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MALDANIDAE (POLYCHAETA)
FROM WEST GREENLAND WATERS

BY

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WITH 29 FIGURES IN THE TEXT

KØBENHAVN

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INTRODUCTION

During my studies on arctic Polychaeta especially intended for publication in the Report of the Danish "Ingolf" Expedition I found in the various collections in the Zoological Museum a fairly great number of Maldanids from more or less shallow waters west of Greenland, an area which is beyond the scope of the "Ingolf" report. The material appeared to be fairly well preserved although many of the specimens were fragmentary, but in most cases I succeeded in ascertaining the mutual interdependence of the anterior and posterior parts. A study of the literature showed that by far the greater part of the species hitherto known from West-Greenland waters was represented in the collections, which besides also comprises four new species and seven species new to this area. I therefore consider it adequate to publish a separate paper on West-Greenland Maldanids, most probably comprising all the species from these waters. For the sake of completeness, however, the specimens from abyssal regions are also concluded in this revision, although they ought to be published in the "Ingolf" report, and therefore the description of these abyssal species will be rather compendious and only references to the present description with the accompanying figures will be given in the "Ingolf" report.—Nearly every species mentioned is accompanied by drawings of the cephalic lobe, the pygidium and the various kinds of setæ, as far as they offer anything of interest, and I wish to bring the scientific drawer Mr. POUL H. WINTHER my best thanks for his fine drawings and excellent collaboration. I also owe my sincerest thanks to the CARLSBERG FOUNDATION for financial support for the performance of the drawings.

The material originates from the following collections: WANDEL 1889; the "Ingolf" Expedition 1895 and 1896; the "Tjalfe" 1908 and 1909; the investigations of the two extensive fjord-areas Nordre Strømfjord and Bredefjord, V. NORDMANN 1911 and K. STEPHENSEN ("Rink") 1912 resp.; the "Dana" 1925; Mr. E. BERTELSEN 1935; Mr. F. SALOMONSEN 1936 and Mr. CHR. VIBE 1939.

The following species are present:

Subfamily *Lumbriclymeninae*:

1. *Praxillura longissima* ARWIDSSON 1906.
2. *Lumbriclymene nasuta* n. sp.
3. *L. constricta* n. sp.
4. *L. minor* ARWIDSSON 1906.
5. *Notoproctus oculatus* var. *minor* ARWIDSSON 1906.
6. *N. oculatus* var. *arctica* ARWIDSSON 1906.
7. *N. scutiferus* n. sp.

Subfamily *Nichomachinae*:

8. *Nicomache lumbricalis* (FABRICIUS). 1780.
9. *Nicomache quadrispinata* ARWIDSSON 1906.
10. *Nicomache* sp.

Subfamily *Euclymeninae*:

11. *Leiochone polaris* (THÉEL) 1879.
12. *L. borealis* ARWIDSSON 1906.
13. *Maldanella davisii* n. sp.
14. *Praxillella gracilis* (M. SARS) 1861.
15. *P. prætermissa* (MALMGREN) 1867.
16. *Axiothella catenata* (MALMGREN) 1865.

Subfamily *Maldaninae*:

17. *Maldane sarsi* MALMGREN 1865.
18. *M. glebifex* GRUBE 1860.
19. *Asychis biceps* (M. SARS) 1861.

The following species previously known from Greenland waters are not represented:

1. *Rhodine Lovéni* MALMGREN 1865.
2. *Petaloproctus tenuis* THÉEL 1879.
3. *Heteroclymene robusta* ARWIDSSON 1906.

New to science are these four species:

1. *Lumbriclymene nasuta* n. sp.
2. *L. constricta* n. sp.
3. *Notoproctus scutiferus* n. sp.
4. *Maldanella davisii* n. sp.

New to West Greenland waters are:

1. *Praxillura longissima* ARWIDSSON.
2. *Lumbriclymene minor* ARWIDSSON.
3. *Notoproctus oculatus* var. *minor* ARWIDSSON.
4. *Nicomache quadrispinata* ARWIDSSON.

5. *Leiochone polaris* THÉEL.
6. *L. borealis* ARWIDSSON.
7. *Maldane glebifex* GRUBE.

All the species mentioned may be found in the open sea west of Greenland in abyssal regions as well as on the great banks Store and Lille Hellefiskebanke and Fyllasbanke (between 69° and 63° N. Lat.) with the exception of *Maldane glebifex* GRUBE which only has been found in the Fjord-area (Skovfjord). Besides, the following species are also more or less common in coastal waters or even penetrate far into the great fjords:

1. *Nicomache lumbricalis* (FABRICIUS).
2. *Praxillella gracilis* (M. SARS).
3. *P. prætermissa* (MALMGREN).
4. *Axiothella catenata* (MALMGREN).
5. *Maldane sarsi* MALMGREN.
6. *M. glebifex* GRUBE.
7. *Asychis biceps* (M. SARS).

As to the abyssal distribution the following species seem to be true abyssal forms, surpassing the 2000 m line:

1. *Praxillura longissima* ARWIDSSON.
2. *Lumbriclymene nasuta* n. sp.
3. *L. constricta* n. sp.
4. *Notoproctus oculatus* var. *arctica* ARWIDSSON.
5. *N. scutiferus* n. sp.
6. *Leiochone polaris* (THÉEL).
7. *L. borealis* ARWIDSSON.
8. *Maldanella davisii* n. sp.

Mainly restricted to or at any rate common in shallow waters (below the 100 m line) are:

1. *Nicomache lumbricalis* (FABRICIUS).
2. *Praxillella gracilis* (M. SARS).
3. *P. prætermissa* (MALMGREN).
4. *Axiothella catenata* (MALMGREN).

In depths between 100 and 1000 m we will find:

1. *Lumbriclymene minor* ARWIDSSON.
2. *Notoproctus oculatus* var. *minor* ARWIDSSON.
3. *Nicomache lumbricalis* (FABRICIUS).
4. *N. quadrispinata* ARWIDSSON.
5. *N.* sp.
6. *Leiochone polaris* (THÉEL).

7. *L. borealis* ARWIDSSON.
8. *Maldanella davisii* n. sp.
9. *Praxillella gracilis* (M. SARS).
10. *P. prætermissa* (MALMGREN).
11. *Axiothella catenata* (MALMGREN).
12. *Maldane sarsi* MALMGREN.
13. *M. glebifex* GRUBE.
14. *Asychis biceps* (M. SARS).

The Maldanids are found in the greater part of the long-stretched West-Greenland waters. *Axiothella catenata* and *Praxillella prætermissa* are the species which penetrate farthest northwards (Thule about 76° N. Lat. and Upernavik about 73° N. Lat. resp.). The rest does not surpass the 66° N. Lat.

The following species are found as far southwards as to Cape Farewell (60° N. Lat.):

1. *Notoproctus scutiferus* n. sp.
2. *Nicomache lumbricalis* (FABRICIUS).
3. *Maldanella davisii* n. sp.
4. *Praxillella gracilis* (M. SARS).
5. *P. prætermissa* (MALMGREN).
6. *Maldane sarsi* MALMGREN.
7. *Asychis biceps* (M. SARS).

This Polychaete family is mainly restricted to soft bottom; they are all of them tubicolous and prefer sand, mud or clay for their tubes. In Greenland waters no species seems to be found in rocky or stony grounds. From the material of the tubes the following conclusions as to the character of the bottom preferred by the various species may be drawn:

Exclusively clayey and muddy bottom:

1. *Axiothella catenata* (MALMGREN).
2. *Maldane sarsi* MALMGREN.
3. *M. glebifex* GRUBE.

Muddy bottom with more or less admixture of sand:

1. *Lumbriclymene nasuta* n. sp.
2. *L. constricta* n. sp.
3. *Leiochone borealis* ARWIDSSON.
4. *Praxillella gracilis* (M. SARS).
5. *P. prætermissa* (MALMGREN).
6. *Asychis biceps* (M. SARS).

Pure, loose sand with gravel and shell fragments:

1. *Praxillura longissima* ARWIDSSON.
2. *Notoproctus oculatus* var. *minor* ARWIDSSON.
3. *N. oculatus* var. *arcticus* ARWIDSSON.
4. *N. scutiferus* n. sp.
5. *Nicomache quadrispinata* ARWIDSSON.
6. *Leiochone polaris* (THÉEL).

The single species which seems to be rather indifferent as to bottom and tube-material is:

1. *Nicomache lumbricalis* (FABRICIUS).

The West Greenland Maldanid fauna is mainly composed of arctic and boreal species. The following may be regarded as more southern species immigrated from the Atlantic-Lusitanian area:

1. *Lumbriclymene minor* ARWIDSSON.
2. *Nicomache lumbricalis* (FABRICIUS) which has a very wide distribution outside the Arctic.
3. *Praxillella gracilis* (M. SARS).
4. *P. prætermissa* MALMGREN.
5. *Maldane sarsi* MALMGREN.
6. *M. glebifex* GRUBE.
7. *Asychis biceps*.

The Zoological Museum
of the University of Copenhagen.

Family **MALDANIDAE** SAVIGNY (1817) 1820.

Subfamily **Lumbriclymeninae** ARWIDSSON 1906.

Genus **PRAxILLURA** VERRILL 1879.

1. *Praxillura longissima* ARWIDSSON 1906.

1906. *Praxillura longissima* ARWIDSSON p. 27.

1911. *Praxillura longissima* FAUVEL p. 33.

1928. *Praxillura longissima* AUGENER p. 767.

Occurrence: The Davis Strait; "Ingolf" St. 24; 63°06' N. 56°00' W.; 25.6.1895; 2258 m; 1 spec.

One perfect but rather badly preserved specimen was dredged by the "Ingolf" in the Davis Strait. It measures 86 mm; this figure is, however, of little value only, because the middle part of the body is highly stretched and macerated. The number of chætigers is 19. The colour of the long thread-like body is yellowish white with distinct darker glandular belts. The anterior and the hindmost segments are considerably shorter than the middle ones, and in this region the boundaries between the segments are faintly discernable. The cephalic lobe is blunt and frontally like a flat rounded "snout" much thinner or lower than the posterior part of the head. The cephalic ridge is broad and low, and the nuchal organs are small and formed as transversal arches. The number of achaetous, præanal segments is three in the present specimen, but this as well as the complete number of segments may vary according to the growth of the animal. This species it is true has not the maximum number of segments, because in an anterior fragment from the ridge between the Faroes and Iceland ("Ingolf" St. 139) 20 segments were counted. The body gradually diminishes into a long cylindrical cone, on the tip of which, a little displaced to the dorsal side, the small anus, surrounded by irregular radiate wrinkles is situated. The number of spine-carrying segments is 4, one spine in each of the foremost three, 2 in the fourth segment. This feature may be variable too; in the said fragment from St. 139 there are 5 segments with spines and in 2 anterior fragments from St. 8 there are no less than 6 segments with acicular setæ. According to ARWIDSSON there may be seven segments in all with spines; this he has seen in specimens from Jan Mayen. These

spines are yellowish, rather delicate and only slightly curved. The number of hooks in the ventral ridges in the present specimen is considerably higher than reported by ARWIDSSON; it amounts to 10—12. The capillary bristles are very similar to each other with rather narrow

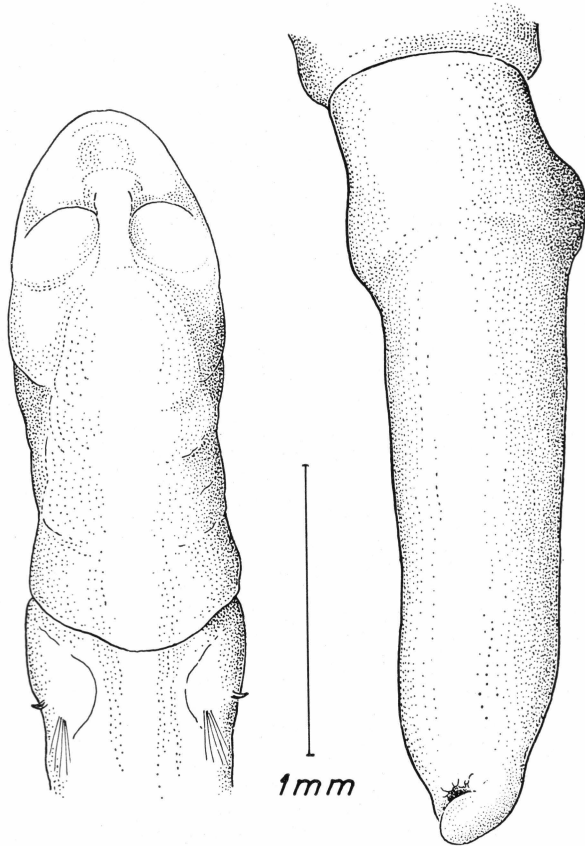


Fig. 1. *Praxillura longissima* ARWIDSSON. "Ingolf" St. 24.

wings; the hooks are small, only with one gular bristle and 4 distinct teeth above the main fang.

The tubes are free and straight; a great part of the tube still surrounded the West-Greenland specimen. It is composed of fine grey or transparent sand grains without any mixture of mud, covering a silky coating; it is fairly brittle.

The species was previously recorded from East-Greenland, E. of Sabine Island (about 75° N. Lat.) and from Jan Mayen; both the specimens mentioned here were dredged in the deep sea; it is evidently a pronounced arctic and abyssal species.

Hitherto not known from West Greenland.

Further distribution: West and East of Spitsbergen, the Kara Sea (ARWIDSSON and FAUVEL resp.).

Genus **LUMBRICLYMENE** SARS 1872.

2. *Lumbriclymene nasuta* n. sp.

Occurrence: The Davis Strait: 65°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2258 m; 4 fragments.

Some fragments of a *Lumbriclymene* have been dredged in the Davis Strait; undoubtedly they belong to the same species, and they are here described as a new species. The material comprises three anterior ends with well preserved prostomium and one posterior end with anal cone, and furthermore there are some intermediate segments, the identity of which I dare not decide. The number of segments in the complete worm I therefore can not give. The colour is rusty red, the shape of the whole worm is cylindrical, elongate with very distinct constrictions marking the segmentation. The cephalic lobe is characteristic and similar in all specimens. The frontal border is turned upwards—like a turn-up nose—as seen in the figure in profile. The ventral side of it carries the mouth, towards which a number of longitudinal furrows runs. No description of the proboscis can be given. The nuchal organs are well developed and deep, forming a wide curve almost the half part of an ellipsis, the inner shank of it a little longer than the outer. The cephalic keel is distinctly set off; in all the specimens it widens considerably backwards forming a broad, soft cushion with slightly crenated lateral rims in the peristomial segment. I do not know whether this feature may be due to contraction and preservation or whether it is a specific character—it looks, however, very natural and is perfectly uniform in all the specimens. I have never seen it so pronounced in any other Maldanid as here. The prostomium is completely fused with the buccal segment, and this foremost part is of the same length as the following segments. The first four segments each have a single, ventral spine besides the dorsal tuft of capillary setæ placed close to the anterior border of the segment, and each of these four segments is furthermore distinguished by a constriction in the middle; it therefore looks as if a chætiforous segment three times alternates with an achaetous one. In the largest fragment now follow 5 segments in which the most characteristic feature is a lateral line on each side running unbroken from segment to segment in such a manner that the dorsal tuft of setæ is situated just in this line.

The fragment with the posterior end consists of 7 segments with distinct boundaries; the parapodia are here close to the posterior border

and then follows 4 (?) achaetous segments as far as it is possible to ascertain, the whole part being blown up and sausage-shaped and the segmental furrows quite obliterated. The figure shows the presumed interpretation. The body ends in an anal opening placed almost terminally, surrounded by a number of longitudinal striations and small rounded

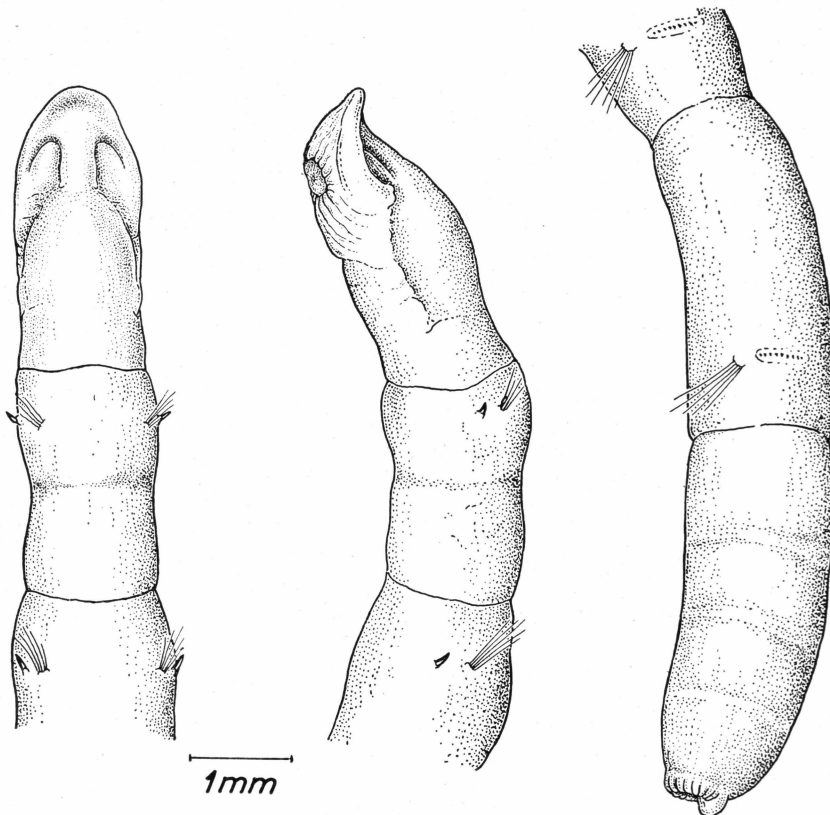


Fig. 2. *Lumbriclymene nasuta* n. sp. "Ingolf" St. 24. Dorsal and left lateral view of anterior end and right lateral view of posterior end.

papillæ; in the ventral midline there is one papilla which is considerably bigger than the others.

In the first two chætigers the parapodia are fairly distinct, especially the ventral ones with the strong spine. In the following segments they are completely missing, the bristles emerging directly from the body-wall. The posterior fragment consists of 7 chætigers and the achaetous anal section; between the first four chætigers there are distinct segmental furrows; they are short and swollen, carrying close to their posterior border distinct parapodial ridges with setæ and hooks. Then follows the three last chætigers, completely devoid of parapodia and dilated

like the achætous section; the last of these segments is indistinctly set off from this latter.

As to the bristles the capillary setæ offer nothing of interest; there is only one kind, straight and with narrow wings. The ventral acicular setæ of the first four segments are straw-coloured, completely straight, evenly pointed with a slight circular constriction close to the tip.

The hooks have a rather short, stout shaft, a marked shoulder just where they dip out of the skin, a neck growing slightly broader and curved backwards, finally a big, coarse main fang coming off at an

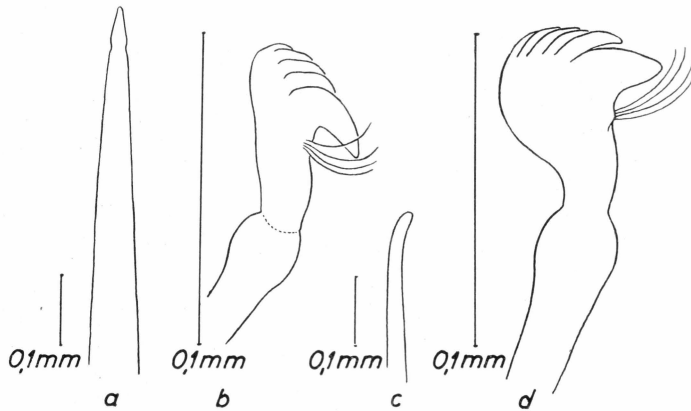


Fig. 3. *a, b* aciculum and uncinus of *Lumbriclymene nasuta* n. sp. *c, d* the same of *L. constricta* n. sp.

acute angle; the crown is high and presents in lateral view 4 teeth. There are 4—5 long curved gular bristles.

One of the fragments was partly hidden in a rather stiff tube composed of a delicate hyaline lining invested by fine grey clay in which small sand grains are imbedded.

Further distribution: In the arctic material of polychætes the species was found by the "Ingolf" at St. 10, west of Iceland.

3. *Lumbriclymene constricta* n. sp.

Occurrence: The Davis Strait: 63°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2258 m; 1 spec. — 63°30' N. 54°25' W.; "Ingolf" St. 25; 26.6.1895; 1096 m; 3 spec.

The West-Greenland material consists of the following: from St. 24 two fragments of what is considered a single specimen which here is described as the type of the new species. From St. 25 several fragments, 2 anterior and one posterior, the latter, however, very badly preserved and of no systematic value, and finally a few intermediate fragments.

The following description refers to the specimen from St. 24. It is of a rusty red colour with lighter glandular girdles in front of the parapodia; the length is about 80 mm by 2 mm width; 19 chætigers and 5 præanal achætous segments. The cephalic lobe is broadly rounded in front with a narrow, flat snout and a high keel rising abruptly from the

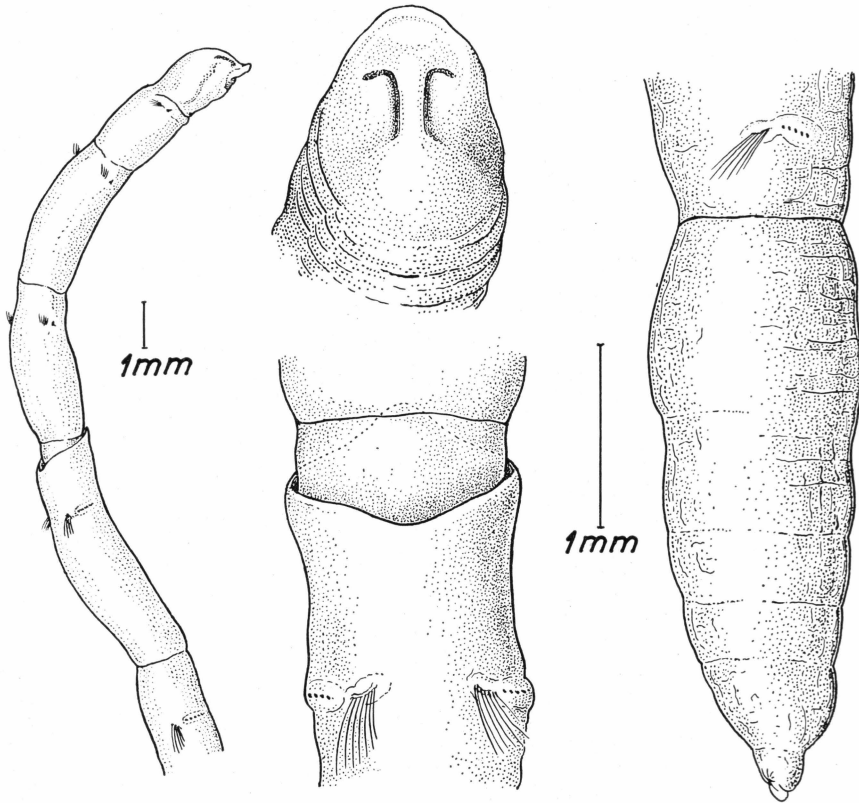


Fig. 4. *Lumbriclymene constricta* n. sp.

snout and deeply marked laterally by the nuchal organs. Posteriorly the keel widens to a high, broad, cushion-like neck at each side of the peristomial segment, distinctly set off from the ventral side by a pigmented, slightly crenated line. This feature is very similar to what is described for *L. nasuta* n. sp.—The nuchal organs are deep curves, the inner shank of the curve is considerably longer than the outer. The mouth-opening is diamond-shaped, with a thick U-shaped underlip with numerous longitudinal furrows; the upper-lip is formed by the ventral side of the snout. The proboscis is perfectly withdrawn; no description of it can be given. The fusion of pro- and peristomium is complete, and this part of the body is about two thirds of the length of the following

first chætiger. The three first chætigers have distinct segmental furrows; the middle segment is a little longer than the two others. All three have a single acicular spine in the ventral rudimentary parapodium.

The structure of the fourth chætiger is characteristic and the main reason for the establishment of a new species. The hind end of the preceding segment is telescoped into the anterior end of this segment, which therefore is furnished with a rather high, free, membranous collar at its anterior border. The collar is obliquely cut off in such a manner that it is highest in the ventral midline and has a deep V-shaped incision dorsally; none of the other segments has anything similar to this. Between the following 7—8 segments the segmental furrows are rather indistinct, but between the last chætigers they again get very deep. The first 6 parapodia behind the collared segment are situated in the foremost part of the segments, in the last 8 they are close to the posterior ends of them. In the 11th—14th chætigers the parapodia form rings round the body, rings which are high at the lateral parts and low in the ventral and dorsal mid-line. All the other parapodia are small knobs or missing. The five last achætous segments form a ringed cone gradually tapering and ending in a little, blunt, soft papilla, at the dorsal side of which the anus is situated. This part of the body is very much like that of *L. nasuta* n. sp., only this latter species has 4 and not 5 achætous segments.

There is only one kind of capillary bristles, long, straight with very narrow wings and no characteristic feature. The acicular spines are straw-coloured, slightly curved and pointed, obliquely cut and without any circular constriction near the top as in the preceding species. The uncini have a long, elegantly curved shaft, ending in a swollen knob, the shoulder, just about which the neck projects from the skin. The neck is stout, strongly curved backwards, with the main fang arising at an almost right angle and with a crown of 5 teeth in lateral view. The teeth are more separated from each other than in *L. nasuta*; in some few uncini there are 6 rows of teeth. 4—5 curved gular bristles.

The tubes are free, cylindrical with a delicate silky lining coated with grains of sand and especially with fine mudparticles. It is easy to get the worm out of the tube; it does not adhere to its walls. —

I am not inclined to regard the presence of a collar in the fourth chætiger as a feature of generic value. We find this feature in other Maldanid-genera, where it is not regarded as that (genus *Clymenella*), but there is no doubt that the collar is of specific value, it is inconceivable that its presence or absence should be an individual character. In many respects the present species bears so great resemblance to the genus *Lumbriclymene* that I do not hesitate to incorporate it into this genus. Even the near relationship to *L. nasuta* n. sp. may be pointed

out. The present species differs from *L. nasuta* by the presence of the collar in the 4th chætiger, the presence of three anterior segments with acicular hooks and 5 præanal achætous segments (in *L. nasuta* 3 and 4 resp.). In *L. constricta* the nuchal organs are perhaps a little more open than in *L. nasuta* and the nose is not turned upwards as in this species.

Further distribution: Besides from the two localities in the outer part of the Davis Strait the "Ingolf" has taken the species at St. 40, South of Iceland. The species seems to be an abyssal form.

4. *Lumbriclymene minor* ARWIDSSON 1906.

1906. *Lumbriclymene minor* ARWIDSSON p. 46.

1913a. *Praxillura A* (fragment) Mc'INTOSH p. 116.

1914. *Lumbriclymene minor* DITLEVSEN p. 713.

1915. *Lumbriclymene minor* Mc'INTOSH p. 297.

Occurrence: The Davis Strait, E. of Store Hellefiskebanke, off Ikertok: 66°45' N. 53°45' W.; "Dana" St. 2350; 23.6.1925; 420 m; 1 spec.

Only an anterior fragment is present; it consists of the head and the 9 first chætigers and is fairly well preserved. The colour is yellowish-pink. The fusion of the pro- and peristomium is complete, and this part resembles that of the two just described species, especially *L. constricta*, very much. The snout is not turned upward, the nuchal organs are semicircular, the two shanks of the curve nearly of the same length. The keel and the cushion-like blown-up neck is just as in the former species. The mouth is a longitudinal fissure, the underlip by far not so broad and bulky as in *L. constricta*. The following four chætigers are very long, about three times the length of the head and the first segment; all of them carry ventral, acicular hooks; there is no collar. There are no true parapodia, the bristles and hooks emerge directly from the body-wall. The first set of bristles is situated very near to the anterior border of the segment and consists of one small yellow aciculum and a few short, delicate winged setæ; there seems to be no glandular belt in front of this set. The same holds good of the following set of setæ, only here the hook is considerably stronger. As to the third set there is in front of it a distinct glandular belt; two strong acicles. In front of the fourth set the glandular belt is much broader, and the place of the setæ therefore not so close to the anterior border as in the preceding segments. Also here two strong acicles. In the fifth segment the setæ are found in the middle of the segment, the glandular belt here being as broad as half the length of the segment. There are 7 uncini, not yet fully developed i. e. with only 2—3 teeth above the main fang, but gular bristles are present. In the 6th and 7th chætiger the glandular ring is short but thick and swollen and the setæ emerge directly behind them; here the

number of the uncini is about 15—17. In the two remaining segments the glands do not form continuous belts, but they are interrupted in the ventral midline, and here we may speak of real parapodial ridges.

The capillary bristles are of the usual winged sort; the hooks have a bulky shoulder, a short, stout neck and when fully developed 6 rows of teeth widely separated from each other above the main fang, which is sharply bent downwards in an acute angle; 3—5 gular bristles emerge

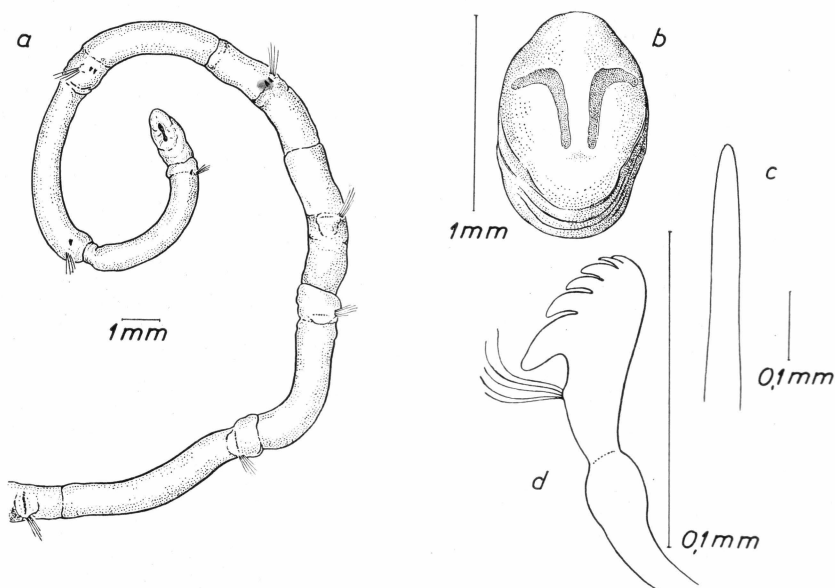


Fig. 5. *Lumbriclymene minor* ARWIDSSON. *a* anterior end, *b* dorsal view of the prostomium, *c* aciculum, *d* uncinus.

from a little projection just below the outspring of the main fang.—The acicles are completely straight, evenly tapering to the blunt apex; no circular constriction.

The tube is not present.

The reasons for referring this fragment to ARWIDSSON'S species are the long anterior segments, the position of the setæ in the middle of the 5th and 6th chaetiger, and the presence of 4 segments with acicles.

Further distribution: The species was originally described from the West coast of Sweden. In the same paper ARWIDSSON (however, with some hesitation) refers a specimen from East-Greenland (Off Kong Oscars Fjord abt. 72° N.) to the same species. If he is right the new find in the Arctic is not so astonishing. When comparing his description of the species and of his unnamed specimen from East-Greenland (1906 p. 49) and the present one from the Davis Strait, I am inclined to think

that we have three identic specimens before us.—Furthermore Mc'INTOSH records the species from the Channel and adds: "in the midst of a northern fauna"—an addition of some value to the present considerations.

Genus **NOTOPROCTUS.**

5. *Notoproctus oculatus* var. *minor* ARWIDSSON 1906.

1906. *Notoproctus oculatus* var. *minor* ARWIDSSON p. 56.

Occurrence: Davis Strait: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; c. 10 spec. — 66°22' N. 57°16' W.; "Tjalfe" St. 366; 19.5.1909; 686 m; c. 10 spec.

The largest specimen from St. 32 is described here. It is 17 mm long by 0.5 mm width. It is completely colourless with a beautiful mother of pearl sheene over the foremost segments. The middle segments are unnaturally stretched, the entire length of the animal there-

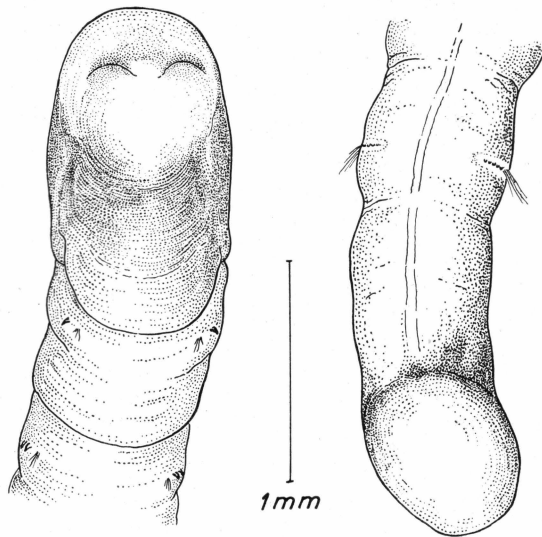


Fig. 6. *Notoproctus oculatus* var. *minor* ARWIDSSON. "Tjalfe" St. 366.

fore a little shorter than mentioned above. There are 17 chaetigers and 3 (indistinct) achætous segments. A distinct furrow between pro- and peristomium. The foremost end is an abruptly truncated plate, obliquely cut off, devoid of any sort of brim or keel. The nuchal organs form two slightly arched, transversally placed, widely open curves. The mouth is T-shaped; the proboscis withdrawn (this is the case in all specimens). After the head follow 7 very short annular segments with fairly distinct

segmental furrows; the first 4 of them carry acicular hooks, only one in the first, 2 in each of the next three; then follow the segments with uncini which do not surpass the number of 5. The body terminates in a posterior plate, much like the cephalic plate, obliquely cut off without glands and border and without incisions or crenulations of any kind. The anus lies dorsally quite close to the margin of the plate.

The acicular hooks are straight, tapering, blunt; the uncini have a long, nearly straight shaft; from the shoulder the neck bends strongly backwards. The main fang is triangular, acute; there are most frequently 3, now and then 4 teeth.

The tubes are cylindrical, curved, exceedingly fragile and of varying material; from St. 32 they are composed of crystalline, transparent sand grains, and a few black basalt grains, all of nearly the same size and placed close to each other without intermediate material; from St. 366 there are among the grains tufts of long sponge-spicules.

Further distribution: The variety was described from the Norwegian West-coast and has not been refound since its establishment. The present material furthermore contains specimens from localities North of Iceland. Here in the North Atlantic the finding-places are inside the 1000 m line.

6. *Notoproctus oculatus* var. *arctica* ARWIDSSON 1906.

1906. *Notoproctus oculatus* var. *arctica* ARWIDSSON p. 57.
 1914. *Notoproctus oculatus* var. *arctica* DITLEVSEN p. 713.
 1928. *Notoproctus oculatus* var. *arctica* AUGENER p. 762.
 1937. *Notoproctus oculatus* var. *arctica* DITLEVSEN p. 36.

Occurrence: Davis Strait: 63°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2258 m; about 10 spec. —

Some specimens are present from the outer parts of the Davis Strait. One of them was pulled out of its tube and subjected to a closer examination. It is about 15 mm long by hardly 1 mm broad. It is almost transparent, the anterior part is slightly yellowish or light brown. It possesses 18 chætigers and three achætous præanal segments. In the first two chætigers the setæ are extremely reduced; the capillaries are small and narrow, and in the first one no ventral setæ were to be seen at all; in the second chætiger the ventral setæ are very small and there is only one in each neuropodium; they are neither spines nor genuine hooks, but may be described as a little blunt, transparent yellow cone much like the microscopical papillæ of the skin. In the third and the fourth chætigers each neuropodium has a single narrow pointed, but short acicular hook and some few (3—5) capillaries with narrow wings and a very long, flexible, flagelliform tip. In the fifth chætiger the first genuine hooks appear with long erect shafts, slightly developed shoulder,

a broad neck with two long, curled gular bristles and a pointed, triangular main fang, crowned by only two rows of teeth, the inferior of which is broad and acute. There are only two of these hooks present in each neuropodium. In the tenth chaetiger there are 5 hooks and three rows of teeth above the main tooth. The number of hooks does not in any segment surpass 5.

The anal plate is circular and without any incisions at all.

The tubes are free, composed of a very heterogenous material: sand grains of different colours, pebbles, Foraminifera shells and the small

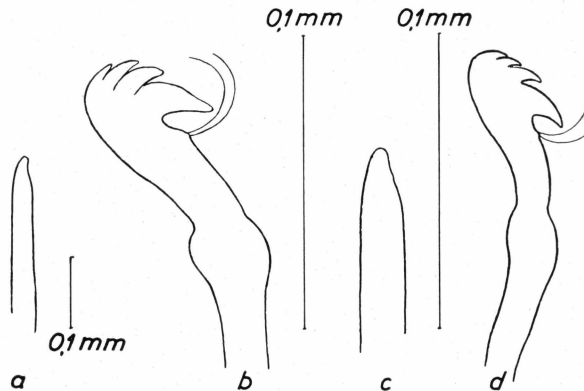


Fig. 7. *a, b* aciculum and uncinus of *Notoproctus oculatus* var. *minor* ARWIDSSON. "Ingolf" St. 32, *c, d* the same of *N. oculatus* var. *arctica* ARWIDSSON (the measuring staff between *c* and *d* counts for both figures) "Ingolf" St. 24.

rusty red tubes of the Foraminiferon, *Hyperammina*, and very characteristic are the numerous tufts of sponge spicules, which in some tubes stand on end over the whole surface.

Further distribution: The variety is hitherto known as an exclusively arctic form. In the waters West of Greenland its northernmost finding place is at 73° N. Lat. ARWIDSSON reports it from Godhavn and in East-Greenland from 74° N. (the Scoresbysund area); furthermore from Finmarken and Spitsbergen. In the material determined by me one specimen originates from the Denmark Strait.

7. *Notoproctus scutiferus* n. sp.

Occurrence: West of Greenland: 63°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2258 m; about 10 spec. — 60°17' N. 54°05' W.; "Ingolf" St. 37; 29.7.1895; 3229 m; about 10 spec. —

A number of well preserved specimens from the Davis Strait is here described as a new species. All of them were found inside their tubes. The body is rusty red or brown all over. The length only slightly varying.

The type specimen from St. 24 measures 47 mm by 1 mm. The anterior end resembles a piston, and like a piston it closes the tube in which the animal lives. The cephalic plate with the nuchal organs is a vertically placed plate. There is not the slightest constriction behind the head; this and the following segments form together a rod with the same breadth all over. No eyes could be found. The plate is almost circular, in some specimens a little longer than broad and with two slight curvatures a little beneath the midline. The nuchal organs are transversally placed arches with very short inner shanks; there is not the slightest indication of a keel, only a pigmented figure between the nuchal organs. In the middle of the first part, which is formed by the fused pro- and peristomium and on the ventral side, there is a simple round hole, the mouth, without lips, only with some furrows, soon fading away. In all specimens the proboscis is withdrawn. An annular line runs all round the head, marking that it is composed of the cephalic lobe and the peristomium, the fusion thus not being complete. After the head follow 19 chætigers with distinct segmental boundaries. The length of the 5 foremost segments is nearly the same as the length of the head; then they increase gradually until the fourteenth, which is about three times as long as the head, then the segments diminish rapidly again, and the last achætous segments are much reduced.

The first four chætigers have an annular line in the middle as if they were biannular, and laterally just below the setal tufts a little transversal pit is seen. The first three chætigers each has a ventral acicular hook; in the fourth there are two hooks. The fourth segment has a very low, smooth, anterior collar. In the 14 anterior segments no true parapodia, the segments are quite smooth and cylindrical, only a semilunar slit from which the hooks project; in the last 5 and, especially in the last 2—3 chætigers, there are big lip-like ventral parapodial ridges. In the first 9 chætigers the setæ are distinctly placed in the anterior part. Then follows some segments unnaturally stretched, in which it is impossible to ascertain the true position of them. In the posterior somites the swollen tori, however, are near the posterior borders.

In the first four chætigers there seems to be no glands. They appear as a narrow girdle in front of the setæ in the fifth chætiger. The glands do not form closed girdles; they are interrupted in the dorsal midline, only by a narrow interspace in the 5th and 6th segment, but then it grows broader, and, as far as I can see, the glands are only broad pads round the tori in the last 7—8 chætigers, thus being broken dorsally as well as ventrally.

There are three achætous segments all rather short; the anal segment with the pygidial plate is, however, very long, a little broader

too than the preceding segments and therefore the hind end may look slightly club-shaped. It is as long as the three achætous segments together. The pygidial plate is much like the cephalic plate. It is piston-shaped and placed at right angles to the body, in some few specimens a little obliquely; it also closes the hind end of the tube as a cork. This plate as well as the cephalic plate is strongly coloured, quite dark red or

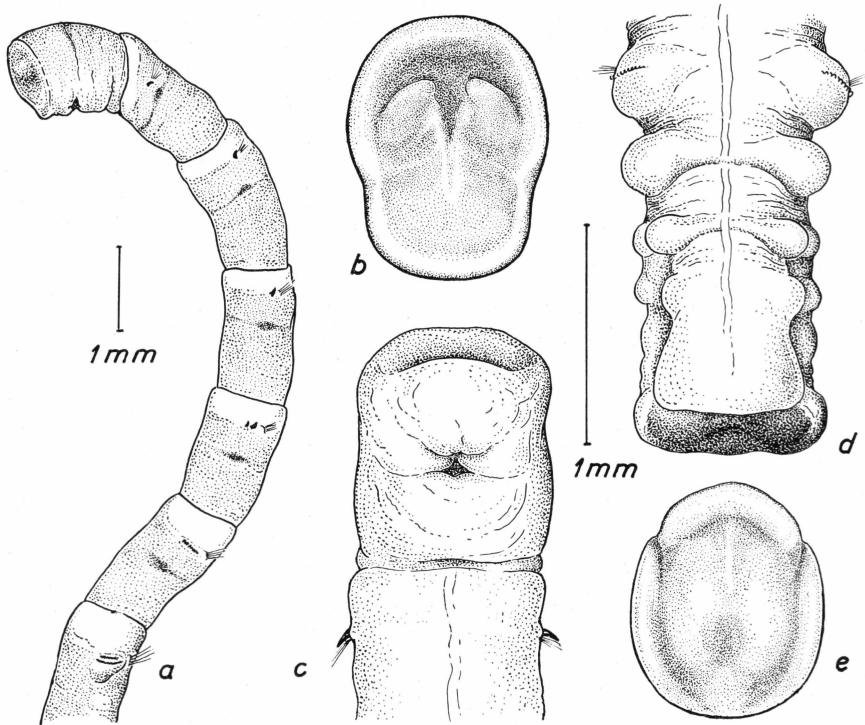


Fig. 8. *Notoproctus scutiferus* n. sp. a anterior end, b cephalic plate, c ventral view of the anterior end, d ventral view of posterior end, e pygidial plate.

purple red. There is no structure at all to be seen at its surface. When seen directly from the end two small incisions are found ventrally and the rim between them is a little thicker than the rest of the rim of the plate.

The ventral side of the hind end is, however, highly characteristic and shows a feature, which is the main reason for the establishment of the species and to which it owes its specific name. From the two above named incisions in the pygidial plate two deep longitudinal furrows run forwards one on each side of the ventral nerve cord. They unite with the transversal furrow formed by the last segmental boundary. At the pygidial plate the rim between the two incisions form a low ridge, and

thus we find on the ventral side of the anal segment a quadrangular plate, like a scutellum, reaching from the terminal plate forwards to the last segmental furrow. This structure is very distinct and is visible even under a slight magnification.

In the first segments with acicular hooks there are two kinds of capillary bristles; 1° long, straight with narrow wings and broadest a little above the place where the wings begin, tapering towards a rather

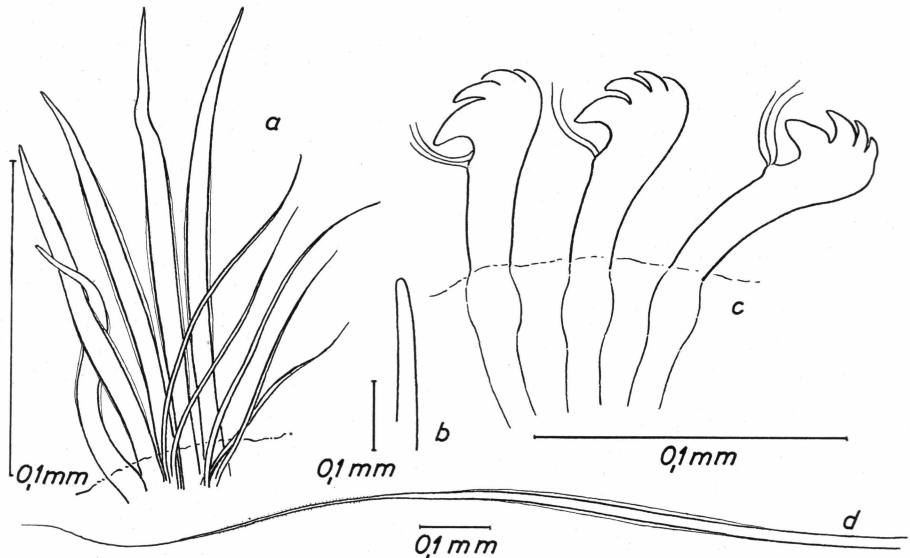


Fig. 9. *Notoproctus scutiferus* n. sp. a capillary bristles from 2nd parapodium, b aciculum from 2nd parapodium, c uncini, d capillary bristle from 7th parapodium.

short tip, faintly geniculate; 2° long bristles, much thinner than the others, bent in serpentine-like curvations and without wings. The capillaries of the other segments are winged too but not geniculate, and their tips are much longer and flagelliform. The acicular hooks are stout and coarse and blunt, only one third of them projecting out of the skin. The hooks have a slightly developed shoulder, a long, slender neck and most frequently three, seldom four, teeth behind the main fang; a few gular bristles arise from a small knob-like projection.

The tubes are cylindrical, much longer than the worm itself and in proportion to the small width of them composed of rather coarse sand grains.

It is common for the two localities, where the species has been dredged, that they are inside the abyssal region.

Subfamily **Rhodinae** ARWIDSSON 1906.Genus **RHODINE** MALMGREN 1865.8. *Rhodine lovéni* MALMGREN 1865.

This species is not represented in the material here worked out. The reason why it is included in this paper is that a *Rhodine* species once has been found in West Greenland waters. Mc'INTOSH (1877 p. 507) reports *Rhodine lovéni* from Holsteinborg Harbour ("Valorous" Expedition), 30 fathoms, and adds: "A fragment in a tube, sparsely coated with clear quartz sand-particles and rather brittle". ARWIDSSON (1906 p. 81) takes this up for a short discussion, writing that this "Angabe über das Vorkommen von *Rh. lovéni* dürfte auf die hier behandelte Art (*Rh. gracilior* (TAUBER) 1879) zu beziehen sein". He does not put forth the reasons for this supposition. Mc'INTOSH (1915 p. 300) does not seem to acknowledge ARWIDSSON's theory; without entering in a discussion or even mentioning it, he only writes about the hooks of *Rh. gracilior* that "though similar to those of *Rh. lovéni* (from the "Valorous Expedition) they are distinguished by the shorter spike-like process behind the great fang". This shows that Mc'INTOSH still is of the opinion that his specimen from Holsteinborg Harbour is identical with *Rh. lovéni*. As far as I can see we can not definitely decide what species of the genus *Rhodine* has been dredged in the waters west of Greenland.

Subfamily **Nichomachinae** ARWIDSSON 1906.Genus **NICHOMACHE** Malmgren 1865.Subgenus **Nichomache** ARWIDSSON 1906.9. *Nicomache lumbricalis* (FABRICIUS) 1780.

1780. *Sabella lumbricalis* FABRICIUS p. 374.
 1865. *Nicomache lumbricalis* MALMGREN p. 190.
 1867. *Nicomache lumbricalis* MALMGREN p. 99.
 1877. *Nicomache lumbricalis* Mc'INTOSH p. 507.
 1883. *Nicomache lumbricalis* LEVINSSEN p. 147.
 1906. *Nicomache lumbricalis* ARWIDSSON p. 86.
 1914. *Nicomache lumbricalis* DITLEVSEN p. 717.
 1928. *Nicomache lumbricalis* AUGENER p. 764.
 1937. *Nicomache lumbricalis* DITLEVSEN p. 36.

Occurrence: The open sea West of Greenland: 67°57' N. 55°30' W.; "Ingolf" St. 33; 12.7.1895; 66 m; 1 spec. — 66°50' N. 20°02' W.; "Ingolf" St. 128; 2.8.1896; 365 m; 3 spec. — 66°35' N. 56°30' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 3 spec. — 65°36' N. 56°02' W.; Wandel; 1889;

about 600 m; 3 spec. — $65^{\circ}16' N.$ $55^{\circ}05' W.$; "Ingolf" St. 35; 18.7.1895; 682 m; 2 spec. — $64^{\circ}53' N.$ $53^{\circ}06' W.$; Wandel; 1889; about 500 m; 3 spec. — In coastal waters West of Greenland: Sigrids Havn, Langø, Upernavik; Finn Salomonsen; St. F 2; 21.7.1936; clay mixed with sand; 12 m; 1 spec. — Bredefjord; "Rink" St. 33; St. 70; St. 74; St. 76; 16.7.—25.7.1912; 90—320 m; 6 spec. — Kvanefjord; "Rink" St. 1; 21.6.1912; 84 m; 1 spec. —

None of the specimens are complete. This big, coarse Maldanid seems to be very brittle, and often the animals are badly preserved and unnaturally stretched in the middle part of the body; the total length therefore can not be given, but most probably the length may be more than 150 mm in big specimens. The following description refers to a specimen from the Davis Strait (Wandel 1889). The colour is yellowish-brown, only the foremost part is more strongly pigmented, almost reddish brown. The pro- and peristome are completely coalesced, rather short and stout; the prostomium nearly vertical with rounded and thickened frontal border. Between the nuchal organs a rather high median ridge as long as the vertically placed part of the prostomium, which is arched in the dorsal part of the neck. The nuchal organs are long slits with a very short anterior shank bent outwards and in their posterior parts slightly bent inwards. The mouth is a large T-shaped opening with a thick, vaulted U-shaped under-lip and a long, thick, straight upper-lip; both lips, especially the under-lip, are furrowed.

There are 22 setigerous segments and two achæitous præanal segments. The two first chætigers are short, of the same length as the head; the third is as long as the first and the second together. These three anterior somites have acicular setæ, in the specimen here described two in the second, one in each of the others. The aciculi of the third segment are especially coarse and stout. In the following three segments the number of hooks is 8, 16 and 30; in the middle of the body the number amounts to 40. — The head and the succeeding three segments are quite smooth and iridescent, and unicoloured; the following have pale anterior glandular zones in front of the setigerous tubercles. Behind the glands the skin is yellowish and roughened. In the first four segments the glandular belts form closed rings, broad ventrally, much narrower dorsally. Distinctly elevated tori do not exist in the first about 12 somites; on the succeeding segments they get very prominent. In the last segments (about 7—9) they, together with the glandular girdles, shift from the anterior end of the segment to the posterior. Although the last two segments are achæitous, they have faint traces of elevated tori. These two segments are very short, vaulted and distinctly separated from each other and from the anal cup.

The anal cup is a funnel, widening distally with a concave bottom, in the centre of which the anus is situated; when protruded it lies on the top of a little radiately furrowed cone. The margin of the funnel has 14 small denticles in the here described specimen, and this seems to be the most common number; AUGENER has found the same in a rather big specimen from Spitsbergen. In another animal, of which

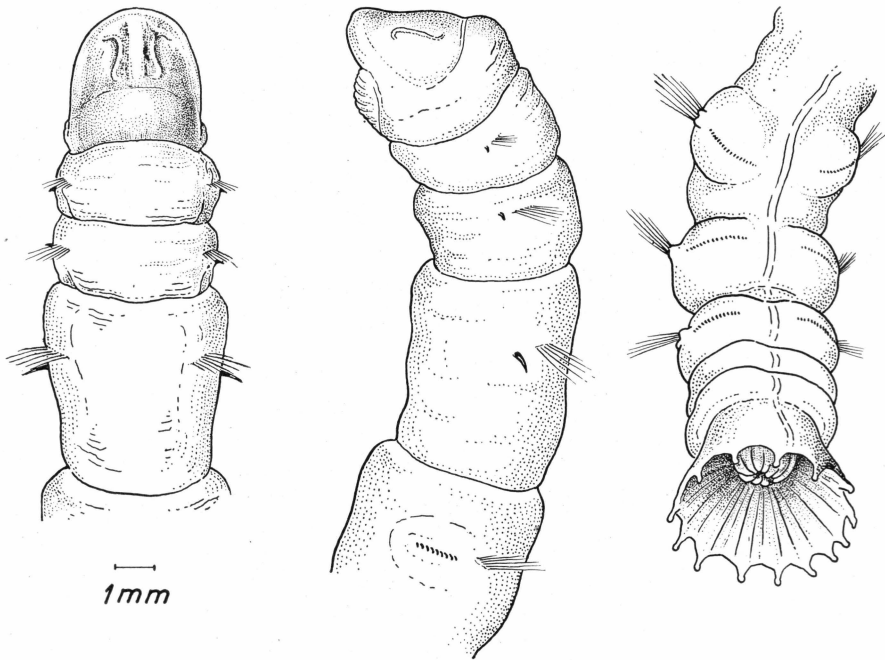


Fig. 10. *Nicomache lumbricalis* (FABR.).

only a very thick and large posterior end is present, I have, however, counted 21 small teeth. The denticles are rather widely separated from each other; they arise abruptly from the quite smooth rim of the funnel or they may, as figured, divide the rim into broad tongues. The denticles are all of the same length and shape and extraordinarily short. The ventral nerve-cord may easily be traced on the exterior side of the anal cup; it ends between two denticles.

The ventral aciculi are stout, fibrous, slightly curved, acute, much like the canines of a carnivore. In the segments with acicular hooks the notopodial tufts contain two kinds of capillaries, one sort rather stout, with longitudinally striated stems and very narrow wings and flagelliform smooth tips; beneath these stouter setæ a few much shorter and more delicate capillaries without wings. The stouter setæ remain unchanged in the rest of the segments, only the flagelliform tip is now

provided with minute cilia-like hairs, only visible with great magnification. The delicate capillaries become more numerous posteriorly. In the 20th chætiger there are e. g. 15; some of them are not longer than the stouter, winged bristles, and they are stiff and straight, but some others are considerably longer, thread-like, spirally coiled; they arise in a group from the ventral side of the bundle.

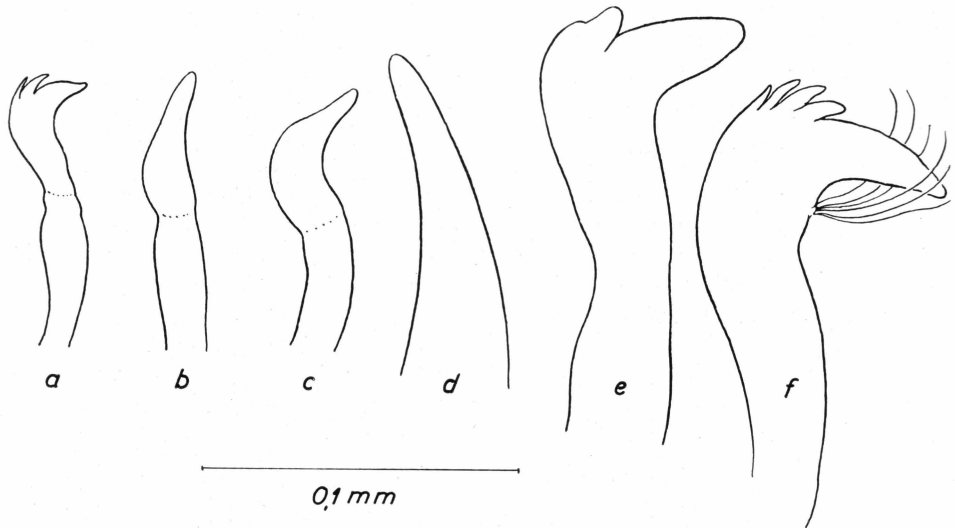


Fig. 11. *Nicomache quadrispinata* ARWIDSSON. *a* uncinus from last chætiger, *b*, *c* hooks from 2nd and 3rd parapodium. *Nicomache lumbricalis* (FABR.). *d* aciculum from 3rd parapodium, *e* reduced uncinus from 4th parapodium, *f* ventrally placed uncinus from the 20th parapodium.

In the fourth chætiger the uncini are not yet fully developed; they have no gular bristles and only 2 teeth above the main fang. In the 20th segment the hooks are very long, slender, almost straight, without shoulder, only a slight nodulus hidden in the skin; the head is only slightly curved backwards, the neck is slender, the main fang or beak is acute, only slightly curved; three narrow, acute teeth above the beak. The gular bristles short and few, only slightly curved and rudimentary in the most dorsally placed hooks; the ventrally placed uncini have 4 teeth and more and longer gular and bristles.

The tubes are cylindrical, circular in diameter and on an average with very thick (about two mm) walls. The animal selects material of very different kinds for building its tube, e. g. fine, grey mud or clay, pebbles, silicious grains, shell fragments, etc. They are slightly curved in S-shaped windings and mostly free.

Further distribution: The species is exclusively arctic and in boreal tracts replaced by the variety *borealis* ARWIDSSON. It is known

from West and East Greenland, Jan Mayen, northern Norway, the Finmarken, Kola peninsula, The White Sea, the Kara Sea, Spitsbergen, Novaya Zemlya.

Subgenus **Loxochona** ARWIDSSON 1906.

10. *Nicomache quadrispinata* ARWIDSSON 1906.

1906. *Nicomache quadrispinata* ARWIDSSON p. 108.

1914. *Nicomache quadrispinata* DITLEVSEN p. 714.

1928. *Nicomache quadrispinata* AUGENER p. 765.

Occurrence: The Davis Strait: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; ∞ spec. — 65°16' N. 55°05' W.; "Ingolf" St. 35; 18.7.1895; 682 m; 20 spec. —

This species, which does not seem to be refound since its establishment, is present in rather great numbers especially from St. 32, most of them, unfortunately, fragmentary and small, some of them still in their tubes, but then stretched and badly preserved, because the preservation fluid has not been able to penetrate them in time. When they are drawn out of the tubes they are nearly always torn to pieces. The colour is light-yellowish, only the worms in the tubes are dark brown. The following description refers to a specimen from St. 32. It is stretched in the foremost part and curved in great serpentine windings, according to the windings of the tube from which it was "dug-out". The anterior end is slightly club shaped, the head being slightly broader than the first segments. The cephalic plate with the nuchal organs is placed nearly vertically to the longitudinal axis of the animal, the snout is rounded with a flat, thickened but narrow border. The keel is high and compressed, and at an almost right angle it gradually passes over in the neck, which is high and swollen. The nuchal organs are fairly long, deep furrows almost straight. The mouth is a round hole with no especially developed lips. The pro- and peristomium are not completely fused; there is a deep furrow behind the prostomium, and what is still more remarkable, there are two furrows more in front of the first chætiger; it looks as if the anterior end consists of the prostomium and three further segments. This feature is refound in a great number of animals, and I can not tell whether it is solely due to contraction, or whether it is a characteristic feature in the species. ARWIDSSON does not mention it.—In the specimen described the three first chætigers are almost twice as long as the fourth one, and three times as long as the head, a feature which is not constant, but undoubtedly due to preservation. The 4th—6th chætigers are shorter. Then follow 5 very long, smooth cylindrical, almost transparent segments and finally 10 much shorter segments, the last 6—7 of which are only narrow, arched rings. In other

specimens the proportions of the length of the segments may be different; I have seen worms in which the foremost chætigers are not so long as here, and in which especially the 7th—12th segment are much shorter. But the narrow hindmost segments are common of all specimens. In all there are 22 chætigers and always only one achætous, præanal segment.—In the four anterior setigerous segments there are ventral aciculi, in some specimens dark brown and stout, in others of a straw-

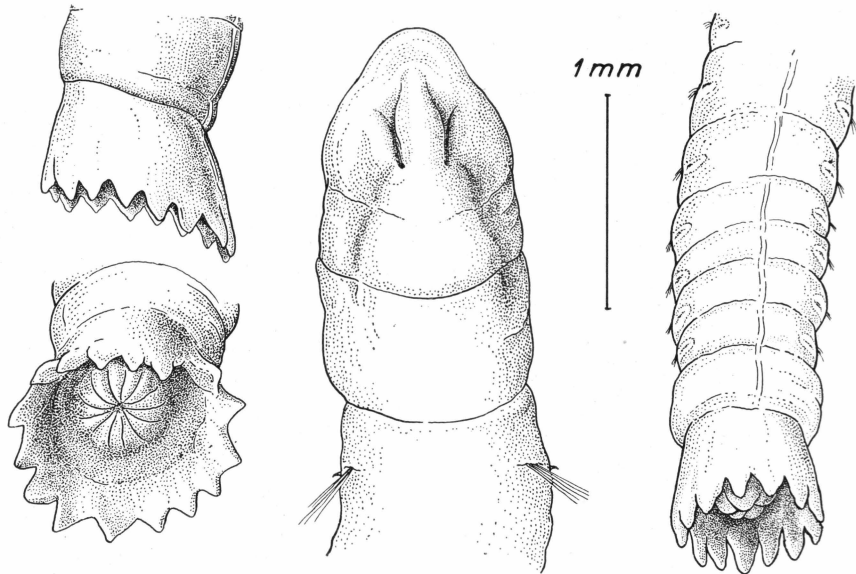


Fig. 12. *Nicomache quadrispinata* ARWIDSSON. The two figures to the left from one specimen, the two to the right from another. "Ingolf" St. 32.

yellowish colour. Glandular belts in front of the setal tufts from the second chætiger. The setigerous tubercles are always very little prominent.

The anal cup is oblique, the ventral side slightly longer than the dorsal. The floor of the cup only slightly vaulted, the anus in the centre of it. Its margin is divided into 16 triangular teeth of almost the same size and shape and with nearly the same interspaces.

The acicular hooks of the first four segments are straight, erect, subulate. The ordinary capillary setæ have very narrow wings and minute cilia-like hairs; the inferior flagelliform bristles are only present in few numbers (3—4) and may be enormously long, easily seen with slight magnification. As far as I can see they are smooth, devoid of barbules.—The hooks are but slightly developed; they are devoid of gular bristles, have no marked shoulder or nodulus and only one or two small, acute teeth above the beak, which is more or less erect,

nearly a prolongation of the shaft or they are coming off at a very obtuse angle. There are at most only 6 hooks in one of the uncinigerous tori.

The tubes are composed of sand and very brittle, yielding to the slightest pressure; often rather long, red tubes of the Foraminiferon *Hyperammia subnodosa* adhere to them. They are curved and twisted in more or less irregular windings sometimes resembling snail shells, as shown in the figure; most frequently the windings are, however,

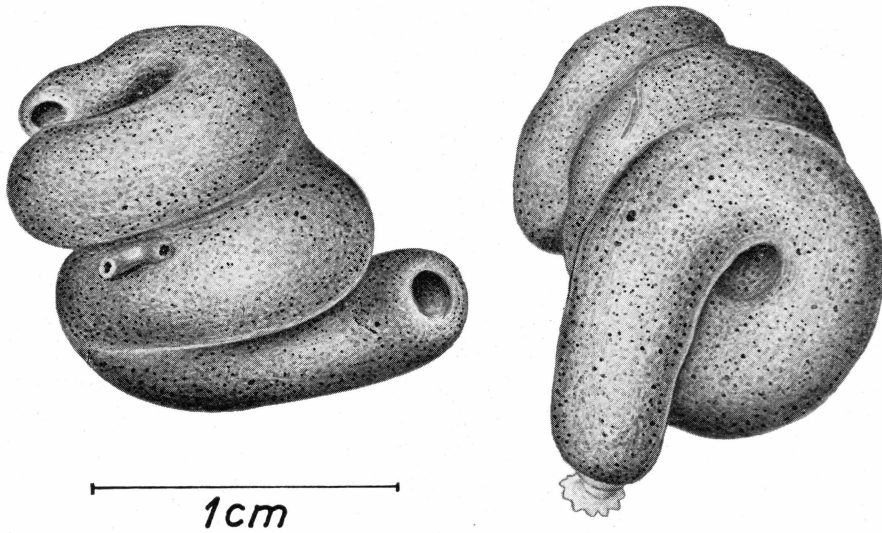


Fig. 13. *Nicomache quadrispinata* ARWIDSSON. The same tube from different views. "Ingolf" St. 32.

hidden in a mass of silicious grains, the whole tube forming a shapeless conglomeration of sand.

Further distribution: Exclusively arctic. Previously known from East-Greenland waters (74° – 72° N. Lat.) but not from West-Greenland, Spitsbergen and East of it.—In the present material it is dredged in waters north and north east of Iceland. The species thus seems to have a rather wide distribution in the Arctic. As to its bathymetrical range it does not seem to belong to the abyssal region; all the finds of ARWIDSSON'S are within the 450 m line (some of them from only 18–45 m); the here published finds are all from greater depths, but yet only one from about the 1000 m line.

11. *Nicomache* sp.

Occurrence: West of Greenland: $64^{\circ}54'$ N. $55^{\circ}10'$ W.; "Ingolf" St. 27; 1.7.1895; 740 m; 1 spec.

Only a posterior fragment consisting of four chaetigers and three

achætous segments and the anal funnel is present. In the dorsal side the chætigers show a characteristic annulation; about 14 semicircular wrinkles divide the skin into fine rings; in the achætous segments the wrinkles continue all round the body forming closed rings. The uncini-gerous tori are very prominent; the uncini are arranged in a single row in a deep furrow between two swollen lips. The notopodium is a distinct little conical projection. In the achætous segments the tori are still

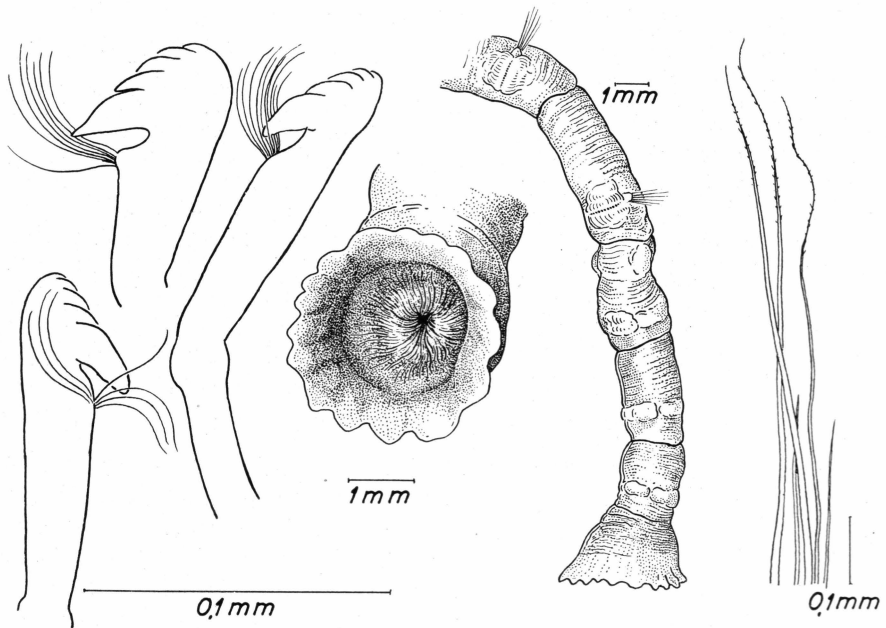


Fig. 14. *Nicomache* sp. "Ingolf" St. 27.

very distinct. The anal cup is slightly oblique, the floor of it flat, and the anus considerably displaced to the dorsal side; it is completely withdrawn, and in its surroundings there are numerous radiating wrinkles as shown in the figure. The rim of the funnel is neatly and fairly regularly tongued in broad low indentations; there are 16 scallops.

Two kinds of capillaries, 1° stout, winged setæ with short thread-like tips and in their distal part with minute cilia-like hairs, and 2° a few much thinner and more delicate, flexible setæ without wings, but barbed as the first kind. They are placed ventrally to the former. — The hooks are rather peculiar. The shaft is remarkably short perfectly straight, ending in a slightly developed shoulder and in prolongation of it a very long, narrow neck with almost parallel borders, crowned with a head with a downwards bent, acute main tooth, which comes off at an acute angle; above it four small teeth. Numerous gular bristles

(about 15) in a long tuft arise from a projection on the "throat" of the hook.

It seems to me impossible to refer this fragment to any hitherto known arctic species; and it may be doubtful whether it is correct to regard it as a *Nicomache*. It is the structure of the funnel which especially leads me to this assumption: the oblique shape, the few, broad denticles all of equal size, and the number of achætous segments which may vary in this genus. In *Isocirrus* the anal cup is almost of the same structure, but here is only one achætous segment. As to the hooks there are some discrepancies from *Nicomache* e. g. the great number of gular bristles and the long neck. In the present fragment the long thread-like *Nicomache*-setæ were not found, but the state of preservation may account for this.

Genus **Petaloproctus** QUATREFAGES 1865.

12. *Petaloproctus tenuis* THÉEL 1879.

1906. *Petaloproctus tenuis* ARWIDSSON p. 114.

This species is not present in this material. As ARWIDSSON, however, reports it from localities in East-Greenland it is included here for the sake of completeness. It is easily recognized by the oblique anal funnel, the dorsal part of which has almost disappeared, whereas the ventral part in return is strongly developed. The rim of the funnel is smooth or slightly crenelated. Number of chætigers 20; 1 achætous, præanal segment.

The species is hitherto not known from West-Greenland. ARWIDSSON'S specimens originate from 74°10' N. 20°08' W., south east of the Clavering Ø, 25—40 m, and from the inner part of Kejser Franz Josephs Fjord 73°06' N. 27°17' W., 3—9 m.

Further distribution: Spitsbergen, Novaya Zemlya.

Subfamily **Euclymeninae** ARWIDSSON 1906.

Genus **LEIOCHONE** GRUBE 1868.

13. *Leiochone polaris* (THÉEL) 1879.

1879. *Praxilla polaris* THÉEL p. 58.

1883. *Clymene polaris* LEVINSSEN p. 143.

1906. *Leiochone polaris* ARWIDSSON p. 150.

1914. *Leiochone polaris* DITLEVSEN p. 715.

1928. *Leiochone polaris* AUGENER p. 766.

Occurrence: The Davis Strait: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 1 spec. — 65°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2250 m; 1 spec.

From St. 32 three fragments evidently of the same specimen, consisting of an anterior end with 4 chætigers and two intermediate pieces. From St. 24 a posterior fragment consisting of 6 chætigers, 4 achætous segments and the pygidium. The length of the worm and the number of segments I can not give. In none of the fragments the 8th segment

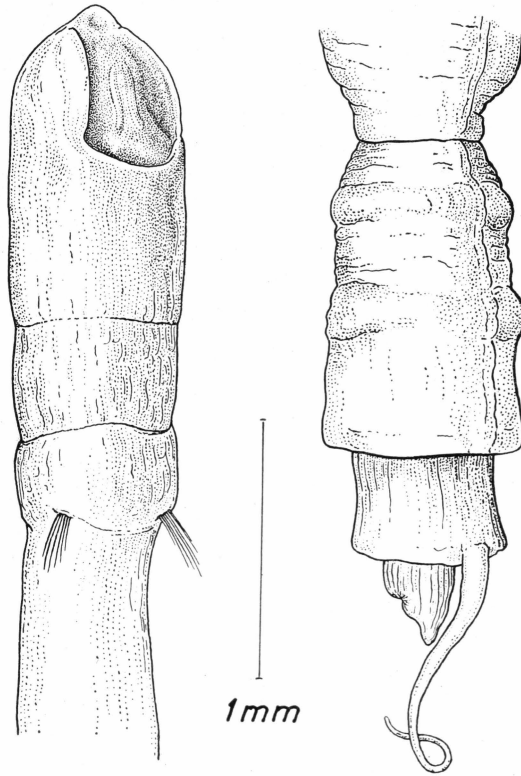


Fig. 15. *Leiochone polaris* (THÉEL). Anterior end, "Ingolf" St. 32; posterior end, "Ingolf" St. 24.

with the triangular shield is present. The head and the two foremost segments are of the same length, considerably longer than the two following. The cephalic plate is fairly well developed, it is short and narrow with reduced lateral borders. The frontal border has a blunt, conical tip. The posterior border is very low, without incision, completely smooth and straight. Where the lateral and posterior borders meet in a right angle, there is on each side a small notch. The median ridge is low and narrow; the nuchal organs short and in the present specimen rather indistinct. The mouth lies near the anterior end; no description of the proboscis can be given. Close to the border between the head

and the first chætiger a distinct furrow. From the second and in the following chætigers rather broad glandular belts.

There are four achætous, præanal segments with rudiments of feet. Then follows the part in front of the anal cone; it is long and cylindrical with an annulate rim, from which the single long subulate cirrus projects; it is situated in the ventral mid-line. The anal cone is rather long and tapering; the anus lies in the middle of its dorsal side.

In the first segments the parapodia are moved close to each other on the dorsal side. The capillary setæ are pale yellow, some are straight with narrow wings, others are slender with very pointed tips and without wings. In the first chætigers the hooks are reduced; no gular bristles and only two or three teeth; a fully developed hook from one of the last chætigers have long bristles and 6 teeth above the main fang. The shaft is abruptly bent backwards and shows a bold shoulder beneath the neck.

Only a short piece of the tube is present, partly surrounding the posterior fragment. The delicate, web-like, transparent lining is invested by minute transparent silicious grains; in the anterior fragment this lining is still preserved, but all the débris have been lost.

The colour of the animal is white, no pigmental spots at all, most probably due to the preservation fluids.

Further distribution: East-Greenland (ARWIDSSON: Pendulum Island, Mackenzie Bay, Fame Island, Jan Mayen). Spitsbergen, Novaya Zemlya. The species is exclusively arctic.

Not previously known from West-Greenland.

14. *Leiochone borealis* ARWIDSSON 1906.

1906. *Leiochone borealis* ARWIDSSON p. 156.

1915. *Leiochone borealis* McINTOSH p. 317.

Occurrence: Davis Strait: 65°16' N. 55°05' W.; "Ingolf" St. 35; 18.7.1895; 682 m; 3 spec. — 64°54' N. 55°10' W.; "Ingolf" St. 27; 1.7.1895; 740 m; 1 spec. — 64°08' N. 55°20' W.; "Tjalfe" St. 337; 8.5.1909; 1100 m; 1 spec. — 63°30' N. 54°25' W.; "Ingolf" St. 25; 26.6.1895; 1096 m; 4 spec. — 63°06' N. 56°00' W.; "Ingolf" St. 24; 25.6.1895; 2258 m; 1 spec. —

The specimen here described is from the Davis Strait (St. 27). Present are three fragments, two anterior ends, one with 8 chætigers, the other with 15, and a posterior end with 4 chætigers, 5 achætous segments and the pygidium. Length and number of chætigers of this specimen can not be given (According to ARWIDSSON the number of segments is 19).

The colour is yellowish-white. A white glandular girdle in front of the setigerous lobes in the first 7 chætigers; in the 8th chætiger a large

ventral triangular shield with a light, thickened rim; in some specimens this shield is much shorter and broader and more rounded anteriorly than in the figured specimen; this is perhaps due to the preservation. The cephalic lobe is an oblong, ovate plate with large rounded palpode. The nuchal organs are two longitudinal furrows reaching backwards to the middle of the cephalic plate. The ridge between the furrows is very flat and only slightly developed. The cephalic border is rather broad, especially in front of the lateral notches, which are situated at the level of the posterior ends of the nuchal organs. Its posterior border is low and has a slight incision in the dorsal midline. The proboscis has 28 longitudinal rows of blunt papillæ, in the lateral rows there are three, 5 in the posterior rows. The mouth is surrounded by two lips, the outer one, viz. the papillose part of the proboscis, is broad posteriorly and very low or even interrupted frontally, thus being formed like a horse-shoe with the opening turned apically; the inner ring is much smaller and also horse-shoe-shaped, but the opening is here turned posteriorly.

The pro- and peristomium are completely fused; no transversal furrow is found. The first three chætigers are nearly twice the length of the following; the parapodial ridges close to their anterior borders. In the 7th chætiger they are in the middle of the segment, in the 8th at the base of the shield, and from that and in the following segments they have shifted to the posterior end. From the 11th chætiger the uncinigerous tori are very prominent with the row of numerous uncini in the middle. True notopodial knobs are absent. Of the 5 achætous segments the first is much longer than the rest; the last four are rather short, vaulted rings with traces of biannulation. They have all rudiments of feet. The pygidium is short, widened in its distal part, and seen directly from the end like a flat plate, at the rim of which a number of long cirri of varying length arises; most probably they are evenly distributed all over the rim; in the present specimen there were (as shown in the figure) four on each side of the ventral cirrus; dorsally there were none; the others have most likely been lost. In the middle of the pygidial plate the anal conus arises; the anus is placed at its dorsal side, therefore invisible in the figure.

In the first three chætigers the neuropodia carry one or two modified hooks of the reduced type; no gular bristles, and only 2—3 teeth; their shafts not quite straight but curved slightly backwards. The notopodium of the first segments have delicate capillaries with narrow wings and long tips. In the second parapodium there are 12. The fully developed uncini have rather long, strongly bent shafts with a big nodulus, a far backwards bent neck, a big main fang coming off at an obtuse angle and above a crown of 5—6 long slender teeth; only a few long gular bristles (2—3) curved upwards over the beak.

The tubes have a tough, yellow inner lining, invested with fine mud and sand particles, neatly arranged in very narrow, closely lying rings. They are nearly cylindrical and very fragile.

Further distribution: Inside the arctic area the species has hitherto only been taken at Finmarken. In the boreal zone it is known from Skagerrack and the west coast of Norway, the North Sea, the

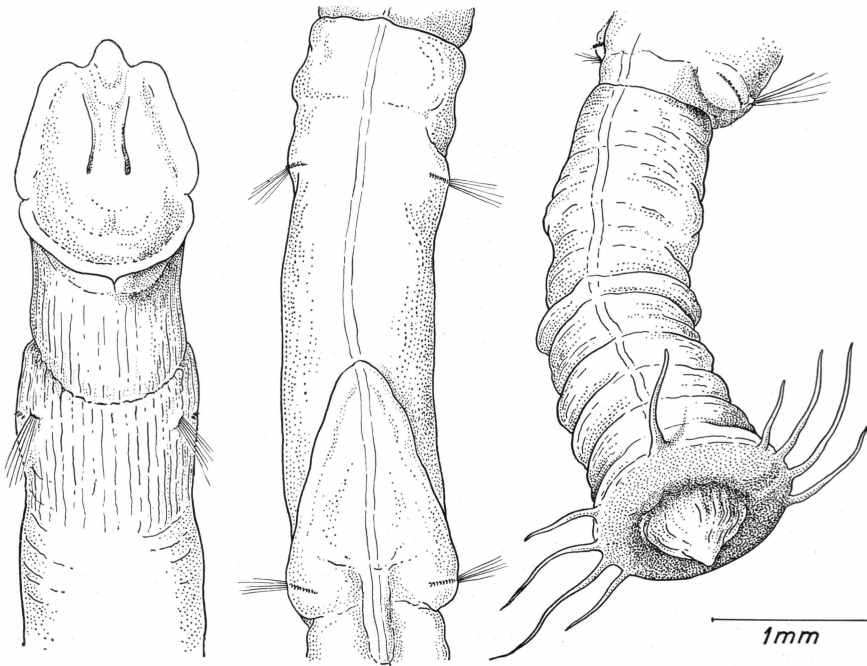


Fig. 16. *Leiochone borealis* ARWIDSSON. "Ingolf" St. 27.

islands north of Scotland. The here published finds and the finding places south and east of Iceland, which will be published in the "Ingolf" Report, indicate a much wider distribution in the North Atlantic. The species seems mainly to belong to the deep-sea fauna in the arctic seas.

Not previously known from Greenland waters.

Genus **MALDANELLA** Mc'INTOSH 1885.

15. *Maldanella davisi* n. sp.

Occurrence: The Davis Strait: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 1 spec. — 60°17' N. 54°05' W.; "Ingolf" St. 37; 29.7.1895; 3229 m; about 6 spec. —

The material comprises numerous fragments from St. 37, among which 6 anterior ends but no posterior, and from St. 32 three fragments

which are considered to belong to a single specimen, here described as the type of the new species. Put together the fragments measure about 65 mm by 6 mm as the greatest width (5th—6th chætiger). The colour is light brown, strongly iridescent and with lighter glandular belts. The cephalic lobe is a symmetrical, ovate plate with no true ventral process frontally. In some specimens from St. 37 it may seem as if there is a little process, but in reality it is the anterior part of the proboscis, which projects in the frontal notch of the cephalic border. Behind the nuchal organs the plate has a number of transversal furrows, the concavities of which are directed forwards. Otherwise the plate is quite flat; there is no median ridge; only between the two nuchal organs there is a slight elevation which frontally has a slit-like fissure. The nuchal organs are short, only slightly longer than one third of the plate; they are rather deep, slightly curved outwards at both ends, otherwise straight, parallel. The margin of the cephalic plate is a fairly broad, flappery, lamelliform border, deepest posteriorly, where the rim is smooth; a few rounded and very small notches occur a little above the middle. In the ventral midline there is a deep notch, the two halves of the lamella do not meet. It is in this interspace, that the anterior rim of the proboscis project, reminding of the palpode so characteristic for so many of the Maldanids with a cephalic plate of this type (e. g. *Praxillella*).

The proboscis is not fully protruded, but the mouth is surrounded by a circular soft lip with radiating furrows; inside this, but deeper, another circular lip is seen. The pro- and peristomium are perfectly coalesced; this part, the head, is very short, hardly as long as the first chætiger. —

If I am correct in regarding the three fragments as one specimen, the number of chætigers is 19; the first fragment consists of 11, the middle one of 5 and the posterior of 3 chætigers. The transition between head and first chætiger is smooth and even; the first chætiger carries only capillary setæ, arranged in a rather broad fan and in a number of about 20. They project directly from the skin; no notopodial ridge at all. There is no neuropodium and no neuropodial bristles. The next two chætigers are of the same length as the first one; the following are considerably shorter, only about half the length. The 2nd to the 7th chætiger have distinct collars, particularly deep in the 4th to the 7th chætiger. The rim of these collars is quite smooth and rounded and evenly annular, perhaps a little lower in the dorsal and the ventral midline. The collars are white, on account of the glandular zones, which occupy them. In these collared segments the parapodial ridges are fairly well developed and situated close to the anterior border; in all these and the following segments capillary setæ as well as uncini are present. Here the former are not fan-likely arranged, but form a com-

pressed tuft. The part of the body after the collared segments is unnaturally stretched, and in this part the specimen is torn.

In the next fragment, i. e. from the 12th chætiger, the neuropodia are prominent ridges with a long row of yellow uncini; there is no notopodial knob, and the long capillary setæ are highly compressed into a narrow bundle. The parapodia now are situated close to the posterior

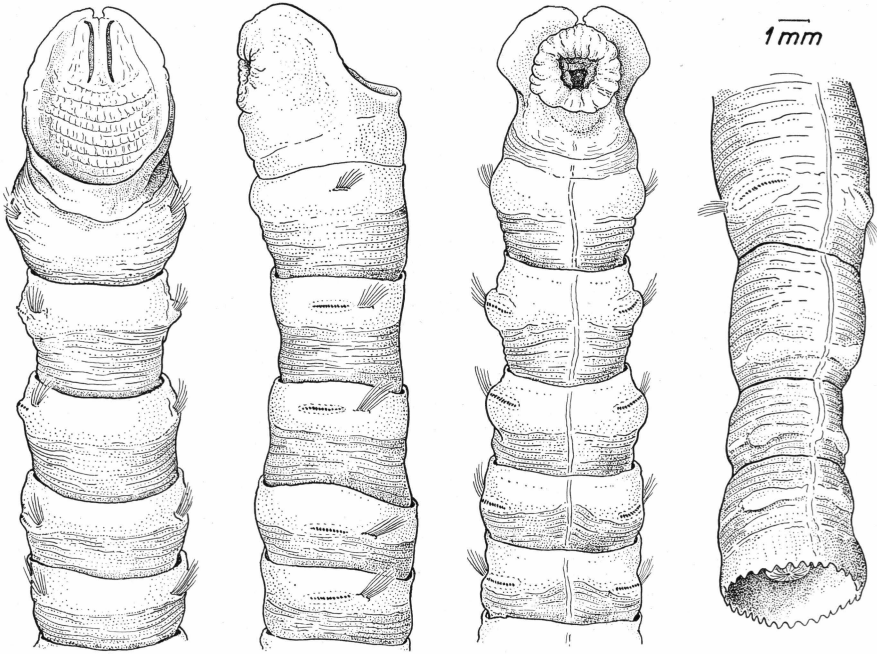


Fig. 17. *Maldanella davisi* n. sp. "Ingolf" St. 32.

border of the segments. In the two last chætigers the parapodial ridges are low, resembling those in the foremost part of the body. At last follow three anteanal, achætous segments with rudiments of parapodial elevations, the first about as long as the two last together. The pygidium is about half the length of the last segment, it is a low funnel with a free, circular rim with the same diameter all way round and evenly tongued with a great number of small denticles all of the same length and with the same interspaces. There is no especially developed ventral cirrus. The ventral nerve-cord may easily be traced as a broad shimmering line to the very rim of the funnel. The bottom of this latter is concave, cup-shaped; the anal cone is placed ventrally, is rather low, rounded, and radiately striated.

The capillary setæ offer no specific characters; they are of the usual two types, the stouter of them have very narrow wings, often it would

be natural to say that there were no wings at all; they have a long flexible tip and no barbules. The delicate capillaries are much shorter and in the hindmost tufts placed ventrally in the bundles, in the foremost scattered among the stouter ones; they have no wings, are not barbed and very fine. The uncini of the second chætiger are fully developed; there are 19, all with a long, elegantly curved, longitudinally striated shaft, a long slender nodulus, just beneath the place where

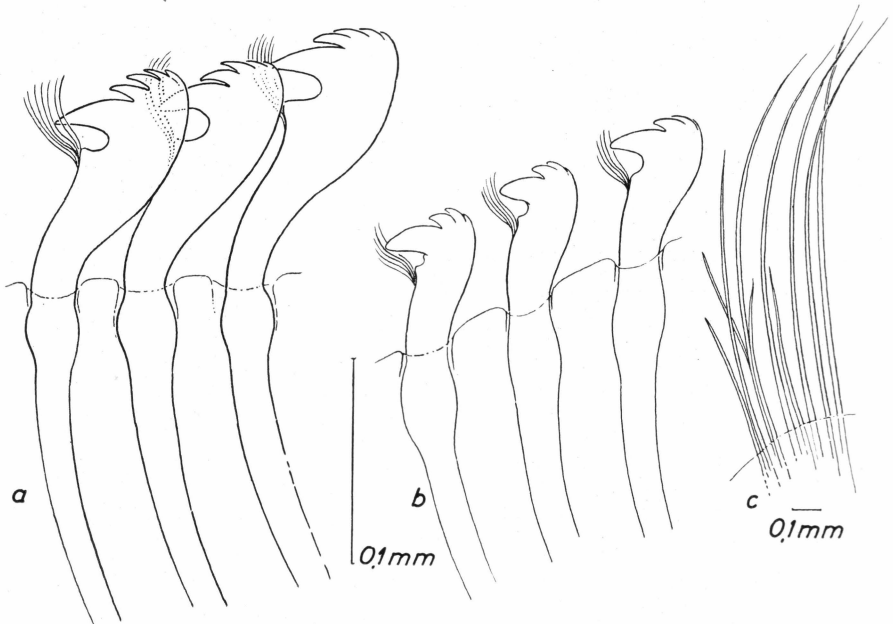


Fig. 18. *Maldanella davisi* n. sp. uncini and setæ. a 8th parapodium, b 2nd parapodium, c 2nd parapodium.

they pierce the skin, a slight restriction above the shoulder, a rather short neck, a tuft of short, curved gular bristles and above the insertion of the latter a little prominence. The main fang is fairly narrow, pointed and crowned by three teeth, only the most ventral of the uncini have only two teeth.—In the more two posterior segments the uncini vary a little from this description. In the 8th chætiger there are 42 uncini with shafts and noduli of the same shape, but the necks are bent backwards in a great curve, the main teeth are more narrow and acute and there are four narrow acute teeth above the beak; most characteristic is, however, the marked prominence just above the insertion of the gular bristles and the deep curve between this and the big fang.

The tubes were not secured.

In the present material a posterior fragment of this species has been secured at St. 80 between Iceland and Greenland.

The genus *Maldanella* was established by Mc'INTOSH 1885; he gives no generic diagnosis. ARWIDSSON (1906 p. 127) has extracted a diagnosis from Mc'INTOSH's description of the three species which he erected in the Challenger Report and as the present specimens agree with this in all essentials, viz. the structure of the head and the funnel, the absence of uncini in the first chætiger and the shape of the fully developed uncini, I refer these specimens to the genus. Mc'INTOSH's species bear the names of *M. antarctica*, *M. valparaiensis* and *M. neo-zealanix*, all indicating the localities from which they originate. *Clymene harai* IZUKA 1902, which probably is identic with *Axiothea campanulata* MOORE (1903 p. 485) is evidently a *Maldanella* (ARWIDSSON 1906 p. 127, FAUVEL 1927 p. 186); if this is correct the genus has a very wide distribution: the Antarctic, New Zealand, South America, Japan and France, and now two or three localities in the Arctic Atlantic Ocean are added to this list—once more the peculiar distribution of the Polychæta has been proved.

Genus **PRAXILLELLA** VERRILL 1882.

16. *Praxillella gracilis* (M. Sars) 1861.

1861. *Clymene gracilis* Sars p. 256.
 1865. *Praxilla gracilis* MALMGREN p. 192.
 1867. *Praxilla gracilis* MALMGREN p. 100.
 1882. *Praxillella gracilis* VERRILL p. 298.
 1906. *Praxillella gracilis* ARWIDSSON p. 183.
 1914. *Praxillella gracilis* DITLEVSEN p. 715.
 1915. *Praxillella gracilis* Mc'INTOSH p. 324.
 1928. *Praxillella gracilis* AUGENER p. 762.
 1934. *Praxillella gracilis* E. WESENBERG-LUND p. 25.

Occurrence: Davis Strait: 65°17' N. 54°17' W.; "Ingolf" St. 34; 18.7.1895; 104 m; 1 spec. — The West Greenland Fjords: 53 miles from the outlet of the Nordre Strømfjord; V. Nordmann; St. 11 B; 6.7.1911; 67—56 m; 2 spec. — Kvanefjord; "Rink" St. 23; 20.6.1912; 200—410 m; 1 spec. — Bredefjord; "Rink" St. 45, St. 67, St. 75, St. 80, St. 98; 18.7.—4.8.1912; 200—520 m; 1, 1, 2, 1, 1 spec. —

The described specimen originates from "Ingolf" St. 34. It has fallen into two fragments, the anterior with 13, the posterior with 6 chætigers and 4 achætous segments. The colour is greyish-white, with vaguely coloured glandular belts. The cephalic plate has a well developed border, anteriorly produced into a digitiform tip, and a lateral incision on each side almost at the level of the dorsal end of the nuchal organs. Behind the notches the border is high and shows in the midline a slight V-shaped incision. The nuchal organs are very long, more than three fourths the length of the plate; they are slightly bent outwards anteriorly, and they

lie close to each side of the narrow and compressed cephalic keel. The proboscis is fully protruded and is a large bladder-like organ with a smooth thin-skinned basal part and a papillose distal part. There are about 36 longitudinal rows of papillæ; in the anterior rows there are 3—4, in the posterior 9—10 papillæ; they are conical, fairly large,

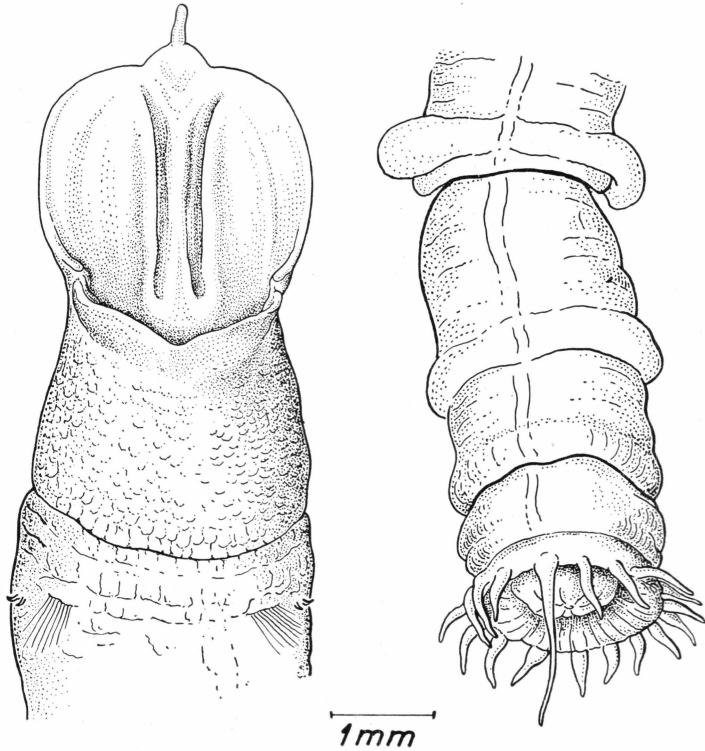


Fig. 19. *Praxillella gracilis* (M. Sars). "Ingolf" St. 34.

especially in the posterior rows. Inside this bladder-like proboscis lies a circular lip, surrounding the entrance to the oesophagus. The pro- and peristomium are completely fused, the skin finely striated longitudinally as well as transversally, whence tessellated. The segmental furrows are very distinct between the anterior 8—9 segments, then they seem to vanish on account of the bad preservation, and in this region the rupture has taken place; here the segments are unusually stretched and it is therefore impossible to state exactly, where the shift of the parapodia from the anterior to the posterior part of the segment takes place. We must confine ourselves to report, that in the last chaetigers they are situated very close to the posterior border. In the first chaetigers the parapodial ridges are only slightly prominent; in the second and third

they are small knob-like protrusions, and in these the neuropodia carry dark brown, stout uncini, one in the second and the third, two in the first; in the fourth chætiger there are 17 uncini.

There are four achætous segments; the anal funnel is comparatively small with a rounded border, which in the present specimen carries 17 subulate anal cirri of equal length and an almost twice as long ventral cirrus; the distance between the cirri, which arise abruptly from the rim, is the same everywhere. The cup is of slight depth; the anal cone lies in the centre. The number of anal cirri may in large specimens amount to 25.

Capillaries of two kinds, strong, narrowly winged bristles and slender, translucent bristles without wings and shorter than the former.—The uncini of the first three segments are reduced, they have no gular bristles and there is only one or two small teeth above the main fang. The uncinus is like a strong hook, it is stout, dark brown, and visible even with a slight magnification. On this point the present specimen differs from the typical form of the species, as this normally has two or three or even more reduced hooks. I have never in the present specimens found more than one or two; I do not, however, regard this as a constant character; it may undoubtedly vary according to age and length; therefore the present specimens will not be described as a new variety. A fully developed hook has a thick head, and above the fairly blunt, main fang there are 5—6 long, acute, narrow teeth lying close to each other; a few strongly curved gular bristles.

The tubes are free, often considerably longer than the worm; occasionally the translucent lining projects beyond the coating of mud and fine sand at both ends.

Further distribution: The species is mainly arctic. Previously known from both West- and East-Greenland, Spitsbergen, Siberia, North America. In the boreal zone it is known from the west coast of Scandinavia.

17. *Praxillella prætermissa* (MALMGREN) 1867.

1867. *Praxilla prætermissa* MALMGREN p. 100.
1867. *Praxilla arctica* MALMGREN p. 101.
1877. *Praxilla arctica* Mc'INTOSH p. 507.
1883. *Clymene prætermissa* LEVINSEN p. 144.
1906. *Praxillella prætermissa* ARWIDSSON p. 192.
1911. *Clymene affinis* DITLEVSEN p. 427.
1914. *Praxillella prætermissa* DITLEVSEN p. 716.
1915. *Praxillella prætermissa* Mc'INTOSH p. 327.
1928. *Praxillella prætermissa* AUGENER p. 762.
1929. *Praxillella prætermissa* DITLEVSEN p. 41.

Occurrence: Davis Strait: 65°16' N. 55°05' W.; "Ingolf" St. 35; 18.7.1895; 682 m; 1 spec. — Skibshavnen, Langø, Upernavik; F. Salomonsen; 12.6.1936; 19.5 m; 1 spec. —

The cephalic lobe is not produced into a digitiform process as in *P. gracilis*, but ends in a blunt, conical process with a deep notch at

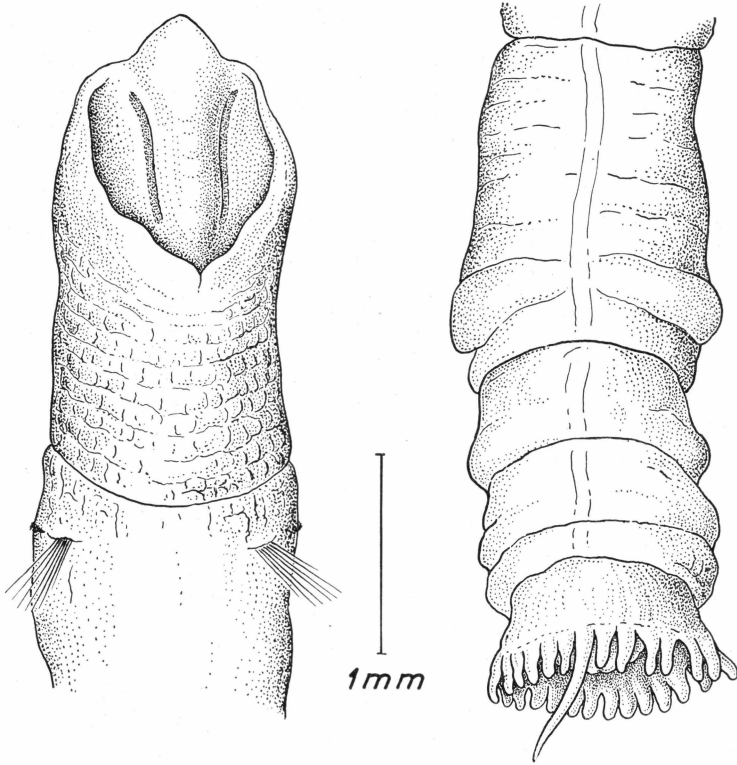


Fig. 20. *Praxillella prætermissa* (MALMGREN). "Ingolf" St. 35.

each side where the edges of the cephalic margin are rounded off. The plate has a long, median ridge almost from the anterior to the posterior border and on each side of the ridge a nuchal organ almost as long as the ridge itself. These organs are slightly diverging anteriorly, reaching almost to the anterior notches in the cephalic rim. This latter is broad, has a deep notch dorsally, and in big specimens a deep one also on either side; in the specimen from St. 35 these two lateral incisions have not yet developed; here the rim is almost perfectly smooth, only with very indistinct curves. The mouth opens ventrally close to the base of the median process. The proboscis is a big, thin-walled, ovoid sack, covered with small, flattened papillæ.—The fused pro- and peristomium is

solid, the skin thick, with longitudinal and transversal wrinkles. 19 chætigers; the first three of the same length; their glandular belts fairly well developed, in the first on both sides of the parapodia, in the second especially in front of them, and in the third behind them. In the following segments the glands form distinct white belts in front of the feet. The posterior end has four achætous segments with rudimentary feet. The pygidium is longitudinally striated, it forms a rather deep funnel with a flat floor, in the centre of which the anal cone arises.

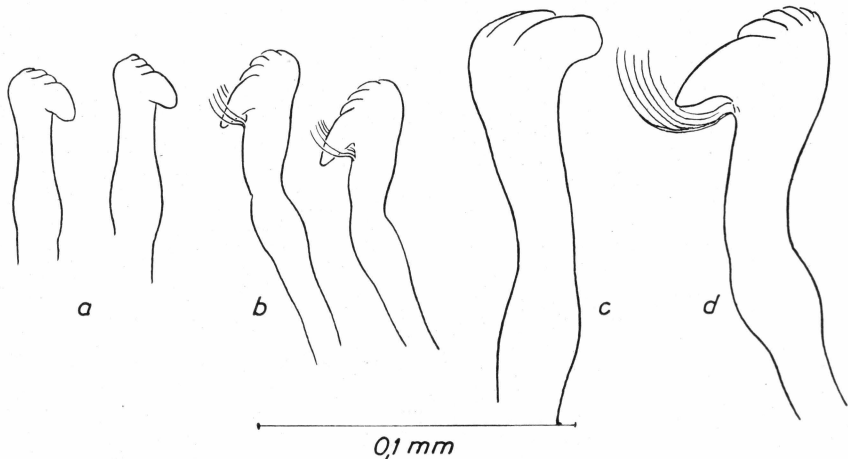


Fig. 21. *a, b* hooks from 3rd and 14th parapodium of *Praxillella prætermissa* (MALMGREN). *c, d* hooks from 3rd and 16th parapodia of *P. gracilis* (SARS).

The rim of the funnel carries a number of short cirri, in the figured specimen 25 short, blunt cirri besides the long ventral one. The shape of the cirri is blunt and conical in contracted forms, but much more pointed in stretched specimens. The ventral cirrus is more than twice as long as the rest. In small specimens the number of cirri is much smaller, and according to ARWIDSSON it may amount to 38 in specimens of about 100 mm.

In the first three chætigers there are ventral uncini of the reduced type, about 3—7 in each neuropodium; they either have rudimentary gular bristles or these may be perfectly missing. The number of teeth above the beak is 3—4; the fully developed uncini from about the 10th chætiger have 4—5 big, pointed teeth and gular bristles, difficult to discern because they are short and very delicate. In these specimens, I have not been able to see, that they form “2 breiten Bündeln, eines jederseits von dem grossen Zahn, dessen Spitze frei gelassen wird” as ARWIDSSON reports (1906 p. 197).

The tube is free, composed of clay, mud, sand, to which shell fragments and Foraminiferon shells adhere. They are slightly curved and fragile.

Further distribution: The species is formerly known from West- and East-Greenland (ARWIDSSON and DITLEVSEN). The last author has erroneously determined a specimen from the "Danmark" Expedition (76° N. Lat.) as *P. affinis* (SARS), a species which is not known from the Arctic. Furthermore known from Finmarken, the White Sea, Spitsbergen, the Kara Sea, Novaya Zemlya; Scandinavia, Iceland, the Faroes; North America. Mc'INTOSH reports it from Scotland, Ireland and other more southern localities; ARWIDSSON presumes, that this may be due to a misinterpretation, and he is most probably correct in this, as Mc'INTOSH describes the species as having strong hooks in the first three chætigers, which absolutely must be due to some mistake.

The species is mainly restricted to the clay bottom.

Genus AXIOTHELLA (VERRILL) 1900.

18. *Axiothella catenata* (MALMGREN) 1865.

1865. *Axiiothea catenata* MALMGREN p. 190.
 1867. *Axiiothea catenata* MALMGREN p. 99.
 1877. *Axiiothea catenata* Mc'INTOSH p. 507.
 1883. *Clymene catenata* LEVINSEN p. 146.
 1902. *Axiiothea catenata* MOORE p. 275.
 1906. *Axiiothella catenata* ARWIDSSON p. 209.
 1914. *Axiiothella catenata* DITLEVSEN p. 716.
 1920. *Paraxiiothea catenata* CHAMBERLIN p. 23 B.
 1928. *Axiiothella catenata* AUGENER p. 763.
 1937. *Axiiothella catenata* DITLEVSEN p. 37.

Occurrence: West of Greenland: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 2 spec. — 66°22' N. 57°16' W.; "Tjalfe" St. 366; 19.5.1909; 686 m; 1 spec. — 65°36' N. 56°24' W.; Wandel 1889; 650 m; 2 spec. — Coastal Waters West of Greenland: Thule Harbour; F. Salomonsen St. G 2 and G 6; 14.—15.8.1936; 14 m; very fine clay; 1, 1 spec. — Uvdle, Thule; Chr. Vibe; 30.7.1939; 12 m; 2 spec. — Saunders Island, Thule; Chr. Vibe; 30.7.1939; 45 m; 1 spec. — Sigridshavn, Langø, Upernavik; F. Salomonsen; St. F 6; 21.7.1936; clay; 10 m; 1 spec. — Godhavn; 2 spec. — Bredefjord; "Rink" St. 55; St. 79; St. 170; 20., 27.7. and 8.8.1912; 310—330 m; 90—200 m; 55—90 m; 1, 1, 1 spec. — South East Greenland: Lindenows Fjord; Bertelsen; 17.7.1935; 18 m; 1 spec.

A fairly large and well preserved material is present from nearly the whole western coast of Greenland; the largest specimen is from Lindenows Fjord in South East Greenland; it measures no less than about 160 mm. The colour is white, or yellowish, the glandular zones grey or

light brown, evidently discoloured by the preservation fluid. The following description refers to two fragments from two different individuals from Godhavn.

The cephalic plate elongated antero-posteriorly, therefore elliptical; it slopes from above downward and forward and ends in a blunt, mid frontal process. The lateral margin is broad, prominent, conspicuous all round, perfectly smooth without any notch posteriorly, but with two deep notches on each side exactly at the level of the posterior ends of the nuchal organs. The cephalic keel is rather high, rounded; it stretches

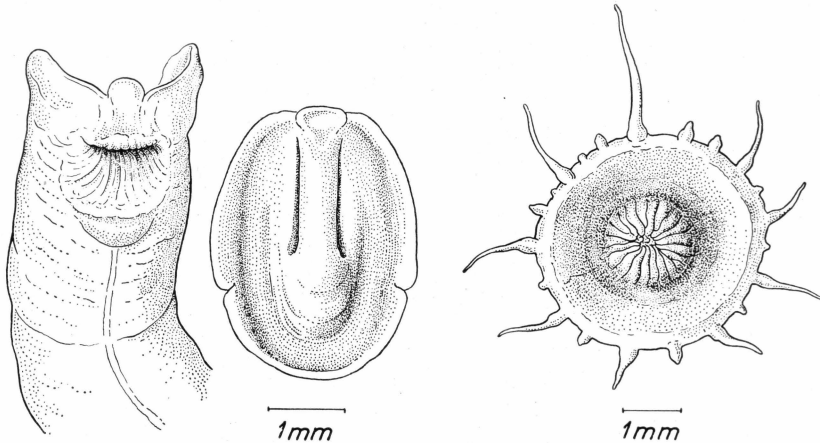


Fig. 22. *Axiothella catenata* (MALMGREN). Godhavn; two different specimens.

a little more backwards than the nuchal grooves and ceases just at the base of the anterior tip. The nuchal organs are deep, completely straight, parallel, beginning just inside the notches, which separate the anterior tip from the cephalic margin; behind the keel there are a few semi-circular furrows with the concavity turning forwards. The mouth is a transverse fissure close to the anterior border. The under-lip is thick with many radiating furrows regularly arranged; the upper-lip is much shorter and narrower and with more indistinct furrows. The proboscis is a thin-walled bladder with about 25 longitudinal papillar rows; the papillæ in the lateral rows are considerably smaller than those in the median rows.

The pro- and peristomium are perfectly fused; their surface is irregularly tessellated; 18 chætigers; the first ones fairly stout, distinctly separated from each other by deep segmental furrows, and with the parapodial ridges close to the anterior border; in the 8th and 9th chætiger the parapodia shift from the anterior to the posterior end of the segment. The first 8 chætigers are rich in glands in their anterior parts; in the following segments the glands do not form closed rings.

There are four achætous, præanal segments, the first of them almost as long as the three last together. In these the rudimentary feet are well developed, they diminish gradually in the other three specimens. The pygidium is rather long, flattened, and broadened in its distal part forming a broad low funnel brimmed with cirri highly varying in length. The ventral cirrus is by far the longest of them all. In the present specimen there are two small, knob-like protrusions on each

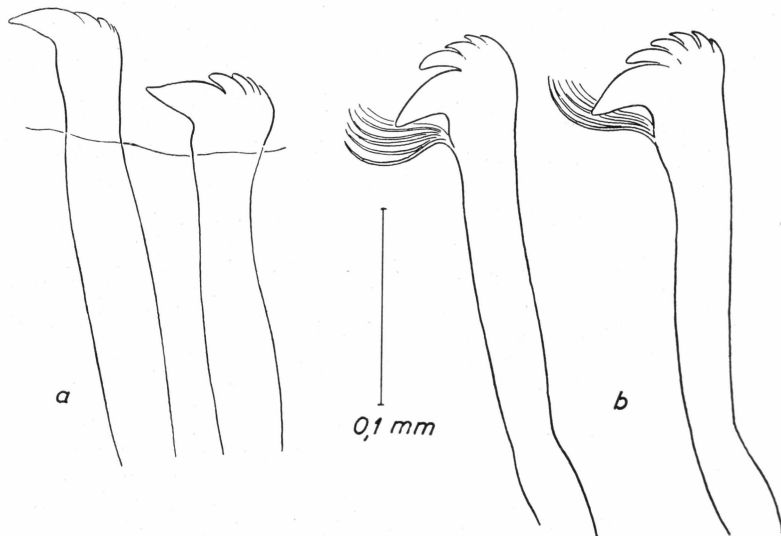


Fig. 23. *Axiothella catenata* (MALMGREN). *a* uncini from 3rd parapodium, *b* from last parapodium.

side of it, then follows a long, subulate cirrus on each side and now long and short cirri alternate comparatively regularly. There are 8 long and 12 short cirri besides the ventral one. The floor of the funnel is a flat plate, in the centre of which the slightly protruded anal cone arises. The anus lies on the top of the cone.

In the first chætigers the parapodial ridges are very little prominent; but in the middle and posterior segments they arise to enormous elevations, big cushions with a row of numerous uncini and a tuft of capillary bristles emerging from a little knob-like protrusion close to the dorsal end of the uncinigerous torus. In the first chætigers there are about 10 hooks; the hooks of the first 4—5 segments have no gular bristles, and only 3—4 teeth above the main fang. The hooks are long and slender, shaft and neck passing evenly into each other, practically without any nodulus. In the other segments the gular bristles are present, and the number of teeth amounts to 6. The main fang has a perfectly

straight lower margin and the crown of teeth is rather high, the neck is long and slender with parallel sides; the nodulus very small.

The tubes are composed of fine mud and clay, rarely with coarser particles adhering to them; they are free, cylindrical, very long, often bent in long curves.

Further distribution: Previously known from numerous localities in West-Greenland waters, in the open sea as well as inside the fjords and in the littoral zone. From East-Greenland the present specimen from Lindenows Fjord. Different authors report it from West Greenland localities in Godhavn and Holsteinborg districts, the species thus actually being distributed along the whole western coast of Greenland.—Furthermore it is known from arctic Norway, Spitsbergen, the White Sea, the Kara Sea, the Bering Sea. It is most probably an exclusively arctic species and according to ARWIDSSON (quoted by DITLEVSEN 1937) records from boreal tracts (e. g. Skagerrak, Scotland, the Shetland Islands) may be due to wrong determinations.

The species seems to be mainly restricted to coastal waters, but may as the captures from the Davis Strait (Wandel, "Tjalfe", "Ingolf") indicate, be found on the banks off Holsteinborg and Sukkertoppen.

Genus **HETEROCLYMENE** ARWIDSSON 1906.

19. *Heteroclymene robusta* ARWIDSSON 1906.

This species is not represented in the present material; yet it is included in this synopsis of new and hitherto known Greenland Maldanids, because DITLEVSEN 1937 p. 37 reports it from the Davis Strait ("Godthaab" 1928 St. 14). However, he does it with some reservation, indicated by a note of interrogation, on account of the paucity of his material: only three hindmost segments of a specimen. He refers this fragment to *H. robusta* because "the anal disc perfectly agrees with ARWIDSSON's figures and description". I have studied his specimen and also find the conformity with ARWIDSSON's description convincing, but still I find it correct to maintain the note of interrogation, because the species previously has not been found in the Arctic; its distribution is hitherto only known as boreal and lusitanian, viz. the West coast of Norway, Ireland and the Channel.

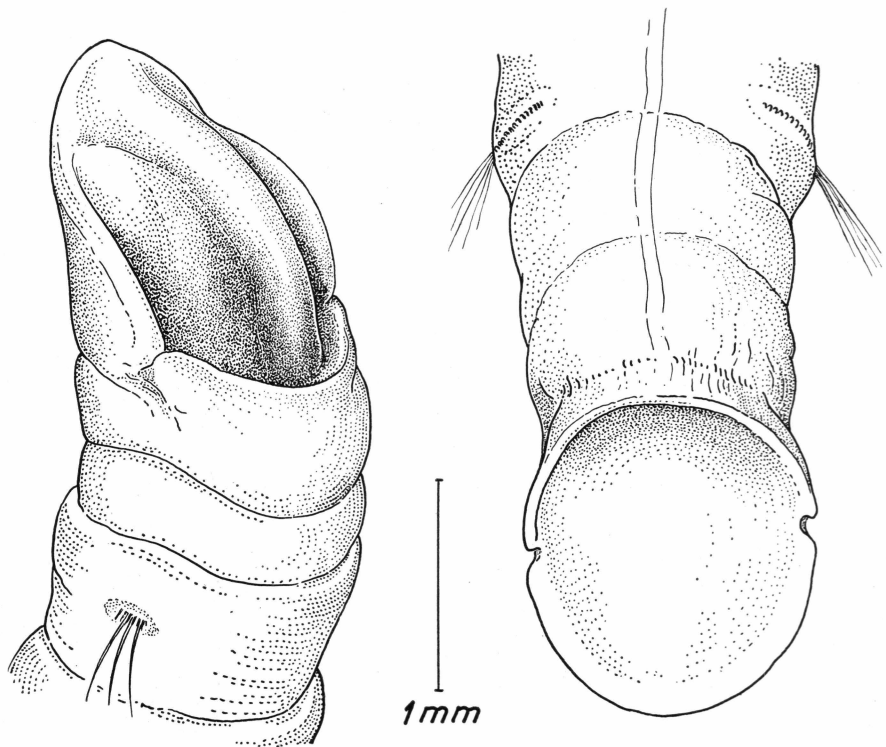


Fig. 24. *Maldane sarsi* MALMGREN.

Subfamily **Maldaninæ** ARWIDSSON 1906.

Genus **MALDANE** GRUBE 1860.

20. *Maldane sarsi* MALMGREN 1865.

1865. *Maldane sarsi* MALMGREN p. 188.
 1867. *Maldane sarsi* MALMGREN p. 99.
 1877. *Maldane sarsi* Mc'INTOSH p. 507.
 1883. *Maldane sarsi* LEVINSEN p. 145.
 1898. *Maldane sarsi* MICHAELSEN p. 128.
 1906. *Maldane sarsi* ARWIDSSON p. 251.
 1914. *Maldane sarsi* DITLEVSEN p. 717.
 1928. *Maldane sarsi* AUGENER p. 759.
 1937. *Maldane sarsi* DITLEVSEN p. 38.

Occurrence: Davis Strait: 66°35' N. 56°38' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 1 spec. — The West Greenland fjords: 63 miles from the mouth of Nordre Strømfjord; Nordmann St. 21 B; 14.7.1911; 325 m; 5 spec. — Bredefjord; "Rink" St. 45, St. 76, St. 87; 18.—31.7.1912; 430—450 m, 260—320 m, 230 m; 6 spec., 3 spec., 1 spec. —

The specimen described is complete, well preserved, slightly constricted, measures 45 mm and is of a yellowish-pale colour. The cephalic plate is elongated, ovoid, anteriorly pointed, not produced into a tip but ending in a blunt process above the mouth and separated from the cephalic border by two small notches. The border is rather high posteriorly, with a smooth rim and two deep lateral notches, in front of which the border bends outwards, passes forward and unites with the border round the anterior blunt process. The cephalic keel is a prominent, compressed ridge, commencing from the hindmost border of the cephalic plate, from where it continues forward to the notches in the anterior margin. The mouth is a \perp shaped fissure without lips; the proboscis is not protruded.—The caudal disc is slightly oblique with regard to the axis of the body, sloping from the dorsal to the ventral side; the rim is highest ventrally, perfectly smooth, only laterally two deep notches. The pygidial disc itself is flat and without structures. Dorsally and very close to the pygidial rim is the anus.

The pro- and peristomium are not perfectly fused; there is in this foremost part a distinct annulate furrow. The body has 19 chætigers.

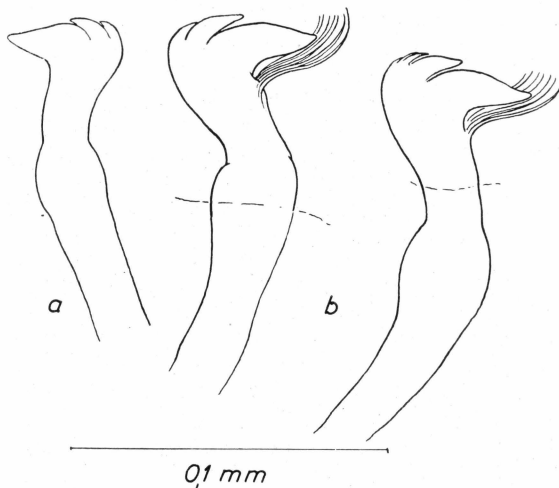


Fig. 25. *Maldane Sarsi* MALMGREN. *a* uncinus from 3rd parapodium, *b* uncini from last parapodium.

The segmental furrow is distinct between the first 7—8 segments, and in these segments a furrow is furthermore seen in the middle, whence they look biannulate. The anterior chætigers are considerably shorter than the middle ones and have indistinct parapodial elevations, whereas the latter are big and bulky in the last segments. There are two achætous præanal segments with slight elevations on each side as rudimentary feet. In the first chætiger there are only capillaries, in all the following

furthermore a row of uncini. Two sorts of capillaries; in the anterior group they are curved upwards just distally to the wings and provided with a long tip with a few spikes; in the posterior segments this type is not so strongly curved as in the anterior. The capillaries in the posterior group of the tuft are longer, with narrow wings and long hair-like tips with minute spines.

The uncini of the second chaetiger are not fully developed, the gular bristles are either absent or very small and few; the main fang is coarse and stout and there are two or three small teeth in the crown. In the other uncinigerous segments the uncini have a tuft of bristles just beneath the beak, which here is more slender and acute, and the number of accessory teeth amounts to four or five. The great fang leaves the neck at an acute angle. The smaller teeth are strongly developed, for which reason the crown is broad and high.

The tubes are free, circular in both interior and exterior diameter. They are composed of fine clay and mud. In some of them pebbles, sand grains, Foraminifera are adhering to the coating.

Further distribution: The species is mainly arctic; it is very common both in West- and East-Greenland waters and the sea north of Norway; the Kara Sea, Spitsbergen, Siberia; in the littoral zone as well as in the open sea. Yet it does not seem to be an abyssal form; it seldom surpasses the 1000 m line.

21. *Maldane glebifex* GRUBE 1860.

1860. *Maldane glebifex* GRUBE p. 92.

1912. *Maldane glebifex* ARWIDSSON p. 425.

1914. *Maldane glebifex* FAUVEL p. 256.

1927. *Maldane glebifex* FAUVEL p. 199.

Occurrence: West Greenland, inside the fjord area: Skovfjord, Tunugdliarfik; "Rink" St. 139; 2.9.1912; 280—300 m; 2 spec.

It is with reservation that these two specimens are referred to this species hitherto not known from the Arctic. It was in 1860 established by GRUBE, who described the anterior end as the posterior and vice versa and gave some very elementary figures. Later on, ARWIDSSON (1912) redescribed the species; Mc'INTOSH (1915) puts forth, that it possibly is identic with *M. sarsi*, whereas FAUVEL in "Faune de France" keeps the two species apart. The present specimens on one essential point differ absolutely from the typical *M. sarsi*, viz. the structure of the cephalic plate. In *M. sarsi* the cephalic keel is very prominent and vaulted, whereas in *M. glebifex* it is long and slightly prominent and does not rise above the level of the cephalic plate. It gradually disappears on the thin, conical plate, which forms the anterior rim of

the prostomium, and thus it is only present posteriorly. Another feature, of specific character for *M. glebifex* is the structure of the anal plate. In *M. sarsi* its ventral border is indistinctly serrated, in *M. glebifex* it is scolloped in neatly rounded tongues. Along its dorsal borders runs a dark glandular band. Otherwise the pygidium is as in *M. sarsi*, i. e. with two lateral incisions. Both these features, the structure of the

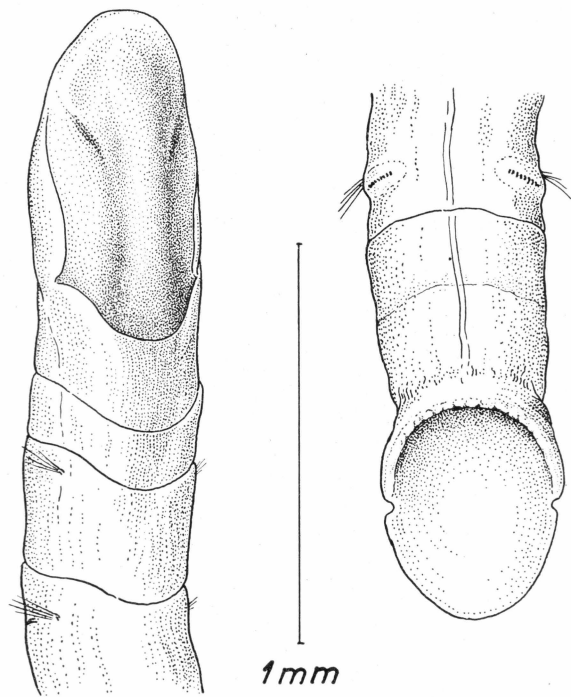


Fig. 26. *Maldane glebifex* (GRUBE).

cephalic and the pygidial plate, characteristic of *M. glebifex* are found in the two present specimens and consequently they should be referred to GRUBE's species.

M. glebifex has two achætous segments. Th uncini resemble those of *M. sarsi*; they have 5—6 teeth and well developed gular bristles. The first uncinigerous segment is the second chætiger.

There is no doubt, that the two species are very closely related; it may even be, that they ought not to be specifically separated, but *M. glebifex* only considered as a variety of *M. sarsi*. Yet it is a fact, that they may be easily distinguished from each other. Once before, when working up a material of polychætes from the Iranian Gulf, I happened to find some *Maldane*-specimens with the low, hardly vaulted keel, and I consequently referred them to *M. glebifex* (not yet

published). As its congener it thus has a wide range of distribution. FAUVEL in his study on polychaetes from the Indian Museum (1932) mentions the arctic *M. sarsi* from the Iranian Gulf, and when studying arctic collections I now find the Lusitanian and Mediterranean *M. glabifex* in arctic waters.

One of the specimens was partly hidden in a delicate tube of fine clay and mud.

The species is on an average much smaller and tinier than *M. sarsi*, and this holds good of the present specimens too.

Further distribution: Atlantic (France), Mediterranean (Marseille); the Adriatique.

Genus **ASYCHIS** KINBERG 1867.

22. *Asychis biceps* (SARS) 1861.

1861. *Clymene biceps* SARS p. 257.
 1865. *Maldane biceps* MALMGREN p. 188.
 1867. *Maldane biceps* MALMGREN p. 98.
 1877. *Maldane biceps* Mc'INTOSH p. 507.
 1883. *Maldane biceps* LEVINSSEN p. 148.
 1906. *Asychis biceps* ARWIDSSON p. 263.
 1914. *Maldane biceps* DITLEVSEN p. 718.
 1928. *Asychis biceps* AUGENER p. 761.
 1934. *Asychis biceps* E. WESEBERG-LUND p. 25.
 1937. *Asychis biceps* DITLEVSEN p. 38.

Occurrence: West of Greenland: 66°35' N. 56°05' W.; "Ingolf" St. 32; 11.7.1895; 599 m; 5 spec. — 66°21' N. 56°54' W.; "Tjalfe" St. 365; 18.5.1909; 600—700 m; 1 spec. — 65°16' N. 55°05' W.; "Ingolf" St. 35; 18.7.1895; 682 m; 5 spec. — 65°14' N. 55°42' W.; "Ingolf" St. 28; 1.7.1895; 791 m; 10 spec. — 64°54' N. 55°10' W.; "Ingolf" St. 27; 1.7.1895; 740 m; 2 spec. — 63°30' N. 54°25' W.; "Ingolf" St. 22; 26.6.1895; 1096 m; 6 spec. — The fjord areas: Bredefjord; "Rink" St. 77; 27.7.1912; 245—470 m; 1 spec. — Skovfjord, Tunugdliarfik; "Rink" St. 139; 2.9.1912; 280—300 m; 1 spec.

A fairly great and on the whole well preserved representation of this species is present, mainly secured by the "Ingolf" Expedition in the Davis Strait. One of them which is described here measures about 90 mm. It is of a dark, yellowish colour with lighter glandular girdles in front of the parapodial ridges especially in the 6th to the 8th chætiger and with a broad white-shimmering ventral nerve-cord. The cephalic plate differs highly in shape from that of the genus *Maldane*. The anterior part of it is very broad and rounded, almost as broad as the breadth of the body and perfectly smooth; the posterior rim is deeply serrated,

the number of teeth increasing during the growth; in the present specimen there are 17 teeth. Between these two parts of the cephalic rim two lateral parts are intercalated, separated from the rest by deep incisions. These parts are denticulated too, more or less regularly; the number of teeth is 4 or 5. The keel is very broad and flat and short, it does not reach either the anterior or the posterior border of the plate.

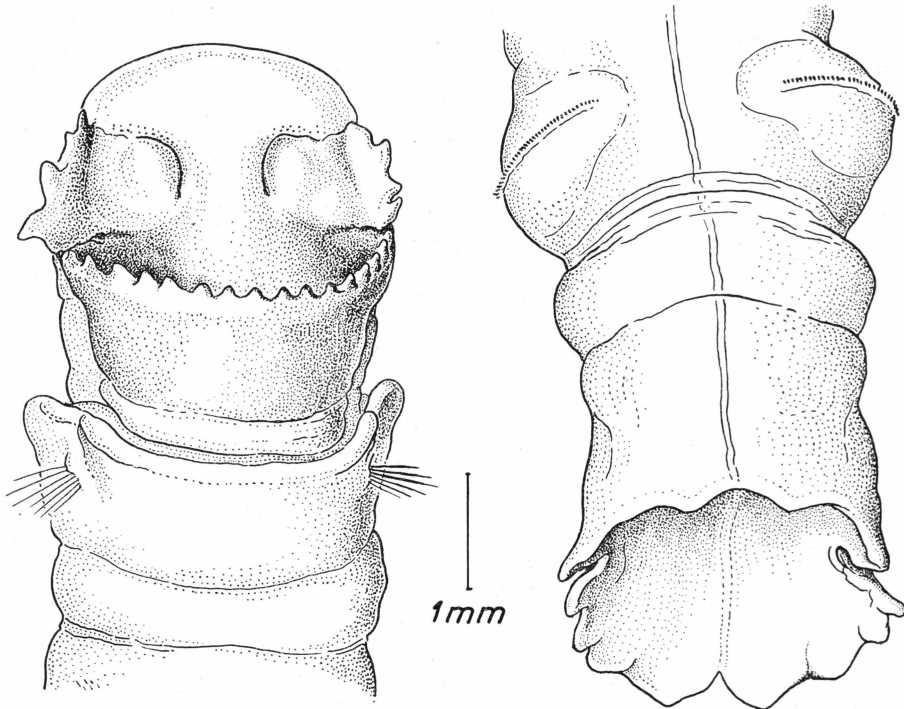


Fig. 27. *Asychis biceps* (SARS). "Ingolf"; the Davis Strait.

The nuchal organs are broadly open semicircles, the concavities of which turn laterally; they commence anteriorly just behind the first lateral incision, curve inward, are for a short distance parallel to the median ridge, then curve outward to the posterior of the lateral incisions. On each side a deep furrow runs backwards on the peristomial segment from the posterior notch, to the border between the peristomium and the first chætiger, thus delimiting the posterior serrated part of the cephalic rim laterally. The perfectly fused pro- and peristomium is deeply telescoped into the first chætiger. The mouth is a longitudinal fissure surrounded by two lips (the upper and lower part of the proboscis), of which the under-lip—the part directed backward—is a swollen, flat U-shaped bladder, with thin walls and without papillæ;

the upper-lip, turning forward, is small, smooth and much lower and less vaulted than the under-lip.

The first chætiger has a high collar, is short and biannulate, the secondary furrow lying behind the feet close to the posterior border. The following segments, which have no collar, are also short and show a tendency to biannulation. In the fourth chætiger the parapodia shift from the anterior part to the posterior—i. e. behind the secondary

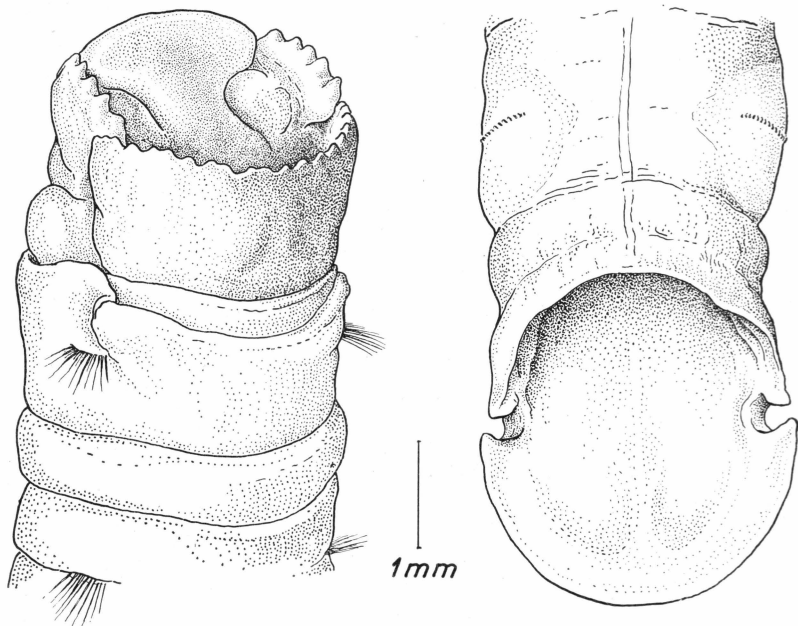


Fig. 28. *Asychis biceps* (SARS). "Ingolf" St. 58.

furrow—of the segments. The eight first chætigers have distinct glandular bands; in the three foremost they form closed rings all round the body, in the last 5 they are only distinct on the ventral side. In the middle parapodia the glands are mainly restricted to the parapodial elevations. There are 19 chætigers and one achætous segment. The pygidial plate is obliquely cut off; it slopes downward to the ventral side, the bottom declining ventrally with the nerve-cord distinctly crossing it longitudinally. In the specimen described here the anal rim is separated into two parts: a ventral and a dorsal one by means of two lateral notches. Both parts are deeply serrated; the ventral part with 4 broad, widely separated teeth, the dorsal with 8, arranged in two groups, four on each side of the medio-dorsal incision. In this and other specimens examined by me there is only one achætous segment, a feature which is in accordance with the statement of Mc'INTOSH but in disa-

agreement with ARWIDSSON's, who writes, that the species has two achætous segments.

The pygidial plate may, however, differ in shape from that described here. In a specimen from St. 58 it looks rather different, the dorsal and the ventral rim being perfectly smooth; only the two lateral notches are present. This can not be due to contraction or preservation, nor is it in my opinion due to age, the two animals being of nearly the same

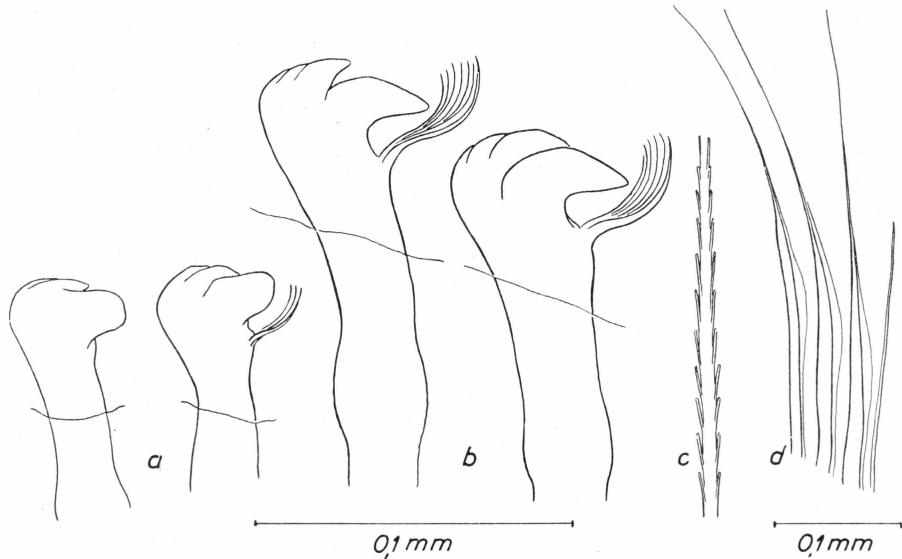


Fig. 29. *Asychis biceps* (SARS). *a* uncini from 2nd parapodium, dorsal and ventral of the uncinigerous row, *b* from 17th parapodium, *c* spiny capillary seta, *d* winged capillaries from 2nd parapodium.

size and also of the same age, because the number of teeth in the lateral and dorsal rims of the cephalic plate is nearly the same, and ARWIDSSON has distinctly shown (p. 264) that this number increases proportionally with the length of the animal. The said difference in the shape of the anal-rim must be an individual one. The first described structure is the normal feature of the species.

The first chætiger only carries capillary setæ. There are two kinds of setæ. The anterior with curved tip and shorter and broader wings, the posterior with narrow wings and with much longer tips with delicate spikes.

The uncini from the first 2—3 segments are of the reduced type. Those most dorsally in the row have no gular bristles at all, the most ventral have 1—3 very short, slightly curved and delicate bristles. The main fang comes off at a right angle, is coarse, stout and rounded. The

crown is rather high, only with one or two teeth; in the second chætiger there are 6 uncini. An uncinus from the 17th chætiger, which has 30 uncini, has a tuft of bristles of a rather peculiar structure. Below the main fang a broad, stout bristle projects curved with the concavity towards the fang; it tapers evenly towards the tip; it seems to be penate, since from its convex side a series of very fine and delicate bristles arise. Here the main fang is pointed and more slender than in the anterior segments, the crown is high, the number of teeth only two or three and laterally seen they lie very close to each other, often not at all separated from each other. The neck is long and straight, and the nodulus only slightly developed.

Further distribution: Previously known from West and East Greenland. In 1928 AUGNER writes that the species "gehört zu den Formen, deren Verbreitungsbezirk überwiegend ausserhalb des arktischen Gebietes liegt". The present material and that worked up by DITLEVSEN from the "Godthaab" 1928 Expedition show, however, that this theory must be abandoned; the "Godthaab" Expedition has secured the species at several localities in Baffin Bay; it is reported from Hare Ø north of Disco and from waters north of Iceland, i. e. from true arctic waters outside the area of the influence of the Gulf Stream, and thus it must be regarded as a species widely distributed in the Arctic.

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