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DEEP-WATER ERRANT POLYCHAETES FROM HARDANGERFJORDEN, WESTERN NORWAY

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ABSTRACT

The errantiate polychaetes from waters deeper than 200 m in Hardangerfjorden include 37 species of which 5 are newly described. These include *Nothria fiordica*, *Eunice dubitatus*, *Lumbrineris agastos*, *L. aniara*, and *L. scopa*. The faunal composition indicates a close relationship to shallow-water faunas in the region, and differs from the usual composition of deep-water polychaetes. A preliminary analysis indicates the presence of ecological groupings of polychaetes in Hardangerfjorden.

CONTENTS

INTRODUCTION

The present survey of the errant polychaetes from waters deeper than 200 m in Hardangerfjorden reviews part of the material collected during the last ten to fifteen years. Material from a few shallow-water and intertidal stations has been included; this was done to gain information about the vertical distinctness of the deep-water fauna. It has been disregarded in the faunistic treatment.

Polychaetes from Hardangerfjorden have previously been reported extensively; BIDENKAP (1895) specifically mentioned 16 species of errants found in this area:

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he did not specify records for an additional 23 species that he considered widespread along the whole Norwegian coast. The fauna of the fjord at that time was considered to include approximately 40 species. Most of these species are shallow-water organisms; only a few of the typical deep-water species such as *Laetmonice filicornis* and *Sthenolepis tetragona* (for complete references see below) were reported.

All species listed by BIDENKAP and all species reported in the present paper are large-bodied organisms. Material from Hardangerfjorden has largely been collected with dredges and screened through 1 mm screens. The result is that all smaller species, if present, have been lost.

The present collections contain 37 species; several additional species are present, but are not identifiable due to the condition of the specimens. New species are described in *Nothria*, *Eunice*, and *Lumbrineris*. The material of the families Glyceridae and Goniadidae has not been treated; these two families will be considered by C. Stöp-Bowitz.

Faunistically the deep-fjord fauna of Hardangerfjorden is very similar to the one found in Sognefjorden (FAUCHALD 1972a) and to the fauna of the deeper parts of Skagerrak as reported by ELIASON (1962). Because of the lack of smaller species in these investigations, it is difficult to compare this fauna to the one found in deep water off north America by HARTMAN (1965) and HARTMAN & FAUCHALD (1971). The faunal composition in terms of the relative importance of the different families resembles more closely the pattern usually found in shallow water than the emerging deep water pattern (FAUCHALD 1972b, pp. 10–11).

HARTMANN-SCHRÖDER (1971) reviews the fauna of the North Sea and the Skagerrak. Several of the species listed below were reported in this survey, and in these instances, reference is only given to HARTMANN-SCHRÖDER's publication; she has given comprehensive bibliographies for most species and accurate and complete descriptions as well.

STATION LIST[1]

64–53. Stord, just S of Midtöy light, 59°46′30″N, 5°33′E, 300–240 m, gravel, mud, mixed bottom.

4–56. Hissfjorden, S of Bakke, SW of Småholmene, 60°14′10″N, 06°00′30″E, rocky intertidal, 28 June, 1956.

22–56. Hissfjorden, middle of the fjord, E of Skjerdingen, 60°13′40″N, 06°05′00″E, 640–660 m, fine mud, 3 July, 1956.

25–56. Ytre Samlafjorden, SW of Jonanes, 60°17′00″N, 06°13′10″E, 840–842 m, fine mud, 4 July, 1956.

41–56. Indre Samlafjorden, off Hesthamar, 60°26′05″N, 06°33′50″E, 210–240 m, muddy sand rocks, 6 July, 1956.

[1] The station list consists of two separate parts; in the first part of the list, the two numbers behind the hyphen represent the year and the numbers in front of the hyphen, the station number in that year. Thus, Stn 64—53 is station number 64 in the year 1953. The station numbers in the second part of the list are prefixed ZF. These stations were taken during an investigation of the fishes in the fjord and are simply listed chronologically, without any indication of the year.

43–56. Ytre Samlafjorden, off Straumesteinen, 60°16′48″N, 06°12′30″E, 210–150 m, very fine muddy sand, 7 July, 1956.
44–56. Sildafjorden, middle of the fjord, between Varaldsöy and Ænes, 60°05′15″N, 06°03′30″E, 670–390 m, fine muddy sand, 7 July, 1956.
45–56. Lokksund, Nymark, just S of the pier, 60°01′05″N, 05°42′40″E, rocky intertidal, 7 July, 1956.
46–56. Kvinnheradsfjorden between Hatlestrand and Kalven, 59°59′30″N, 05°54′00″E, 560–630 m, fine sand and mud, 20 August, 1956.
48–56. Öynefjorden, E of Grönevik, 60°05′25″N, 05°57′00″E, 465–468 m, rather stiff clayey mud, 21 August, 1956.
54–56. Hissfjorden, E of Ljonestangen light, 60°14′30″N, 06°11′20″E, 576 m, mud, 22 August, 1956.
57–56. Indre Samlafjorden, off Hesthamar, 60′26′05″N, 06°33′50″E, 230–294 m, mixed bottom, rocks, slags, coarse sand, 22 August, 1956.
63–56. Granvinfjorden, between Sauaneset and Hamre, 60°28′30″N, 06°39′20″E, 198–200 m, shelly debris, mixed with coarse and fine sand, some pure clay, 23 August, 1956.
65–56. Sörfjorden, NW of Ullensvang, 60°19′40″N, 06°38′30″E, 350 m, mud or very fine sand, a few small rocks, 24 August, 1956.
66–56. At the mouth of Sörfjorden, S of Slåttenes light, 60°24′35″N, 06°42′40″E, 737 m, very fine, somewhat muddy sand, two medium sized rocks, 24 August, 1956.
67–56. Indre Samlafjorden, off Hesthamar, 60°26′05″N, 06°33′50″E, 210–250 m, fine sand, some coarse sand, a few rocks, 24 August, 1956.
72–56. Hissfjorden, the shoal W of Hamaren light, 60°11′30″N, 06°04′10″E, 250–270 m, rocky, loose rocks, muddy sand, 25 August, 1956.
2–57. Kvinnheradfjorden, off Rosendal, just S of the rivermouth, 59°58′50″N, 06°00′40″E, 20 m, rock and sand, 3 June, 1957.
3–57. Kvinnheradfjorden, middle of the fjord, E of Steinanes, 59°58′20″N, 05°51′00″E, 495–540 m, fine mud, 3 June, 1957.
17–57. Maurangerfjorden, inside Maurangsnes, 60°06′10″N, 06°09′45″E, 210 m, mud with some sand, 6 June, 1957.
18–57. Maurangerfjorden, W of Krokalandet, 60°06′45″N, 06°13′45″E, 246–249 m, mud with some sand, 6 June, 1957.
19–57. Maurangerfjorden, W of Krokalandet, 60°06′52″N, 06°14′15″E, 246 m, mud with some sand, 6 June, 1957.
24–57. Kvinnheradfjorden, E of Fjæreflu light, 60°02′30″N, 05°58′20″E, 588–594 m, mud and some gravel, 29 July, 1957.
25–57. Öynefjorden, E of Bondesund light, 60°08′10″N, 05°54′25″E, 499 m, mud, 30 June, 1957.
26–57. Bondesund, S of Kråka, on the sill, 60°08′50″N, 05°57′10″E, 204–240 m, rocky, 30 July, 1957.
27–57. Lokksund, W of Berge, just under land, 60°03′20″N, 05°43′15″E, appr. 40 m, rocks and shelly debris, 30 June, 1957.
32–57. Mouth of Simadalsfjorden, 60°28′30″N, 07°04′25″E, 200–150 m, soft, clean mud, 7 November, 1957.
5–58. Öystese, at the mouth of the bay, 60°21′50″N, 06°14′15″E, 200–180 m, mud and some gravel, 20 May, 1958.
13–58. Indre Ålvik, off the bay, 60°25′10″N, 06°25′30″E, 240 m, rocky, with loose rocks, sand and shelly debris, 21 May, 1958.
26–58. Between Raudholmene and Håskru light, 59°32′54″N, 05°11′40″E, 350–330 m, rocky with gravel, 8 September, 1958.

27–58. Bömlafjorden, off Bömlahavn, 59°35′30″N, 05°14′50″E, 390–370 m, stiff clay with small rocks and gravel, 9 September, 1958.

30–58. Southern part of Langenuen, between Huglhamaren and Midtöy light, 59°47′45″N, 05°34′20″E, 315–300 m, sand and mud, 10 September, 1958.

31–58. S of Huglo, outside the sill, 59°48′35″N, 05°35′30″E, 220–170 m, sand and mud, small rocks and gravel, 10 September, 1958.

32–58. Kvinnheradfjorden, SE of Steinanes, 59°58′20″N, 05°51′25″E, appr. 500 m (echosounder out of order), mud and sand, 11 September, 1958.

33–58. Outside Maurangsnes, up the outside of the sill, 60°06′08″N, 06°08′30″E, appr. 225–170 m (echosounder out of order), sand and mud with small rocks and gravel, 11 September, 1958.

36–58. Ytre Samlafjorden, NW of Jonaneset light, 60°18′00″N, 06°13′30″E, 300–150 m, fine sand, 23 September, 1958.

38–58. Utnefjorden abeam Granvinfjorden, 60°26′20″N, 06°37′00″E, 790–810 m, fine sandy mud, 23 September, 1958.

46–58. Sörfjorden, E of Åkre, 60°15′35″N, 06°35′00″E, 396–397 m, fine sand, 24 September, 1958.

57–58. Sörfjorden, E of Lindvik, 60°12′45″N, 06°35′45″E, 412 m, fine sandy mud, 26 September, 1958.

74–58. Osafjorden, deepest part off Salthella, 60°32′25″N, 06°58′00″E, 260–240 m, soft mud, 20 October, 1958.

75–58. Osafjorden, off Bergetangen, 60°31′30″N, 06°55′48″E, 204–190 m, soft mud with some sand, 21 October, 1958.

77–58. Osafjorden, off Bolstad, 60°30′18″N, 06°55′E, 306 m, mud, 21 October, 1958.

80–58. Simadalsfjorden, outer part, 60°28′54″N, 07°04′30″E, 126–190 m, mud with a little sand and gravel, 22 October, 1958.

86–58. Osafjorden, outer part, 60°29′24″N, 06°54′E, 438–366 m, mud, 23 October, 1958.

95–58. Eidfjorden, off Djönno, 60°28′N, 06°45′45″E, 150–264 m, sand and mud, 24 October, 1958.

98–58. Husnesfjorden, W of Öykjaneset, 59°51′24″N, 05°40′30″E, 480–450 m, mud with some sand, 10 November, 1958.

99–58. Husnesfjorden, between Metlesvik and Stovik, 59°50′24″N, 05°40′48″E, 290–240 m, soft mud with fine shell debris, 11 November, 1958.

101–58. Ålfjorden, off Vikebygd, 59°35′30″N, 05°32′35″E, 220–186 m, hard coral bottom with mud pockets, 11 November, 1958.

104–58. Bjoafjorden, N of Apalvik, 59°48′15″N, 05°40′30″E, 372–324 m, rocky, very hard clay with smaller and larger rocks, 12 November, 1948.

110–58. Skåneviksfjorden, SE of Toftekalven, 59°44′45″N, 05°51′40″E, 354–350 m, soft bottom, 13 November, 1958.

113–58. Höylandssundet, W of Ölfernes, 59°46′20″N, 05°51′35″E, 232–230 m, mud, 13 November, 1958.

116–58. Husnesfjorden, off Huglo, E of Langaskjær, 59°49′24″N, 05°37′18″E, 355–352 m, rocky bottom, smaller rocks, 14 November, 1958.

3–59. Klosterfjorden, E of Eldöyane, 59°45′30″N, 05°34′00″E, 373–384 m, mud, 3 June, 1959.

7–59. Klosterfjorden, probably between Tittlesnes and Fjellbergöy, no closer locality, 378–382 m, *Calocaris* bottom, 3 June, 1959.

10–59. Bömlafjorden, E of Otteröy, 59°43′10″N, 05°28′25″E, 100–200 m, coral bottom, 5 June, 1959.

13–59. S of Huglhamaren, 59°48′42″N, 05°35′10″E, 260–180 m, hard bottom, coral fauna, 6 June, 1959.

15–61. Klosterfjorden, S of Huglo on sill to Langenuen, 59°48′30″N, 05°35′10″E, 180–250 m, 3 November, 1961.

20–61. Kvinnheradfjorden, between Heröy and Ånuglo, 59°54′52″N, 05°45′45″E, 510–520 m, mud, 30 November, 1961.
24–63. Indre Samlafjorden, S of Ålvik, 60°23′45″N, 06°25′E, 870 m, soft clay and mud, 11 and 13 June, 1963 (two subsamples).
25–63. Utnefjorden between Rånes and Eikenes, 60°25′10″N, 06°40′E, 719 m, mud and terrestrial debris, 11 June, 1963.
26–63. Sörfjorden, between Troneset and Kyrkjeneset, 60°24′10″N, 06°41′30″E, 570–400 m, mud, 11 June, 1963.
30–63. Sörfjorden, E of Kvitno–Måge, 60°11′N, 06°34′E, 390 m, soft bottom, 12 June, 1963.
31–63. Eidfjorden, E of Ringöy, 60°26′40″N, 06°45′E, 588–600 m, mud, 12 June, 1963.
32–63. Sörfjorden, Aga, 60°18′12″N, 06°36′30″E, 0–12 m, beach-collecting, 12 June, 1963.
34–63. Indre Samlafjorden, NW of Hesthamar, 60°26′30″N, 06°33′30″E, appr. 500–300 m, mud and rock, 13 June, 1963.
35–63. Bondesundet, E of Langaneset, 60°08′50″N, 05°56′30″E, 210–270 m, mud with some rocks, 13 June, 1963.
36–63. Storsundet, E of Nautaneset, 59°56′40″N, 05°51′40″E, 225 m, soft sandy mud, terrestrial plant debris, 14 June, 1963.
38–63. Kvinnheradfjorden, NE of Ånuglo, 59°57′30″N, 05°47′00″E, 450–475 m, mud with some sand and gravel, 14 June, 1963.
40–63. Ytre Samlafjorden, off Jondal, between Jonaneset and Sötveitneset, 60°17′N, 06°15′E, 180–300 m, rocky with mud in pockets, 16 September, 1963.
41–63. Ytre Samlafjorden, E of Vangsvik, 60°19′20″N, 06°14′16″E, 870 m, mud with a few rocks, 17 September, 1963.
43–63. Osafjorden, middle of the fjord between Salthella and Brummedal, 60°32′33″N, 06°57′58″E, 250–230 m, mud, 18 September, 1963.
44–63. Osafjorden, middle of the fjord, W of Bolstad, 60°30′05″N, 06°55′E, 300 m, mud, 18 September, 1963.
45–63. Eidfjorden, off the mouth of Osafjorden, 60°28′45″N, 06°55′E, 430 m, mud, 18 September, 1963.
46–63. Outer part of Eidfjorden in the middle of the fjord between Slåttenes and Sengjaneset, 60°25′25″N, 06°43′44″E, 630–660 m, mud (dredge washed), 18 September, 1963.
47–63. Sörfjorden, middle of the fjord between Lofthus and Vilurdo, 60°20′N, 06′38′E, 330–360 m, mud, 18 September, 1963.
48–63. Utnefjorden, middle of the fjord between Troneset and Tjoflåtneset, 60°25′26″N, 06°40′E, 730 m, mud, 19 September, 1963.
49–63. Indre Samlafjorden, middle of the fjord, S of Ålvik, 60°24′N, 06°25′26″E, 870 m, mud, 19 September, 1963.
51–63. Kvinnheradfjorden, middle of the fjord, E of Ulvanes, 59°59′30″N, 05°55′08″E, 660–670 m, mud, 20 September, 1963.
2–64. Granvinfjorden, 19 August, 1964.
3–64. Utnefjorden–Granvinfjorden, 60°27′30″N, 06°37′20″E, 216 m, mud, 19 August, 1964.
4–64. Utnefjorden by Tjoflåtneset, 60°25′45″N, 06°41′E, 300–100 m, rocky, shells, 19 August, 1964.
5–64. Eidfjorden, NW of Klyngstu, 60°29′15″N, 06°57′30″E, 425–424 m, soft mud, some terrestrial debris, 19 August, 1964.
6–64. Sörfjorden, outer part between Eidnes and Kjeken, 60°20′30″N, 06°38′40″E, 360–340 m, mud, 20 August, 1964.
7–64. Sörfjorden, outer part off Kjeken–Lutro, 60°21′10″N, 06°39′E, 350–336 m, mud, 20 August, 1964.
15–64. Indre Samlafjorden, middle of the fjord S of Ytre Ålvik, 60°23′30″E, 06°23′00″E, 880 m, mud, 21 August, 1964.

16–64. Sildafjorden, E of Öykhaganeset, 60°08′N, 06°05′45″E, 684 m, soft mud, 21 August, 1964.
20–64. Kvinnheradfjorden, opposite Husavågen, S of Ystanes, 59°58′N, 05°46′E, 486 m, mud, 22 August, 1964.
1–65. Utnefjorden, NW of Hesthamar, 60°26′30″N, 06°33′E, 806 m, soft mud, 18 August, 1965.
2–65. Utnefjorden, NW of Hesthamar, 60°26′30″N, 06°33′E, 600–285 m (up the slope), soft mud, 18 August, 1965.
6–65. Sörfjorden, SE of Grimo, 60°23′N, 06°40′30″E, 245–260 m, mud, 18 August, 1965.
7–65. Eidfjorden, S of Vassvik, W of Bunes, 60°27′54″N, 06°47′36″E, 500–516 m, mud, 19 August, 1965.
8–65. Eidfjorden, S of Vangsbygd, 60°28′55″N, 06°51′18″E, 460–454 m, mud, 19 August, 1965.
9–65. Eidfjorden, SW of Vangen, 60°29′N, 06°52′E, 200–125 m, mud, 19 August, 1965.
10–65. Sörfjorden, from Kjeken to Lutro, 60°21′N, 06°39′30″E, 340–320 m, mud, 20 August, 1965.
11–65. Indre Samlafjorden, S of Ålvik, 60°24′15″N, 06°25′20″E, 860 m, muddy clay, 20 August, 1965.
15–65. Kvinnheradfjorden, NE of Ånuglo, 59°56′N, 05°45′45″E, 512 m, mud, 21 August, 1965.
16–65. Kvinnheradfjorden, NW of Skorpegavlen, 59°58′N, 05°47′E, 480 m, muddy clay, 21 August, 1965.
ZF7. Bömlafjorden, E of Moster, 59°43′00″N, 05°25′12″E, 230–290 m, otter-trawl, 23 March, 1956.
ZF8. Langenuen, from Store Grovaholmen light southwards, 59°50′00″N, 05°33′30″E, 265–220 m, long-line, 28–29 May, 1956.
ZF27. Off Midtöy light by Leirvik, Stord, 59°46′N, 05°34′E, 342 m, soft bottom with some large rocks, otter-trawl, 19 October, 1956.
ZF40. Kvinnheradfjorden, W of Kalven, along the deepest part, 59°59′50″N, 05°54′E, 672–687 m, otter-trawl, 7 December, 1956.
ZF46. Sildafjorden, E of Varaldsöy, along the deepest part, 60°05′40″N, 06°05′40″E, 678 m, long-line, 12–13 March, 1957.
ZF51. Öynefjorden, S of Bondesund light, 495–475 m, otter-trawl, 14 March, 1957.
ZF52. Hissfjorden, E of Varaldsöy, 60°09′20″N, 06°06′E, 678–684 m, otter-trawl, 15 March, 1957.
ZF56. Ytre Samlafjorden, across the fjord from Jondal, 60°16′40″N, 06°13′E, 170–855 m, first rocky, later soft bottom, long-line, 6–7 May, 1957.
ZF63. Sörfjorden, between Kvitno and Melland, 60°10′48″N, 06°33′48″E, 396 m, otter-trawl, 9 May, 1957.
ZF64. Utnefjorden, off Utne, 60°25′50″N, 06°41′E, 732–735 m, otter-trawl, 10 May, 1957.
ZF85. Ålfjorden, midway along the northern part, 59°41′00″N, 05°34′00″E, 450–465 m, soft muddy bottom, otter-trawl, 31 October, 1957.
ZF89. Husnesfjorden, across from Sunde, 59°49′15″N, 05°38′35″E, 460–440 m, soft bottom with sponges, otter-trawl, 2 November, 1957.

SPECIES REPORTED

Family Aphroditidae

Aphrodita aculeata Linnaeus, 1761

Aphrodita aculeata Bidenkap 1895, pp. 64–65; Hartmann-Schröder 1971, pp. 38–39, fig. 7.

Material examined. 48–56 (2); 66–56 (1); 67–56 (2); 3–57 (1); 25–57 (1); 30–58 (1); 33–58 (1); 36–58 (1); 77–58 (5); 34–63 (1); 35–63 (1); 47–63 (2); 4–64 (2); 7–64 (6); 6–65 (4); 7–65 (1); ZF51 (1); ZF64 (1).

The characteristic dorsal felt can, especially in small specimens, be poorly developed. The species can always be distinguished from other nordic aphroditids on the presence of a single large subdistal tooth on the otherwise smooth neurosetae.

Distribution. *A. aculeata* is known from the northern Atlantic Ocean; it is generally considered a shallow-water form, but has previously been reported from slope depths.

Laetmonice filicornis Kinberg, 1855

Laetmonice filicornis Bidenkap 1895, p. 65; Hartmann-Schröder 1971, p. 41, fig. 8.

Material examined. 65–56 (1); 67–56 (2); 6–65 (2).

L. filicornis has large, distally harpoon-shaped notosetae, but these setae are frequently broken. Each neuroseta has a single subdistal tooth and a fringe of fine hairs between this tooth and the tip of the seta. A dorsal felt is absent.

Distribution. *L. filicornis* has been reported from the northern hemisphere, and, as most members of this genus, is primarily found in deep waters.

Family Polynoidae

Alentia gelatinosa (Sars, 1860)

Alentia gelatinosa Bidenkap 1895, p. 62; Hartmann-Schröder 1971, pp. 45–46, fig. 10.

Material examined. 4–64 (fragment).

A. gelatinosa is common in western Norway. The present collection contains only a fragment, which can be recognized on the characteristic setae and elytrae (compare Hartmann-Schröder 1971, fig. 10 b and d).

Distribution. *A. gelatinosa* is primarily a shallow-water form. It has been reported from the eastern Atlantic Ocean between Norway and northern Africa.

Antinoella plumosa Fauchald, 1972

Antinoella plumosa Fauchald 1972a, pp. 90–92, fig. 1.

Material examined. 45–56 (1); 48–56 (2); 65–56 (3); 66–56 (2); 67–56 (3); 46–58 (4); 57–58 (3); 77–58 (1); 110–58 (1); 7–59 (1); 38–63 (1); 47–63 (3); 3–64 (2); 7–64 (10); 1–65 (1); 2–65 (1); 7–65 (6); 16–65 (1); ZF40 (1); ZF63 (24); ZF89 (3).

A. plumosa has prolonged neurosetae that are distally produced in fine, distinctly plumose filaments. The eyes are small. The elytrae, not mentioned in the original description, are nearly smooth marginally, but a few, scattered long papillae are present. The elytral surface is covered with small, rounded smooth papillae. The elytrae are whitish flesh-colored in alcohol.

Distribution. *A. plumosa* was described from Sognefjorden; the present records are from Hardangerfjorden and may indicate a wider distribution of this species in Norwegian fjords.

Antinoella sarsi Malmgren, 1865

Harmothoe sarsi Bidenkap 1895, p. 50.
Harmothoe (*Antinoella*) *sarsi* Hartmann-Schröder 1971, pp. 62–64, fig. 18.

Material examined. ZF27 (3); ZF51 (1); ZF63 (1); ZF89 (7).

The present specimens are all rather large; they are posteriorly incomplete and lack elytrae. They are considered belonging to *A. sarsi* because the distal ends of the neurosetae are pointed, but not filamentous. All specimens have the anterior eyes very much larger than the posterior ones and lensed; they are in the normal position in this species. It should be noted that all specimens were caught in trawls above the bottom, rather than in dredges on the bottom proper.

Distribution. Several rather similar species of the genus *Antinoella* have been confused and it is presently difficult to assess the exact distribution of this species. It may be widespread in the northern hemisphere.

Eucranta villosa Malmgren, 1865

Eucranta villosa Malmgren 1865, p. 80, pl. 10, fig. 9.
Harmothoe villosa Bidenkap 1895, p. 52.
Harmothoe (*Eucranta*) *villosa* Hartmann-Schröder 1971, pp. 48–49.

Material examined. 64–53 (3); 31–58 (2); 35–63 (2); ZF89 (4).

E. villosa has the superior neurosetae deeply bifid and the elytrae are covered with long, slender papillae resembling the fringe of marginal papillae. Several of the present specimens were invested in a thin layer of mucus and black mud covering the elytral papillae and setae.

Distribution. *E. villosa* is known from the Arctic Ocean and along the Norwegian coast down to Skagerrak.

Eunoe nodosa (Sars, 1860)

Harmothoe nodosa Bidenkap 1895, pp. 50–52.
Hartmothoe (*Eunoe*) *nodosa* Hartmann-Schröder 1971, pp. 61–62, fig. 17.

Material examined. 10–59 (2); ZF85 (2).

E. nodosa has unidentate, falcigerous neurosetae without any trace of secondary teeth. The elytrae are rather ornate with a well developed fringe; both macro- and microtubercles are usually present in this species. One of the specimens from Stn 10–59 has all the microtubercles distally pointed and it is only under doubt that this specimen is assigned to this species. The other specimens have the characteristic multifid distal tips on the microtubercles. Macrotubercles are absent in all present specimens; this is not rare in smaller specimens from other parts of western Norway.

Distribution. *E. nodosa* is known from the northern hemisphere. It is possible that some of the more exotic records belong to related species, since the species is essentially defined on negative characters.

Harmothoe antilopes McIntosh, 1876

Harmothoe norvegica Bidenkap 1894, pp. 2–4.
Harmothoe antilopes Hartmann-Schröder 1971, p. 50.

Material examined. 67–56 (11); 24–63 (1); 34–63 (1); 38–63 (3); 41–63 (1); 47–63 (1); 49–63 (1); 15–64 (1); 6–65 (5).

H. antilopes resembles *H. imbricata* (see below) closely. The elytral fringe is better developed in the former than in the latter and the elytral microtubercles are distally bi- or tripartite in the former and bluntly rounded in the latter. The secondary tooth of the neurosetae is parallel to the main tooth in *H. antilopes* and diverging from the main tooth in *H. imbricata*.

Distribution. *H. antilopes* is known from the Atlantic Ocean in slope depths, from northern Norway to South Africa.

Harmothoe imbricata (Linnaeus, 1767)

Harmothoe imbricata Bidenkap 1895, pp. 53–54; Hartman-Schröder 1971, pp. 50–53, fig. 11.

Material examined. 67–56 (1); 31–58 (1); 101–58 (2); 13–59 (3); 16–64 (1).

H. imbricata is less succinctly defined than the congeneric species. The elytrae of the present specimens have a poorly developed fringe; the structure of the microtubercles resembles the species as illustrated by Hartmann-Schröder. The three specimens from Stn 13–59 differ from the others in the collection in that they are white with whitish elytrae and elytral fringe is even more poorly developed than in the other specimens. The structure of the microtubercles and the postition of the eyes is the same as in the other specimens. The setal structures are the same in all specimens.

Distribution. *H. imbricata* as presently defined, is known from the whole northern hemisphere; generally it seems to be most common in cold-water areas.

Lagisca extenuata (Grube, 1840)

Harmothoe rarispina Bidenkap 1895, pp. 48–49.
Lagisca extenuata Fauvel 1923, pp. 76–78, fig. 28; Hartmann-Schröder 1971, pp. 71–73, fig. 22.

Material examined. 101–58 (3); 10–59 (5); 13–59 (1); 15–61 (1); 38–63 (1).

The current concept of *L. extenuata* is diffuse and it is difficult to get a clear idea of the variability within the species. The present specimens all lack macrotubercles and only have a series of small curved microtubercles on the elytrae. The position of the eyes and the structure of the neurosetae are as illustrated by Fauvel (1923, fig. 28 g–m).

Distribution. *L. extenuata* is widespread in the northern Atlantic Ocean; it has also been reported from South Africa and Japan.

Macellicephala mirabilis (McIntosh, 1885)

Macellicephata mirabilis Fauvel 1914, pp. 39–40.

Material examined. 67–56 (1); 30–63 (1); 6–64 (1); 8–65 (1); ZF63 (2).

Several species of *Macellicephala* have been described from Atlantic waters. The present material fits very well with *M. mirabilis* originally described from the Pacific Ocean, as this species was redescribed by FAUVEL (1914); it has previously been reported from the Atlantic Ocean. ELIASON (1962, pp. 214–216, fig. 2) described *M. paucidentata* from Skagerrak and did at that time review all species known from the Atlantic Ocean.

Distribution. *M. mirabilis* appears to be cosmopolitan in intermediate and deep waters; it is considered pelagic.

Macellicephala, species indeterminable

Material examined. 48–56 (fragments).

The present fragments cannot be identified since all setae are broken.

Family Sigalionidae

Sthenelais atlantica McINTOSH, 1876

Sthenelais atlantica McINTOSH 1900, pp. 415–417, pl. 29, fig. 2, pl. 41, figs 27–28.

Material examined. 35–63 (2).

S. atlantica differs most conspicuously from the better known *Sthenolepis tetragona* (see below) in that it has two pairs of small prostomial eyes; *S. tetragona* lacks eyes. All setae are falcigerous in *Sthenelais atlantica* and spinigerous in *Sthenolepis tetragona*.

Sthenelais boa (JOHNSTON, 1839) has previously been reported from Norway (BIDENKAP 1895, p. 66 as *S. idunae*). *S. boa* has tapering marginal elytral papillae; these papillae are truncately clavate in *S. atlantica*.

HARTMANN-SCHRÖDER (1971, p. 81) indicated that *S. atlantica* might be a synonym of *S. zetlandica* McINTOSH (1876) and indeed McINTOSH (1900, p. 417) indicated that his two species were very similar. The present specimen fits exactly with *S. atlantica* as described and illustrated by McINTOSH and not with *S. zetlandica*. The two species are for that reason retained here.

Distribution. *S. atlantica* appears to be known from the original description only; the type locality is in deep water at the entrance to the British Channel.

Sthenolepis tetragona (ÖRSTED, 1844)

Leanira tetragona BIDENKAP 1895, pp. 65–66.
Leanira (*Sthenolepis*) *tetragona* HARTMANN-SCHRÖDER 1971, pp. 86–87, fig. 28.

Material examined. 44–56 (1); 46–56 (2); 48–56 (1); 57–56 (2); 65–56 (3); 66–56 (1); 67–56 (1); 17–57 (2); 18–57 (1); 19–57 (2); 24–57 (1); 13–58 (1); 36–58 (1); 46–58 (5); 57–58 (1); 74–58 (5); 75–58 (6); 77–58 (3); 86–58 (4); 95–58 (3); 113–58 (5); 3–59 (16); 20–61 (1); 24–63 (fragment); 25–63 (1); 31–63 (fragment); 38–63 (3); 43–63 (14); 45–63 (3); 46–63 (5); 48–63 (2); 49–63 (fragment); 51–63 (4); 5–64 (2); 7–64 (2); 15–64 (1); 16–64 (1); 20–64 (5); 2–65 (2); 7–65 (7); 8–65 (4); 9–65 (1); 10–65 (2); 15–65 (2); ZF51 (fragments); ZF52 (fragments); ZF63 (4); ZF64 (fragment); ZF85 (20).

All present specimens have very well developed dorsal cirri on the third setiger. The median antenna has distinct ctenidia; eyes are absent. *S. tetragona* is one of the most frequently encountered species in the deep fjords of Norway.

Distribution. *S. tetragona* is known from muddy bottoms in the Atlantic Ocean; the main distribution appears to be in the northern parts of this ocean.

Family Amphinomidae

Paramphinome jeffreysii (McIntosh, 1868)

Paramphinome jeffreysii Hartmann-Schröder 1971, p. 31.
Paramphinome pulchella Bidenkap 1895, p. 108.

Material examined. 43–56 (1); 2–64 (8); 3–64 (3); 6–64 (1).

The present specimens have relatively well developed caruncles. The first setiger has a single large recurved hook in each notopodium.

Distribution. *P. jeffreysii* is known from both sides of the northern Atlantic Ocean; it appears to be most common in shallow water.

Family Phyllodocidae

Anaitides, species indeterminable

Material examined. 6–64 (1).

The present specimen has the four antennae and nuchal papilla of an *Anaitides*, but all dorsal cirri have been lost and it cannot be further identified.

Genetyllis lutea Malmgren, 1865

Genetyllis lutea Bergström 1914, pp. 160–161, fig. 54; Hartmann-Schröder 1971, p. 103.

Material examined. ZF89 (4).

The present specimens differ from *G. lutea as* redescribed by Bergström in that the dorsal cirri are distally rounded rather than slightly pointed and in that the ventral cirri are held obliquely behind the acicular lobes so that each tip is pointing obliquely dorsal. The specimens are bright orange in alcohol. The lensed eyes are very large.

These differences are not considered sufficient to justify a separate status for these specimens.

Distribution. *G. lutea* is known from the eastern part of the northern Atlantic Ocean.

Notophyllum foliosum (Sars, 1835)

Notophyllum foliosum Bidenkap 1895, pp. 67–68; Hartmann-Schröder 1971, pp. 120–121, fig. 38 c–d.

Material examined. 4–64 (2); ZF89 (1).

N. foliosum is the only known Scandinavian phyllodocid to have biramous parapodia. The notopodial acicula may be difficult to see, but can always be recognized with the help of the compound microscope.

Distribution. *N. foliosum* is known from the northern hemisphere in both the Pacific and Atlantic Oceans.

Paranaitis kosteriensis (MALMGREN, 1867)

Anaitis kosteriensis BERGSTRÖM 1914, pp. 156–158, fig. 52.
Paranaitis kosteriensis HARTMANN-SCHRÖDER 1971, p. 104.

Material examined. 67–56 (1); 4–64 (1).

P. kosteriensis has two lateral rows of papillae on the proximal part of the proboscis and the distal ends of the setal shafts have one large and one smaller tooth. The present specimens are greyish with colorless dorsal cirri as preserved.

Distribution. *P. kosteriensis* is found in the northern Atlantic Ocean; it has been recorded mainly from the European side.

Family Hesionidae

Nereimyra punctata (O. F. MÜLLER, 1788)

Castalia punctata BIDENKAP 1895, pp. 88–89.
Nereimyra punctata HARTMANN-SCHRÖDER 1971, pp. 128–129, fig. 40.

Material examined. 38–63 (2); 2–64 (1); 3–64 (1).

N. punctata is common in shallow water along the Norwegian coast. It is differentiated below from the rather similar *Ophiodromus flexousus*.

Distribution. *N. punctata* is known from the northern Atlantic Ocean, mainly in shallow water areas.

Ophiodromus flexuosus (DELLE CHIAJE, 1822)

Ophiodromus vittatus BIDENKAP 1895, p. 88.
Ophiodromus flexuosus HARTMANN-SCHRÖDER 1971, pp. 129–131, fig. 41.

Material examined. 3–64 (1).

O. flexuosus is most easily distinguished from *Nereimyra punctata*, the other common hesionid in Norwegian fjords, in that it has three rather than two prostomial antennae. Both species have a pair of palps.

Distribution. *O. flexuosus* is known from the northern part of the Atlantic Ocean as far south as the Mediterranean Sea.

Family Syllidae

Haplosyllis spongicola (GRUBE, 1855)

Syllis (Haplosyllis) spongicola FAUVEL 1923, p. 257, fig. 95 a–d.

Material examined. 26–58 (1); 101–58 (3); ZF7 (1).

The present specimens fit with *H. spongicola* in the structure of the simple setae. These setae have a large thick subdistal tooth and the distal tooth is bifid.

Distribution. *H. spongicola* is mainly known from warm waters; it is possibly cosmopolitan, but the current concept may cover more than one species.

Trypanosyllis, species indeterminable

Material examined. ZF89 (3).

These three specimens have the dorsoventrally flattened body characteristic of species of *Trypanosyllis*. A trepan with ten teeth is present, but a separate middorsal tooth is absent, making the species a member of the subgenus *Trypanodenta* sensu HARTMAN & IMAJIMA (1964).

The structure of the composite setae and the number of articles in the dorsal cirri are as in *T. coeliaca* (CLAPARÈDE, 1868) (see FAUVEL 1923, p. 270, fig. 101 f–h), but this species has a middorsal tooth in the pharynx.

More material is needed before the identity of the present species can be decided.

Typosyllis hyalina (GRUBE, 1863)

Typosyllis hyalina HARTMANN-SCHRÖDER 1971, p. 148.

Material examined. 46–56 (1); 66–56 (1); 25–57 (1); 24–63 (3); 4–64 (1); 15–64 (1); ZF89 (1).

The European species of the genus *Typosyllis* were partially reviewed by HARTMANN-SCHRÖDER (1971). *T. hyalina* has bidentate composite falcigers and the number of articles in the dorsal cirri varies from six to about twelve.

Distribution. *T. hyalina* is considered cosmopolitan.

Family Nereidae

Nereis elitoralis ELIASON, 1962

Nereis elitoralis ELIASON 1962, pp. 250–252, fig. 13.
Nereis (Eunereis) elitoralis HARTMANN-SCHRÖDER 1971, p. 207.

Material examined. 3–57 (1).

N. elitoralis has paragnaths limited to a single row of three on areas VII and VIII and, in the present specimen, to four in area IV and a single in each area VI. The species was originally described with five or six in area IV and two or three in area VI.

HARTMANN-SCHRÖDER (1971) moved this species to *Eunereis* (treated as a subgenus of *Nereis*). This genus is usually limited to species with paragnaths on the oral ring only. *N. elitoralis* has paragnaths on both rings and will thus have to be retained in *Nereis*. The validity of the genus *Eunereis* is doubtful, but at present it seems best to retain the concept of the genus unmodified until a complete revision can be accomplished.

Distribution. *N. elitoralis* is known from deep water in the Skagerrak.

Nereis pelagica Linnaeus, 1761

Nereis pelagica Bidenkap 1895, p. 85; Hartmann-Schröder 1971, pp. 194–196, fig. 62.

Material examined. 26–57 (1); 116–58 (1); 4–64 (1); ZF89 (1).

N. pelagica usually has well developed paragnaths on all areas, but may lack them on area V.

Parts of the material reported above were identified by Dr. Asher Gitay during a stay in Bergen.

Distribution. *N. pelagica* is considered cosmopolitan.

Platynereis dumerilii (Audouin and Milne Edwards, 1834).

Nereis dumerili Bidenkap 1895, p. 86.

Platynereis dumerilii Hartmann-Schröder 1971, pp. 209–211, fig. 68.

Material examined. ZF7 (2).

P. dumerilii has homogomph falcigers in the notopodia. The tip of the appendage of each falciger is strongly curved and is connected to the basal part of the appendage by a delicate fiber like a carabin-hook.

Distribution. *P. dumerilii* has an extended circumtropical distribution; its presence in a deep Norwegian fjord may indicate an influx of warmer waters at depth.

Family Nephtyidae

Nephtys incisa Malmgren, 1865

Nephtys incisa Bidenkap 1895, p. 75; Fauchald 1963, pp. 15–16, figs 1h, 2c, 3b; Hartmann-Schröder 1971, pp. 217–218, fig. 70 d–e.

Material examined. 64–53 (1); 25–56 (1); 46–56 (fragment); 57–56 (2); 67–56 (2); 18–57 (1); 19–57 (2); 24–57 (1); 25–57 (1); 27–58 (1); 30–58 (2); 46–58 (2); 74–58 (1); 75–58 (1); 77–58 (1); 98–58 (1); 113–58 (3); 34–63 (1); 35–63 (3); 36–63 (4); 38–63 (4); 40–63 (1); 16–64 (1); 20–64 (1); 6–65 (7); 7–65 (2); 9–65 (1) ZF85 (1); ZF89 (6).

N. incisa has conical acicular lobes and the other parapodial lobes barely project beyond the acicular lobes in median setigers.

Distribution. *N. incisa* is known from both sides of the Atlantic Ocean in relatively shallow water; it also penetrates to the greatest depths in the Norwegian fjords and is one of the most common polychaetes in these bottoms (Fauchald 1972a, pp. 94–95).

Nephtys paradoxa Malm, 1874

Nephtys paradoxa Bidenkap 1895, p. 74; Fauchald, 1963, pp. 13–15, figs 1a, 2b, 3c; Hartmann-Schröder 1971, p. 214.

Material examined. 43–56 (1); 63–56 (1); 27–57 (1); 32–57 (4); 5–58 (1); 36–58 (1); 98–58 (fragment); 101–58 (fragment); 104–58 (2); 113–58 (2); 7–59 (1); 36–63 (2); 5–64 (1); 16–64 (1); 9–65 (1); 11–65 (1).

N. paradoxa is the only species of the genus reported from European waters that has foliose interramal cirri.

Distribution. *N. paradoxa* is widely distributed geographically, but appears to be limited to cold water regions. In tropical waters it has been reported from deep water only, whereas in boreal regions it is also known from shallow subtidal areas.

Family Sphaerodoridae

Sphaerodorum gracilis (Rathke 1843)

Ephesia gracilis Bidenkap 1895, pp. 92–93.
Sphaerodorum gracilis Fauchald 1974, pp. 278–279, fig. 4. 1–5.

Material examined. 67–56 (1); 31–58 (1); 95–58 (1).

The sphaerodorids were recently reviewed by Fauchald (1974). The present specimens do not differ from *S. gracilis* as defined on that occasion. The specimens are all rather large and one (Stn 31–58) is a female with large oocytes in the body cavity.

Distribution. *S. gracilis* has a reported wide distribution (cfr. Hartmann-Schröder 1971, p. 225) but as indicated by Fauchald (1974) the species has been confused with other, similar species on several occasions.

Family Onuphidae

Nothria conchylega (Sars, 1835)

Onuphis conchylega Bidenkap 1895, pp. 91–93; Fauvel 1923, pp. 415–417, fig. 164 (? partim).
Nothria conchylega Fauchald 1968, pp. 20–21, pl. 5, figs i–n.

Material examined. 63–56 (1).

N. conchylega may have been confused with other, similar species, probably because several species have similar tubes, which in this case may have been the overriding character in identifying the species rather than the morphology of the animal itself. It appears that the species as described by Fauvel (1923) may include several species, but this cannot be determined without recourse to material from all geographical areas mentioned by Fauvel. The tube is flattened and is covered externally by shells and shell-fragments. The Norwegian material from near the area where the type was collected, was reviewed and distinguished from Eastern Pacific forms by Fauchald (1968).

Distribution. *N. conchylega* appears limited to the Atlantic Ocean in relativcly shallow water in mixed bottoms.

Nothria fiordica, new species

Fig. 1

Material examined. 22–56 (42); 25–56 (100, *Type-lot, holotype*: Zoological Museum, Bergen, No. 55 040; *paratypes*: Zoological Museum, Bergen, No. 55 041, and Allan Hancock Foundation No. Poly. 1120); 41–56 (1); 43–56 (8); 44–56 (10); 46–56 (3); 48–56 (72); 54–56 (15); 57–56 (5); 63–56 (1); 65–56 (4); 66–56 (4); 67–56 (4); 2–57 (10); 17–57 (9); 18–57 (8); 19–57 (1); 24–57 (3); 25–57 (6); 32–57 (20); 5–58 (2); 27–58 (1); 31–58 (4); 32–58 (7); 33–58 (10); 36–58 (1);

38–58 (6); 46–58 (12); 57–58 (2); 77–58 (21); 95–58 (12); 98–58 (2); 99–58 (17); 110–58 (1); 113–58 (2); 20–61 (1); 24–63 (19); 25–63 (9); 26–63 (12); 31–63 (24); 32–63 (1); 35–63 (12); 38–63 (4); 41–63 (4); 43–63 (2); 44–63 (8); 45–63 (2); 46–63 (2); 48–63 (2); 49–63 (6); 2–64 (13); 3–64 (1); 15–64 (18); 16–64 (5); 20–64 (23); 1–65 (70); 2–65 (4); 6–65 (2); 7–65 (1); 8–65 (2); 11–65 (3); 15–65 (1); 16–65 (11); ZF46 (1); ZF56 (1); ZF64 (1); ZF89 (2).

The holotype is an incomplete specimen with 105 setigers that is 43 mm long and 1.1 mm wide without setae. The body is slender; the anterior part is cylindrical and the median and posterior parts are dorsally flattened. Most specimens were contained in thin-walled tubes covered externally by a layer of black mud. Females with large oocytes in the body-cavity were present in Stn 25–63.

The small prostomium (Fig. 1B, F) is slightly wider than long and is somewhat excavate on the dorsal side. The short frontal antennae are ovoid. The five occipital tentacles are arranged so that they are directed forwards when the animal is retracted into the tube. Each of the outer lateral tentacles has a short, biarticulated ceratophore and a short, clavate style that does not reach beyond the posterior margin of the peristomium. Each of the inner lateral tentacles has a ceratophore with four articles of which the outermost one is as long as the inner three together. The ceratostyle is slender and reaches the anterior margin of setiger 5. The median tentacle has three articles in the ceratophore of which the outermost one is as long as the two others together; the ceratostyle is slightly shorter than the inner lateral ones.

The peristomium is as long as the first setiger and has a pair of short, clavate peristomial cirri near the anterior margin. These cirri barely reach beyond the frontal margin of the peristomium. The palps are directed transversely and reach laterally beyond the prostomium. Branchiae are absent.

The first four parapodia differ only in the relative proportions of the different parts. Each (Fig. 1D) has a low, transverse presetal lobe, a somewhat higher, truncate acicular lobe, and a long, clavate postsetal lobe. The dorsal cirrus is penetrated by a few notopodial acicula and has a distinct cirrophore. The ventral cirrus is as long as the distal part of the dorsal cirrus; it is clavate.

The dorsal cirrus becomes shorter and more slender in posterior setigers and the ventral cirrus is pad-shaped from setiger 5. The postsetal lobes become gradually reduced in setigers 5–10 and are low, transverse folds in all more posterior setigers.

Each of the four first parapodia has four or five tridentate pseudocomposite hooded hooks. The hoods are long and pointed in all hooks. The distal tooth of each hook (Fig. 1E) is twice as large as the other teeth; all teeth are distally rounded. Posterior setigers have limbate, pointed setae and slender pectinate setae in addition to the subacicular hooks. Each pectinate seta (Fig. 1A) is distally slightly oblique and has between twenty-five and thirty fine teeth. Subacicular hooks are present from setiger 16; each (Fig. K) has a slender distal tooth and a thick subdistal one.

Fig. 1. *Nothria fiordica*, new species. A. Pectinate seta, 950 ×. B. Anterior end, ventral view, 25 ×. C. Subacicular hook, 385 ×. D. Second parapodium, anterior view, 95 ×. E. Pseudocomposite seta, 950 ×. F. Anterior end, dorsal view, 25 ×.

The pharyngeal apparatus was everted in several specimens (Fig. 1B). Maxilla I is falcate; left maxilla II has seven teeth of which the three distalmost ones are larger than the others and spread rather far apart, appearing like three fangs. Right maxilla II has nine teeth, evenly spaced and of the same size. Left maxilla III has seven teeth, left maxilla IV has six. The combined right maxilla III and IV has seven teeth. Each maxilla V has one tooth.

N. fiordica belongs to the small group of species of *Nothria* that lack branchiae completely. Species in this group were reviewed by FAUCHALD (1968, p. 27). *N. fiordica* resembles *N. notialis* (MONRO 1930, pp. 129–131, fig. 48) and *N. pygidialis* FAUCHALD (1968, pp. 26–27, pl. 7, figs. f–m) in that these three species have exclusively tridentate hooded hooks in the anterior setigers.

N. fiordica has all teeth of the same length in the hooded hooks and the pectinate setae have between twenty-five and thirty teeth. *N. notialis* and *N. pygidialis* have approximately ten teeth in the pectinate setae and the size of the teeth in the hooded hooks is distinctly decreasing from the distal to the proximal one.

Distribution. *N. fiordica* is very common in the Hardangerfjorden and will probably turn out to be quite common in deep muddy bottoms in other Norwegian fjords.

Onuphis quadricuspis SARS, 1873

Onuphis quadricuspis SARS 1873, pp. 16–22, pl. 15, figs 7–19; BIDENKAP 1895, p. 83; FAUVEL 1923, pp. 418–419, fig. 165 l–p; PETTIBONE 1963, pp. 249–250, fig. 65b.

Material examined. 48–56 (3); 65–56 (4); 72–56 (1); 32–57 (14); 5–58 (1); 30–58 (2); 31–58 (1); 33–58 (3); 46–58 (6); 57–58 (2); 74–58 (1); 77–58 (7); 80–58 (3); 95–58 (1); 113–58 (1); 1–65 (1); ZF89 (1).

O. quadricuspis resembles *N. fiordica* in that both have slender mud-walled tubes, but the two species differ in most other respects. *O. quadricuspis* has distinctly pectinate branchiae; the anterior parapodia differ completely in structure and the whole animal is considerably stouter than *N. fiordica*. The tubes of the adult animals are about twice as thick as those of *N. fiordica*.

Distribution. *O. quadricuspis* has been reported from north Atlantic areas and may be limited to this ocean.

Onuphis, species indeterminable

Material examined. 64–53 (fragment); 75–58 (posterior fragment).

These fragments cannot be further identified; they appear in general proportions to differ from *O. quadricuspis*.

Family Eunicidae

Eunice dubitatus, new species

Fig. 2

Material examined. 13–59 (3, *holotype* and *paratypes*, Zoological Museum, Bergen, Nos 55042, 55043); ZF89 (2).

The type is an incomplete specimen with 114 setigers that is 130 mm long and 6 mm wide without setae. The cuticle is strongly iridescent. All specimens have been badly preserved and color patterns cannot be identified. A pair of black eyes is on the prostomium at the base of the inner lateral occipital antennae.

The short prostomium is anteriorly deeply cleft. The occipital antennae are

irregularly articulated with from five to nine articles, depending on the length of each antenna. The median antenna is the longer, reaching setiger 3; the inner lateral ones reach setiger 2 and the outer lateral ones barely beyond the second peristomial rings. The first peristomial ring is about three times as long as the prostomium and more than twice as long as the second peristomial ring which is about as long as the normal body-segments. The articulated peristomial cirri reach to the frontal margin of the first peristomial rings.

The acicular lobes of the parapodia appear similar in all setigers; each is bluntly rounded. A low transverse presetal lobe is present in anterior setigers and a rounded postsetal lobe may be made out in some setigers; the exact shape cannot be determined since the specimens are badly preserved.

Branchiae are present from the third setiger in the type and from setigers 3 or 4 in the other specimens. The maximal number of branchial filaments is three in the type and four in the other specimens; each branchia is short and does not project beyond the long dorsal cirrus. Each dorsal cirrus has about three long, cylindrical articles. Branchiae are absent posterior to setiger 39 in the type and setigers 37–45 in the other specimens. The maximal number of branchiated setigers appears related to the size of the specimen.

Setae include bidentate hooded hooks in all setigers; each hook (Fig. 2E) has a short appendage with well developed distal and proximal teeth; the proximal tooth is nearly at right angles to the long axis of the appendage. The hoods are delicately dentate along the cutting edge. Limbate setae are present in most setigers; under high magnification they appear pilose. Pectinate setae (Fig. 2B) have unequal margins and approximately nine or ten sharply pointed teeth. Subacicular hooks are present from setigers 31–39, depending on the size of the specimen (from setiger 38 in the type). Each hook (Fig. 2C, D) is black and distally bidentate (worn in most specimens and may appear unidentate). Where fully developed, each hook appears nearly bifid with both teeth pointing distad; the hooks are abruptly tapering towards the tip. Acicula are black; each is distally slightly bent, and has a conical tip.

The jaw-apparatus (seen in dissection) is well developed. The mandibles (Fig. 2F) are anteriorly strongly calcified and are fused along the medial anterior third of their length. The maxillary carriers (Figs. 2A) are posteriorly rounded. Maxilla I is falcate, maxilla II has six teeth on each side. Left maxilla II has eight teeth; left maxilla IV has six teeth. The combined right maxilla III and IV has eight teeth. Maxilla V has one tooth on each side and a small plate is present distal to maxilla V on each side.

E. dubitatus resembles *E. oerstedi* Stimpson (1853) as this species was interpreted by McIntosh (1885, p. 273–275, pl. 38, figs 1–2, pl. 19A, figs 14–15). The name *E. oerstedi* has also been used in a different sense by Fauvel (1914, pp. 143–145, pl. 10, figs 5–10, repeated in 1923, p. 405, fig. 159 a–d). Fauvel's species differs from McIntosh's in the number of teeth on the different jaw-plates.

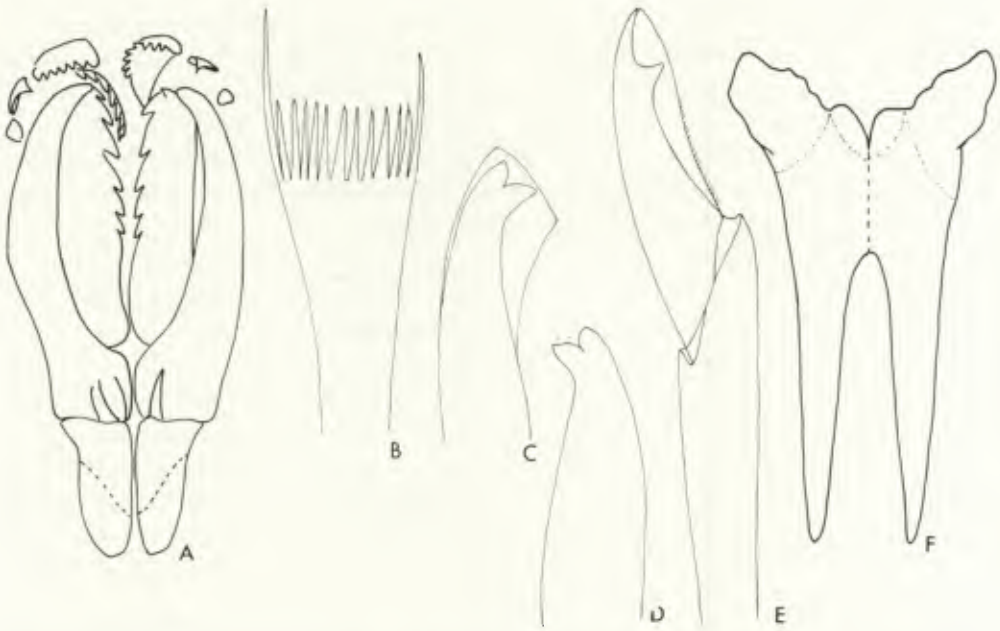

Fig. 2. *Eunice dubitatus*, new species. A. Maxillary apparatus, dorsal view, 10 ×. B. Pectinate seta, 950 ×. C. Subacicular hook, 160 ×. D. Subacicular hook, 160 ×. E. Composite seta, 385 ×. F. Mandibles, dorsal view, 10 ×.

Stimpson's original description (1853, pp. 34–35) is incomplete and it is not known exactly what his specimens looked like.

The present specimens differ from those described by McIntosh in that the numbers of teeth on the different jaw-plates is different. The maxillary formula of *E. oerstedi* sensu McIntosh can be summarized as follows: max. I: 1+1, max. II: 6+6, left max. III: 8, left max. IV: 9, right max. III–IV: 12–13 and max. V: 1+1. *E. dubitatus* has: max. I: 1+1, max. II: 6+6, left max. III: 8, left max. IV: 6, right max. III–IV: 8 and max. V: 1+1. A plate is present anterior to maxilla V in both species (called maxilla VI by McIntosh).

Major differences are in the structure of maxilla IV on the left side; this piece has only six teeth in the present species and nine in McIntosh's species. Especially noticeable is the difference in numbers in the combined right maxillae III and IV. *E. dubitatus* has only eight teeth in this piece; McIntosh's species has 12–13. The low number of teeth in the combined right plate in *E. dubitatus* is rather rare in the genus, and is paralleled by a similar low number of teeth in the specimens reported as *E. oerstedi* by Fauvel (1914) from the Azores and near Monaco.

McIntosh (1885, p. 273) compared his *E. oerstedi* with a specimen he referred to as *E. norvegica* from Bergen, Norway. This specimen cannot have been *E. norvegica* (Linnaeus, 1767) since this latter species has branchiae along the whole length of the body starting at setigers 6–8 (see below). McIntosh's specimen from

Bergen had branchiae from setiger 3 limited to a relatively short area in the anterior end. It is not clear from McIntosh's comment that he examined the jaw-apparatus in this Norwegian specimen, but it is feasible that he had a specimen of *E. dubitatus*.

As mentioned above, it is not known exactly what Stimpson's *E. oerstedi* looked like. McIntosh's material came from the same general area as Stimpson's; and McIntosh's description is here assumed to be representative of Stimpson's species. The material here treated from western Norway differs from *E. oerstedi* sensu McIntosh and it is considered probable that *E. dubitatus* may turn out to be common also further south in the Atlantic Ocean (Fauvel 1914).

Distribution. *E. dubitatus* is presently known only from two localities in deep water in Hardangerfjorden. It may have a wide distribution in deep water in the Atlantic Ocean.

Eunice norvegica (Linnaeus, 1767)

Leodice norvegica Bidenkap 1895, p. 87.
Eunice norvegica Hartmann-Schröder 1971, p. 250.

Material examined. 10–59 (7); 13–59 (54).

E. norvegica has black, bidentate subacicular hooks present from setigers 23–41 in the present material; the first occurrence seems to be related to the size of the specimens. Branchiae are first present from setigers 6–8 and are present to the last setigers.

Distribution. *E. norvegica* is known from the northern Atlantic Ocean, probably on both sides.

Eunice pennata (O. F. Müller, 1776)

Eunice pennata Hartmann-Schröder 1971, pp. 250–252, fig. 83.

Material examined. 4–56 (1); 43–56 (1); 57–56 (2); 67–56 (1); 72–56 (1); 26–58 (6); 31–58 (3); 46–58 (1); 101–58 (3); 116–58 (1); 10–59 (21); 13–59 (2); 15–61 (1); 4–64 (26); ZF8 (4); ZF89 (10).

E. pennata has yellow, bidentate subacicular hooks. The first hooks are on setigers 29–39 in the present material. Branchiae are first present from setiger 3 in all eighty specimens and terminate at setigers 35–45. Most specimens have the last branchiae on setigers 35–45. There thus appears to be a limited variation in this character in the material from Hardangerfjorden compared to the variation usually attributed to this species. The numbers of branchiae and first occurrence of subacicular hooks appear related to the size of the specimen.

Distribution. *E. pennata* has been reported from widely scattered areas in the Atlantic Ocean from the Arctic to the Antarctic. The differing reports on the variability in the species may indicate that more than one species is involved in the present concept.

Eunice, species indeterminable

Material examined. 31–58 (1); 35–63 (1).

These two anterior ends have so few setigers that the distribution of subacicular hooks and branchiae could not be determined. They do not appear to differ markedly from other eunicids found in the area.

Family Lumbrineridae

Lumbrineris agastos, new species
Fig. 3

Material examined. 57–56 (1); 31–58 (1, *holotype*, Zoological Museum, Bergen, No. 55 044); 4–64 (1); ZF7 (1, *paratype*, Zoological Museum, Bergen, No. 55 045).

The type is an incomplete specimen with 63 setigers that is 30 mm long and 3.5 mm wide. The body is cylindrical; it is tan-colored and lacks color patterns.

The short prostomium (Figs 3A, D) is conical; the two peristomial rings are together as long as the prostomium, seen from the dorsal side. The first peristomial ring is twice as long as the second one. Ventrally, the first peristomial ring forms parts of the ventrolateral lips and the second ring forms the medioposterior part of the ventral lip. All lips are deeply creased.

Anterior parapodia have bluntly conical acicular lobes and very wide, broadly rounded, flattened presetal lobes (Fig. 3B). The thick postsetal lobes are triangular and are held straight out from the body. Notopodial rudiments are present in most setigers and are visible externally as small buttons at the bases of the neuropodia. Posterior parapodia (Fig. 3H) have similarly shaped acicular lobes and the presetal lobes retain their broadly rounded shape, but are slightly oblique dorsad. The postsetal lobes are triangular and are tilted dorsad, but are no longer than in anterior setigers.

Acicula are black. Setae include composite hooded hooks in the first twenty setigers and simple hooks in more posterior setigers, in addition to geniculate simple setae in the first fifty setigers. Each composite hook (Fig. 3E) has a very long, slender appendage and a crest of one large and seven smaller teeth. The simple hooks (Fig. 3G) are similar, but are larger and the distal teeth are truncate. The hoods are finely pilose (omitted in illustration).

The mandibles (Fig. 3C) are fused for more than one-half of their total length. The posterior ends are very slender and the sides are straight forming a broad triangle anteriorly. The maxillary formula is 1–4–2–1. The maxillary carriers (Fig. 3F) are short and have a deep external excavation.

The specific name, meaning wonderful or admirable, refers to the fact that this is a rather nice looking lumbrinerid.

L. agastos belongs to group IBb2 as the groupings of species in this genus were defined by Fauchald (1970, p. 213). Other species in this group that have black acicula include *L. japonica* (Marenzeller 1879, pp. 137–139, pl. 5, fig. 3), *L. grandis* (Treadwell 1906, pp. 1170–1171, figs 52–56) and *L. index* (Moore 1911, pp. 288–289, pl. 19, figs 119–127). Of these, *L. index* has prolonged parapodial

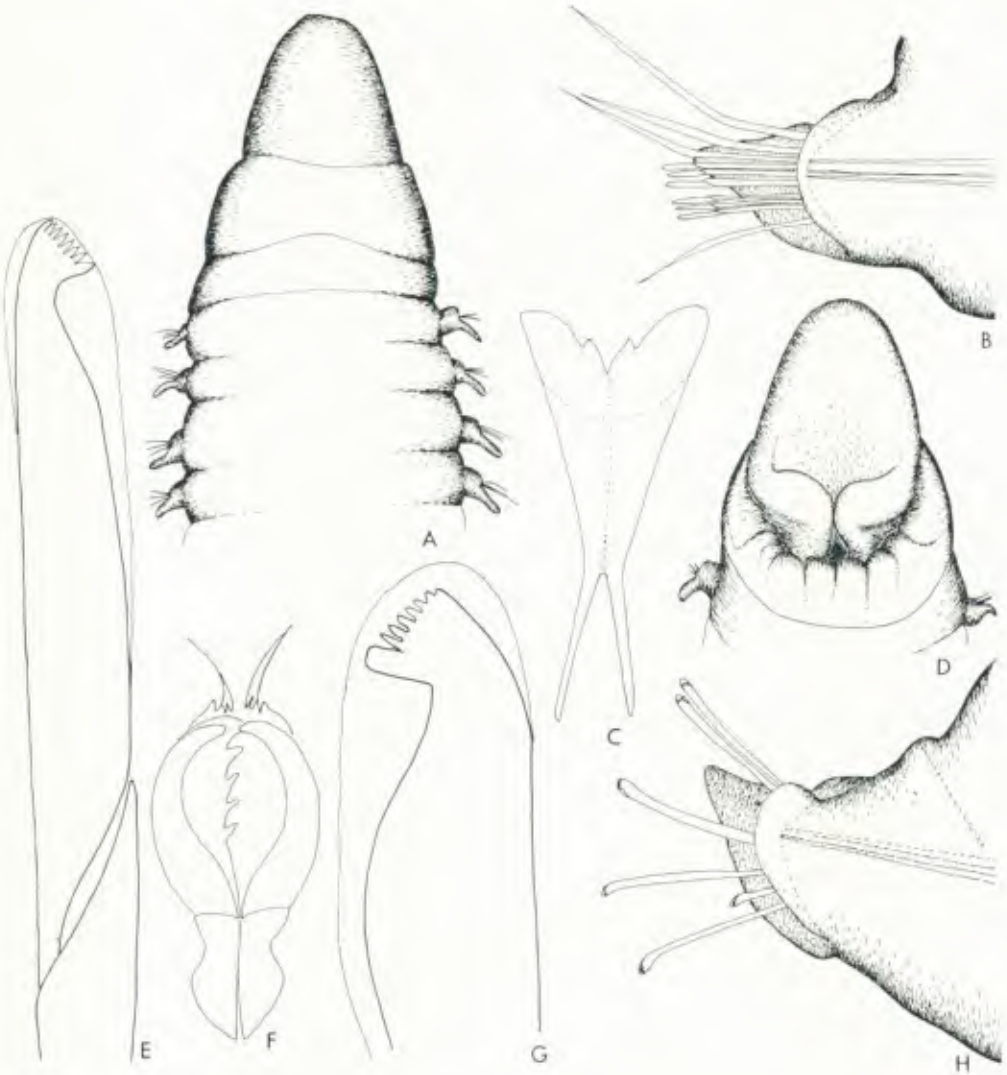

Fig. 3. *Lumbrineris agastos*, new species. A. Anterior end, dorsal view, 16.5 ×. B. Sixth parapodium, anterior view, 51.5 ×. C. Mandibles, 25 ×. D. Anterior end, ventral view, 16.5 ×. E. Composite seta, 950 ×. F. Maxillary apparatus, 25 ×. G. Simple hook, 950 ×. H. Parapodium 58, anterior view, 51.5 ×.

lobes in posterior setigers, the other three, including *L. agastos*, have short lobes in all setigers. *L. agastos* has distinct, broadly rounded presetal lobes in all setigers examined; such lobes are absent in *L. grandis* and *L. japonica*. The shape of the mandibles is distinctly different in all four species.

Distribution. *L. agastos* is known from four localities in Hardangerfjorden, western Norway.

Lumbrineris aniara, new species
Fig. 4

L. latreilli FAUCHALD 1972a, p. 96 (not AUDOUIN & MILNE EDWARDS 1834).

Material examined. 22–56 (2); 43–56 (1); 63–56 (2); 65–56 (1); 66–56 (2); 18–57 (4); 19–57 (1); 32–57 (10); 5–58 (2); 13–58 (1); 33–58 (2); 36–58 (1); 46–58 (1); 57–58 (4); 98–58 (1); 110–58 (5, *holotype*, Zoological Museum, Bergen, No. 55 046; *paratypes*, Zoological Museum, Bergen, No. 55 047 and Allan Hancock Foundation, Los Angeles, No. Poly 1121); 35–63 (1); 36–63 (3); 40–63 (1); 44–63 (1); 1–65 (1); 7–65 (3); 8–65 (3).

The type is an incomplete specimen with 133 setigers that is 37 mm long and 1.5 mm wide without setae. It is evenly salmon-colored and lacks color patterns. The slender body is cylindrical.

The prostomium (Fig. 4A, H) is rounded conical and appears somewhat inflated. The two peristomial rings are nearly fused dorsally and the separation is visible only as a faint line. Ventrally the first peristomial ring forms the large, folded ventral lip as a separate, nearly triangular piece. The second peristomial ring is very narrow ventrally. Dorsally, both peristomial rings are about as long as the first setiger.

Anterior parapodia (Fig. 4D) are bluntly conical and have short, triangular postsetal lobes; posterior parapodia (Fig. 4E) are somewhat more distinctly conical and the postsetal lobes are slightly narrower. Prolonged posterior lobes are absent.

Acicula are yellow. The first thirteen or fourteen setigers have composite hooded hooks with short, thick appendages; more posterior setigers have simple hooks. Each composite hook (Fig. 4C) has a crest of about twenty teeth; a main fang cannot be distinguished. Each simple hook (Fig. 4G) has a small main fang and a crest of about twelve teeth. The hoods, both in the simple and composite hooks, are externally covered with long, slender hairs especially near the base of the hoods (omitted in the drawing of the composite hook).

The slender mandibles (Fig. 4F) are very long and are fused along most of their lengths; the posterior ends diverge only slightly. The maxillary formula is 1–5–1–1 and the maxillary carriers (Fig. 4B) are long and slender with indistinctly marked exterior excavations.

The specific name, meaning troublesome or annoying, refers to the fact that species resembling *L. latreilli* (AUDOUIN & MILNE EDWARDS) have given the polychaete specialists considerable head-aches.

L. aniara belongs to group IBb1 as the groups were defined by FAUCHALD (1970). It resembles *L. oxychaeta* GRAVIER (1900, pp. 275–278. pl. 14, figs 96–98, textfigs 148–153) and *L. quinquedentata* KINBERG (1865, p. 568; see also HARTMAN, 1944, p. 140) in that all three species have similar maxillary formulas. *L. quinquedentata*, described from Argentina, is very poorly known, and was characterized as indeterminable by HARTMAN (1948, p. 7).

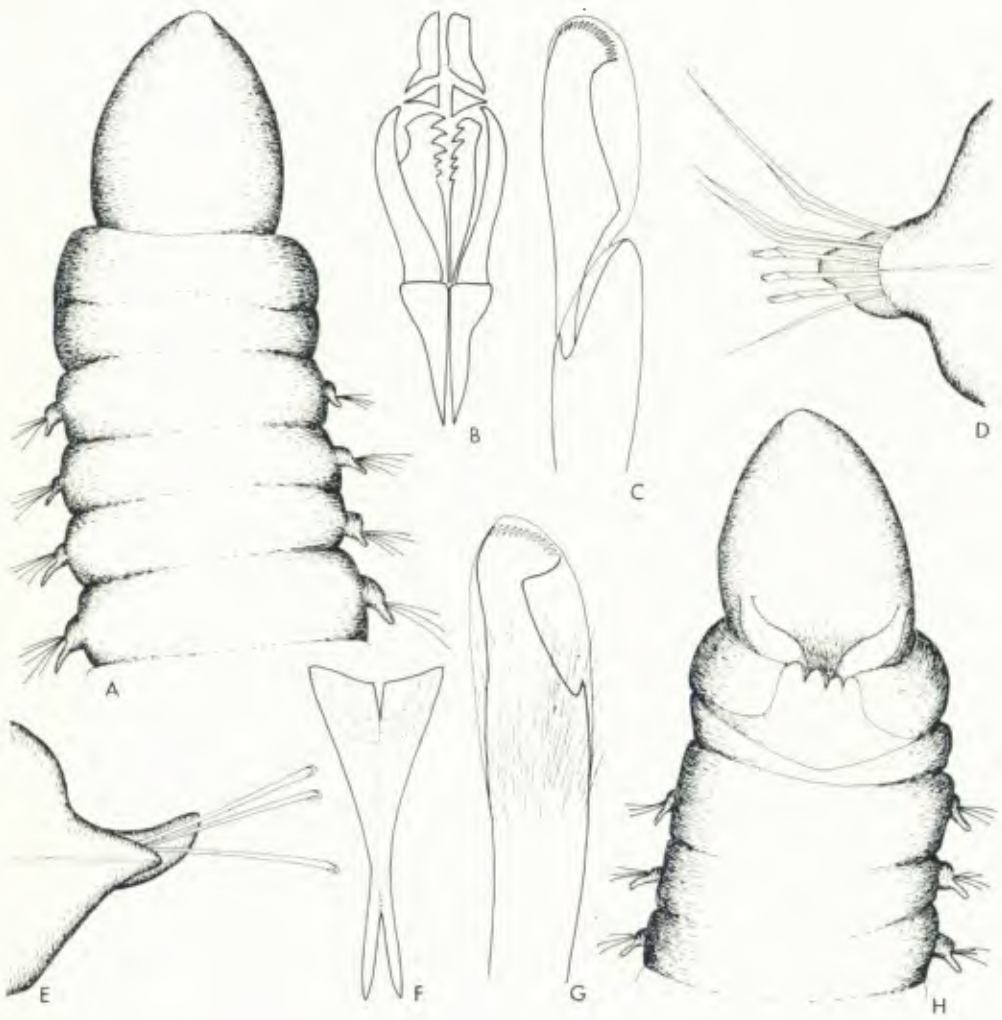

Fig. 4. *Lumbrineris aniara*, new species. A. Anterior end, dorsal view, 50 ×. B. Maxillary apparatus, 50 ×. C. Composite seta, 950 ×. D. Anterior parapodium, anterior view, 95 ×. E. Posterior parapodium, anterior view, 95 ×. F. Mandibles, 50 ×. G. Simple hook, 950 ×. H. Anterior end, ventral view, 50 ×.

L. oxychaeta has long pointed hoods in a number of the anterior composite hooks; all hoods are bluntly rounded in *L. aniara*.

Distribution. *L. aniara* may be quite common in Norwegian fjords; the present records are from Hardangerfjorden, but it has also been taken in Sognefjorden (FAUCHALD 1972) and appears to be present also in the fjords near Bergen (unpublished records of T. Brattegard, K. Rasmussen, and P. Hovgaard, Biological Station, Espegrend).

Lumbrineris scopa, new species
Fig. 5

Material examined. 22–56 (1); 25–56 (3); 43–56 (3); 44–56 (1); 48–56 (1); 57–56 (2); 66–56 (8); 67–56 (3); 3–57 (4); 17–57 (4); 18–57 (6); 25–57 (2); 32–57 (2); 5–58 (5); 13–58 (1); 33–58 (2); 36–58 (2); 38–58 (3); 46–58 (6); 57–58 (2); 74–58 (1); 75–58 (2); 77–58 (4); 95–58 (11); 98–58 (1); 110–58 (5); 113–58 (8); 24–63 (6); 26–63 (11); 31–63 (1); 35–63 (3, *holotype*, Zoological Museum, Bergen, No. 55 048, *paratypes*, Zoological Museum, Bergen, No. 55 049); 36–63 (1); 38–63 (3); 2–64 (1); 5–64 (1); 15–64 (2); 16–64 (3); 20–64 (2); 1–65 (7); 2–65 (5); 7–65 (2); 11–65 (2); 16–65 (1); ZF85 (1).

The type is a complete specimen with 180 setigers that is 50 mm long and 2 mm wide without setae. It is light salmon-colored and lacks color patterns. The posterior end has four short, tapering anal cirri. The posterior part of the body is encased in a thin tube made of a tough membrane covered sparsely with sand-grains.

The prostomium (Figs 5A, C) is pointed conical and considerably narrower than the rest of the anterior end. The first peristomial segment is nearly twice as long as the second one and is as wide as the widest part of the body. The first parapodial segment is incomplete ventrally and the second barely reaches the ventral mid-line.

Anterior parapodia (Fig. 5G) are broadly rounded with a short, rounded postsetal lobe. Median parapodia have the acicular lobes slightly more pointed and the postsetal lobes are shorter. In far posterior setigers, including the last twenty setigers, the postsetal lobes (Fig. 5F) become abruptly elongated and are directed dorsad. They contain a vascular loop.

Acicula are yellow. The anterior twenty parapodia have bilimbate, pointed setae only. Simple hooded hooks are present from approximately setiger 20; each hook (Fig. 5D) is slender and has a very small main fang surmounted by a crest of approximately ten slender pointed teeth. The hood is bluntly rounded and is basally thickly pilose.

The mandibles (Fig. 5E) are very wide compared to their length; they are fused over their greatest length; the posterior ends are abruptly diverging. The maxillary formula is 1–5–1–1. Maxilla IV has a very large base plate and the tooth proper appears jointed to this plate (Fig. 5B). The maxillary carriers are very short and wide with a distinct excavations on the outer edges.

The specific name refers to the stiff twig-like appearance of this organism when encased in its tube.

L. scopa belongs to group IIb1. Other species in this group that have hooded hooks starting from a median setiger include *L. bassi* Hartman (1944, pp. 150-151, pl. 10, figs 217–223), *L. ehlersii* var. *tenuisetis* McIntosh (1885, pp. 253–254, pl. 37, fig. 9, pl. 18A, fig. 12, textfigs 20–22), *L. moorei* Hartman (1942a, pp. 116–118, figs. 12 a–b and g), and *L. tenuis* Verrill (1873, p. 594, see also Hartman, 1942b, p. 54).

L. scopa differs from these species in a set of characters. *L. moorei* and *L. tenuis* lack prolonged lobes in the posterior setigers, such lobes are present in *L. bassi* and *L. scopa;* it is not known whether such lobes are present in *L. ehlersii* var. *tenuisetis.*

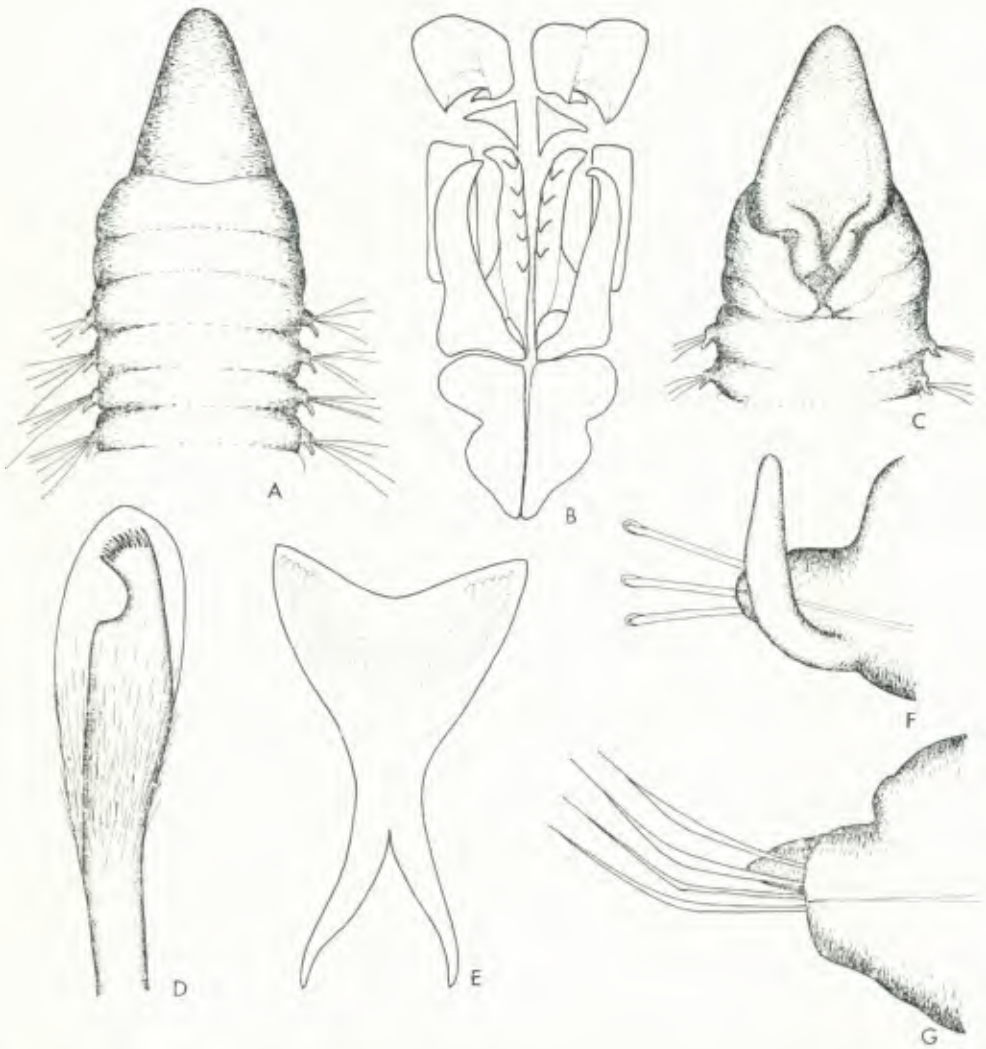

Fig. 5. *Lumbrineris scopa*, new species. A. Anterior end, dorsal view, 25 ×. B. Maxillary apparatus, 62.5 ×. C. Anterior end, ventral view, 25 ×. D. Simple hook, 950 ×. E. Mandibles, 62.5 ×. F. Far posterior parapodium, posterior view, 95 ×. G. anterior parapodium, anterior view, 95 ×.

L. bassi has four teeth on maxilla II and the maxillary carriers are long and slender as are the manibles. *L. scopa* has five teeth on maxilla II, the maxillary carriers are short and wide and the mandibles are short.

L. ehlersii var. *tenuisetis* is poorly known, but differs from *L. scopa* in that the maxillary carriers are long and slender and the mandibles are slender in the former and short in the latter.

Distribution. *L. scopa* is known from all parts of Hardangerfjorden in depths greater than 200 m.

Family Arabellidae

Drilonereis brattstroemi FAUCHALD 1972

Drilonereis brattstroemi FAUCHALD 1972, pp. 96–97, fig. 2F.

Material examined. 22–56 (1); 57–56 (1); 32–57 (1); 31–58 (1); 57–58 (5); 95–58 (1); 44–63 (1); 2–64 (2).

The present specimens agree with *D. brattstroemi* as originally described. The specimens are dark yellow with pigmented areas on each segment.

One of the specimens from Stn 57–58 was removed from the oral surface of a specimen of *Brisaster fragilis* (DÜBEN and KOREN). Arabellids are known to be associated with other polychaetes as inquilines or parasites (PETTIBONE 1957), but have never been reported from echinoderms. The association may have been an accident of the sampling.

Distribution. *D. brattstroemi* was described from deep water in Sognefjorden; the present records are from Hardangerfjorden in somewhat shallower depths.

Drilonereis, species indeterminable

Material examined. 2–64.

This large fragment cannot be further identified; it is several times larger than any specimen of *D. brattstroemi* and probably belongs to a different species.

FAUNAL COMPOSITION

A preliminary faunal analysis using a computer program under development at the Allan Hancock Foundation by Mr. Robert W. Smith was undertaken. This program is an agglomerating, polythetic classification program, giving the correspondances between faunal and station groups in a two-way coincidence table. Jacard coefficients and group-average sorting were used (SMITH, personal communication).

The program makes it possible to analyse for joint occurrences and for similarities in the faunal composition between stations. Because of the collecting techniques used, the absence of any species from a station does not demonstrate that the species does not (or did not at the time) occur at that location; thus only positive joint occurrences have been considered. It is impossible to quantify the occurrences of the different species at the stations because of inconsistencies in sampling and processing procedures.

The preliminary analysis has demonstrated that there are two distinct deep-water elements in the fjord, each associated with a distinct bottom type. Two other faunal elements appear associated in the main with shallower water, each also representing a different bottom type.

By far the greatest number of species is associated with the deep muddy bottoms. These include *Antionella plumosa*, *Aphrodita aculeata*, *Drilonereis brattstroemi*, *Eucranta villosa*, *Eunice pennata*, *Harmothoe antilopes*, *H. imbricata*, *Laetmonice filicornis*, *Lumbrineris aniara*, *L. scopa*, *Macellicephala mirabilis*, *Nephtys incisa*, *N. paradoxa*, *Nothria fiordica*, *Onuphis quadricuspis*, *Sphaerodorum gracilis*, *Sthenelais atlantica*, and *Shtenolepis tetragona*. Included in this list are several species known to be widespread in shallow water in western Norway (e.g., *Aphrodita aculeata* and *Harmothoe imbricata*). The method of analysis cannot resolve the possibility that more species have this distribution since the shallow-water material has not yet been treated.

The other group appears characteristic of hard-bottoms in the deeper part of the fjord and includes *Eunice dubitatus*, *E. norvegica*, *Eunoe nodosa*, *Lagisca extenuata*, and *Haplosyllis spongicola*. Again, some members of this list may be common in shallow water, especially those that are geographically widespread such as *Eunoe nodosa* and *Haplosyllis spongicola*. Members of this fauna are mainly associated with the deep ahermatypic coral reefs (Tambs-Lyche 1958).

The final two species groups are associated mainly with the shallower stations included in this study. Only stations taken deeper than 200 m were treated, including some marginally relevant stations. Most of the species listed below have been mainly found on these stations. One group of these species is found on rocky bottoms including *Alentia gelatinosa*, *Lumbrineris agastos*, *Nereis pelagica*, *Notophyllum foliosum*, *Paranaitis kosteriensis*, and *Typosyllis hyalina*. Another group of species appears only in gravelly, sandy, and muddy bottoms including *Nereimyra punctata*, *Ophiodromus flexuosus*, and *Paramphinome pulchella*.

The station analysis does not indicate that there are any great geographical differences between soft-bottom stations within the fjord. The distribution of the hard-bottom fauna is associated with the distribution of deep coral reefs in the fjord as mentioned above (Tambs-Lyche 1958).

The present analysis is at best preliminary; the rest of the material from the fjord, both deep and shallow, will have to be worked up before any analysis can be completed. At that, such an analysis will be suggestive rather than conclusive due to the quality of the material.

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I am grateful to Dr. Hans O. Brattström for allowing me to work on this material and for his hospitality during a stay at Espegrend in 1972. Taxonomic problems were discussed with Dr. Olga Hartman and with students at the Allan Hancock Foundation. Without this input, the study would have been even less complete than it is now.

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