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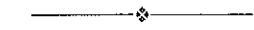
LEDER: ADOLF HOEL

SKRIFTER OM SVALBARD OG ISHAVET

Nr. 61

ZOOLOGICAL RESULTS
OF THE NORWEGIAN SCIENTIFIC EXPEDITIONS
TO EAST-GREENLAND. III.

I. MAURICE BURTON, M. SC.: REPORT ON
THE SPONGES OF THE NORWEGIAN EXPE-
DITIONS TO EAST-GREENLAND
(1930, 1931, AND 1932)



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1934

Printed, January 15th, 1934.

Report on the Sponges of the Norwegian Expeditions to East-Greenland (1930, 1931, and 1932).

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4 Textfigures.

The Norwegian Government Expeditions to East-Greenland, equipped by *Norges Svalbard- og Ishavs-undersøkelser*, have brought home zoological collections, of which the sponges, gathered during the expeditions in 1930, 1931, and 1932 by Paul Løyning, M. Sc., have been entrusted to the present author for report.

The study of this collection of sponges has afforded the opportunity of making a preliminary survey of the distribution of Arctic sponges generally. At present it is not possible to draw any conclusions in this matter, but two points of interest emerge from it which may be worthy of more detailed consideration later. In the first place, it is evident that the distribution of deep-sea and shallow-water sponges follows different lines, which is only to be expected, and it will be essential in the future, before any comprehensive work on the zoogeography of sponges generally can be begun, for more attention to be paid to the bathymetric distribution. The second point concerns the remarkable connection between the Arctic fauna and that of the Indo-Pacific and Sub-Antarctic regions (see page 20).

The sponges obtained from the East coast of Greenland by the Norwegian Expeditions include 54 species of which 1 is new to science, 26 are new to the fauna of Greenland, 43 are recorded from the area north of $71^{\circ} 30'$ Lat. N. for the first time. Previously 44 (? 43) species of sponges were known from the same area.

The material is stored in the Zoological Museum of the University of Oslo.



Map of the coast of East-Greenland between $71^{\circ} 30'$ and $75^{\circ} 40'$ L. N.

**Systematic list of species, with the description
of a new species.**

Order *Hexactinellida*.

Schaudinnia rosea (Fristedt).

Hyalonema rosea Fristedt 1887, p. 411, pl. XXIII, figs. 1—11, pl. XXVI, fig. 5; *Schaudinnia arctica* Schulze 1899, p. 199; 1900, p. 87, pl. I, figs. 1—6, pl. II, pl. III; *S. rosea* Lundbeck 1909, p. 456; Brøndsted 1914, p. 527; Burton 1928, p. 11; Hentschel 1929, p. 913; *Bathydorus* (?) *roseus* Hentschel 1929, p. 913.

Occurrence. — Samples Nos. 9, 47, 55.

Distribution. — Greenland, Spitsbergen.

Trichasterina borealis Schulze.

T. borealis Schulze 1899, p. 199; 1900, p. 100, pl. I, figs. 7—9, pl. IV, figs. 1—10; Burton 1928, p. 12; Hentschel 1929, p. 914.

Occurrence. — Samples Nos. 9, 548.

Remarks. — New to the fauna of Greenland.

Distribution. — Spitsbergen, Greenland.

Scyphidium septentrionale Schulze.

S. septentrionale Schulze 1899, p. 199; 1900, p. 104, pl. I, fig. 10, pl. IV, figs. 11—17; Hentschel 1929, p. 915.

Occurrence. — Sample No. 9.

Remarks. — New to the fauna of Greenland.

Distribution. — Spitsbergen, Greenland.

Order *Calcarea*.

Leucosolenia macleayi (Lendenfeld).

(For synonymy see Burton 1930, p. 14).

Occurrence. — Samples Nos. 1066, 1067, 1081.

Remarks. — New to the fauna of Greenland.

Distribution. — Practically cosmopolitan.

Sycon ciliatum (Fabricius) Autt.

Occurrence. — Sample No. 1044.

Remarks. — It is impossible to give anything like a complete list of synonyms for this species without considerable research. The geographical distribution given below is, however, derived from two sources: Arndt 1928 and Breitfuss 1932.

Distribution. — Arctic (Greenland, Spitsbergen, Barents Sea, Franz Josef Land); E. coast of North America (from Newfoundland as far south as Wood's Hole); W. coast of Europe (as far south as Spain); Zanzibar.

Sycandra utriculus (Schmidt).

(For synonymy see Arnesen 1901, p. 22 and Breitfuss 1932, p. 246).

Occurrence. — Sample No. 1063.

Distribution. — Arctic (Greenland, Jan Mayen, Kola Fjord, Murman Coast, Barents Sea, Novaya Zemlya).

Grantia capillosa (Schmidt).

(For synonymy see Breitfuss 1932).

Occurrence. — Samples Nos. 562, 623.

Distribution. — Arctic (Greenland, Jan Mayen, Kola Fjord, Barents Sea, Novaya Zemlya).

Grantia mirabilis (Fristedt).

Ascandra mirabilis Fristedt 1887, p. 406, pl. XXII, figs. 3—13, pl. XXVI, figs. 1—2; Breitfuss 1898, p. 26; *Grantia mirabilis* Lundbeck 1909, p. 460; Dendy and Row 1913, p. 761; Breitfuss 1932, p. 248.

Occurrence. — Sample No. 1092.

Distribution. — East Greenland.

Order *Tetragonida*.

Oscarella lobularis (Schmidt).

(For further synonymy see Lendenfeld 1903, p. 123).

Halisarca lobularis Schmidt 1862, p. 80; *Oscarella lobularis* Stephens 1912, p. 16; Topsent 1917, p. 32; Id. 1925, p. 629; Arndt 1928, p. 28, figs. 25—26; Burton 1930, p. 331.

Occurrence. — Samples Nos. 548, 562, 1038.

Remarks. — New to the fauna of Greenland.— Although there are nearly thirty references in the literature to this species, and the embryology and biology generally have been dealt with at great length, it is disconcerting to find that only in 13 cases have exact localities been given and in 2 cases only an exact record of the depth. Of the locality records, 6 are for the Adriatic, 1 for Naples, 2 for France and 1 each for the Black Sea, Belgium, England and Ireland. In addition there are 2 records for the Antarctic. In most cases it appears that the sponge was taken between tide-marks or in shallow waters (down to 10 fathoms?), but Stephens (1912) gives an exact record, "between tide-marks". Outside Europe, Topsent records specimens from 70—40 m (Petermann Island, Antarctic) and the present specimens were found off Greenland at 14—3 m, 137 m and 168 m.

Distribution. — Greenland, Ireland, England, France, Mediterranean, Black Sea, Antarctic (South Georgia and Petermann Island).

Thena muricata (Bowerbank).

Occurrence. — Samples Nos. 9, 548, 562, 615.

Remarks. — The specimens are mainly of large size, up to 10 cms. across, and one, collected on August 13, bears a number of small buds.

Distribution. — North-east coast of N. America, Greenland, Iceland, White Sea, Spitsbergen, Faröes, Atlantic coast of Europe, Mediterranean, Azores, West coast of Africa.

Stelletta normani Sollas.

S. normani Sollas 1880, p. 132, pl. VI, fig. 7; *Dragmastra normani* Sollas 1886, p. 193; 1888, p. 187; Topsent 1892, p. 45; *Stelletta normani* Lendenfeld 1903, p. 41.

Occurrence. — Sample No. 9.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Greenland.

Geodia nodastrella Carter.

G. nodastrella Carter 1876, p. 397, pl. XVI, fig. 45; *G. barretti* var. *nodastrella* Sollas 1888, p. 247; *G. nodastrella* Lendenfeld 1903, p. 108; Stephens 1915, pp. 16, 38, pl. IV, fig. 1; Topsent 1928, p. 107, pl. V, fig. 1.

Occurrence. — Sample No. 548.

Remarks. — New to the fauna of Greenland.

Distribution. — Azores, Morocco, Ireland (off West coast), Shetlands, Faröes, Greenland.

Geodia mesotriaena (Hentschel).

Sidonops mesotriaena Hentschel 1929, p. 865, pl. XII, figs. 1, 2, pl. XIII, fig. 1.

Occurrence. — Sample No. 548.

Remarks. — New to the fauna of Greenland.

Distribution. — Spitsbergen, Greenland.

Tetilla cranium (Müller).

(= *Craniella cranium* (Müller) Autt.).

Occurrence. — Samples Nos. 9, 562.

Remarks. — There are two oval specimens from No. 562, 7 cm high and 5 cm diameter and 6 cm high and 3.5 cm diameter respectively. In the larger of these, the surface is coarsely tuberculate, as in *Craniella carteri* Sollas (1888, pl. I, fig. 28); in the smaller the surface is coarsely tuberculate in the upper parts, finely tuberculate in the middle third and smooth around the base (the orientation of the sponges being determined by a group of apical oscules in each case). There is practically no hispidation of the surface in either specimen.

Sections were made to see whether the variation in the surface bears any relation to differences in the internal structure, but, except that subdermal lacunae are markedly more numerous where the surface is coarsely tuberculate, a negative result was obtained.

Distribution. — Rockall Island, Ireland, Norway, Spitsbergen, White Sea, Iceland, Greenland, North-east coast of Canada.

Tetilla geniculata Marenzeller.

T. geniculata Marenzeller 1886, p. 13, pl. I, fig. 4; Sollas 1888, p. 46; Lendenfeld 1903, p. 22; Topsent 1927, p. 254, figs. 1—3.

Occurrence. — Samples Nos. 1016, 1018.

Remarks. — New to the fauna of Greenland.

Distribution. — Jan Mayen, Greenland.

Tetilla polyura Schmidt.

T. polyura Schmidt 1870, p. 66, pl. VI, fig. 8; Vosmaer 1885, p. 323; Levinsen 1887, p. 344; Sollas 1888, p. 47; Lendenfeld 1903, p. 19; Topsent 1923, p. 1; Rezvoi 1924, p. 242; 1928, p. 76.

Occurrence. — Samples Nos. 1019, 1020, 1021.

Remarks. — New to the fauna of Greenland.

Distribution. — Iceland, Kara Sea, Barents Sea, Greenland.

Haliclona jugosa (Bowerbank).

Isodictya jugosa Bowerbank 1866, p. 296; 1874, pl. I, figs. 11—14; 1882, p. 131; *Halichondria couchii* Bowerbank 1874, p. 203, pl. XXIII, figs. 12—15; 1882, p. 99; *Gellius jugosa* Gray 1867, p. 538; *G. stylifera* Lendenfeld 1897, p. 87, fig. 4; *G. angulatus* Lundbeck 1902, p. 63, pl. XII, fig. 12; *G. massa* Arnesen 1903, p. 7, pl. I, fig. 3; *G. arnesenae* Arndt 1927, p. 151; Burton 1930, p. 499.

Occurrence. — Sample No. 549.

Remarks. — I have given elsewhere (Report on the Sponges of the Great Barrier Reef) my reasons for including the genotype of *Gellius* in *Haliclona*. The re-examination of the holotype of *Isodictya jugosa* Bowerbank shows it to possess a structure rather different to what has always been assumed in the past. The microscleres, for example, are sigmata and toxa, the latter looking more like toxiform microxea. It was doubtless on this account that the latter have been overlooked, largely because of their resemblance to immature oxea.

Distribution. — Greenland, Norway, British Isles.

Haliclona aquaeductus (Schmidt).

(For synonymy and discussion see Burton 1930, pp. 511—517).

Occurrence. — Sample No. 1038.

Remarks. — The specimen is almost identical with the holotype of *Reniera laxa* Lundbeck (1902, p. 46, pl. II, fig. 6, pl. XI, fig. 13).

Distribution. — Arctic generally, Mediterranean, Azores, Madeira, Indian Ocean, Indo-Pacific, New Zealand, Patagonia.

Haliclona oblonga (Hansen).

Reniera oblonga Hansen 1885, p. 4, pl. II, fig. 5 A, pl. VI, fig. 2; *Halichondria oblonga* Lundbeck 1902, p. 24, pl. II, fig. 4, pl. IX, fig. 10.

Occurrence. — Sample No. 548.

Remarks. — The specimen appears to agree closely with the description given by Lundbeck, but is on the other hand a typical *Haliclona*.

Distribution. — Greenland, Faröes.

Haliclona rufescens (Lambe).

Reniera rufescens Lambe 1892, p. 75, pl. IV, fig. 6, pl. V, fig. 12; Id. 1894, p. 115; Id. 1896, p. 183; Hentschel 1929, p. 980.

Occurrence. — Sample No. 1038.

Remarks. — It is very doubtful whether a distinction can be maintained between this species and the low-growing forms of *H. aqueductus* (Schmidt) (q. v.).

New to the fauna of Greenland.

Distribution. — Gulf of St. Lawrence, Behring Sea, Kamchatka Greenland.

Adocia tenera (Marenzeller).

Isodictya tenera Marenzeller 1877, p. 364, pl. I, fig. 2; *Reniera tenera* Topsent 1913, p. 56; Hentschel 1929, p. 986; *Halichondria tenera* Burton 1930, p. 516.

Occurrence. — Sample No. 9.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Franz Josef Land, Greenland.

Isodictya flabelliformis (Hansen).

Myxilla flabelliformis Hansen 1885, p. 12, pl. II, fig. 14, pl. VI, fig. 6; *Desmacidon clavellata* Arnesen 1903, p. 13, pl. II, fig. 2, pl. IV, fig. 4; *Homoeodictya flabelliformis* Lundbeck 1905, p. 118, pl. IV, figs. 2—3, pl. XIII, fig. 5; Rezvoi 1928, p. 88; Hentschel 1929, p. 967; *Isodictya flabelliformis* Burton 1930, p. 490.

Occurrence. — Sample No. 1131.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Faröes, Bear Island, Spitsbergen, Barents Sea, Greenland.

Mycale arctica (Fristedt).

Esperia lingua var. *arctica* Fristedt 1887, p. 449, pl. XXV, figs. 20—24, pl. XXIX, fig. 18; *Mycale arctica* Hentschel 1929, p. 930.

Occurrence. — Samples Nos. 527, 562.

Remarks. — Hentschel (l. c.) speaks of this species as "Krüstenförmig", but, although, Fristedt (l. c.) described the type as "incrusting hard objects, as worm-tubes, stones, shells, etc.", its shape is massive, sub-spherical or irregular. This is evident from Fristedt's illustration (l. c. pl. XXIX, fig. 18). The present specimen consists of a macerated system of fibres only.

New to the fauna of Greenland.

Distribution. — Behring Islands, Greenland.

Mycale lingua (Bowerbank).

(For synonymy see Topsent 1924).

Occurrence. — Samples Nos. 18, 20, 55, 548, 549, 615, 1081, 1131.

Distribution. — Newfoundland, Greenland, Norway, North-east of British Isles, Bay of Biscay, Port Jackson, Australia.

Mycale strelnicovi Rezvoi.

M. strelnicovi Rezvoi 1924, p. 245, fig. 4.

Occurrence. — Sample No. 55.

Remarks. — New to the fauna of Greenland.

Distribution. — Barents Sea, Greenland.

Amphilectus columnata (Topsent).

Esperiopsis columnata Topsent 1890, p. 67; Id. 1892, p. 90, pl. V fig. 5, pl. X, fig. 5.

Occurrence. — Sample No. 644.

Remarks. — New to the fauna of Greenland.

Distribution. — Newfoundland, Greenland.

Asbestopluma lycopodium (Levinsen).

(For synonymy see Lundbeck 1905, p. 62).

Occurrence. — Sample No. 1116.

Remarks. — New to the fauna of Greenland.

Distribution. — Shetlands, Faröes, Norway, Jan Mayen, Kara Sea, Baffin Bay, Greenland.

Cladorhiza corticocancellata Carter.

(For synonymy see Lundbeck 1905, p. 93).

Occurrence. — Sample No. 9.

Remarks. — New to the fauna of Greenland.

Distribution. — Faröes, Greenland.

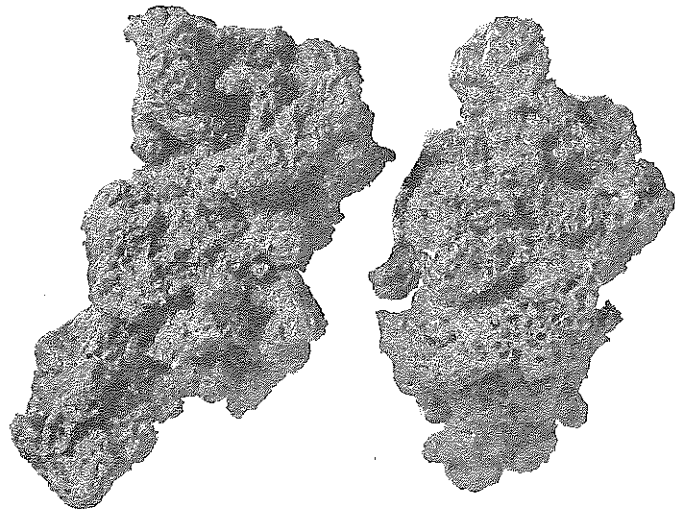


Fig. 1. *Ectyodoryx loyningi* sp. n.
Two fragments of the same specimen (i. e. the holotype).

Lissodendoryx indistincta (Fristedt).

Hastatus indistincta Fristedt 1887, p. 444, pl. XXV, figs. 13—19; *Lissodendoryx indistincta* Lundbeck 1905, p. 162, pl. V, fig. 10, pl. XVI, fig. 3; Brøndsted 1916, p. 480; Hentschel 1929, p. 947; Burton 1930, p. 492.

Occurrence. — Sample No. 1101.

Distribution. — Norway, Spitsbergen, Barents Sea, Murman Coast, Greenland.

Lissodendoryx fragilis (Fristedt).

Hastatus fragilis Fristedt 1885, p. 35, pl. III, fig. 6; *Lissodendoryx fragilis* Lundbeck 1905, p. 158, pl. V, figs. 7—8, pl. XVI, fig. 1; Arndt 1912, p. 115; Topsent 1913, p. 40; Hentschel 1929, p. 946; Burton 1930, p. 492.

Occurrence. — Sample No. 9.

Remarks. — New to the fauna of East Greenland.

Distribution. — Denmark Strait, Greenland, Barents Sea, Farøes, Norway.

Lissodendoryx complicata (Hansen).

Reniera complicata Hansen 1885, p. 7, pl. I, fig. 8, pl. VI, fig. 8; *Myxilla grisea* Id. l. c., p. 12, pl. I, fig. 3, pl. VI, fig. 9; *Clathria corallohizoides* Fristedt 1887, p. 460, pl. XXV, figs. 73—77, pl. XXIX, fig. 23; *Lissodendoryx complicata* Lundbeck 1905, p. 166, pl. V, fig. 11, pl. XVI, fig. 4; Topsent 1913, p. 40, pl. I, fig. 3; Brøndsted 1916, p. 481; Arnesen 1920, p. 20, pl. II, fig. 1; Hentschel 1929, p. 947; Burton 1930, p. 492.

Occurrence. — Sample No. 9.

Distribution. — Baffin Bay, Iceland, Greenland, Jan Mayen, Spitsbergen, Norway.

Ectyodoryx loyningi sp. n.

(Text-figs. 1, 2).

Holotype. — In the Zoological Museum of the University, Oslo.

Occurrence. — Sample No. 548.

Diagnosis. — Sponge sub-clathrate, massive; surface uneven, porose, irregularly and minutely hispid; oscules not apparent; texture soft, compressible; colour, in formalin, a dull brick-red; skeleton a sub-isodictyal reticulation of triangular mesh, composed of large acanthostyli and echinated by small acanthostyli; dermal spicules disposed irregularly, usually at right angles to surface; large acanthostyli, entirely spined, .45 by .018 mm; small acanthostyli, .18 by .01 mm; tornota, hastate at each end, .21 by .006 mm; chelae arcuatae, .011 and .07 mm chord, with occasional intermediates; sigmata .02 to .06 mm chord.

Remarks. — This species shows a remarkable resemblance to *Anchinoë roemeri* Hentschel (1929) in spiculation, but differs in external form and in the structure of the main skeleton. It is the only Arctic species of *Ectyodoryx* with sigmata and hastate tornota.

Stelodoryx pluridentata (Lundbeck).

(For synonymy and discussion see Burton 1932, p. 316).

Occurrence. — Sample No. 627.

Remarks. — New to the fauna of Greenland.

Distribution. — Greenland, Iceland, Falkland Islands.

Cornulum textile Carter.

C. textile Carter 1876, p. 309, pl. XII, fig. 9, pl. XV, fig. 28; *Clathria textile* Vosmaer 1880, p. 154; *Cornulum textile* Fristedt 1887, p. 446; Lundbeck 1909, p. 443; Id. 1910, p. 22, pl. II, figs. 13—14, pl. V, fig. 1; Hentschel 1929, p. 968.

Occurrence. — Sample No. 562.

Distribution. — Baffin Bay, East Greenland, Farøes.

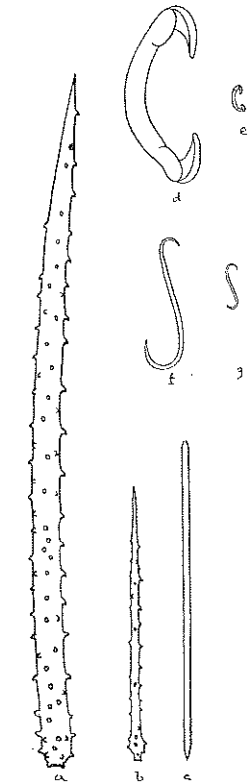


Fig. 2. *Ectyodoryx loyningi* sp. n. spicules: a. Acanthostyle of main skeleton; b. echinating acanthostyle; c. tornote, $\times 200$; d-e. chelae arcuatae; f-g. sigmata, $\times 300$.

Iophon piceus Vosmaer.

(For probable synonymy see Lundbeck 1905, pp. 175—183, under *I. piceus*, *I. frigidus* and *I. dubius*).

Occurrence. — Samples Nos. 9, 527, 623, 1092, 1131.

Remarks. — Examination of the present specimens serves to corroborate the suggestion made by me (1932, p. 348) as to the identity of *I. piceus* Vosmaer, *I. frigidus* (Levinsen) and *I. frigidus* (Hansen).

Distribution. — Arctic (from Barents Sea to Denmark Strait), Norway.

Iophon frigidus Lundbeck.

I. frigidus Lundbeck 1905, p. 183, pl. XVII, fig. 5; Hentschel 1916, p. 10; 1929, p. 950.

Occurrence. — Sample No. 1092.

Distribution. — Greenland, Spitsbergen.

Crella pyrula (Carter).

(For further synonymy see Lundbeck l. c.).

Cometella pyrula Carter 1876, p. 388, pl. XIV, fig. 20, pl. XV, fig. 38; *Reniera membranacea* Hansen 1885, p. 4, pl. I, fig. 11, pl. VI, fig. 12; *Grayella pyrula* Lundbeck 1910, p. 30, pl. II, figs. 15—19, pl. V, fig. 2; Arndt 1912, p. 116; Topsent 1913, p. 45; Stephens 1921, p. 32; Rezvoi 1928, p. 88; *Yvesia pyrula* Topsent 1928, p. 230; *Grayella pyrula* Hentschel 1929, p. 969; *Crella pyrula* Burton 1930, p. 494.

Occurrence. — Sample No. 1092.

Distribution. — Atlantic coast of Africa, Azores, Atlantic coast of Europe, Faröes, Spitsbergen, White Sea, Barents Sea, Greenland, Iceland, North-east coast of North America.

Artemisina arciger (Schmidt).

Suberites arciger Schmidt 1870, p. 47, pl. V, fig. 6; *Artemisina suberitoides* Vosmaer 1885, p. 25, pl. I, fig. 16, pl. V, figs. 51—55; Fristedt 1887, p. 430, pl. XXIV, figs. 15—17; Ridley and Dendy 1887, p. 112; *A. arciger* Lundbeck 1905, p. 110, pl. I, figs. 9—11, pl. XIII, fig. 3; Arndt 1912, p. 115; Topsent 1913, p. 47, pl. I, fig. 6; Rezvoi 1928, p. 85; Hentschel 1929, p. 938.

Occurrence. — Samples Nos. 527, 548, 1087, 1101, 1131.

Remarks. — The two specimens from samples Nos. 527 and 548 contain numerous aspiculous embryos, up to .3 mm diameter, and from these it is clear that the development in this species is, in the early stages, closely similar to that of the species of *Tedania* described by me (1932).

Distribution. — Nova Scotia, Greenland, Iceland, Faröes, Spitsbergen, Barents Sea, Bear Island, Norway.

Halichondria panicea (Pallas) Autt.

Occurrence. — Samples Nos. 34, 615, 1038.

Distribution. — Cosmopolitan (?).

Halichondria osculum Lundbeck.

H. osculum Lundbeck 1902, p. 23, pl. III, figs. 3—7, pl. IX, figs. 7—9; Hentschel 1929, p. 991.

Occurrence. — Sample No. 18.

Distribution. — Davis Strait, Greenland.

Siphonocalypta elegans (Vosmaer).

Auletta elegans Vosmaer 1882, p. 40; *Siphonocalypta elegans* Burton 1931, p. 140, fig. 1.

Occurrence. — Samples Nos. 37, 1092.

Remarks. — New to the fauna of Greenland.

Distribution. — Barents Sea, Norway, Greenland.

Suberites carnosus (Johnston) Autt.

Occurrence. — Sample No. 1017.

Distribution. — Arctic generally, Eastern Atlantic, Mediterranean, Indian Ocean, Australia.

Stylocordyla borealis (Lovén) subsp. *typica* Burton.

Hyalonema boreale Lovén 1868, p. 105, pl. II, figs. 1—38; *Ficulina boreale* Gray 1868, p. 484; *Hyalonema longissimum* Sars 1872, p. 70, pl. VI, figs. 34—35; *Stylocordyla boreale* Thomson 1873, p. 113, fig. 13; *Polymastia stipitata* Carter 1876, p. 393; *Stylocordyla longissima* Marenzeller 1877, p. 9; *Wagnerella borealis* Merejkowsky 1878, p. 22, pl. II, figs. 1—5; *Stylorhiza stipitata* Schmidt 1880, p. 79, pl. X, fig. 5; *Stylocordyla borealis* Vosmaer 1885, p. 10; Hansen 1885, p. 3; Levinsen 1887, p. 349; *S. stipitata* Ridley and Dendy 1887, p. 223, pl. XLIII, figs. 6—9; *S. borealis* Topsent 1896, p. 286, pl. VIII, figs. 11—12, 14, 15; Lambe 1896, p. 200, pl. I, fig. 11; *S. longissima* Thiele 1898, p. 31, pl. I, fig. 15, pl. VII, fig. 20; *S. borealis* Arndt 1912, p. 113; Topsent 1913, p. 27, pl. II, fig. 7; Burton 1928, p. 64, fig. 5; Rezvoi 1928, p. 77, fig. 3; Hentschel 1929, pp. 867, 921; Burton 1930, p. 496.

Occurrence. — Samples Nos. 615, 617.

Remarks. — Although so much has been written about this species, no list of synonyms has been published since Vosmaer (1885). In view of the detailed consideration of its distribution given below, it seems worth while to publish here the complete list, together with details of geographical and bathymetric distribution. Lambe (1896) refers to a record by Verrill, from the north-east coast of North America, but this I have been unable to trace. Hentschel (1929) also gives a record,

viz. Vosmaer 1882, which I have been unable to find. Apart from these, the list of synonyms given here is probably quite complete.

Embryos were found in the specimen from Jackson Island.

New to the fauna of Greenland.

Distribution. — Iceland, 325 (Topsent); Spitsbergen, 300—500 (Hentschel) Franz Josef Land, 99—100 (Marenzeller); Barents Sea, 140—165 (Vosmaer), 40—590 (Rezvoi); White Sea, 1—2 (Merejkowsky); Kara Sea, 44—75 (Levinsen); Bear Island, 658—767 (Hansen); between Iceland and Norway, 412—1215 (Hansen); Norway, 90—100 (Arndt), 170 (Topsent), — (Lovén), — (Burton); Lofoten, 540 (Topsent), — (Sars); between Scotland and Farøes, — (Carter); Oban Bay, west coast of Scotland, — (Gray); Bay of Biscay, — (Topsent); Nova Scotia, 85 (Ridley and Dendy); Gulf of St. Lawrence, — (Lambe); (?) north-east coast of U. S. A., — (Verill) (*vide* Lambe 1896); Grenada, 159 (Schmidt); Bahia, Brazil, 7—20 (Ridley and Dendy); between Marion and Crozet Islands, 1600 (Ridley and Dendy); Japan, 100 (Thiele).

(The depths, represented by the figures after each locality, are given in fathoms).

The species appears to be a typically deep-water species which is rarely found in depths less than 100 fathoms. The average of the records for the depths at which the species has been found is 350 fathoms, and of nearly thirty records only 5 are for depths less than 100 fathoms, and of these only 3 are for depths less than 50 fathoms.

Ficulina lütkenii (Schmidt).

Suberites lütkenii Schmidt 1870, p. 47, pl. V, fig. 7; *S. montalbidus* Carter 1880, p. 256; Id. 1882, p. 353; Fristedt 1885, p. 19, pl. II, fig. 4; *S. sp.* Vosmaer 1885, p. 32, pl. I, figs. 22—23, pl. IV, figs. 140—144; *S. lütkenii* Marenzeller 1886, p. 3; *S. montalbidus* Fristedt 1887, 428; *S. montalbidus* Lambe 1894, p. 127, pl. III, fig. 6; Id. 1900, p. 24; Id. 1900 (bis), p. 162; Swartschewsky 1906, p. 318, pl. XIII, fig. 3; *Ficulina lütkenii* Topsent 1913 p. 25; Hentschel 1929, p. 928.

Occurrence. — Sample No. 627.

Distribution. — Aleuten Islands; Behring Straits, Hudson Bay (Canada); Greenland (east and west coasts), Jan Mayen, Spitsbergen, Barents Sea, White Sea, Siberia, Norway, Sweden, Denmark.

Depth. — 3—191 m.

Polymastia mammillaris (Müller) Autt.

Occurrence. — Sample No. 562.

Remarks. — The specimens are all remarkably hirsute at the surface and in microscopic sections it is seen that, although the surface is covered with densely-packed large tylostyli with the bases embedded

in the dermal tissues, the radial bundles of the choanosome are almost denuded of spicules. These specimens seem therefore to be in the process of extruding the spicules of the main skeleton.

Distribution. — East coast of North America (from New England to Newfoundland), Greenland, Iceland, Spitsbergen, Kara Sea, White Sea, Bear Island, West coast of Europe (as far south as Spain), Mediterranean, North Pacific, ?Indo-Pacific (Amboina).

Polymastia robusta (Bowerbank) Autt.

Occurrence. — Sample No. 562.

Remarks. — New to the fauna of Greenland.

Distribution. — East coast of North America (from New England to Newfoundland), Greenland, West coast of Europe (from Norway to the west coast of France).

Polymastia uberrima (Schmidt).

Rinalda uberrima Schmidt 1870, p. 51, pl. VII, fig. 3; Hansen 1885, p. 8, pl. I, fig. 1; Stuxberg 1887, pp. 165—186; *Polymastia uberrima* Thiele 1903, p. 376, fig. 2; Lundbeck 1909, p. 450, Topsent 1913, p. 18, pl. II, fig. 5, Ferrer 1922, p. 12; Hentschel 1929, p. 923.

Occurrence. — Sample No. 562.

Distribution. — Greenland, Iceland, Novaya Zemlya, Bear Island, Vigten in Norway, Spain.

Radiella sol Schmidt.

(For synonymy see Burton 1930, p. 510).

Occurrence. — Samples Nos. 36, 1066, 1101.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Bear Island, Spitsbergen, White Sea, Barents Sea, Greenland, North-east coast of North America.

Radiella grimaldi (Topsent).

Polymastia penicillus Vosmaer 1882, p. 26, pl. I, figs. 12—13, pl. IV, figs. 127—132; *P. mamillaris* Id. 1885, p. 14, pl. I, figs. 5—6, pl. III, figs. 10—14, 21; *P. penicillus* Fristedt 1887, p. 434; *P. mamillaris* Levinsen 1887, p. 15; *P. mamillaris* Lambe 1896, p. 196, pl. III, fig. 1; *Trichostemma grimaldi* Topsent 1913, p. 21, pl. I, fig. 4; *P. mammillaris* var. *hyperborea* Hentschel 1916, p. 8; Id. 1929, pp. 868, 923. Nec *P. penicillus* (Montagu) Auctt. and *P. mammillaris* (Müller) Auctt.

Occurrence. — Samples Nos. 562, 1087.

Remarks. — As Hentschel (1916) has rightly pointed out, the specimens described under *Polymastia mam(m)illaris* and *P. penicillus*, by Vosmaer, Fristedt, Levinsen and Lambe, are not identical with the types of these two species. In establishing for them the var. *hyperborea*

of *P. mammillaris*, he had, however, overlooked the species *Trichostemma grimaldi* described by Topsent three years earlier. Several specimens are present in this collection and from these it is clear that *T. grimaldi* and *Polymastia mammillaris* var. *hyperborea* are identical.

New to the fauna of Greenland.

Distribution. — Gulf of St. Lawrence (Canada), Greenland, Iceland, Spitsbergen, Barents Sea, Novaya Zemlya, Kara Sea.

Tentorium semisuberites (Schmidt).

(For synonymy see Burton 1932, p. 337).

Occurrence. — Samples Nos. 9, 18, 548, 562, 1101.

Remarks. — The specimens range from 0.5 to 3 cm high and all are, or appear to have been, attached to fragments of shell or worm tubes.

Distribution. — Eastern coast of N. America, Greenland, Iceland, White Sea, Spitsbergen, West coast of Europe, Azores, West coast of Africa, Cape Town¹, Tristan da Cunha (see Burton 1930, pp. 496—497).

Latrunculia triloba (Schmidt).

Sceptrella triloba Schmidt 1875, p. 119; Thiele 1903, p. 377 pl. XXI, fig. 3; *Latrunculia triloba* Hentschel 1929, p. 926.

Occurrence. — Sample No. 562.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Greenland.

Order Keratosa.

Aplysilla rosea (Barrois).

Verongia rosea Barrois 1876, p. 57; *Aplysina noevus* Carter 1876, p. 229, pl. XII, figs. 1—2; *Aplysilla rosea* Schulze 1878, p. 416, pl. XXIII, figs. 16—17; *Aplysina noevus* Carter 1886, p. 285; *A. cruor* Id. l. c., p. 286; *Aplysilla rosea* Lendenfeld 1889, p. 708, pl. XLIV, fig. 2; Stephens 1912, p. 38; Ferrer 1918, p. 32; Burton 1930, p. 510, pl. II, fig. 3.

Occurrence. — Sample No. 1067.

Remarks. — New to the fauna of Greenland.

Distribution. — Greenland, Norway, Farøes, Shetlands, France, Spain, Mediterranean, Australia.

Spongia carteri Burton.

Spongia officinalis Carter 1876, p. 231, pl. XII, fig. 1 d; *S. carteri* Burton 1930, p. 510.

¹ From specimens in the British Museum.

Occurrence. — Samples Nos. 9, 548, 562.

Remarks. — New to the fauna of Greenland.

Distribution. — Between Scotland and Farøes; Norway, Greenland.

Psammopemma finmarchica Hentschel.

P. finmarchica Hentschel 1929, pp. 905, 995.

Occurrence. — Sample No. 1131.

Remarks. — New to the fauna of Greenland.

Distribution. — Norway, Greenland.

Geographical distribution.

a) of the Calcarea and Tetraxonida generally.

Although the distribution of the species of sponges found around Greenland and in the Arctic generally follows closely on the lines described by me (1930, pp. 536—542) in dealing with the Norwegian sponges, there remains yet another line of distribution which promises to be a profitable item for investigation. This concerns the number of species common to Greenland and Africa, Australia and the Antarctic; and although at first sight the results of such investigation would seem to be antagonistic to all hypotheses yet put forward to account for the distribution of sponges, the data are as yet too meagre to be used in support of conclusive argument. It is, however, sufficiently interesting and provocative to be put on record.

When the distribution of the 53 species enumerated in this report is analysed, it is found that 15 of them are confined to the Arctic region, while the rest have been found at other points outside the Arctic area. For the purposes of this discussion it will be convenient to ignore *Stylocordyla borealis* subsp. *typica* and *Halichondria panicea*. The first because it is discussed in greater detail below, and the second because its distribution is so imperfectly known, and cannot be accurately known without considerable research over a wide range of material. The remaining 36 species extend into one or more of the following areas: I) the coast of Western Europe; II) the eastern coast of North America, as far south as the New England States; III) the coast of Siberia, as far south as the Sea of Japan; IV) the western coast of North America as far south as Vancouver, perhaps even to California. When plotted on a map, the extra-Arctic distribution of these species can be represented by four extensions around the north-eastern and north-western boundaries of the Europo-Asian continent and the continent of North America (fig. 3).

Recent investigation has convinced me that the Arctic species do not extend farther south, on the north-eastern coast of Asia than the

Sea of Japan, and that in the region of the southern extremity of the Japanese Empire a comparatively abrupt change from an Arctic to an Indo-Pacific fauna may be found. Similarly, on the north-western coast of North America, the works of Lambe (see list of literature) and de Laubenfels (1932) suggest that the Arctic influence is strongly felt as far south as Vancouver Island, but is little felt on the coast of California. In the Atlantic we find approximately the same distribution. So far as this extra-Arctic distribution of the present species is concerned, 8 species are found to be common to areas I and II, 9 are found only in area I, along the European coast, and 2 are found in area II, along the coast of north-eastern America. It is possible that this difference between the species found on the European and American sides of the north Atlantic may be accounted for by the fact that the former has been more intensively searched. On the other hand, the further distribution of some of these species suggests that this is not so much the case as that there is a marked line of distribution extending down the European and West African coasts also. Thus, of the 9 species which extend from the Arctic southwards along the coast of Europe, 1 is also found at Morocco, 1 on the West coast of Africa, 1 at Zanzibar, and 1 at Tristan da Cunha. In addition, 2, *Mycale lingua* and *Polymastia mammillaris*, are found in the Australasian region and 1 in the Antarctic (*Oscarella lobularis*), while another, *Haliclona aqueductus*, is found both in the Australasian region and in the Antarctic. And, finally, there is one species, *Stelodoryx pluridentata*, which has so far been found only around Greenland and the Falkland Islands.

Summarising the results of the analysis given above, we find that the extra-Arctic distribution of many of the species enumerated in this report suggests a line of distribution which extends southwards along the west coast of Europe and Africa, around the southern extremity of the African continent, through the Southern Ocean to Australia (and perhaps to New Zealand). This same line continues into the Antarctic, but whether this point is reached from the Southern Ocean or from Australia and New Zealand it is impossible to guess from the data cited here, but from the study of the distribution of other European species showing this same line of distribution (e. g. *Haliclona oculata* Pallas), the line would appear to extend through the Australasian region to the Antarctic, rather than from any other point. From the Antarctic the line probably continues up to the southern extremity of South America, although the only species common to this area and to Greenland, so far as we know at present, is *Stelodoryx pluridentata*, which appears to have a discontinuous distribution in these two places.

The most obvious criticism of the suggestions put forward above is that such a line of distribution is apparent only, due to our lack of knowledge of the sponge faunas in other parts of the world; and while

it is true that the Arctic species may have reached the Antarctic, the Falkland Islands or Australia by three other routes, namely along the eastern and western coasts of America and the western Pacific, my own investigations definitely suggest that this is not the case. As regards the eastern (Atlantic) coast of America, south of the New England states of the U. S. A., we have fairly conclusive evidence to use. According to my list (1930, pp. 488—497) there are three species common to Greenland and the West Indies. Two of these are *Calcarea*, of which one is almost certainly cosmopolitan and the other is so little known that its use in this connection is of doubtful value, and the third is *Melonanchora elliptica* which will probably be found to be a deep-water species with the distribution characteristic of such forms. With regard to the rest of the sponge fauna of the West Indies, there can be little doubt that it has nothing in common with the fauna of the Arctic, and my confidence in this statement is the result of having examined recently a large number of specimens from the West Indies and of having made a preliminary survey of the species hitherto described from that area. Similarly, there is no indication at all of the presence of species common to the Arctic along the northern part of the west coast of South America, while from the mouth of the River de la Plata to Cape Horn, the sponge fauna is essentially of the same type as that of the Antarctic and Sub-Antarctic, and does not appear to contain any species common to the Arctic, unless they be at the same time cosmopolitan or nearly so.

The eastern seaboard of the Atlantic is very different in character to that of the western, the European waters having many species in common with the Arctic, of which several persist down to the extreme southerly point of the African continent. In addition, the European species are, numerically, well represented at Cape Town and, as I have shown in a recent paper (1933, pp. 242—43), persist with diminishing intensity round to the Natal coast.

Our knowledge of the eastern and western seaboard of the Pacific is slight compared with that of both sides of the Atlantic, but here again my own researches, combined with the published accounts of other authors enable me to speak with a fair degree of certainty. Thus on the Asiatic side of the Pacific, as far north as Amoy (China), the fauna is definitely Indo-Pacific in character, while around the Japanese Islands there is a mixing of Arctic and Indo-Pacific elements. More striking, however, is the fact that no Arctic species have so far been recorded for the Indo-Pacific by the various authors who have worked on this area, nor is there anything in the large collections of the Siboga Expedition, which I have examined with some degree of thoroughness in anticipation of future publication, to lead us to think otherwise. A few species are common to Europe and the Indo-Pacific, but these

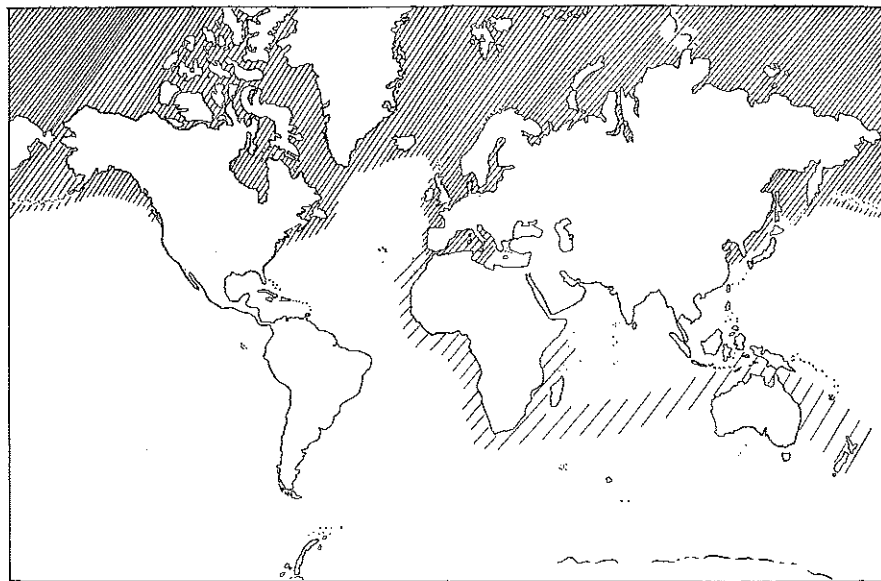


Fig. 3. Map showing distribution of Arctic sponge-fauna, with extra-Arctic range of many species. It may be seen that the majority of Arctic species of sponges extend no farther southwards than approximately latitude 40° N on each side of the two continents, and that the only exceptions to this are a number of species (represented by lighter shading) which are found down the eastern seaboard of the Atlantic, around the southern end of the African continent, and around Australia and New Zealand.

do not extend into the Arctic and their distribution can, as a rule, be traced through the Indian Ocean and around the southern end of the African continent.

On the eastern side of the Pacific, we have evidence from the recent work of de Laubenfels (1932) that along the western seaboard of the U. S. A. the sponge fauna, though containing a few species originally described from the Pacific coast of Canada is more typical of the faunas of temperate and tropical seas, and does not contain a single Arctic species. From this point southwards the fauna is more closely allied to that of the Antarctic and, in spite of the comparatively meagre state of our knowledge of the sponges inhabiting these regions, it can be definitely accepted that there is no sign of a continuous distribution of Arctic species along the eastern seaboard of the Pacific such as is found along the eastern seaboard of the Atlantic.

b) The distribution of *Stylocordyla borealis* subsp. *typica*.

In contrast to the species discussed in the previous section *Stylocordyla borealis* subsp. *typica* appears to follow a different line of distribution. So far as the records go, this species has been found in the Arctic, off the coasts of Western Europe, along the eastern coast



Fig. 4. Map showing distribution of *Stylocordyla borealis* (Lovén), suggesting that deep-water species follow a different line of distribution to the shallow-water species (cf. with fig. 3).

of North and South America as far south as Bahia, off Japan, and between Marion and Crozet Islands. Judging merely from the plan presented when the distribution of this species is plotted on a map, it appears as if the distribution of the species follows a line on the western side of the Atlantic comparable to that followed by *Mycale lingua*, *Polymastia mammillaris*, etc. on the eastern side. The probability is, however, that the subspecies is equally distributed throughout the Atlantic. But whatever may be the case, it seems probable that the distribution of typically deep-sea species does not follow the same lines as that of typically shallow-water, or only occasionally deep-sea, species. In future considerations of the distribution of sponges, it will be well therefore to make a careful distinction between deep-sea and shallow-water species to see how far this holds good.

In contrast to the distribution of the subsp. *typica*, the other three subspecies of *S. borealis*, *globosa*, *acuata* and *irregularis*, show a line of dispersal which approximates closely to the southerly part of the distribution of the shallow-water species (*Mycale lingua*, etc.). With *typica*

probably extending throughout the Atlantic and into the Southern Ocean, *globosa* occupying the Kerguelen area, *irregularis* occurring off Wilhelm Land and *acuata* extending throughout the Antarctic and making its way up into the Sub-Antarctic by way of Graham Land and South Georgia, we have a distribution, so far as the species as a whole is concerned, almost parallel to the Europo-Australasian-Antarctic distribution of the shallow-water Arctic species discussed in section a, except that the Atlantic distribution is mainly on the western side of the ocean. The significance of this is, however, not immediately apparent, but it serves to emphasize the possibility that the distribution of shallow-water and deep-sea sponges is markedly different.

Stylocordyla borealis presents another feature of importance. The similarity between the four subspecies suggests that they are not of great age, and by comparison with the distribution of Antarctic species generally it would appear that *acuata* is still spreading¹. The restricted distribution of *irregularis* is significant in this respect, and suggests that this is the last of the four subspecies to arise. The recent age of the other three subspecies is further suggested by the abundance in which they are found in any given locality.

List of Stations where Sponges have been collected.

Expedition 1930.

Sample No. 1016.

Herschelhus, July 19. Depth: 53—43 m. Bottom: clay mixed up with sand. Species: *Tetilla geniculata*.

Sample No. 1017.

Herschelhus, July 19. Depth: 80—78 m. Bottom: clay. Species: *Suberites carnosus*.

Sample No. 1018.

Herschelhus, July 19. Depth: 83—35 m. Bottom: clay with stone. Species: *Tetilla geniculata*.

Samples Nos. 1019, 1020, 1021.

Revet, Claveringfjorden, July 22. Depth: 25 m. Bottom: viscous clay. Species: *Tetilla polyura*.

¹ In general, it may be said that where a species is common to the Antarctic and the Magellan Area of the Sub-Antarctic, it is the more abundantly represented in the Antarctic, which may mean that migration of such species has been from the Antarctic northwards, in the region of the Magellan Area. *S. borealis* var. *acuata* has the appearance of being in process of migration.

Sample No. 1038.

Loch Fine, July 26. Depth: 14—3 m. Bottom: stone with brown and red algae. Species: *Oscarella lobularis*, *Haliclona aqueductus*, *Haliclona rufescens*, *Halichondria panicea*.

Sample No. 1044.

Claveringfjorden, vis à vis K. Stosch, July 28. Depth: 30 m. Bottom: dead shells, mainly of *Cardium*, *Mya*, and *Saxicava*. Species: *Sycon ciliatum*.

Sample No. 1063.

Mackenziebukta, August 2. Depth: 40 m. Bottom: mud with some red algae. Species: *Sycandra utriculus*.

Sample No. 1066.

Mackenziebukta, August 2. Depth: 83—63 m. Bottom: mud. Species: *Leucosolenia macleayi*, *Radiella sol*.

Sample No. 1067.

Kap Humboldt, August 3. Depth: 30—20 m. Bottom: stone with Lithothamnium. Species: *Leucosolenia macleayi*, *Aplysilla rosea*.

Sample No. 1081.

Alpfjorden, August 8. Depth 70 m. Bottom: clay with stone. Species: *Leucosolenia macleayi*, *Mycale lingua*.

Sample No. 1087.

Antarctichamna, August 10. Depth: 100 m. Bottom: clay with stone. Species: *Artemisina arciger*, *Radiella grimaldi*.

Sample No. 1092.

Forsbladfjorden, August 12. Depth: 300 m. Bottom: clay. Species: *Grantia mirabilis*, *Iophon frigidus*, *Iophon piceus*, *Crella pyrula*, *Siphonocalypta elegans*.

Sample No. 1101.

K. Oscars Fjord, outside Kempefjord, August 12. Depth: 100—55 m. Bottom: Clay with stone. Species: *Artemisina arciger*, *Lissodendoryx indistincta*, *Radiella sol*, *Tentorium semisuberites*.

Sample No. 1116.

Vegasund, August 15. Depth: 250 m. Bottom: clay. Species: *Asbestopluma lycopodium*.

Sample No. 1131.

South of Kap Bennet, August 20. Depth: 290 m. Bottom: clay. Species: *Isodictya flabelliformis*, *Mycale lingua*, *Artemisina arciger*, *Iophon piceus*, *Psammopemma finmarchica*.

Expedition 1931.*Sample No. 9.*

74° 56' Lat. N., 12° 50' Long. W., July 23. Depth: 200 m. Bottom: clay. Temp. (at 150 m): — 1,65° C. Species: *Schaudinnia rosea*, *Trichasterina borealis*, *Scyphidium septentrionale*, *Thenea muricata*, *Stelletta normani*, *Tetilla cranium*, *Adocia tenera*, *Cladorhiza corticocancellata*, *Lissodendoryx fragilis*, *L. complicata*, *Iophon piceus*, *Tentorium semisuberites*, *Spongia carteri*.

Sample No. 18.

West of Bontekoe-øya, August 3. Depth: 275 m. Bottom: clay. Temp. (at the bottom): — 0,06° C. Species: *Halichondria osculum*, *Mycale lingua*, *Tentorium semisuberites*.

Sample No. 20.

K. Oscars Fjord, north of Kap Petersen, August 4. Depth: 250—60 m. Bottom: clay. Species: *Mycale lingua*.

Sample No. 34.

Claveringfjorden, outside Grantafjorden, August 12. Depth: 115 m. Bottom: clay. Temp. (near the bottom): — 1,46° C. Species: *Halichondria panicea*.

Sample No. 36.

South of Kap Mary, August 13. Depth: 250—230 m. Bottom: clay. Temp. (near the bottom): — 1,16° C. Species: *Radiella sol*.

Sample No. 37.

South of Hold with Hope, August 14. Depth: 310—260 m. Bottom: clay with stone. Temp. (near the bottom): — 0,21° C. Species: *Siphonocalypta elegans*.

Sample No. 47.

Frans Josefs Fjord, NE of Kap Petersen, August 17. Depth: 462—400 m. Bottom: clay with stone. Temp. (near the bottom): — 0,03° C. Species: *Schaudinnia rosea*.

Sample No. 55.

Dusénfjorden, August 20. Depth: 185—75 m. Bottom: clay. Temp. (at 60 m): — 1,2° C. Species: *Schaudinnia rosea*, *Mycale lingua*, *Mycale strelnikovi*.

Expedition 1932.*Sample No. 527.*

Holmbukta, K. Oscars Fjord, July 31. Depth: 100 m. Bottom: reddish brown clay. Temp. (near the bottom): — 1,15° C. Sal.: 33,57 ‰. Species: *Mycale arctica*, *Iophon piceus*, *Artemisina arciger*.

Sample No. 548.

Nathorst Fjord, August 4. Depth: 137 m. Bottom: reddish brown clay. Temp. (near the bottom): — 1,76° C. Sal.: 33,71 ‰. Species: *Trichasterina borealis*, *Oscarella lobularis*, *Thenea muricata*, *Geodia nodastrella*, *Geodia mesotriaena*, *Haliclona oblonga*, *Mycale lingua*, *Ectyodoryx loyningi*, *Artemisina arciger*, *Tentorium semisuberites*, *Spongia carteri*.

Sample No. 549.

K. Oscars Fjord, vis à vis K. Petersens, August 4. Depth: 432 m. Bottom: clay. Temp. (near the bottom): 1,08° C. Sal.: 34,77 ‰. O₂: 7,22 cc., 92,2 ‰. Species: *Haliclona jugosa*, *Mycale lingua*.

Sample No. 562.

East of Bontekoe-øya, August 9. Depth: 168 m. Bottom: greyish blue clay with stone. Temp. (near the bottom): — 1,40° C. Sal.: 34,14 ‰. O₂: 7,56 cc., 90,1 ‰. Species: *Grantia capillosa*, *Oscarella lobularis*, *Thenea muricata*, *Tetilla cranium*, *Mycale arctica*, *Cornium textile*, *Polymastia mammillaris*, *Polymastia robusta*, *Polymastia uberrima*, *Tentorium semisuberites*, *Radiella grimaldi*, *Latrunculia triloba*, *Spongia carteri*.

Sample No. 615.

Frans Josefs Fjord, West of K. Franklin, August 13. Depth: 170 m. Bottom: blue clay with stone. Temp. (near the bottom): — 1,16° C. Sal.: 34,18 ‰. Species: *Thenea muricata*, *Mycale lingua*, *Halichondria panicea*, *Stylocordyla borealis* subsp. *typica*.

Sample No. 617.

Northeast of Jackson-øya, August 14. Depth: 320 m. Bottom: mud mixed up with clay. Temp. (near the bottom): 1,38° C. Sal.: 34,87 ‰. O₂: 6,84 cc., 87,8 ‰. Species: *Stylocordyla borealis* subsp. *typica*.

Sample No. 623.

Tyrolerfjorden, near the head, August 15. Depth: 125 m. Bottom: clay and sand. Temp. (near the bottom): — 1,40° C. Sal.: 33,30 ‰. O₂: 6,29 cc., 74,4 ‰. Species: *Grantia capillosa*, *Iophon piceus*.

Sample No. 627.

Tyrolerfjorden, near Young-sundet, August 15. Depth: 320 m. Bottom: clay mixed up with sand. Temp. (near the bottom): — 1,73° C. Sal.: 33,54 ‰. O₂: 6,65 cc., 78,2 ‰. Species: *Stelodoryx pluridentata*, *Ficulina lütkenii*.

Sample No. 644.

Dusénfjorden, August 19. Depth: 300 m. Bottom: reddish brown clay with mud. Temp. (near the bottom): — 1,59° C. Sal.: 33,79 ‰. O₂: 6,51 cc., 76,9 ‰. Species: *Amphilectus columnata*.

List of sponges hitherto known from East-Greenland
North of 71° 30' N. Lat.

Species	2. Deutsche Nordpolarfahrt 1869-70	Ryder Expedi- tion 1891-92	Amdrup Expe- dition 1900	Duc d'Orleans 1905	Danmark Expeditions 1906-08	Norwegian Expeditions 1930, 1931, 1932
Phylum Nuda						
Order Hexactinellida						
Family Rossellidae						
Genus Asconema						
A. setubalense Kent	-	-	-	-	+	-
Genus Schaudinnia						
S. rosea (Fristedt)	-	-	+	-	-	+
Genus Trichasterina						
T. borealis Schulze	-	-	-	-	-	+
Genus Scyphidium						
S. septentrionale Schulze	-	-	-	-	-	+
Genus Rhabdocalyptus						
R. arcticus Brøndsted	-	-	-	-	+	-
Phylum Gelatinosa						
Order Calcarea						
Family Homocoelidae						
Genus Leucosolenia						
L. fabricii Schmidt	-	+	-	-	-	-
L. coriacea (Montagu)	-	-	-	-	+	-
L. macleayi (Lendenfeld)	-	-	-	-	-	+
Family Sycettidae						
Genus Sycon						
S. ciliatum (Fabricius) Autt.	-	-	-	-	-	+
S. arcticum (Haeckel)	-	-	-	-	+	-
Genus Sycandra						
S. utriculus (Schmidt)	-	-	-	-	-	+
Family Grantiidae						
Genus Grantia						
G. capillosa (Schmidt)	-	-	-	-	-	+
G. mirabilis (Fristedt)	-	-	-	-	-	+
Genus Achramorpha						
A. schulzei (Breitfuss)	-	-	+	-	-	-
Genus Leuconia						
L. ananas (Montagu)	-	-	-	-	+	-
Order Tetraxonida						
Sub-order Homosclerophora						
Family Plakinidae						
Genus Oscarella						
O. lobularis (Schmidt)	-	-	-	-	-	+
Sub-order Streptastrosclerophora						
Family Theneidae						
Genus Thenea						
T. muricata (Bowerbank)	-	+	+	+	-	+
Sub-order Astrosclerophora						
Family Stelletidae						
Genus Stelletta						
S. normani Sollas	-	-	-	-	-	+
Family Geodiidae						
Genus Geodia						
G. nodastrella Carter	-	-	-	-	-	+
G. mesotriaena (Hentschel)	-	-	-	-	-	+

List of sponges (continued).

Species	2. Deutsche Nordpolarfahrt 1869-70	Ryder Expedi- tion 1891-92	Amdrup Expe- dition 1900	Duc d'Orleans 1905	Danmark Expedition 1906-08	Norwegian Expeditions 1930, 1931, 1932
Order Tetraxonida (cont.)						
Sub-order Sigmatosclerophora						
Family Tetillidae						
Genus Tetilla						
T. cranium (Müller)	-	+	-	-	-	+
T. geniculata Marenzeller	-	-	-	-	-	+
T. polyura Schmidt	-	-	-	-	-	+
Family Haploscleridae						
Genus Haliclona						
H. jugosa (Bowerbank)	-	-	-	-	-	+
H. aquaeductus (Schmidt)	-	-	-	-	-	+
H. oblonga (Hansen)	-	-	-	-	-	+
H. rufescens (Lambe)	-	-	-	-	-	+
? H. clavata (Levinsen)	-	+	-	-	-	-
H. porosus (Fristedt)	-	-	+	-	-	-
H. arcoferus (Vosmaer)	-	+	-	+	-	-
H. plexa (Lundbeck)	-	+	-	-	-	-
Genus Adocia						
A. cinerea (Grant)	-	-	-	-	+	-
A. tenera (Marenzeller)	-	-	-	-	-	+
Family Desmacidonidae						
Genus Isodictya						
I. flabelliformis (Hansen)	-	-	-	-	-	+
Genus Biemna						
B. variantia (Bowerbank)	-	-	+	-	-	-
Genus Mycale						
M. arctica (Fristedt)	-	-	-	-	-	+
M. lingua (Bowerbank)	-	+	-	+	-	+
M. thaumatochela Lundbeck	-	-	-	-	+	-
M. strelnikovi Rezvoi	-	-	-	-	-	+
M. intermedia (Schmidt)	+	-	-	-	-	-
Genus Amphilectus						
A. columnata (Topsent)	-	-	-	-	-	+
Genus Esperopsis						
E. typichela Lundbeck	-	-	+	-	-	-
Genus Asbestopluma						
A. lycopodium Levinsen	-	-	-	-	-	+
A. cupressiformis Carter	-	+	-	-	-	-
Genus Cladorhiza						
C. corticocancellata Lundbeck	-	-	-	-	-	+
Genus Lissodendoryx						
L. indistincta (Fristedt)	-	-	-	-	+	+
L. fragilis (Fristedt)	-	-	-	-	-	+
L. complicata (Hansen)	-	-	-	-	+	+
Genus Ectyodoryx						
E. loyningi n. sp.	-	-	-	-	-	+
Genus Stelodoryx						
S. pluridentata (Lundbeck)	-	-	-	-	-	+
Genus Cornulum						
C. textile (Carter)	-	+	-	-	-	+
Genus Forcepia						
F. fabricans (Schmidt)	+	+	+	-	-	-

List of sponges (continued).

Species	2. Deutsche Nordpolarfahrt 1869-70	Ryder Expedi- tion 1891-92	Amdrup Expe- dition 1900	Duc d'Orleans 1905	Danmark Expedition 1906-08	Norwegian Expeditions 1930, 1931, 1932
Order Tetraxonida (cont.)						
Genus Iophon						
I. piceus (Vosmaer)	-	+	-	-	-	+
I. frigidus Lundbeck	-	+	-	-	-	+
Genus Tedania						
T. suctoria Schmidt	-	+ (?)	-	-	-	-
Genus Crella						
C. pyrula (Carter)	-	-	-	-	-	+
Genus Hymedesmia						
H. dujardini (Bowerbank)	-	-	+	-	-	-
H. truncata Lundbeck	-	+ (?)	-	-	-	-
H. lacera Lundbeck	-	-	+	-	-	-
H. dermatia Lundbeck	-	-	+	-	-	-
Genus Artemisia						
A. arciger Schmidt	-	-	+	-	-	+
A. appollinis Ridley and Dendy	-	+ (?)	-	-	-	-
Family Axinellidae						
Genus Tragosia						
T. infundibuliformis (Johnston)	+	-	-	-	-	-
Genus Phakellia						
P. bowerbanki Vosmaer	-	-	-	+	-	-
Genus Higginsia						
H. piriformis Brøndsted	-	-	-	-	+	-
Genus Halichondria						
H. panicea (Pallas)	-	-	-	-	-	+
H. oblonga (Hansen)	-	+	-	-	-	-
H. osculum Lundbeck	-	-	-	-	-	+
H. tenuispiculata Brøndsted	-	-	-	-	+	-
Genus Eumastia						
E. sitiens Schmidt	-	-	+ (?)	-	-	-
Genus Siphonocalyptra						
S. elegans (Vosmaer)	-	-	-	-	-	+
Family Clavulidae						
Genus Suberites						
S. carnosus (Johnston)	-	-	-	-	-	+
Genus Stylocordyla						
S. borealis (Lovén) subsp. ty- pica Burton	-	-	-	-	-	+
Genus Ficulina						
F. lütkenii (Schmidt)	-	-	-	-	-	+
F. ficus Linné	-	-	-	+	-	-
Genus Polymastia						
P. mammillaris (Müller) Autt.	-	-	-	-	-	+
P. robusta (Bowerbank) Autt.	-	-	-	-	-	+
P. uberrima (Schmidt)	-	-	+	+	-	+
Genus Radiella						
R. sol Schmidt	-	-	-	-	-	+
R. grimaldi (Topsent)	-	-	-	-	-	+
Genus Tentorium						
T. semisuberites (Schmidt)	+	+ (?)	+	-	-	+
Genus Quasillina						
Q. brevis (Bowerbank)	-	+	-	-	-	-

List of sponges (continued).

Species	2. Deutsche Nordpolarfahrt 1868-70	Ryder Expedi- tion 1891-92	Amdrup Expe- dition 1900	Duc d'Orleans 1905	Danmark Expedition 1906-08	Norwegian Expeditions 1930, 1931, 1932
Order Tetraxonida (cont.)						
Genus Latrunculia Bocage						
L. triloba (Schmidt)	-	-	-	-	-	+
Order Keratosa						
Genus Halisarca						
H. dujardini Johnston	+	-	-	-	-	-
Genus Aplysilla						
A. rosea Schulze	-	-	-	-	-	+
Genus Spongia						
S. carteri Burton	-	-	-	-	-	+
Genus Psammopemma						
P. finmarchica Hentschel	-	-	-	-	-	+

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