: Bredefjord (abt. 60° N.) 16—17 m. and 30—50 m. (K. Stephensen leg. 31-VIII and 27-VII-1912). Godthaab, deep water among Sertulariæ (Holböll leg.). Davis Strait abt. 66° N., 60—75 m., shells, (Torell leg.). 66°30' N., 54°50' W., 75 m. (Th. Holm leg.). 67°34' N., 55°28' W., 100 m., sand and stones (Wandel

<sup>1)</sup> ? indicates that the determination (but not the locality) is uncertain.



leg. 1889). The harbour of Proven, 10—20 m. (Th. Holm leg. 21-7-1886). Greenland without special locality (Bergendal leg. 1890). — Thus the species is known from W. Greenland abt.  $60^{\circ}$ — $72\frac{1}{2}^{\circ}$  N.

Distribution. N. Norway (Kvalö and Selsövik), 60—80 m. (G. O. Sars l. c.). — Between Norway and Scotland  $57^{\circ}04'$  N.,  $2^{\circ}30'$  E., 70 m., on a cable (Kapt. Ørsted leg. 1908; specimens in the Copenhagen Zool. Museum).

180. *Metopa bruzelii* Goës (Chart 32).

*Metopa Bruzelii* G. O. Sars 1895, p. 261, pl. 92 fig. 1.

— (partim) H. J. Hansen, Vid. Medd., ser. 4, vol. 9, 1887, p. 97, pl. 4 fig. 2c, d.

*Proboloides bruzelii* Stebbing 1906, p. 188.

Occurrence. As the species has been confused with *M. sinuata* (see G. O. Sars l. c.), I give a complete list of the whole revised material in the possession of the Copenhagen Zoological Museum. The "Ingolf" has secured the species at 3 (4?) localities.

W. Greenland: Bredefjord, 9—11 and 12.5—13 m. (K. Stephensen leg. 22(-23)-7-1912).

—  $63^{\circ}27'$  N.,  $52^{\circ}41'$  W., 64 m., temp.  $0.6^{\circ}$  "Ingolf" St. 26).

— The mouth of the Ameralikfjord (Godthaab), 10—140 m., shells ("Ingolf" 23-7-1895).

— Godthaab, deep water (abt. 75—110 m.), among Sertulariæ (Holböll leg.; numerous specimens).

— ?Sukkertoppen, between "roots" of Laminariæ. (cand. med. S. Hansen leg. 1895).

—  $66^{\circ}35'$  N.,  $55^{\circ}54'$  W., 166 m., temp.  $1.6^{\circ}$  ("Ingolf" St. 31).

— ?  $67^{\circ}4'$  N.,  $54^{\circ}28'$  W., 60 m., stones without algæ ("Fylla" 18-7-1884).

— Egedesminde (Traustedt leg. 1892).

— Godhavn, stony bottom, 200 m. (Dr. E. Reisinger leg. 17-7-1926).

— Prøven, the harbour, 10—20 m., stones with algæ ("Fylla" 1886, Th. Holm leg.).

E. Greenland: ?Danmarks Ø (E. Bay leg. 1891).

— ?Hurry Inlet, 40 m. (E. Greenland Exped., Søren Jensen leg. 21-7-1900).

N. Iceland: Grimsey, 30 m. ("Diana" 20-6-1884).

N.E. Iceland: Hornet in N.  $74^{\circ}$  E., 70 m. ("Diana" St. 42, 18-6-1898, R. Hörring leg.).

N.W. Iceland: ?Dyrafjörðr (Mariboë ded. 1863).

E. Iceland:  $64^{\circ}27'$  N.,  $13^{\circ}27'$  W., 160 m. ("Michael Sars" 23-8-1902, Ad. Jensen leg.).

—  $63^{\circ}43'$  N.,  $14^{\circ}34'$  W., 169 m., temp.  $7.0^{\circ}$  ("Ingolf" St. 6).

S. Iceland: Vestmannaeyar, 20—30 m., stony bottom (H. Jónsson leg. 18-5-1897).

The Faroes: 6 miles N.W. of Kalsö, 113 m. (Th. Mortensen leg. 25-5-1899).

— 7 miles N.E. of the east point of Myggenæs, 108 m.

— the deep between Nolsö and Østnæs, abt. 120 m. (Th. Mortensen leg. 9-6-1899).

— Glivursnæs (near Thorshavn) (F. Børgesen leg. 5-1898).

Thus the species is known from W. Greenland abt.  $60$ — $72\frac{1}{2}^{\circ}$  N., abt. 10—200 m., ?E. Greenland abt.  $70\frac{1}{2}^{\circ}$ — $71^{\circ}$  N., Iceland (but not the west coast), 20—169 m., and the Faroes, down to abt. 120 m.



Remarks. In Vid. Meddelelser, vol. 82, 1926, p. 70 I have stated that the species has only one joint in the palp of maxilla 1 and that it thus belongs to the genus *Metopa*, not to the genus *Proboloides* as proposed by Stebbing l. c. 1906.

Distribution (Chart 32). Spitsbergen: Bell Sound (Goës 1866, p. 522, type-locality?). — Norway: Vardö (Goës 1866); Hammerfest; Trondhjemsfjord; Bratholmen (near Bergen); 60—115 m., especially

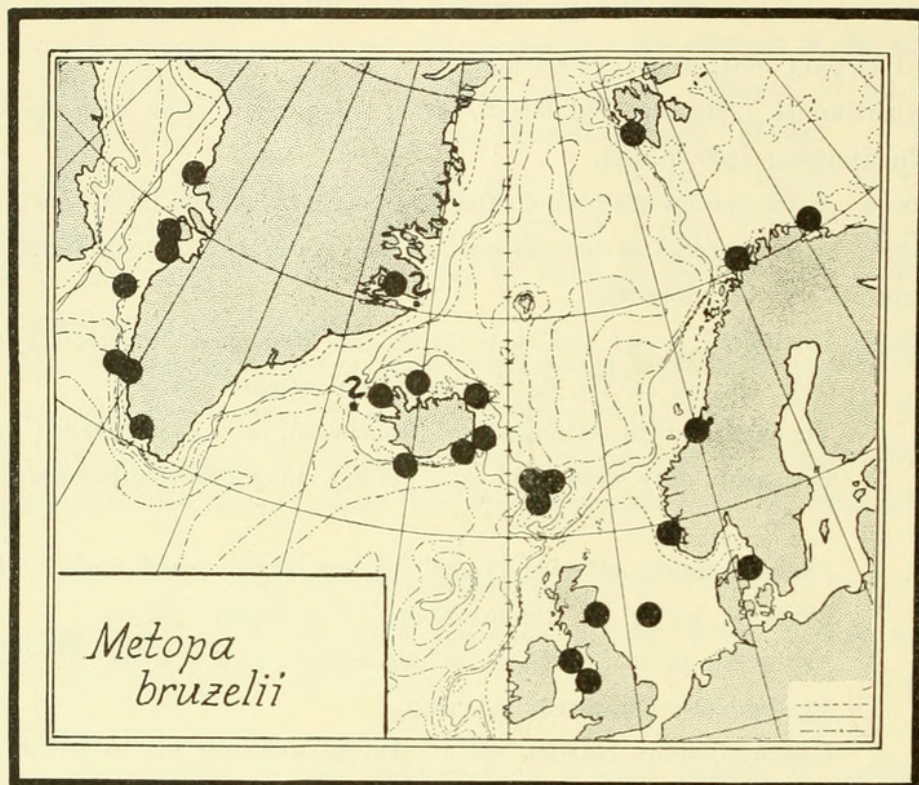


Chart 32. *Metopa bruzelii*. (Two American localities are outside the chart).

among Hydroida (G. O. Sars l. c.). — Kattegat, without special locality (K. Stephensen l. c. 1926). — Great Britain: Isle of Man 45 m.; North Wales (Colwyn Bay and Little Orme); Firth of Forth (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 44). —  $56^{\circ}26' N.$ ,  $2^{\circ}50' E.$ , 75 m. (Kapt. Ørsted leg. 1897; specimens in the Copenhagen Zool. Museum). — Smith Sound: Rice Strait (G. O. Sars, Second Norweg. Arctic Exped. "Fram", no. 18, 1909, p. 11). — Gulf of St. Lawrence: Off Cheticamp Island, 60 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 270)

\*181. *Metopa palmata* G. O. Sars.

*Metopa palmata*, G. O. Sars 1895, p. 272, pl. 96 fig. 2.

— — Stebbing 1906, p. 174.

Occurrence. The "Ingolf" has secured a single specimen of this species in the mouth of the Bredefjord, W. Iceland:

W. Iceland:  $65^{\circ}02' N.$ ,  $23^{\circ}56' W.$ , 208 m. ("Ingolf" St. 87).



The species was hitherto not known outside the type-locality.

Distribution. Hammerfest, Finmark (type-locality: G. O. Sars l. c.).

182. *Metopa clypeata* (Kröyer).

*Leucothoë clypeata* Kröyer, Naturh. Tidsskr., vol. 4, 1842, p. 157.

— — — ibid. ser. 2, vol. 1, 1845, p. 545, pl. 5 fig. 2.

— — — Voyage en Scand. 1846, pl. 22 fig. 2.

*Metopa* — H. J. Hansen, Vid. Medd. ser. 4, vol. 9, 1887, p. 90, pl. 3 fig. 3.

— — Stebbing 1906, p. 175.

Occurrence. The "Ingolf" has secured this species at one station, the E. Greenland Exped. 1900 at two stations.

W. Greenland: 66°35' N., 55°54' W., 166 m., temp. 1.6°. On *Thujaria*. ("Ingolf" St. 31).

— Fyllas Banke, 50 m. (O. Hagerup leg. 10-7-1925).

— Kugssukfjord (Godthaab Fjord), abt. 300 m. ("Tjalfe" St. 52, 15-6-1908).

— Northern Strömfjord near Holsteinsborg (V. Nordmann leg. 1911).

E. Greenland: Cape Tobin (abt. 70°23' N.), 108 m., stones (E. Greenland Exped. 21-8-1900, Søren Jensen leg.).

— N. of Stewart Land (abt. 70½° N.), 300 m. (E. Greenland Exped. 29-7-1900, Søren Jensen leg.).

The Copenhagen Zool. Museum possesses specimens from the following localities, recorded by H. J. Hansen 1887 (including Kröyer's types): Godthaab, "deep water" (Holböll leg.); Godthaab 80—115 m., on *Sertulariæ*; and Greenland without special locality (Holböll leg.; Kröyer's types).

Remarks. The largest specimen (from Cape Tobin) is a ♂, 15 mm.

Distribution. The species has been found in the Gulf of St. Lawrence, between Cape Breton and Magdalen islands, 40—45 m., sand (Shoemaker, Contrib. Canad. Biol. and Fish., vol. 5, 1930, p. 263).

183. *Metopa alderi* (Sp. Bate).

*Metopa Alderi* G. O. Sars 1895, p. 250, pl. 86.

— *alderi* Stebbing 1906, p. 175.

Occurrence. The species was not taken by the "Ingolf", but the "Thor" has secured two specimens.

S.W. of Iceland: 63°46' N., 22°56' W., 150 m. ("Thor" St. 171, 2-7-1904).

A single, very small specimen (abt. 2 mm.), possibly belonging to the same species, has been taken at E. Greenland: Hurry Inlet (abt. 70°50' N.), 40 m. (E. Greenland Exped. 21-7-1900, Søren Jensen leg.).

The species is not new to the area, for it is "not uncommon in the harbour of Rejkjavik", abt. 40—60 m. (G. O. Sars, Crust., Norw. North Atlantic Exped., II, p. 47, 1886).

Distribution. On account of the earlier confusion with other species, localities recorded in the literature are to be taken with due caution; all the localities listed below are probably to be referred to this species. Spitsbergen (Bell Sound, 60 m.), Bohuslän (Goës 1866, p. 6). — The Murman coast (Jarzynsky,



teste G. O. Sars). — "Off the south and west coasts of Norway this species is found not unfrequently in moderate depths", abt. 40—115 m.; "it extends northwards at least to Tromsö" (G. O. Sars 1895). — Off the Storeggen Bank 63°10' N., 5°0' E., 763 m., sabulous clay (G. O. Sars l. c. 1886, p. 47). — West edge of the Great Fishing Bank 57°07' N., 2°40' E., 70 m. (specimen in the Copenhagen Zool. Museum). — Northumberland: Cullercoats (Sp. Bate; type locality). — Other British localities: Aberdeen shire, Northumberland coast, Firth of Forth, Firth of Clyde, Mull of Kintyre, North Wales, Torbay (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 40). — Denmark: 3 localities from W.N.W. of the light-ship Horns Rev, 40 m. to 16 miles N.E. of the light-ship of the Skaw, 188 m. (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 65). The species is not recorded by Reibisch 1905—06.

\*184. *Metopa spectabilis* G. O. Sars.

*Metopa spectabilis* G. O. Sars 1895, p. 251, pl. 87.

— — Stebbing 1906, p. 176.

Occurrence. A single specimen was taken by the "Ingolf"; the species is new to the area.

W. of Greenland: 66°35' N., 55°54' W., 166 m., temp. 1.6°. 1 ♂ 14 mm. ("Ingolf" St. 31).

Distribution. S.W. of Spitsbergen 76°34' N., 12°51' E., 1359 m., temp. ÷1.2°, clay, and off the Storeggen Bank 63°10' N., 5°0' E., 763 m., temp. ÷1.0° (G. O. Sars, type localities). — Hammerfest, abt. 100—150 m., rather sparingly, among Hydroidæ (G. O. Sars l. c.). — In the Danish water it has been taken more than 10 times in Skagerak and a few times in Kattegat, depths 10—abt. 100 (510) m., often pelagically (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 66). — Heligoland (Sokolowski 1900). — 55°10' N., 4°26' E., in the surface (depth of the sea 51 m.) (Reibisch 1905, p. 175). — Off Cape Breton, Gulf of St. Lawrence, 75 m. (Shoemaker, Contrib. Canad. Biol. and Fish., vol. 5, 1930, p. 264).

185. *Metopa latimana* H. J. Hansen (Fig. 54).

*Metopa latimana* H. J. Hansen, Vid. Medd., ser. 4, vol. 9, 1887, p. 92 (no fig.).

— — Stebbing 1906, p. 177.

— *abscisa* Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 42, pl. 3 figs. 6—10.

Occurrence. W. Greenland: 65°35' N., 54°50' W., 150 m., stones with Hydroidæ and algæ, 1 spec. (sex?, jun.?) (type-locality, H. J. Hansen l. c.).

Remarks. H. J. Hansen had only one specimen, and no more specimens have later on been recorded under the same name. As H. J. Hansen has not given any figure, I give drawings of the most important limbs and some additions to his description.

The length is abt. 4 (not 3) mm.

Antenna 1 has flagellum almost 2½ (not 2) times as long as peduncle, with abt. 16 joints. The articulation between 3rd joint of peduncle and 1st joint of flagellum is very indistinct. Antenna 2 has 4th and 5th joints of peduncle subequal (— 5th joint not "perpaulo" longer than 4th—), with 7 joints; 1st joint of flagellum a trifle longer than the two next joints combined. Pereiopod 3 has 2nd joint rather heavy, somewhat curvate; dactylus very long and slender, only a trifle shorter than 6th joint. Pereiopods 4—7 heavy,



with strong dactyli; upon the whole pereiopods 3—7 have a close similarity with those of *M. affinis* (G. O. Sars 1891—95, pl. 91 fig. 2). The dactyli of pereiopods 4—7 have near the apex a seta and a little notch. Uropods 1—2 and telson have probably no spines; uropod 3 has peduncle a little shorter than ramus, with one rather strong apical spine on peduncle and one somewhat more slender apical spine on 1st joint.

As emphasized by H. J. Hansen the species is rather closely allied to *M. affinis*, but the two species are not identic. I cannot characterise the differences better than done by H. J. Hansen: "6th joint of perei-

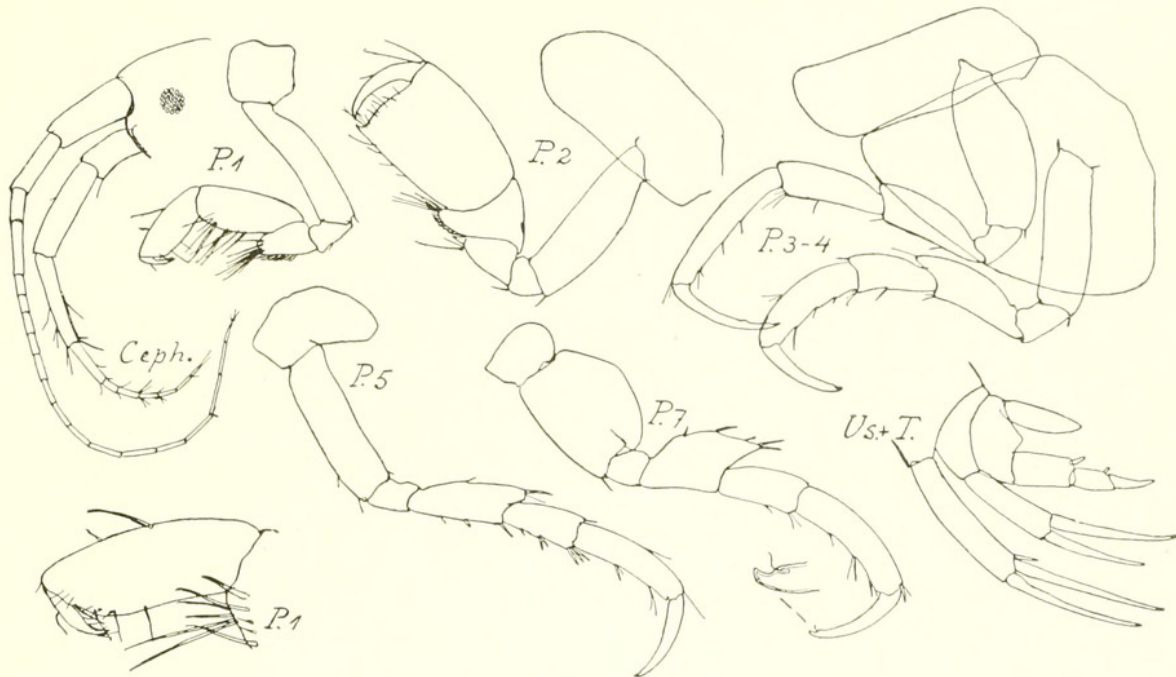


Fig. 54. *Metopa latimana*, the type-specimen.

opod 1 has a rather broad oblique palm as in *M. norvegica*, and 6th joint of pereiopod 2 is somewhat longer and narrower with the palm not dentate".

*M. latimana* is identic with *M. abscisa* Norman 1900; all the limbs are of exactly the same shape, and also the size is the same, abt. 4 mm<sup>1</sup>).

H. J. Hansen has pointed out the similarity of pereiopod 1 of *M. latimana* and of *M. norvegica* (= *M. pollexiana*), and I have myself (in Vid. Medd., vol. 82, 1926, p. 67) considered *M. abscisa* as possibly established on young specimens of *M. norvegica*, as at that time I did not know that *M. latimana* and *M. abscisa* are identic. At all events *M. latimana* and *M. norvegica* are more closely allied than any of the other species, and antennæ 1—2, pereiopods 1—7 (except prp. 2) and uropoda are almost identic in the two species; even the broad, somewhat curvate 2nd joint in pereiopod 3 is of the same shape in both of the species. The only important differences are the smooth palm of pereiopod 2, and the inner side of 4th joint not having the thin lamella which is present in *M. norvegica* (and a few other species).

Distribution. East side of Great Britain: Aberdeen, St. Andrews, Cullercoats (in Northumberland) (Norman l. c.).

<sup>1</sup>) "Three twentieths of an inch" is the length of *Montagua clypeata* Bate & Westwood vol. 2, 1868, p. 499, and this species (but not *Leucothoë clypeata* Kr. [= *Metopa clypeata*]) is identic with Norman's species (teste Norman).



186. *Metopa norvegica* (Lilljeborg).

*Metopa pollexiana* G. O. Sars 1895, p. 269, pl. 95.

— *norvegica* Stebbing 1906, p. 177.

Occurrence. The "Ingolf" has secured this species at 4 localities.

W. Greenland: 65°17' N., 54°17' W., 104 m., on *Thujaria* ("Ingolf" St. 34).

N.W. of Iceland: 66°18' N., 25°59' W., 611 m., temp. ÷ 0.75°. On *Thujaria* ("Ingolf" St. 15).

Between Iceland and the Faroes: 64°07' N., 11°12' W., 446 m., temp. 2.5° ("Ingolf" St. 4).

S.E. Iceland: 63°43' N., 14°34' W., 169 m., temp. 7.0° ("Ingolf" St. 6).

The Copenhagen Zoological Museum possesses material, not recorded in existing literature, from the following localities.

W. Greenland: Davis Strait, without special locality, 200 m., from *Halecium muricatum* and *Thujaria thuja* ("Fylla" 9-7-1884, Th. Holm leg.).

N.W. Iceland: 66°20' N., 25°12' W., 180 m., temp. 6.5° (Kapt. Wandel leg. 1891). 65°50' N., 26°53' W., 392 m. ("Thor" St. 150, 18-6-1904).

S.E. Iceland: ? 5 miles E. of Seyðisfjörður, 250 m., black clay (Kapt. Wandel leg. 1890). 64°17' N., 14°44' W., 85 m. ("Michael Sars" 23-8-1902, Ad. Jensen leg.). 64°58' N., 12°4' W., 133 m. ("Thor" St. 26, 16-5-1903). —

The following localities in the area are recorded in the literature. W. Greenland: Kugssukfjord (Godthaab Fjord), abt. 300 m. (K. Stephensen, Vid. Medd. vol. 64, 1912, p. 90). Northern Strömfjord (K. Stephensen, Medd. om Grönl. vol. 51, 1913, p. 66). 67°59' N., 56°33' W., 185 m., stones and mud (H. J. Hansen, Vid. Medd. ser. 4, vol. 9, 1887, p. 92). — The Faroes: 8 localities round the Islands, 54—255 m. (K. Stephensen, Amphip.; Zoology of the Faroes, no. XXIII, 1929, p. 5).

As it appears from the localities listed above, the species is known from W. Greenland abt. 64°—68° N., 104—300 m.; N.W. and S.E. Iceland 85—611 m.; the waters round the Faroes 54—255 m.

Distribution. Murman coast (Jarzinsky, teste G. O. Sars). — Norway: Tromsø, "rather plentiful"; Bejan at the entrance of the Trondhjemsfjord, abt. 60—100 m., among Hydroids, especially *Hydrallmannia falcata*; west coast of Norway, without special locality (G. O. Sars l. c.). — North Sea: 57°30' N., 1°40' E., 60 m.; 57°16' N., 5°30' E., 55 m., stones; 57°07' N., 2°40' E., 70 m.; 57°4' N., 2°30' E., 70 m., on a cable; 56°28' N., 3° E., 75 m.; 55°12' N., 1°25' E., 45 m. (specimens in the Copenhagen Zool. Museum). — Western Great Britain: St. Ives (N.E. of Landsend); eastern Great Britain: Shetland, St. Andrews, Aberdeen, Firth of Forth, Holy Island (Northumberland), Durham (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 41). — Skagerak, 4 localities, 55—108 m. (Reibisch 1905, p. 177; K. Stephensen, Vid. Medd. Dansk Naturh. Fören., vol. 82, 1927, p. 67).

\*187. *Metopa boeckii* G. O. Sars.

*Metopa Boeckii* G. O. Sars 1895, p. 252, pl. 88.

— *boeckii* Stebbing 1906, p. 178.

Occurrence. The "Ingolf" has taken the species at one or two stations; it is new to the area.



?W. Greenland: The mouth of the Ameralikfjord (near Godthaab), 10—140 m., shells ("Ingolf" 23-7-1895).

S.E. Iceland: 63°43' N., 14°34' W., 169 m., temp. 7.0°. 1 ♂ ("Ingolf" St. 6).

Distribution. Norway: Hammerfest, Tromsø, Tjötö, Haugesund; depth? (G. O. Sars).

\*188. *Metopa leptocarpa* G. O. Sars.

*Metopa leptocarpa* G. O. Sars 1895, p. 265, pl. 93 fig. 2.

— — Stebbing 1906, p. 178.

Occurrence. The "Ingolf" has secured a single specimen.

S.W. of Iceland: 60°37' N., 27°52' W., 1505 m., temp. 4.5° ("Ingolf" St. 78).

The species is new to the area; the specimen recorded from Northern Strömfjord in W. Greenland (K. Stephensen, Meddel. om Grönl. vol. 51, 1913, p. 66) is in reality another species (*M. nordmanni* n. sp., see below).

Distribution. W. Norway: Christianssund, abt. 115—150 m. (G. O. Sars l. c.; type-locality). — Nordenskiöld Sea off the Chatanga Bay: 75°38' N., 114°11' E., 19 m., gravel and grey sand (Brüggen, Mém. Acad. Sci. St.-Pétersb., Phys. Math., vol. 18, no. 16, p. 22, 1909).

\*189. *Metopa nordmanni* n. sp. (Fig. 55).

*Metopa leptocarpa* K. Stephensen, Meddel. om Grönland, vol. 51, 1913, p. 66 (non *M. leptocarpa* G. O. Sars).

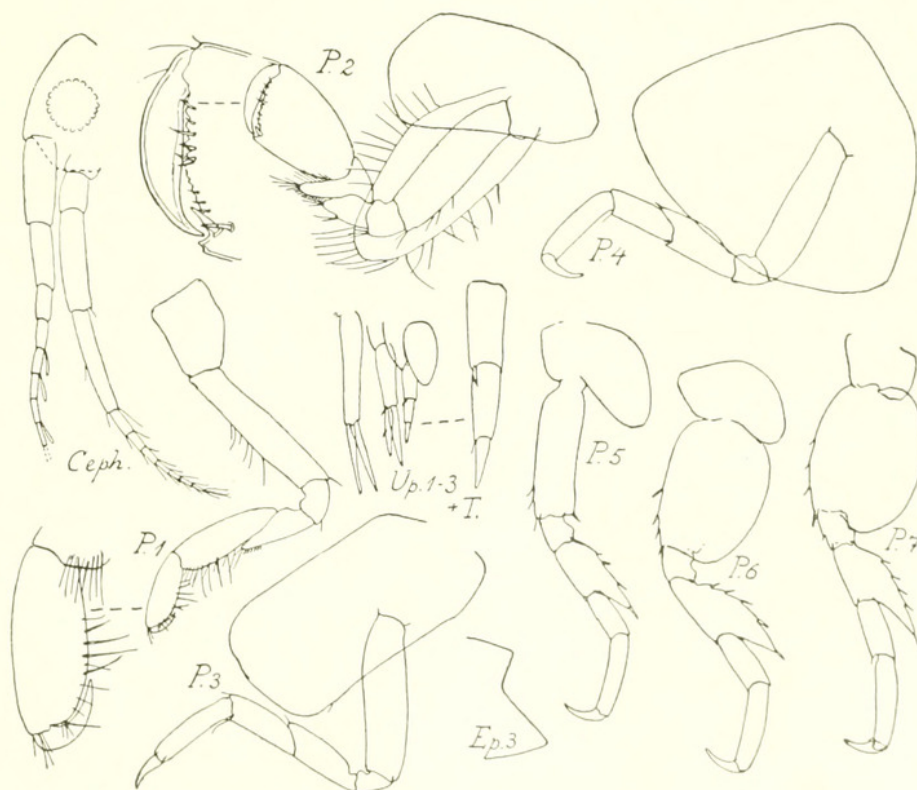


Fig. 55. *Metopa nordmanni*.



Occurrence. W. Greenland: Northern Strömfjord near Holsteinsborg, St. 3 B, Dr. V. Nordmann leg. 1911, 1 ♀ ovig. abt. 5 mm.

Description and Remarks. In my paper l. c. 1913 I have referred the specimen to *M. leptocarpa*; but as I have now dissected the specimen, it appears that this determination is not correct, though it is rather closely allied to the species in question. It may suffice to record the deviations between the two species (— the mouth organs were not dissected out —). Antenna 1: as apex is lost, the number of joints cannot be given. Antenna 2 has 5th joint of peduncle as long as (not shorter than) 4th joint; flagellum has 7 joints. Pereiopod 1 has 4th joint abt.  $1\frac{1}{2}$  times as long as 3rd joint, 5th joint abt.  $1\frac{1}{2}$  times as long as 4th joint and with almost parallel sides, but not more slender than 2nd joint; 6th joint as long as 4th joint, almost as broad as 5th joint, with almost parallel sides, and with the palm oblique, rounded, but not definite; the dactylus curvate, abt.  $\frac{2}{5}$  as long as 6th joint. Pereiopod 2 as in *M. leptocarpa*, with the exception that the fore edge of 1st joint is not so evenly curvate, and the palm of 6th joint is indistinctly dentate (not smooth). All the other limbs are very close to those of *M. leptocarpa*.

The specific name is in honour of the finder, Dr. V. Nordmann.

? **Metopa pusilla** G. O. Sars.

*Metopa pusilla* G. O. Sars 1895, p. 256, pl. 90 fig. 1.

— — Stebbing 1906, p. 179.

Occurrence. E. Greenland: Forsblads Fjord, 6—26 m. (E. Greenland-Exped., Søren Jensen leg. 28-8-1900). The single specimen (abt. 4 mm.) is somewhat defective, and the determination is not certain.

Distribution. "In several places, both on the south and west coasts of Norway, as also in the Trondhjemsfjord", in comparatively shallow water among algæ and Hydroida (G. O. Sars l. c.). — Denmark: southern Kattegat, Storebelt (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 68). — Great Britain: Off Fairland Point (Isle of Cumbæ), 38—45 m.; Menai Strait, 13—22 m.; Rhos Bay on north coast of Wales, just below tide-marks (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 44); Firth of Forth, from mouth of whiting (Th. Scott 1902, p. 478). — Franz Josef Land (Th. Scott, Journ. Linn. Soc., Zool., vol. 27, 1899, p. 72).

190. **Metopa longicornis** G. O. Sars.

*Metopa longicornis* G. O. Sars 1895, p. 258, pl. 90 fig. 2.

— — Stebbing 1906, p. 179.

Occurrence. The "Ingolf" has secured the species at two localities.

W. Greenland: The mouth of the Ameralikfjord (Godthaab), 10—130 m., shells ("Ingolf" 23-7-1895).

— 66°57' N., 55°30' W., 66 m., temp. 0.8° ("Ingolf" St. 33).

— The (lesser?) Helfiskebank, 53 m. (Th. Holm leg.).

The species is known from 3 localities at W. Greenland: Godthaab, abt. 75—115 m., on Sertulariæ; 66° N., abt. 60—75 m.; 66°30' N., 54°50' W., 75 m., stones without algæ, many Balanidæ (H. J. Hansen, Vid. Medd., ser. 4, vol. 9, 1887, p. 97).

Distribution. Norway: Brettesnæs (Lofoten); Oslofjord (G. O. Sars).



? *Metopa rubrovittata* G. O. Sars.

*Metopa rubrovittata* G. O. Sars 1895, p. 255, pl. 89 fig. 2.

— — Stebbing 1906, p. 180.

— — Chevreux & Fage 1925, p. 127, fig.

Occurrence. This species has possibly been taken at two localities in the area, viz. the Faroes: off Hvidenæs near Trangisvaag, 20—25 m. (P. Kramp leg. 8-10-1926; the specimen is very small), and S.W. of the Faroes: 61°07' N., 9°30' W., 850 m. ("Thor" St. 78, 12-5-1904; 4 specimens; the joints in the peduncle of antenna 2 very long). If the determination is right, the species is new to the area.

Distribution. Norway: Christiansund, abt. 60 m. (type-locality?), Vadsö (G. O. Sars l. c.). — Great Britain: Lerwick Bay (Shetland), Isle of Cumbrae, off the north side of Little Cumbrae 19—28 m., North Wales, Cullercoats (Northumberland) (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 41); Firth of Forth (Th. Scott 1906, p. 153). — Holland (Hoek 1889, p. 188). — Bay of Biscay, 180 m., sandy clay (Chevreux & Fage 1925, p. 127). — North Sea, Skagerak, and Kattegat, numerous localities, depths 10—55 (350) m., sometimes pelagically, bottom stones, gravel, sand or clay (Sokolowsky 1900; Reibisch 1905, p. 175; K. Stephensen 1925, p. 69).

\*191. ? *Metopa tenuimana* G. O. Sars (Fig. 56).

*Metopa tenuimana* G. O. Sars 1895, p. 259, pl. 91 fig. 1.

— — Stebbing 1906, p. 181.

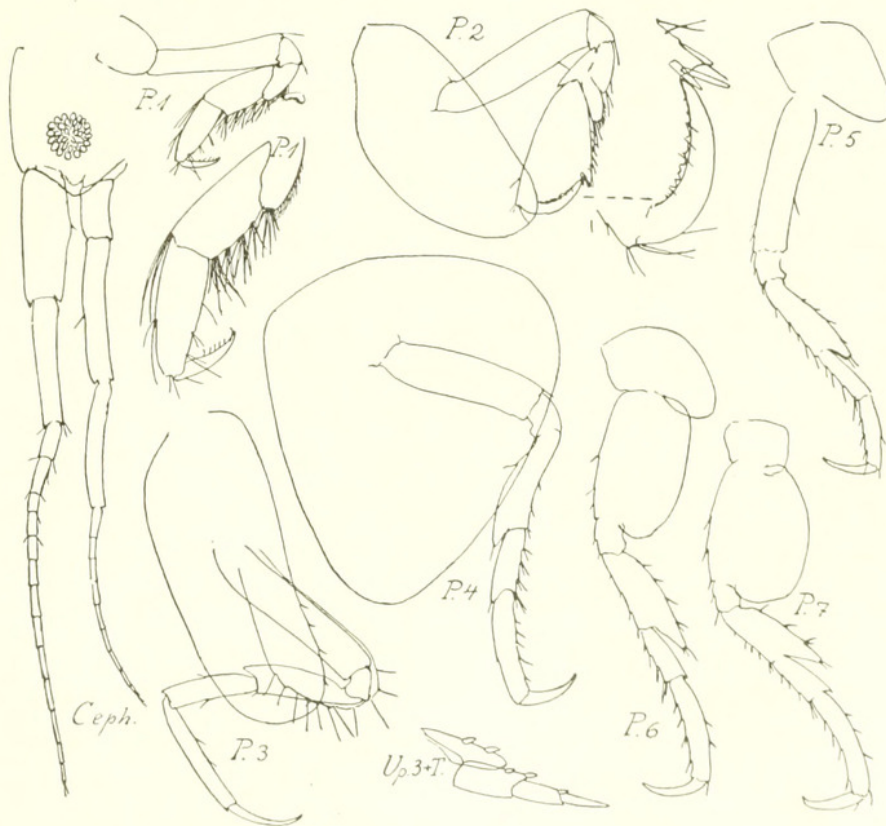


Fig. 56. *Metopa tenuimana*?, ♀.



Occurrence. 3 specimens (♀, 2—3 mm.), probably belonging to this species, were taken at the following locality: E. Greenland: Hurry Inlet (abt. 70°50' N.), 40 m. (E. Greenland-Exped., Søren Jensen leg. 21-7-1900). If the identification is correct, the species is new to the "Ingolf"-area.

Remarks. The determination is not certain; for though the agreement with the said species is rather great, there are some possibly not unimportant disagreements. Antenna 1 has 1st and 2nd joints of peduncle subequal, 3rd joint very short, flagellum has abt. 12 joints. Antenna 2 has in flagellum 9 joints. Pereiopods 1—2 a little too heavy, palm of pereiopod 2 has some very indistinct teeth. Uropod 3 has peduncle a little longer than 1st joint of ramus and provided with 2 spines; the two joints of ramus subequal.

Distribution. W. Norway, exact locality cannot be stated (type-locality, G. O. Sars). W. Norway; Shetland (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 44).

\*192. *Metopa sölsbergi* Sp. Schneider.

*Metopa sölsbergi* G. O. Sars 1895, p. 266, pl. 94 fig. 1.

— — Stebbing 1906, p. 181.

— *borealis*? H. J. Hansen, Vid. Medd. ser. 4, vol. 9, 1887, p. 91, pl. 3 fig. 4, 4a.

Occurrence. The specimen (♀ ovig., abt. 7 mm.) by H. J. Hansen l. c. called *M. borealis*?, is a rather typic specimen of *M. sölsbergi*. It was taken at W. Greenland: Godthaab, abt. 80—120 m. (Holböll leg.); the species is new to the "Ingolf"-area.

Distribution. Norway: Malangenfjord near Tromsø (type-locality) and Sunde in the Hardangerfjord; "on hard stony bottom overgrown with algæ" (G. O. Sars l. c.). — The Sound N. of Hven, at certain localities very numerous, > 20 m., clay (W. Björck, Lunds Univ. Årsskrift, N. F., Afd. 2, vol. 11, 1915, no. 7, p. 20). — Firth of Clyde, semi-parasitic on *Actinoloba* (Elmhirst, Scottish Naturalist 1925, p. 149).

\*193. *Metopa abyssalis* n. sp. (Fig. 57).

Occurrence. The "Ingolf" has secured this species at two stations, both of them situated in the polar deep North of the Ridge.

N. of the Faroes: 63°26' N., 7°56' W., 887 m., temp. ÷ 0.6°. 1 ♀ with marsupial plates, abt. 4 mm.  
("Ingolf" St. 138).

N. E. of Iceland: 66°23' N., 12°05' W., 1011 m., temp. ÷ 0.7°. 2 spec. (♂?), 3 mm. and abt. 4.5 mm.  
("Ingolf" St. 101).

Description of ♂(?), abt. 4.5 mm. Lateral corners of the head probably evenly rounded. Eyes rather small, rounded. Antennæ almost as long as head and 5 anterior segments combined. Antenna 1 a trifle shorter than antenna 2; 1st joint of peduncle a little shorter than 2nd and 3rd joints combined; flagellum, somewhat longer than peduncle, has 13 joints. Antenna 2 has peduncle much longer than flagellum; 4th and 5th joints subequal; flagellum has 8 joints. Oral parts not differing essentially from those typic of the genus, as described by G. O. Sars for *M. alderi*. Pereiopod 1 rather heavy, with all the joints rather short, 5th and 6th joints subequal in length; 5th joint differing from almost all other species in being broader near the base; 6th joint irregularly ovate, widening somewhat at the middle, with palm smooth (but with extremely



small spines) and not defined from the hind portion of the joint; dactylus slightly curvate, half as long as 6th joint. Pereiopod 2 rather powerful, 4th and 5th joints not much produced, 6th joint oblong oval, palm not very oblique, with abt. 6 broad but rather indistinct teeth and defined at the corner by a single, acute, much larger tooth; dactylus very heavy. Pereiopod 3 rather slender, with dactylus very long and slender,  $\frac{3}{4}$  as long as 6th joint. Pereiopod 4 has side plate longer than deep, much larger than sideplates of pereiopods

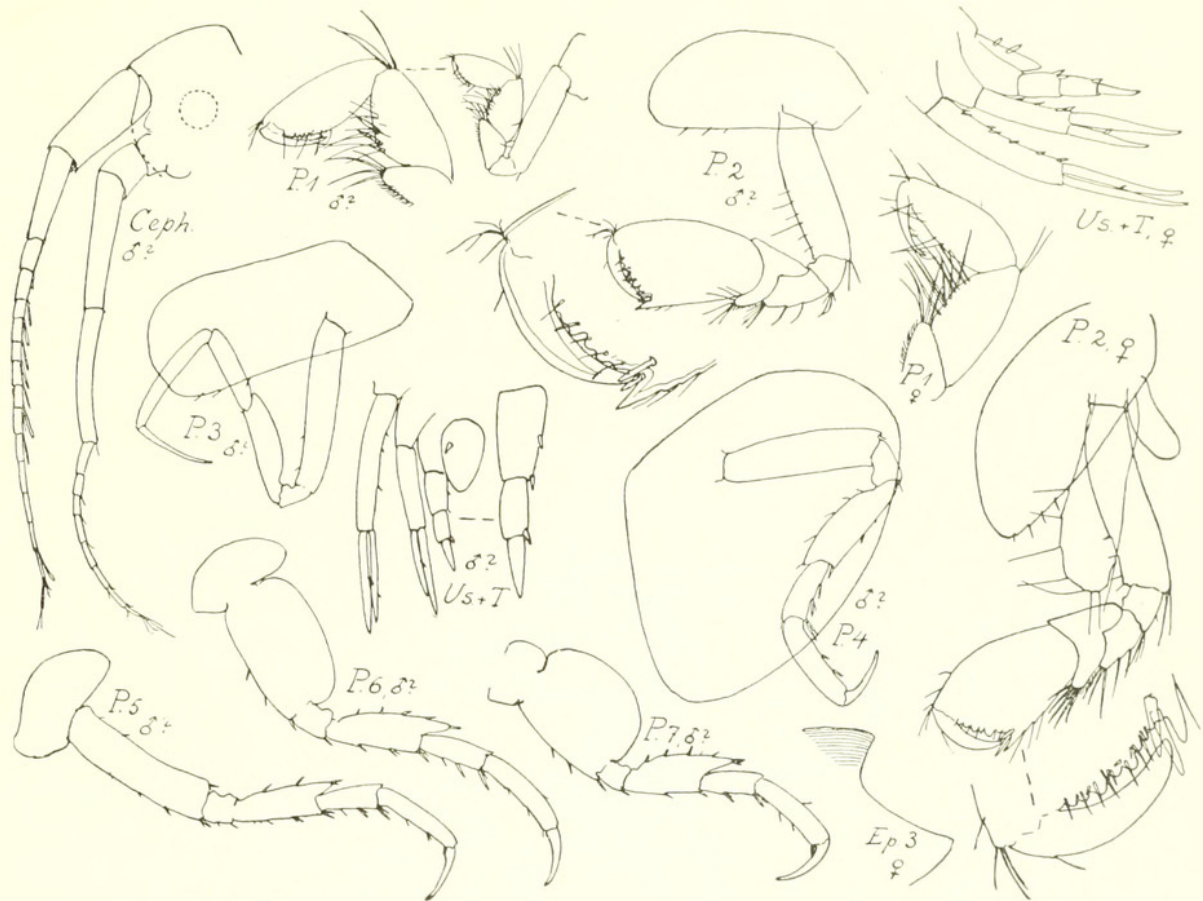


Fig. 57. *Metopa abyssalis* (♂? from "Ingolf" St. 101, ♀ from "Ingolf" St. 138).

2 and 3 combined; the other joints rather more stout than those in pereiopod 3, dactylus (— as also in pereiopods 5—7 —) abt.  $\frac{2}{3}$  as long as 6th joint. Pereiopod 5 has 4th joint very little produced, in pereiopod 7 4th joint is produced to about the middle of 5th joint.

Metasome segment 3 has hind corners produced, acute. Uropod 1 has rami a little shorter than peduncle; uropod 2 has outer ramus shorter than inner ramus; in uropod 3 peduncle has 2 spines and is somewhat shorter than ramus. Telson is oval, with probably only one spine. —

♀ with marsupial plates, abt. 4 mm. Differs only very little from ♂. Antenna 1 a little shorter than antenna 2, and flagellum has 9 joints. Antenna 2: flagellum has 8 joints. Pereiopod 1 has 5th and 6th joints narrower than those of ♂. Pereiopod 2 has fore margin of 6th joint more curvate. Pereiopod 3 has dactylus still longer than that of ♂, almost as long as 6th joint. Uropods 1—2 have more distinct spines, and uropod 3 has peduncle and the two joints of ramus almost equal in length. Telson has 2 pairs of spines. —



This species is easily recognisable especially in the shape of pereopod 1 (5th joint proximally widened) and in the long dactylus of pereopod 3.

### Genus *Metopella* G. O. Sars.

*Metopella* G. O. Sars 1895, p. 274.

— Stebbing 1906, p. 182.

Of the 8 species of the genus no fewer than 4 are known from the area.

#### 194. *Metopella nasuta* (Boeck) (Chart 33, partim).

*Metopa nasuta* G. O. Sars 1895, p. 276, pl. 98 fig. 1.

*Metopella nasuta* Stebbing 1906, p. 182.

Occurrence. The "Ingolf" has secured the species at one locality viz., W. Greenland: Ameralik-fjord N. of Godthaab, 10—130 m., shells, 2 spec. ("Ingolf" 23-7-1895).

Numerous specimens have been taken in the Faskruðfjörður, S.E. Iceland, blue clay (new to Iceland; R. Hörring leg. 17-7-1899).

The species is known from W. Greenland: 66°30' N., 54°50' W., 75 m., stones without algæ, many Balanidæ (H. J. Hansen, Vid. Medd. 1887, p. 102); the determination is no doubt correct though H. J. Hansen has provided his identification with a?

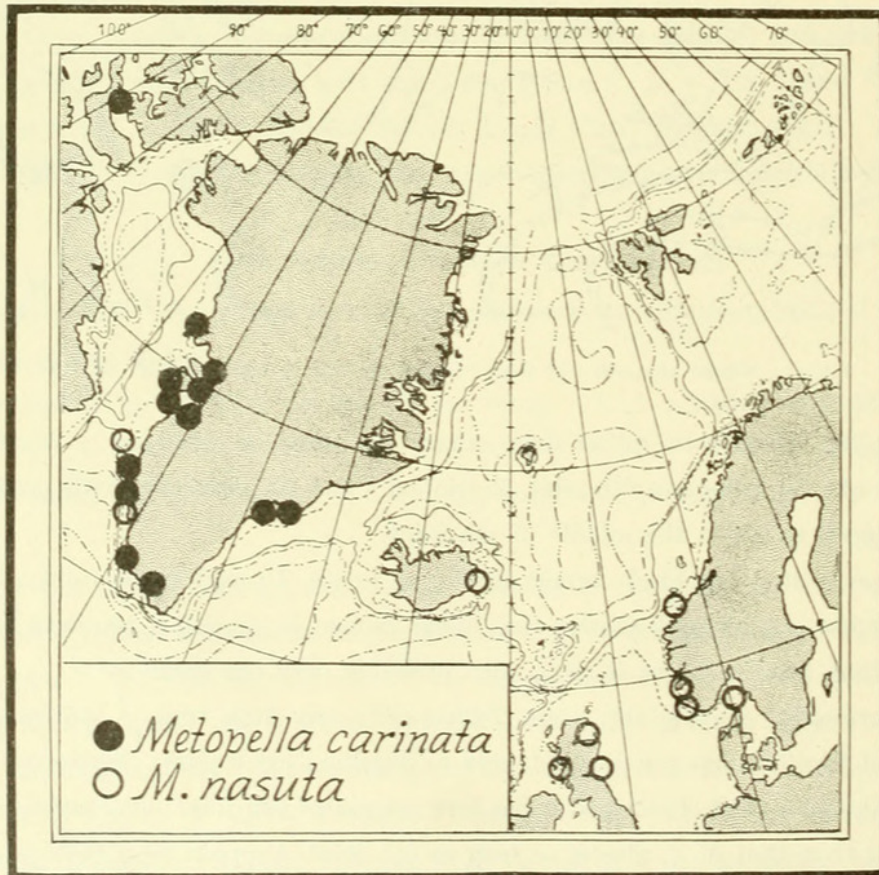


Chart 33. *Metopella carinata*, *M. nasuta*. (Localities in the Gulf of St. Lawrence are outside the chart to the S.E.)

Distribution (Chart 33, partim). W. Norway: Hardangerfjord (type-locality), Kopervik (in Karmøyen N. of Stavanger), Christianssund; abt. 100—200 m. (G. O. Sars l. c.). — N.W. of the Skaw, 205 m., clay (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 70). — Great Britain: Fairland Point (Isle of Cumbrae), 40 m.; off May Island (Firth of Forth), deep water; Moray Firth (Norman, Ann. Mag. Nat. Hist., ser. 6 vol. 7, 1900, p. 45). Firth of Forth (Th. Scott 1906, p. 154). — Gulf of St. Lawrence: North of Cheticamp island, 40 m. (Shoemaker, Contrib. Canad. Biol. and Fish., vol. 5, 1930, p. 265).

195. *Metopella carinata* (H. J. Hansen) (Chart 33, partim).

*Metopa carinata* H. J. Hansen, Vid. Medd. 1887, p. 99, pl. 4 fig. 3.

*Metopella carinata* Stebbing 1906, p. 184.

Occurrence. The "Ingolf" has not secured this species which is at hand from the following localities not mentioned in existant literature.

W. Greenland: Kronprinsens Eyland (S. of Godhavn), C. Kruuse leg. 17-7-1897.

E. Greenland: 7 finds near Angmagssalik. The exact localities are: Angmagssalik, 0—18 m. (S. Jensen leg. 19-9-1900); Tasiusak, 3 finds, in one the depth was 6—10 m. and the bottom rocky with some algæ (Amdrup-Exped. 28-10-1898, and Kruuse leg. 1901—1902); Cape Dan 20—30 m., rocky bottom with Laminariæ (Amdrup-Exped. 11-6-1899); Tiningniketok (65°54' N., 37°40' W.), 2 m (Kruuse leg. 5-7-1902); Ingolf Fjord (66°15' N.), rocky bottom with algæ (Amdrup-Exped. 5-8-1899).

In the literature it is mentioned from abt. 35 finds (14 localities) from W. Greenland abt. 60°—72½° N. (H. J. Hansen l. c. 1887; K. Stephensen, Conspectus 1913, p. 142, and Meddel. om Grönl. vol. 53, 1916, p. 287). The depths are as a rule < 30 m. (only in one case as much as 113 m.), and it seems to be most common among algæ.

Remarks. The material contains numerous ovigerous females; the dates are: 19-6, 22-6, 26-6, 3-7, 5-7, 12-7, 17-7, 31-7, 5-8, 17-8, 25-8, 19-9.

Distribution (Chart 33, partim). Ren Bay, Ellesmere Land (G. O. Sars, Crust.; Sec. Arctic Exped. "Fram" 1898—1902, no. 18, 1909, p. 12). — S.E. part of the Gulf of St. Lawrence, 2 loc., 30—40 m. (Shoemaker, Contrib. Canad. Biol. and Fish., vol. 5, 1930, p. 264).

196. *Metopella longimana* (Boeck).

*Metopa longimana* G. O. Sars 1895, p. 273, pl. 97 fig. 1.

*Metopella longimana* Stebbing 1906, p. 185.

Occurrence. The "Ingolf" has not taken this species; it is at hand from the following localities:

W. Greenland: Egedesminde (and Ritenbenk?) (Traustedt leg. 1892).

E. Greenland: Tasiusak near Angmagssalik, dredging under the ice, 40—60 m., stony bottom with rich vegetation of algæ (Amdrup-Exped. 23-5-1899) (new to E. Greenland).

N. E. Iceland: Hornet in N. 74 E., 70 m. ("Diana" St. 42, 18-6-1898; R. Hörring leg.) (new to Iceland).

From the "Ingolf"-area it is noted from the following localities at W. Greenland: Godthaab, abt.



75—115 m., on Sertulariæ; Sukkertoppen, among "roots" of Laminariæ; Greenland without special locality (H. J. Hansen 1887, p. 95), and from Bredefjord (abt. 60° N.), 12.5-13 m. (K. Stephensen, Meddel. om Grönl. vol. 53, 1916, p. 286).

Distribution. Norway: Oslofjord and Haugesund, depth? (type-localities; G. O. Sars 1. c.).

197. **Metopella neglecta** (H. J. Hansen).

*Metopa neglecta* H. J. Hansen, Vid. Medd. 1887, p. 96, pl. 3 fig. 9.

— — G. O. Sars 1895, p. 274, pl. 97 fig. 2.

*Metopella neglecta* Stebbing 1906, p. 184.

Occurrence. In the "Ingolf"-area this species has only been taken three times at W. Greenland viz., Bredefjord (abt. 60° N.), 12.5-13 m., 3 spec. (K. Stephensen leg. 22-7-1912); Godthaab (type-locality) "deep water" (abt. 75—115 m.) among Sertulariæ, Holböll ded. (H. J. Hansen 1. c.), and Egedesminde, 3 spec. (Traustedt leg. 1892).

Distribution. W. Norway: Haugesund, depth? (G. O. Sars 1. c.).

Genus **Proboloides** Della Valle.

*Proboloides* Stebbing 1906, p. 187.

— Chevreux & Fage 1925, p. 128.

Only two species of this genus have been found in the area.

198. **Proboloides glacialis** (Krøyer).

*Metopa glacialis* H. J. Hansen, Vid. Medd. 1887, p. 93, pl. 3 fig. 6.

*Proboloides glacialis* Stebbing 1906, p. 189.

Occurrence. The "Ingolf" has not secured this species; it is noted from two localities at W. Greenland (Prøven, 30—75 m., rocky bottom, and Augparlartok, abt. 275 m., clay; H. J. Hansen 1. c.) and from Iceland without special locality (Goës 1866, p. 6).

Remarks. Pereiopod 2 of this species has a striking similarity to the same limb of *Metopa pacifica* Holmes (Proc. U. S. Nat. Mus., vol. 35, 1909, p. 524, with figs.; from Monterey Bay, California, abt. 1300—1400 m.), but pereiopod 1 has a quite different shape (in *M. pacifica* rather nearly allied to that of *M. norvegica*).

Distribution. Spitsbergen: Bell Sound (Krøyer; type-locality); Kingsbay, Horn Sound, Storfjord, abt. 40—115 m. (Goës 1866, p. 6); Green Bay in the Icefjord, 33 m., gravel, stones and shells with *Lithothamnion* and *Balanus porcatus* (Oldevig 1917, p. 19).

199. **Proboloides clypeatus** (Stimpson).

*Metopa groenlandica* H. J. Hansen, Vid. Medd. 1887, p. 94, pl. 3 fig. 7.

*Proboloides groenlandicus* Stebbing 1906, p. 190.

*Stenothoë clypeata* Stimpson, Stebbing 1906, p. 195, 725.

Occurrence. A few specimens of this species are at hand from W. Greenland: Sakrak in the Waigat (Traustedt leg. 1892), and Thule, from *Ascidia prunum* (P. Freuchen leg. 24-7-1917), — and from E. Greenland: Turner Sound ( $69^{\circ}\frac{3}{4}'$  N.) 6 m. (E. Greenland-Exped., Søren Jensen leg. 25-7-1900).

It is noted from 4 localities at W. Greenland viz., Kvanefjord, 34—40 m. (K. Stephensen, Meddel. om Grönl., vol. 53, 1916, p. 286), and from Godthaab, Egedesminde and Disco (Nordfjord), abt. 50 m., clay (H. J. Hansen l. c., type-localities). 2 specimens from "W. Greenland?" are found in "*Boltenia bolteni* L."

Remarks. In the very characteristic shape of pereopod 1 the species is closely allied to *Metopa spitzbergensis* Brüggén (Ann. Mus. Zool. St.-Pétersbourg, vol. 11, 1906, p. 223, fig. 3), found at Spitsbergen ( $78^{\circ}34'$  N.,  $20^{\circ}25'$  E., 42 m., in Storfjord, Ginevrabay; type-locality) and N. of the New Sibirian Islands ( $77^{\circ}20'30''$  N.,  $138^{\circ}47'$  E., 38 m., clay; Brüggén, Mém. Acad. Imp. Sci. St.-Pétersbourg, ser. 7, classe math.-phys., vol. 18, no. 16, 1909, p. 21, pl. 1 fig. 2, pl. 3 fig. 20, text figs. 3—4).

Distribution. Grand Manan (Stimpson); Eastport (in Maine), and "Albatross" stations 2057 and 2062 (? not far from the locality named) (Holmes, Bull. U. S. Bureau Fisheries, vol. 24, 1904 (1906), p. 483, with figs.).

### Genus *Stenothoë* Dana.

*Stenothoë* G. O. Sars 1895, p. 235.

— Stebbing 1906, p. 192.

— Chevreux & Fage 1925, p. 131.

This genus comprises abt. 30 species, but only 4 are known from the "Ingolf" area, and two of them (*S. macrophthalma* and *S. æquicornis*) are here described for the first time.

#### 200. *Stenothoë monoculoides* (Bate).

*Stenothoë monoculoides* G. O. Sars 1895, p. 240, pl. 82 fig. 1.

— — Stebbing 1906, p. 196.

— — Chevreux & Fage 1925, p. 133, fig.

Occurrence. The "Ingolf" Expedition has not taken this species; but material is at hand from the Vestmanøerne (S. of Iceland), 20—30 m., stony bottom, numerous spec. (H. Jónsson leg. 18-5-1897). It has been found abt. 10 times at the Faroes, 0—12 m., but once in abt. 120 m. (K. Stephensen, in Zoology of the Faroes, XXIII, 1929, p. 6).

Distribution. A littoral species, living in shallow water among algæ or Hydroida; found from S. Iceland (see above) and the Trondhjemsfjord along the European coasts to Senegal and the Black Sea. The special localities are: "Norway in several places, both off the south and west coast", northwards to Bejan, at the entrance of the Trondhjemsfjord (G. O. Sars l. c.). — Denmark: Samsø(?) and Store Belt (K. Stephensen, Vid. Medd. Dansk Naturh. Foren., vol. 82, 1926, p. 71). — Heligoland (Sokolowsky 1900). — East Friesland, 14—10 m. (Metzger 1875, p. 283). — Great Britain and Ireland: Firth of Forth (Th. Scott 1906, p. 153); Shetland Islands, Skye, Moray Firth, Salcombe Bay (Devonshire), Falmouth, Tenby, Pen-



zance, Plymouth, Sligo and Belfast Bay (Ireland) (Bate & Westwood vol. 1, 1863, p. 57); Firth of Clyde, Guernsey, Jersey, Roundstone (Ireland), Cullercoats (Northumberland), Ardbear Bay (Ireland), North Wales and Isle of Man, St. Andrews, Loch Fyne, Valentia (Ireland) (Norman 1900, p. 39). — N. and W. coasts of France, "rather common", down to 80 m.; Portugal; mediterranean coast of France, 5 localities; Algérie; Black Sea; Azores (Chevreux & Fage 1925, p. 135). — Canarian Islands and Senegal (Chevreux, Bull. Soc. Zool. France, vol. 50, 1925, p. 300).

201. ? *Stenothoë marina* (Sp. Bate).

*Stenothoë marina* G. O. Sars 1895, p. 236, pl. 80.

— — Stebbing 1906, p. 198.

— — Chevreux & Fage 1925, p. 136, fig.

Occurrence. A specimen, probably being a ♀ jun. of this species, is found at the Faroes in the deep between Nolsö and Østerö, abt. 120 m. (K. Stephensen, in Zool. of the Faroes, no. XXIII, 1929, p. 6).

Distribution. From N. Norway to Portugal, Spain and the Azores, etc. The special localities are as follows: "Off the south and west coast of Norway this species is by no means rare", as a rule in depths from abt. 40 to abt. 100 m., especially among Hydroida; "it extends northwards to the Nordland coast (Tjötta), and is also found in the Trondhjemsfjord" (G. O. Sars l. c.). — Waters round Denmark: 57°16' N., 5°30' E., 55 m., stones; N. of Gl. Skagen, 90 m.; ? 57°40' N., 9°0' E., 65 m.; 4.7 miles S.W. of the Winga light-house, 80 m., clay (K. Stephensen, Vid. Medd. Dansk Naturh. Foren., vol. 82, 1926, p. 72). — North Sea: 55°08' N., 6°27' E., 41 m., clay; 54°29' N., 2°08' E., 19 m., fine sand; 54°10' N., 2°9' E., 39 m., sand; 52°41' N., 3°22' E., 37 m., sand (Reibisch 1905, p. 174); Heligoland (Sokolowsky 1900, p. 151); Eastern Friesland 16—40 m. (Metzger 1875, p. 283); 53°28' N., 3°45' E., 32 m.; 54°16' N., 5°15' E., 42 m.; 54°22.5' N., 2°33.5' E., 28—31 m. (Tesch 1915, p. 331, 355). — Great Britain and Ireland, 18 localities, from the Shetlands to Jersey (Norman 1900, p. 39). — Firth of Forth (Th. Scott 1906, p. 152). — W. France, 9 localities, "not common", 10—20 m. (Chevreux & Fage 1925, p. 137). — Spain, Portugal, Azores (Chevreux & Fage l. c.). — W. Africa, off Sahara (Chevreux, Bull. Soc. Zool. France, vol. 50, 1925, p. 300). — Bermudas (Kun- kel, Trans. Connecticut Acad., New Haven, vol. 16, 1910, p. 14, figs.). — Adriatic (Stebbing 1906). — Ceylon (*S. marina* var. *sinhalensis*, Walker, in Herdman, Rep. Ceylon Pearl Fish., vol. 2, 1904, p. 261).

\*202. *Stenothoë* (?) *macrophthalma* n. sp. (Fig. 58).

Occurrence. A single specimen was taken at the following locality:

S.W. of the Faroes: 60°23' N., 8°55' W., 425 m. ("Michael Sars" St. 77, 13-8-1902; Ad. S. Jensen leg.), 1 ♂ abt. 7 mm.

Description. The species to be described below belongs probably to the genus *Stenothoë*; but this is not quite certain, for the oral parts of the single specimen were not investigated.

Head has rostrum short and upper lateral angle nearly rectangular. Eyes very large, diametre almost half as long as dorsal length of head. Antenna 1 has 1st and 2nd joints subequal in length, 3rd joint very short; flagellum somewhat longer than peduncle, has 22 joints and reaches to distal end of peduncle of



antenna 2. Antenna 2 has peduncle very long, 5th joint somewhat longer than 4th joint; flagellum short (as long as 4th joint of peduncle), with abt. 11 joints.

Pereiopod 1 has sideplate very small, quadrangular; 4th joint produced almost to distal end of 5th joint; 6th joint somewhat widened distally, with palm even and somewhat oblique; dactylus not longer than palm. Pereiopod 2 has sideplate large, ovate; 6th joint very powerful, fully as long as 2nd joint, oblong,

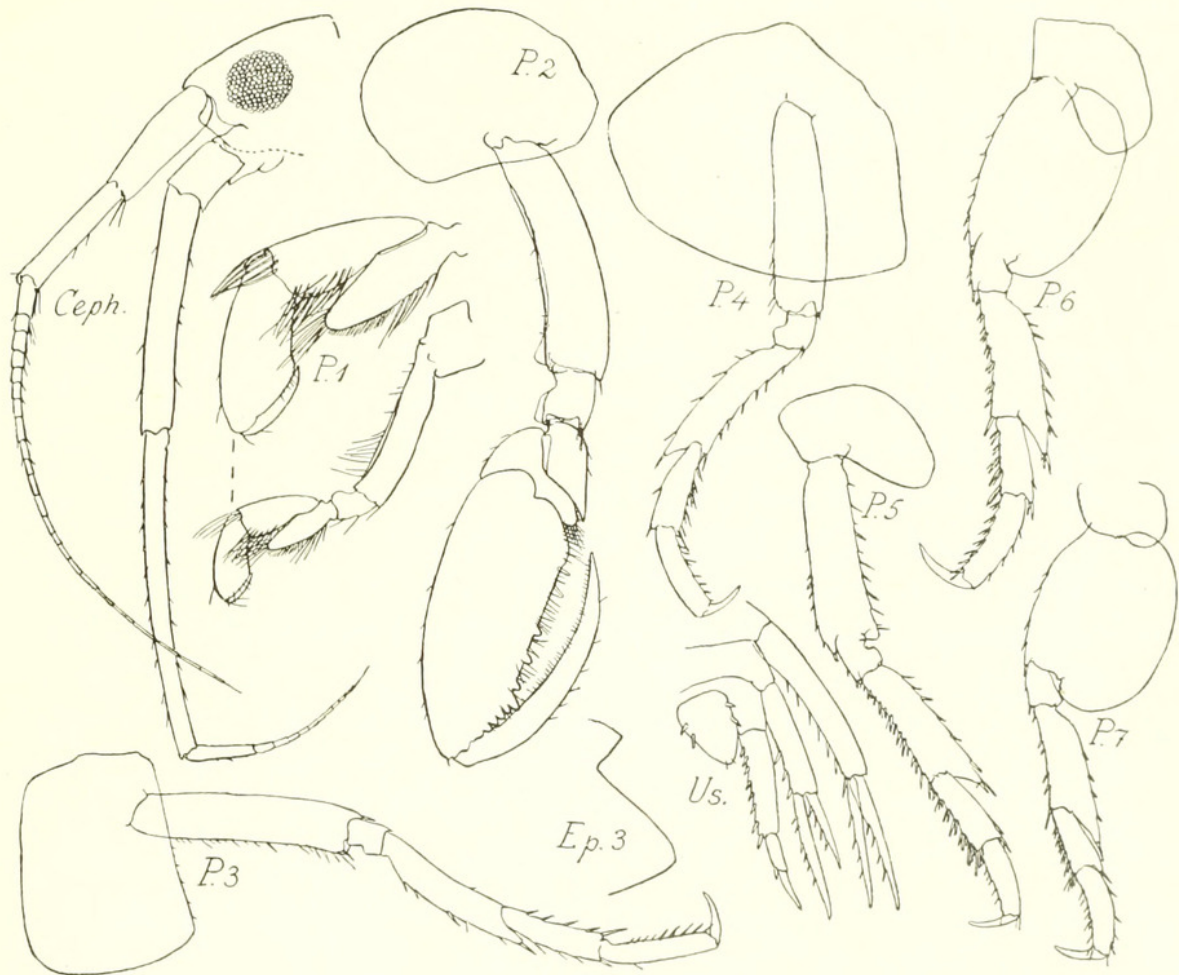


Fig. 58. *Stenothoë(?) macrophthalma*.

slightly tapering distally, palm forming anteriorly a dentate expansion (with 5 teeth), then come 3 teeth with rather large intervals, and near the rounded hind angle 1 spine. Pereiopod 3 has sideplate distally somewhat widened; sideplate of pereiopod 4 broad, with hind corner almost rectangular, as large as sideplates 2 and 3 combined. Pereiopods 3—7 not very slender; 4th joint rather narrow and distally very little produced in 3rd and 4th pair, broader and somewhat more produced (to middle of next joint) in 6th and 7th pair. Pereiopods 6 and 7 have 2nd joint broad, oval. Lower hind corner of 3rd metasome segment not acute. Uropod 3 has peduncle about as long as ramus, with 8 spines; the two joints of ramus are of equal length, 1st joint with one apical spine. Telson oblong, with 2 pairs of dorsal spines and with 1 pair of fine setae apically. —



In having the peduncle of antenna 2 extremely long this species is most closely allied to *Stenothoë megacheir* (Boeck) (G. O. Sars 1895, p. 242, pl. 83), but it differs among other things in having pereopod 2 (incl. the side plate) of another shape, and pereopods 6—7 have 4th joint much more produced in the lower hind corner.

\*203. *Stenothoë* (?) *æquicornis* n. sp. (Fig. 59).

Occurrence. 5 specimens were taken at the following locality:

Between the Faroes and Iceland: 64°16' N., 11°15' W., 375 m. Kaptain Wandel leg. 1891.

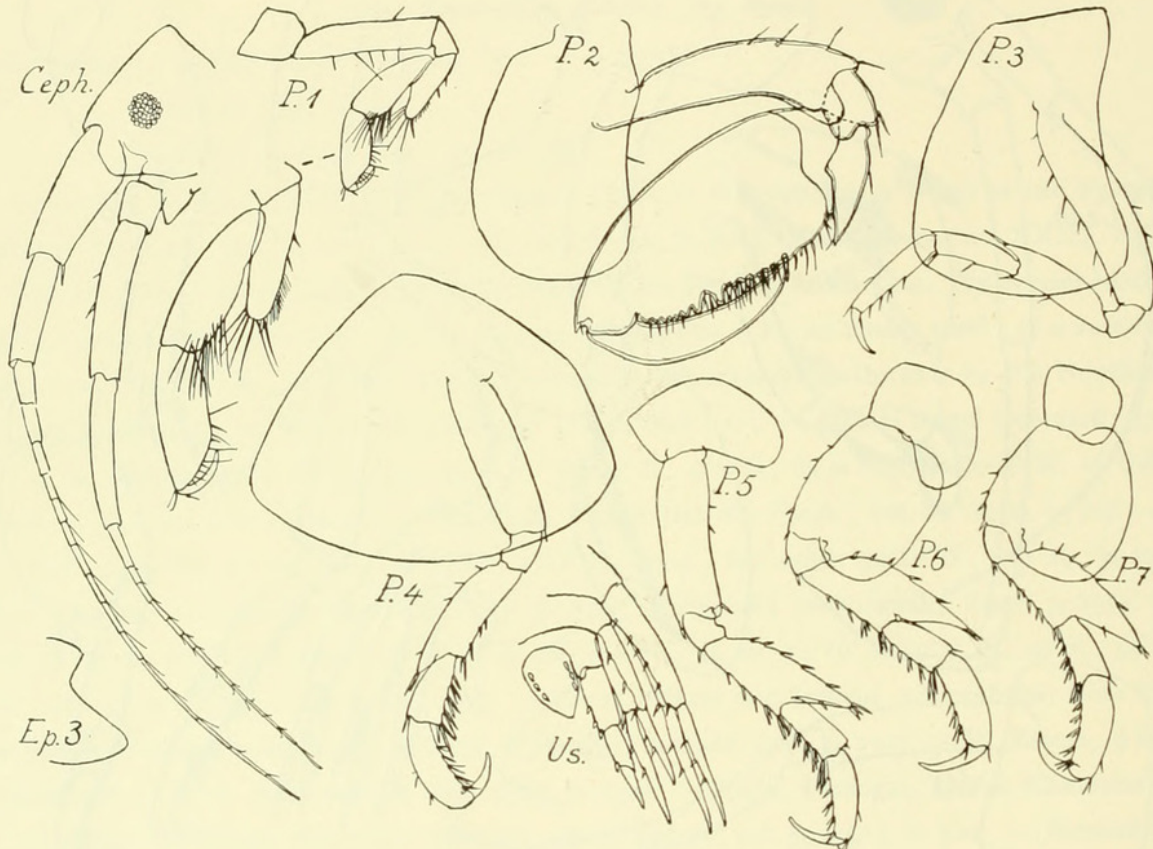


Fig. 59. *Stenothoë* (?) *æquicornis*.

Description of ♂(?), abt. 5 mm. The oral parts were not especially examined; but there does not seem to be any doubt that the species really belongs to the genus *Stenothoë*.

Head has lateral corners bluntly angular; rostrum very short. Eyes very small, round, diameter  $\frac{1}{4}$  or  $\frac{1}{5}$  of the dorsal length of head. Antennæ rather long, subequal in length. Antenna 1 has 1st joint somewhat longer and heavier than 2nd joint; 3rd joint only  $\frac{1}{3}$  as long as 2nd joint; flagellum, abt.  $1\frac{1}{2}$  time as long as peduncle, has 14 rather long joints. Antenna 2 has peduncle as long as flagellum; 4th and 5th joint subequal, flagellum has 11 joints.

Pereopod 1 not strong; side plate very small; 4th, 5th and 6th joint subequal in length; 4th joint produced to the middle of the free under edge of 5th joint; 6th joint has almost parallel sides, with palm oblique. Pereopod 2 has sideplate large, with lower forecorner evenly rounded; 6th joint powerful, oval,



with palm irregularly serrate. Pereiopod 3 much more slender than pereiopod 4, with sideplate distally widened. 4th sideplate very large, wider than 2nd and 3rd combined. Pereiopod 5—7 very heavy (nos. 6—7 with 2nd joint extremely broad), with 4th joint broad and distally produced to or near to apex of next joint. Lower hind corner of 3rd metasome segment acutely angled, rounded at apex. Uropod 3 has peduncle (with 3 spines) much shorter than ramus. Telson ovate, apically narrowed, with 3 pairs of spines.

All the specimens are probably ♂, for they seem to be mature, and there are no traces of marsupial plates.

The species does not seem to be especially closely allied to any of the hitherto described species.

## Fam. *Cressidæ* Stebbing.

*Cressidæ* Stebbing 1906, p. 190.

— Chevreux & Fage 1925, p. 141.

The fam. *Cressidæ* was established by Stebbing 1899 (Ann. Mag. Nat. Hist., ser. 7, vol. 4, p. 210); it differs from the fam. *Stenothoidæ* (incl. fam. *Metopidæ*) especially in having the palp of the mandibles very long, and the single genus hitherto known (*Cressa*) has in the hind edge of the side plate of pereiopod 4 a deep excavation for the sideplate of pereiopod 5. The "Ingolf" material contains an important material of a new species which must be the type of a new genus (*Cressina*), as this species has no such excavation.

The family comprised hitherto only one genus with 3 species, probably all found in the area; the "Ingolf" Expedition has enriched the fauna of the area with 3 nn. spp. (one of them belonging to a new genus).

### Genus *Cressa* Boeck (*Danaia* Sp. Bate).

*Cressa* G. O. Sars 1895, p. 277.

— Stebbing 1906, p. 191.

— Chevreux & Fage 1925, p. 141.

Of the 5(6) species recorded below 2(3) are new to science.

#### 204. *Cressa dubia* (Spence Bate) (Chart 34, partim).

*Cressa dubia* G. O. Sars 1895, p. 278, pl. 98 fig. 2, pl. 99 fig. 1.

— — Stebbing 1906, p. 191.

— — Chevreux & Fage 1925, p. 141, figs.

Occurrence. This species has only once been taken in the "Ingolf"-area, viz., at the Faroes: 6 miles N. of Kalsö, 113 m., numerous spec. including ♀ with eggs (Dr. Th. Mortensen leg. 25-5-1899).

Distribution (Chart 34, partim). From W. Norway (Trondhjemsfjord) and the Faroes to Monaco, depths 5—146 m. The special localities are: "several places, both off the west and south coast of Norway, as also in the Trondhjemsfjord, at depths varying from 40 to abt. 150 m."; also found at Haugesund (G. O. Sars l. c.). — Great Britain: Firth of Forth (Th. Scott 1906, p. 155); off the Eddystone Lighthouse (*Danaia dubia*; Bate & Westwood, vol. 1, 1863, p. 68). Moray Firth; Firth of Forth; off Tarbert, Loch Fyne; Isle of



Mull (S.W. Scotland); North Wales; Isle of Man; off Cullercoats, Northumberland, 40 m.; Isle of Cumbraë; Torquay (Norman 1900, p. 46).  $55^{\circ}12' N.$ ,  $1^{\circ}25' W.$  (N.E. of Newcastle), 45 m. (Kapt. Ørsted leg. 1910; specimens in the Copenhagen Zool. Museum). — Heligoland (Sokolowsky 1900). — France, 8 localities, 5—20(132) m., both in the Atlantic and in the Mediterranean (Chevreux & Fage 1925).

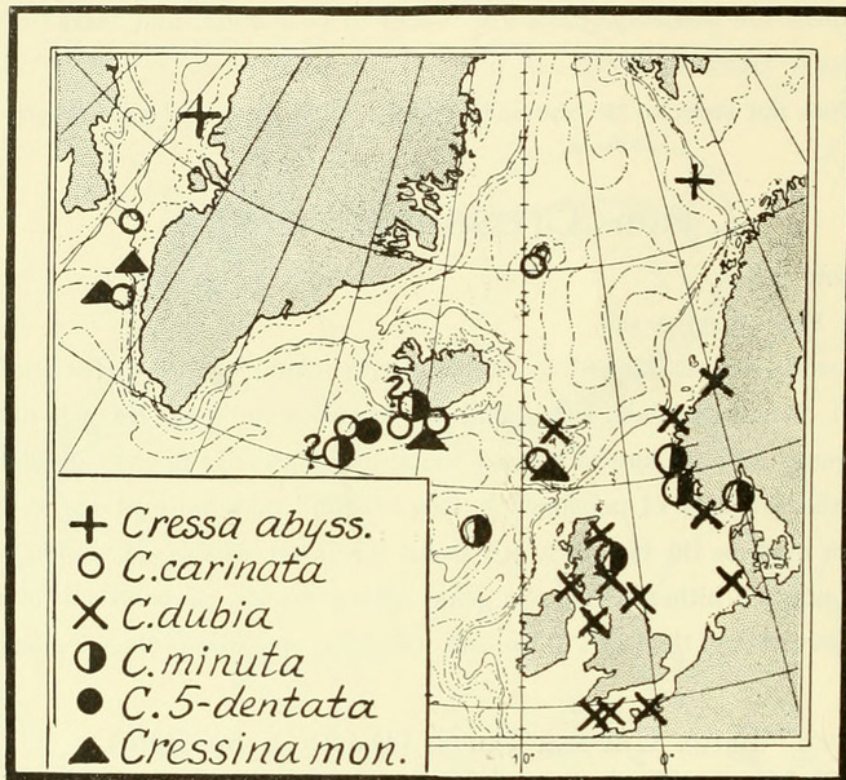


Chart 34. *Cressa abyssicola*, *C. carinata*, *C. dubia*, *C. minuta*, *C. 5-dentata*, and *Cressina monocuspis*.

205. ? **Cressa minuta** Boeck (Chart 34, partim).

*Cressa minuta* G. O. Sars 1895, p. 280, pl. 99 fig. 2.

— — Stebbing 1906, p. 192.

Occurrence. 2 very small specimens from two different localities in the area are possibly to be referred to the present species; but on account of the small size of the specimens the determination is very uncertain. The localities are:

S. of Iceland: Vestmanna Islands, 93 m. "Diana" 28-6-1900 (Dr. A. C. Johansen leg.).

S.W. of —  $60^{\circ}37' N.$ ,  $27^{\circ}52' W.$  1505 m., temp.  $4.5^{\circ}$  ("Ingolf" St. 78).

The species has not hitherto been found in the "Ingolf"-area.

Distribution (Chart 34, partim). S. and W. Norway, 4 localities, viz., Risør, Sunde, Bekkervik and Haugesund, depths? (G. O. Sars l. c.). — Firth of Forth (Stebbing l. c.). — N. of Rockall  $57^{\circ}32' N.$ ,  $13^{\circ}36' W.$ , 90 m. (Dollfuss, Bull. Inst. Océanogr. Monaco 438, 1924, p. 23).



206. *Cressa abyssicola* G. O. Sars (Chart 34, partim).

*Danaia abyssicola* G. O. Sars, Crust.; Norske Nordhavs-Exped., vol. 6, 1885, p. 190, pl. 16 fig. 1.

*Cressa* — Stebbing 1906, p. 192.

Occurrence. The species has only once been taken in the "Ingolf"-area, viz. W. of Greenland  $71^{\circ}10' N.$ ,  $58^{\circ}56' W.$ , abt. 375 m., 2 spec. (H. J. Hansen, V. Grönland 1887, p. 103).

Remarks. The specimens recorded above belong the Naturhistorisk Riksmuseum of Stockholm; they are the only specimens mentioned in the literature, apart from the single type-specimen, and I have not seen them wherefore I am unable to state if the determination is correct. This would besides have been very difficult if not impossible, for the original description is not elaborate enough, and the accompanying figure has no detail figures except that of pereopod 2.

Occurrence (Chart 34, partim). Between the Finmarken and Bear Island  $72^{\circ}57' N.$ ,  $14^{\circ}32' E.$ , 817 m.,  $\div 0.8^{\circ}$ , clay (G. O. Sars l. c.; type-locality).

***Cressa* sp. (*C. abyssicola* G. O. Sars?) (Fig. 60).**

Occurrence. At two stations. The "Ingolf" has secured a few specimens of a doubtful species:

W. of Greenland:  $65^{\circ}14' N.$ ,  $55^{\circ}42' W.$  791 m., temp.  $3.5^{\circ}$ . 1 spec. abt. 2 mm. ("Ingolf" St. 28).

N. of Iceland:  $67^{\circ}19' N.$ ,  $15^{\circ}52' W.$  552 m., temp.  $\div 0.5^{\circ}$ . 3 spec. abt. 2.5 mm., abt. 4 mm., 5 mm. (♀ with marsupial plates) ("Ingolf" St. 126).

Description of ♀ with marsupial plates, 5 mm., from "Ingolf" St. 126. This species is very closely allied to *C. quinquedentata* (see below, p. 203), but differs as to a few characters. Back is even, totally without teeth. Head has lateral corner produced to a single, sharp point. Antenna 1 not very heavy; both 1st and 2nd joints apically produced. Pereiopod 7 has inferior hind corner of 2nd joint rectangular, and the joint is almost as broad as long. Pereiopods 5—7 very heavy, with the elongation of 4th joint covering half of 5th joint. Uropods 1—2 have a row of spines on peduncle. Uropod 3 has peduncle shorter than ramus, apically produced on underside and with a single apical spine; 1st joint of ramus has 2 spines and is twice as long as 2nd ramus.

This species is very nearly allied not only to *C. quinquedentata*, but also to *C. abyssicola*, and it is possibly identic with this last-named species, though there are some disagreements (*C. abyssicola* is, f. i., described as having no eyes).

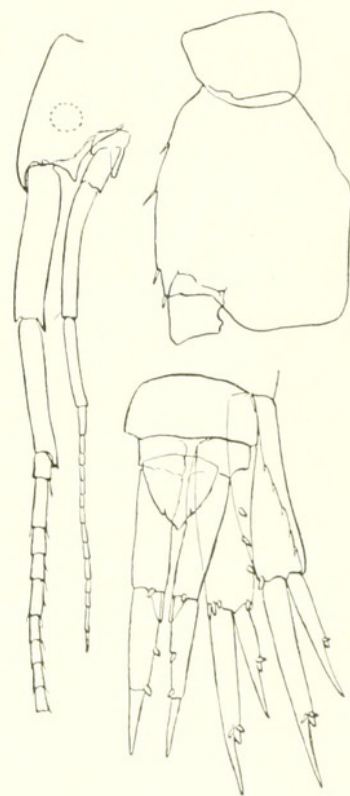


Fig. 60. *Cressa (abyssicola?)*. Head, pereopod 7 (proximal part), urosome.

\*207. *Cressa carinata* n. sp. (Fig. 61) (Chart 34, partim).

Occurrence. This new species was taken at 4 stations by the "Ingolf" and at 3 stations by the "Thor"; material from a single locality is from another source. The localities are as follows.



- W. of Greenland: 63°30' N., 54°25' W. 1096 m., temp. 3.3°. 1 ♀ ovig. ("Ingolf" St. 25).  
 — 66°35' N., 56°38' W. 600 m., temp. 3.9°. 4 spec. ("Ingolf" St. 32).  
 S.W. of Iceland: 60°37' N., 27°52' W. 1505 m., temp. 4.5°. 2 spec. ("Ingolf" St. 78).  
 S. of — 62°00' N., 21°36' W. 1393 m., temp. 3.3°. 1 spec. ("Ingolf" St. 40).  
 — — 62°57' N., 19°58' W. 957 m. 4 spec. ("Thor" St. 166, 14-7-1903).

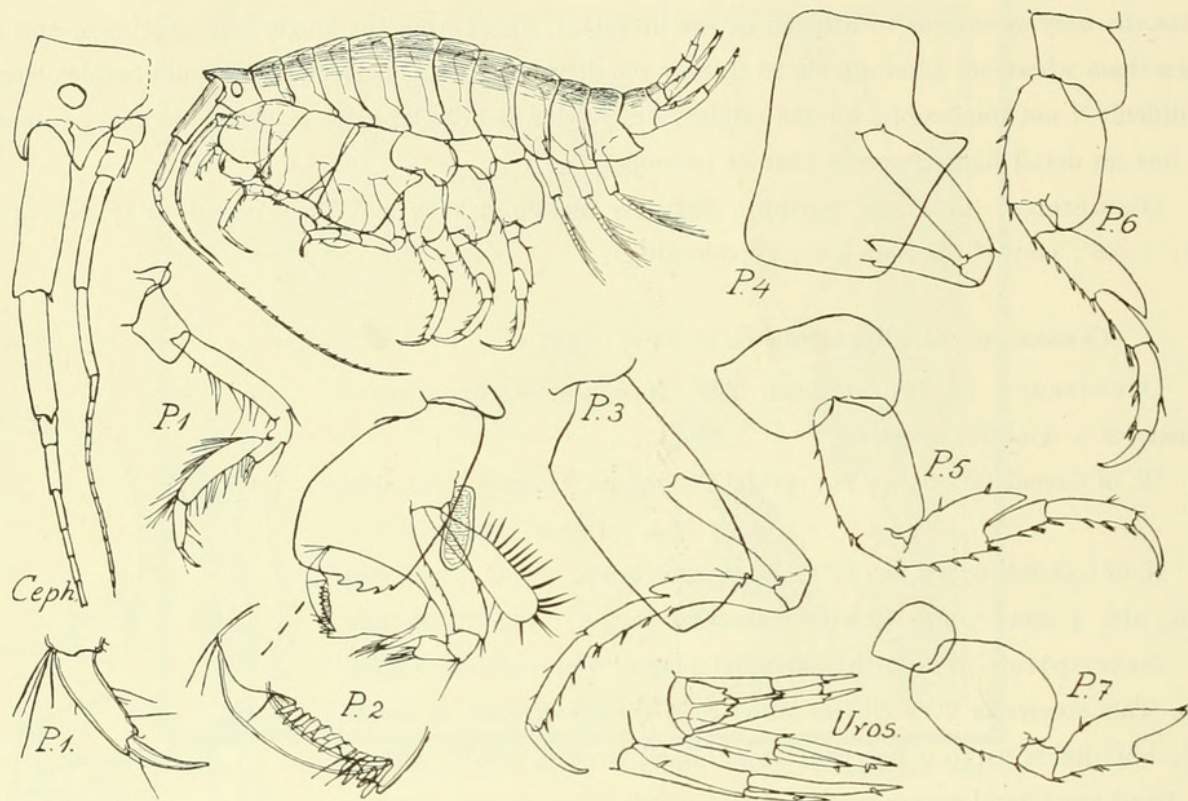


Fig. 61. *Cressa carinata*.

- S.W. of the Faroes: 61°07' N., 9°30' W. 850 m. Abt. 10 spec. ("Thor" St. 78, 12-5-1904).  
 — 61°15' N., 9°35' W. 900 m. (type-locality). Numerous spec. ("Thor" St. 99,  
 22-5-1904).  
 S. of Jan Mayen: 70°32' N., 8°10' W. 885 m. Clay with small stones. 1 ♀ ovig. (H. Deichmann leg.  
 27-8-1891).

The depths are 600—1505 m. All the localities are in the Atlantic deep, except Jan Mayen; but I have not been able to find any difference between the Jan Mayen-specimen and the Atlantic material.

Description of ♀ with marsupialplates, abt. 5 mm., from "Thor" St. 99, 22-5-1904. Body compressed and distinctly carinate, but the urosome has the back evenly vaulted; no dorsal teeth. Head has rostrum rather long and lateral corners produced and acute, but there are no accessory teeth on under edge. Eyes not very small, somewhat oblong, sometimes rather distinct, but always colourless (in spirits). Antenna 1 not much shorter than body; 1st joint very heavy, somewhat longer than 2nd joint, distally not produced;



2nd joint more slender, near underside distally produced; 3rd joint very short; flagellum more than twice as long as peduncle, with abt. 20 joints. Antenna 2 not half as long as antenna 1; 4th joint abt.  $1\frac{1}{4}$  time as long as 5th joint; flagellum as long as peduncle, abt. 13 — articulate. Oral parts were not examined.

Pereiopod 1 closely resembling that of *C. dubia* (Sars 1895, pl. 98 fig. 2), except that 5th joint is more than twice as long as 6th joint. Pereiopod 2 in shape very similar to that of *C. dubia*, but much heavier; 1st joint has 2—4 serrations in front of lower hind corner, and palm is almost even, but provided with abt. 10 strong spines. Pereiopod 3 has abt. 2 teeth in front of lower hind corner of 1st joint; 4th joint very little produced distally; 6th joint has on hind edge 5 spines or couples of spines; dactylus not extremely feeble,  $\frac{2}{3}$  as long as 6th joint. Pereiopod 4 has lower fore corner of 1st joint very nearly rectangular; angle of hinder emargination not especially acute; 2nd—7th joints as in pereiopod 3. Pereiopods 5—7 rather heavy; 2nd joint rather broad; 4th joint broad, with hind edge curved, and produced into abt.  $\frac{2}{3}$  of the length of 5th joint; 6th joint has on fore edge 3 spines or couples of spines; dactylus rather strong, not much shorter than 6th joint.

Metasome segment 2 has lower hind corner rectangular, segment 3 acute and moderately produced. Uropods 1—2 have rami narrow, acute; inner ramus as long as or longer than peduncle, constricted towards the end; outer rami abt. half as long as inner rami; there are very few spines. Uropod 3 has peduncle as long as ramus, with one apical spine, but no marginal spines, and not produced at apex; ramus has 1st joint abt.  $1\frac{1}{2}$  time as long as 2nd joint; 1st joint a little apically produced, and with 1 apical spine, but without other spines. Telson shaped as in *C. dubia*.

The species is easily distinguishable from the other species in having the back districtly carinate, but not dorsally dentate.

There does not seem to be any difference between the two sexes.

\*208. **Cressa quinquedentata** n. sp. (Fig. 62) (Chart 34, partim).

The "Ingolf" has secured three specimens of this species at a single station:

S.W. of Iceland:  $60^{\circ}37' N.$ ,  $27^{\circ}52' W.$  1505 m., temp.  $4.5^{\circ}$ . 3 spec.: 2, 2.5, and 5 mm. ("Ingolf" St. 78).

Description of ♂(?), 5 mm. The specimen is probably a ♂, for it seems to be adult, and there are no marsupial plates.

Body compressed, but not carinate. Mesosome segments 5—7 and metasome segments 1—2 produced backward in a distinct rather long tooth (in metasome segment 2 shorter than in the other segments), much longer and stronger than in *C. dubia*. Head has rostrum rather long; lateral corners bifid, with two teeth of almost equal size, but the superior broader than the inferior. Eyes of medium size, round, colourless (in spirits). Antenna 1 at all events as long as body, probably longer (apex is lost); 1st joint very heavy, longer than 2nd joint, distally produced; 2nd joint more slender, distally not produced; 3rd joint very short. Antenna 2 abt.  $1\frac{1}{2}$  time as long as peduncle of antenna 1; 4th joint somewhat longer than 5th joint; flagellum has abt. 13 joints. Oral parts were not examined.

Pereiopods 1—7 closely resembling those of *C. carinata*, except for a few disagreements. 1st joint of pereiopod 2 has on lower hind corner only 2 teeth, and palm has only 7 strong spines. 1st joint of pereiopod



4 has quite a different shape; inferior corners are much more evenly rounded; angle of hinder emargination almost rectangular. Pereiopods 5—7 have 4th joint narrower and only produced to abt.  $\frac{1}{3}$  of 5th joint.

Metasome segment 3 has lower hind corner produced and acute. Uropods 1—2 have inner rami acute, as long as peduncle; outer rami half as long as inner rami; rami are constricted towards the end and

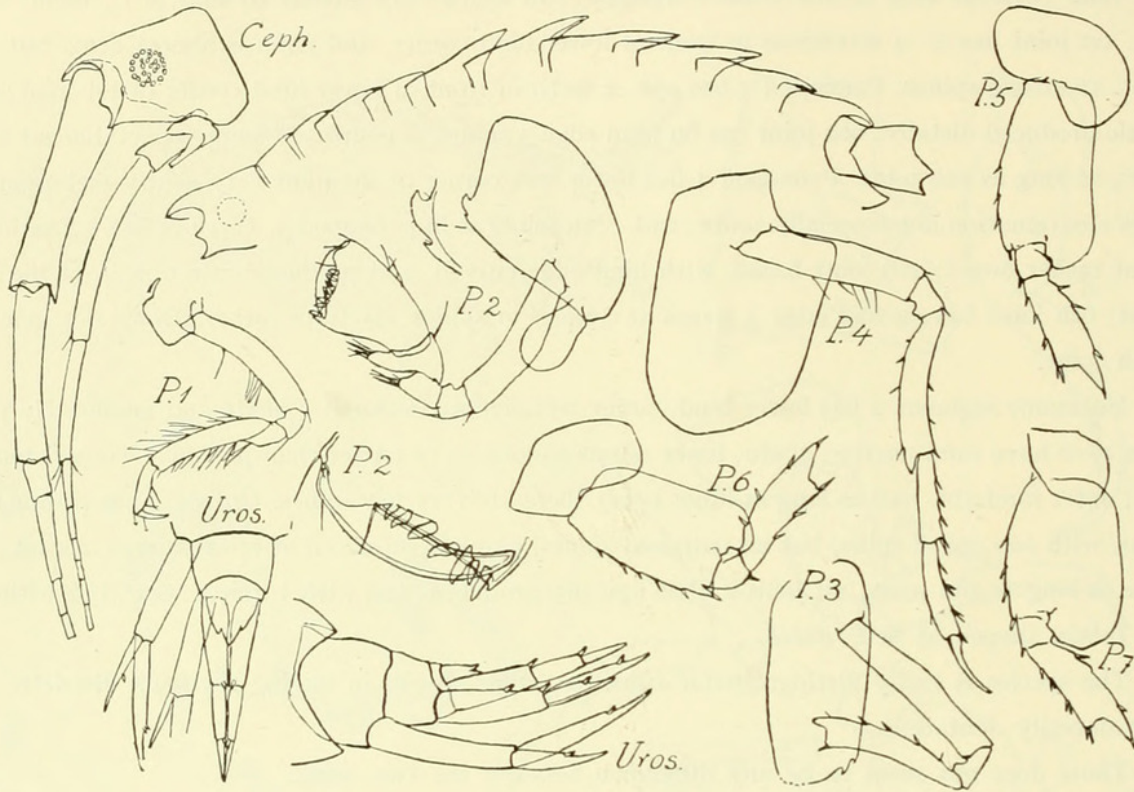


Fig. 62. *Cressa 5-dentata*. (The figure of the urosome in lateral view was drawn from the small specimen of 2.5 mm.)

have a single spine. Peduncle of uropod 1 has probably no spine, peduncle of uropod 2 has 2 spines. Uropod 3 has peduncle as long as ramus, of which 1st joint is a little longer than 2nd joint; peduncle and 1st joint of ramus have 1 apical spine. Telson has the usual shape.

The species is easily recognisable in having 5 large dorsal teeth (not 4 small as in *C. dubia*) and in having the lateral corners of the head bifid with the two points equal sized and situated one just above the other.

### Genus *Cressina* n. gen.

This new genus is rather closely allied to genus *Cressa* (— there does not seem to be any difference of importance as to the oral parts —); it differs in having 1st joint (side plate) of pereiopod 4 of almost the same shape as that of pereiopod 2, without any emargination on hind margin.

\*209. *Cressina monocuspis* n. sp. (Fig. 63) (Chart 34, partim.).

Occurrence. Taken at two stations by the "Ingolf" and at two by the "Thor". The localities are: W. of Greenland: 63°30' N., 54°25' W. 1096 m., temp. 3.3°. 3 specimens. ("Ingolf" St. 25).



W. of Greenland: 65°16' N., 55°05' W. 682 m., temp. 3.6°. 1 spec. (♂?). ("Ingolf" St. 35).

S. of Iceland: 62°07' N., 19°58' W. 957 m., 4 spec. (♂, ♀). ("Thor" St. 166, 14-7-1903).

S.W. of the Faroes: 61°15' N., 9°35' W. 900 m. Numerous spec. ("Thor" St. 99, 22-5-1904).

Description of ♂?, 5.5 mm., from "Ingolf" St. 25. Head has a rather long, somewhat acute rostrum; lateral corners acutely produced. Body somewhat compressed, but without dorsal carina or teeth, except for a single, blunt, erect tooth on 3rd metasome segment. Metasome segment 1 has lower hind corner rounded,

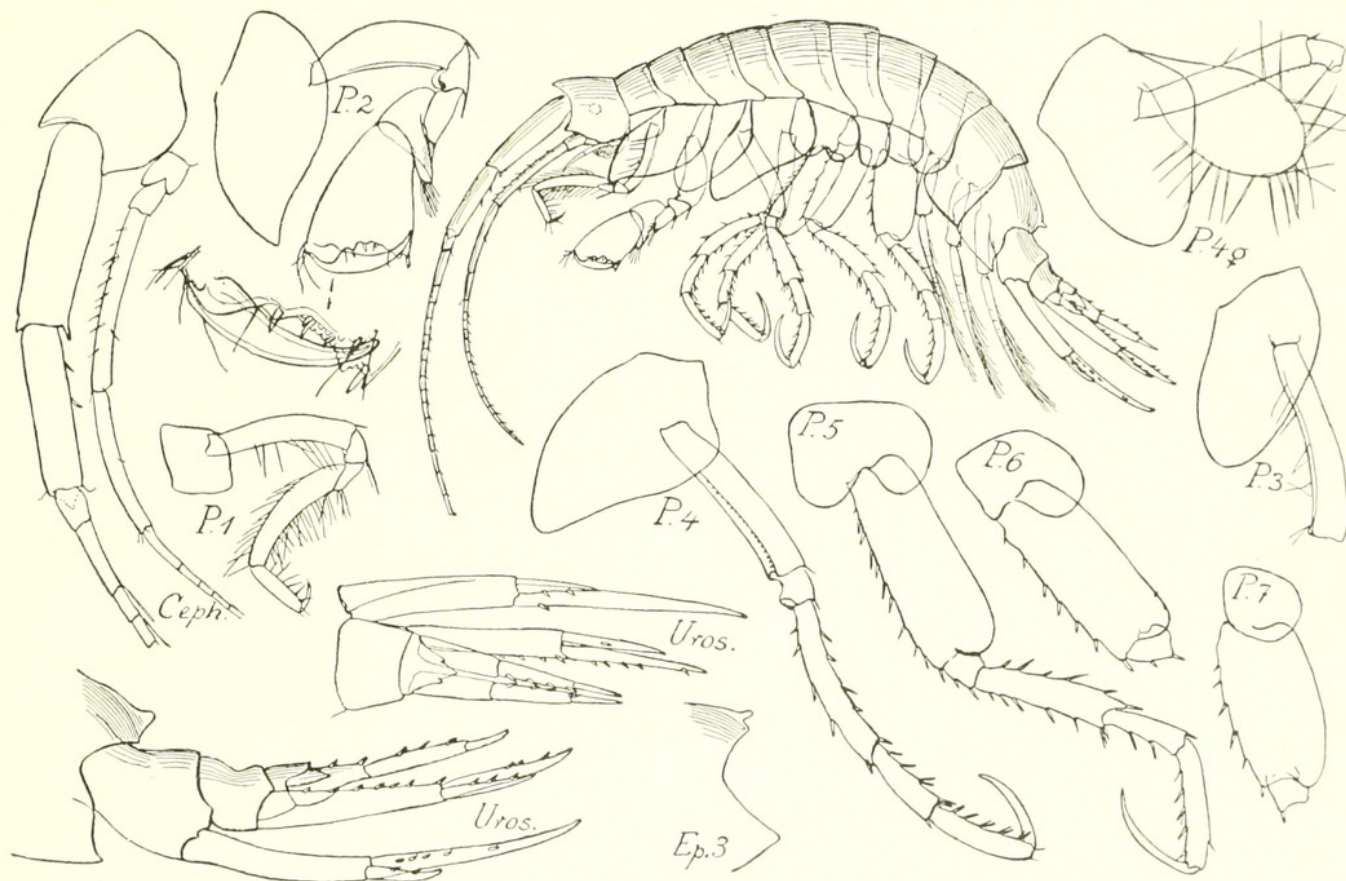


Fig. 63. *Cressina monocuspis* ♂ (P. 4 ♀ is from "Thor St. 99, urosome in lateral view from a ♂ from "Thor" St. 166, and urosome in dorsal view from a ♂ from "Ingolf" St. 25.)

segment 2 nearly rectangular, segment 3 acute-angled. Sometimes there seems to be traces of small, round, colourless eyes. Antenna 1 has 1st joint heavy, abt. 1½ times as long as head, apically acutely produced on underside; 2nd joint not so heavy and somewhat shorter, apically with a triangular elongation on median side; 3rd joint very short; flagellum consists of much over 25 joints (apex is lost in all the specimens), and the whole antenna is probably 1½—2 times as long as the whole body. Antenna 2 has peduncle much more slender than in antenna 1; 5th joint somewhat shorter than 4th joint; peduncle reaches to apex of antenna 1 and is as long as flagellum; flagellum has abt. 16 joints.

Pereiopod 1 has sideplate very little, quadrangular; all joints slender; 4th joint apically not produced; 5th joint somewhat curvate, abt. 2 times as long as 6th joint; 6th joint has the sides almost parallel; dactylus feeble, somewhat curvate, half as long as the preceding joint. Pereiopod 2 has sideplate rather large,



somewhat curvate, with anterior lower corner acute; shape not essentially different from that of sideplate of pereopod 4; 2nd joint rather heavy; rest of the limb very nearly as in the species of genus *Cressa*: 5th joint cup-shaped; 6th joint triangular, with palm concave, not even but provided with a few strong spines and (especially toward the hind angle) with small blunt warts.

Pereopod 3—7 rather slender, with the curvate dactylus not essentially shorter than the preceding joint. Sideplate of pereopod 3 somewhat ovate; sideplate of pereopod 4 of nearly the same shape as in pereopod 2, but forecorner not so acute; hind margin has no emargination for 5th sideplate. 2nd joint of pereopod 5—7 somewhat expanded, with lower hind corner rounded; 5th joint much shorter than 4th joint. 4th joint in pereopod 3—7 apically only very little produced.

Uropod 1 has the quite even peduncle (without spines) as long as inner ramus (with a few spines); outer ramus (with 2 spines) only abt.  $\frac{1}{3}$  as long. Uropod 2 has peduncle up to  $1\frac{1}{2}$  times as long as inner ramus and 2 times as long as outer ramus. Uropod 3 has peduncle (with 2 spines) as long as 1st joint of ramus (with 3—4 spines); 2nd joint (without spines) only half as long. Telson of exactly the same shape as in *Cressa*, ending in a point, with a small, sharp tooth on each side; the lateral teeth are very easily to be overlooked (as also is the case in *Cressa*), especially in dorsal view.

Remarks. The species is most easily recognisable from all the other species within the family in having the dorsum quite even, except for the characteristic tooth on 3rd metasome segment. It was not possible to find any essential sexual difference; both the two sexes seem to obtain a size of abt. 5.5 mm.

## Fam. Colomastigidæ (Chevreux) Stebbing.

*Colomastigidæ* Stebbing 1906, p. 206.

*Colomastixidæ* Chevreux & Fage 1925, p. 144.

Of this very characteristic family only one species is found in European waters.

### Genus *Colomastix* Grube.

*Colomastix* Stebbing 1906, p. 206.

— Chevreux & Fage 1925, p. 144.

#### 210. *Colomastix pusilla* Grube.

*Colomastix pusilla* (p.p.) Della Valle 1893, p. 854, pl. 6 fig. 2, pl. 61 figs. 23—37.

— — Stebbing 1906, p. 207.

— — Chevreux & Fage 1925, p. 144, figs.

Occurrence. A single very little specimen (♀ jun., abt. 2 mm.) is found at the Faroes, viz. N. of Nolsö, abt. 120 m. (K. Stephensen, in Zool. of the Faroes, pt. XXIII, 1929, p. 7).

Distribution. A widely distributed species, found from the Faroes to the Mediterranean, often in sponges, etc. The special localities are as follows: Great Britain: Birturbay Bay, Shetlands, in a sponge (*Exunguia styliques*; Norman, Ann. Mag. Nat. Hist., ser. 4, vol. 3, 1869, p. 359; Banff (*Cratiþþus tenuipes*, Bate, Catal. Amphip. Brit. Mus. 1862, p. 485); Menai Bridge (Anglesey), among sponges, and Port Erin



(Man) (Walker, Trans. Liverpool Biol. Soc., vol. 9, 1895, p. 318); Torquay (E. of Plymouth), Plymouth, Falmouth (Norman & Scott, Crust. Devon and Cornwall 1906, p. 97). — Jersey, Sark (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 20, 1907, p. 366). — France, 13 localities, all round the coasts, both Atlantic and Mediterranean, in sponges, 0—100 m. (Chevreux & Fage 1925). — Vigo (N. Spain; Chevreux, Bull. Soc. Zool. France, vol. 50, 1925, p. 300). — Algérie, 7 loc., 12—75 m.; Naples; Adriatic Sea (Chevreux, Mém. Soc. Zool. France, vol. 23, 1910, p. 202). — S. of Sicily 35°44' N., 15°07' E., 98 m. (K. Stephensen, Danish Oceanogr. Exped., vol. 2, D 1, 1915, p. 44). — Red Sea (Walker: *C. crassimanus*, teste Chevreux l. c. 1910). — Bermudas (Kunkel, Trans. Connecticut Acad., New Haven, vol. 16, 1910, p. 21). — Between the delta of Mississippi and Cedar Keys, abt. 50 m. (Pearse, Proc. U. S. Nat. Mus., vol. 43, 1913, p. 370, fig.). — S. Africa, 2 loc., 32—250 m., in sponges (Barnard, Ann. S. Afr. Mus., vol. 20, 1925, p. 346). — Ceylon (Walker, Ceylon Pearl Oyster Report, vol. 2, 1904, p. 299). — Perak, Federated Malay States (Chilton, Mem. Asiatic Soc. of Bengal, vol. 6, 1925, p. 533). — Some localities in the southern hemisphere, see Barnard l. c. 1925, p. 347.

### Fam. Laphystiidæ G. O. Sars.

*Laphystiidæ* G. O. Sars 1895, p. 382.

*Lafystiidæ* Stebbing 1906, p. 208.

*Laphystiidæ* Chevreux & Fage 1925, p. 145.

The family comprises only the species mentioned below.

### Genus *Laphystius* (*Lafystius*) Krøyer.

*Laphystius* G. O. Sars 1895, p. 383.

*Lafystius* Stebbing 1906, p. 208.

#### \*211. *Laphystius sturionis* Krøyer.

*Laphystius sturionis* G. O. Sars 1895, p. 384, pl. 134.

*Lafystius* — Stebbing 1906, p. 208.

*Laphystius* — Chevreux & Fage 1925, p. 146, fig.

Occurrence. This species is new to the area; it has been secured at two localities viz.

N.W. Iceland: Isafjörðr, shallow water, "Ingolf"-Exped. 6-6-1895. 1 spec.

S.W. — Reykjavik. Wiinstedt ded. 2 spec.

Distribution. Found on different sorts of fishes (especially on cod; parasitic? or semiparasitic?) from W. Norway (Trondhjemsfjord) along the European coasts (but not known from the Faroes) to the Mediterranean (Naples). Norway S. of the Trondhjemsfjord; Bohuslän (G. O. Sars l. c.). 57°41' N., 3°41' E., from the mouth of a cod (specimens in the Copenhagen Zool. Museum). — Danish waters, several localities from the Skagerak and Kattegat to S. of Sjælland; depth (when noted) 56 m. (K. Stephensen, Vid. Meddel. vol. 82, 1926, p. 72). — Great Britain: Firth of Forth (Th. Scott 1906, p. 159); Banff and Polperro (Bate & Westwood 1863, p. 185). — Jersey; off Belle-Ile, 100 m., on *Mamaia squinado*; Brest; Naples (Chevreux & Fage 1925, p. 146).



## Fam. Laphystiopsidæ Stebbing.

*Laphystiida* (partim) G. O. Sars 1895, p. 382.

*Laphystiopsidæ* Stebbing 1906, p. 209.

This family has only one genus.

### Genus *Laphystiopsis* G. O. Sars.

*Laphystiopsis* G. O. Sars 1895, p. 386.

— Stebbing 1906, p. 209.

The genus comprises only two species, and only one of these is found in the Atlantic.

#### \*212. *Laphystiopsis planifrons* G. O. Sars.

*Laphystiopsis planifrons* G. O. Sars 1895, p. 386, pl. 135.

— — Stebbing 1906, p. 209.

Occurrence. This species is new to the area, taken at one locality:

S.W. of the Faroes: 61°15' N., 9°35' W., 900 m. 1 spec. ("Thor" St. 99, 22-5-1904).

Distribution. The species was hitherto only known from Norway: Hvalöer in the southern part of the Oslofjord, Trondhjemsfjord, and Selsövik (Nordland), depths abt. 200—750 m. (G. O. Sars l. c.).

## Fam. Acanthonotozomatidæ Stebbing.

*Iphimediidæ* G. O. Sars 1895, p. 372.

*Acanthonotozomatidæ* Stebbing 1906, p. 210.

— Chevreux & Fage 1925, p. 147.

Three genera with in all 5 species have been found in the area; only one species (*Iphimedia obesa*) is new to the "Ingolf"-area.

### Genus *Iphimedia* Rathke.

*Iphimedia* (partim) G. O. Sars 1895, p. 376.

— Stebbing 1906, p. 214.

#### \*213. *Iphimedia obesa* Rathke (Chart 35, partim).

*Iphimedia obesa* G. O. Sars 1895, p. 377, pl. 132.

— — Stebbing 1906, p. 214.

— — Chevreux & Fage 1925, p. 150, fig.

Occurrence. The species has been taken a few times in the fjords at the southernmost island (Suderö) of the Faroes, down to abt. 15 m. (K. Stephensen 1928).

Distribution (Chart 35, partim). Along the whole south and west coasts of Norway very common; it extends to the Lofoten Isles and has been found once off the Finmarken (viz., Hammerfest); 12—abt. 60 m., bottom "especially coarse sand, and covered with stones overgrown with algæ" (G. O. Sars l. c.).



— In Danish waters very frequent to the Storebelt and the Sound (Hven), the depths most commonly 15—40 m. (K. Stephensen, Vid. Medd. vol. 82, 1926, p. 74). — 61°14' N., 1°19' E., 160 m. ("Thor" St. 120, 21-7-1905; specimens in the Copenhagen Zool. Museum). — North Sea, several localities: 56°02' N., 3°16' E., 73 m., fine sand; 57°54' N., 4°48' E., 100 m., fine sand with clay (Reibisch 1907, p. 189); 54°05' N., 1°28' E.,

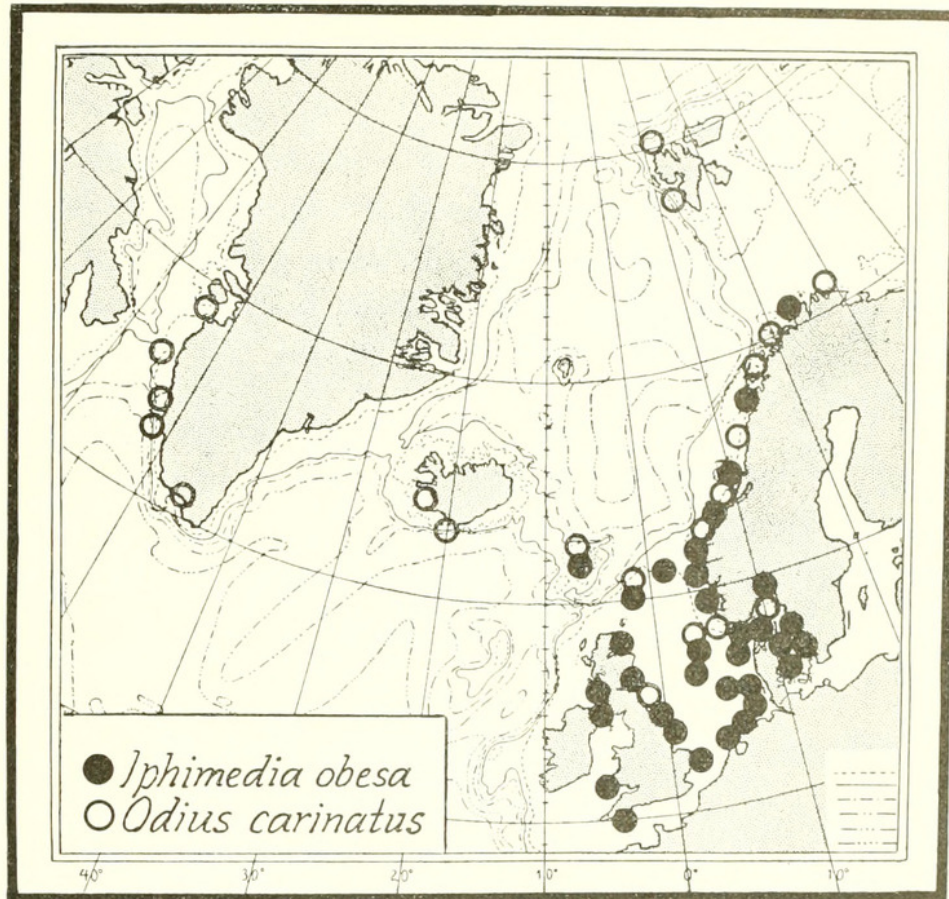


Chart 35. *Iphimedia obesa*, *Odius carinatus*.

48 m. (Tesch 1915); Heligoland (Metzger 1875, p. 282; Sokolowsky 1900). — Great Britain and Ireland: Firth of Forth (Th. Scott 1906, p. 158); Northumberland and Durham, several localities (Norman & Brady 1909, p. 312); Tenby (S.W. Wales), Moray Firth, Shetland Islands, Loch Fyne, Belfast Bay 40 m., Drake's Island (near Plymouth) (Bate & Westwood vol. 1, 1862, p. 219). — Holland (Hoek 1889, p. 194, figs.). — N.W. France: off Belle-Ile, 60—100 m., on *Mamaia squinado*; and N. of Tunis, 170 m. (Chevreux & Fage 1925).

### Genus *Odius* Lilljeborg.

*Odius* G. O. Sars 1895, p. 380.

— Stebbing 1906, p. 210.

The genus has in the "Ingolf"-area only one species.



214. *Odius carinatus* (Sp. Bate) (Chart 35, partim).

*Odius carinatus* G. O. Sars 1895, p. 381, pl. 133 fig. 2.

— — Stebbing 1906, p. 211.

Occurrence. Material is at hand from the following localities in the area:

W. Greenland: 63°57' N., 52°41' W., 65 m., temp. 0.6° ("Ingolf" St. 26).

— In the mouth of the Ameralikfjord near Godthaab, 10—14 m., shells ("Ingolf" 23-7-1895).

— Egedesminde, shells, 135 m. (Bergendal leg. 1890).

S.W. Iceland: Hvalfjord (near Reykjavik), 46 m. ("Thor" St. 167, 30-6-1904).

S. of — 66°33' N., 20°05' W., 83 m., temp. 5.6° ("Ingolf" St. 127).

It is known from W. Greenland abt. 60°—68<sup>3</sup>/<sub>4</sub>° N., 6 localities, 12<sup>1</sup>/<sub>2</sub>—110 m. (K. Stephensen, *Conspetus* 1913, p. 170, and 1916, p. 289), and from a few localities at the Faroes, 6—25 m. (K. Stephensen 1928).

Distribution (Chart 35, partim). Arctic America (Stebbing 1906; I have not been able to state the source). — Spitsbergen: abt. 80° N., ca. 40 m., stones and algæ, and Bell Sound (Goës 1866, p. 522). — Norway from the Finmark coast to the Oslofjord, "moderate depths", on rocky bottom, among algæ and Hydroida (G. O. Sars l. c.). — North Sea: 58°12' N., 4° E., 115 m.; 57°17' N., 7°47' E., 62 m., sand, and 57°24' N., 3°41' E., 64 m., fine sand (K. Stephensen, *Vid. Medd.*, vol. 82, 1926, p. 73; Reibisch 1906, p. 189). — Shetlands (Bate & Westwood 1863, p. 224). — 10 miles off Berwick Bay, Northumberland, abt. 85 m., gravelly ground (Norman & Brady 1909, p. 312). — St. Paul (Pribilof Islands, Bering Sea) (Holmes, *Harri-man's Alaska Exped.*, vol. 10, 1904, p. 238).

Genus *Acanthonotozoma* Boeck.

*Acanthonotosoma* G. O. Sars 1895, p. 372.

*Acanthonotozoma* Stebbing 1906, p. 218.

Of this genus three species are known from the area.

215. *Acanthonotozoma serratum* (O. Fabricius) (Chart 36, partim).

*Acanthonotosoma serratum* G. O. Sars 1895, p. 374, pl. 131 fig. 1.

*Acanthonotozoma* — Stebbing 1906, p. 218.

Occurrence. This species has been taken at several localities in the area by the "Ingolf" and by other expeditions and collectors.

W. Greenland: The mouth of Ameralikfjord near Godthaab, 10—19 m., shells ("Ingolf" 23-7-1895).

— 66°35' N., 56°38' W., 600 m., temp. 3.9° ("Ingolf" St. 32).

— 67°57' N., 55°30' W., 66 m., temp. 0.8° ("Ingolf" St. 33).

— Egedesminde (Traustedt leg. 1892 and Lundager leg. 12-8-1905).

— Godhavn, stones, 200 m. (Reisinger leg. 17-7-1926).

— Ritenbenk (Traustedt leg. 1892).



- E. Greenland: Angmagssalik,  $65^{\circ}51' N.$ , sublitoral (Kruuse leg. 19-6-1902).  
 — Tasiusak (near Angmagssalik), stony bottom with algæ, 10—36 and 39—57 m.  
 (Amdrup-Exped., May 1899).  
 — Solo's Fjord ( $67^{\circ}14' N.$ ), rocky bottom with algæ, 19—28 m. (Amdrup-Exped.,  
 24-7-1899).

Jan Mayen, 95—113 m. (E. Greenland-Exped. 1900, Søren Jensen leg.).

W. Iceland: Stykkisholmur, 12—17 m. (H. Jónsson leg. 6-5-1897).

- Dyrafjörðr, abt. 35 m., clay with stones and vegetation (W. Lundbeck leg. 29-6-1893).

E. Iceland: Faskruðfjörðr, 19—95 m., clay (R. Hörring leg. 7-7-1899).

S.E. of Iceland:  $64^{\circ}17' N.$ ,  $14^{\circ}44' W.$ , 90 m. (Ad. Jensen leg. 23-8-1902).

- $64^{\circ}58' N.$ ,  $13^{\circ}25' W.$ , 76 m. ("Thor" St. 27, 16-5-1903).

The species has been recorded from abt. 25 localities at W. Greenland abt.  $60^{\circ}$ — $72\frac{1}{3}^{\circ} N.$ , especially 10—50 (100) m., stones or algæ, and from one locality at E. Greenland (K. Stephensen: "Tjalfe" 1912, p. 93, Conspectus 1913 p. 167, N. Strömfjord 1913, p. 67, and 1916, p. 289). It is recorded from Jan Mayen 128 m. (G. O. Sars 1886, p. 53) and from Iceland (Goës 1866, p. 522).

Distribution. An arctic and boreo-arctic, possibly circumpolar species; for special localities see Stappers 1911, p. 50. In the Atlantic its southern limit is determined by the following points: Bay of Fundy (U. S. A., abt.  $45^{\circ} N.$ ), S. Greenland, S. Iceland (not the Faroes and Great Britain), Skagerak and Bohuslän. The distribution from West to East extends from the Baffin Bay to Spitsbergen and the Kara Sea. The depths are rarely more than abt. 100 m.

#### 216. *Acanthonotozoma cristatum* (J. C. Ross) (Chart 36, partim).

*Acanthonotosoma cristatum* G. O. Sars 1895, p. 375, pl. 131 fig. 2.

*Acanthonotozoma* — Stebbing 1906, p. 219.

Occurrence. The "Ingolf" has secured this species at two localities.

W. of Greenland:  $66^{\circ}35' N.$ ,  $56^{\circ}38' W.$ , 600 m., temp.  $3.9^{\circ}$  ("Ingolf" St. 32).

S. of Jan Mayen:  $70^{\circ}05' N.$ ,  $8^{\circ}26' W.$ , 700 m., temp.  $\div 0.4^{\circ}$  ("Ingolf" St. 116).

E. Iceland: 20 miles E. of Seydisfjörðr, 250 m., black clay (Wandel leg. 1890).

The species is not new to the area, for it was recorded by Koelbel 1886, p. 7, from Jan Mayen. 100—140 m.

Distribution (Chart 36, partim). From the arctic America to Spitsbergen and Franz Josef-Land, N.W. Norway (Komagfjord in Finmarken 8—100 m., Svolvær in Lofoten), (8) abt. 100—abt. 400 m. (for special localities see Oldevig 1917, p. 19). Also found W. of S. Norway  $58^{\circ}32' N.$ ,  $4^{\circ}18' E.$ , 280 m. ("Thor" St. 3, 30-4-1903; specimen in the Copenhagen Zool. Museum).

#### 217. *Acanthonotozoma inflatum* (Krøyer) (Chart 36, partim).

*Acanthonotozoma inflatum* Stebbing, Bijdr. Dierk. vol. 17, 1894, p. 32, pl. 6.

- — Stebbing 1906, p. 219.



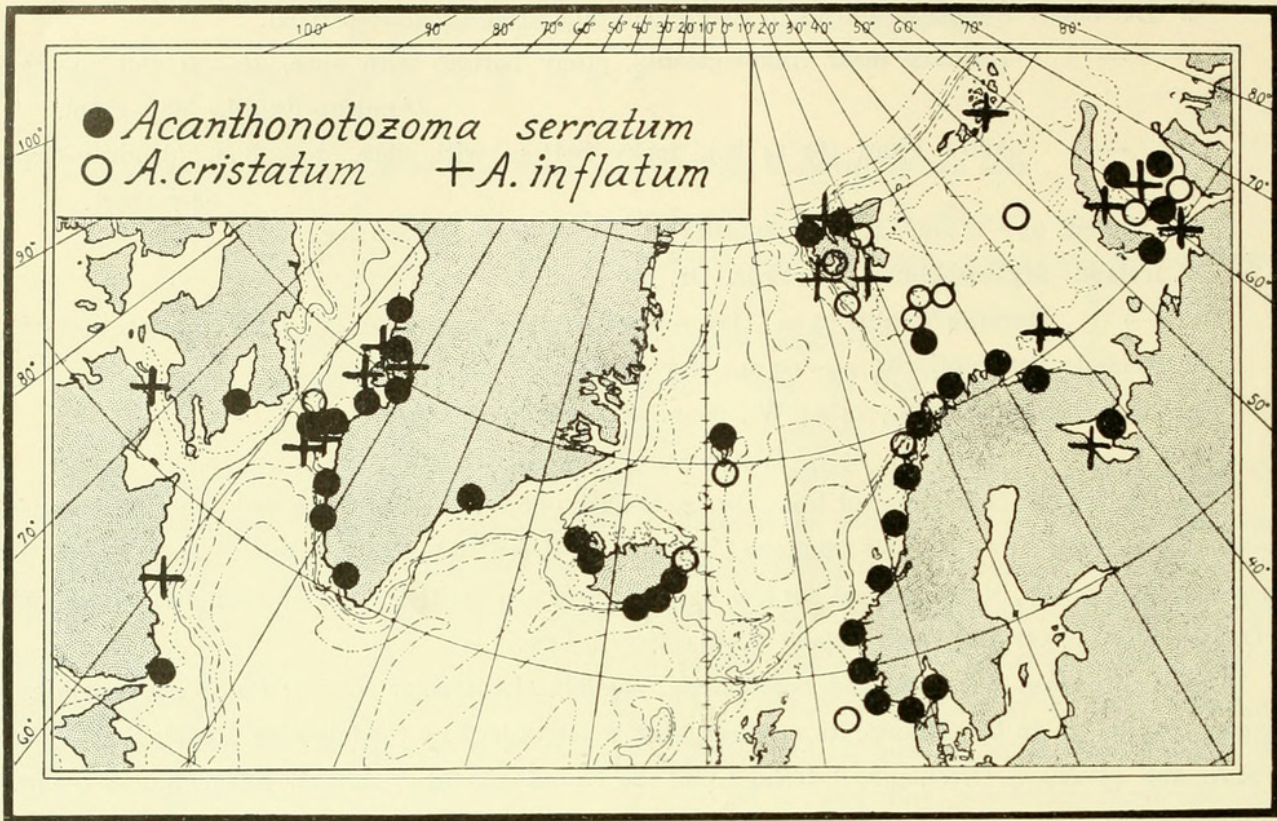


Chart 36. *Acanthonotozoma serratum*, *A. cristatum*, *A. inflatum*.

Occurrence. The "Ingolf" has secured this species at a single locality.

W. Greenland: 67°57' N., 55°30' W., 66 m., temp. 0.8° ("Ingolf" St. 33).

In my *Conspectus* 1913, p. 168, 4 localities are recorded from W. Greenland abt. 67°—70½° N., abt. 110—240 m.

Distribution (Chart 36, partim). From the westside of the Baffin Bay and Labrador to Spitsbergen (not Iceland) and the Siberian Polar Sea, 5—<200 m. (for special localities, see Oldevig 1917, p. 19). Probably also found at Korea, 115—190 m. (Suenson leg. 1882; specimen in the Copenhagen Zool. Museum). Collinson Point, Alaska, 2 m. (Shoemaker 1920, p. 10). Gulf of St. Lawrence: between Cape Breton and Magdalen islands, 40 m., and the Strait of Belle Isle (N. of New Foundland), 15 m. (Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930, p. 271).

### Fam. *Pardaliscidæ* (Boeck) G. O. Sars.

*Pardaliscidæ* G. O. Sars 1895, p. 401.

— Stebbing 1906, p. 220.

— Chevreux & Fage 1925, p. 151.

6 genera with 8 species are found in the "Ingolf"-area; 3 of these genera (3 spp.) are new to the area, one species (*Synopioides tertia*) also new to science.



Remarks. The accessory flagellum of antenna 1 of ♂ is "peculiarly modified" (G. O. Sars, l. c. p. 401), 1st joint of which is figured and described as "somewhat laminar" (*Pardalisca cuspidata*, Sars l. c. 403; *Nicippe tumida*, ibid. p. 410), or as "pronouncedly laminar" (*Halice abyssii*; Sars l. c. p. 413).

But this is not correct. It is true that in lateral view the accessory flagellum seems to be simply lamellar; but in reality the first joint is roof-shaped, as a rule as long as the long first joint of the flagellum and may cover and protect the sensory setæ of this joint (see fig. 66 [*Pardaliscoides tenellus*?]). From investigation of ♂ of all the species belonging to the Copenhagen Zool. Museum (the 8 species to be mentioned below) it may be stated that the accessory flagellum has the shape described above in all these species (belonging to no less than 6 genera), and it has probably the same shape all over the family (— the family has totally 9 genera, viz., (in addition to the 6 mentioned in the present paper) *Pardaliscopsis* (with the single species *P. tenuipalpa* Chevreux 1911; only 1 ♀ known, not ♂), *Halicella* (with the single species *H. parasitica* Schellenberg 1926; only 3 ♀ known, not ♂), and *Halicoides* (with one species, *H. anomalus* Walker 1896; ♂ of this species has possibly no or at all events only a very short accessory flagellum)—).

### Genus *Pardalisca* Krøyer.

*Pardalisca* G. O. Sars 1895, p. 402.

— Stebbing 1906, p. 221.

3 (or 4?) species of this genus are known from the area.

#### 218. *Pardalisca tenuipes* G. O. Sars (Chart 37, partim).

*Pardalisca tenuipes* G. O. Sars 1895, p. 404, pl. 142 fig. 2.

— — Stebbing 1906, p. 223.

Occurrence. This species has only two times been taken in the "Ingolf"-area, viz. the Stormbugt in E. Greenland (abt.  $76\frac{3}{4}^{\circ}$  N.), abt. 40 m., Delesseria region, 20(21)-8-1907, 1 ♀ ovig. (K. Stephensen, Danmark-Exped. 1912, p. 536), and S.W. of the Faroes  $61^{\circ}15'$  N.,  $9^{\circ}35'$  W., 900 m. ("Thor" St. 99, 22-5-1904).

Distribution. "Rather sparingly in a few places off the west coast of Norway, as also in the Trondhjemsfjord", abt. 100—200 m. (G. O. Sars l. c.). The Copenhagen Zool. Museum possesses specimens from a few localities at S. Norway: Stavangerfjord (Sars ded.), Skagerak  $58^{\circ}54'$  N.,  $10^{\circ}37'$  E., 246 m. ("Thor", 3-7-1907), and Oslofjord near Tønsberg abt. 150 m. (Danish Biol. Station, 9-7-1914). — Off Cheticamp island, Gulf of St. Lawrence, 30—93 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 272).

#### 219. *Pardalisca cuspidata* Krøyer (Chart 37, partim).

*Pardalisca cuspidata* G. O. Sars 1895, p. 403, pl. 141, pl. 142 fig. 1.

— — Stebbing 1906, p. 223.

Occurrence. The "Ingolf"-Expedition has not secured this species, but material from Iceland is at hand:



N. Iceland: Skagestrand, abt. 100—120 m. (Steincke ded. 1875).

E. Iceland: Seiðisfjörður, 90 m. ("Thor" St. 30, 21-5-1903).

— Breidalsvik, 26 m., sandy bottom ("Diana" 16-8-1900).

The species has been recorded from several localities in the "Ingolf"-area: W. Greenland abt.  $63^{\circ}$ — $64\frac{1}{4}^{\circ}$  ( $70\frac{1}{2}^{\circ}$ ?) N., 2(4?) localities, depth abt. 50 m., and E. Greenland abt.  $76\frac{3}{4}^{\circ}$  N., abt. 40 m. (see my Conspectus 1913, p. 190, and the „Tjalfe"-Exped. 1912, p. 94). Jan Mayen 20 m. (Koelbel 1886, p. 5). The Copenhagen Zool. Museum possesses several specimens from Greenland without special locality.

Distribution (Chart 37, partim). From Greenland to Spitsbergen (19—406 m.) and Franz Joseph Land and along Norway to Bohuslän; for special localities, see Oldevig 1917, p. 20, and Stappers 1911, p. 52. Recently it has been recorded from 3 loc. in the Gulf of St. Lawrence, viz. N. of Cheticamp Island (twice), 40—50 m., and Cape Gaspé (S.E. of Anticosti), 60 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 271).

220. *Pardalisca abyssi* Boeck (Chart 37, partim).

*Pardalisca abyssi* G. O. Sars 1895, p. 406, pl. 143 fig. 1.

— Stebbing 1906, p. 222.

Occurrence. The "Ingolf" has secured the species at two stations, viz.

W. Greenland:  $63^{\circ}30'$  N.,  $54^{\circ}25'$  W., 1096 m., or  $63^{\circ}51'$  N.,  $53^{\circ}03'$  W., 260 m. ("Ingolf" St. 25).

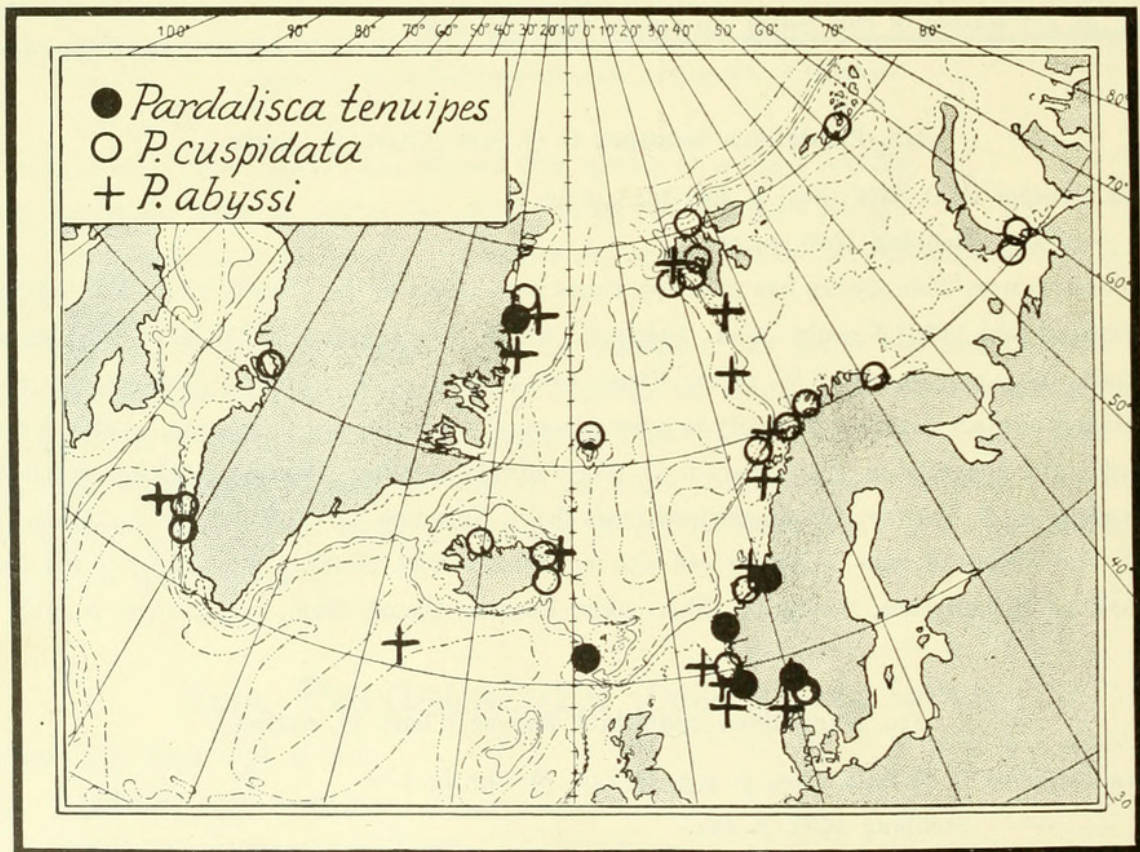


Chart 37. *Pardalisca tenuipes*, *P. cuspidata*, *P. abyssi*. (*P. tenuipes* has 1, *P. cuspidata* has 4 recent loc. in the Gulf of St. Lawrence outside the Chart).



S.W. of Iceland: 60°37' N., 27°52' W., 1505 m., temp. 4.5° ("Ingolf" St. 78).

The "Thor" and the "Dana" have, each of them, taken the species at a single station.

E. of Iceland: 66°00' N., 11°41' W., 280 m. ("Thor" St. 52, 21-4-1903).

— 64°36' N., 11°40' W., 445 m., from stomach of cod ("Dana" St. 2226, 31-7-1924).

The Danmark-Expedition has secured a specimen in the Stormbugt (E. Greenland, abt. 76<sup>3</sup>/<sub>4</sub>° N.).

In existent literature the species has been recorded from E. Greenland (N. Shannon, abt. 75<sup>1</sup>/<sub>2</sub>° N.; Buchholz 1874) and possibly from W. Greenland (see my *Conspectus* 1913, p. 189).

Distribution (Chart 37, partim). From Greenland and S. of Halifax abt. 160 m., +1.66°, to Spitsbergen and S. of Bear Island; along Norway to Bohuslän (for special localities, see Oldevig 1917, p. 20). The Copenhagen Zool. Museum possesses specimens from 60°57' N., 3°42' E., 360 m., 6.12° (Ad. Jensen leg.) and from 58°32' N., 4°18' E., 280 m. ("Thor" St. 3, 30-4-1903).

Remarks. The largest specimens (32 mm.) were taken 66°00' N., 11°41' W. (♀ ovig.) and 64°36' N., 11°40' W.

#### ***Pardalisca* (*abyssi* Boeck?).**

Occurrence:

W. Greenland: 63°30' N., 54°25' W., 1096 m., temp. 3.3°. 1 spec. abt. 7 mm. ("Ingolf" St. 25).

E. Greenland: Stormbugt (abt. 76<sup>3</sup>/<sub>4</sub>° N.), 19—38 m., Delesseria region ("Danmark"-Exped. 28-8-1907). 1 spec. 10 mm.

W. of Iceland: 65°27' N., 27°10' W. 700—765 m., temp. 5.83°. 1 spec. abt. 10 mm. ("Thor" St. 154, 20-6-1904).

Remarks. The specimens listed above have pereopods 1—2 provided with long dactyli as in *P. abyssi*, but the dactyli of pereopods 5—7 are long and a trifle heavier than in *P. tenuipes*, and the subdorsal lobes of the third metasome segment are short and rounded as in the same species.

Possibly the specimens should be types of a new species, but as they are probably not adult, I dare not establish a new species based upon these specimens alone.

### **Genus *Nicippe* Bruzelius.**

*Nicippe* G. O. Sars 1895, p. 409.

— Stebbing 1906, p. 225.

The genus has only one species.

#### 221. ***Nicippe tumida* Bruzelius (Chart 38, partim).**

*Nicippe tumida* G. O. Sars 1895, p. 410, pl. 144, pl. 145 fig. 1.

— — Stebbing 1906, p. 227.

Occurrence. The species has been taken in the area by the "Ingolf" and the "Thor" at the following localities.

W. Greenland: 66°35' N., 56°38' W., 600 m., temp. 3.9° ("Ingolf" St. 32).



S. of Iceland: 63°15' N., 22°23' W., 216—326 m. ("Thor" St. 173).

— 62°00' N., 21°36' W., 1393 m., temp. 3.3° ("Ingolf" St. 40).

— 63°18' N., 21°30' W., 178 m. ("Thor" St. 176, 8-7-1904).

The species is known from W. Greenland with out special locality (H. J. Hansen, V. Grönland 1887, p. 143).

Remarks. Some specimens (both ♂ and ♀, from "Ingolf" St. 32 and "Thor" St. 171 and 176) have only one, but large, dorsal tooth on first urosome segment.

Distribution (Chart 38, partim). N.E. of Shetland 61°14' N., 1°19' E., 160 m., and 61°31' N., 0°39' W., 196 m. ("Thor" St. 120—21, 21-7-1905). — Shetland (Sp. Bate). — "Along the whole south and west coasts of Norway", northwards to the Lofoten Isles, abt. 110—565 m. (G. O. Sars l. c.). — Off Cape Finisterre, 510—363 m. (Chevreux, "Hirondelle" 1900, p. 64). — 60 miles N.E. of Peterhead, 130 m. (Metzger 1875, p. 283).

### Genus *Halice* Boeck.

*Halice* G. O. Sars 1895, p. 411.

— Stebbing 1906, p. 229.

Only one of the three species of the genus is known from the area.

#### 222. *Halice abyssi* Boeck (Fig. 64) (Chart 38, partim).

*Halice abyssi* G. O. Sars 1895, p. 412, pl. 145 fig. 2.

— Stebbing 1906, p. 229.

Occurrence. The species has been taken at 3(5?) localities by the "Ingolf" and the "Thor".

W. Greenland: 66°35' N., 56°38' W., 600 m., temp. 3.9°. 1 little specimen ("Ingolf" St. 32).

?S. of Jan Mayen: 69°31' N., 7°06' W., 2465 m., temp. ÷ 1.0°. 1 ♂ abt. 15 mm. ("Ingolf" St. 113).

S. of Iceland: 63°46' N., 22°56' W. 150 m. 1 spec. ("Thor" St. 171, 2-7-1904).

?N.E. of Iceland: 66°23' N., 8°52' W. 1090 m., temp. ÷ 0.6°. 1 ♂ abt. 11 mm. ("Ingolf" St. 103).

N. of the Faroes: 63°26' N., 7°56' W. 887 m., temp. ÷ 0.6°, 1 spec. ("Ingolf" St. 138).

The species is known from the "Ingolf"-area from N.E. Greenland between 75°58' N., 14°08' W. and 75°59' N., 14°12' W., 300 m. (Duc d'Orléans 1907—09), and from 76°06' N., 13°26' W., 180—235 m.,

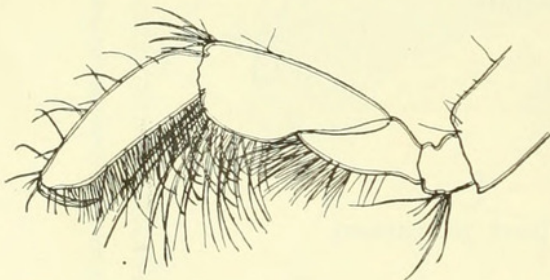


Fig. 64. Pereiopod 2 of *Halice abyssi*? (♂ abt. 15 mm., from "Ingolf" St. 113).

clay and gravel with shells, several specimens, the largest of them (♀ ovig.) abt. 16 mm. (K. Stephensen, "Danmark"-Exped. 1912, p. 537). (A specimen from Stormbugt, in the same paper referred to the species in question, is possibly *Pordalisca abyssi* jun.). N.W. of Iceland 66°42' N., 26°40' W., 550 m., temp. + 0.11°, and E. of Iceland 64°44' N., 10°0' W., 630 m., temp. ÷ 0.69° (Grieg, in Duc d'Orléans).

Remarks. The two specimens marked with a ? have the dactylus of p. 2 (fig. 64) much shorter than that of the typical form as drawn by G. O. Sars l. c.: the dactylus is  $< \frac{1}{3}$  as long (not half as long) as metacarpus. Possibly this short dactylus is characteristic of the aged male.



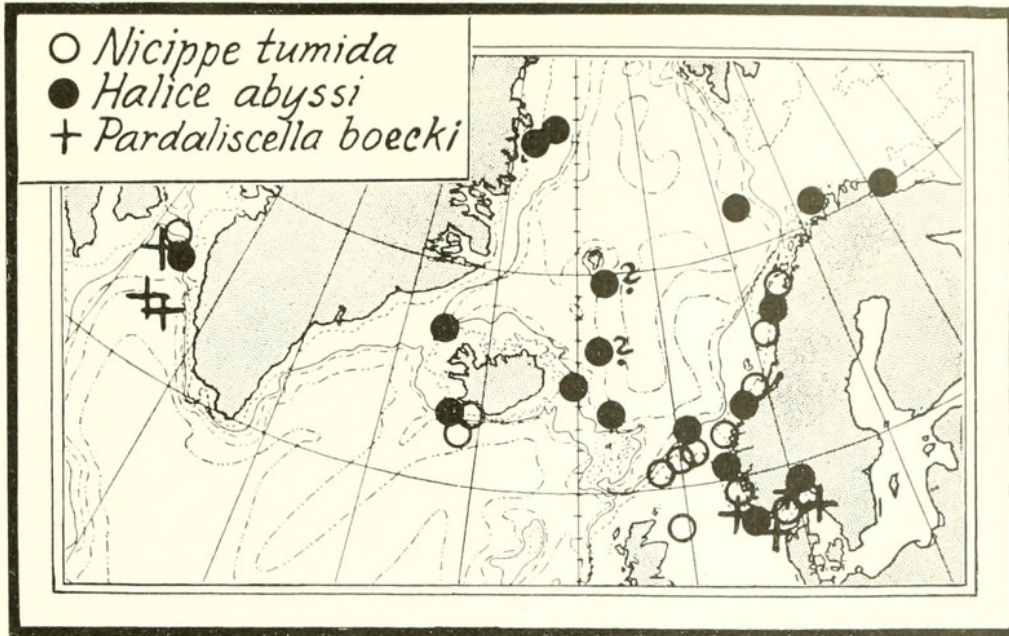


Chart 38. *Nicippe tumida*, *Halice abyssi*, *Pardaliscella boeckii*.

Distribution (Chart 38, partim). N.W. of N. Norway  $71^{\circ}59' N.$ ,  $11^{\circ}40' E.$ , 2030 m., temp.  $\div 1.30^{\circ}$ ; N.E. of Shetland  $62^{\circ}44' N.$ ,  $1^{\circ}48' E.$ , 753 m., temp.  $\div 1.0^{\circ}$  (Sars 1886, p. 59). Along the whole of Norway, from Vadsö to the Oslofjord and Bohuslän, abt. 200—800 m. (G. O. Sars 1895; K. Stephensen 1926, p. 77).

### Genus *Pardaliscoides* Stebbing.

*Pardaliscoides* Stebbing, Amphip. "Challenger" 1888, p. 1725.

— Stebbing 1906, p. 224.

The genus comprises only the species mentioned below.

\*223. ?*Pardaliscoides tenellus* Stebbing (Fig. 65, 66).

*Pardaliscoides tenellus* Stebbing l. c. 1888, p. 1725.

— — Stebbing, Trans. Linn. Soc., London, ser. 2, vol. 7, 1897, p. 38, pl. 12.

— — Stebbing 1906, p. 225.

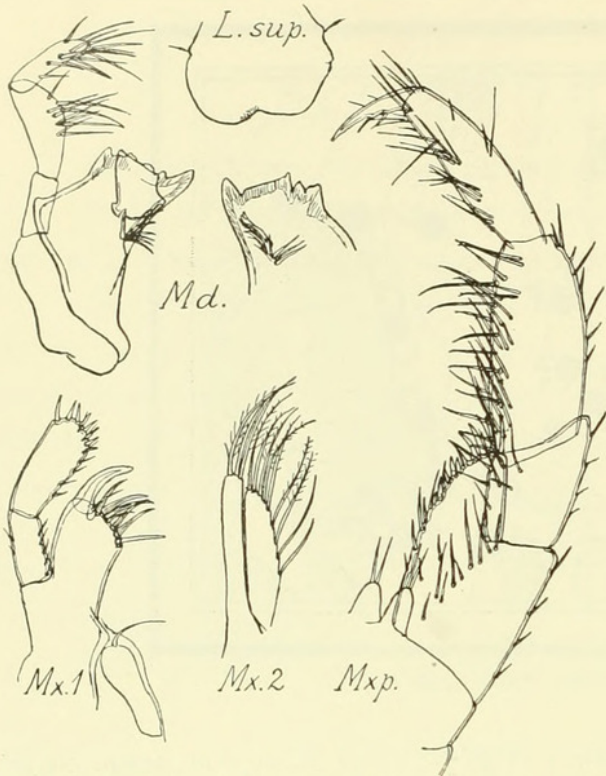
Occurrence. A few specimens, probably belonging to this species, were taken by the "Ingolf" at a single station:

S.W. of Iceland:  $60^{\circ}37' N.$ ,  $27^{\circ}52' W.$ , 1505 m., temp.  $4.5^{\circ}$ .  $2\frac{1}{2}$  spec. (1 ♂ abt. 10 mm., 1 ♀ with marsupial plates abt. 11 mm) ("Ingolf" St. 78).

Remarks. The specimens from the "Ingolf" agree upon the whole well with Stebbing's single specimen (♀, 8 mm.), but some additions are to be made to the original descriptions.

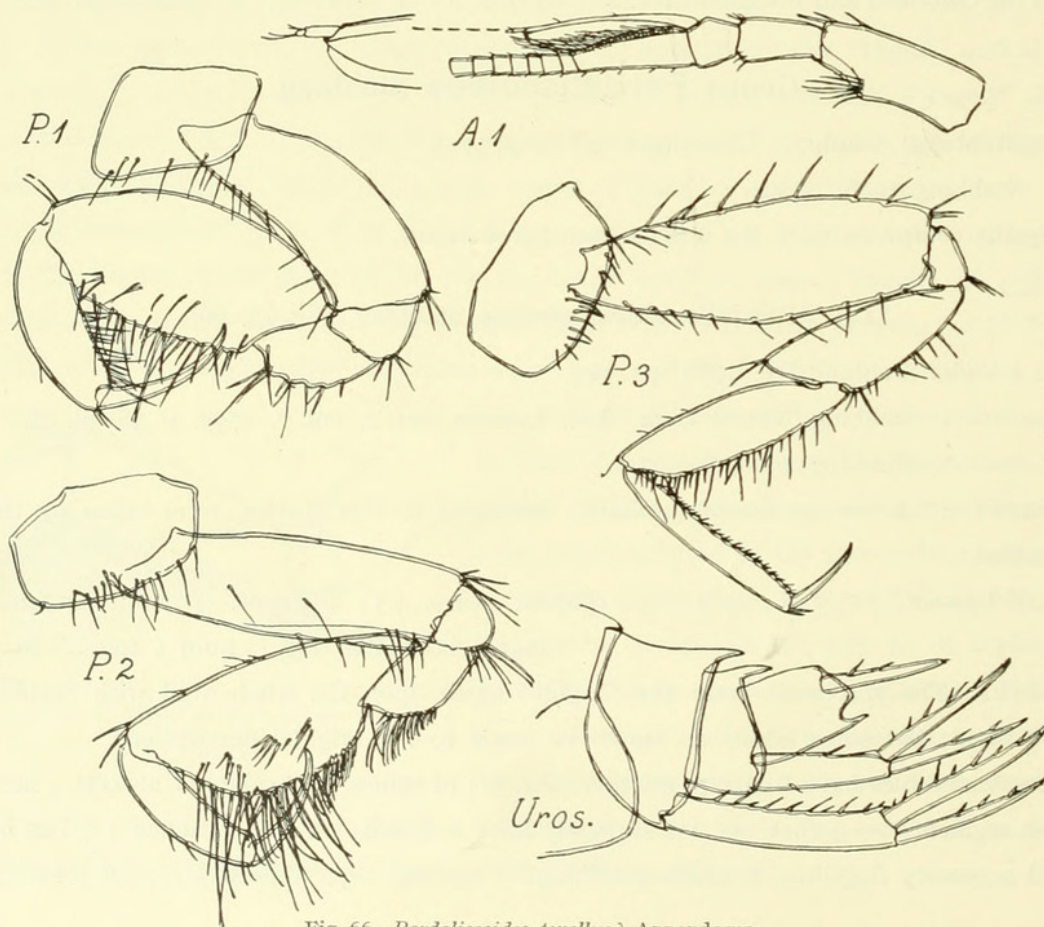
The two mandibles have a certain number (abt. 8?) of spines. Innerplate of maxilla 2 has 10 (not 6) setæ. Urosome segments 2—3 (but not 1st segment) have a dorsal denticle. Antenna 1 ♀ has in flagellum 50 joints, and accessory flagellum 5 joints (Stebbing:  $> 13$ , and  $> 7$ , respectively); 1st joint of assessor



Fig. 65. *Pardaliscoides tenellus?* Oral parts.

flagellum as the very short 1st and 2nd joints of primary flagellum combined. Antenna 1 ♂: flagellum has 49 joints; accessory flagellum has in lateral view the same shape as in the other genera of the family, with 1st joint very large and the few (2) apical joint extremely small. Antenna 2 ♀: flagellum almost as long as peduncle (Stebbing: half as long), with 16 joints. Antenna 2 ♂: a trifle shorter than antenna 1, flagellum a little longer than peduncle, with abt. 30 joints (Stebbing: 12 joints). Pereiopods 3—4 (Stebbing: prp. 1—2) have 5th joints a little longer than 4th joints, but not longer than 6th joints. Pereiopod 7 not longer than pereiopod 6; 2nd joint not essentially broader and 4th joint not longer than the same joints in pereiopod 5—6. Uropod 3 totally lost.

Distribution. South Pacific 37°29' S., 83°07' W., 3246 m. (type-locality; Stebbing).

Fig. 66. *Pardaliscoides tenellus?* Appendages.



Genus *Synopioides* Stebbing.

*Synopioides* Stebbing, Amphip. "Challenger" 1888, p. 999.

— Stebbing 1906, p. 227.

— Schellenberg, Gammariden; Deutsche Tiefsee-Exped. vol. 23, 1926, p. 224.

This genus comprises three species, *S. secunda* Stebbing (see below, under *S. tertia*), *S. macronyx* Stebbing (see Schellenberg l. c. 1926, p. 225, fig.), and *S. tertia* n. sp.

\*224. *Synopioides tertia* n. sp. (Fig. 67).

Occurrence. The "Ingolf" has secured two specimens at the following locality:

W. Greenland: 66°35' N., 56°38' W., 600 m., temp. 3.9°. 2 spec.: 1 spec. 5 mm., 1 ♀ 8 mm. ("Ingolf" St. 32).

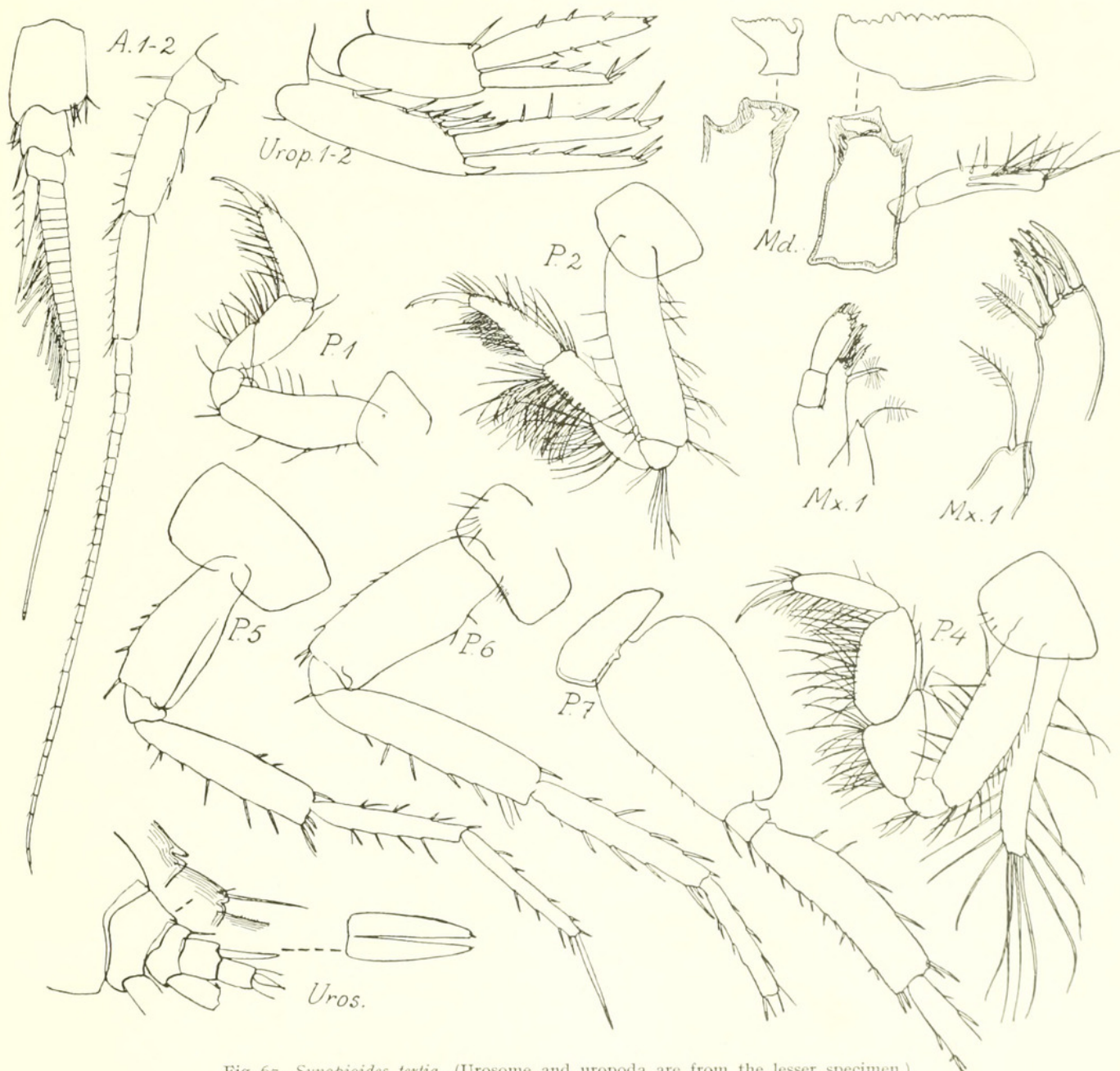


Fig. 67. *Synopioides tertia*. (Urosome and uropoda are from the lesser specimen.)



Description. The present specimens are closely allied to *S. secunda* Stebbing (*S. secunda* Stebbing, Amphip. "Challenger" 1888, p. 1224; *S. macronyx* (*secunda*) Schellenberg, Gammaridea, Deutsche Südpol-Exped. vol. 18, Zool. vol. 10, 1926, p. 336, with figs.; *S. secunda* Schellenberg, Gammariden, Deutsche Tiefsee-Exped. vol. 23, 1926, p. 224, fig.), but is distinctly different from this species.

The head has the same shape as that of *S. secunda* (Schellenberg, D. Tiefsee-Exped., fig. p. 224), and there are no eyes. Lateral hind corners of epimeral parts of metasome segments are rectangular. 2nd urosome segment has a dorsal spine  $\frac{2}{3}$  as long as 3rd segment; this spine is very fragile and is lost in the greater specimen. Telson cleft almost to base, with two long, narrow lobes.

Antenna 1 as in *S. secunda* (*S. macronyx* Stebbing l. c. 1888 and 1906), but flagellum only  $3\frac{1}{2}$  (not 5) times as long as peduncle, and the number of joints cannot be stated exactly, for it is extremely difficult to trace the articulations of the joints in the distal part of flagellum. Accessory flagellum has only 2(?) joints, almost as long as peduncle, covers the 10 proximal joints of flagellum. Antenna 2 has the two distal joints of peduncle much shorter than those of the said species; flagellum has abt. 27—30 joints. Mandibles agree fairly well with Stebbing's figure (1888, pl. 94A) and with Schellenberg's description and figure (D. Südpol-Exped., p. 336), but distal joint of palp is totally lost. Maxillæ and maxillipedes very nearly as in the other species; the distal tooth on inner lobus of maxilla 1 (drawn by Schellenberg) is also to be found in the present species.

Pereiopod 1 very different from that of "*S. macronyx*" Stebbing 1888, in that it has almost the same shape as pereiopod 2, but with fewer setæ. Pereiopods 3—4 much heavier than in the other species, especially as regards 4th and 5th joints. Pereiopod 5 has 5th and 6th joints of equal length, pereiopod 6 has 6th joint a little shorter than 5th (in pereiopod 7 only the proximal  $4\frac{1}{2}$  joints are preserved). Uropods 1—2 not very different from those of "*S. macronyx*" (Stebbing 1888, pl. 94A), but with much fewer spines. Uropod 3 is totally lost. —

The first described species was called *macronyx*, the next *secunda*; for this reason the specific name *tertia* is proposed for the present species.

### Genus *Pardaliscella* G. O. Sars.

*Pardaliscella* G. O. Sars 1895, p. 407.

— Stebbing 1906, p. 227.

The genus has only one (or two) species.

\*225. *Pardaliscella boeckii* (Malm) (Fig. 68) (Chart 38, partim (p. 217)).

*Pardaliscella boeckii* G. O. Sars 1895, p. 408, pl. 143 fig. 2.

— — Stebbing 1906, p. 228.

Occurrence. This species was taken by the "Ingolf" at 3 localities; it is new to the area.

W. Greenland: 63°06' N., 56°00' W. 2258 m., temp. 2.4°. 1 ♀ (St. 24).

— 63°30' N., 54°25' W. 1096 m., temp. 3.3°. 1 ♂ (St. 25).

— 66°35' N., 56°30' W. 600 m., temp. 3.9°. 1 ♀ (St. 32).



Remarks. The specimens have on the upper (median) side of peduncle of 1st uropod 3 or 4 spines, and on the innerside of inner ramus 2 spines (Sars: only 1 spine on each side of inner ramus). Antenna 1 ♂ has 1st joint of accessory flagellum roof-shaped as in the other genera of the family.

Distribution (Chart 38, partim (p. 217)). Only known from the waters along S. Norway and from Skagerak (Haugesund; 42 miles N.W.  $\frac{3}{4}$  N. of Hirshals 640 m.; Hvaløer in the Oslofjord) (G. O. Sars l. c.; specimen in the Copenhagen Zool. Museum). The type-locality was "in locis profundis ad insulas Koster" in Bohuslän (Malm 1870, p. 547).

## Fam. Lilljeborgiidae Stebbing.

*Gammaridae* p.p. G. O. Sars 1895, p. 529.

*Lilljeborgiidae* Stebbing 1906, p. 229.

*Lilljeborgiidae* Chevreux & Fage 1925, p. 152.

Of the three genera, including abt. 17 species, two genera with three species were secured by the "Ingolf".

### Genus *Lilljeborgia* Sp. Bate.

*Lilljeborgia* G. O. Sars 1895, p. 529.

*Liljeborgia* Stebbing 1906, p. 230.

*Lilljeborgia* Chevreux & Fage 1925, p. 153.

Two species have been secured in the area; one of them was not hitherto known from these waters.

#### \*226. *Lilljeborgia brevicornis* (Bruzelius).

*Lilljeborgia pallida* G. O. Sars 1895, p. 530, pl. 187.

*Liljeborgia brevicornis* Stebbing 1906, p. 231.

*Lilljeborgia* — Chevreux & Fage 1925, p. 155, figs.

?*Liljeborgia pallida* Sp. Bate & Westwood vol. 1, 1863, p. 203, fig.

— — Stebbing 1906, p. 230.

Occurrence. The species was secured as new to the area at two stations, viz.,

S. of Iceland: 63°13' N., 15°41' W., 1130 m., temp. 4.5°. 1 spec. ("Ingolf" St. 7).

W. of — 65°38' N., 26°27' W., 260 m., temp. 5.9°. 2 spec. ("Ingolf" St. 98).

Remarks. According to Sars the eyes have "very dark pigment, but with the visual elements imperfectly developed". This holds good of the specimens from shallow water in Senegambia (see below), but not of the specimens from the "Ingolf"-exped.: the specimen from st. 98 (depth 260 m.) has the eyes light brown, in the specimen from st. 7 (depth 1130 m.) they are quite invisible.

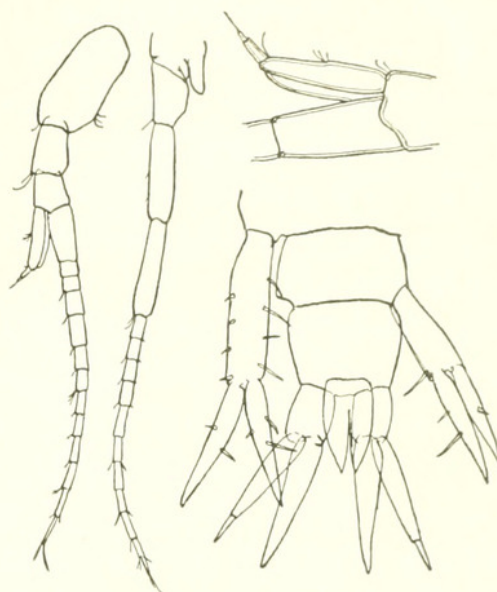


Fig. 68. *Pardaliscella boeckii* ♂ from the Oslofjord (Antenna 1 and 2, accessory flagellum, urosome).



On the synonymy. Stebbing (1906) considers *L. pallida* Sp. Bate and *L. brevicornis* Bruzelius not synonymous and separates them on account of the shape of the lower hind corner of third metasome segment (angle upturned: *L. pallida*; angle not upturned: *L. brevicornis*). Possibly Sp. Bate's fig. (l. c. 1863, p. 203) shows this character somewhat exaggerated; at all events the specimens at my disposal have the tooth and the sinus above it not very large (nearly as figured by G. O. Sars (l. c.) for *L. kinahani* (Sars pl. 188, fig. 1, ep.<sup>3</sup>)). On the other hand none of my specimens agrees with Sars's figure as to the said character. The small material in the Copenhagen Zool. Museum (not 10 specimens in all) does not illustrate how much the species can vary; but as it was impossible to find any difference between my specimens (from the "Ingolf" (see above), from Tromsö and from Senegambia), it is probable that Sars has described not quite typical specimens, and that the two "species" are synonyms.

Distribution. Iceland, see above. — "Along the whole coast of Norway, from the Oslofjord to Vadsö, in depths ranging from abt. 75 to abt. 565 m. In the Trondhjemsfjord I have found it in some places in great abundance" (G. O. Sars l. c.). Tromsö (Kröyer leg. 1836, spec. in the Copenhagen Zool. Museum). "From Finmarken to Bohuslän" (Bruzelius 1859; type-locality (exact locality not noted) for *Gammarus brevicornis*). — Great Britain: Scotland: Oban; Cumbrae, 40—50 m. (Norman, Ann. Mag. Nat. Hist., ser. 6, vol. 4, 1889, p. 116); Drake's Island near Plymouth (Bate & Westwood 1863, p. 203; type-locality for *L. pallida*); Torquay (Stebbing 1906); Jersey (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 20, 1907, p. 366). — France: W. of Ile d'Yeu (S. of Bretagne), 100 m., in *Dendrophyllia* with Ascidiae; Bay of Biscay, 138 and 180 m. (Chevreux & Fage 1925). — Senegambia: Dakar, 10, 20 and 27 m., A. Brinkmann leg. Feb. 1906 (specimens in the Copenhagen Zool. Museum), and Dakar, 15 m., shells (Chevreux, Bull. Soc. Zool. France, vol. 50, 1925, p. 301).

The species has been recorded from Ceylon with *Nicippe pallida* Della Valle as a synonym (Walker, Rep. Pearl Oyster Fisheries Gulf of Manaar, suppl.-rep. no. 17, 1904, p. 279); but *Nicippe pallida* Della Valle is another species (= *Lilljeborgia della-vallei* Stebbing) and the identity of the Ceylon specimens for this reason uncertain.

It has been recorded also from Australia and South Africa, and possibly these specimens belong to the same species, though established with other names (*L. æquabilis* Stebbing 1910, *L. proxima* Chevreux 1907), see Chilton, Amphipods, Biol. Results of the Fishing Experiments carried out by the F.I.S. "Endeavour" 1909—14, vol. 5, pt. 2, 1921, p. 64—65.

227. *Lilljeborgia fissicornis* (M. Sars) (Chart 39).

*Lilljeborgia fissicornis* G. O. Sars 1895, p. 534, pl. 189.

*Lilljeborgia* — Stebbing 1906, p. 231.

*Lilljeborgia* — Chevreux & Fage 1925, p. 156, figs.

Occurrence. The "Ingolf" has secured the species at 7 stations, the "Thor" at 3 stations.

W. Greenland: 63°30' N., 54°25' W., 1096 m., temp. 3.3°. 2 spec. ("Ingolf" St. 25).

— 66°35' N., 56°38' W., 600 m., temp. 3.9°. 1 spec. ("Ingolf" St. 32).

Jan Mayen, 100 m., clay. 1 spec. (♀), abt. 19 mm. (E. Greenl. Exped. 28-6-1900).



- S.W. of Iceland: 61°02' N., 29°32' W., 1761 m. temp. 4.0°. 1 spec., abt. 14 mm. ("Ingolf" St. 80).  
 — — 60°37' N., 27°52' W., 1505 m., temp. 4.5°. 1 spec. jun. abt. 2 mm. ("Ingolf" St. 78).  
 S.W. Iceland: 63°15' N., 22°23' W., 216—326 m. Abt. 10 spec., including 2 ♂ ad. ("Thor" St. 171,  
 16-7-1903).  
 S.W. of the Faroes: 61°07' N., 9°30' W., 835 m. 6 spec. (incl. 1 ♂ ad.) ("Thor" St. 78, 12-5-1904).  
 — — 61°15' N., 9°35' W., 900 m. Abt. 10 spec. ("Thor" St. 99, 22-5-1904).  
 Between Jan Mayen and the Faroes: 67°57' N., 6°44' W., 2385 m., temp. ÷ 1.1°. 1 spec. abt.  
 22 mm. ("Ingolf" St. 112).  
 — — — — 66°23' N., 7°25' W., 1802 m., temp. ÷ 1.1°. 1 spec. abt.  
 28 mm. ("Ingolf" St. 104).  
 — — — — 66°23' N., 8°52' W., 1090 m., temp. ÷ 0.6°. 1 spec. abt.  
 18 mm. ("Ingolf" St. 103).

The species has been recorded from three localities in the area, viz., W. Greenland 67°59' N., 56°33' W., 185 m., stones and mud, 1 spec., length 20.5 mm. (H. J. Hansen 1887, p. 142), from S. of Jan Mayen, 70°32' N., 8°10' W., 885 m., clay with small stones (H. J. Hansen 1895, p. 129), and from N. of the Faroes 63°22' N., 5°29' W., 2222 m., temp. ÷ 1.2°, Biloculina clay (G. O. Sars 1886, p. 58, St. 40).

Remarks. The species varies in a fairly high degree not only as to size (10—28 mm.<sup>1</sup>), but also as regards the dorsal armature and in the shape of the lower hind corner of the 3rd metasome segment.

Most of the specimens agree well with Sars's species in shape and in size (abt. 10 mm. in length). In the following will be recorded those (often very large) specimens differing from the typical form.

The dorsal tooth of 3rd metasome segment is totally missing in the two specimens from Jan Mayen (lengths 10 and 19 mm., depths 885 and 100 m.), in the three specimens from the great depths between Jan Mayen and the Faroes ("Ingolf" St. 103, 104, and 112, lengths 18, 28 and 22 mm., depths 1090, 1802, and 2385 m., negative temperatures), and in the largest specimen from W. Norway ("Thor" St. 3, 1903 (see below, under distribution), ♀ 16 mm., depth 280 m.). The same character has been recorded in the literature as to specimens from Spitsbergen ("*Gammarus (Lilljeborgia) pallidus*" Goës 1866, p. 529 [in the figure 27 on plate 40, not recorded in the text] from the Storfjord, depth abt. 10 m., abt. 25 mm. in length; — N. of Spitsbergen, depth 1000 m., ♀ jun. abt. 10 mm. in length [Schellenberg, Mitt. Zool. Mus. Berlin, vol. 11, 1924, p. 203]), from Jan Mayen 885 m. (H. J. Hansen 1895, p. 129, the specimen recorded above), and from N. of the New Sibirian Islands, depth 38 m., length 11—12 mm. (Brüggen 1907, p. 23).

In a few specimens from W. Greenland ("Ingolf" St. 25, depth 1096 m.) and from S.W. of Iceland ("Ingolf" St. 80, depth 1761 m.), the dorsal teeth have the typical number, but they are directed more upward than normally, are (especially on the metasome segments) very narrow, more spine-like than tooth-like.

In a number of the specimens the lower hind corner of the 3rd metasome segment has a very large tooth; this applies to the specimens from Jan Mayen 100 m., from W. Norway ("Thor" St. 3, 1903), from

<sup>1</sup>) Specimens from the "Ingolf" up to 28 mm., but specimens from Spitsbergen (exact locality not stated, depth abt. 3000 m.) up to 31 mm. (Brüggen 1907, p. 233).



the New Siberian Islands (Brüggen 1907), and from the Storfjord, Spitsbergen (Goës 1866, pl. 40 fig. 27). In the specimen from S. of Jan Mayen, 885 m., the tooth is a little larger than typically.

Distribution (Chart 39). The species is widely distributed; on the "Ingolf"-area, see above. — N. of the New Siberian Islands  $77^{\circ}20\frac{1}{2}'$  N.,  $138^{\circ}47'$  E., 38 m., clay (Brüggen 1909, p. 23). — The waters round Spitsbergen:  $81^{\circ}20'$  N.,  $19^{\circ}$  E., 1000 m. (Schellenberg 1924, p. 203).  $78^{\circ}02'$  N.,  $9^{\circ}25'$  E., 761 m.,  $0.8^{\circ}$ , clay;  $78^{\circ}16'$  N.,  $15^{\circ}30'$  E., 87—100 m.,  $1.7^{\circ}$ , clay, and 113—137 m.;  $74^{\circ}19'$  N.,  $19^{\circ}41'$  E., 68 m., gravel

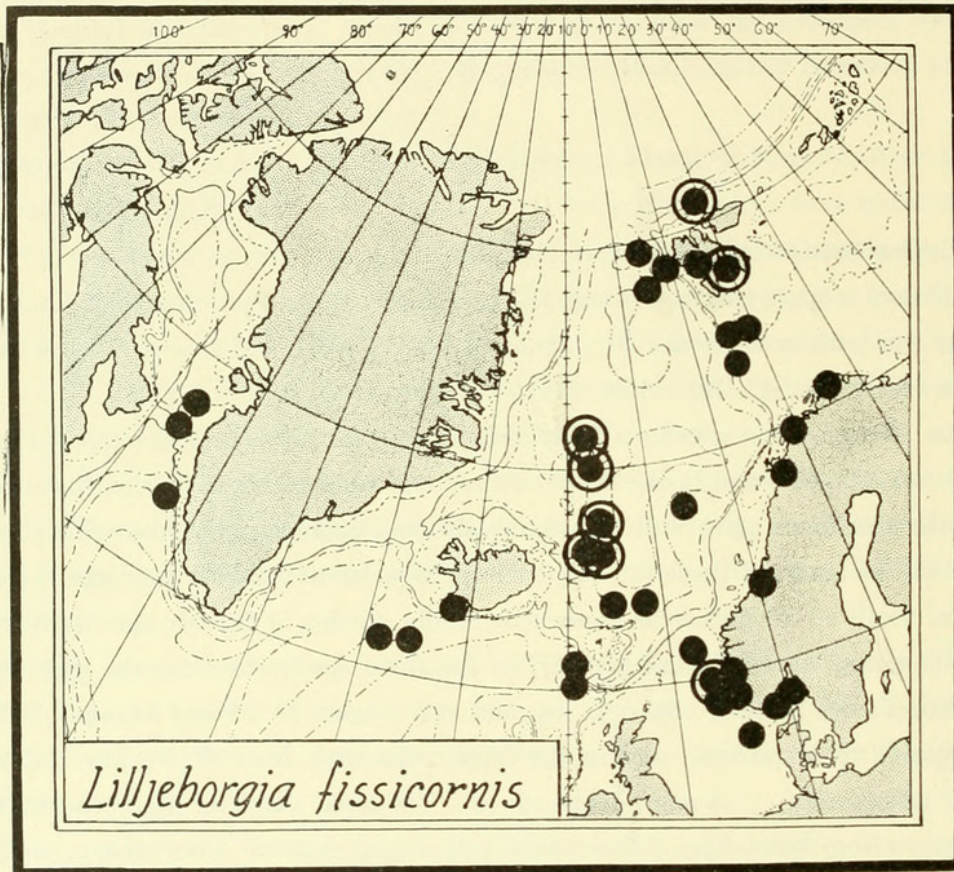


Chart 39. *Lilljeborgia fissicornis*. The spots with a ring are localities of specimens without dorsal tooth on metasome segment 3.

(Grieg 1926, 24). Storfjord 10 m. (Goës 1866, p. 529). Whales head in the Storfjord, 120 m., clay (Brüggen 1907, p. 233).  $77^{\circ}58'$  N.,  $5^{\circ}10'$  E., 2438 m.,  $\div 1.4^{\circ}$ , Biloculina clay;  $78^{\circ}02'$  N.,  $9^{\circ}25'$  E., 761 m.,  $0.8^{\circ}$ , clay;  $74^{\circ}54'$  N.,  $14^{\circ}53'$  E., 1203 m.,  $\div 1.2^{\circ}$ , clay;  $73^{\circ}47'$  N.,  $14^{\circ}21'$  E., 1403 m.,  $\div 1.4^{\circ}$ , clay (G. O. Sars 1886, p. 58).  $79^{\circ}41'$  N.,  $4^{\circ}58'$  E., 2857 m., clay (Brüggen 1907, p. 233). — Norway: "Off the coast of Finmark this form is not infrequently met with in greater depths, varying from abt. 100 to abt. 400 m. It extends southwards along the Nordland coast, at least to the Trondhjemsfjord, where, in some places, it is rather abundant" (G. O. Sars 1891—95, and other authors; the type was from Vadsö, abt. 40—60 m). Trondhjemsfjord: Skarnsund, 150—200 m., 3 spec. (including 2 ♀ with eggs) (Dr. Th. Mortensen leg. 21-7-1911). Selbjørnsfjord near Bergen 300—400 m. (Nordgaard 1911, p. 23). Karmøen near Stavanger, 1 spec. (in the



Copenhagen Zool. Museum; A. Boeck ded.). 61°0' N., 4°49' E., 366 m., 6.6°, clay, sand, stones (G. O. Sars 1886, p. 58). 61°14' N., 1°19' E., 160 m. 5 spec. (incl. 1 ♀ ovig.) ("Thor" St. 120, 21-7-1905). 58°32' N., 4°18' E., 280 m. 4 spec., incl. 1 ♀ 16 mm. without dorsal spine on 3rd metasome segment ("Thor" St. 3, 30-4-1903). — Skagerak and the northern North Sea, found 7 times from W. of the Thyborön Kanal (W. Limfjord) to Koster in Bohuslän, 105 to 425 m. (Malm, fide Boeck 1876, p. 500; Appellöf, in Murray & Hjort: Depths of the Ocean 1912, p. 506, note; K. Stephensen, Vid. Medd., vol. 82, 1926, p. 78). — The great depths W. of Norway: 67°56' N., 4°11' E., 1423 m., 1.4°, Biloculina clay; 63°17' N., 1°27' W., 1977 m., ÷ 1.0°, Biloculina clay (G. O. Sars 1886, p. 58). — Southern localities: Bay of Biscay 46°31' N., 6°52' W., 180 m., and W. of the Azores 39°18'35" N., 33°32'15" W., 1372 m. (Chevreux, "Hirondelle" 1900, p. 88).

The species is probably mainly arctic (circumpolar?), but has also, as appears from the above, been found far to the south of the arctic area.

### Genus *Idunella* G. O. Sars.

*Idunella* G. O. Sars 1895, p. 536.

— Stebbing 1906, p. 234.

— Chevreux & Fage 1925, p. 158.

Only one species has been found in the "Ingolf"-area.

#### 228. *Idunella æquicornis* G. O. Sars.

*Idunella æquicornis* G. O. Sars 1895, p. 537, pl. 190.

— — Stebbing 1906, p. 234.

Occurrence: The species was secured by the "Ingolf" at 4 stations.

Jan Mayen, abt. 100—120 m., 1 ♀ with eggs. (E. Greenl. Exped. 25-6-1900, Søren Jensen leg.).

S. of Jan Mayen: 70°50' N., 8°29' W., 162 m., temp. 0.1°. 1 spec. ("Ingolf" St. 115).

N. of Iceland: 67°19' N., 15°52' W., 552 m., temp. ÷ 0.5°. 1 spec. ("Ingolf" St. 126).

— 66°50' N., 20°06' W., 367 m., temp. 0.6°. 1 spec. ("Ingolf" St. 128).

Between Iceland and the Faroes: 64°07' N., 11°12' W., 446 m., temp. 2.5°. 1 spec. ("Ingolf" St. 4).

It has been recorded from Jan Mayen, 128 m., dark grey sabulous clay, temp. ÷ 0.6° (G. O. Sars 1886, p. 59).

Distribution. N. Norway: Varangerfjord, abt. 100—200 m. (G. O. Sars 1891—95) and 200—235 m. (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 10, 1902, p. 483); Kvænangen, 300—343 m. (Nordgaard, Norweg. fjords 1905, p. 185). — Barents Sea 73°25' N., 31°30' E., 360 m., clay, temp. 2.2° (G. O. Sars 1886, p. 59). — The Storeggen 63°10' N., 5°03' E., 763 m., sabulous clay, temp. ÷ 1.0° (G. O. Sars 1886, p. 59). The species seems to belong to the borders of the Arctic Polar deep.

### Fam. *Oedicerotidæ* (Boeck) Sparre Schneider.

*Oediceridæ* G. O. Sars 1895, p. 286.

*Oedicerotidæ* Stebbing 1906, p. 235.

*Oedicerosidæ* Chevreux & Fage 1925, p. 161.



11 genera with 30 species have been found in the area and will be discussed below; a single genus, *Monoculoides*, comprises nearly half of the species, viz. 14. A single genus (*Oedicerina*) and 9 (10?) are new to the area; one genus (*Oedicerina*) and 3 species (*Monoculoides latissimanus*, *M. rostratus*, and *Oedicerina ingolfi*) are new to science.

### Genus *Pontocrates* Boeck.

*Pontocrates* G. O. Sars 1895, p. 315.

- Stebbing 1906, p. 239.
- Chevreux & Fage 1925, p. 164.

Only one species was stated (as new) in the "Ingolf"-area.

#### \*229. *Pontocrates arcticus* G. O. Sars.

*Pontocrates norvegicus* G. O. Sars 1895, p. 315, pl. III fig. 2.

- *arcticus* G. O. Sars 1895, p. 693.
- — Stebbing 1906, p. 240.

Occurrence. Material is at hand from 6 localities. As the species most frequently lives in rather shallow water, it was not taken by the "Ingolf". It is new to the area. The localities are as follows:

N.W. Iceland: Adalvik, 18 m. 1 spec. (W. Lundbeck leg. 16(17)-5-1892).

N. Iceland: Haganesvik, 7-8 m. 1 spec. ("Diana" 8-8-1902).

N.E. Iceland: Thistilfjörður, near Thorshöfn, 10 m. 1 spec. ("Beskytteren" 30-6-1904).

— Bakkafjörður, 16-20 m., black sand. Several spec. ("Diana" 13-6-1900, A. C. Johansen).

— Hjúraðs Flóin, 28-47 m. Numerous spec. ("Thor" St. 219, 29-7-1904).

— 65°41' N., 14°09' W., 63 m. 1 spec. ("Thor" St. 201, 20-7-1904).

Distribution. N. Norway: Vardö, Busse Sound, abt. 10 m. (type-locality; Sparre Schneider, Tromsø Mus. Årshefter 6, 1883, p. 17, *P. norvegicus*). Hasvik (W. Finmark) 12-20 m., sandy bottom (G. O. Sars 1891-95). Tromsø: Skatören, 40-50 m., clay (Sp. Schneider, Tromsø Mus. Årshefter 47, no. 8, 1926, p. 30, *P. norvegicus*). All other localities cited in the literature are to be discarded, on account of confusion with the true *P. norvegicus* (Boeck).

### Genus *Oediceros* Kröyer.

*Oediceros* G. O. Sars 1895, p. 287.

- Stebbing 1906, p. 243.

Two species of this genus are known from the "Ingolf"-area.

#### 230. *Oediceros saginatus* Kröyer (Chart 40, partim).

*Oediceros saginatus* G. O. Sars 1895, p. 288, pl. 102.

- — Stebbing 1906, p. 244.

Occurrence. Material, not recorded in existing literature, is present from at great number of localities in the area.



W. Greenland: Fylla's Banke, 50 m. (O. Hagerup leg. 10-7-1925). — Off the Ikertokfjord (S. of Holsteinsborg), 30 m., stones with algæ ("Fylla" 3-8-1886, Th. Holm leg.). — Holsteinsborg (depth not noted), and the same place, on the Pecten-Bank, 140 m. (Traustedt leg. 1892). — The Bank outside Holsteinsborg, 34 m., shells of Balanidæ ("Ingolf" 6-7-1895). — Holsteinsborg, the harbour, 15—19 m. ("Ingolf" 9-7-1895).

N.W. Iceland: Dyrafjörður, shallow water (W. Lundbeck leg. 12-9-1892).

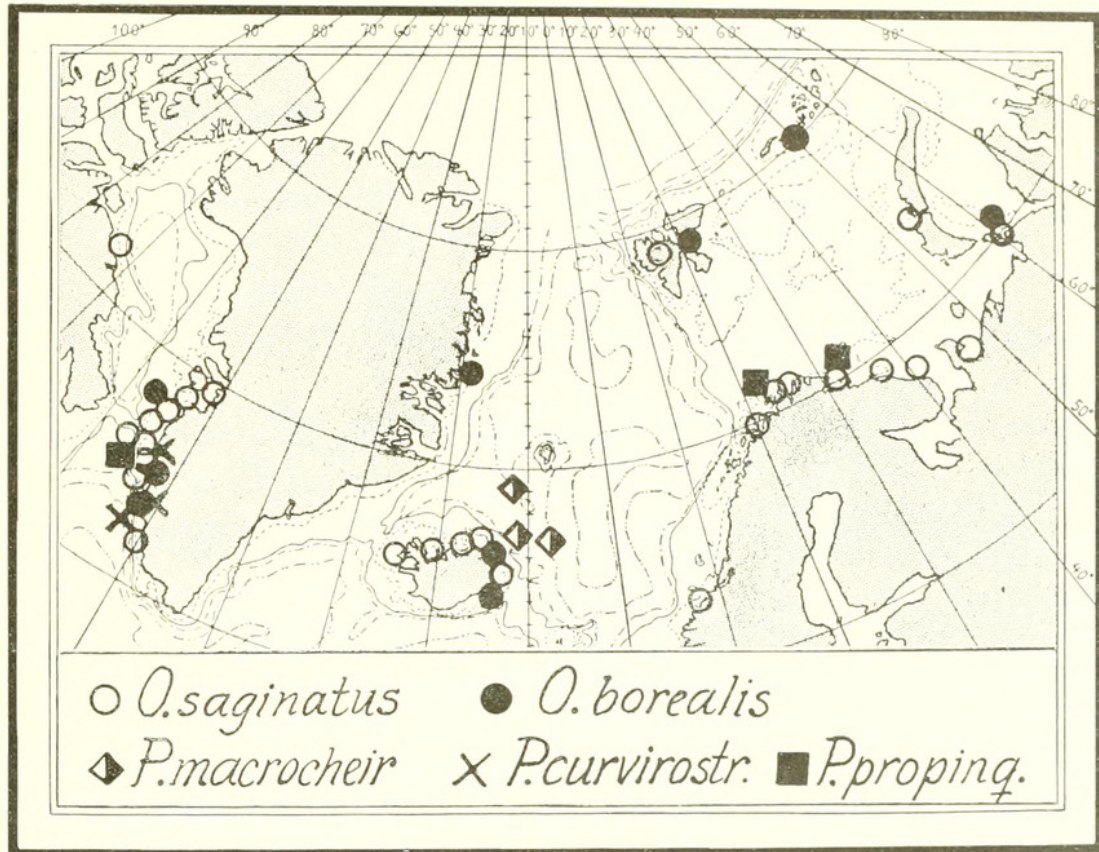


Chart 40. *Oedicerus saginatus*, *O. borealis*, *Paroedicerus macrocheir*, *P. curvirostris*, *P. propinquus*.

N. Iceland: Skagestrand, 12 m. and 100—115 m. (Steincke ded. 1875). — Skjalfandifloí, 7—10 m. ("Dana" St. 2210, 27-7-1924, B. Sæmundsson leg.) and 8—10 m., 31-7-1905 (specimens in the Reykjavik Museum). — Husavik 90—110 m. ("Thor" St. 128, 1-6-1904). — Snartarstadir, 4—0 m., black sand, (C. Otterström leg. 24-6-1903).

E. Iceland: Miðfjörður, 10 m., and the same fjord, near Langaness, 16 m., (R. Hörring leg. 19—7 and 12-6-1899). — 65°41' N., 14°09' W., 63 m. ("Thor" St. 201, 20-7-1904). — 65°40' N., 14°08' W., 51 m. ("Thor" St. 188, 26-7-1903) and Loðmundarfjörður, abt. 65½° N., 14° W., from stomachs of fishes ("Thor" 26-7-1903) (specimens in the Reykjavik Museum). — Vopnafjörður, from stomachs of *Gadus aeglefinus*, 6—7 and 6-9-1898 (B. Sæmundsson leg.), and 12—23 m., temp. 1.8°, black sand (R. Hörring leg. 20-8-1899). — Hjeradsfloin, 100 m. w. ("Thor" St. 156, 24-8-1905) and 28—47 m. ("Thor" St. 219, 29-7-1904). —



Borgarfjörðr, 8—0 m. (R. Hörring 30-5-1899). — Seyðisfjörðr (Hallas ded. 1867). — Lonsvik, 19 m., black sand ("Diana" 20-7-1900, A. C. Johansen). —

In existing literature it is noted from the following localities in the area: W. Greenland (but not E. Greenland) abt.  $62^{\circ}$ — $69^{\frac{3}{4}}^{\circ}$  N., 10—abt. 50 m., stones with or without Balanidæ, 11 localities (K. Stephensen, *Conspectus* 1913, p. 147). — Iceland, "sat frequens org. 25", without special locality (Goës 1866, p. 10).

Remarks. Maximum size of Greenland specimens is 32 mm. (♀ ovig. from Holsteinsborg and from  $66^{\circ}56'$  N.,  $54^{\circ}45'$  W.), of Iceland specimens abt. 25 mm. (♀ ovig. from Husavik), and of Norwegian specimens abt. 20 mm. (G. O. Sars l. c.).

Distribution.  $71^{\circ}57'$  N.,  $73^{\circ}56'$  W., 10—40 m., sand (Ohlin 1895, p. 36). — Hudson Bay (Shoemaker, *Contrib. Canad. Biol. & Fish.*, vol. 3, no. 1, 1926, p. 6). Spitsbergen, "rarissimus", without special locality (Goës 1866, p. 10). — Matotschkin schar, western part, 10—20 m., sand; Jugor schar, eastern part, 20 m., shells; Murman Sea: Möller Bay, 10—40 m., sand and stones (Stuxberg, in *Vega Exped.*, vol. 5, 1886, p. 65). — Murman coast (Jarzynski). — N. Norway: Varangerfjord at Vadsö, 20—40 m., sandy clay; Porsangerfjord; Vardö; Tromsö; Christiansund (G. O. Sars l. c.); — Vadsö Harbour, 50 m. (Norman 1902, p. 487); — Troldfjordsund, 40 m., "occurred in very large numbers and with young" (Nordgaard 1905, p. 184).

### 231. *Oediceros borealis* Boeck (Chart 40, partim).

*Oediceros borealis* G. O. Sars 1895, p. 290, pl. 103 fig. 1.

— — Stebbing 1906, p. 244.

Occurrence. Material of this species is present from three new localities in the area:

E. Iceland:  $65^{\circ}40'$  N.,  $14^{\circ}08'$  W., 51 m. ("Thor" St. 188, 26-7-1903; specimens in the Reykjavik Museum).

— Hjárads Floín, 28—47 m. ("Thor" St. 219, 29-7-1904).

S.E. Iceland: Breidalsvik, 20 m., sand ("Diana" 6-8-1900, A. C. Johansen).

In existing literature it is recorded from 4 localities at W. Greenland abt.  $64^{\circ}$ — $68^{\frac{1}{2}}^{\circ}$  N., 12—90 (abt. 300) m. and from 2 localities at E. Greenland, abt.  $74^{\frac{1}{2}}^{\circ}$  N., 20 m. (K. Stephensen, *Conspectus* 1913, p. 148).

Distribution (Chart 40, partim). Kara Sea, N.E. of Jugor Schar, 100 m. (Stuxberg 1886, p. 65). — Spitsbergen: Storfjord near Cape Lee ( $78^{\circ}06'$  N.,  $20^{\circ}52'$  E.), sand with clay, 9 m., and clayish sand with gravel, 12.8—14.6 m. (Brüggen 1906, p. 224). — The Finmarken or Spitsbergen (Boeck 1876, p. 262, by G. O. Sars cited as the Finmarken); thus it is not with certainty known from N. Norway.

### Genus *Paroediceros* G. O. Sars.

*Paroediceros* G. O. Sars 1895, p. 291.

— Stebbing 1906, p. 245.

This genus comprises four species in the area; only one of them is possibly new to the "Ingolf"-area.

### 232. *Paroediceros macrocheir* (G. O. Sars) (Chart 40, partim).

*Oediceros macrocheir* G. O. Sars, *Crust.*, in *Norske Nordhavs Exped.*, vol. 6, 1885, p. 170, pl. 14 fig. 4.

*Paroediceros* — Stebbing 1906, p. 245.



Occurrence. The "Ingolf" has secured this species at two (three?) stations viz.,  
 N.E. of Iceland: 66°23' N., 12°05' W. 1011 m., temp.  $\div$  0.7° (St. 101). ?1 very little specimen.  
 — — 66°23' N., 10°26' W., 1412 m., temp. 0.9° (St. 102). 4 small specimens.  
 — — 66°23' N., 7°25' W., 1802 m., temp.  $\div$  1.1° (St. 104). Fragments of 2 ♀ with marsupial plates, one of them probably 15 mm.

The two type-specimens (♀ with large marsupial plates, 18 mm.) were taken close to the localities recorded above, viz., 69°2' N., 11°26' W., 1836 m., temp.  $\div$  1.1°; other specimens are not known.

233. **Paroediceros curvirostris** (H. J. Hansen) (Chart 40, partim).

*Oediceros curvirostris* H. J. Hansen, Vid. Medd. ser. 4, vol. 9, 1887, p. 107, pl. 4 fig. 4.

*Paroediceros* — Stebbing 1906, p. 246.

Occurrence. Material is present from one or two localities, hitherto not recorded in literature.

The localities are:

W. Greenland: Holsteinsborg (Traustedt leg. 1892). 2 spec.

S. of Iceland: 63°46' N., 22°56' W. 150 m. ("Thor" St. 171, 2-7-1904). Some small specimens; determination possibly not correct.

The species is known only from W. Greenland, and it has not been recorded since 1887, when it was established. The localities (of types and cotypes) were: 63°35' N., 52°57' W., 80 m., sand; Godthaab 12—19 m.; and Greenland without special loc., numerous specimens (H. J. Hansen 1887).

234. **Paroediceros propinquus** (Goës?) G. O. Sars (Chart 40, partim).

?*Oediceros propinquus* Goës 1866, p. 526, pl. 39 fig. 19.

*Paroediceros* — G. O. Sars 1895, p. 293, pl. 104 fig. 2.

— — Stebbing 1906, p. 246.

*Oediceros microps* G. O. Sars, Forhand. Vid.-Selsk. Christiania 1882, no. 8, p. 95, pl. 4 fig. 8.

— — Sparre Schneider, Tromsø Mus. Århefter, vol. 6, 1883, p. 15, pl. 2 fig. 14.

Occurrence. The "Ingolf" has secured this species at one (two?) station; it is probably new to the "Ingolf"-area (see below).

W. of Greenland: 65°16' N., 55°05' W. 682 m., temp. 3.6°. 3 spec. ("Ingolf" St. 35).

?N. of the Faroes: 63°36' N., 7°30' W. 1322 m., temp.  $\div$  0.6°. Fragments of one specimen; determination possibly not correct ("Ingolf" St. 139).

Remarks. G. O. Sars is of opinion that "probably Goës has confounded both species (—*P. lynceus* and *P. propinquus*; Goës has no record of "*P. lynceus*"—), but the figure he gives of the anterior part of the body, agrees more with the present species (*P. propinquus*) than with *Oe. lynceus*". I do not feel convinced that Goës' species is identic with Sars's species of the same name; and as Sars's description and figures are so elaborate and exact that no doubt is left as to the identity of the species described by him, I propose to alter the specific name to *P. propinquus* (Goës?) G. O. Sars. (If Goës's species really is identic with



*P. lynceus*, the name of *P. propinquus* G. O. Sars 1895 should be *P. microps* (G. O. Sars 1882), for these two names are synonyms (see G. O. Sars 1895, p. 294)).

Goës records his species from Spitsbergen 6—60 m., Greenland and Iceland, but as the other species, *P. lynceus*, is extremely common in these waters, where *P. propinquus* has never been found after Goës's time (except for the find of *P. propinquus* from "Ingolf" St. 35 (depth 682 m.) recorded above), also the testimony of the localities is against the theory that Goës's species is another species than *P. lynceus*.

Distribution. Specimens of this species from the "Ingolf"-area determined with certainty have probably only been found by the "Ingolf" Expedition (St. 35, see under Occurrence); all other localities are questionary (Iceland and Greenland: Goës 1866; E. and W. Greenland: K. Stephensen, *Conspectus* 1913, p. 149, under *P. lynceus*). *Oedicerus microps* H. J. Hansen 1887 from the Kara Sea is another species (*P. intermedius* Stebbing 1906, p. 245).

The true *P. propinquus* G. O. Sars has hitherto probably only been found (outside the "Ingolf"-area) in N. Norway, from the Varangerfjord to Kvalö (near Hammerfest) (G. O. Sars 1882 and 1895, Sp. Schneider 1893).

### 235. *Paroedicerus lynceus* (M. Sars) (Chart 41).

*Paroedicerus lynceus* G. O. Sars 1895, p. 292, pl. 103 fig. 2, pl. 104 fig. 1.

— — Stebbing 1906, p. 246.

Occurrence. Material of this well-known species is present from a great number of localities, not recorded in existing literature; the "Ingolf" has secured it at one station. The localities are as follows.

W. Greenland: Holsteinsborg (Traustedt leg. 1892). — 67°57' N., 55°30' W., 66 m., temp. 0.8° (numerous spec.; "Ingolf" St. 33). — Egedesminde, 20 m., clay (Bergendal leg. 12-8-1890). — ? Kronprinsens Eyland (C. Kruuse leg. 17-7-1897). — Godhavn, 120—200 m., clay (Dr. E. Reisinger leg. 19(20)-7-1926). — Jacobshavn (Traustedt leg. Aug. 1892). — Ritenbenk (Traustedt leg. 1892).

E. Greenland: Cape Dan (near Angmagssalik), 20—30 m., rocky bottom with a few algæ (Amdrup-Exped. leg. 17-6-1899). — Danmarks Ø (Scoresby Sound), clay (Deichmann leg. Aug. 1891), and 2—10 m., mud and stones with *Laminariæ* and *Desmarestia* (E. Bay leg. 20-4 and 9-7-1892). — Rosenvinge Bay (Scoresby Sound) (26(27)-10-1924, Scoresby-Sound-Exped. leg.). — Scoresby Sound: Amdrup Harbour and Hvalros Bay, 8—35 m. (Alwin Pedersen leg. 2-9-1927). — Sabine Island, in the anchoring-place between *Laminariæ*, and 6—10 m. (Søren Jensen leg. 12-7 and 13-7-1900).

N.W. Iceland: Dyrafjörðr, 19—23 m. (R. Hörring leg., St. 58, 30-8-1901). — Önundarfjörðr, 23 m., clay with a few stones, scarce vegetation (W. Lundbeck leg. 10(16)-5-1893).

N. Iceland: ?Nordfjörðr near Skagestrands Bay, 10—12 m. ("Diana", 22-7-1902). — The head of the Skalfandi Bay, 17—21 m. ("Thor" St. 207, 21-7-1904). — Husavik, 90—110 m. ("Thor" St. 128, 1-6-1904).

E. Iceland: 65°41' N., 14°09' W., 31—41 and 63 m. ("Thor" St. 83, 28-7-1906, and St. 201, 20-7-1904). — 65°40' N., 14°08' W., 51 m. ("Thor" St. 188, 26-7-1903; spec. in the Reykjavik Museum). — Bakkafjörðr, 23—28 m., black sand, and 40—50 m., and 100 m. clayish sand ("Diana" 14-6-1900; Dr. A. C.



Johansen leg.). — Hellisfjörðr, 14—40 m. ("Diana" St. 34, 7-6-1898; R. Hörring leg.). — Nordfjords Floín, 65—100 m. ("Diana" St. 38, 9-6-1898, R. Hörring leg.). — Eskifjörðr, 34 m. (Prem.lieutenant Jensen leg. 1886). — Reyðarfjörðr, 95 m., 113—150 m., 130 m., 135 m., 140 m., 163 m.; bottom not noted ("Thor", St. 48—51, 30-4-1904; "Diana" St. 17, 18-5-1898, R. Hörring leg.; "Thor" St. 192, 31-7-1903). — Seyðisfjörðr, 40 m. ("Thor" St. 30, 22-5-1903). — Faskrudfjörðr, 40—95 m., blue clay (R. Hörring leg. 7-7-1899). — Viðfjörðr, 30 m., (13-7-1899). — Miðfjörðr, 10 m. (R. Hörring leg. 19-7-1899). —

In existing literature the species is recorded from a great number of localities from W. Greenland

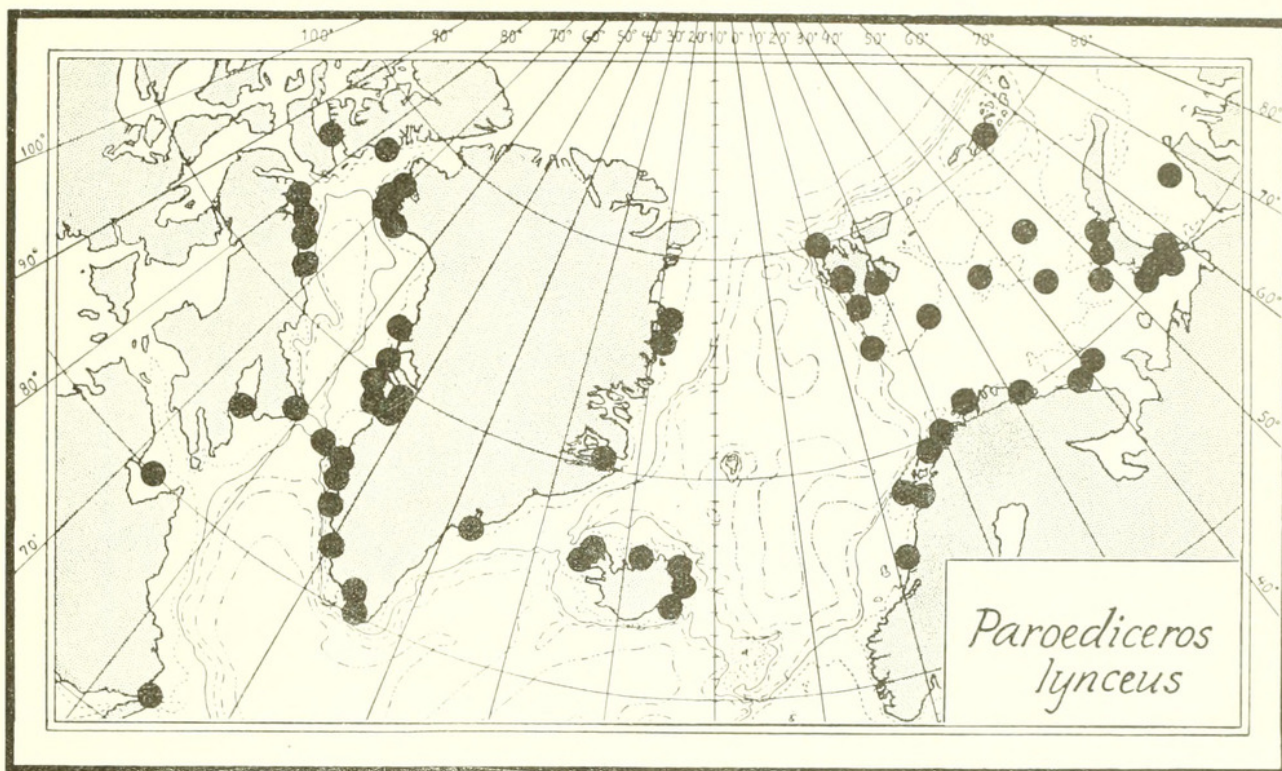


Chart 41. *Paroedicerus lynceus*. (The localities in the Gulf of St. Lawrence are outside the chart).

(— see under Remarks —) abt.  $60^{\circ}$ — $77\frac{1}{2}^{\circ}$  N., from E. Greenland (abt.  $70\frac{1}{2}^{\circ}$ — $76\frac{3}{4}^{\circ}$  N.) (K. Stephensen, *Conspectus* 1913, p. 150, K. Stephensen, *Meddel. om Grönland* vol. 51, 1913, p. 66 and vol. 53, 1916, p. 287), and from ?Iceland (Goës 1866, p. 526; *Oedicerus propinquus*).

Remarks. After having revised the very great material of this species in the possession of the Zool. Museum of Copenhagen, I cannot find any reason to doubt that all specimens from Greenland recorded as belonging to this species are correctly determined (not *P. propinquus*; see under this species).

There are very few specimens with eggs in the marsupium. Maximum size of specimens from W. Greenland is 21 mm. (♀ with large marsupial-plates, taken July 22th); a ♀ with eggs (taken July 24th) is 18 mm. Young specimens were taken at the following dates: Aug. 5th (length 2—3 mm.), Aug. 25th (length up to 7 mm.) and Sept. 2nd (length abt. 4 mm.).

At E. Greenland specimens with large marsupial-plates (length 18—22 mm.) were taken from July 1st to July 13th.



At Iceland the maximum size was 20 mm. A single ♀ with eggs (14 mm.) was taken May 22th; ♀ with large marsupial plates (length 12—17 mm.) were taken April 30th, May 10(-16)th and 18th, June 14th, July 19th and 21th.

Distribution (Chart 41). This species is one of the most frequent in the area; it is almost merely arctic and probably circumpolar, found from Alaska to the New Siberian Islands. For special localities see Stappers 1911, p. 32, and Oldevig 1917, p. 21. Posterior to these two papers the following localities have been published: Alaska: Collinson point, 6 m., mud with algæ, and from the stomach of *Salvelinus malma*; N. Labrador: Port Burwell in Ungava (Shoemaker 1920, pp. 12 and 27). Hudson Bay (Shoemaker, Contrib. Canadian Biol. a. Fisheries, vol. 3, no. 1, 1926, p. 6). Gulf of St. Lawrence, several stations, 30—93 m. (Shoemaker, *ibid.* vol. 5, 1930, p. 287, figs.).

It is bound to clay bottom and is often very abundant. The depths are most often from a few to about 100 m., but it can extend to very great depths: 1267 m. (E. of New Foundland; Chevreux 1900). The southern limit in the Atlantic is determined by the following localities: eastern U.S.A. abt. 45° N., S. Greenland, N.W. and S.E. Iceland, and Norway at Appelvær (abt. 65° N.).

### Genus *Arrhis* Stebbing.

*Aceros* G. O. Sars 1895, p. 338.

*Arrhis* Stebbing 1906, p. 248.

Only one species is known from the area.

#### 236. *Arrhis phyllonyx* (M. Sars) (Chart 42).

*Aceros phyllonyx* G. O. Sars 1895, p. 338, pl. 119, pl. 120 fig. 1.

*Arrhis* — Stebbing 1906, p. 248.

Occurrence. This species was taken at several localities by the "Ingolf", the "Thor" and other expeditions or collectors. The localities are:

W. Greenland: 63°06' N., 56°00' W. 2258 m., temp. 2.4° ("Ingolf" St. 24).

— 63°30' N., 54°25' W. 1096 m., temp. 3.3° ("Ingolf" St. 25).

— 64°54' N., 55°10' W. 740 m., temp. 3.8° ("Ingolf" St. 27).

— 65°14' N., 55°42' W. 791 m., temp. 3.5° ("Ingolf" St. 28).

— 65°16' N., 55°05' W., 682 m., temp. 3.6° ("Ingolf" St. 35).

E. Greenland: Hurry Inlet (ca. 70°50' N.), 13—0 m. (E. Greenland-Exped. 7-8-1900, Søren Jensen leg.).

S. of Jan Mayen: 69°31' N., 7°06' W. 2465 m., temp. 1.0° ("Ingolf" St. 113).

N. Iceland: 66°50' N., 20°02' W. 367 m., temp. 0.6° ("Ingolf" St. 128).

— Skagestrandsbugt, 215 m., mud, temp. 2.9° (Capt. Wandel leg. 1890).

— Husavik, 80 m. ("Thor" St. 117, 1-7-1906) and 90—110 m. ("Thor" St. 128, 1-6-1904).

E. Iceland: Reyðarfjörðr, 95 m., 130 m., 132 m., 113—150 m., 140 m. ("Thor" St. 48, 49 and 51, 29(30)-4-1904; "Thor" St. 192, 31-7-1903; "Diana" St. 17, 18-5-1898 [R. Hörring leg.]).

— Faskrudfjörðr, 40—100 m., clay (R. Hörring leg. 7-7-1899).



N. of the Faroes:  $63^{\circ}26' N.$ ,  $7^{\circ}26' W.$ , 887 m., temp.  $\div 0.6^{\circ}$  ("Ingolf" St. 138).

In existing literature the species is recorded from the following localities in the "Ingolf" area: W. Greenland, 3 localities from abt.  $69\frac{1}{2}^{\circ}$ — $72\frac{1}{2}^{\circ} N.$ , abt. 200—570 m. (K. Stephensen, *Conspectus* 1913, p. 157); between Iceland and Jan Mayen  $69^{\circ}2' N.$ ,  $11^{\circ}26' W.$ , 1836 m., temp.  $\div 1.1^{\circ}$ , Biloculina clay, and E. of Iceland  $64^{\circ}36' N.$ ,  $10^{\circ}22' W.$ , 547 m., temp.  $\div 0.3^{\circ}$ , darkgrey clay (G. O. Sars 1886, p. 57).

Remarks. Maximum sizes of the specimens from the "Ingolf"-area are: W. Greenland 10(—13) mm., N. Iceland 18 mm., E. Iceland 21 mm., N. of the Faroes ("Ingolf" St. 138) 19 mm.; — Spitsbergen specimens

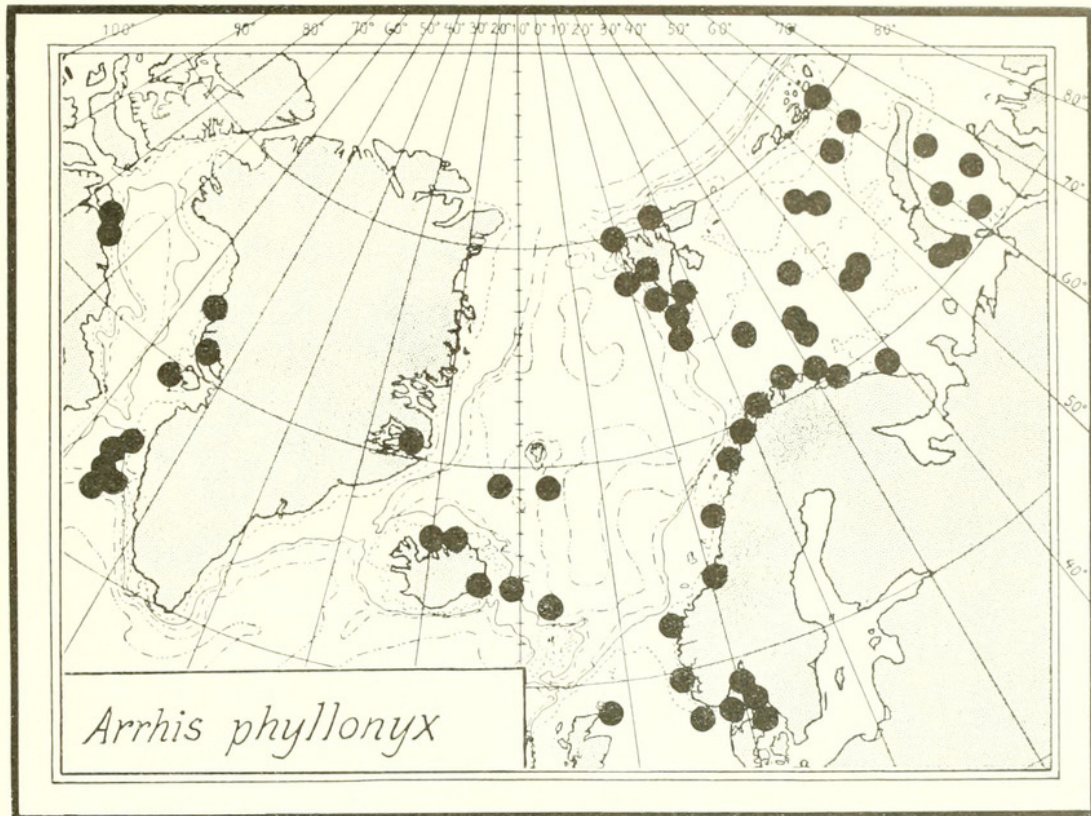


Chart 42. *Arrhis phyllonyx*. The localities in the Gulf of St. Lawrence are outside the chart.

can attain a length of 24 mm. (Oldevig 1917, p. 22), and to specimens from the Kara Sea the same applies (spec. in the Copenhagen Zool. Mus.; ♀ ovig.).

Female specimens with large marsupial plates (— there are no ♀ with eggs in the material —) were found at E. Iceland (Reyðarfjörðr) on May 18th (length 20 mm.) and at N. Iceland (Husavik) on June 1st (length 18 mm.).

Distribution (Chart 42). An almost purely arctic species, bound to clay bottom, from abt. 10 to 2258 m., temp. probably rarely more than abt.  $4^{\circ}$  (but can be  $\div 1.63^{\circ}$  [Oldevig 1937, p. 22]). It is probably circumpolar; at all events it is found from N.W. Canada (Dolphin and Union Strait, off Stapyton Bay [abt.  $69^{\circ} N.$ ,  $115^{\circ} W.$ ], Shoemaker 1920, p. 11) to the New Siberian Islands (abt.  $75^{\circ} N.$ ,  $140^{\circ} E.$ ). For special localities see Stappers 1911, p. 38, and Oldevig 1917, p. 21. Recently it has been recorded from some localities in the Gulf of St. Lawrence, 30—135 m. (Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930,



p. 272). The southern limit is determined by the following localities: Gulf of St. Lawrence, W. Greenland abt.  $63^{\circ}$  N., N. Iceland, E. Iceland abt.  $65^{\circ}$  N., N. of the Faroes  $64\frac{1}{2}^{\circ}$  N., N.E. Scotland, Skagerak and Kattegat.

### Genus *Westwoodilla* Sp. Bate.

*Halimemon* G. O. Sars 1895, p. 326.

*Westwoodilla* Stebbing 1906, p. 246.

— Chevreux & Fage 1925, p. 173.

Only two species of this genus live in the area; a third species, *W. caecula* (Bate) has wrongly been recorded from the area (from W. Greenland; see under *W. megalops*).

#### 237. *Westwoodilla brevicalcar* (Goës) (Chart 43, partim).

*Halimemon brevicalcar* G. O. Sars 1895, p. 331, pl. 116 fig. 3.

*Westwoodilla* — Stebbing 1906, p. 249.

Occurrence. The species was not secured by the "Ingolf", but material is at hand from two new localities in the area.

E. Iceland: Vidfjörðr, 16—22 m., 1 ♀ ovig. (R. Hörring leg. 16-5-1899).

— Breidalsvik, 12 m., mud and black sand. Several spec., including ♀ ovig. ("Diana" 19-7-1900, A. C. Johansen).

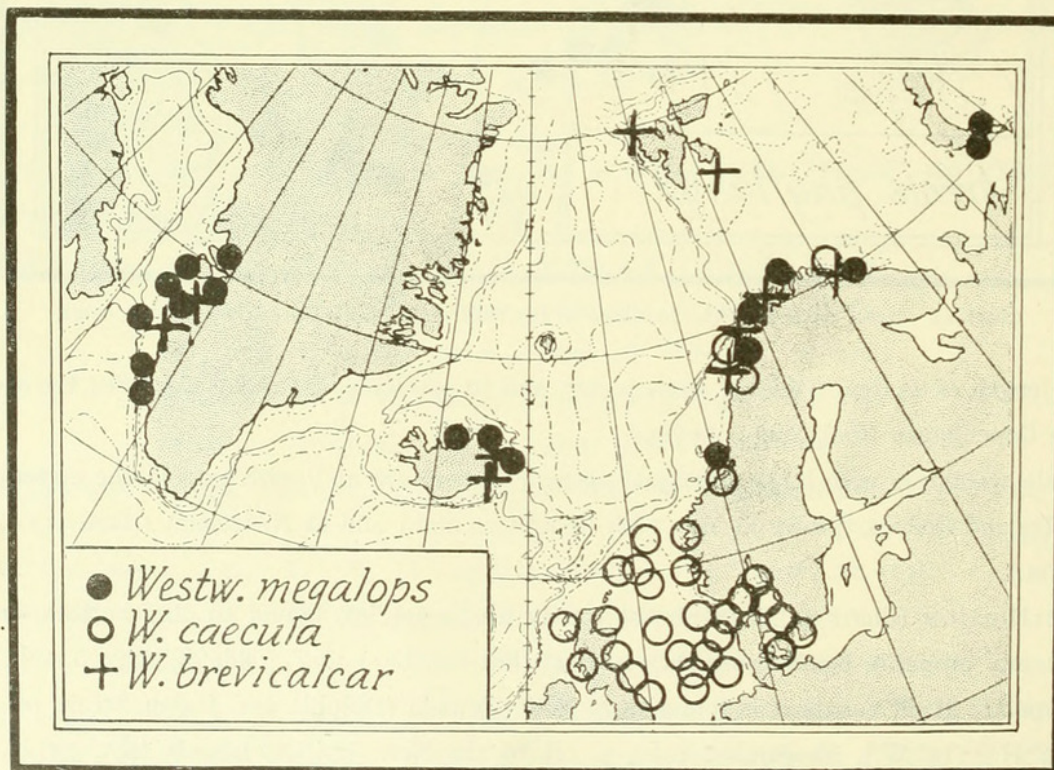


Chart 43. *Westwoodilla megalops*, *W. caecula*, *W. brevicalcar*.

All the three species have recently been found in the Gulf of St. Lawrence (outside the chart).



It has been recorded from 3 localities in W. Greenland abt.  $67^{\circ}$ — $68\frac{3}{4}^{\circ}$  N., 2—60 m., algæ and clay (H. J. Hansen 1887, p. 115) and from Iceland without special locality (Goës 1866, p. 527).

Distribution: N.W. Spitsbergen: Hakluyts Headland, between algæ (type-locality; Goës 1866, p. 527). S.E. Spitsbergen: Halfmoon Isl., 75 m. (Schellenberg 1924, p. 203). Norway, several places from the Lofoten Isles (Skraaven) to Vadsö, especially at Tromsö, 10—40(380) m. (Sparre Schneider 1884, p. 92, and 1926, p. 32; G. O. Sars l. c.; Norman 1902, p. 481; Nordgaard 1905, p. 184), but probably not Bohuslän, as recorded by Boeck. — S.E. part of the Gulf of St. Lawrence: N. of Cheticamp island, 40—50 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 289).

238. **Westwoodilla megalops** (G. O. Sars) (Fig. 69, Chart 43, partim) (and **W. cæcula** (Sp. Bate)).

*Halimедon megalops* G. O. Sars, Forhandl. Vid. Selsk. Christiania, no. 18, 1882, p. 96, pl. 4 fig. 9, 9a.

— — Sparre Schneider, Tromsö Mus. Aarshefter, vol. 6, 1883, p. 38, pl. 2 fig. 9.

— — G. O. Sars 1895, p. 330, pl. 116 fig. 2.

*Westwoodilla* — Stebbing 1906, p. 250.

Occurrence. Material of *M. megalops* is at hand from several localities in the "Ingolf"-area, viz., W. Greenland:  $66^{\circ}35'$  N.,  $55^{\circ}54'$  W., 166 m., 1.6°, 5 spec. ("Ingolf" St. 31).

N. Iceland: Skjalfandibugt, near Flatey, 40 m., 1 spec. ("Beskytteren" 21-7-1903).

— Skjalfandibugt, the head, 17—21 m., several spec. including ♀ ovig. ("Thor" St. 207, 21-7-1904).

— Husavik, 80 m., 1 spec. ("Thor" St. 117, 1-7-1906).

N.E. Iceland: Finna fjörðr, 35 m., 3 spec. including ♀ ovig. ("Thor" St. 252, 12-8-1904).

— Bakkafjörðr, 80—100 m., clayish sand, 4 spec. including ♀ ovig. ("Diana" 14-6-1900, A. C. Johansen).

— Hjárads Flóin, 28—47 m., several spec. including ♀ ovig. ("Thor" St. 219, 29-7-1904).

— Hjárads Flóin  $65^{\circ}41'$  N.,  $14^{\circ}09'$  W., 63 m., several spec. including ♂ and ♀ ovig. ("Thor" St. 201, 20-7-1904).

The species has been recorded from 14 localities at W. Greenland, from Godhavn (abt.  $64^{\circ}$  N.) to Lille Karajakfjord (abt.  $71^{\circ}$  N.), (2)20—75 (abt. 400) m., stony or clayish bottom (H. J. Hansen 1887, p. 115 and 116 [*Halimедon megalops* and *H. Mülleri*; on "*H. Mülleri*" (= *W. cæcula*) see below] and Vanhöffen 1897).

Remarks. *Westwoodilla (Halimедon) megalops* was established by G. O. Sars 1882 and was characterised as differing from the other species (especially from *W. cæcula*) in having the frontal process strongly vaulted and the eyes large and (apparently) confluent. These same characters were recorded repeatedly by Sp. Schneider 1883 and by G. O. Sars 1895.

Nevertheless the shape of the head cannot always be used as a specific character, for numerous specimens take an intermediate position. As it appeared extremely difficult to determine the material recorded above, I begged the Zool. Museum of Oslo to lend me some specimens of *W. megalops* determined by Sars. For comparison I have used some specimens of *W. cæcula* from Denmark.



A close examination has proved that the two species may be separated with certainty. The most important and most easily recognisable character is the telson (drawn and described by Sars 1895): in *W. cæcula* it is oval, with the tip broadly rounded; in *W. megalops* it is nearly as broad as long, and transversely truncated (or sometimes a little concave) at the tip. Also the second joint of pereopod 7 is specifically different: the upper hind corner is in *W. cæcula* evenly rounded, making part of a circular arch; in *W. megalops* it is nearly rectangular with rounded corner; the margins of the joint are much more densely setose in *W. cæcula* than in *W. megalops*. The antennæ are shorter and have fewer and shorter joints in

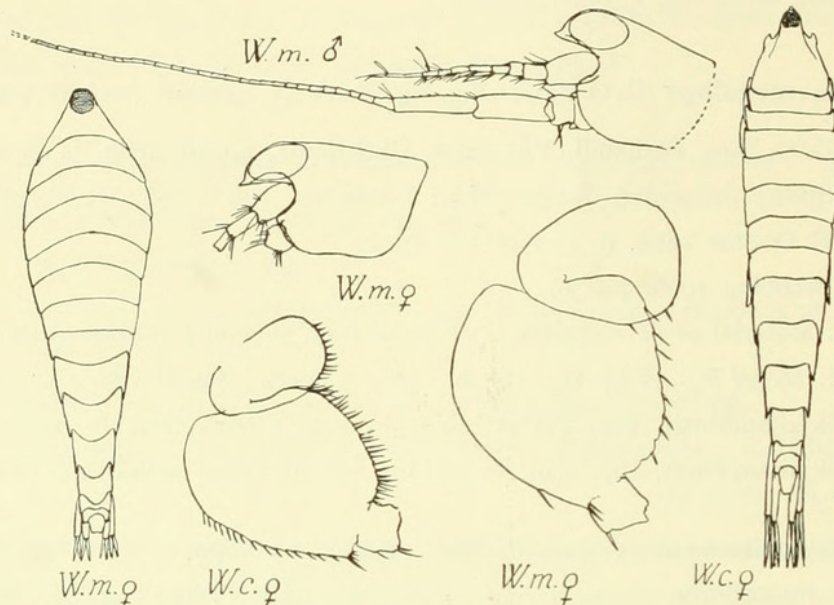


Fig. 69. *Westwoodilla megalops* (W.m.) (from "Thor" St. 201, 1904, N.E. Iceland) and *W. cæcula* (W.c.) (from "Thor" 11-10-1904, Kattegat). Dorsal view, head, pereopod 7.

*W. megalops* than in *W. cæcula*. In dorsal view the body is much stouter in *W. megalops* ♀ than in *W. cæcula* ♀; in both species the ♂ is still more slender than the ♀ of *W. cæcula*.

The ♂ of *W. megalops* was hitherto unknown, but there are several specimens in the material. It is much more slender than ♀, but as to the appendages there are no sexual differences apart from the antennæ. Antenna 1 is as long as the head + first segment, with the flagellum abt. twice as long as the peduncle; the first joint of the peduncle is as long as the two next joints combined, and the flagellum has 8 joints. Antenna 2 is not much shorter than the body, with the two distal joints of the peduncle of equal length. Length of ♂: abt. 5–6 mm.

♀ ovig. is abt. 6 mm. The eggs may be rather varying in number; a ♀ ovig., 6 mm., from 65°41' N., 14°09' W. ("Thor" St. 201, 20-7-1904), has the marsupium totally filled with abt. 20 eggs of a diametre as long as the length of the first metasome segment; another ♀, 5 mm., from the same locality, has the marsupium filled with only 6 eggs, of the same size. —

H. J. Hansen 1887 records "*Halimедon Mülleri*" from two localities in W. Greenland. As it was quite impossible to me to find any specimen of the species in the material from the "Ingolf"-area, and as



the whole of the Hansen-material (of *W. megalops* and of "*Halimedes Mülleri*") is in the possession partly of the Zoological Museum of Stockholm, partly of that of Copenhagen, I begged the Zoological Museum of Stockholm (Naturhistoriska Riksmuseet, Everttebratavdelningen, Dr. Nils Odhner) to send me the material; I wish to tender my best thanks to Dr. Odhner for his valuable assistance in placing this material at my disposal, and to Dr. A. Wollebæk of the Zool. Museum of Oslo for having kindly provided me with Norwegian specimens (types?) of *W. megalops* for comparison. The result of my revision was that the two Greenland specimens determined as *Halimedes Mülleri* were in reality *W. megalops*. Especially the specimen from 68°24' N., 54°39' W., abt. 400 m., bears, as regards the head, very considerable resemblance to *W. caecula*. It is a ♂ jun. (the antennæ have numerous, but short joints; ant. 2 is only half as long as the body); the peduncle of antenna 1 bears as regards the length of the joints a closer resemblance to *W. caecula* than to *W. megalops*, and the second joint of pereopod 7 is much narrower than that of typical specimens; but the telson does not leave any doubt as to the correctness of the identification.

Distribution of *W. caecula* and of *W. megalops* (Chart 43, partim (p. 234)).

1. *W. caecula*. Found along the western Europe from N. Norway (Vadsö abt. 70° N.) to W. France (Belle-Ile en Mer, abt. 47° N.), but not at the Faroes or at Iceland; the depths are 9—375 m., usually abt. 50—100 m. It is most abundant in the North Sea and in the Danish waters outside the Belts. The special localities are: Norway. "Off the south and west coasts of Norway this form is very commonly met with in moderate depths, from 40 to 100 m., muddy bottom. It also occurs rather frequently in the Trondhjemsfjord, and extends northwards along the whole coast of Nordland and Finnmark until Vadsö, though being less common here" (G. O. Sars l.c. 1891—95, p. 328). Tromsö: Skatören, 50—60 m. (Sp. Schneider 1926, p. 31). Mortsund 200 m., and Gaukværö 250 m. (Lofoten) (Nordgaard 1905, p. 184). Foldenfjord (abt. 67½° N.) (K. Stephensen 1926, p. 10). Saltenfjord, inner part (G. O. Sars 1886, p. 50). Trondhjemsfjord: Trondhjem and Rødberg, 40—135 m. (Norman 1895, p. 486). Florö (N. of Bergen), 85—135 m. (*Halimedes parvimanus*, Norman, Ann. Mag. Nat. Hist., ser. 6, vol. 3, 1889, p. 455). Alverstrømmen and Herdlafjord (near Bergen) (Nordgaard 1911, p. 22). — Skagerak and Danish waters to the Belts, very common (Björck 1911, p. 21, and 1916, p. 7; K. Stephensen 1926, p. 82). — North Sea, several loc. (Reibisch 1905, p. 184); 56°33' N., 1°47' E., 89 m. ("Thor" St. 112, 12-7-1905), 59°37' N., 1°55' E., 122 m. ("Thor" St. 100, 1-7-1906, and 61°14' N., 1°19' E., 160 m. ("Thor" St. 120, 21-7-1905) (specimens in the Copenhagen Zool. Museum). — Great Britain: 60 miles E. of Shetland 135—170 m., St. Magnus Bay (Shetland), Durham, Skye, Cumbrae 40 m., Banff (*Halimedes parvimanus* Norman, Ann. Mag. Nat. Hist., ser. 6, vol. 3, 1889, p. 455); N.E. of Peterhead 130 m. (Metzger 1875, p. 282); Shields (abt. 55¼° N.) 78 m. (Tesch 1915); Firth of Forth (Th. Scott 1906, p. 156); Northumberland and Durham, several loc. (Norman & Brady 1909, p. 311). — France: Belle Ile en Mer (abt. 47° N.) 180 m. (Chevreux & Fage 1925, p. 174). — Recently it has been recorded from 6 loc. in the Gulf of St. Lawrence, 30—93 m. (Shoemaker, Contrib. Canad. Biol. vol. 5, 1930, p. 290).

2. *W. megalops*. A mainly arctic species, found at southern Novaya Zemlya, Norway N. of abt. 65° N., N. and E. Iceland, and W. Greenland; the depths are 10—abt. 400 m., usually abt. 20—75 m. The special localities are as follows. Gulf of St. Lawrence, see below. — W. Greenland and Iceland, see above. — Norway: Finnmark, several places; Vadsö, Langfjord (S. Varanger), Tromsö; "it extends southwards



along the Nordland coast to Valdersund, Namdal" (close N. of the Trondhjemsfjord; G. O. Sars 1891—95, p. 331). The sounds round Tromsö, common; Øxfjord (abt. 70° N.) (Sparre Schneider 1884, p. 94, and 1926, p. 31). — Novaya Zemlya: in the Kara Sound, 66 m., and along the south coast, three times, 61—90 m. (Stappers 1911, p. 37). — Recently it has been recorded from 8 loc. in the Gulf of St. Lawrence, 12—93 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 290). —

Thus the two species have a totally different European distribution: *W. megalops* is mainly arctic, *W. cæcula* is mainly lusitanic, but in Norway N. of abt. 65° N. both the species are to be found.

### Genus *Acanthostepheia* Boeck.

*Acanthostepheia* Stebbing 1906, p. 253.

Only one species of this genus is known from the area.

#### 239. *Acanthostepheia malmgreni* (Goës) (Chart 44).

*Amphinotus Malmgreni* Goës 1866, p. 526, pl. 39 fig. 17.

*Acanthostepheia malmgreni* Stebbing 1906, p. 254.

non *Acanthostepheia Malmgreni* Stuxberg, Vega-Expeditionens vetenskapliga iakttagelser, vol. 1, Stockholm 1882, the fig. on pag. 724 (= *M. behrengiensis* (Lockington) (= *A. pulchra* Miers)).

Occurrence. Several times this species has been taken in the "Ingolf"-area; the localities are as follows:—

W. Greenland: 69°30' N., 56°32' W. 202 m. "Dana" St. 2363, 27-6-1925. Ad. S. Jensen.

E. Greenland: E. Greenland-Exped. St. I, 210 m., 10-7-1900. Søren Jensen leg.

— Ryder's Sund, 6 m., E. Greenl. Exped. 25-7-1900. Søren Jensen leg.

— Turner Sund, 6 m., E. Greenl. Exped. 25-7-1900. Søren Jensen leg.

— Forsblad's Fjord, 100 m. E. Greenl. Exped. 28-8-1900. Søren Jensen leg.

— Off Canning's Island, 375 m. E. Greenl. Exped. 1-9-1900. Søren Jensen leg.

N. of Iceland: 67°19' N., 15°52' W. 552 m., temp. ÷ 0.5°. ("Ingolf" St. 126).

S.E. of — 64°25' N., 12°09' W., 397 m., temp. 0.8° ("Ingolf" St. 58).

N.W. of the Faroes: 63°15' N., 9°35' W., 508 m. (Capt. Wandel leg. 1891).

As a rule only a single or very few specimens were taken at a time.

The species has been recorded from a few localities in the area. W. Greenland: Umanak Fjord and Murchison Sound 48 m., clay; E. Greenland: 69°25' N., 20°1' W., 315 m., large stones and clay; between 75°58' N., 14°08' W., and 75°59' N., 14°12' W., 300 m.; 77°31' N., 18°24' W., 275 m. (K. Stephensen, Conspectus 1913, p. 147).

The species is a true arctic species, as a rule only found in water of a temperature below 3° (Oldevig 1917, p. 51); the depths are in the "Ingolf"-area most frequently > 200 m. (—552 m.), only twice it was found in quite shallow water (E. Greenland abt. 69° N., 6 m.). It is not found South of the ridge from Iceland and Greenland to America.



Remarks. A ♀ with eggs, length 31 mm., was secured at W. Greenland by the "Dana" June 26th.

The species has been confused with *A. behringiensis* (Lockington 1877) (= *A. pulchra* Miers 1881) (Stebbing 1906, p. 254 and 726; see especially S. J. Holmes, Proc. California Acad. of Sci., 3rd series, Zool., vol. 3, 1904, pp. 315—317, pl. 36 figs. 25—28); all the specimens from the "Ingolf"-area are with certainty to be determined as *A. malmgreni*. The same applies to the very large material of the species recorded by

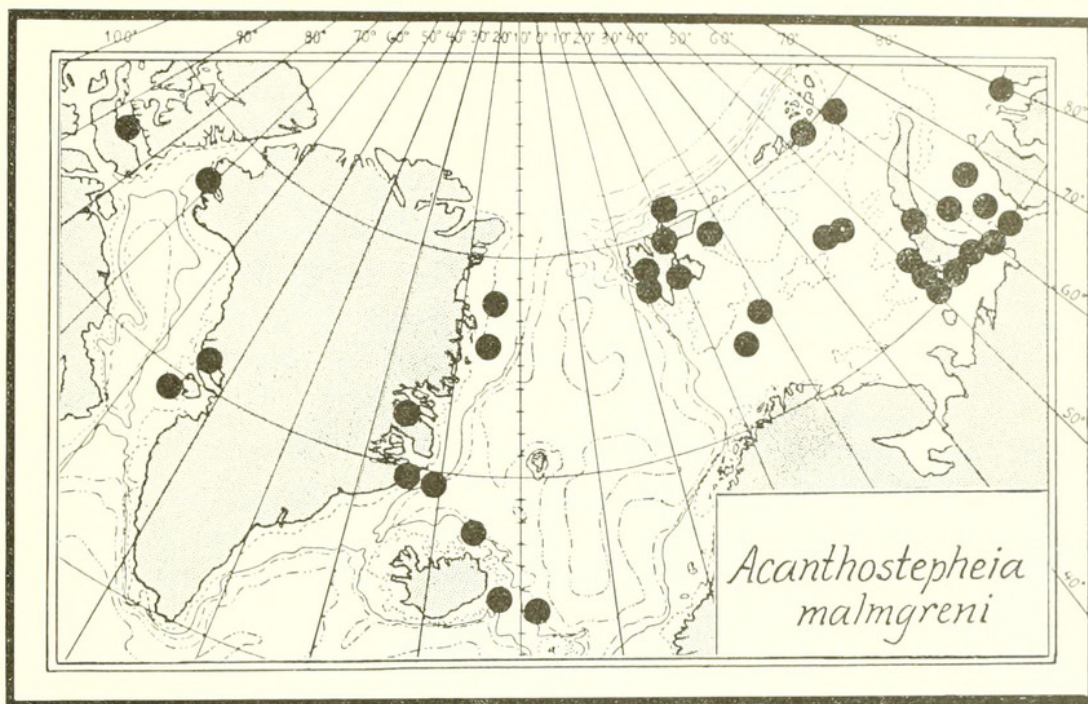


Chart 44. *Acanthostepheia malmgreni*.

H. J. Hansen (in the Dijnphna-Exped. 1887, p. 220) from the Kara Sea; I have revised the whole material but not found any specimen of *A. pulchra*, though this species does not seem to be rare in the said sea.

Distribution (Chart 44). The species is arctic, possibly circumpolar, found from the arctic America (Stapylton Bay in the Dolphin and Union Strait (abt. 68° N., 116° W.), 50—60 m., sandy mud with pebbles (Shoemaker, Amphip.; Report Canadian Arctic Exped. 1913—18, vol. VII, pt. E, 1920, p. 11)) and Greenland, Spitsbergen, Franz-Josef Land etc. to the New Siberian Islands abt. 147° E. (for special localities, see Oldevig 1917, p. 25). It is bound to clay bottom and may extend to a depth of abt. 550 m.

### Genus *Aceroides* G. O. Sars.

*Aceroides*, *Aceropsis* G. O. Sars 1895, p. 340.

— Stebbing 1906, p. 254.

The genus has only one northern species.

#### 240. *Aceroides latipes* G. O. Sars.

*Aceros distinguendus* H. J. Hansen 1887, p. 118, pl. 4 fig. 8.

*Aceropsis latipes*, *Aceroides latipes* G. O. Sars 1895, p. 341, pl. 120 fig. 2.

*Aceroides latipes* Stebbing 1906, p. 255.



Occurrence. A single specimen of this species has been secured at the following locality:—

E. Greenland: Danmark's Ø (abt.  $70^{\circ}1/2^{\circ}$  N.), clay. H. Deichmann leg. 1891.

In existant literature it has been recorded from some few localities in the "Ingolf"-area: W. Greenland: Sukkertoppen, 113 m., clay; Jacobshavn, 660 m., sandy clay; Umanak Fjord, depth?. — E. Greenland: Hekla Havn, clay (K. Stephensen, *Conspectus* 1913, p. 158).

Distribution. The species is arctic and probably circumpolar; but only rather few specimens are known. It is bound to clay, depths 6—abt. 200 m. The localities are as follows. Greenland (see above). Spitsbergen, without special locality (*Oedicerus obtusus*, "alia forma"; Goës 1866, p. 527). N. Norway: Varangerfjord, abt. 160—200 m. (G. O. Sars l. c.). Kara Sea:  $71^{\circ}10'$  N.,  $64^{\circ}02'$  E., abt. 150 m. (*Halicreion latipes*; H. J. Hansen, *Dijmphna Exped.* 1887, p. 221), and  $74^{\circ}28'$  N.,  $83^{\circ}33'$  E., 52 m., clay (Brüggen 1909, p. 24). Sibirian Polar Sea: Kotelny Island (Michailov-Stan, the New Sibirian Islands), and N. of the New Sibirian Islands  $77^{\circ}20^1/2'$  N.,  $138^{\circ}47'$  E., 38 m., clay (Brüggen 1909, p. 24). Alaska: Collinson Point, 6 m., mud with algæ, and from the stomach of *Salvelinus malma* (Shoemaker 1920, p. 11).

### Genus *Bathymedon* G. O. Sars.

*Bathymedon* G. O. Sars 1895, p. 332.

— Stebbing 1906, p. 255.

Two species have been found; one of them (*B. saussurei*) is new to the area.

#### 241. *Bathymedon obtusifrons* (H. J. Hansen).

*Halimedon obtusifrons* H. J. Hansen, *Vid. Medd.* 1887, p. 116, pl. 5 fig. 1.

*Bathymedon* — G. O. Sars 1895, p. 336, pl. 118 fig. 2.

— — Stebbing 1906, p. 256.

— — Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930, p. 276—78, figs.

Occurrence. This species was taken at several localities in the area both by the "Ingolf" and by the "Thor". The localities are as follows:—

W. Greenland:  $64^{\circ}54'$  N.,  $55^{\circ}10'$  W. 740 m.  $3.8^{\circ}$  ("Ingolf" St. 27).

—  $65^{\circ}14'$  N.,  $55^{\circ}42'$  W. 791 m.  $3.5^{\circ}$  ("Ingolf" St. 28).

—  $66^{\circ}35'$  N.,  $55^{\circ}54'$  W. 166 m.  $1.6^{\circ}$  ("Ingolf" St. 31).

—  $66^{\circ}35'$  N.,  $56^{\circ}38'$  W. 600 m.  $3.9^{\circ}$  ("Ingolf" St. 32).

—  $65^{\circ}16'$  N.,  $55^{\circ}05'$  W. 682 m.  $3.6^{\circ}$  ("Ingolf" St. 35).

N. Iceland: Skjalfandi Bugt, 40 m. ("Beskytteren", 21-7-1903).

E. Iceland: Bakkafjörðr, 100—80 m., clayish sand. ("Diana", 14-6-1900).

— Eskifjörðr, 35 m. ("Diana" 1886, Premierlieutenant Jensen).

S. Iceland:  $63^{\circ}46'$  N.,  $22^{\circ}56'$  W., 150 m. ("Thor" St. 171, 2-7-1904).

As a rule only a single specimen was taken at a time; only at the locality recorded from S. Iceland numerous specimens were secured.



The species has been recorded from 2 localities in W. Greenland: 68°9' N., 56°32' W., 90 m., sand, and 68°24' N., 54°39' W., abt. 400 m., mud (H. J. Hansen 1887, p. 116; type-localities).

Distribution. Franz-Josef Land: Cape Flora (Scott 1899, p. 73). S. of Novaja Zemlya 70°20' N., 56°34'(35') E., 90 m. (two finds; Stappers 1911, p. 37). N. Norway, several localities from Varanger to Malangen (abt. 69°30' N.), depths down to abt. 225 m. (see Sparre Schneider, Tromsø Museums Årshefter 47, 1924 (1926), no. 8, p. 32). A single specimen (♀ ovig.) is found, far from these localities, in the Skagerak: 57°54' N., 7°58' E., 400 m. ("Thor" St. 294, 9-9-1904; specimen in the Copenhagen Zool. Museum). South-eastern part of the Gulf of St. Lawrence, 2 loc., 30—93 m. (Shoemaker l. c. 1930).

\* 242. **Bathymedon saussurei** (Boeck).

*Bathymedon saussurei* G. O. Sars 1895, p. 335, pl. 118 fig. 1.

— — Stebbing 1906, p. 257.

Occurrence. The species is new to the "Ingolf"-area; a single specimen was secured by the "Ingolf": W. Greenland: 66°35' N., 56°38' W., 600 m. 3.9° ("Ingolf" St. 32).

Distribution. Known from "a few places off the . . . coast of Norway", from the Trondhjemsfjord to the Oslofjord, abt. 100—600 m. (G. O. Sars). Skagerak, 2 localities, 525 and 640 m. (K. Stephensen, Vid. Medd. vol. 82, 1926, p. 84).

Genus **Monoculopsis** G. O. Sars.

*Monoculopsis* G. O. Sars 1895, p. 310.

— Stebbing 1906, p. 257.

The genus has in northern seas only one species.

243. **Monoculopsis longicornis** (Boeck).

*Monoculopsis longicornis* G. O. Sars 1895, p. 311, pl. 110 fig. 1.

— — Stebbing 1906, p. 258.

Occurrence. The "Ingolf" has not secured this species; a new locality is:—

N. Iceland: Skjalfandi Bugt, 19 m., 2 small spec. ("Beskytteren", 21-7-1907).

It has been recorded from 2 localities at W. Greenland: Godthaab, the harbour, 4—6 m., sand with algæ, and from 68°9' N., 56°32' W., 90 m.; also Greenland without special locality (H. J. Hansen 1887, p. 112). — Jan Mayen, shallow water (G. O. Sars 1886, p. 50). —

Distribution. Norway, several localities from Sydvaranger and Vadsö to Tromsö, abt. 15—40 m., clay or sand (G. O. Sars 1895; Sparre Schneider, Tromsø Mus. Årshefter 47, 1924 (1926), no. 8, p. 30); also found near Haugesund (Sars l. c.). — Franz-Josef Land: West Bay, 4—20 m. (Scott 1899, p. 73). — Arctic Canada: Bernard harbour in the Dolphin and Union Strait (ca. 70° N., 115° W.), surface (Shoemaker 1920, p. 12). — Gulf of St. Lawrence, 3 loc., 12—45 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 287).



Genus *Monoculodes* Stimpson.

*Monoculodes* G. O. Sars 1895, p. 294.

— Stebbing 1906, p. 258.

14 species have been found in the area; 6 are new to the area, 2 even new to science (*M. latissimanus*, *M. rostratus*).

\*244. *Monoculodes longirostris* (Goës) (Chart 45).

*Monoculodes longirostris* G. O. Sars 1895, p. 306, pl. 108 fig. 3.

— — Stebbing 1906, p. 260.

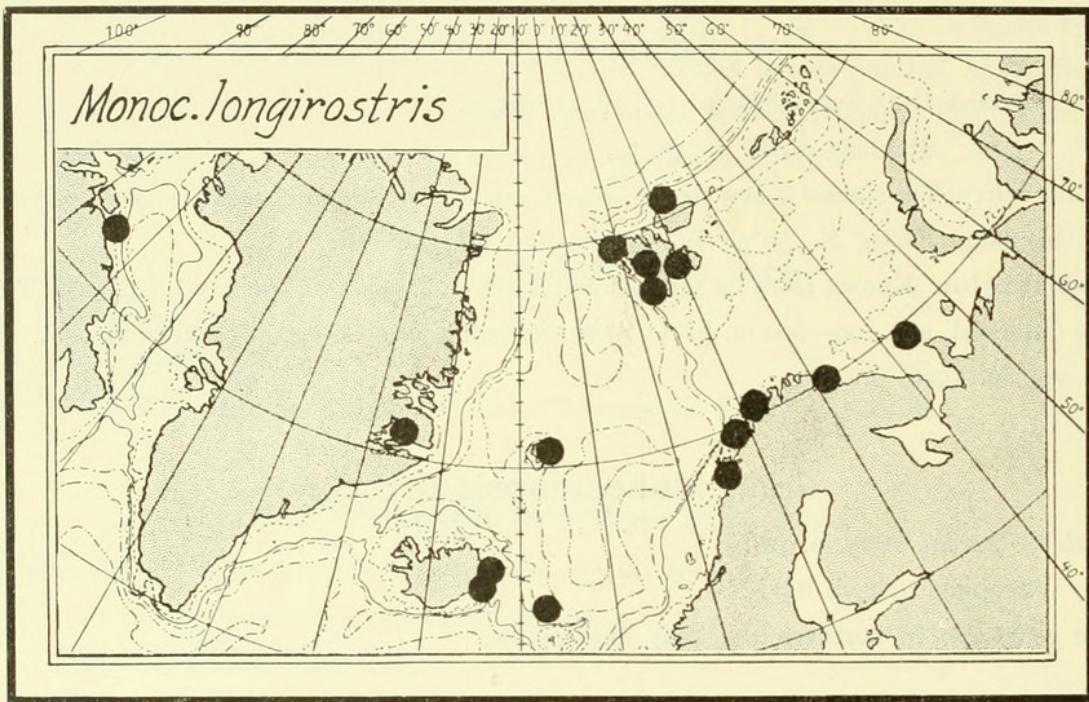


Chart 45. *Monoculodes longirostris*. (The locality in the Gulf of St. Lawrence is outside the chart.)

Occurrence. This species has been secured at 5 localities; it is new to the area.

E. Greenland: Hurry Inlet, 140 m. (E. Greenl. Exped., 7-8-1900, Søren Jensen leg.).

Jan Mayen: 100 m. (Søren Jensen leg. 25-6-1900).

S.E. Iceland: Faskrudfjörður, 40—100 m., blue clay (R. Hörring leg. 7-7-1899).

— Breidalsvik, 19 m., sand ("Diana" 16-8-1900, A. C. Johansen).

N. of the Faroes: 63°26' N., 7°56' W., 887 m., ÷ 0.6° ("Ingolf" St. 138).

Only a single species was taken at a time.

Distribution. A widely distributed, mainly arctic species, found from the arctic America to Spitsbergen and the Barents Sea, depths down to abt. 100 (887) m. In Europe its southern limit is the Saltenfjord (Norway, abt. 67¼° N.), but not the Kattegat (the specimen noted by Meinert 1890 is in reality *Westwoodilla hyalina*, see K. Stephensen, Vid. Medd. vol. 82, 1926, p. 84). For special localities see Oldevig 1917, p. 26, and Sparre Schneider, Tromsø Mus. Årshefter 47, 1924 (1926), no. 8, p. 29; it prefers especially the



sheltered fjords (Schneider l. c.). Also found in the Bernard Harbour, Dolphin and Union Strait (Canada, ca. 70° N., 115° W.), 4 m. (Shoemaker 1920, p. 12). Recently it has been found in the Gulf of St. Lawrence: near Cape Breton, 75—85 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 284).

245. **Monoculodes kröyeri** Boeck.

*Monoculodes kröyeri* G. O. Sars 1895, p. 305, pl. 108 fig. 2.

— — Stebbing 1906, p. 261.

Occurrence. This species is noted from a few localities in W. Greenland abt. 64-73° N.: Godthaab 12—19 m.; Atanikerdluk, 48 m., sand and stones; Nugsuak, 12 m., mud, clay and sand; Upernivik (H. J. Hansen 1887, p. 112); it has not been secured by the "Ingolf" or any of the recent expeditions.

Distribution: S.W. Norway: Haugesund, depth? (Boeck 1870, p. 166; type-locality).

\*246. **Monoculodes pallidus** G. O. Sars.

*Monoculodes pallidus* G. O. Sars 1895, p. 299, pl. 106 fig. 3.

— — Stebbing 1906, p. 261.

Occurrence. This species has been taken at two localities; it is new to the area.

S. Iceland: 63°27' N., 19°37' W., 84 m. ("Thor" St. 194, 16-7-1904).

S.W. of the Faroes: 61°08' N., 9°28' W., 820 m. ("Thor" St. 78, 12-5-1904).

Distribution. Found "in a few places off the west coast of Norway, and recently also in the Trondhjemsfjord and at Apelvær, Namdal", depths abt. 120—375 m. (G. O. Sars).

247. **Monoculodes borealis** Boeck.

*Monoculodes borealis* G. O. Sars 1895, p. 298, pl. 106 fig. 2.

— — Stebbing 1906, p. 262.

Occurrence. The species has been taken by the "Ingolf" at a single locality.

W. Greenland: Ameragdla (near Ameralik, 64°12' N.), mud ("Ingolf" 22-7-1895).

E. Greenland: Cape Dan near Angmagssalik, 20—30 m., rocky bottom, a few algæ (Amdrup Exped. 7-6-1899).

S.E. Iceland: Breidalsvik, 12 m., mud and black sand ("Diana" 19-7-1900, A. C. Johansen).

It has been noted from several localities in W. Greenland abt. 60°—70° N., 5—abt. 20 (190) m. (K. Stephensen, Conspectus 1913, p. 154, and 1916, p. 288), and from 2 localities at E. Greenland, abt. 76<sup>3</sup>/<sub>4</sub>° N., 0—12 m. (K. Stephensen, Danmark-Exped. 1912, p. 533).

Distribution. Widely distributed, from Greenland to Spitsbergen 4—35 m., Franz Josef Land and the Kara Sea 6—30 m.; for special localities see Stappers 1911, p. 36, and Oldevig 1917, p. 26. The southernmost localities are: Nova Scotia, S. Greenland, S. E. Iceland, and the Trondhjemsfjord (Oldevig 1917). It is also noted from W. Scotland: Blackwater-foot, Arran (in the Firth of Clyde), 40 m., muddy sand (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 50), and from Halifax 40 m. and Gulf of St. Lawrence (very common), 30—93 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 279).



248. *Monoculodes crassirostris* H. J. Hansen.

*Monoculodes crassirostris* H. J. Hansen 1887, p. 108, pl. 4 fig. 5.

— — Stebbing 1906, p. 263.

Occurrence. Of this species only the two type-specimens are known; they were taken in the Davis Strait (without special locality) along with *Priscillina armata* (Boeck) (H. J. Hansen l. c.).

249. *Monoculodes latimanus* (Goës).

*Monoculodes latimanus* G. O. Sars 1895, p. 304, pl. 108 fig. 1.

— — Stebbing 1906, p. 364.

Occurrence. This species was not secured by the "Ingolf"-Expedition; material, not recorded in the literature, is present from the following localities in the area.

W. Greenland: Egedesminde, 20 m., clay. 12-8-1890. Bergendal leg.

E. Greenland: Danmarks Ø, 10—12 m., mud and stones (E. Bay leg. 23-2-1892), and *ibid.*, in the harbour, mud (E. Bay leg. 22-9-1891). — Rosenvinge's Bugt (Scoresby Sound), 10—12 m., 27-10-1924 (Scoresby-Sound Exped. ded.). — Sabine Island, 6—10 m. (E. Greenland-Exped., 13-7-1900, Søren Jensen leg.).

E. Iceland. Bakkafjörðr, 90—100 m., clayish sand, 14-6-1900 ("Diana", A. C. Johansen). — Eskifjörðr, 34 m. ("Diana" 1886, Prem.-lieuten. Jensen). — Faskruðfjörðr, 40—100 m., blue clay (R. Hörring leg. 7-7-1899). — Berufjörðr, 12 m., mud with black sand ("Diana" 19-7-1900, A. C. Johansen).

This littoral species has been recorded from numerous localities in W. Greenland abt. 60°—71° N. and from 3 localities in E. Greenland abt. 70<sup>1</sup>/<sub>2</sub>°—76<sup>3</sup>/<sub>4</sub>° N. (K. Stephensen, *Conspectus* 1913, p. 152, and *Meddel. om Grönl.* vol. 53, 1916, p. 287). The depths are (o) 10—80 (135) m., and the bottom very often clayish or stony.

Distribution. A mainly arctic species, known from Gulf of St. Lawrence, Greenland and Iceland (see above), W. and N. Spitsbergen 85 m., Franz-Josef Land, south coast of Novaja Zemlya 61—90 m., and Norway from Vadsö to Namdal (abt. 65° N.) down to abt. 100 m. (for special localities see Stappers 1911, p. 34). Recently it has been found in the Gulf of St. Lawrence, 6 loc., 30—93 m. (80 spec.) (Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930, p. 284).

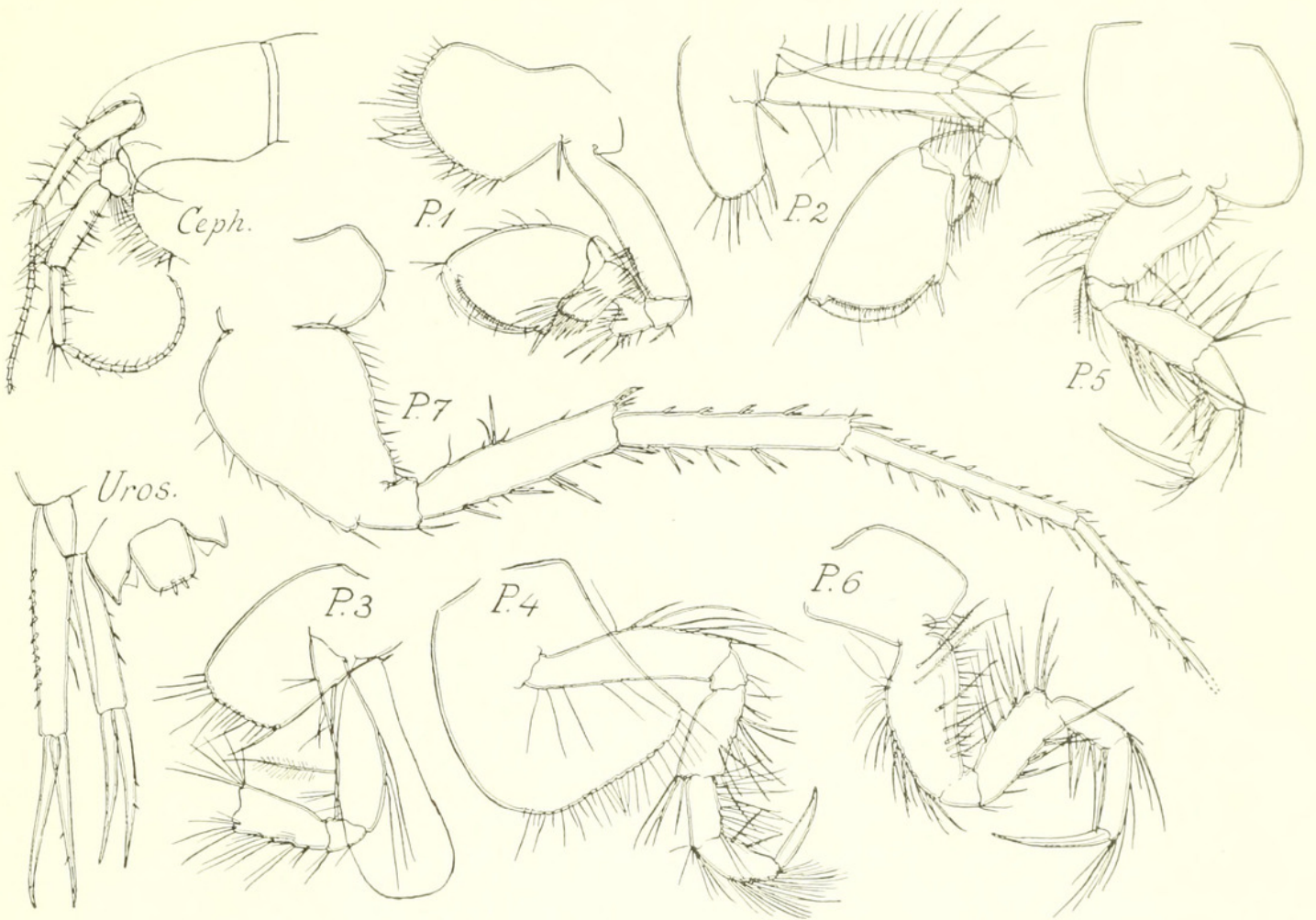
\*250. *Monoculodes latissimanus* n. sp. (Fig. 70).

Occurrence. A single specimen of this new species was secured by the "Ingolf":—

W. Greenland: 63°30' N., 54°25' W., 1096 m., temp. 3.3°. 1 ♀ abt. 7 mm. ("Ingolf" St. 25).

Description of ♀ with large marsupial plates, 7 mm. The present species is rather closely allied to *M. latimanus* (see above), but it still more deviating from the other species within the genus. The frontal process is only feebly curved and covers the proximal <sup>3</sup>/<sub>4</sub> of the first joint of antenna 1. Eyes could not be found. Antenna 1—2 not essentially deviating from those of *M. latimanus*. The oral parts were not dissected out. Pereiopod 1 has the side plate extremely widened distally; the fifth joint has a process on the fore edge, and the hind lobe extremely broad, as broad as long, reaching to the middle of the hind edge of 6th joint,



Fig. 70. *Monoculodes latissimanus*.

and with the end oblique. The 6th joint is extremely broad, nearly as broad as long, with the palm not much longer than the hind edge, and with a strong spine on the hind corner of the palm. Pereiopod 2 resembles pereiop. 1, but the process on 5th joint and the 6th joint are not so broad, and yet they are much heavier than those of *M. latimanus*. Pereiopods 3—7 resembling those of the said species, except that the dactyli are longer (nearly as long as the two preceding joints together; the dactylus of pereiopod 7 has lost the apex), and the second joint of pereiopod 5—6 is narrower, with the hind margin concave. On the uropods 1—2 (no. 3 is lost) nothing of especial interest is to be noted; the telson is shaped as in *M. latimanus*, but the apical spines are more heavy.

Remarks. The species is easily recognisable especially in having pereiopods 1—2 extremely heavy, with 6th joint even broader than in *M. latimanus*.

#### 251. *Monoculodes tessellatus* Sparre Schneider.

*Monoculodes tessellatus* G. O. Sars 1895, p. 297, pl. 106, fig. 1.

— — Stebbing 1906, p. 264.



Occurrence. This species is not known from Greenland; but it has been taken several times at Iceland and once at the Faroes. The localities are:—

N. Iceland: near Husavik, 80 m. ("Thor" St. 117, 1-7-1906) and 9—110 m. ("Thor" St. 128, 1-6-1904).

N.E. Iceland: Thistilfjörðr, Grenjaness in E. 20° S., 4 miles, 90 m., sandy clay ("Beskytteren", 25-6-1904).

E. Iceland: Seyðisfjörðr, 40 m. ("Thor" St. 30, 22-5-1903). — Eskifjörðr, 32 m. ("Diana" 1886, Premierl. Jensen). — Faskrudfjörðr, 40—100 m., blue clay (R. Hörring leg. 17-7-1899). — ? Breidalsvik, 12 m., mud with black sand ("Diana" 19-7-1900, A. C. Johansen leg.). — 65°41' N., 14°09' W., 63 m. ("Thor" St. 201, 20-7-1904). —

S. Iceland: 63°18' N., 21°30' W., 178 m. ("Thor" St. 176, 8-7-1904). — 63°46' N., 22°56' W., 150 m. ("Thor" St. 171, 2-7-1904).

The Faroes: Kongshavn, 50—70 m. ("Diana" 1886, Premierl. Jensen).

The species is thus found as new to Iceland along the coasts of the eastern half of the island, from abt. 17° W. on the north coast to abt. 23° W. on the south coast.

Distribution. The species is rather common in N. Norway, found in several places from Malangen (off Tromsö) to Kvænangen (abt. 70° N.), > 20 to > 100 m., but specimens recorded by Norman (Ann. Mag. Nat. Hist., ser. 7, vol. 10, 1902, p. 481) from the East Finmark are not this species, but *M. schneideri* G. O. Sars (fide Sparre Schneider, Tromsö Mus. Årshefter 47, no. 8, 1926, p. 26). N. of Cheticamp island, Gulf of St. Lawrence, 40 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 286).

#### 252. *Monoculodes simplex* H. J. Hansen.

*Monoculodes simplex* H. J. Hansen, Vid. Medd. 1887, p. 114, pl. 4 fig. 6.

— — Stebbing 1906, p. 264.

Occurrence. A few small specimens have been taken at E. Greenland:—

Tasiusak (abt. 65½° N.), two times (Kruuse leg. 25-9-1901 and 1902), and Sabine Island (abt. 74½° N.) (E. Greenland Exped. 13-7-1900).

The species was known from 3 localities at W. Greenland (the type-localities) abt. 62°—69° N., 20—50 m. (H. J. Hansen l. c.).

#### 253. *Monoculodes tuberculatus* Boeck.

*Monoculodes tuberculatus* G. O. Sars 1895, p. 303, pl. 107, fig. 3.

— — Stebbing 1906, p. 265.

Occurrence. The species has been taken at E. Greenland: Danmarks Ø (abt. 70½° N.), three times, 10—21 m., once among stones with Lithothamnion (E. Bay leg. 1892), including 1 ♀ ovig., 10 mm., secured April 20th.

In the literature it is noted from W. Greenland: Kekertak (abt. 70° N.), 115—135 m., stones (H. J. Hansen 1887, p. 113) and from E. Greenland: Danmarks Havn (abt. 76¾° N.), 10—20 m. (K. Stephensen, Meddel. om Grönl., vol. 45, 1912, p. 533). It is not known from Iceland.



Distribution. Norway from the East Finmarken to Haugesund, down to 200 m.; Spitsbergen 27—29 m.; Barents Sea 53 m.; S. of Novaja Zemlya 61—90 m.; for special localities see Stappers 1911, p. 35, and Oldevig 1917, p. 26. — Also found "a few miles east of the Island of Arran" (Firth of Clyde) (Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 50). — Recently it has been recorded from 3 loc. in the S.E. part of the Gulf of St. Lawrence, 30—93 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 286).

\*254. **Monoculodes norvegicus** (Boeck).

*Monoculodes norvegicus* G. O. Sars 1895, p. 301, pl. 107 fig. 1.

— — Stebbing 1906, p. 265.

Occurrence. This species has only been taken at a single locality:

S. of Iceland: 63°18' N., 21°30' W., 178 m. ("Thor" St. 176, 8-7-1904).

A single specimen taken at N. Iceland: Brekkusker 4 miles in West, 365 m. ("Thor" St. 148, 1-7-1903, Dr. Johs. Schmidt) probably belongs to the same species.

Distribution. The species has been found "in several places, both on the south and west coasts of Norway, and northwards even to Vadsö", abt. 100—400 m. (G. O. Sars l. c.). Trondhjemsfjord: Trondhjem and Rödberg, 40—80 m. (Norman, Ann. Mag. Nat. Hist., ser. 6, vol. 15, 1895, p. 486). ?Kattegat, 2 localities, 56—60 m. (K. Stephensen, Vid. Medd. vol. 82, 1926, p. 86). Gulf of St. Lawrence: N. of Cheticamp island, 50 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 285).

\*255. **Monoculodes subnudus** Norman.

*Monoculodes falcatus* G. O. Sars 1895, p. 302, pl. 107 fig. 2.

— *subnudus* Stebbing 1906, p. 266.

— — Chevreux & Fage 1925, p. 171, figs.

Occurrence. A few specimens, partly very badly preserved, have been secured at the following locality:—

S.E. Iceland: Breidalsvik, 12 m., mud and black sand ("Diana" 19-7-1900, A. C. Johansen).

Distribution. Norway, from Finmarken to the Oslofjord (Klosterelvfjord (E. Finmark) and Langfjord (Alten, abt. 70° N.), 10—60 m. [Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 10, 1902, p. 481]; Ure and Kirkfjord (S. Lofoten, abt. 68° N.), 70—80 m. [Nordgaard 1905, p. 184]; W. Norway northwards to Selsövik (abt. 66½° N.), abt. 100—300 m., and Soon in the Oslofjord [G. O. Sars l. c. p. 302, 693]; Rödberg in the Trondhjemsfjord, abt. 300 m. [Norman, Ann. Mag. Nat. Hist., ser. 6, vol. 15, 1895, p. 486]. Korsfjord (near Bergen, W. Norway); the Shetland Islands and the Hebrides (Sleat Sound, Isle of Skye; Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 6, 1900, p. 49). — North coast of Bretagne: Portrieux, chenal de Saint-Quay, in *Lithothamnion*, 6—9 m. (Chevreux & Fage l. c.)

256. **Monoculodes packardi** Boeck.

*Monoculodes packardi* G. O. Sars 1895, p. 307, pl. 109 fig. 1.

— — Stebbing 1906, p. 266.



Occurrence. The species was taken at 2 (4?) localities in the area:

?W. of Greenland: 61°50' N., 56°21' W., 2702 m., temp. 1.5° ("Ingolf" St. 36). A single, very defective specimen; is possibly *M. tenuirostratus* Boeck.

N. of Iceland: 66°50' N., 20°02' W. 367 m., temp. 0.6° ("Ingolf" St. 128).

E. Iceland: Reyðarfjörðr, 135 m. ("Thor" St. 192, 31-7-1903).

— ? Reyðarfjörðr 62°02' N., 13°56<sup>1</sup>/<sub>2</sub>' W., 140 m. ("Thor" St. 48, 29-4-1904).

The species is not new to the "Ingolf"-area, for it has been listed from Jan Mayen (G. O. Sars 1886, p. 50).

Remarks. The single, very defective specimen from Reyðarfjörðr ("Thor" St. 48, 1904) has pereopods 1—2 too heavy, and the same applies to some specimens from Finmarken, determined by Sars.

Distribution. On the south coast of Novaja Zemlya, two times, 90 m. (Stappers 1911, p. 34). — "Rather commonly met with along the coast of Norway, from the Oslofjord to Vadsö", 20—200 m., especially in soft bottom (G. O. Sars l. c.) (Special localities are listed by Sp. Schneider 1884, p. 87; G. O. Sars 1886, p. 50 and 1891—95, p. 309; Norman 1900, p. 50, and 1902, p. 481, and by Sp. Schneider 1926, p. 29). — In Danish waters it is found from (? the North Sea or) Skagerak to the Sound, 23—190 m. (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 86). — Scotland: Loch Striven, Firth of Clyde, 80 m., and Upper Loch Fyne (Norman 1900, p. 50). — Gulf of St. Lawrence: off Cape Breton, 75—85 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 285).

\*257. **Monoculodes rostratus** n. sp. (Fig. 71).

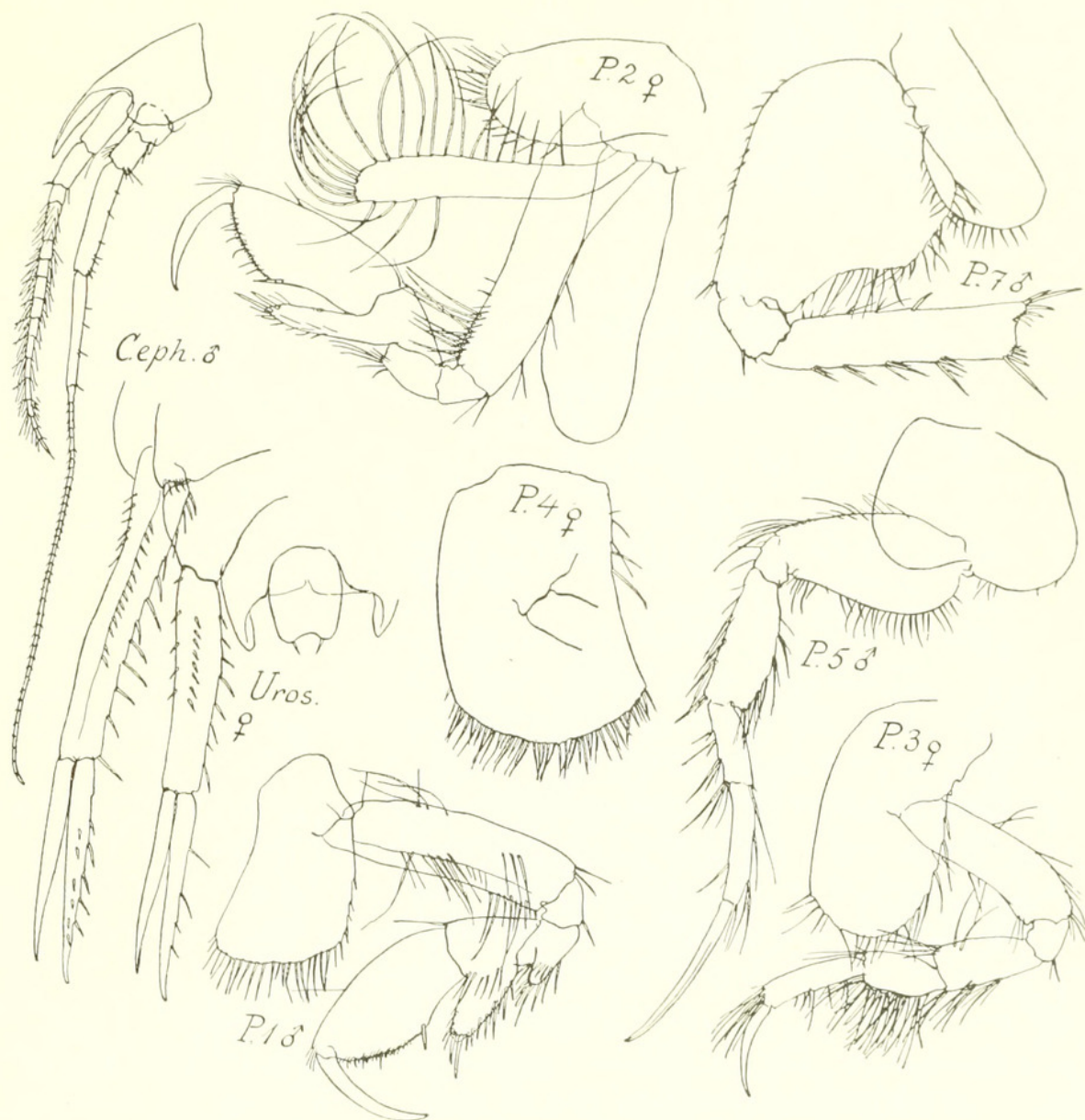
Occurrence. The "Thor" secured two specimens of this new species at a single station:

S. of Iceland: 62°57' N., 19°58' W. 957 m. 1 ♂ abt. 5.5 mm., 1 ♀ abt. 7 mm. ("Thor" St. 166, 14-7-1903).

Description of ♀ with large marsupial plates, abt. 7 mm. As regards the very long frontal process the species agrees with *M. packardi* Boeck and *M. tenuirostratus* Boeck, and the present species is altogether very closely allied to these two species, but it is not identic with any of them, as there are several important disagreements.

The body is rather slender. The frontal process is evenly but feebly curved, as long as the head behind the process, and covers the first joint and the proximal half of the second joint of antenna 1. No traces of eyes could be found. Antenna 1—2 were lost. The oral parts were not dissected out. Pereiopod has the side plate distally somewhat expanded, with the forecorner more acute than in the two species named above; the limb is upon the whole closely resembling that of *M. packardi* (Sars 1895, pl. 109 fig. 1) with the exception that the process of the fifth joint (with a couple of heavy spines on the apex) reaches to the hind corner of the palm; the palm fairly well defined, with a spine on the hind corner. Pereiopod 2 not essentially disagreeing from that of *M. packardi*, but has spines on the apex of the process of the fifth joint and a single spine on the well marked hind corner of the palm. Pereiopods 3—6 very close to those of *M. packardi*; the dactyli of pereiopods 3—4 as long as the preceding joint, those of pereiopods 5—6 as long as the two preceding joints together (pereiopods 5—6 are described from ♂, as they are lost in the ♀-spe-



Fig. 71. *Monoculodes rostratus*.

cimen). Pereiopod 7 has the second joint broad, with the lower part of the hind margin concave; the distal joints of both specimens are lost. Uropods 1—2 are long, slender, with the peduncles and inner rami spinulose, and inner rami a little longer than outer rami (urop. 3 is lost in both specimens); in urop. 2 the peduncle is as long as the inner ramus, in urop. 1  $1\frac{1}{2}$  time as long. The telson is somewhat longer than broad, its sides nearly parallel, and the apex somewhat concave, with one spine on each hind corner.

Description of ♂ abt. 5.5 mm. Apparently not differing from ♀, except possibly in the antennæ (that are lost in the ♀ specimen). Antenna 1 is as long as the cephalon + 4 mesosome segments, a little longer than the peduncle of antenna 2. The peduncle of antenna 1 rather short; the length ratio of the joints is about 4, 3, 1; the flagellum is abt. twice as long as the peduncle, and consists of 13 joints. Antenna 2 nearly



twice as long as antenna 1, and the peduncle only a trifle shorter than the flagellum. The two distal joints of the peduncle are of equal length; the flagellum has abt. 40 joints.

Remarks. In spite of the close agreement with *M. packardi* and *M. tenuirostratus* the present species is distinguished by some very good characters: the very short peduncle of antenna 1, the concave party of the hind margin of 2nd joint of pereopod 7, and the concave hind margin of the telson.

### Genus *Oedicerina* n. gen.

#### \*258. *Oedicerina ingolfi* n. sp. (Fig. 72).

Occurrence. The "Ingolf" has secured an extremely damaged specimen of this very characteristic species at the following locality:

Between the Faroes and Jan Mayen: 66°23' N., 7°25' W., 1802 m., temp. ÷ 1.1°. 1 ♀ with marsupial plates ("Ingolf" St. 104).

Description of ♀ with marsupial plates, total length abt. 12 mm.? (length of the preserved parts (head + 4 anterior segments) abt. 6 mm.).

The specimen is very badly damaged; only the following segments and limbs are preserved: the head with the oral parts and the proximal parts of the antennæ; mesosome segments 1—4; side plates of pereopods 1—2 (but these limbs totally lost except for the proximal part of second joint), and pereopods 3—4 on the right side, but not on the left side.

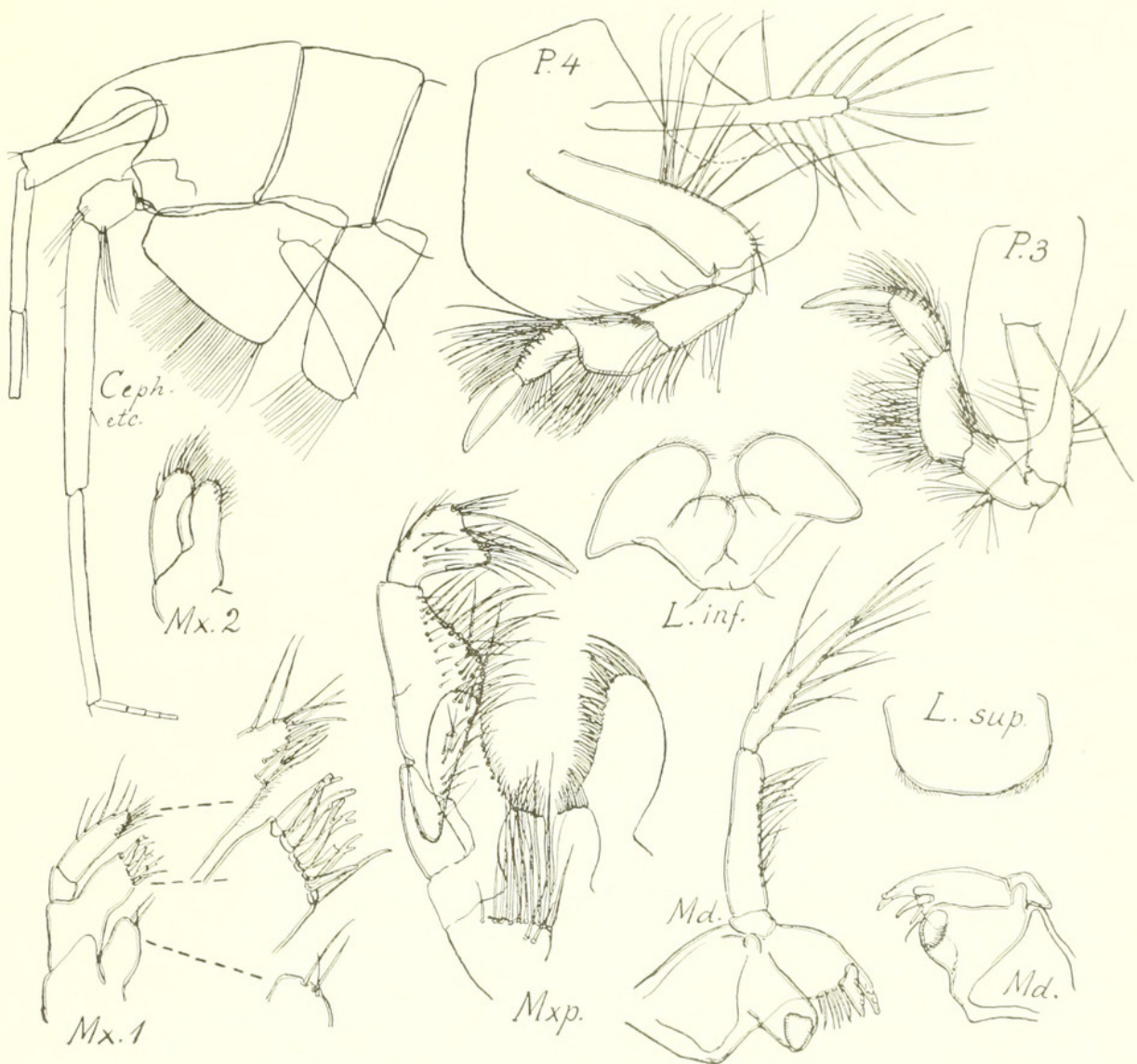
Nevertheless the preserved parts are so characteristic that the species may with certainty be determined as a new species, and it may probably be established as the type of a new genus.

The head is abt. as long as the two first segments; the rostrum as long as the rest of the head, knife-shaped, somewhat curved, acute in the apex and covering the proximal two-thirds of first joint of antenna 1; the lateral lobes rather prominent, truncate with a little emargination. No traces of eyes could be found. Of antenna 1 only the rather elongate peduncle is preserved; joints 1 and 2 are of equal length, nearly twice as long as the third joint. The peduncle of antenna 2 is nearly twice as long as that of antenna 1; 4th joint is somewhat longer and much heavier than 5th joint.

Of the oral parts the upper and under lips and the two maxillæ do not differ essentially from those of *Oedicerus* (Sars 1895, pl. 102). The mandibles have the molar expansion well developed and the palp long, with third joint apically narrowed. The maxillipedes have a rather characteristic shape, with the two pairs of lobes rather large; the palp has the second joint almost triangular, broadest a little beyond the middle; the third joint has a distal elongation on the median side of the long, heavy 4th joint.

Pereopod 1 has the side plate nearly triangular (the rest of the limb is totally lost except for a little of second joint); with truncate forecorner, and long setæ on the under margin. There are setæ also on the under margin of the narrow side-plate of pereop. 2 (the rest of the limb is lost), but there are no setæ (lost?) on the under margins of sideplates 3—4. Pereopod 3 has the sideplate a little broader than that of pereop. 2; 5th joint is as long as 4th joint, widened on the underside and with long stiff setæ; 6th joint is somewhat narrower and shorter, the heavy dactylus a little longer than the 6th joint. The sideplate of



Fig. 72. *Oedicerina ingolfi*.

pereiopod 4 has a rather strange shape; there is a very large hind lobe, still longer than that of *Oediceropsis* (Sars 1891—95, pl. 114), and this is a solitary case within the family, for all the other genera have the hind edge feebly concave, without any emargination for the 5th sideplate. The rest of the limb is in shape not very different from that of pereiopod 3. All the other appendages are totally lost.

Remarks. No doubt it is very bold to establish a new genus based upon a single, very damaged specimen that has lost even limbs which are from a systematic point of view as important as the two first pairs of pereiopods. The large hind lobe of the 4th sideplate, however, seems to be of so great importance as generic character, even if all other features should appear to coincide with already described species or genera, that the establishment of a new genus is justified. It is to be hoped that future expeditions will procure better preserved specimens.



## Fam. Tironidæ Stebbing.

*Syrrhoidæ* G. O. Sars 1895, p. 388.

*Tironidæ* Stebbing 1906, p. 273.

Stebbing (1906) refers 7 genera to the family. One of these genera, *Argissa*, has later on been made the type of a new family, *Argissidæ* (by A. O. Walker 1904; see *Argissidæ*, the present paper p. 260). In return 4 genera have been established during the years from 1906 till now, viz., *Alexandrella* (Chevreux, in Antarct. Expéd. Française, 1913, p. 134, figs.), *Austrosyrrhoë* (Barnard, see below p. 258), *Bruzeliopsis* (Chevreux, in Bull. Monaco, no. 204, 1911, p. 3, with figs.), and *Liouvillea* (Chevreux, l. c. 1913, p. 139, with figs.).

In the "Ingolf"-area 6 genera with 7 species have been found; 5 of these species are new to the area, 2 of them even new to science (*Bruzelia dentata*, *Austrosyrrhoë* (?) *septentrionalis*).

### Genus *Bruzelia* Boeck.

*Bruzelia* G. O. Sars 1895, p. 394.

— Stebbing 1906, p. 274.

2 species are found to be new to the area, one of them, *B. dentata*, even new to science.

#### \*259. *Bruzelia tuberculata* G. O. Sars.

*Bruzelia tuberculata* G. O. Sars 1895, p. 397, pl. 139 fig. 2.

— — Stebbing 1906, p. 275.

Occurrence. The "Thor" has secured this species at a single station; it is new to the "Ingolf"-area. S.W. of the Faroes: 61°15' N., 9°35' W. 900 m. Abt. 25 spec. ("Thor" St. 99, 22-5-1904).

There are no ♀ ovig. and no ♂ in the material (the ♂ is probably unknown).

Distribution. Norway: The Lofoten Isles, and at Bejan in the outer part of the Trondhjemsfjord, abt. 200—600 m. (G. O. Sars l. c.).

#### \*260. *Bruzelia dentata* n. sp. (Fig. 73) (Chart 46, partim).

Occurrence: This new and very characteristic species was taken by the "Ingolf" at 8 stations in the Arctic Polar Basin.

S. of Jan Mayen: 68°27' N., 8°20' W., 1996 m., temp. ÷ 1.0°. 1 spec. ("Ingolf" St. 118).

N.E. of Iceland: 67°29' N., 11°32' W., 1667 m., temp. ÷ 1.0°. 1 spec. ("Ingolf" St. 120).

E. of Iceland: 66°23' N., 10°26' W., 1412 m., temp. ÷ 0.9°. 2 spec. jun. ("Ingolf" St. 102).

— 66°23' N., 8°52' W., 1090 m., temp. ÷ 0.6°. 1 spec. ("Ingolf" St. 103).

— 66°23' N., 7°25' W., 1802 m., temp. ÷ 1.1°. 3 spec. ("Ingolf" St. 104).

— 65°34' N., 7°31' W., 1435 m., temp. ÷ 0.8°. 1 spec. ("Ingolf" St. 105).

N. of the Faroes: 63°36' N., 7°30' W., 1322 m., temp. ÷ 0.6°. 6 spec. (incl. ♀ ovig.) ("Ingolf" St. 139).



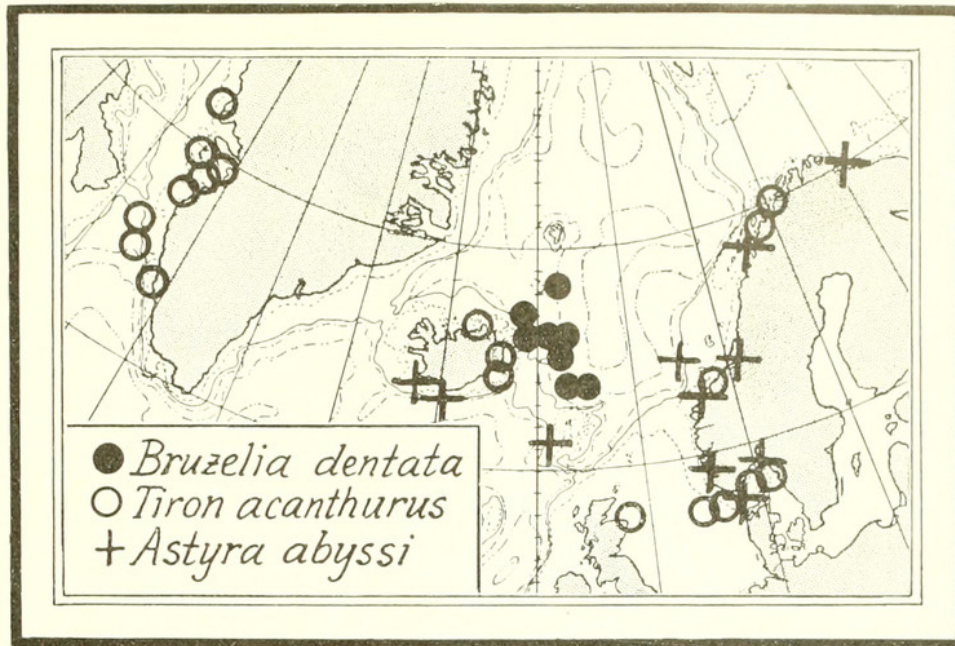


Chart 46. *Bruzelia dentata*, *Tiron acanthurus*, *Astyra abyssi*.

(*Tiron acanthurus* has recently been found at a few American localities outside the chart.)

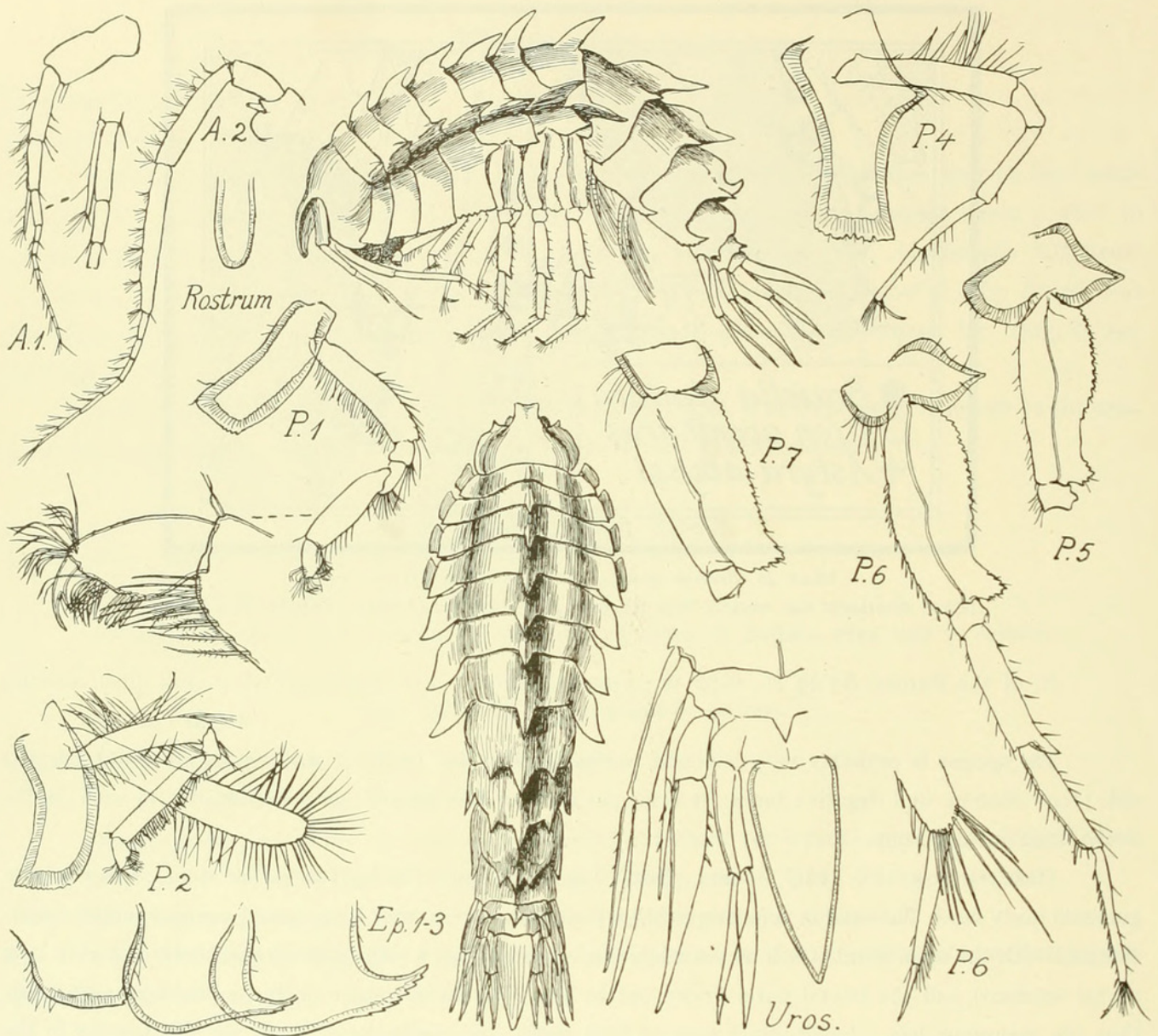
N. of the Faroes:  $63^{\circ}29' N.$ ,  $6^{\circ}57' W.$ , 1469 m., temp.  $\div 0.9^{\circ}$  (type-locality), 8 spec. (incl. ♀ ovig.)  
("Ingolf" St. 140).

The species is probably very common in the Arctic Polar Basin; it was secured at 8 stat., depths abt. 1100—2000 m. and negative temp., it is 44 per cent. of the "Ingolf" stations (totally 18) with depths  $>$  abt. 1100 m. and temp.  $< 0^{\circ}$ .

Description of ♀ ovig., 16 mm., from "Ingolf" St. 140. The body is rather stout, with the integuments fairly hard. The head is very deep, with a deflexed rostrum, that is somewhat concave on the upper side and with the apex blunt. Each of the mesosome segments has a long medio-dorsal tooth (not very long on 1st segment) and the lateral parts drawn out to long outgrowths (acute on the 4 hindmost segments); thus the mesosome has 3 longitudinal rows of long teeth. The medio-dorsal teeth are still heavier in the metasome, and each segment has in addition a pair of latero-dorsal teeth; the medio-dorsal tooth on 3rd segment ends in an upturned apex behind a depression. The 1st metasome segment has the epimeral part nearly rectangular; the two next segments have the lower hind corner drawn out into a long acute process (in 3rd segment much broader than in 2nd segment), with denticulation on the ventral margin. The 1st urosome segment has the dorsal side somewhat inflated; 2nd segment has a little medio-dorsal tooth, 3rd segment is quite even. The telson is abt. 3 times as long as broad, evenly acute towards the apex, reaches nearly to the apex of the uropoda.

No traces of eyes could be found. Antenna 1 does not reach to the distal end of the peduncle of antenna 2. 1st joint is very heavy, longer than 2nd joint, this one longer than third; accessory flagellum 1-articulate, a little longer than the first (long) joint of the flagellum. The flagellum a trifle shorter than the peduncle, with 10 joints. Antenna 2 abt.  $1\frac{1}{2}$  time as long as ant. 1; 4th and 5th joint rather long, subequal



Fig. 73. *Bruzelia dentata*.

in length; the flagellum not much longer than 5th joint of the peduncle, with 7 joints. The oral parts not essentially disagreeing with those of the type-species (*B. typica*, G. O. Sars 1895, pl. 138).

The sideplates of the pereopods 1—3 nearly alike, somewhat curvate, with the ventral margin finely and unevenly serrate or denticulate. The 4th sideplate has the same shape as nos. 1—3, apart from the process on the hind margin, and is quite different from that of the other species of the genus which have the foremargin convex, not concave. The sideplates 5—6 have the hind lobe acute; no. 7 is oval-quadrangular. Pereiopods 1—4 have about the same shape as those of *B. typica*; but the palm of pereiop. 1—2 is defined by 4 stout spines (not by a single), 5th joint in pereiop. 2 is almost as long as 2nd joint, and in pereiop. 3—4 are the 4th, 5th and 6th joints of equal length (in *B. typica* 5th joint is twice as long as 4th joint and



abt.  $1\frac{1}{2}$  time as long as 6th joint). Pereiop. 5—7 have the 2nd joint rather narrow, with a longitudinal carina on the outer side; in pereiop. 5—6 the joint has on the foremargin setæ or spines, and the hind margin is serrate, with an incurvation above the projecting hind corner; in pereiop. 7 the fore- and the hind-margins of the joint are almost parallel. In these 3 pairs of pereiopods the 4th, 5th, and 6th joints are of nearly equal length, and 4th joint has the lower hind corner somewhat projecting; the 7th joint is acute, with the apex articulate. The uropoda have abt. the same shape as those of *B. typica*, but are more slender.

The specimens may attain a length of up to abt. 16 mm.

The type specimen has abt. 30 eggs of a size abt. 0.8 by 0.9 mm.

No ♂ could be found.

Remarks. 4 species of the genus were hitherto described, viz. *B. typica* Boeck and *B. tuberculata* G. O. Sars (Species no. 259) (these two are N.E. Atlantic, abt. 150—550 (900) m., described by G. O. Sars 1895, p. 395 seq., pls. 138—139), *B. australis* Stebbing (Mem. Austral. Mus., Sydney, vol. 4, 1910, p. 590, pl. 50\*, from N.S. Wales, abt. 100 m.), and *B. diodon* Barnard (Ann. S. African Mus., vol. 15, 1916, p. 168 (no. figs.), from Cape Point, abt. 1200 m.).

With the strong dorsal armature (— and the specific name is an allusion hereto —) it is most closely allied to *B. australis*, but this species has no processes on the lateral sides and is much smaller (3 mm. only). The present species cannot be confused with any other species of the genus; the heavy armature is common to several other Amphipods belonging to the depths of the Polar Basin (e.g. *Acanthostepheia malmgreni* (Goës), *Cleippides quadricuspis* Heller, *Paramphithoë hystrix* (Ross) (= *Acanthozone cuspidata* (Lepechin)).

### Genus *Tiron* Lilljeborg.

*Tiron* G. O. Sars 1895, p. 398.

— Stebbing 1906, p. 275.

The genus has only one northern species.

#### 261. *Tiron acanthurus* Lilljeborg (Chart 46, partim).

*Tiron acanthurus* G. O. Sars 1895, p. 399, pl. 140.

— — Stebbing 1906, p. 276.

Occurrence. This species is at hand from five new localities in the "Ingolf"-area, viz.:

W. Greenland:  $65^{\circ}16' N.$ ,  $55^{\circ}05' W.$ , 682 m., temp.  $3.6^{\circ}$  ("Ingolf" St. 35).

—  $66^{\circ}35' N.$ ,  $56^{\circ}38' W.$ , 600 m., temp.  $3.9^{\circ}$  ("Ingolf" St. 32).

N.E. Iceland: Bakkafjörðr, 80—100 m., sandy clay ("Diana" 14-6-1900).

E. Iceland: Faskruðfjörðr, 40—100 m., blue clay (R. Hörring leg. 17-7-1899).

—  $64^{\circ}58' N.$ ,  $13^{\circ}25' W.$ , 76 m. ("Thor" St. 27, 16-5-1903).

It has been found at abt. 10 localities at W. Greenland, abt.  $64^{\circ}$ — $72\frac{3}{4}^{\circ} N.$ , abt. 40—150 m. (H. J. Hansen 1887, p. 104).

Distribution. Norway, from the Finmarken to Arendal on the south coast, abt. 40—120 m. G. O. Sars l. c.; Kristiansund in W. Norway is the type-locality). Skagerak, 6 localities, 90—140 m. (K. Ste-



phensen, Vid. Medd., vol. 82, 1926, p. 87). 57°54' N., 4°48' E., 100 m., fine sand and clay (Reibisch 1907, p. 190). Off the Aberdeenshire coast (*Tessarops hastata*; Norman, Ann. Mag. Nat. Hist., ser. 4, vol. 2, 1868, p. 412.) — Recently it has been recorded from 3 loc. in the S.E. part of the Gulf of St. Lawrence, 30—93 m., and from the La Have bank, off Nova Scotia, 85 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 291).

### Genus *Astyra* Boeck.

*Astyra* G. O. Sars 1895, p. 213.

— Stebbing 1906, p. 278.

The position of this genus is somewhat questionable; it does not agree with any of the existing families. Boeck (and Sars) referred it to the *Amphilochidae*, though it has some relations to the *Pardaliscidae* (the mandibles with the molar very small; the maxillipedes with very broad outer plates; the first antenna with a distinct (though small) accessory flagellum). Stebbing (1906) has removed the genus to the fam. *Tironidae*, without giving any explanation; also in this family its position is not the natural one, but it is proposed to let it remain here, until a more suitable position may be found.

The genus has only one species.

#### \*262. *Astyra abyssi* Boeck (Chart 46, partim).

*Astyra abyssi* G. O. Sars 1895, p. 214, pl. 73.

— — Stebbing 1906, p. 278.

Occurrence. The species is new to the "Ingolf"-area and has been taken five times by the "Thor" and possibly once or twice by the "Ingolf".

S.W. of Iceland: 63°46' N., 22°56' W. 150 m. ("Thor" St. 171, 2-7-1904).

S. of — 63°5' N., 20°7' W. 557 m. ("Thor" St. 167, 14-7-1903).

— — 63°15' N., 20°04' W. 216—326 m. ("Thor" St. 171, 16-7-1903).

S.W. of the Faroes: 61°07' N., 9°30' W. 835 m. ("Thor" St. 78, 12-5-1904).

— — 61°15' N., 9°35' W. 900 m. ("Thor" St. 99, 22-5-1904).

? Between the Faroes and Jan Mayen: 66°23' N., 7°25' W., 1802 m., ÷ 1.1°. 1 ♀ with marsupial plates, abt. 16 mm., very defective ("Ingolf" St. 104).

? N. of the Faroes: 63°26' N., 7°56' W., 887 m., ÷ 0.8°. 1 ♀ ovig., very defective. ("Ingolf" St. 138).

Remarks. The specimen from St. 104 is enormous, 16 mm. in length (the size is usually 8 mm.), but unfortunately it could not be identified with certainty, as it is very defective.

As a rule only a few specimens were secured at a time.

Distribution (Chart 46, partim (p. 253)). Found at several places from Vadsö to the Oslofjord, abt. 100—660 m. (G. O. Sars 1895, pp. 215, 690; Norman 1895, p. 485; K. Stephensen, Vid. Medd. vol. 82, 1926, p. 88). 64°02' N., 5°35' E., 911 m., ÷ 1.1°, clay (G. O. Sars 1886, p. 47).

### Genus *Syrrhoites* G. O. Sars.

*Syrrhoites* G. O. Sars 1895, p. 391.

— Stebbing 1906, p. 279.

Only one species was found (as new) in the area.



\*263. *Syrrhoites serratus* G. O. Sars (Chart 47, partim).

*Syrrhoites serrata* G. O. Sars 1895, p. 392, pl. 137.

— *serratus* Stebbing 1906, p. 729.

Occurrence. The "Ingolf" secured the species as new to the area:

S.W. of Iceland: 60°37' N., 27°52' W. 1505 m., temp. 4.5°. 4 spec. ("Ingolf" St. 78).

Distribution. Along the Norwegian coast from the Lofoten Isles to Skagerak, abt. 300—660 m. (G. O. Sars 1895; K. Stephensen, Vid. Medd. vol. 82, 1926, p. 88). The types were taken 66°41' N. 6°59' E., 640 m., temp. ÷ 0.9°, coarse clay (G. O. Sars 1885, p. 182).

Genus *Syrrhoë* Goës.

*Syrrhoë* G. O. Sars 1895, p. 389.

— Stebbing 1906, p. 281.

Only one species has been found in the "Ingolf"-area.

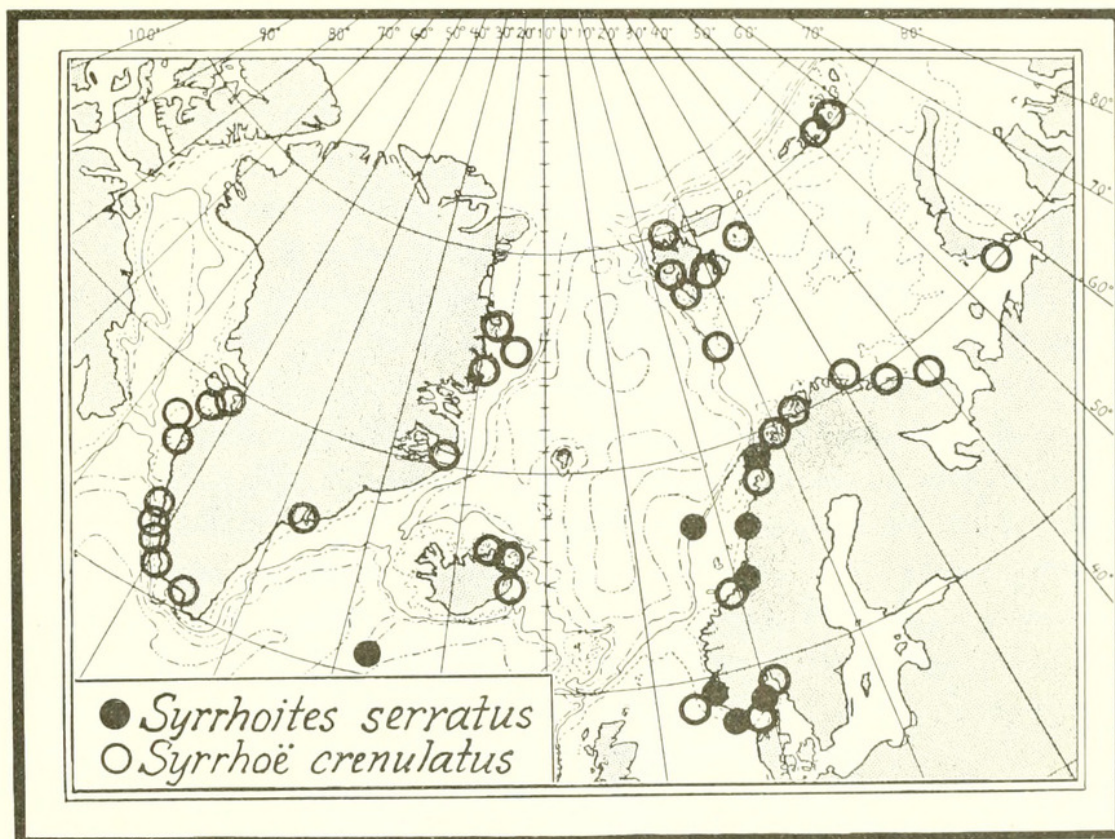


Chart 47. *Syrrhoites serratus*, *Syrrhoë crenulatus*. (The last-named species has been recorded from a number of localities in the Gulf of St. Lawrence, outside the chart.)

264. *Syrrhoë crenulata* Goës (Chart 47, partim).

*Syrrhoë crenulata* G. O. Sars 1895, p. 390, pl. 136.

— — Stebbing 1906, p. 282.

Occurrence. This species was secured by the "Ingolf" at two localities:

W. Greenland: 67°57' N., 55°30' W. 66 m., temp. 0.8° ("Ingolf" St. 33).



W. Greenland: Mouth of the Ameralikfjord (near Godthaab), 10—135 m., shells ("Ingolf"-Exped. 23-7-1895).

E. Greenland: Tasiusak (65°37' N.), under the ice, 30—40 m., rocks with algæ, and 40—60 m., stones and algæ (Amdrup-Exped. 20(25)-5-1899).

N.E. Iceland: Bakkafjörðr, abt. 80—100 m., clayish sand. ("Diana" 14-6-1900).

— 65°41' N., 14°09' W. 63 m. ("Thor" St. 201, 20-7-1904).

E. Iceland: Faskrudfjörðr, 40—100 m., clay (R. Hörring leg. 7-7-1899).

It has been recorded from abt. 20 localities in W. Greenland, abt. 60°—70° N., abt. 10—50 (135) m. (K. Stephensen 1913, p. 145, and Medd. om Grönl. vol. 53, 1916, p. 287), and from 5 localities at E. Greenland, abt. 70½°—76¾° N., 10—20 (300—0) m. (K. Stephensen 1913, p. 145).

There are no ♀ with eggs in the material.

Distribution outside the "Ingolf"-area. East coast of N. America: Grand Manan and St. Lawrence Gulf (Smith & Harger, in Trans. Conn. Acad. vol. 3, 1876). — Recently it has been recorded from 10 loc. in the Gulf of St. Lawrence, 12—93 m. and from other N.E. American localities (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 291).

Franz Josef Land: Flora Cottage 29 m., and West Bay, Cape Flora (Scott 1899, p. 75.) — South coast of Novaja Semlya, 90 m. (Stappers 1911, p. 52). — Spitsbergen, 8 finds, viz.: W. Spitsbergen: Hornsund 16—31 m., sand with gravel (Brüggen 1907, p. 227), Green Harbour in the Icefjord 78°04' N., 14°13' E. (Grieg 1909, p. 527); N. Spitsbergen: Treurenberg Bay 79°55' N., 66°55' E., 22—84 m., 0.08° (Grieg 1909, p. 527), and Shoal Point, Verlegenhoek and Treurenberg Bay, algæ etc. (Goës 1866, p. 528; type-localities); E. Spitsbergen: Kong Karls Land, 85 m., and West Thymen Strait, 38 m. (Schellenberg 1924, p. 204). — Close S. of the Bear Island, 64 m., stones, 1.1° (G. O. Sars 1886, p. 48). — Murman coast (Jarzynsky 1870). — Numerous localities along the Norwegian coasts from Vadsö to the Oslofjord, "sometimes in great abundance", depths (40) 150—200 (330) m. (G. O. Sars 1886, p. 48, and 1895, p. 390; Sp. Schneider 1884, p. 76, and 1926, p. 38; Norman 1895, p. 488; Nordgaard 1905, p. 184; K. Stephensen 1926, p. 88). — 58°32' N., 4°18' E., 280 m. ("Thor" St. 3, 30—4—1903; specimens in the Copenhagen Zool. Museum).

The variety *S. crenulata* Goës var. *psychrophila* Monod is antarctic, found 70°48' S., 91°54' W., abt. 400 m., and 71°19' S., 87°37' W., abt. 400 m. (Monod, Tanaidacés.... et Amphipodes; "Belgica"-Exped. 1926, p. 54).

### Genus *Austrosyrrhoë* Barnard.

*Austrosyrrhoë* Barnard, Ann. South African Mus., vol. 20, 1925, p. 354.

Barnard has l. c. 1925 established the genus *Austrosyrrhoë* and gives the following diagnosis: "Like *Syrrhoë* Goës, but body dorsally carinate, gnathopod 1 stout, more robust than gnathopod 2, with the 5th joint broad, both gnathopods simple, side-plate 1 widened below and side-plate 4 almost as deep as 3."

Barnard had only a single specimen of a single species which he calls *A. crassipes* (from near Cape Point, abt. 1325 m.); he gives a description of the species, but unfortunately only a single figure (of pereopod 1 (Barnard: gnathopod 1)).

The "Ingolf" has secured a couple of specimens which are possibly to be referred to the same genus, though they disagree with the generic diagnosis in several characters.



\*265. *Austrosyrrhoë* (?) *septentrionalis* n. sp. (Fig. 74).

Occurrence. The "Ingolf" has secured two specimens; a third specimen probably belongs to the same species.

W. of Greenland: 61°50' N., 56°21' W., 2702 m.; temp. 1.5°. 1 ♀ jun., abt. 3 mm. (the type) ("Ingolf" St. 36).

Between Iceland and Greenland: 64°45' N., 29°06' W., 1070 m., temp. 4.4°. 1 spec. (sex?) abt. 3 mm. ("Ingolf" St. 90).

?E. of Jan Mayen: 70°32' N., 8°16' W. 885 m. Clay bottom with small stones, 27-6-1891. 1 spec. abt. 2 mm.

Description of ♀ jun. (with small marsupial plates), abt. 3 mm., from "Ingolf" St. 36, compared with the type species, *A. crassipes*.

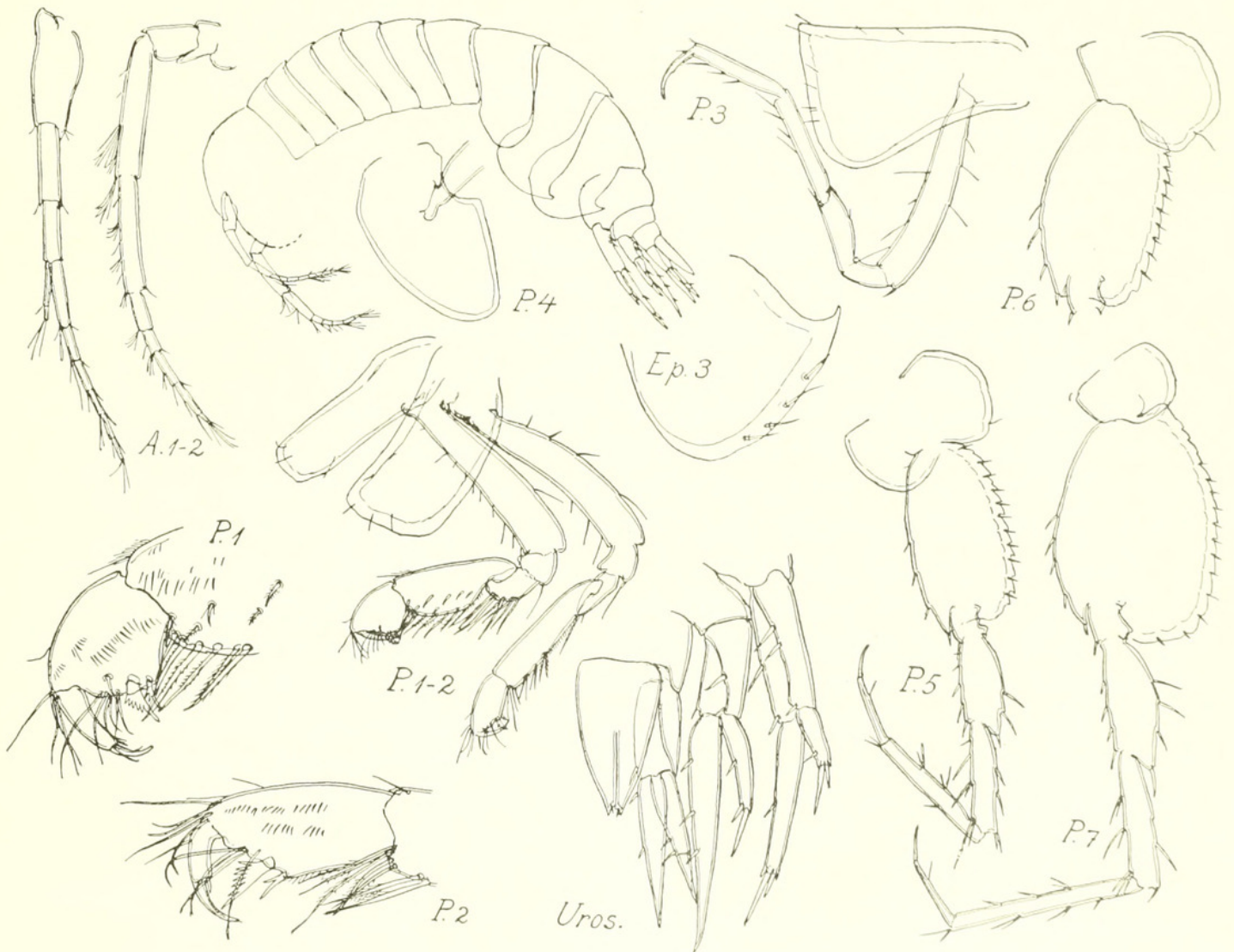


Fig. 74. *Austrosyrrhoë* (?) *septentrionalis*.

The specimen in lateral view was from "Ingolf" St. 90, all the dissected appendages were from a specimen from "Ingolf" St. 36.



The body is not very slender. The rostrum is strongly deflexed, covers the proximal  $\frac{2}{3}$  of 1st joint of 1st antenna. Eyes could not be found. Mesosome and metasome segments keeled, a few of them (mesos. segm. 7, metas. segm. 1—2) each with a little tooth dorsally. Epimeral part of metasome segment 1 rather evenly rounded; metasome segments 2—3 have a tooth on the inferior hind corner. The telson elongate, cleft about half-way, with the apices acute.

First antenna has 1st joint somewhat longer than 2nd joint, this again somewhat longer than 3rd joint. The specimen from St. 36 has the first joint of flagellum very long, the specimen from St. 90 has the same joint divided into two. Accessory flagellum has 2 joints, as long as the first long joint of the flagellum of the specimen from St. 36. Second antenna a trifle longer than first antenna, with the two distal joints of the peduncle subequal in length, and 5 joints in the flagellum.

The oral parts were dissected out and agree fairly well with those of *Syrrhoë crenulata*.

First and second pereopods are subchelate.

First pereopod is stout; the side-plate has nearly parallel edges, with rounded quadrangular inferior corners. 2nd joint abt. 5 times as long as broad, 5th joint abt.  $\frac{2}{3}$  as long as 2nd joint, but not much broader; the hind edge has abt. 8 pectinate spines, and there are a few short spines on the lateral side. 6th joint is triangular-ovate, not much narrower than the preceding joint, with two very strong pectinate spines on the hind corner of the palm. The dactylus a little shorter than 6th joint, curvate, with the apex articulate.

Second pereopod not much longer than the first, but with the side-plate much broader, somewhat curvate, with the inferior forecorner subacute and the posterior corner rounded. All the other joints are narrow, 5th joint not much shorter than 2nd, with almost parallel edges. 6th joint abt.  $\frac{2}{5}$  as long as 5th joint, with a similar armature as that of 1st pereopod, but much narrower. The dactylus is as in 1st pereopod.

Third and fourth pereopod are very narrow. The 3rd side-plate triangular, widened below, with the forecorner acute and the hindcorner rounded, but without excavation in the hind edge. The 4th side-plate triangular-oval, not much shorter than the 3rd plate, rounded below. Pereopods 5—7 not very slender, no. 6 longer than no. 5, no. 7 again longer than no. 6. Second joint of these limbs more or less oval, with hind margin denticulate; the dactylus long and slender.

The uropods are very different from those of the type-species ("as in *Syrrhoë crenulata*"); the rami have the same length as in *Syrrhoë crenulata*, but they have only very few but in return much heavier spines on the edges, and the same applies to the peduncles; the apical joint of the outer ramus of urop. 3 is abt.  $\frac{2}{3}$  as long as the proximal joint. —

Barnard writes that "the character of the first gnathopod is quite unique in the family". This is correct as to his species, and as the species from the "Ingolf" agrees fairly well with Barnard's South African species as to this limb, I have referred, however, with some doubt, the new species to the same genus.

## Fam. Argissidæ Walker.

*Argissidæ* Walker, Report Pearl Oyster Fish. Gulf of Manaar, pt. 2, 1904, p. 246.

— Chevreux & Fage 1925, p. 89.

The family was established by Walker l. c. 1904 in order to include the genera *Argissa* (Boeck 1870)



and *Platyischnopus* (Stebbing 1888). Later on a new genus, *Parargissa* (Chevreux 1908), has been established. Walker's diagnosis runs as follows: "First or upper antennæ in the males with the flagellum longer or more slender than in the females. Gnathopods subequal and similar. Last one or two pairs of peræopods much more powerful than the rest of the limbs". The family is not well defined.

Only one genus, *Argissa*, is known from northern waters.

### Genus *Argissa* Boeck.

*Argissa* G. O. Sars 1895, p. 140.

— Stebbing 1906, p. 276.

— Chevreux & Fage 1925, p. 90.

#### 266. *Argissa hamatipes* (Norman).

*Argissa typica* G. O. Sars 1895, p. 141, pl. 48.

— *hamatipes* Stebbing 1906, p. 277.

— — Schellenberg, Nordisches Plankton, vol. 6 (Lief. 20), 1927, p. 686, fig.

— — Shoemaker, Contrib. Canad. Biol. and Fish., vol. 5, 1930, pp. 255—58, figs.

Occurrence. The species was only once taken by the Ingolf and a single time by the "Thor", the localities are:—

W. of Greenland: "Ingolf" St. 25: 63°30' N., 54°25' W., 1096 m., temp. 3.3°. 1 spec.

S.W. of Iceland: "Thor" St. 171, 2-7-1904: 63°46' N., 22°56' W., 150 m. Numerous specimens, including ♀ ovig.

It is known from Greenland without special locality (H. J. Hansen 1887, p. 129).

Distribution. Kola Bay (Derjugin 1915, p. 447). — Norway, several localities from Vadsö to the Oslofjord, 40—200 m. (G. O. Sars l. c.; Norman 1895, p. 482). — Danish waters: Kattegat and Øresund, 23—40 m., sand and clay (K. Stephensen, Vid. Medd., vol. 82, 1926, p. 88). — North Sea: Heligoland (Sokolowsky 1900). — British waters: Aberdeen Bay (Th. Scott 1902, p. 477); Shetland, Firths of Forth and Clyde (Stebbing l. c.; Th. Scott 1906, p. 158). — It is also recorded from N.W. France (S.W. of Belle-Ile en Mer, 100 m.; Stebbing 1906) and from Ceylon (Walker l. c. 1904, p. 246); but probably these two records apply to another species, *A. stebbingi* Bonnier, found from N.W. France to W. Africa near Dakar; at all events it is not listed in Chevreux & Fage's work on the French Amphipoda 1925.

From the western side of the Atlantic it is known from W. of Greenland and S.W. of Iceland (see above), and from some localities at the American coasts, viz., the south-eastern part of the Gulf of St. Lawrence, 4 loc., 30—90 m., Casco Bay (Maine), and Cape Ann (Mass.) (Shoemaker l. c. 1930).

### Fam. *Calliopiidæ* G. O. Sars.

*Calliopiidæ* (partim) G. O. Sars 1895, p. 431.

— Stebbing 1906, p. 285.

The fam. *Calliopiidæ* was established by Sars 1895; already in 1906, however, Stebbing established the new fam. *Pontogeneiidæ* in order to include some of the genera. As long as it was maintained this new



fam. *Pontogeneiidae* has caused many difficulties; it seems to be separated from the original fam. mainly in the shape of the telson (cleft in *Pontogeneiidae*, entire in *Calliopiidae*), and till now its genera have been very badly defined. In the present paper I had originally taken the two families together; but when the manuscript was ready for the press, I received from Prof. Schellenberg a paper (Schellenberg: Revision der Amphipoden-Familie Pontogeneiidae, in Zool. Anzeiger, vol. 85, 1929, pp. 275—282) from which appears that the fam. *Pontogeneiidae* seems to be a valid fam., and I have then transferred the single species from the area, *Pontogeneia inermis* (Kröyer), to the fam. *Pontogeneiidae*.

Strangely enough most of the species of the *Calliopiidae* seem to belong to the northern hemisphere, whilst the reverse is the case as to the majority of the species of the other fam.

In the "Ingolf"-area the fam. *Calliopiidae* has 8 genera with 19 species. 2 genera (*Laothoës*, *Haliragoides*) are new to the area; the same is the case with 6 species, 3 of which are new to science (*Halirages mixtus*, *Leptamphopus*(?) *paripes*, *Cleipphides bicuspis*), while the three others are fairly well known species (*Laothoës meinerti*, *Leptamphopus sarsi*, *Haliragoides inermis*).

### Genus *Laothoës* Boeck.

*Laothoë* G. O. Sars 1895, p. 453.

*Laothoes* Stebbing 1906, p. 286.

The genus possibly comprises only the species recorded below.

#### \*267. *Laothoës meinerti* Boeck.

*Laothoë meinerti* G. O. Sars 1895, p. 454, pl. 160.

*Laothoes* — Stebbing 1906, p. 286.

Occurrence. This species was twice secured by the "Ingolf"; it is new to the area.

N.W. of Iceland: 65°14' N., 30°39' W., 1318 m., temp. 2.1°. Abt. 10 spec. ("Ingolf" St. 95).

— 65°24' N., 29°00' W., 1384 m., temp. 1.2°. 1 spec. ("Ingolf" St. 96).

S.E. of the Faroes: 61°35' N., 4°39' W., 400 m. 1 spec. ("Thor" St. 5, 2-5-1903).

Distribution. The species was hitherto not known out of Norway; the localities are: Hardangerfjord: Utne, abt. 600—1000 m. (type-locality), and Sunde; Trondhjem, 285 m. (Norman 1895, p. 489); Trondhjemsfjord, near Vennæs; Apelvær, Namdal, Kvalö (G. O. Sars l. c.). Near Tromsö: "Juledagene", 25—30 m., sand with algæ, and Skatören (Sparre Schneider 1926, p. 45).

### Genus *Amphithopsis* Boeck.

*Amphithopsis* G. O. Sars 1895, p. 455.

— Stebbing 1906, p. 289.

The genus has only one species in the "Ingolf"-area; a second species, *A. megalops* (Buchholz), has been transferred to the genus *Halirages* (p. 272).

#### 268. *Amphithopsis longicaudata* Boeck.

*Amphithopsis longicaudata* G. O. Sars 1895, p. 456, pl. 161.

— — Stebbing 1906, p. 289.



Occurrence. This species was secured several times by the "Ingolf" and the "Thor".

W. Greenland: Sakrak in the Waigat ( $70^{\circ}$  N.), 1 spec. (Traustedt leg. 1892).

Between Iceland and Greenland:  $65^{\circ}14'$  N.,  $30^{\circ}39'$  W., 1318 m.; temp.  $2.1^{\circ}$ . 2 spec. ("Ingolf" St. 95).

— — — —  $65^{\circ}24'$  N.,  $29^{\circ}00'$  W., 1384 m., temp.  $1.2^{\circ}$ . 3 spec. ("Ingolf" St. 96).

S.W. of Iceland:  $63^{\circ}18'$  N.,  $21^{\circ}30'$  W., 178 m. 1 spec. ("Thor" St. 176, 8-7-1904).

—  $63^{\circ}15'$  N.,  $22^{\circ}23'$  W., 216—326 m. 1 spec. ("Thor" St. 171).

—  $60^{\circ}37'$  N.,  $27^{\circ}52'$  W., 1505 m., temp.  $4.5^{\circ}$ . 1 spec. ("Ingolf" St. 78).

The species was known from W. Greenland: Off the Mudderbugt, Disko, abt. 240 m. (K. Stephensen, "Tjalfe" 1912, p. 96).

Distribution. Hudson Bay (Shoemaker 1927, p. 6). — Gulf of St. Lawrence: N. of Cheticamp island, 40 m. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 292). — Norway, "numerous places of the west coast, and also in the Trondhjemsfjord and as far north as Bodö", abt. 100—300 m., rocky bottom (G. O. Sars l. c.); Bömmelen near Bergen, 150—160 m. (Nordgaard 1911, p. 23); Rødberg in the Trondhjemsfjord, 285 m. (Norman 1895, p. 489). — White sea, 1 loc. (Derjugin 1928, p. 278).

### Genus *Halirages* Boeck.

*Halirages* G. O. Sars 1895, p. 435.

— Stebbing 1906, p. 290.

This genus is more closely allied to the genus *Apherusa* (p. 274) than to any other genus of the family. In reality the agreement is so complete that the two genera possibly might to be taken together, as was originally the case. *Halirages* was established by Boeck 1871 as a new genus for *Amphithoë fulvocincta* M. Sars (and for 3 other species, later on transferred to the genus *Apherusa*). The genus *Apherusa* was established by Walker 1891 (Ann. Mag. Nat. Hist., ser. 6, vol. 8, p. 83), but without any clear diagnosis.

The first good diagnoses were given by G. O. Sars 1895 (*Halirages* p. 435, *Apherusa* p. 438) and later on partly repeated by Stebbing 1906 (p. 290 and p. 304, respectively). If, however, we take all species known into consideration (at Sars's times only 3 species of *Halirages* were described; the present paper has 5) we find that apart from small differences in the oral parts (especially in the palp of the mandible) the single difference is the presence (*Halirages*) or absence (*Apherusa*) of calceoli on the antennæ.

As we know at present more species than did Sars, it will be necessary to alter a few points in his (and Stebbing's) diagnosis. The back is not always dentate (not so in *H. megalops* and *H. mixtus*). Antenna 1 has not always a lamellar expansion in the distal end of 3rd joint of the peduncle (this process is present in *H. fulvoc.*, *H. mixtus* (and *H. nilssoni*), absent in the other species). The lower lip has small or large inner lobes. Uropod 3 has not always the rami lanceolate.

In the "Ingolf"-area 5 species of *Halirages* have been found and will be treated below; a sixth species, *H. nilssoni* Ohlin (Stebbing 1906, p. 290), of which I have not seen any specimen, has been found close outside the "Ingolf"-area, viz., at the western side of the Baffin Bay (the types), and in the arctic Canada (Shoemaker 1920, p. 13).



I have dissected one or two specimens of all the species from the "Ingolf"-area, and below is given a characteristic of the oral parts, compared with those of *H. fulvocinctus* (Sars 1895, pl. 154). Anterior lip: in *H. megalops* as in *H. fulv.*; *H. mixtus* has an epistomal process more acute than that of *H. fulv.*; *H. elegans* and *H. quadr.* have above a very acute process. — Posterior lip: *H. mixtus* and *H. fulv.* have small, but distinct inner lobes (not drawn by Sars); the 3 remaining species have rather large inner lobes. — Mandibles: In *H. megalops* 3rd joints of the two palps are not always alike: the right one may have parallel margins, the left one is more triangular, and both have setæ in only the distal half; — in the 4 other species (like *H. fulv.*) 3rd joint of the palp is curved, with setæ along almost the whole of the median side. — Maxilla 1: *H. mixtus* has on the inner lobe only 3—4 spines; the other species as in *H. fulv.* — Maxilla 2: in all species like *H. fulv.* — Maxillipedes: *H. elegans* and *H. quadrident.* like *H. fulv.*; *H. mixtus* has no distal process on 2nd joint of the palp; in *H. megalops* this process may be present or absent.

Calceoli on the antennæ are probably present in ♂ of all the species (I have found them in *H. fulv.*, *H. elegans*, *H. quadr.*, and *H. megalops*, but I have not had any ♂ of *H. mixtus*); in ♀ they are present in *H. fulv.* and *H. mixtus*, but not in *H. megalops* and *H. quadrident.* (there are no ♀ of *H. elegans* in the "Ingolf"-material).

269. **Halirages fulvocinctus** (M. Sars) (Chart 48, partim).

*Halirages fulvocinctus* G. O. Sars 1895, p. 436, pl. 154.

— — Stebbing 1906, p. 291.

— *bidentatus* K. Stephensen, Meddel. om Grønland, vol. 53, 1916, p. 290, with figs.

#### Occurrence.

E. Greenland: Angmagssalik. 1 spec. (Thalbitzer leg. 1905—06).

— Cape Dan (near Angmagssalik), 20—30 m., rocky bottom, with a few or with many algæ. 4 spec. (Amdrup-Exped. 11-6 and 17-6-1899).

— Cape Dan Islands, 12—20 m., rocky bottom almost without vegetation. 10 spec. incl. 1 ♀ ovig. 12 mm. (Amdrup-Exped. 14-6-1899).

— Tasiusak (near Angmagssalik), 10—38 m., stony bottom with algæ. 4 spec. incl. 1 ♀ with large marsupial plates 18 mm. (Amdrup-Exped. 14-5 and 17-5-1899).

— *ibid.*, 40—60 m., stony bottom with algæ, 10 spec. incl. 1 ♀ with large marsupial plates 16 mm. (Amdrup-Exped. 20-5-1899).

— Ødesund (abt. 66°10' N.), 10—30 m., rocky bottom with algæ. 4 spec. (Amdrup-Exped. 6-8-1899).

— Solo's Fjord (abt. 67°14' N.), 20—30 m., rocky bottom with very few algæ. 5 spec. (Amdrup-Exped. 24-7-1899).

— Ryder's Sound, 6 m. 1 spec. (E. Greenl. Exped. 25-7-1900, Søren Jensen leg.).

— Danmarks Ø (Scoresby Sound), 1 ♀ with empty marsupium, 12 mm. (E. Bay leg. 20-4-1892).

— 70°10' N., 22°21' W., 25 m. 7 spec. up to 19 mm. (Alwin Pedersen leg. 27-7-1924).

— Sabine Island (abt. 74°30' N.), 6—10 m. 1 spec. (E. Greenl. Exped. 13-7-1900, Søren Jensen leg.).



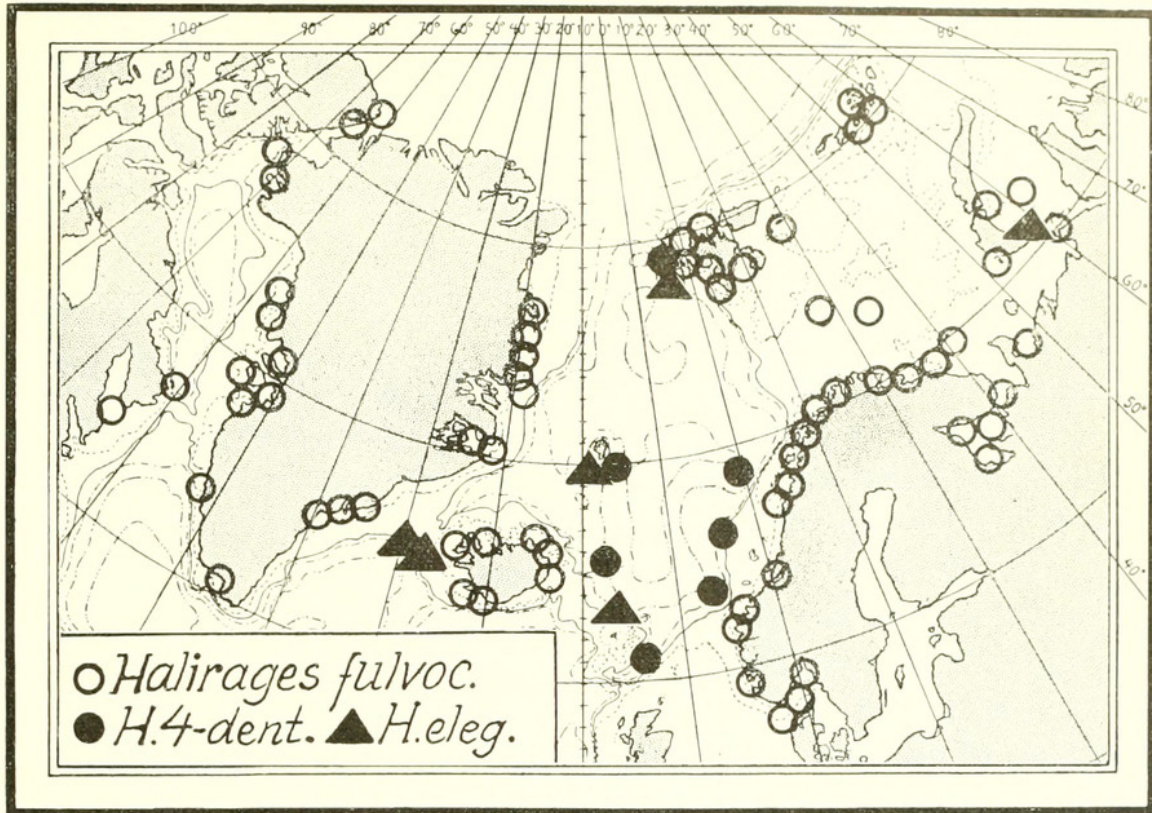


Chart 48. *Halirages fulvocinctus*, *H. 4-dentatus*, *H. elegans*. (The stations nos. 31, 48, 137 and 192 of the Norwegian Arctic Expedition are not noted, as they apply to *H. 4-dent.* + *H. elegans*; also Norman's type-loc. for "*H. elegans*" is not noted. *H. fulvocinct.* has some loc. in the Gulf of St. Lawrence outside the chart.)

S.W. Iceland:  $63^{\circ}46' N.$ ,  $22^{\circ}56' W.$ , 150 m. Numerous spec., including several ♀ ovig. abt. 10 mm.  
("Thor" St. 171, 2-7-1904).

—  $63^{\circ}15' N.$ ,  $20^{\circ}04' W.$ , 216—326 m. 1 ♀ with empty marsupium 9 mm. ("Thor" St. 171, 16-7-1903).

N.W. Iceland: Dyrafjörðr, abt. 35 m., clay with a few stones and abundant vegetation. 3 ♀ ovig. abt. 11—12 mm. (W. Lundbeck leg. 29-6-1893).

N. Iceland: Nordfjord's Flóin, abt. 65—105 m. 1 spec. ("Diana" St. 38, 9-6-1898. R. Hörring).

E. Iceland: Bakkafjörðr, 24—30 m., black sand. 1 ♀ ovig. 12 mm. ("Diana" St. 8, 14-6-1900, A. C. Johansen).

— Seyðisfjörðr, 60—120 m. 1 ♀ ovig. abt. 10 mm. (R. Hörring leg. 8-7-1899).

— Viðfjörðr, 10 m. and 30 m., 7 ♀ ovig. 11—13 mm. (13-7 and 19-7-1899, R. Hörring leg.).

— Eskifjörðr, 35 m. 3 spec. (Prem.-lieutn. Jensen 1886).

— Reyðarfjörðr  $62^{\circ}07' N.$ ,  $13^{\circ}56\frac{1}{2}' W.$ , 140 m. 8 spec. includ. 4 ♀ ovig. 9—12 mm.  
("Thor" St. 48, 29-4-1904).

— Faskruðfjörðr, 40—100 m., clay. 5 spec. includ. 3 ♀ ovig. abt. 12 mm. (R. Hörring leg. 7-7-1899).

— Berufjörðr, 0—12 m. 1 ♀ ovig. 12 mm. ("Diana" St. 23, 21-5-1898. R. Hörring).



E. Iceland: 64°25' N., 12°09' W. 397 m., temp. 0.8°. 1 ♂ (?), 23 mm. ("Ingolf" St. 58).

— 64°30' N., 12°25' W. 230 m., young fish trawl 250 m. wire. 7 spec. ("Thor" St. 223, 30-7-1904).

The species is very common in the "Ingolf"-area; it has been recorded from abt. 20 localities along W. Greenland 60°—78½° N. and from abt. 15 localities at E. Greenland abt. 66°—78° N. (K. Stephensen, *Conspectus* 1913, p. 178, and 1916, p. 290).

It seems to be most abundant at depths of abt. 10—30 m. among algæ, but may even descend to abt. 400 m.

Remarks. In *Meddel. om Grönl.* vol. 53, 1916, p. 290, I established a species, *H. bispinosus*, characterised especially in having only two dorsal teeth (the tooth on 7th mesosome segment lacking). In the present material there are several specimens with this tooth more or less rudimentary and also a number with the tooth totally lacking; thus there are numerous transitory forms between the typical *H. fulvocinctus* and *H. bidentatus*, and I dare no more maintain the latter species. —

The oral parts vary a little from Sars's figures; see above under the genus.

The length is rather varying: at W. Greenland abt. 11—12 mm., rarely more (a ♂ from the Skovfjord in S.W. Greenl. 18 mm.), at E. Greenland up to abt. 17 mm., at Iceland (all the coasts) 9—13 mm., but a single specimen (♂?) from 397 m. at E. Iceland 23 mm. This is probably the maximum size of the species.

Ovigerous ♀ were found at the following dates: E. Greenland June 14th (♀ with empty marsupium April 20th and May 14th (20th)); S.W. Iceland July 2nd (and ♀ with empty marsupium July 16th); N.W. Iceland June 26th; E. Iceland April 29th and from June 14th to July 19th.

Distribution. (See chart 48.) The species is extremely abundant in the arctic area with adjacent waters, abt. 10—50 m., among algæ and Hydroida, rarely much deeper. It has been found from Grinnell Land and the Hudson Bay (Shoemaker 1926, p. 6) to Franz Joseph Land and the Kara Sea. The southern limit in the Atlantic is a line connecting the following points: Ipswich Bay in New England, S. Greenland, S. Iceland (not the Faroes) and Skagerak with the Oslofjord. For special localities see Oldevig 1917, p. 27, but some additions and corrections are to be made. Sars (1895) records it as rather frequent at N. and W. Norway, but not at S. Norway; the Zool. Mus. of Oslo, however, possesses numerous specimens from W., S.W. and S. Norway, viz., from Åfjord (between Bergen and Florö), Mosterhavn (N. of Haugesund), Lange-sund (S. of Kragerö), Dröbak, and the Oslofjord without special locality, and the Zool. Mus. of Copenhagen possesses specimens from Tönsberg 150 m. (Oslofj.) and from Skagerak, 250—640 m., 6 loc. (partly quoted by K. Stephensen, *Vid. Medd.*, vol. 82, 1926, p. 89). The specimens recorded from the Polar deep (Norweg. North. Atlant. Exped., Sars 1886) are not this species, but *H. quadridentatus* and *H. elegans* (see below, under *H. quadrident.*). "This species appears to be very common in the Gulf of St. Lawrence": 5 loc., 30—93 m. (102 spec., *H. fulvocinct.*), and 1 loc. 30—93 m. (*H. bispinosus*) (Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930, p. 298).

\*270. *Halirages mixtus* n. sp. (Fig. 75).

Occurrence. This new species was secured at the following locality:—

E. Greenland: Ingolf's Fjord (abt. 66°15' N.), rocky bottom with algæ. Abt. 30 spec. jun. abt. 5 mm.,  
1 ♀ abt. 11 mm. (Amdrup-Exped. 5-8-1899).



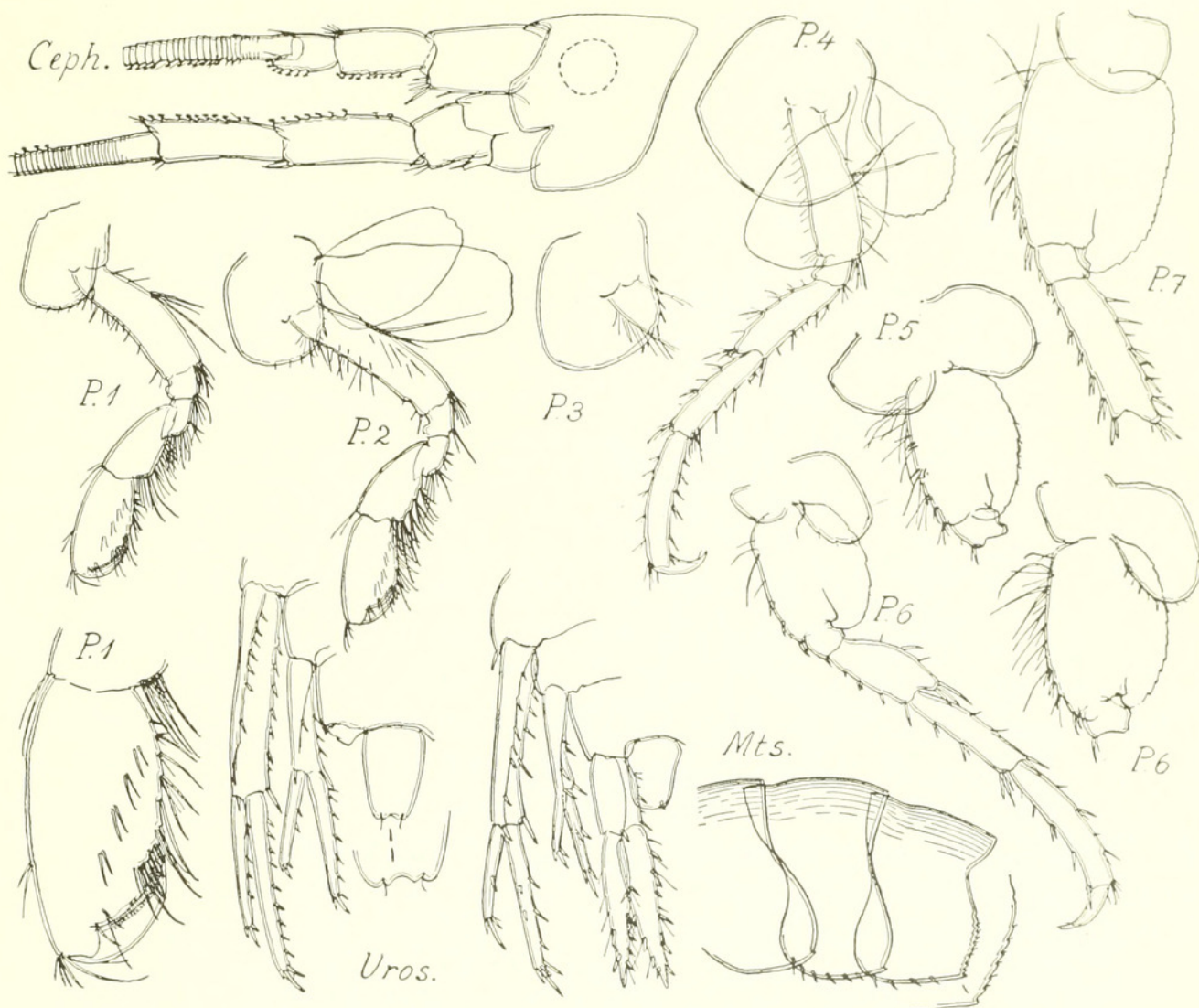


Fig. 75. *Halivages mixtus*. The figures of the complete pereiopod 7 and of the urosome with uropod 3 were drawn from a little specimen.

Description of ♀, abt. 11 mm. (with large marsupial plates, but the marginal setæ lost). This specimen (like all the others) was very defective. The back is vaulted, without dorsal teeth. The head has a little rostrum; the ocular lobe has the corners quadrangularly rounded, and the subantennal process is not very protruding, with the corner quadrangular. The eyes were so damaged, that it was impossible to give any drawing; they have had dark pigment. The antennæ have exactly the same shape as that of *H. fulvo-cinctus* and *H. nilssoni* (the apex of both pairs is lost), with the same apical process on 3rd joint of antenna 1, and with calceoli on both pairs.

On the oral parts, see above (p. 264).

The pereiopoda are not essentially different from those of *H. fulv.*, but the side-plate (1st joint) of pereiop. 1 has the forecorner more rounded than that of Sars's fig. of *H. fulv.*, and 2nd joint of pereiop. 5—7 have a serrate hind margin. The metasome segments 1—2 have the hind margin even, with a single



tooth on the inferior hind corner; segm. 3 has the hind margin serrate. Uropod 1 reaches the apex of urop. 3, urop. 2 is much shorter. Urop. 1 has the inner ramus as long as the peduncle, the outer ramus only  $\frac{2}{3}$  as long. Urop. 2 has the same shape as urop. 1. Urop. 3 (totally lost in the ♀, kept only in a single spec. of 5 mm.) has the rami of equal length, twice as long as the peduncle, lanceolate, fringed with spines and setæ. The telson not fully twice as long as broad, slightly tapering distally, with 3 small notches and two setæ on the hind margin (the little spec. has the hind margin even, without notches).

The species is easily recognisable; from the single hitherto known northern species of the genus without dorsal teeth (*H. megalops*, see p. 272) it differs especially in having the very characteristic process on 3rd joint of ant. 1, but there are several other differences (e.g. the quadrangular subantennal corner of the head; the 2nd joint of pereiop. 5—7 broader; the whole of the pereiop. 3—7 much heavier; and the hind edge of metasome segment 2 not serrate).

The specific name *mixtus* is an allusion to the combination of characters found in other species of the genus: ant. 1 like that of 2 other species, hind edge of metasome segment 3 dentate as in a third species.

271. **Halirages quadridentatus** G. O. Sars (Fig. 76) and

272. **Halirages elegans** (Norman?) Stappers (Fig. 77).

1. *Halirages quadridentatus* G. O. Sars.

*Halirages quadridentatus* G. O. Sars, Archiv for Math. og Naturvid., vol. 2, Kristiania 1876, p. 357.

— — G. O. Sars 1885, p. 176, pl. 14, fig. 4 bis.

— — (partim?) Stebbing 1906, p. 292.

? — *elegans* Norman, Proc. R. Soc. Edinburgh, vol. 11, 1882, p. 688 (no. fig.).

2. *Halirages elegans* (Norman?) Stappers.

? *Halirages elegans* Norman, l. c. 1882, p. 688.

— — Stappers 1911, p. 58, pl. 3 figs. 5—18.

On the literature. G. O. Sars (1876) established the species *H. quadridentatus* on a single specimen and gave an only short Latin diagnosis. In 1885 he gave a more elaborate description accompanied with a few figures.

Norman established in 1882 a new species, *H. elegans*; he gave a description (without drawings) and stated as a summary: "This species comes very near to *Halirages quadridentatus*, G. O. Sars, but differs in the form of the epimera of the first segment of pereion, and in the third segment of pleon. Sars does not describe the telson, which is very characteristic".

Stebbing (1906) considered the two species synonymous, but Stappers (1911) clearly showed, that a species which he considered identic with Norman's species, was as to several characters different from Sars's species, and gave an elaborate description with drawings.

I have not been able to find other records in existing literature, apart from Della Valle 1893 (*Acanthozone quadridentata* [part], p. 611), but this is of no importance in this connection.

On the material. As the material to be treated below comprises a fairly great number of specimens of *Halirages* from deep water, there was a good base for investigating these questions; and I beg to render my most sincere thanks to the Zoological Museum of Oslo (Director Alf Wollebæk and Konservator Paul



Løyning) for having kindly given me an opportunity of revising the whole of Sars's material of the genus *Halirages*. The result is that some additions and corrections may be added to his descriptions and figures.

***Halirages quadridentatus* G. O. Sars**

(Fig. 76).

There is a little rostrum of exactly the same shape as in my fig. of *H. elegans* (fig. 77), and also the "profile-line" of the "face" with the ocular lobe etc. has exactly the same shape as that of the said species. The first joint (the side plate) of pereopods 1—4 is shaped as in Sars's figure; no. 1 is not "simple rounded", but has the lower fore-corner acute rectangular or a little protruding, and it cannot be described as "not differing appreciably from those succeeding it".

The hind margin of the epimeral part of 3rd metasome segment is correctly drawn and described by Sars. There is no description of the peduncles of the antennæ ("the peduncle is comparatively short in both pairs"). In reality the joints have nearly exactly the same shape as those of *H. elegans* (see my fig. 77, or Stappers p. 59, pl. 3 figs. 5—6).

Pereopods 1—2 have 5th joint much longer than 6th joint: in p. 1  $1\frac{1}{2}$  time as long, in p. 2 still longer. Pereopods 3—7 are very long and slender, with the joints 4—7 (especially in p. 5—7) very elongate (e.g.: in p. 6 are 3rd to 6th joints 6 times as long as the length of 2nd joint between the fixations of 1st and 3rd joint, and in the 6th joint the length is 16 times the breadth). Sars describes the 2nd joint of pereopods 5—7 as "somewhat dilated at the origin, as

also produced at the lower posterior corner to a sharp point". But an investigation of Sars's types has shown, that this is not correct: pereopods 5—6 have 2nd joint oval, with the hind margin denticulate and the inferior hind corner rounded quadrangular, but not at all protruding; in p. 7 the 2nd joint has a similar shape, but with the inferior hind corner rectangular. On the oral parts see above, p. 264.

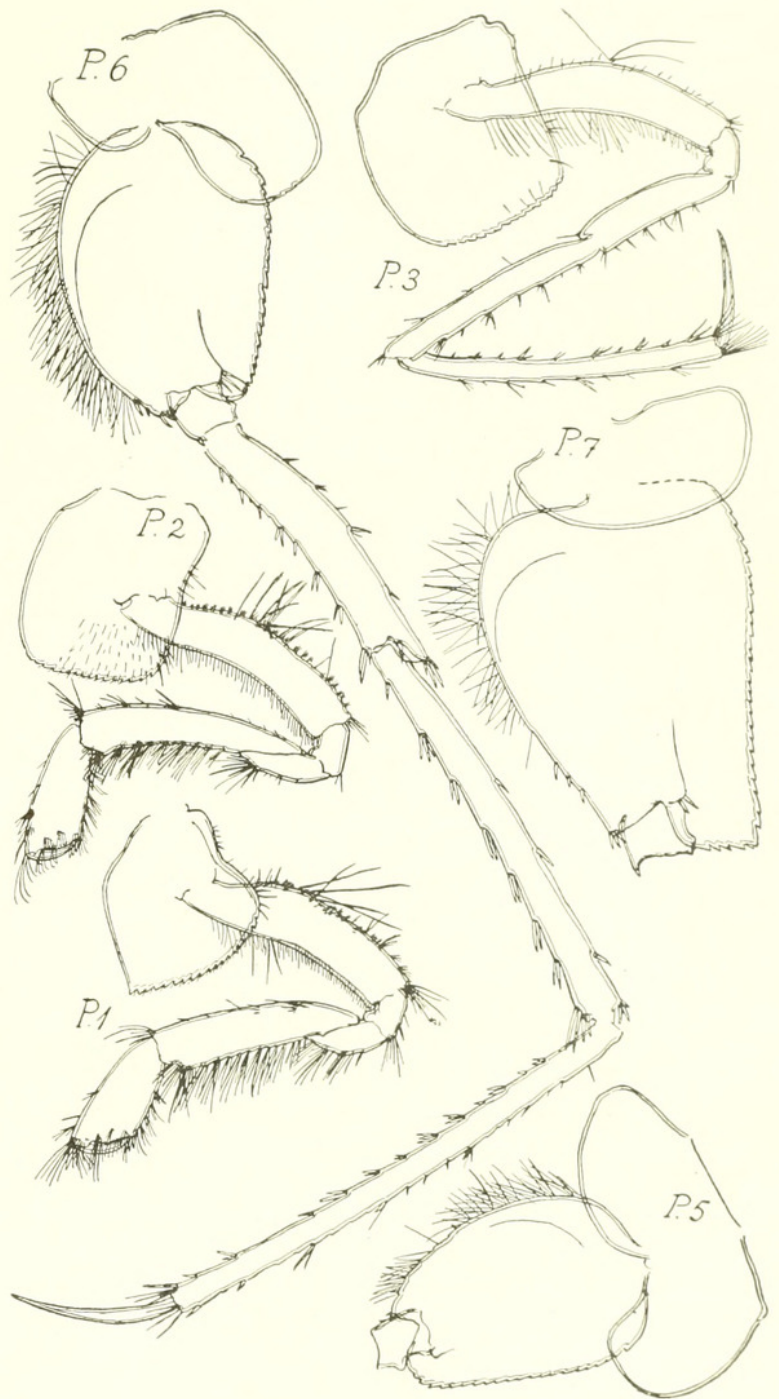


Fig. 76. *Halirages 4-dentatus*, ♀, 26 mm., from "Ingolf" St. 105.



The telson (— as also in *H. elegans* —) has not always 3 teeth; the number may vary from 1 to 5. —

The species may vary to a certain degree. The lower fore corner of 1st joint of pereopod 1 may be somewhat protuding, but not as much as in *H. elegans*. A single specimen (from the Norwegian North Atlantic Exped., St. 124, length probably 17 mm. (urus is lost)) has no tooth on 6th mesosome segment and has the lower hind corner of 2nd joint of pereopod 7 rounded as in *H. elegans* (but the epimeral part of metasome segment 3 has the typical form).

The specific name is not a good one, as not all (even large) specimens have 4 dorsal teeth. I have had an opportunity of to examining probably all specimens known (— totally 31, viz. 23 belonging to the Oslo Museum, 8 to the Copenhagen Museum —), and 6 out of these have only 3 teeth (viz., the specimen quoted above from the Norweg. N. Atlant. Exped. St. 124, 4 in a tube from the same Exped. "St. 31, 48, 124, 137, 192", and 1 from St. 359); a spec. (20 mm.) from St. 251 has the tooth on mesosome segment 6 very little. The length of the specimens is (14) 20—28 (29) mm.

On occurrence and distribution, see below.

#### **Halirages elegans** (Norman?) Stappers (Fig. 77).

The position of *H. elegans* Norman is not clear; when Norman (1882) writes that it differs from *H. quadridentatus* in "the form of the epimera of the first segment of pereion, and in the third segment of pleon", then the first of these "differences" is due to a wrong description by Sars, and from Norman's description of the third segment of pleon ("the second and third segments angled at the hinder corner, and the third also produced into a small spineformed point, and the posterior margin not waved but finely crenated") the specific difference from Sars's species is not evident. As far as I can see *H. elegans* Norman may equally well be identic with *H. quadridentatus* G. O. Sars as with *H. elegans* Stappers 1911.

*H. elegans* Stappers 1911 is well described and drawn, and the differences from *H. quadridentatus* are well marked by Stappers; as according to my opinion, however, it is possibly not identic with Norman's species of the name, I propose to call it *H. elegans* (Norman?) Stappers. Also of this species there are several specimens in the material to be treated below.

There is very little to add or to correct to Stappers's description (he had a single specimen only). The ocular lobes are not "largement arrondis", but are rather protruding with the corners rounded triangular. 1st joint of pereopod 1 has the lower forecorner more protruding than normally in *H. quadridentatus*, and 1st joint of pereopods 2—4 are not as deep as in the said species. Pereopod 1 has 5th joint not essentially longer than 6th joint (the length ratio is 6:5); in pereopod 2 the 5th joint is longer (ratio 4:3). In pereopod 3 the 1st joint has the lower forecorner protruding forwards (in Stappers' fig. (fig. 13) this corner is cut off). 2nd joint of pereopods 5—6 are not essentially differing from those of *H. quadridentatus*, apart from their being much narrower; 2nd joint of pereopod 7 of about the same shape as 2nd joint of pereopod 6, with inferior hind corner rounded, but with the hind edge straight (in p. 5—6 somewhat convex). Pereopod 7 not much longer than p. 6, this latter not much longer than p. 5. Upon the whole the pereiop. 3—7 are not so long and slender as those of *H. quadridentatus*; in p. 6 the 3rd to 6th joints are 3 times as long as 2nd joint, and 6th joint only 10 times as long as broad.



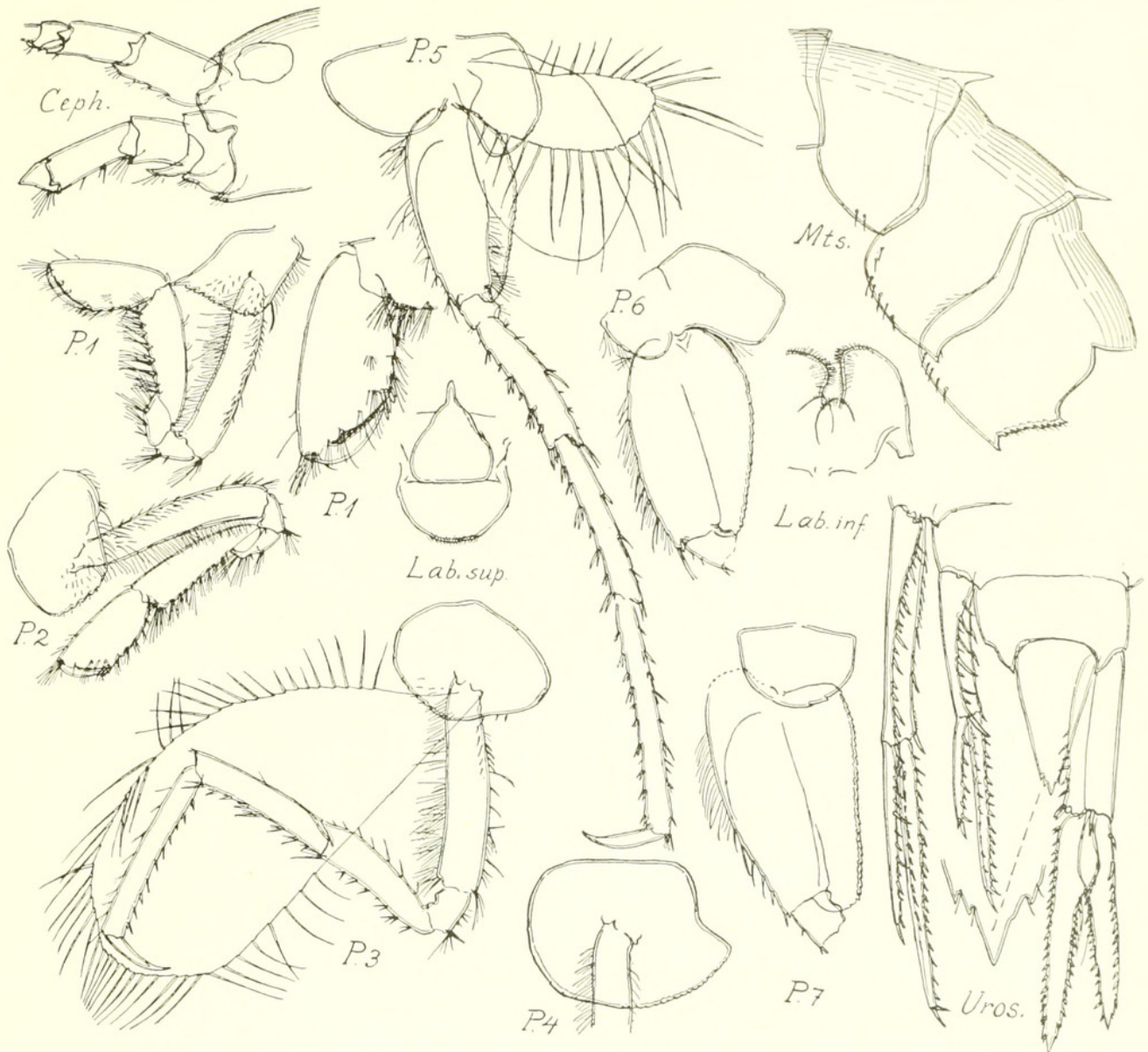


Fig. 77. *Halirages elegans*, ♀ abt. 18 mm., from "Ingolf" St. 95.

The species may vary as to number of dorsal teeth; but as it has been impossible to trace other differences, all the specimens must belong to the same species. The typical form has 3 dorsal teeth (on 7 mesosoma segment and on 1st and 2nd metasoma segment); this is the case in Stappers's specimen and in most of the specimens seen by me. Sometimes there are only two teeth (that on mesosoma segm. 7 lacking); this is the case in the specimens from "Ingolf" St. 95 and 96. Only Norman's spec. had 4 teeth (as in the typical *H. quadridentatus*).

The length of the species is abt. (11) 18—20 mm.

***Halirages quadridentatus*** (Chart 48, partim (p. 265)). (On the literature and remarks on morphology, see above).

Occurrence. The species was only once secured by the "Ingolf"; but it has been taken several times in the area.



E. of Iceland: 65°34' N., 7°31' W., 1435 m., temp.  $\div$  0.8°. 5 spec. (♀ all?), abt. 25—28 mm.  
("Ingolf" St. 105).

S.W. of the Faroes: 61°23' N., 4°21' W., 950 m., temp.  $\div$  0.4°. 2 spec. (♂?), abt. 22—23 mm.  
(Kapt. Wandel leg. 1890).

S.E. of Jan Mayen: 70°32' N., 8°10' W., 890 m. 1 ♀ with large marsupial plates, 23 mm. (Deichmann leg. 27-6-1891) (this specimen was recorded by H. J. Hansen 1895, p. 128, under the name of *H. quadrispinosus*).

Distribution. Outside the "Ingolf"-area the species has only been taken by the Norwegian N. Atlant. Exped. (Sars 1885, p. 176, and 1886, p. 56). The localities are as follows: 63°05' N., 3°03' E., 960 m., temp.  $\div$  1.1° (St. 33, type-locality); 66°41' N., 6°59' E., 640 m., temp.  $\div$  0.9°, 16 spec. (St. 124); 68°06' N., 9°44' E., 1139 m., temp.  $\div$  1.3°. 1 spec. (St. 251, not recorded by Sars). In addition I have in some material from the same Expedition found some specimens of *H. quadridentatus* identified as *H. fulvocinctus*. A tube with "*H. fulvocinctus*" from "St. 31, 48, 124, 137, 192" contained 3½ *H. quadridentatus* and 10 *H. elegans* (but no *H. fulvoc.*), and a tube from St. 359 contained 1 *H. quadr.-dent.* and 2 *H. elegans* (no *H. fulvoc.*). The localities of these stations are as follows: 63°10' N., 5°0' E., 763 m.,  $\div$  1.0° (St. 31); 66°41' N., 6°59' E., 640 m.,  $\div$  0.9° (St. 124); 67°24' N., 8°58' E., 827 m.,  $\div$  1.0° (St. 137); E. of Iceland 64°36' N., 10°22' W., 547 m.,  $\div$  0.3° (St. 48); 69°46' N., 16°15' E., 1187 m.,  $\div$  0.7° (St. 192); 78°2' N., 9°25' E., 761 m., 0.8° (St. 359). Thus the species belongs to the Polar deep, 547—1187 m.

**Halirages elegans** (Chart 48, partim (p. 265)). (On the literature and remarks on morphology, see above.)

Occurrence. This species was secured by the "Ingolf" at 4 stations.

S. of Jan Mayen: 70°05' N., 8°26' W., 700 m., temp.  $\div$  0.4°, or 69°13' N., 8°23' W., 1889 m., temp.  $\div$  1.0°. 1 ♀ with marsupium, abt. 20 mm. ("Ingolf" St. 116 or 117).

N. of the Faroes: 62°58' N., 7°09' W., 731 m., temp.  $\div$  0.4°. 1 spec. (♂?), abt. 18 mm., and ½ ♀  
("Ingolf" St. 143).

W. of Iceland: 65°14' N., 30°39' W., 1435 m., temp. 2.1°. 6 spec. abt. 11—18 mm. ("Ingolf" St. 95).

— 65°24' N., 29°00' W., 1384 m., temp. 1.2°. 1 spec. (defective) ("Ingolf" St. 96).

Norman's specimen was taken S.E. of the Faroes 60°03' N., 5°51' W., 1017 m.

Distribution. Concerning some specimens taken together with *H. quadridentatus*, see under this species. Stappers's specimen was taken in the Kara Sea 71°03' N., 57°48' E., 207 m.

### 273. *Halirages melagops* (Buchholz) (Fig. 78).

*Paramphithoë megalops* Buchholz, 2. Deutsche Nordpolarfahrt, vol. 2, p. 369, Crustacea pl. 12.

*Amphithopsis* — H. J. Hansen, Meddel. om Grönl., vol. 19, 1895, p. 129.

*Halirages* — Stebbing 1906, p. 293.

*Apherusa* — Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, pp. 293—297, with figs.<sup>1)</sup>

<sup>1)</sup> This paper was not received till my own manuscript was ready to the press, and my figures were reproduced; I have added Shoemaker's localities, but not had opportunity to revise my text.



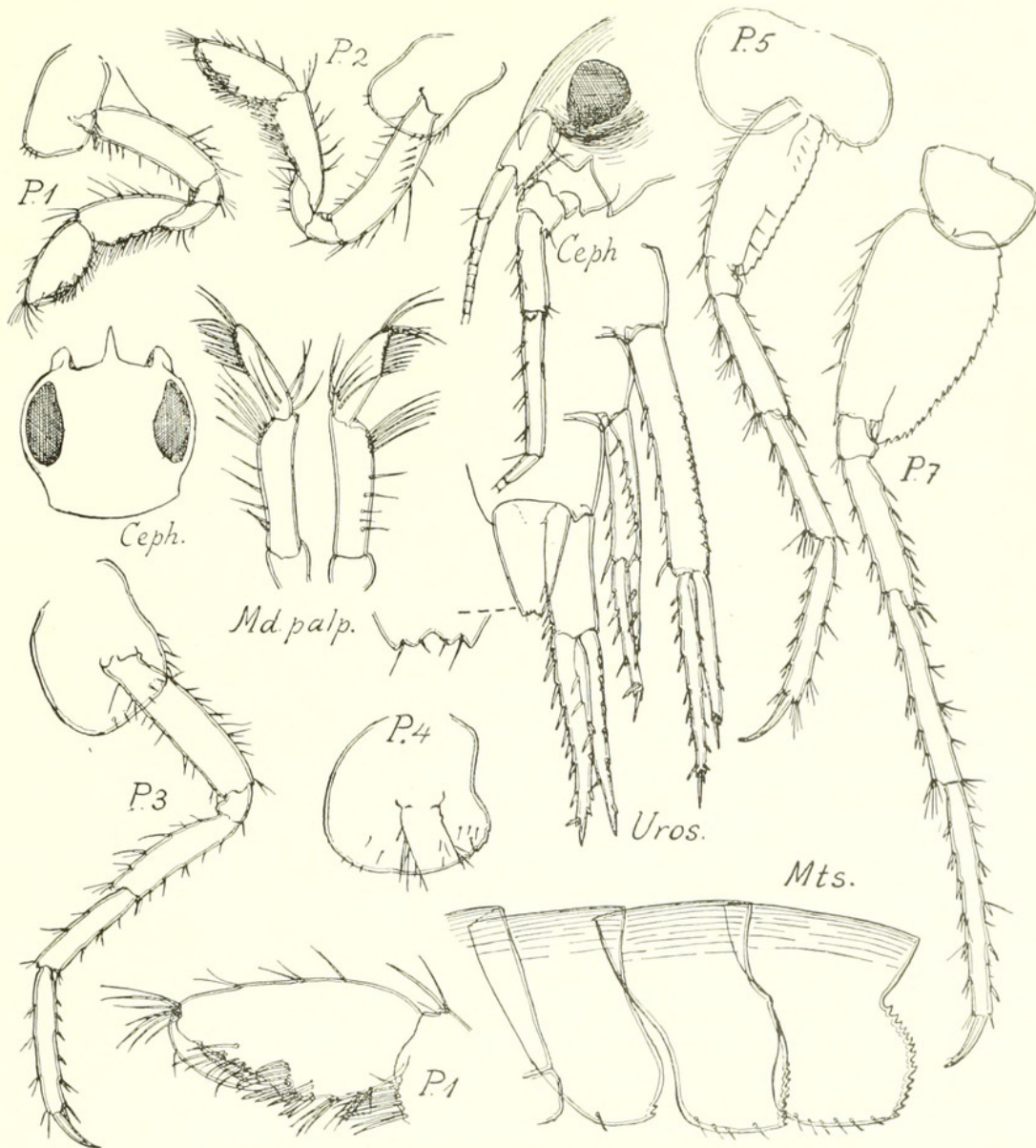


Fig. 78. *Halirages megalops*, ♀, from Bredefjord, S. W. Greenland ("Rink" St. 104 5-8-1912).

Occurrence. This species has been taken at a few new localities by the "Ingolf" and by other expeditions.

W. Greenland: Ameralikfjord near Godthaab, in the mouth of the fjord, 10—20 m., shells ("Ingolf" Exped.).

— Holstensborg and Jakobshavn (Traustedt leg. 1892).

E. Greenland: Angmagssalik, the Cape Dan Islands, 12—20 m., rocky bottom almost without algae (Amdrup-Exped. 14-6-1899), and Cape Dan, 20—30 m., rocky bottom with many algae (Amdrup-Exped. 11-6-1899).

— Tiningiketok 65°51' N., 37°40' W., 2 m. (Kruuse leg. 5-7-1902).

— Turner Sound 69°44' N., 6 m. (E. Greenl.-Exped. 25-7-1900).



The species is extremely common in shallow water (4—abt. 30 m.) among algæ along the Greenland coasts, rarely at 50 m. or still deeper. It has been recorded from abt. 50 finds at W. Greenland 60°—77° N., and from 5 finds at E. Greenland 66°—75° N. (K. Stephensen, *Conspectus* 1913, p. 176, and 1916, p. 290).

Remarks. The species was established by Buchholz 1874 as belonging to the genus *Paramphithoë*. H. J. Hansen (*Meddel. om Grönl.*, vol. 19, 1895, p. 129) transferred it to the genus *Amphithopsis* with the following explanation "I have removed this species to the neighbourhood of [*Amphithopsis*] *glacialis* [= *Apherusa g.*], for it seems to be rather closely allied to this species". In the present paper I have removed it to the genus *Halirages*, for it is, at any rate, more closely allied to this genus than to any of the others (— it has no accessory flagellum in antenna 1—).

Buchholz gave a very elaborate description (— no less than 6 pages —) accompanied by some figures; later on none of those who have seen the species, has written any word on its morphology or delivered any new drawing of it. Therefore I have dissected a specimen and give some new drawing, especially of details not figured by Buchholz, but there is very little to add to or to correct in Buchholz's description. The most important is that the "face line" of the head has the same character as that of the other species of *Halirages*: there is a prominent ocular lobe and an acute subantennal corner, separated by a rather deep notch.

On the oral parts compared with those of the other species, see above, p. 264.

The length is abt. 8 mm. ♀ with eggs in the marsupium have been found at the following dates: W. Greenland (Godthaab) June 19th and July 3rd; S. Greenland (Bredefjord) July 17th to 31st and Aug. 25th, and (Tunugdliarfik) Sept. 2nd; and E. Greenland (Tiningniketok) July 5th.

Distribution. Outside Greenland the species has only been found two times at Barnard harbour, Northwest Territories (N. Canada, abt. 70° N., 115° W.), 4—10 m. (Shoemaker 1920, p. 13). — Gulf of St. Lawrence, 3 loc., 40—60 m. (Shoemaker l. c. 1930).

### Genus *Apherusa* Walker.

*Apherusa* G. O. Sars 1895, p. 438.

— Stebbing 1906, p. 304.

— Chevreux & Fage 1925, p. 176.

This genus has in the "Ingolf"-area 4 species; none of them is new to the area.

On affinities to the genus *Halirages*, see above, p. 263.

#### 274. *Apherusa bispinosa* (Sp. Bate).

*Apherusa bispinosa* G. O. Sars 1895, p. 439, pl. 155 fig. 1.

— . — Stebbing 1906, p. 305.

— — E. W. Sexton, *Journ. Mar. Biol. Assoc.*, Plymouth, vol. 9, 1911, p. 208, pl. 3 fig. 9.

— — Chevreux & Fage 1925, p. 177, fig.

— — R. Poisson & M.-L. Legueux, *Bull. Soc. Zool. France*, vol. 51, 1926, p. 318, fig.

Occurrence. The species has been recorded from three localities at the Faroes, 4—6 m., algæ (K. Stephensen: *Amphipoda; Zoology of the Faroes*, no. 23, 1929, p. 8). It has not been found at other



localities in the "Ingolf"-area, for a specimen recorded from N.E. Greenland (K. Stephensen, Meddel. om Grönl., vol. 45, 1912, p. 538) is in reality a defective specimen of *Halirages fulvocinctus*.

Remarks. The length rarely exceeds 5—6 mm. Oviparous ♀ (specimens in the Copenhagen Zool. Museum) have been found at the following dates: March 1st (Messina), August 18th (Kattegat), Oct. 1st and 14th (the Faroes).

Distribution. The species is an East Atlantic littoral species, found from the White Sea (Derjugin 1928, p. 278) to the Faroes, the Canarian Islands and the Black Sea, and it is probably very common anywhere in this area (except N. Norway where it seems to be rare) under proper conditions: algae in depths of abt. 4—20 m. — but it has been found as deep as 237 m. (Bay of Biscay), and especially the ♂ may often be found to be pelagical. For special localities see especially G. O. Sars 1895 (Norway) and Chevreux & Fage 1925 (more southern areas); on pelagical occurrence see Tesch, Amphip., in Bull. trimestriel 1902—1908, Résumé.... sur le plankton, 2. e partie, 1911, p. 188.

#### 275. *Apherusa sarsii* Shoemaker.

*Apherusa megalops* G. O. Sars 1895, p. 443, pl. 156 fig. 2.

— — Stebbing 1906, p. 306.

— *sarsii* Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 293.

Occurrence. The species has been taken at two new localities in the area, viz.:

E. Greenland without special locality, 2 rather defective spec., abt. 12 mm. (E. Bay leg.).

N. Iceland: 66°33' N., 20°05' W., 83 m., temp. 5.6°. 1 very defective spec., abt. 7 mm. ("Ingolf" St. 127).

Previously it has been recorded from N.E. Greenland: Danmark's Havn (abt. 76°45' N.), 10—20 m., 1 spec. abt. 10 mm. (K. Stephensen 1912, p. 537).

Remarks. In none of the specimens the telson is shaped as drawn by Sars (— it is totally lost in the "Ingolf"-specimen —): the apical teeth are placed more closely to each other, and there are a few lateral teeth.

Distribution. N. Norway: Varangerfjord, at Bugö (type-locality), abt. 100—120 m. (G. O. Sars 1895). — Kola Bay, 2 loc. (Derjugin 1915, p. 447). — Siberia: West Taimyr 75°54' N., 92°59' E., 9—12 and 16 m., sand (Brüggen 1909, p. 28).

#### 276. *Apherusa jurinei* (Milne-Edwards) (Chart 49, partim).

*Apherusa jurinei* G. O. Sars 1895, p. 445, pl. 157 fig. 1.

— — Stebbing 1906, p. 307.

— — Chevreux & Fage 1925, p. 182, figs.

— — Walker, Ann. Mag. Nat. Hist., ser. 8, vol. 9, 1912, pp. 600.

Occurrence. The species has been secured from one new locality in the area, viz., the Vestman-Islands (S.W. Iceland), 20—30 m., stony bottom, a few specimens comprising ♀ ovig. (H. Jónsson leg. 18-5-1897). It has been taken 3 times at the Faroes, on the shore (K. Stephensen, Amphip.; Zool. of the Faroes, no. 23, 1929, p. 8).



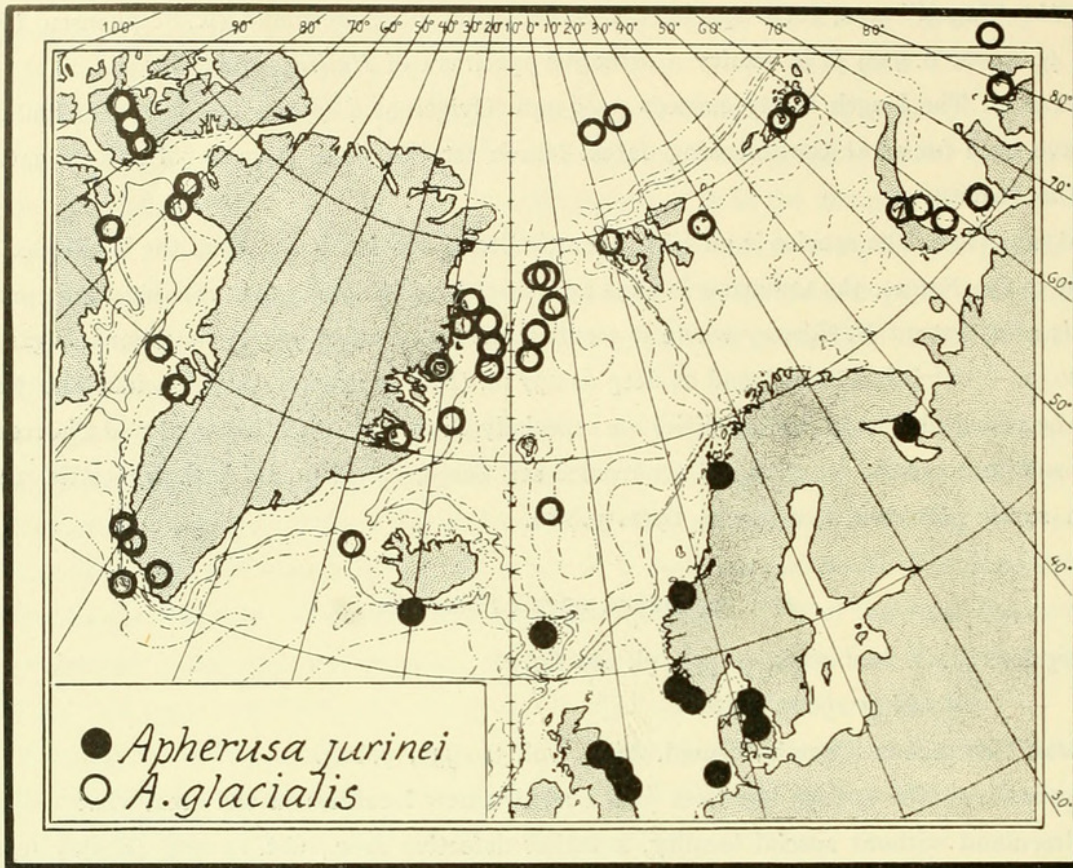


Chart 49. *Apherusa jurinei* and *A. glacialis*. (The last named species has a locality in the Gulf of St. Lawrence, outside the Chart).

The species has been recorded from E. Greenland, but these quotations are due to wrong identification: the specimen (15 mm.) from Hekla Havn (H. J. Hansen, Medd. om Grönl., vol. 19, 1895, p. 129) is *Weiprechtia pinguis* (Kr.), the specimens from Hvalrosnæs (K. Stephensen, Meddel. om Grönl., vol. 45, 1912, p. 537) are *Pontogeneia inermis* (Kr.).

Thus the locality Vestman Islands is the western most locality known.

Remarks. Small specimens (<abt. 4—5 mm.) may easily be confounded with *Weiprechtia pinguis* (Kr.); a good character for such small specimens is the absence (*A. jurinei*) or presence (*W. pinguis*) of accessory flagellum in ant. 1.

Ovigerous ♀ were found at the following dates: Vestman Islands May 18th, Faroes May 13th and 23rd, and Aug. 16th.

The ♂ has the 6th joint of pereopods 1—2 heavier than that of ♀ and the palm more transverse; other sexual differences are treated by Walker l. c. 1912.

Distribution (Chart 49, partim). It is found sparingly along Europe (and at S.W. Iceland, see above), from the White Sea (Gurjanova 1927, pp. 33 and 38; Derjugin 1928, p. 278) and N. Norway (Foldenfjord, abt.  $67\frac{1}{2}^{\circ}$  N.; K. Stephensen, Tromsø Mus. Skr., vol. 1, pt. 5, 1926, p. 10) to Portugal (Sines; Chevreux & Fage l. c.) in shallow water, but only along the Atlantic coast of France it seems to be common.



277. *Apherusa glacialis* (H. J. Hansen) (Fig. 79) (Chart 49, partim).

*Amphithopsis glacialis* H. J. Hansen, Vid. Medd. 1887 (1888), p. 137, figs.

— — Stebbing, Bijdragen Dierk., vol. 17, 1894, p. 36.

*Apherusa* — Ohlin, Acta Univ. Lund., vol. 31, no. 6, 1895, p. 46.

— — Stebbing 1906, p. 307.

— — Stappers 1911, p. 61, figs.

Occurrence. This species was not secured by the "Ingolf", but by other expeditions.

W. Greenland: Thule, off the "Profillinien", 10—50 m., rocky bottom (Lauge Koch leg. 13-7-1916).

E. Greenland: Smalsund, Laminariæ (Amdrup-Exped. 17-9-1898).

E. of Greenland: Abt. 74°12' N., 12° W., and abt. 74°10' N., 10° W. (E. Greenl.-Exped. 1900).

N. of Jan Mayen: Abt. 74°27' N., 7° W. (E. Greenl.-Exped. 7-7-1900).

W. of Iceland: 65°27' N., 27°10' W. 763 m., young fish trawl 800 m. wire ("Thor" St. 154, 21-6-1904).

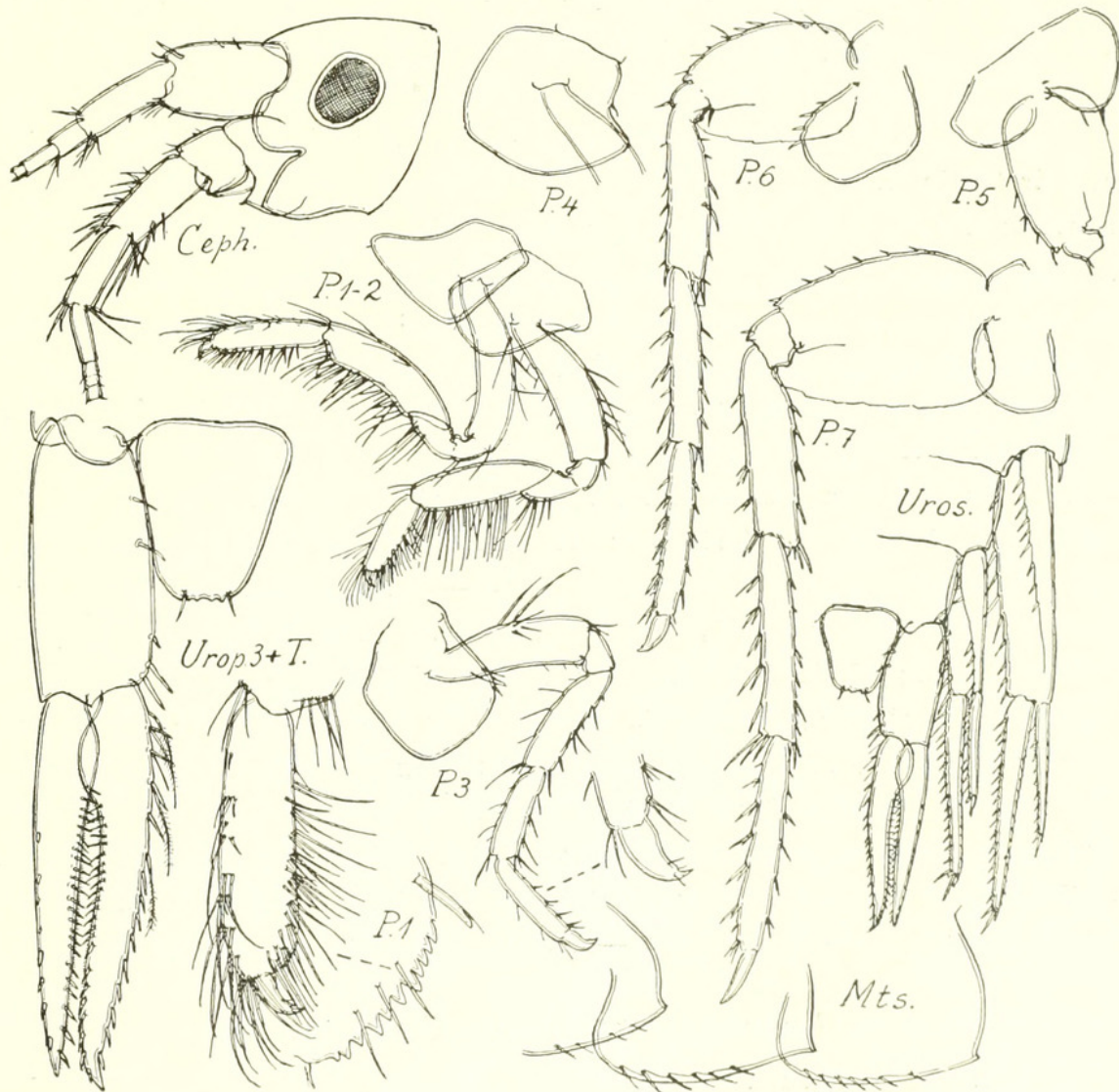


Fig. 79. *Apherusa glacialis*, ♂ (?) abt. 12 mm, from the "Danmark"-Exped. St. 13 c.



E. of Iceland:  $67^{\circ}19' N.$ ,  $4^{\circ}21' W.$  (E. Greenl.-Exped. 30-6-1900).

It is very common in the Greenland waters, found at W. Greenland from abt.  $60^{\circ}$  to  $76\frac{1}{2}^{\circ} N.$ , and at E. Greenland from abt.  $70^{\circ}$  to  $78^{\circ} N.$  (K. Stephensen, *Conspectus* 1913, p. 175, and Meddel. om Grönl., vol. 53, 1916, p. 289). It lives pelagically among the hummocks of ice, and no doubt it belongs to the surface, but has been taken as deep as 550—450 m. (with Nansen closing net, in the Bredefjord, S. Greenland).

Remarks. The species was described by H. J. Hansen l. c. 1887 in a Latin diagnosis, accompanied by some figures on a very minute scale, but the oral parts were not dissected out. Stebbing (1894) gave a description of the oral parts; Stappers (1911) delivered figures of these, with remarks also on the uropoda, etc. Ohlin (1895) gives some excellent remarks on the affinities of the species; he says: "I have referred it to the genus *Apherusa*, as it seems to be most closely allied to this genus as characterised by Sars, — though possibly it should be considered the type of a new genus". No doubt this is correct; I have dissected some specimens and arrived at a similar conclusion, before I had read Ohlin's remarks. It cannot remain in the genus *Amphithopsis*, for the head has large (nearly quadrangular) subantennal corners; antenna 1 is shorter than ant. 2 and has no accessory flagellum; the inferior lip has inner lobes, and the two rami of uropod 3 are subequal in length. On the other hand it differs from all known species of *Apherusa* in the rather long, narrow 6th joint of pereopods 1—2; as to this character it is closely allied to *Halirages (fulvocinctus)* and to the genus *Leptamphopus*.

I have nothing to add to the existing descriptions, but as most of the figures of the appendages are very small, I have given some new drawings on a larger scale.

The length is usually abt. 10 mm.; only a few are longer: N.E. Greenland abt. 11—12 mm., S.W. Greenland (Bredefjord) 13 mm., the Kara Sea abt. 13 mm.

Distribution (Chart 49, partim). The species is a circumpolar, pelagic species, living near the surface among floating ice. Most of the localities up to abt. 1910 are listed by Stappers; but later on it has been recorded by several authors. A completion of Stappers's list is given below. Alaska, three times (Cooper Island, Point Barrow; Cape Smith, Point Barrow; Harrison Bay; pelagical, surf.), and on the beach at Barnard Harbour (abt.  $70^{\circ} N.$ ,  $115^{\circ} W.$ ) (Shoemaker 1920, p. 12). — Gulf of St. Lawrence: off Cheticamp island, 60 m. (Shoemaker, *Contrib. Canad. Biol.*, vol. 5, 1930, p. 292). — Between Spitsbergen and Greenland:  $79^{\circ}44' N.$ ,  $11^{\circ}10' E.$ , surf.;  $78^{\circ}18' N.$ ,  $3^{\circ}40' W.$ , surf.;  $78^{\circ}20' N.$ ,  $4^{\circ}27' W.$ , 300—100 m.;  $76^{\circ}55' N.$ ,  $3^{\circ}30' W.$ , 500—300 m.;  $76^{\circ}48' N.$ ,  $3^{\circ}32' W.$ , to  $76^{\circ}47' N.$ ,  $3^{\circ}32' W.$ , surf.;  $75^{\circ}58.5' N.$ ,  $7^{\circ}52' W.$ , surf. (Koefoed, in *Duc d'Orléans* 1909, p. 34, 68, 70, 82, 85, 94). — Spitsbergen: Kung Carls Land, 8—12 m., and 15 m. (Schellenberg 1924, p. 205). — Between  $84^{\circ}47' N.$  and  $83^{\circ}57' N.$ , and between  $25^{\circ} E.$  and  $11^{\circ} E.$ ;  $85^{\circ}13' N.$ ,  $79^{\circ} E.$ ; between  $84^{\circ}15' N.$  and  $84^{\circ}42' N.$ , and between  $96^{\circ}$  and  $72^{\circ} E.$ ; abt.  $80^{\circ} N.$ ,  $134^{\circ} E.$  (G. O. Sars 1900, pp. 8—11). — 14 localities along the Russian and Siberian North coasts, from the Kara Sea  $71^{\circ}36' N.$ ,  $65^{\circ}36' E.$ , to the Bennett Island  $76^{\circ}34' N.$ ,  $147^{\circ}22\frac{1}{2}' E.$ , (200) 15—0 m. (Brüggen 1909, p. 28).

### Genus *Leptamphopus* G. O. Sars.

*Leptamphopus* G. O. Sars 1895, p. 458.

— Stebbing 1906, p. 293.

The genus was established by G. O. Sars 1893 (1895) in order to include *Amphithopsis longimana*



Boeck, as this species is not a true *Amphithopsis*. At present the genus comprises two (three?) species from the northern waters (to be recorded below) and at all events one from the southern hemisphere, viz., *L. novae-zealandiae* (G. M. Thomson) (for lit. see K. Stephensen, Vid. Medd. vol. 83, 1927, p. 314). But already in 1888 Stebbing (Amphip. Challenger, p. 924) called attention to the fact, that his new-established species *Atyloides serraticauda* from Australia (for lit. see K. Stephensen l. c. 1927, p. 339) was possibly congeneric with *Amphithopsis longimana* Boeck, and I am unable to find any character being a true obstacle to this view, apart from the very different telson.

278. **Leptamphopus (Oradarea) longimanus** (Boeck) (non G. O. Sars).

*Amphithopsis longimana* Boeck, Crust. Amphip. bor. et arct. 1870, p. 120.

— — Boeck, Skand. Arkt. Amphip. 1873—76, p. 353, with figs.

*Leptamphopus longimanus* Vanhöffen, in E. Drygalski, Grönland-Exped. 1891—93, vol. 2, 1897, p. 204.

— — Vanhöffen, Zool. Jahrb., Syst., vol. 25, 1907, p. 509, figs.

*Oradarea longimana* Shoemaker<sup>1)</sup>, Contrib. Canad. Biol., vol. 5, 1930, pp. 299—306, figs. (with remarks on the literature).

non. *Leptamphopus longimanus* G. O. Sars 1895, p. 459, pl. 162.

non — — Stebbing 1906, p. 293.

Occurrence. The "Ingolf" has secured this species at a single Station:

W. of Greenland: 65°16' N., 55°05' W., 682 m., temp. 3.6°. 1 spec. ("Ingolf" St. 35).

A second locality, hitherto not recorded in literature, is Jakobshavn (abt. 69°13' N.), abt. 10 spec. includ. ♀ ovig. (Traustedt leg. 1892). —

Boeck's types were from Greenland without special locality. The species is also known from the Lille Karajakfjord (W. Greenl. abt. 71° N.) ("nicht weniger als 27 Ex. erhielt ich, da regelmässig einige mit dem Brutnetz heraufkamen, wenn es in 190 bis 200 m. Tiefe den Grund erreichte. Nur einmal wurde ein Ex. in geringerer Tiefe gedreht." Vanhöffen 1897, p. 204).

Remarks. (See also Shoemaker l. c. 1930<sup>1)</sup>.) Vanhöffen (1897, 1907) found in the Lille Karajakfjord, W. Greenland, a *Leptamphopus* species not identic with that described by Sars 1895 from Norway.

Vanhöffen's specimens differed from Sars's description and drawings in the following characters:—

	G. O. Sars (specimens from Norway)	Vanhöffen (specimens from W. Greenland)
Ocular lobe of the head	apically cut off, with upper corner obtusely angled and lower corner rectangular.	triangularly rounded (Vanhöffen fig. 5)
Dorsal line of metasome segments 1—2.	without teeth	each of these two segments with a tooth (Vanhöffen fig. 4)
5th joint of pereopod 1.	somewhat widened distally, with a triangular lobe apically on the under (hind) edge	not widened distally and without any triangular lobe, but much broader than 6th joint (Vanhöffen fig. 6)
Proportion of length of 6th joint of pereopod 1 and of pereopod 2.	1:1.8	1:2.5 (Vanhöffen figs. 6—8)
Telson.	apically not much narrower, with a little notch; no dorsal hairs.	apically much narrower, without incision, but with a few dorsal hairs (Vanhöffen fig. 9)

<sup>1)</sup> As Shoemaker's paper did not appear till the present work had gone to the press, I have only cited it, and noted the locality.



From a revision of the literature it appears that Boeck's species is identic with that of Vanhöffen. Boeck's original specimens were from Greenland (Boeck 1870: Groenlandia; they are in the possession of the Zool. Museum of Copenhagen and were revised by Vanhöffen and by my self). Boeck 1873—76 gives a more elaborate description (1½ pp., in Norwegian) than the short Latin diagnosis from 1870. On the distribution he writes: "In the Copenhagen Museum there were a few specimens from Greenland.... By G. O. Sars the species was taken in a few specimens near Christianssund from a depth of abt. 100—200 m." From the description it is rather clear, however, that the Norwegian specimens were not taken in consideration. Stebbing's description (1906) is clearly based upon Sars 1895, and thus does not apply to the species in question, but to *L. longimanus* G. O. Sars (non Boeck) which Vanhöffen proposes to call *L. sarsii*.

Distribution. The species is found at W. Greenland (see above), and in the Gulf of St. Lawrence: at Bancs Verts, 25—30 miles off Cheticamp island, 54 m., 55 spec. (Shoemaker l. c. 1930).

\*279. **Leptamphopus sarsi** Vanhöffen.

*Leptamphopus longimanus* G. O. Sars 1895, p. 459, pl. 162.

— — Stebbing 1906, p. 293.

— *sarsii* Vanhöffen, in E. Drygalski, Grönland-Exped. 1891—93, vol. 2, 1897, p. 204.

— — Vanhöffen, Zool. Jahrb., Syst., vol. 25, 1907, p. 511.

non — (*Amphithopsis*) *longimana* Boeck 1870 and 1873—76.

Occurrence. This species is new to the area; the "Ingolf" has secured it at a single station:— S.W. of Iceland: 66°37' N., 27°52' W., 1505 m., temp. 4.5°. Several small specimens ("Ingolf" St. 78).

Remarks. On the literature and the confusion with *Leptamphopus longimana* Boeck, see the preceding species.

Distribution. Norway, a few localities from abt. 59° to 64° N., viz., Karmöen (near Stavanger; a single specimen in the Copenhagen Zool. Museum, given and determined by Boeck as "*Amphithopsis longimana* Boeck"); — at Sunde and Mosterhavn in the outer part of the Hardangerfjord; at Christiansund, and in the Trondhjemsfjord; always abt. 285—750 m. (G. O. Sars l. c.); — Rödberg in the Trondhjemsfjord, 475—575 m. (Norman 1895, p. 489).

\*280. **Leptamphopus(?) paripes** n. sp. (Fig. 80).

Occurrence. The "Ingolf" secured 3½ specimens of this new species at a single station, viz.: W. of Greenland: 63°30' N., 54°25' W. 1096 m., temp. 3.3° ("Ingolf" St. 25).

Description of a specimen (sex?) abt. 7 mm. in length. The back is evenly vaulted. The head has a very short rostrum; the ocular lobes are rounded, and the subantennal corners quadrangular. The eyes could not be drawn exactly; at all events they are colourless (in spirit). The antennæ are like those of *L. sarsii* Vanhöffen (= *L. longimanus* Sars, non Boeck; Sars 1895, pl. 162), except, that penultimate joint of the peduncle of ant. 1 is longer than the ultimate. The exact length of the antennæ could not be stated; antenna 1 seems to be completely preserved and is as long as the head + mesosome; ant. 2 is abt. as long as ant. 1, but has lost the distal joints.



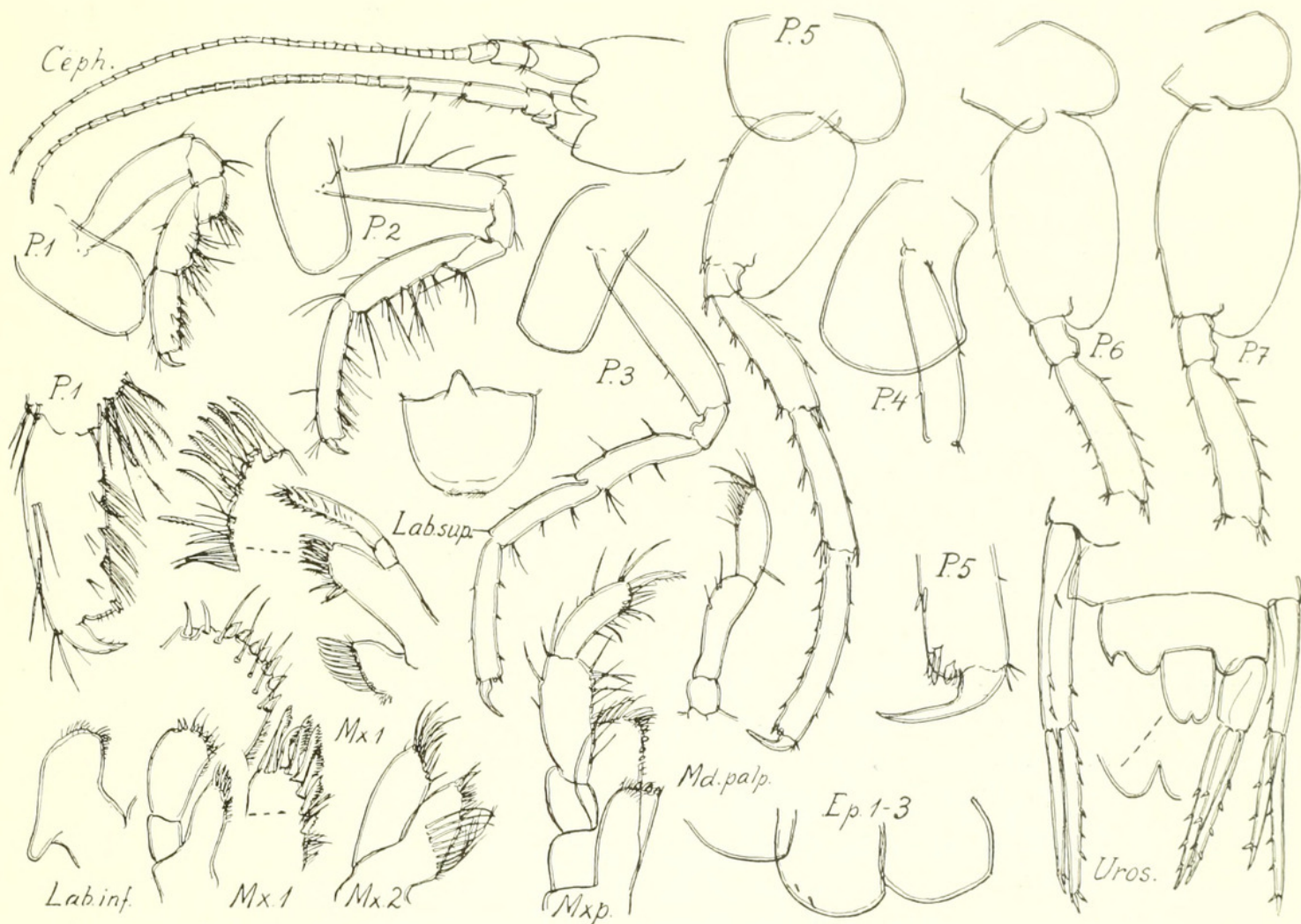


Fig. 80. *Leptamphopus* (?) *paripes*. (Inner lobe of maxilla 1 is lost in the specimen drawn).

The upper lip is rounded, with a little acute process above. The lower lip has no inner lobes. The mandibles are of the type usual in the fam., with accessory plates in both mandibles; 3rd joint of the palp is rather broad. The two pairs of maxillæ and the maxillipedes almost exactly as drawn by Sars (pl. 162), with the exception that the palp of max. 1 is very broad.

1st joint of the pereiopoda almost exactly as drawn by Sars. Pereiop. 1 has 5th joint somewhat widened distally, but without any special lobe; 6th joint as long as 5th, somewhat narrower, with the margins almost parallel; the palm transverse, with two spines on the corner; the finger curved, as long as the palm. Pereiop. 2 of a similar shape, but much more elongate, especially in joints 5—6; these are of equal length and have the margins almost parallel. The pereiopods are not increasing in length from no. 5 to no. 7; the joints 4 and 5 in pereiop. 3—7 have almost equal length, joint 6 a little longer. 6th joint of pereiop. 3—7 has an indication of a palm, with 1 spoon-shaped and 2 acute spines; the dactylus is stout and curved. Thus there is no essential difference between the 2 first and the 5 hinder pereiopods, and I propose the specific name *paripes* (= with legs of the same type) as an allusion hereto.



The epimeral parts of the metasome segments are like those of *L. sarsii*, except that no. 1 has the inferior hind corner rectangular, not rounded. Also the uropoda are very like those of the said species, except urop. 3, which has the inner ramus only a trifle longer than the outer ramus (not twice as long). The telson is oval, with a little notch in the hind margin, and rounded hind lobes.

Remarks. Not without hesitation have I referred the present species to the genus *Leptamphopus*; for in spite of a very good accordance as to most of the characters there are some essential differences: ant. 1 is probably shorter than ant. 2, urop. 3 has the rami of equal length, and the pereopoda 3—7 are not essentially differing from pereop. 1—2; the last-named character is, as far as I know, otherwise totally unknown in the family.

### Genus *Calliopus* Lilljeborg.

*Calliopus* G. O. Sars 1895, p. 446.

— Stebbing 1906, p. 295.

— Chevreux & Fage 1925, p. 183.

In the area the genus has only one, widely distributed species.

#### 281. *Calliopus læviusculus* (Krøyer) (Chart 50).

*Calliopus læviusculus* G. O. Sars 1895, p. 449, pl. 158.

— — Stebbing 1906, p. 296.

— *rathkei* G. O. Sars 1895, p. 447, pl. 157 fig. 2.

— — Stebbing 1906, p. 296.

Occurrence. The species was only twice secured by the "Ingolf"-Expedition, but it has been taken by several collectors.

W. Greenland: The south side of Tasardluarsuk ( $60^{\circ}07'$  N.), on the shore (A. Jessen leg. 16-8-1894).

— The mouth of the Ameralikfjord (near Godthaab), 10—20 m., shells. ("Ingolf"-  
Exped. 23-7-1895).

— Sukkertoppen (cand. med. Søren Hansen leg. 13-5-1885).

— Sukkertoppen, among algæ on the shore ("Ingolf"-Exped. 17-7-1895).

— Holstensborg (Traustedt leg. 1892).

—  $69^{\circ}$  N.,  $54^{\circ}$  W. (cand. med. Søren Hansen leg. 18-8-1888).

— Patoot in the Waigat, in the surface, near the shore. Numerous spec. (♂ only?)  
(N. Hartz leg. 8-8-1890).

S.W. Iceland: Reykjavik (Adjunkt Gröndahl leg. 7-1875), and *ibid.*, on the shore at lowtide  
(A. C. Johansen leg. 9-1900).

— Hafnarfjörðr (near Reykjavik) (Caroc leg. 1876).

— Skeyjafjörðr (near Reykjavik), sandy bottom (A. C. Johansen leg. 25-9-1900).

N.W. Iceland: ? Isafjörðr (H. Koch leg. 17-6-1862).

— Skutilsfjörðr (in the Isafjörðr), 4—8 m. (W. Lundbeck leg. 22-5-1892).

N. Iceland: Skagaströnd, depth not noted, and depth 100—120 m. (Steincke ded. 1875).



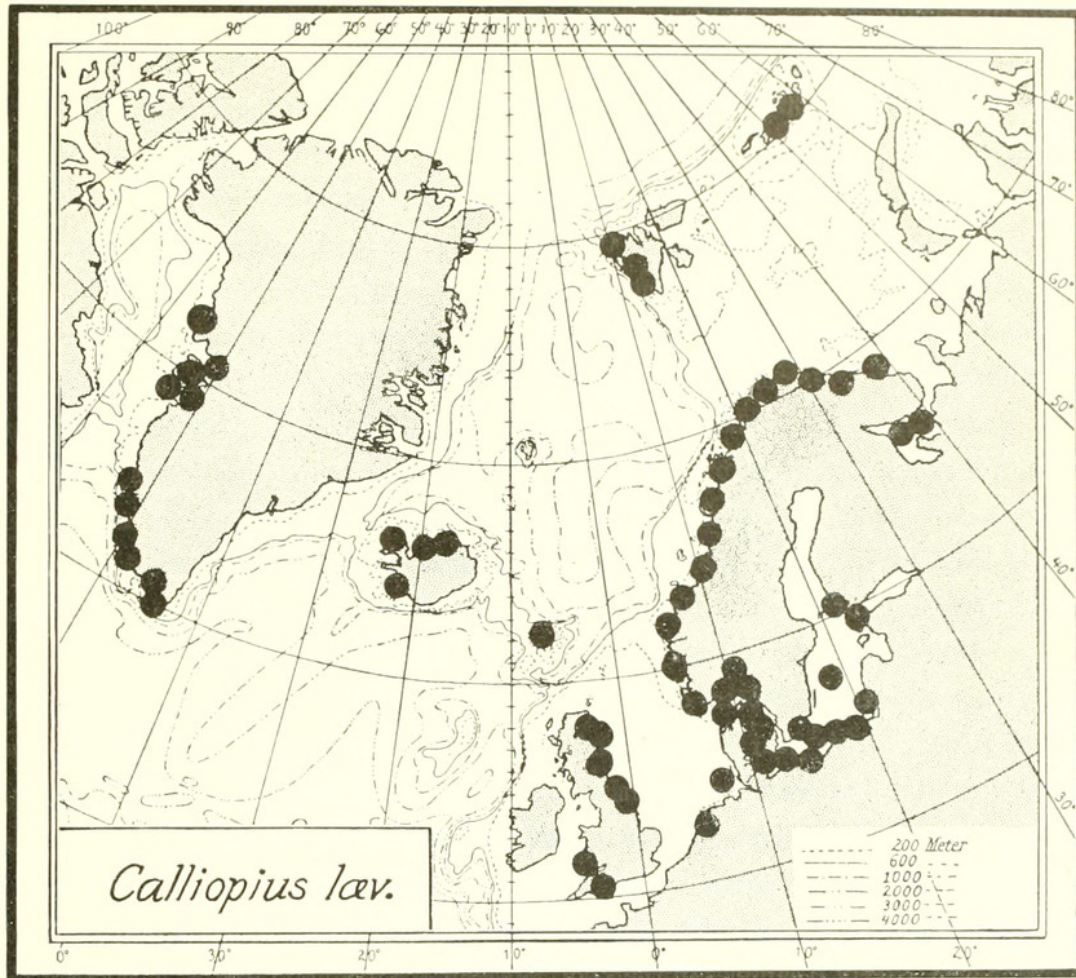


Chart 50. *Calliopijs læviusculus*. American localities are outside the chart.

N. Iceland: Eyjafjörðr (H. Jónsson leg. 1-7-1898).

— Snartarstaðir, 4—0 m., black sand (C. Otterström 24-6-1903).

The Zool. Museum of Copenhagen possesses specimens also from Kolbeinsá (Iceland, where ?), on the shore (H. Jónsson leg. 7-9-1897), and from Iceland without special loc. (Jap. Steenstrup leg. 19-3-1840). Till now it had not been recorded from Iceland.

In existing literature it has been recorded from abt. 20 localities at W. Greenland, 60°—73° N. (K. Stephensen, *Conspectus* 1913, p. 180, and *Meddel. om Grönl.*, vol. 53, 1916, p. 292) (not from E. Greenland), and from a couple of localities at the Faroes (K. Stephensen, in *Zool. of the Faroes*, no. 23 (Amphip.), 1929, p. 8). It prefers rather shallow water, rarely deeper than abt. 20 m., among algæ, but may sometimes (especially the ♂) be found pelagically in large shoals near the shore.

Remarks on the nomenclature etc. *Amphithoë læviuscula* was established by Krøyer 1838, based upon specimens from Fiskensæset in W. Greenland (abt. 63° N.), length  $\frac{1}{2}$  danish inch = 13 mm. Shortly afterwards Zaddach (1844) established *Amphithoë rathkei*, found "in mari baltico prope Gedanum" (Lake Geserich, near Danzig), length "paene 3 lineas". = 6 mm. Zaddach has not given any figure, and



he has not had any knowledge of Krøyer's species; he speaks of similarity with *Amphithoë norvegica* Rathke (= *Apherusa jurinei* (M.-Edw.)), but does not mention any other species in this connection.

The first elaborate descriptions with exact detail figures of the two species were given by Sars 1895; probably all authors anterior to that year have referred their specimens to Krøyer's species. Sars's characteristics were elaborate, and as according to him the two species seem to be well defined, more recent authors (— also the author of this paper —) have tried to identify their material with both species, but frequently with no success, or even with great doubt, as most of the specimens combined characters of the two species.

As the Zool. Museum of Copenhagen possesses a very considerable material (— many hundred specimens —) from Labrador, Greenland, Iceland, the Faroes, Norway, Denmark (and the Baltic to Gotland), and the Eastern Asia, I have closely examined all the specimens, and the result is that the two species are to be considered synonymous. There are a few typical specimens of "*C. læviusculus*" (with long process on antenna 1, and without tooth on the lower hind corner of 3rd metasome segment): Greenland without special loc., 15 and 18 mm.; "N. Greenl.," up to 18 mm.; Ritenbenk (W. Greenl.) up to 16 mm.; Iceland: Skutilsfjörðr 14 mm., ?Isafjörðr 12 mm., and Skagatrönd 10 mm.; Denmark: Hirshals ♀ ovig. 14 mm., and possibly the Faxe Bugt (E. Sealand) abt. 7 mm. But there are scarcely any quite typical specimen of "*C. rathkei*" (with the process on antenna 1 as short as drawn by Sars; possibly a single ♀ ovig., 5 mm., from the eastern Baltic near Gotland, and a ♀ with marsupial plates, 6 mm., from the southern Lille Belt (off Kappeln)). All the other specimens vary to a high degree, and most of them take up an intermediate position; no doubt the authors anterior to Sars are right in considering *C. rathkei* a minor, southern form of *C. læviusculus*.

All the specimens recorded in existing literature from Greenland are in the possession of the Zool. Museum of Copenhagen, except 6 samples in the Zool. Museum of Stockholm (see H. J. Hansen 1887, p. 134, the samples marked S.M.) and a sample in the Oslo Museum. I have not seen the specimens of Stockholm; but through the kindness of the Oslo Museum I have revised the specimens recorded by Sars 1909 from Disko (under the name of *C. rathkei*). This sample comprises abt. 20 spec., abt. 5—6 mm., all typical young specimens *C. læviusculus* (but with calceoli on the antennæ); the process on antenna 1 is little, yet too long to be typical of *C. rathkei*, and 3rd metasome segment has a little tooth, or is nearly devoid of any tooth.

Sars (1895) and Stebbing (1906) record in their diagnosis of the species that *C. læviusculus* has on both rami of uropod 3 both spines and setæ, *C. rathkei* no setæ on the outer ramus. This is, however, not correct; all specimens investigated by me have spines as well as setæ on both rami.

Size of the species; propagation. In Greenland numerous ♀ ovig. are found, but unfortunately very few with dates preserved; these are May 13th and Aug. 7th (Sukkertoppen). The Greenland ♀ ovig. have lengths of (10) 11—16 (18) mm. A single sample (from Holstensborg 1892) is very interesting, as it contains numerous ♀ ovig.; but unfortunately it is not evident, whether the content was secured during a single day, or possibly during a longer period. The lengths of the specimens were as follows:—

10 mm.: 0 spec.; 11 mm.: 10 spec.; 12 mm.: 20 spec.; 13 mm.: 7 spec.; 14 mm.: 7 spec.; 15 mm.: 3 spec.; 16 mm.: 3 spec.; 17 mm.: 1 spec.; 18 mm.: 1 spec.

No specimen from Greenland is over 18 mm. —



The Icelandic ♀ ovig. are 7—14 mm.; no specimens at all were longer than 14 mm., most of them somewhat smaller. The individual specimens had the following lengths: S.W. Iceland (Reykjavik, and Skeyjafjörðr near Reykjavik, Sept. 25th) 8 and 7 mm.; N.W. Iceland (? Isafjörðr) 12 mm.; "Iceland" and Kolbeinsá (where?; Sept. 7th) 11—14 mm., and 7 mm. respective. —

Among the very few specimens from the Faroes the largest are ♀ ovig. from Kongshavn, taken Sept. 14th, length 5—6 mm. —

The Norwegian specimens are, according to Sars, 6 mm. (*C. rath.*) to 12—14 mm. (*C. læv.*).

There are numerous Danish specimens, most of them near to *C. rathkei*; the lengths of ♀ ovig. 5—6 mm., a few 8, 9, 10 mm. Unfortunately very few of the samples have dates; these are (when the Danish waters from the Belts to the Baltic (southern Lille Belt to Bornholm) are taken as a whole):—

April (16th, 18th, 24th): 9—10 mm.; May (1st, 2nd): 8—9 mm.; June (28th): 5 mm.; July (4th, 25th, 30th): 5 mm.; Aug. (9th): 5—6 mm.

Probably these measures indicate that the specimens large in April—May had been hatched the preceding year, and that they die out when the young have left the incubatory pouch; but if the small specimens from June—Aug. were hatched the same or the preceding year, and if the individual specimen has two spawning seasons (in the first year June—Aug., in the next year April—May) it is impossible to determine on the base of this material.

Quite isolated in Denmark is the find (in Hirshals, N.W.—Jutland) of some rather typical *C. læviusculus*, abt. 14 mm., found on Feb. 1st, and including ♀ with eggs. —

All the specimens from the eastern Asia (localities, see below) are rather typical *C. læviusculus*, except that metasome segment 3 has (in almost all specimens) a tooth as in *C. rathkei*. There are numerous ♀ ovig. 10, 11 and 12 mm. in length, but ♂ are 13—15 (18) mm.

Distribution (see Chart 50). Hudson Bay (*C. læv.*; Shoemaker 1926, p. 6). Arctic Canada: Bernard Harbour (abt. 70° N., 115° W.), surf. (*C. rath.*, Shoemaker 1920, p. 13). "This species appears to be quite common in the Gulf of St. Lawrence" (*C. læv.*; Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 80). Labrador (*C. læv.*, Packard, fide Sars). New England, very common (*C. læv.*, *C. rath.*; Holmes, Bull. Bur. Fish., Washington, vol. 24, 1904, p. 494). 5 loc. from Cape Cod to New York (*C. læv.*; Kunkel 1918, p. 87). W. Greenland, Iceland, the Faroes (see above). Probably the whole of Norway, from Vadsö (E. Finmark) southwards (G. O. Sars, and several other authors; *C. læv.* and *C. r.*). Murman coast (*C. læv.*; Jarzynsky 1870). Kola-fjord (*C. læv.* and *C. r.*; Gurjanowa 1927, pp. 29, 37). White Sea (*C. læv.*, Jarzynsky 1870; *C. r.*, Schellenberg 1924, p. 204; *C. læv.* and *C. r.*, Derjugin 1928, p. 278). Spitsbergen: Horn Sound (S.W. Spitsb.) and Cross Bay (N.W. Spitsb.) (*C. læv.*, Goës 1866, p. 525); Icefjord: Ymer Bay, shallow water (W. Spitsb.) (*C. læv.*, Oldevig 1917, p. 27). Franz Josef-Land: West Point, Cape Flora, 4—6 m., and Elmwood (*C. læv.*; Scott 1899, p. 78). Bohuslän (*C. r.*, G. O. Sars 1895). Skagerak: Hirshals, 1 m. (*C. læv.*, K. Stephensen 1926, p. 89). Kattegat, the Belts, and the Baltic to Gotland (*C. r.* and *C. læv.*, K. Stephensen 1926 p. 89, Zaddach 1878 (1879) p. 36, Lenz 1878 and 1882, Möbius 1873). Finland near Åbo and Helsingfors (Hellén 1919, p. 135; *C. r.*). Heligoland (*C. r.* and *C. læv.*, Sokolowsky 1900 and Metzger 1875, p. 282). East Friesland (*C. læv.*; Metzger 1875, p. 282; *C. r.*; Schellenberg, Zool. Anz. vol. 85, 1929, p. 177). Holland (*C. læv.*, Hoek, in Tijdschr.



Nederl. dierk. Ver., vol. 4, 1879, p. 138). Zuider Sea (*C. r.*, Tesch, in Radeke, F. en F. der Zuidersee, 1922, p. 332). River Texel, Holland (*C. r.*, Tesch 1915, p. 358). Great Britain: Devonshire, Moray Firth, Tenby (in S. Wales) (*C. læv.*, Bate & Westwood 1863, vol. 1, p. 259). Moray Firth, Banff (*C. grandoculis* (= *C. r.*), Bate & Westwood 1863, vol. 1, p. 265). Firth of Forth (*C. læv.* and *C. r.*, Scott 1906, p. 160). Northumberland and Durham: common between tidemarks (*C. r.*), or occasionally taken between tidemarks (*C. læv.*) (Norman & Brady 1909, p. 314). Guernsey and Jersey ("*C. læv.* = *C. rathkei*"; Norman, Ann. Mag. Nat. Hist., ser. 7, vol. 20, 1907, p. 366). It has been recorded by Chevreux (*vide* G. O. Sars) from France; but this must be due to an error, for Chevreux & Fage 1925 have not *C. læv.*, but the nearly related species *C. crenulatus* n. sp.

In the northern Pacific it has been secured at several localities. 51° N., 141°20' E., among algæ (Andréa leg. 1869). 49°30' N., 142°8' E. (Sartung in Sakalin) (Andréa leg. 1869). 48° N., 137°30' E., among algæ (Andréa leg. 1869). 45°40' N., 139° E., among algæ (Andréa leg. 1869). 40° N., 134° E., Japan Sea (Andréa leg. 1869). 36° N., 129°50' E., among algæ floating in the surface (Schönau leg. 4-1897). Japan Sea (H. Koch leg. 9-3-1872) (all these specimens, including several ♀ with eggs, belong to the Zool. Mus. of Copenhagen; some of them were examined by G. O. Sars 1895). — 4 loc. S. of Alaska, between 55°42' N., 136°20' W., and 54°23' N., 164°45' W., surf. (*C. læv.*, Shoemaker 1920, p. 13).

### Genus *Cleippides* Boeck.

*Cleippides* Boeck, Vid. Selsk. Forh., Christiania 1870 (1871), p. 201.

— Boeck, Skand. Arkt. Amphip. 1876, p. 357.

— Heller, Denkschr. Akad. Wiss. Wien, Math.-Naturwiss., vol. 35, 1875, p. 32.

— Stebbing 1906, p. 300.

The genus *Cleippides* was established by Boeck 1871 and comprised until 1875 when a second species (*C. quadricuspis* Heller) was established, the single species *C. (Acanthonotus) tricuspis* (Krøyer).

Stebbing (1906) gave a diagnosis of the genus, based upon the existing descriptions of the two species, but he had apparently not seen any specimen himself. As the Zool. Museum of Copenhagen possesses material of the three existing species (the two recorded above, + *C. bicuspis* n. sp.) I have dissected a specimen of each species and revised Stebbing's diagnosis. Upon the whole it is correct; but a few additions or corrections are to be made. Antenna 1 has in all the species a little uniarticulate accessory flagellum (see fig. 81 of *C. bicuspis*). Upper lip is not emarginate. Maxilla 1: outer plate has 10 spines (*C. quadricuspis*), or 9? (left) and 10 (right) (*C. bicuspis* and *C. tricuspis*); palp has 1st joint half as long as 2nd joint (*C. quadricuspis*), or a little more than half as long (*C. tricuspis*, the right palp; the left palp has 1st joint as in *C. quadricuspis*), or not essentially shorter than 2nd joint (*C. bicuspis*). Maxillipedes have the inner plate reaching to the distal end of 1st joint of the palp (*C. quadricuspis*), or a trifle longer (*C. bicuspis*) or to the middle of 2nd joint of the palp (*C. tricuspis*).

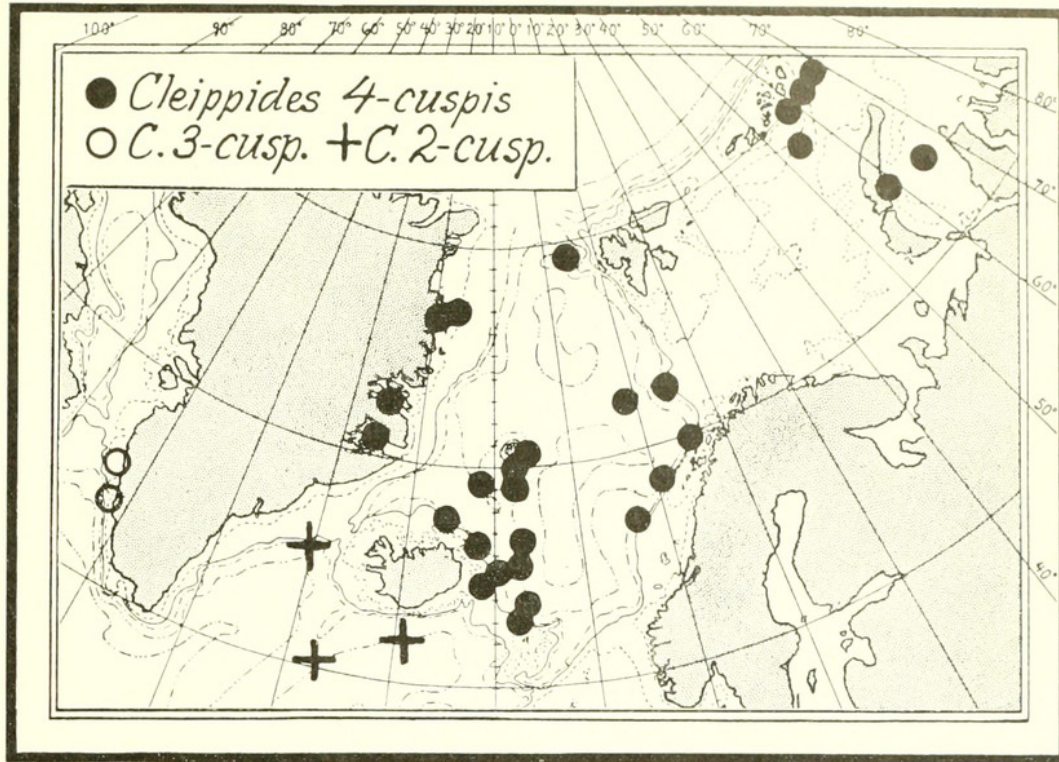
#### 282. *Cleippides quadricuspis* Heller (Chart 51, partim).

*Cleippides quadricuspis* Heller, Denkschr. Akad. Wien, vol. 35, 1875, p. 32, pl. 3 figs. 1—16.

— — G. O. Sars 1885, p. 174, pl. 14 fig. 5.

— — Stebbing 1906, p. 301.



Chart 51. *Cleippides 4-cuspis*, *C. 3-cuspis*, *C. 2-cuspis*.

Occurrence. The "Ingolf" and other expeditions have secured this species at several stations. E. Greenland: Hurry Inlet, the mouth, 100 m. 1 spec. (The E. Greenl. Exped. 11-8-1900).

— Forsblad Fjord, abt. 100 m., 1 ♀ ovig., and abt. 185—100 m., stones with clay and gravel, 4 spec. (E.-Greenl. Exped. 28-8-1900 and 30-8-1900).

N. of Iceland: 67°40' N., 15°40' W., 932 m.; temp. ÷ 0.6°, 2 spec., including 1 ♀ with embryos 52 mm. ("Ingolf" St. 124).

E. of Jan Mayen: 70°32' N., 8°10' W., abt. 900 m., clay with small stones, 3 spec. (Amdrup-Exped. 27-6-1891).

S. of Jan Mayen: 70°05' N., 8°26' W., 700 m. 19 spec., including 2 ♀ with eggs 62.5 and 58 mm., and 1 ♀ with embryos 53 mm. ("Ingolf" St. 116).

— — 69°13' N., 8°23' W., 1889 m., 1 spec. ("Ingolf" St. 117).

E. of Iceland: 66°00' N., 11°41' W., 280 m. 4 spec. ("Thor" St. 52, 21-4-1903).

— — 66°23' N., 7°25' W., 1802 m.; temp. ÷ 1.1°. 1 spec. ("Ingolf" St. 104).

— — 65°34' N., 7°31' W., 1435 m.; temp. ÷ 0.8°. 1 ♀ ovig. 56 mm. ("Ingolf" St. 105).

— — 64°36' N., 11°40' W., 445 m.; 1 spec., from the stomach of cod ("Dana" St. 2226, 31-7-1924).

N. of the Faroes: 63°29' N., 6°57' W., 1469 m.; temp. ÷ 0.9°. 5 spec. ("Ingolf" St. 140).

— — 62°58' N., 7°09' W., 731 m.; temp. ÷ 0.4°. 1 spec. ("Ingolf" St. 143).

The species was known from several localities in the "Ingolf"-area, viz., E. Greenland: Stormbugt



(abt.  $76^{\circ}45'$  N.), abt. 100 m., stones with corals (K. Stephensen, Danmark Exped. 1912, p. 539). — E. Greenland  $77^{\circ}31'$  N.,  $18^{\circ}24'$  W., 275 m., and E. of Iceland  $64^{\circ}53'$  N.,  $10^{\circ}00'$  W., 630 m., temp.  $\div 0.69^{\circ}$  (Grieg, in Duc d'Orléans 1907, p. 550). — S.W. of Jan Mayen  $69^{\circ}2'$  N.,  $11^{\circ}26'$  W., 1836 m., temp.  $\div 1.1^{\circ}$ , Biloculina clay (G. O. Sars 1886, p. 57).

Remarks. Very many of the specimens are very large, up to 67 (69) mm. In the material there are the following mature ♀ from the following dates: ♀ ovig. 49 mm., ♀ with empty marsupium 50 mm. ("Thor" St. 52, 23-3); ♀ ovig. 60 mm. (E. of Jan Mayen, 27-6); ♀ ovig. 56 mm. ("Ingolf" St. 105, 11-7); ♀ ovig. 58 and 62.5 mm., ♀ with embryos 53 mm. ("Ingolf" St. 116, 23-7); ♀ with marsupial plates 65 mm. ("Ingolf" St. 117, 23-7); ♀ with embryos 52 mm. ("Ingolf" St. 124, 28-7); ♀ with large marsupium 67 mm. (Hurry Inlet, 11-8); ♀ ovig. 58, 58 and 65 mm., and ♀ with empty marsupium 65 mm. (Forsblads Fjord 28-8 and 30.8). Thus the ♀ ovig. have a length of 49—65 (67) mm. and have been found from 21-3 to 30-8.

Distribution (Chart 51, partim). The Arctic Polar Basin:  $66^{\circ}41'$  N.,  $6^{\circ}59'$  E., 640 m.,  $\div 0.9^{\circ}$ , coarse clay;  $68^{\circ}21'$  N.,  $10^{\circ}40'$  E., 836 m.,  $\div 0.7^{\circ}$ , sabulous clay;  $69^{\circ}46'$  N.,  $16^{\circ}15'$  E., 1187 m.,  $\div 0.7^{\circ}$ , sabulous clay;  $72^{\circ}57'$  N.,  $14^{\circ}32'$  E., 817 m.,  $\div 0.8^{\circ}$ , clay;  $72^{\circ}02'$  N.,  $9^{\circ}25'$  E., 761 m.,  $0.8^{\circ}$ , clay;  $79^{\circ}59'$  N.,  $5^{\circ}40'$  E., 839 m.,  $\div 1.0^{\circ}$ , clay (G. O. Sars 1886, p. 57). — S. of Franz Joseph Land  $77^{\circ}53'$  N.,  $53^{\circ}16'$  E., 250 m. (Scott 1899, p. 78). — Franz Joseph Land, several localities between abt.  $79^{\circ}\frac{1}{4}'$  N.,  $68^{\circ}$  E., and  $79^{\circ}\frac{1}{2}'$  N.,  $59^{\circ}$  E. (exact localities not stated), 160—265 m. (Heller 1878, p. 32; type-localities). — Kara Sea:  $73^{\circ}28'$  N.,  $58^{\circ}0'$  E. and  $78^{\circ}38'$  N.,  $63^{\circ}45'$  E. (Stuxberg 1882, p. 779), and  $74^{\circ}$  N.,  $57^{\circ}50'$  E., 180 m.,  $\div 1.5^{\circ}$  (Brüggen 1909, p. 29). — Near Taimyr  $76^{\circ}18'$  N.,  $92^{\circ}20'$  E. (Stuxberg 1882, p. 779), and Taimyr Gulf  $76^{\circ}59^{\frac{1}{2}}'$  N.,  $100^{\circ}19^{\frac{1}{2}}'$  E., 28 m., clay with pebbles (Brüggen 1909, p. 29).

The species is a form characteristic of the Arctic Polar Basin. The depths are as a rule very great, abt. 700—1900 m.; but in the high arctic areas it may be found in rather shallow water (E. Greenland abt. 100 m., in the Taimyr Gulf even 28 m.).

### 283. *Cleippides tricuspis* (Krøyer) (Chart 51, partim).

*Acanthonotus tricuspis* Krøyer, Naturhist. Tidsskr., ser. 2, vol. 2, 1846, p. 115.

— Krøyer, in Voyage Nord (Gaimard), Crust., 1846, pl. 18 fig. 1.

*Cleippides* — Stebbing 1906, p. 301.

Occurrence. Krøyer had "five or six specimens, collected by Kaptain Holbøll in South Greenland. On its occurrence and its habits nothing is known to me" (Krøyer l. c. 1846, p. 115). The Zool. Museum possesses 5 type-specimens and in addition a single specimen from Greenland without special locality, recorded by H. J. Hansen (in V. Grönland 1887, p. 139). The Naturhistoriska Riksmuseum, Stockholm, possesses a specimen from Sukkertoppen in W. Greenland, abt. 115—135 m., stones, length 20.2 mm. (this specimen too quoted by H. J. Hansen l. c. 1887), but other specimens are not known. H. J. Hansen is of opinion that the types were from Godthaab.

Remarks. Krøyer has given a very elaborate description (8 pp., in Danish) and very good drawings of the species. Stebbing (1906) has given an excellent summary of Krøyer's original Danish description. On the great agreement with *C. bicuspis*, see this species (below).



Distribution. The species is not found outside of Greenland. Stebbing (1906) notes it from Spitsbergen, but this is no doubt incorrect; Goës 1866 records it from Greenland (Krøyer's specimens), but not from Spitsbergen.

\*284. *Cleippides bicuspis* n. sp. (Fig. 81) (Chart 51, partim).

Occurrence. This new species was secured twice by the "Ingolf" and once by the "Thor"; the localities are:—

W. of Iceland: 65°14' N., 30°39' W., 1318 m.; temp. 2.1. 1 spec. (sex ?), 14 mm. (type) ("Ingolf" St. 95).

S.W. of Iceland: 60°37' N., 27°52' W., 1505 m.; temp. 4.5°. 1 ♀ with large but empty marsupium, 18 mm. ("Ingolf" St. 78).

S. of Iceland: 62°10.8' N., 19°36' W., 1900—2150 m. 3 spec. jun. ("Thor" St. 164, 12(13)-7-1903).

Description of a specimen, 14 mm., from "Ingolf" St. 95, compared with *C. tricuspis* (— that the possibly not mature specimen from St. 95 was chosen as type, is due to the fact that it was much more

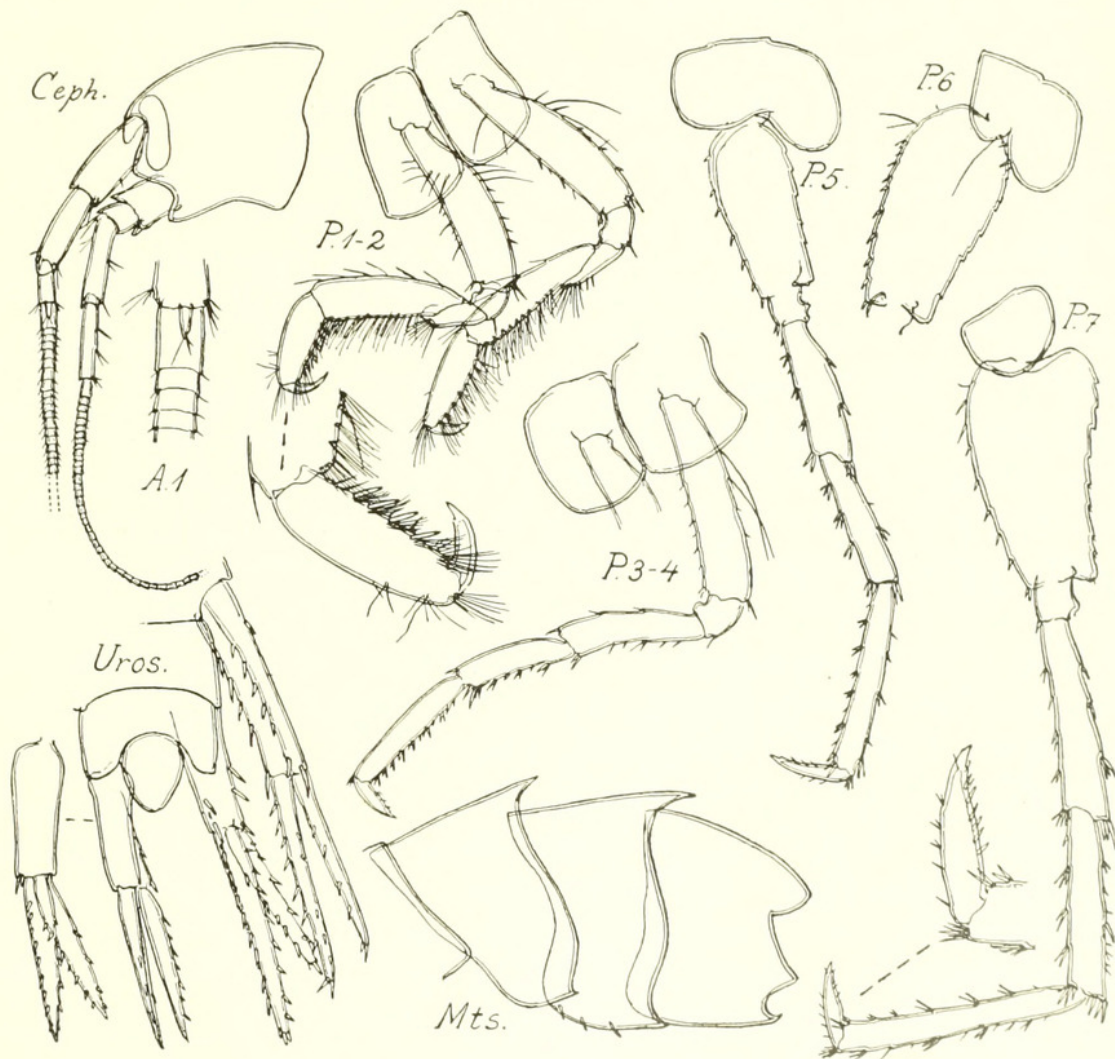


Fig. 81. *Cleippides bicuspis*.



completely preserved than the adult ♀ from St. 78, and there was no difference to be found between these two specimens, apart from the marsupial plates of the larger specimen —).

This species has the most striking resemblance to *C. tricuspis*, but has only two dorsal teeth (one tooth on each of the two first metasome segments, but none in the last mesosome segment). For comparison I have dissected one of Krøyer's types of *C. (Acanthonotus) tricuspis*, abt. 17 mm. in length.

The head has a little curved rostrum, triangular subocular lobes, and inferior lateral corners of the same shape (the head of *C. tricuspis* has the same shape, but is not correctly drawn by Krøyer 1846). The eye is reniform, colourless. The dorsum is evenly vaulted, without carina; on the dorsal teeth see above. The hind edge of 3rd metasome segment has exactly the same form as that of *C. tricuspis*, and the same applies to the telson.

### Genus *Haliragoides* G. O. Sars.

*Haliragoides* G. O. Sars 1895, p. 432.

— Stebbing 1906, p. 303.

This genus has on the northern hemisphere only one species.

#### \*285. *Haliragoides inermis* (G. O. Sars).

*Haliragoides inermis* G. O. Sars 1895, p. 433, pl. 153.

— — Stebbing 1906, p. 303.

Occurrence. The species was secured by the "Ingolf" at a single station; it is new to the area. N. of the Faroes: 63°26' N., 7°56' W., 887 m., temp. ÷ 0.6°, 4 spec. abt. 16—18 mm. ("Ingolf" St. 138).

Distribution. "Occasionally both off the west coast of Norway and in the Trondhjemsfjord, as also along the Nordland coast as far north as Hasvik, West Finmark", abt. 200—600 m. (G. O. Sars l. c.); Mortsund (in the Vestfjord, Lofoten), 200 m., and Sagfjord, 200 m. (Nordgaard 1905, p. 185). — Barents Sea 70°6' N., 60°38½' E., 205 m., clay (Brüggen 1909, p. 28). — Gulf of St. Lawrence: off Cheticamp Island, 30—93 m., 22 spec. (Shoemaker, Contrib. Canad. Biol., vol. 5, 1930, p. 299).



# THE INGOLF-EXPEDITION

1895—1896.

## THE LOCALITIES, DEPTHS, AND BOTTOMTEMPERATURES OF THE STATIONS

Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.
1	62° 30'	5° 21'	132	7 <sup>h</sup> 2	24	63° 06'	56° 00'	1199	2 <sup>h</sup> 4	45	64° 32'	9° 43'	643	4 <sup>h</sup> 17
2	63° 04'	9° 22'	262	5 <sup>h</sup> 3	25	63° 30'	54° 25'	582	3 <sup>h</sup> 3	46	64° 32'	11° 36'	720	2 <sup>h</sup> 40
3	63° 35'	10° 24'	272	0 <sup>h</sup> 5		63° 51'	53° 03'	136		47	61° 32'	13° 40'	950	3 <sup>h</sup> 23
4	64° 07'	11° 12'	237	2 <sup>h</sup> 5	26	63° 57'	52° 41'	34	0 <sup>h</sup> 6	48	61° 32'	15° 11'	1150	3 <sup>h</sup> 17
5	64° 40'	12° 09'	155			64° 37'	54° 24'	109		49	62° 07'	15° 07'	1120	2 <sup>h</sup> 91
6	63° 43'	14° 34'	90	7 <sup>h</sup> 0	27	64° 54'	55° 10'	393	3 <sup>h</sup> 8	50	62° 43'	15° 07'	1020	3 <sup>h</sup> 13
7	63° 13'	15° 41'	600	4 <sup>h</sup> 5	28	65° 14'	55° 42'	420	3 <sup>h</sup> 5	51	64° 15'	14° 22'	68	7 <sup>h</sup> 32
8	63° 56'	24° 40'	130	6 <sup>h</sup> 0	29	65° 34'	54° 31'	68	0 <sup>h</sup> 2	52	63° 57'	13° 32'	420	7 <sup>h</sup> 8;
9	64° 18'	27° 00'	295	5 <sup>h</sup> 8	30	66° 50'	54° 28'	22	1 <sup>h</sup> 05	53	63° 15'	15° 07'	795	3 <sup>h</sup> 08
10	64° 24'	28° 50'	788	3 <sup>h</sup> 5	31	66° 35'	55° 54'	88	1 <sup>h</sup> 6	54	63° 08'	15° 40'	694	3 <sup>h</sup> 9
11	64° 34'	31° 12'	1300	1 <sup>h</sup> 6	32	66° 35'	56° 38'	318	3 <sup>h</sup> 9	55	63° 33'	15° 02'	316	5 <sup>h</sup> 9
12	64° 38'	32° 37'	1040	0 <sup>h</sup> 3	33	67° 57'	55° 30'	35	0 <sup>h</sup> 8	56	64° 00'	15° 09'	68	7 <sup>h</sup> 57
13	64° 47'	34° 33'	622	3 <sup>h</sup> 9	34	65° 17'	54° 17'	55		57	63° 37'	13° 02'	350	3 <sup>h</sup> 4
14	64° 45'	35° 05'	176	4 <sup>h</sup> 4	35	65° 16'	55° 05'	362	3 <sup>h</sup> 6	58	64° 25'	12° 09'	211	0 <sup>h</sup> 8
15	66° 18'	25° 59'	330	—0 <sup>h</sup> 75	36	64° 50'	56° 21'	1435	1 <sup>h</sup> 5	59	65° 00'	11° 16'	310	0 <sup>h</sup> 1
16	65° 43'	26° 58'	250	6 <sup>h</sup> 1	37	66° 17'	54° 05'	1715	1 <sup>h</sup> 4	60	65° 09'	12° 27'	124	0 <sup>h</sup> 9
17	62° 49'	26° 55'	745	3 <sup>h</sup> 4	38	59° 12'	51° 05'	1870	1 <sup>h</sup> 5	61	65° 03'	13° 06'	55	0 <sup>h</sup> 4
18	61° 44'	30° 29'	1135	3 <sup>h</sup> 0	39	62° 00'	22° 38'	865	2 <sup>h</sup> 0	62	63° 18'	10° 12'	72	7 <sup>h</sup> 92
19	60° 29'	31° 14'	1566	2 <sup>h</sup> 4	40	62° 00'	21° 36'	845	3 <sup>h</sup> 3	63	62° 40'	10° 05'	800	4 <sup>h</sup> 0
20	58° 30'	40° 48'	1695	1 <sup>h</sup> 5	41	61° 39'	17° 10'	1245	2 <sup>h</sup> 0	64	62° 00'	19° 00'	1041	3 <sup>h</sup> 1
21	58° 01'	44° 45'	1330	2 <sup>h</sup> 4	42	61° 41'	16° 17'	625	0 <sup>h</sup> 4	65	61° 33'	16° 00'	1089	3 <sup>h</sup> 0
22	58° 10'	48° 23'	1845	1 <sup>h</sup> 4	43	61° 42'	16° 11'	645	0 <sup>h</sup> 05	66	61° 33'	20° 43'	1128	3 <sup>h</sup> 3
23	60° 43'	56° 00'	<small>Only the HARVEY-DEEP</small>		44	61° 42'	9° 30'	545	4 <sup>h</sup> 8	67	61° 30'	22° 30'	975	3 <sup>h</sup> 0



Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.
68	62° 06'	22° 30'	843	3 <sup>o</sup> 4	92	64° 44'	32° 52'	979	1 <sup>o</sup> 4	118	68° 27'	8° 20'	1060	-1 <sup>o</sup> 0
69	62° 40'	22° 17'	589	3 <sup>o</sup> 9	93	64° 24'	35° 14'	767	1 <sup>o</sup> 46	119	67° 53'	10° 19'	1010	-1 <sup>o</sup> 0
70	63° 09'	22° 03'	134	7 <sup>o</sup> 0	94	64° 56'	36° 19'	204	4 <sup>o</sup> 1	120	67° 29'	11° 32'	885	-1 <sup>o</sup> 0
71	63° 40'	22° 03'	46			65° 31'	30° 45'	213		121	66° 59'	13° 11'	529	-0 <sup>o</sup> 7
72	63° 12'	23° 04'	197	6 <sup>o</sup> 7	95	65° 14'	30° 39'	752	2 <sup>o</sup> 1	122	66° 42'	14° 44'	115	1 <sup>o</sup> 8
73	62° 58'	23° 28'	486	5 <sup>o</sup> 5	96	65° 24'	29° 00'	735	1 <sup>o</sup> 2	123	66° 52'	15° 40'	145	2 <sup>o</sup> 0
74	62° 17'	24° 30'	695	4 <sup>o</sup> 2	97	65° 28'	27° 39'	450	5 <sup>o</sup> 5	124	67° 40'	15° 40'	495	-0 <sup>o</sup> 6
	61° 57'	25° 33'	761		98	65° 38'	26° 27'	138	5 <sup>o</sup> 0	125	68° 08'	16° 02'	729	-0 <sup>o</sup> 8
	61° 28'	25° 06'	829		99	66° 13'	25° 53'	187	6 <sup>o</sup> 1	126	67° 19'	15° 52'	293	-0 <sup>o</sup> 5
75	61° 28'	26° 25'	780	4 <sup>o</sup> 3	100	66° 23'	14° 02'	59	6 <sup>o</sup> 4	127	66° 33'	20° 05'	44	5 <sup>o</sup> 6
76	60° 50'	26° 50'	806	4 <sup>o</sup> 1	101	66° 23'	12° 03'	537	-0 <sup>o</sup> 7	128	66° 50'	20° 02'	194	0 <sup>o</sup> 6
77	60° 10'	26° 59'	951	3 <sup>o</sup> 6	102	66° 23'	10° 26'	750	-0 <sup>o</sup> 9	129	66° 35'	23° 47'	117	6 <sup>o</sup> 5
78	60° 37'	27° 52'	799	4 <sup>o</sup> 5	103	66° 23'	8° 52'	579	-0 <sup>o</sup> 6	130	63° 00'	20° 40'	338	6 <sup>o</sup> 55
79	60° 52'	28° 58'	653	4 <sup>o</sup> 4	104	66° 23'	7° 25'	957	-1 <sup>o</sup> 1	131	63° 00'	19° 09'	698	4 <sup>o</sup> 7
80	61° 02'	29° 32'	935	4 <sup>o</sup> 0	105	65° 34'	7° 31'	762	-0 <sup>o</sup> 8	132	63° 00'	17° 04'	747	4 <sup>o</sup> 6
81	61° 44'	27° 00'	485	6 <sup>o</sup> 1	106	65° 34'	8° 54'	447	-0 <sup>o</sup> 6	133	63° 14'	11° 24'	230	2 <sup>o</sup> 2
82	61° 55'	27° 28'	824	4 <sup>o</sup> 1		65° 29'	8° 40'	466		134	62° 34'	10° 26'	299	4 <sup>o</sup> 1
83	62° 25'	28° 30'	912	5 <sup>o</sup> 5	107	65° 35'	10° 28'	492	-0 <sup>o</sup> 3	135	62° 48'	9° 48'	270	0 <sup>o</sup> 4
	62° 36'	26° 01'	472		108	65° 30'	12° 00'	97	1 <sup>o</sup> 1	136	63° 01'	9° 11'	256	4 <sup>o</sup> 8
	62° 36'	25° 30'	401		109	65° 29'	15° 25'	38	1 <sup>o</sup> 5	137	63° 14'	8° 31'	297	-0 <sup>o</sup> 6
84	62° 58'	25° 24'	633	4 <sup>o</sup> 8	110	66° 44'	11° 33'	781	-0 <sup>o</sup> 8	138	63° 26'	7° 56'	471	-0 <sup>o</sup> 6
85	63° 24'	25° 21'	170		111	67° 14'	8° 48'	860	-0 <sup>o</sup> 9	139	63° 36'	7° 30'	702	-0 <sup>o</sup> 6
86	65° 03'	25° 47'	76		112	67° 57'	6° 44'	1267	-1 <sup>o</sup> 1	140	63° 29'	6° 57'	780	-0 <sup>o</sup> 9
87	65° 02'	25° 36'	110		113	69° 31'	7° 06'	1309	-1 <sup>o</sup> 0	141	63° 22'	6° 58'	679	-0 <sup>o</sup> 6
88	64° 58'	24° 25'	76	6 <sup>o</sup> 9	114	70° 36'	7° 29'	773	-1 <sup>o</sup> 0	142	63° 07'	7° 05'	587	-0 <sup>o</sup> 6
89	64° 45'	27° 20'	310	8 <sup>o</sup> 4	115	70° 50'	8° 29'	86	0 <sup>o</sup> 1	143	62° 58'	7° 09'	388	-0 <sup>o</sup> 4
90	64° 45'	29° 06'	568	4 <sup>o</sup> 4	116	70° 05'	8° 26'	371	-0 <sup>o</sup> 4	144	62° 49'	7° 12'	276	1 <sup>o</sup> 6
91	64° 44'	31° 00'	1256	5 <sup>o</sup> 1	117	69° 13'	8° 23'	1003	-1 <sup>o</sup> 0					