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BRYOZOA
FROM JØRGEN BRØNLUND FJORD,
NORTH GREENLAND

BY

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Abstract

From Jørgen Brønlund Fjord, North Greenland, 26 species of Bryozoans are listed.

Five species are new to Greenland, viz. *Crisia klugei* RYLAND, *Ramphonotus gorbunovi* KLUGE, *Tegella armiferoides* KLUGE, *Escharoides bidenkapi* (KLUGE), *Escharella octodentata* KLUGE.

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INTRODUCTION

On the First Peary Land Expedition in the years 1947-50, some collections were made by P. JOHNSEN, Ph.D. The material has been at my disposal, and the results are included in the present paper.

During the Fourth Peary Land Expedition in the summer of 1966 marine investigations of Jørgen Brønlund Fjord (82°10'N-30°30'W) were carried out for the first time on a larger scale.

Twenty-six species of Bryozoans were found, five of which are new to Greenland, viz., *Crisia klugei* RYLAND, *Ramphonotus gorbunovi* KLUGE, *Tegella armiferoides* KLUGE, *Escharoides bidenkapi* (KLUGE), *Escharella octodentata* KLUGE.

A survey of the physiography of Jørgen Brønlund Fjord, including notes on hydrography, bottom-types, vegetation of algae, etc., and list of stations have been given by JUST (1970).

I am deeply indebted to Mrs. K. BILLE HANSEN for her great help during my work, and I want to thank Mrs. VOLSØE for translating this work into English.

SYNOPSIS ON THE SPECIES

Cyclostomata

Idmoneidae

1. *Idmonea* sp.

Material:

St. 52, 160–180 m. 4 fragments. St. 56, clay, 190–200 m, 5 fragments.

Remarks:

In the fragment from St. 52 a gonozoecium is present, but as it is damaged, no gonozoeciostom is seen.

The fragments agree well with the description of *I. atlantica* var. *gracillima* BUSK, given by KLUGE, 1962, p. 111, fig. 45.

Entalophoridae

2. *Entalophora clavata* (BUSK)

Entalophora clavata HINCKS, 1880, p. 456, pl. 65, figs. 5–8.

- - LEVINSEN, 1914, p. 618.
- - MARCUS, 1940, p. 76, text fig. 41.
- - HANSEN, 1962, p. 10.
- - KLUGE, 1962, p. 117, fig. 51.

Material:

St. 52, 160–180 m, 4 colonies. St. 55, 80 m, 8 fragments. St. 56, 190–200 m, 1 fragment. St. 69, 40–45 m, 6 colonies. St. 70, 40–45 m, 4 colonies.

Remarks:

Gonozoecia present in some of the colonies. Gonozoeciostom semi-circular, partly inserted in the wall of the nearest zooecium.

Corymboporidae

3. *Defrancia lucernaria* M. SARS

Defrancia prolifera KLUGE, 1946, p. 215, tab. IV, fig. 6.

Defrancia lucernaria var. *prolifera* KLUGE, 1962, p. 134, fig. 62.

Material:

St. 56, 190–200 m, 2 colonies.

Remarks:

KLUGE op. cit. writes about *D. lucernaria* var. *prolifera* (translated from Russian): "The zoarians are stem-like and cup-shaped. Along the margin of the main cup one or several (up to four) similar daughter-zoarians are situated which again, along their borders, may have zoarian-descendants, however of a smaller size. As a result of this, a complicated zoarian in three tiers is formed; the majority of the zoarians are placed in two tiers. The zoarians are small, measuring as a rule from 3 to 7 mm in height, and from $1\frac{1}{2}$ to $7\frac{1}{2}$ mm in breadth, the diameter of the plates of the single zoarian varies between $1\frac{1}{4}$ mm and $5\frac{3}{4}$ mm. A few zoarians may however attain greater measurements, right up to 12 mm in diameter.

Some zoarians show a structure which is very similar to that of *Defrancia lucernaria*; on the upper frontal side of the plate there are, radially situated, complicated rows or bunches of zooecia which on the border of the plate constitute the attachment of daughter-zoarians; in other zoarians these complicated rows of zooecids are almost invisible, and only appear at the border itself of the plate. No oocidia have been observed.

The species lives on calcareous tubes and pebbles at a depth of from 58 m to 440 m, more frequently from 250 m to 300 m, on clayish and stony bottom, at a temperature ranging from 0.5°C. below zero to 1.4°C. below zero, with a salinity from 34.21‰ to 34.92‰.

This description closely agrees with the colonies found in Peary Land. KLUGE states the distribution to be the southwestern part of the Barents Sea, and the northern part of the Kara Sea; moreover, this species is stated to be arctic.

Crisiidae

Crisia denticulata var. *borgi* KLUGE, 1962, p. 157, fig. 78.

Crisia species 4: RYLAND, 1963a, p. 7.

Crisia klugei RYLAND, 1967, p. 275, fig. 3.

Material:

St. 70, 40–45 m, 4 colonies and several fragments. One colony on leg of *Caetonymphon hirtipes* (BELL) found by P. JOHNSEN in 1947 (St. no. 2001, see JUST, 1970).

Remarks:

The specimens found all agree with the species described by RYLAND (1967); however, not all joints are pale yellow, since there are all transitions to strongly darkbrown, depending on the age of the colony, so that

the oldest joints are the darkest. The four colonies on *Arca (Bathyarca) glacialis* GRAY.

Lichenoporidae

5. *Lichenopora verrucaria* (FABRICIUS)

Madrepora verrucaria FABRICIUS, 1780, p. 430.

Discoporella verrucaria SMITT, 1866, pp. 405 and 479, tab. 10, fig. 6–8, tab. 11, figs. 1–6.

Lichenopora verrucaria LEVINSEN, 1914, p. 621.

– – OSBURN, 1953, p. 703, pl. 74, fig. 3.

– – HANSEN, 1962, p. 13.

– – KLUGE, 1962, p. 169, fig. 84.

Material:

A single colony on a leg of *Chaetonymphon hirtipes* (BELL) found by P. JOHNSEN in 1947 (St. no. 2001, see JUST, op. cit.).

Cheilostomata

Anasca

Serupariidae

6. *Eucratea loricata* (L.)

Gemellaria loricata SMITT, 1867, pp. 286, 324, tab. 17, fig. 54.

– – LEVINSEN, 1914, p. 565.

– – OSBURN, 1936, p. 541.

Eucratea loricata HANSEN, 1962, p. 14.

– – KLUGE, 1962, p. 261, fig. 147.

Material:

St. 11, 105 m, 1 fragment. (Bottom sampler). St. 40, 30 m, 1 colony. St. 55, 80 m, 1 fragment. St. 69, 40–45 m, 1 colony. St. 70, 40–45 m, 2 colonies on *Arca (Bathyarca) glacialis* GRAY. St. 73, 30 m. Several colonies.

Membraniporidae

7. *Tegella armiferoides* KLUGE

Tegella armiferoides KLUGE, 1962, p. 277, fig. 160.

Material:

St. 73, 30 m, 4 colonies.

Remarks:

The colonies found in Jørgen Brønlund Fjord agree very well with the description and fig. in KLUGE op. cit.

KLUGE records this species from the East Siberian Sea near the New Siberian Islands. Depth 73–91 m.

The species is new to Greenland.

8. *Ramphonotus gorbunovi* KLUGE

Ramphonotus gorbunovi KLUGE, 1946, p. 197, fig. 2.

- - - 1962, p. 300, fig. 183.

Material:

St. 52, 160–180 m, 4 colonies. St. 55, 80 m, 1 small colony.

Remarks:

On the present species KLUGE 1962 writes as follows (translated from Russian):

“The zoarian consists of zooecia which are placed in more or less regularly oblique rows. The zooecia are big and oval.

The frontal membrane occupies the greater part of the frontal surface, and is surrounded by a thin, elevated margin, steeply sloping from the outside, whereby the zooecia by depressions are distinctly separated from each other. The gymnocyst is weakly developed. In the distal part the cryptocyst slopes more or less steeply towards the opesium, while it is only faintly sloping in the proximal part. The shape of the opesium is faintly roundedly square, as in *R. mimax*, but in contrast to the latter species the height of the opesium along the median line is $1\frac{1}{2}$ to 2 times smaller than the height of the cryptocyst. The proximal part of the opesium is strongly curved into the cavity of the zoecium, continuing laterally until it fuses with the lateral walls of the zoecium. This invaginated border can be discerned through the wall of the cryptocyst, and from the outside looks like a strongly refractive, narrow girdle, which surrounds the proximal border of the opesium. In each distal corner of the elevated border of the frontal membrane generally one, sometimes two, protuberances are placed. At the proximal border of the frontal membrane, at its transition to the gymnocyst, one, sometimes even two, frontal avicularians are generally situated. The avicularium is placed on a not especially high, broad, cone-shaped elevation, its rostrum is elevated at the tip, and the long mandible, which tapers toward the apex, is directed obliquely laterally.

The ovicells are globular, not particularly bulging, their outer surface is covered by the above lying cryptocysts of the neighbouring zooecia. The opening of the ovicells is closed by a special, semi-round lid.

The species occurs on shells and stones, at depths from 60 m to 180 m.

The species has been found in the East Siberian Sea and at the border of the New Siberian shallow water.”

The species found in Jørgen Brønlund Fjord closely agrees with the above description.

The species is new to Greenland.

Flustridae

9. *Sarsiflustra abyssicola* (M. Sars)

Flustra abyssicola M. Sars, 1872, p. 19, pl. 2, figs. 25-30.

Sarsiflustra abyssicola LEVINSEN, 1914, p. 571.

- - NORDGAARD, 1918, p. 31.

- - HANSEN, 1962, p. 16.

- - KLUGE, 1962, p. 319, fig. 199.

Material:

St. 62, 160-180 m, 1 colony.

Scrupocellaridae

10. *Tricellaria peachi* (Busk)

Cellularia peachi SMITT, 1867, pp. 285, 322, tab. 17, figs. 51-53.

Bugulopsis peachi LEVINSEN, 1914, p. 568.

- - KLUGE, 1962, p. 367, fig. 229.

Tricellaria peachi HANSEN, 1962, p. 21.

Material:

St. 70, 40-45 m, 1 colony.

Remarks:

The colony is typical with the small spine at the distal outer corner of each Zooecium. No frontal avicularium, no ovicells.

The colony was found on a shell of *Arca (Bathyarca) glacialis* GRAY.

11. *Notoplites smitti* (Norman)

Menipea duplex LEVINSEN, 1886, p. 309, pl. 26, figs. 1-2.

- *smitti* NORMAN, 1868, p. 214.

- - LEVINSEN, 1914, p. 568.

Notoplites smitti KLUGE, 1962, p. 371, fig. 233.

Material:

St. 55, 80 m, few fragments.

Remarks:

The fragments contained three ovicells, which all have the oval non-calcified area on the frontal side of the ecto-ooecium.

12. *Scrupocellaria scabra* (van Beneden)

Cellularia scabra SMITT, 1867, pp. 283, 314, tab. 17, figs. 27-34.

Scrupocellaria scabra var. *paenulata* NORMAN, 1903, p. 579.

- - - OSBURN, 1919, p. 607.

- - HANSEN, 1962, p. 22.

- - var. *paenulata* KLUGE, 1962, p. 380, fig. 240.

Material:

St. 56, 190–200 m, 1 colony on *Stephanoscyphus simplex* KIRKPATRICK.

Remarks:

The present colony is the typical var. *paenulata*, characterized by the great scutum. OSBURN writes about this var.: "It appears to replace the typical form in high northern waters."

Bicellariellidae

13. *Kinetoskias aborescens* (DAN. & KOREN)

Bugula umbela SMITT, 1867, pp. 292, 353, pl. 19, figs. 28–31.

Kinetoskias aborescens LEVINSEN, 1886, p. 9.

- - NORMAN, 1903, p. 580.

- - LEVINSEN, 1914, p. 565.

- - KLUGE, 1962, p. 349, fig. 220.

Material:

St. 40, 30 m, 3 colonies and several fragments. St. 52, 160–180 m, 1 colony. St. 55, 80 m, 1 fragment.

Remarks:

The material from St. 40 was found on a bottom consisting of a mixture of sand and clay, one of the colonies here is very big, 40 mm in height. The material from the two other dredge hauls was found on very fine clay.

Ascophora

Exochellidae

14. *Escharoides jacksoni* WATERS

Discopora appensa SMITT, 1867, appendix, pp. 27, 175, tab. 27, fig. 177.

Smitiina jacksoni WATERS, 1900, p. 87, pl. 12, fig. 18.

Escharoides jacksoni LEVINSEN, 1914, p. 586.

Peristomela jacksoni OSBURN, 1936, p. 541.

Escharoides jacksoni HANSEN, 1962, p. 33.

- - KLUGE, 1962, p. 568, fig. 401.

Material:

St. 69, 40–45 m, 5 colonies and some fragments. St. 70, 40–45 m, 1 colony.

Remarks:

The colonies discussed here were taken on a very clayish bottom, the colonies had been lying freely on the bottom without forming a cover; it

is probable, however, that the colonies commenced as a cover on an organic substratum which deteriorated later on.

The ovicells are rather small, with measurements ruling round 0.33 mm.

15. *Escharoides bidenkapi* (KLUGE)

Peristomela bidenkapi KLUGE, 1946, pp. 200, 218, pl. 2, fig. 6.

Escharoides - KLUGE, 1962, p. 566, fig. 400.

(?)*Escharoides jacksoni* HANSEN, 1962, p. 33.

Material:

St. 52, 160–180 m, 4 colonies. St. 55, 80 m, 1 colony on *Alcyonidium gelatinosum* (L.) and 4 fragments. St. 56, 190–200 m, 2 colonies.

Remarks:

KLUGE (1946) primarily separates this species from *E. jacksoni* by the difference in the shape of the peristomes. Although contested by HANSEN (1962), this difference is very characteristic. In addition, by measuring the ovicells, it proved that there is here a marked difference, since the ovicells in *E. bidenkapi* are essentially bigger than in *E. jacksoni*, so that the diameter in *E. bidenkapi* varies between 0.54 and 0.60 mm, while in *E. jacksoni* it rules between 0.32 mm and 0.40 mm.

Smittinidae

16. *Porella proboscidea* HINCKS

Eschara verrucosa f. *propinqua* SMITT, part. 1867, app. pp. 22, 146, tab. 26, fig. 134.

Porella proboscidea HINCKS, 1888, p. 223.

- - NORDGAARD, 1905, p. 169, pl. 4, figs. 8–11.

- - KLUGE, 1962, p. 459, fig. 306.

Material:

St. 52, 160–180 m, 3 colonies.

17. *Porella concinna* (BUSK)

Porella laevis f. *lepraliae* SMITT, 1967, app., pp. 21, 136, tab. 26, figs. 109–111, 115–119.

Porella concinna HINCKS, 1880, p. 323, pl. 46.

- - LEVINSSEN, 1914, p. 595.

- - MARCUS, 1940, p. 267.

- - HANSEN, 1962, p. 36.

Material:

St. 64, 35–15 m, 4 colonies.

Remarks:

Very small colonies on stones.

18. *Pseudoflustra solida* (STIMPSON)

Escharella palmata SMITT, app., pp. 10, 77, tab. 24, figs. 42-46.

Pseudoflustra solida BIDENKAP, 1897, p. 618.

Smittina solida LEVINSEN, 1914, p. 600.

Pseudoflustra solida HANSEN, 1962, p. 37.

- - KLUGE, 1962, p. 441, fig. 292.

Material:

St. 11, bottom sample, 105 m, 2 colonies. St. 52, 160-180 m, 13 fragments. St. 55, 190-200 m, 1 colony. St. 69, 40-45 m, 4 colonies. St. 70, 40-45 m, 2 fragments.

19. *Pseudoflustra hincksi* KLUGE

Pseudoflustra hincksi KLUGE, 1962, p. 443, fig. 293.

Material:

St. 52, 160-180 m, 1 small colony.

Remarks:

KLUGE (op.cit.) describes the species as follows (translated from Russian).

"The zoarian is erect, shovel-shaped flattened with a bilateral placing of the zooecia. The zooecia are large (length 1.05 mm, breadth 0.30 mm), of pronounced elongate, rectangular shape, thin-walled, glassy. The frontal surface is moderately inflated, smooth, compact, surrounded by a projecting border, along which are placed short, transversal, vertical partitions. The hereby formed divisions or chambers extend for a short distance along the edges of the calcareous disc, leaving the greater part of their surface open like big holes of irregular shape. The entire frontal surface is covered by a membrane, which in many zooecia in the proximal part continues as a strongly chitinized tube, which fuses with a similar tube from the neighbouring zooecia to bunches, by means of which the zoarian is attached to the substrate. The primary aperture situated at the distal end of the zoecium is semi-circular with invaginated proximal edge, in the middle of which is found a not very deep sinus. Along the sides of the triangle thus formed cardelles seem to deepen the sinus. In the cardelles a chitinous operculum is suspended, which—corresponding to the shape of the primary aperture—has a semi-circular lirula on the proximal border. In zooecia with ovicells along the sides of the primary aperture a faintly developed peristome can be seen, whose distal ends reach to the ovicell, but does not project on its frontal surface. Posteriorly, on the proximal border of the primary aperture, there is a small, oval avicularium, with a semi-circular mandibula, whose chamber extends to both sides to the lateral borders of the zoecium. The ovicells are hyperstomial, with an incompletely calcified outer layer and a smooth

frontal surface of the interior layer, which is covered by a few (from 4 to 7) pores, placed differently in the individual zooecia. In the lateral wall of the zooecium there are four pore discs with three to four pores in each. In the distal partition wall five to six simple pore discs, situated in the middle of the lower half of the partitioning wall.

P. hincksi lives on bryozoans, shells and stones, at a depth of 40 m to 445 m, most often from 100 m to 200 m, at a temperature from 1.68 C. below zero to 4.95 C. at a salinity of 34.65‰ to 34.95‰.

Distribution. The species was ascertained by the present author in the Barents, Karsk, Laptev and East Siberian seas, and off East Greenland. Literature records: Sct. Lawrence Gulf (HINCKS, 1892; WHITEAVES, 1901) Gulf of Maine (VERRILL, 1879b). The species is arctic."

The species found in Peary Land fully agrees with the description above.

20. *Escharella abyssicola* (NORMAN)

Escharella abyssicola LEVINSEN, 1914, p. 585.

- - KLUGE, 1962, p. 407, fig. 260.

Material:

St. 52, 160–180 m, 1 colony.

Remarks:

One very small colony on a pebble.

21. *Escharella octodentata* (KLUGE)

Mucronella peachi var. *octodentata* HINCKS, 1880, p. 360, plate LI, fig. 2.

Escharella octodentata KLUGE, 1962, p. 409, fig. 262.

Material:

St. 52, clay, 160–180 m, dredge haul, 2 colonies.

Remarks:

The colonies agree well with the description given in HINCKS op. cit.
The species is new to Greenland.

Reteporidae

22. *Phidolopora elongata* (SMITT)

Retepora elongata LEVINSEN, 1886, p. 323, tab. 27 m, fig. 12.

- *wallichiana* LEVINSEN, 1914, p. 611.

- *elongata* KLUGE, 1962, p. 527, fig. 368.

Phidolopora elongata HANSEN, 1962, p. 45.

Material:

St. 69, 40–45, 1 fragment.

Celleporidae

23. *Schismopora nodulosa* (LORENZ)

Cellepora nodulosa NORDGAARD, 1905, p. 172, pl. 3, figs. 21–24.

– – KLUGE, 1962, p. 557, fig. 391.

Schismopora nodulosa HANSEN, 1962, p. 47.

Material:

St. 69, 40–45 m, 2 colonies.

Remarks:

Both colonies on *Pseudoflustra solida* (STIMPSON).

Ctenostomata

Alcyonidiidae

24. *Alcyonidium gelatinosum* (L.)

Alcyonidium gelatinosum SMITT, 1866, pp. 497, 512, tab. 12, figs. 9–13.

Alcyonidium gelatinosum LEVINSEN, 1914, p. 624.

Material:

St. 40, 30 m, 1 colony on *Astarte* sp. St. 52, 160–180 m, 4 colonies. St. 69, 40–45 m, 1 colony. St. 70, 40–45 m, 2 colonies on *Astarte* sp. and *Arca (Bathyarca) glacialis* GRAY. St. 73, 30 m, 2 colonies on *Arca (Bathyarca) glacialis* GRAY.

Remarks:

The present colonies are all very small, the largest is 25 mm high.

25. *Alcyonidium mamillatum* ALDER

Alcyonidium mamillatum HINCKS, 1880, p. 495, pl. 69, figs. 7, 8.

– – ANDERSON, 1902, p. 553, tab. 30, fig. 6.

– – LEVINSEN, 1914, p. 624.

Material:

St. 41, 50 m, 1 colony. Two colonies found by P. JOHNSEN in 1947 (St. no. 2001, see JUST, 1970).

Remarks:

All three colonies were found on legs of *Chaetonymphon hirtipes* (BELL). Number of tentacles: 23.

26. *Alcyonidium disciforme* SMITT

Alcyonidium mamillatum var. *disciforme* SMITT, 1872, p. 1122-1123.

- *disciforme* LEVINSEN, 1914, p. 625.

- - OSBURN, 1953, p. 730, pl. 77, figs. 5-6.

Material:

St. 52, 160-180 m, 1 colony. St. 55, 80 m, 10 colonies. St. 56, 190-200 m, 3 colonies.

Remarks:

The colonies found are all very small, the largest has a disc diameter of 10 mm.

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