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„Diversity of cheilostome Bryozoa in three Arctic Seamounts: Vesteris, Boyd and Southern Seamount "

verfasst von / submitted by

Milica Djokic, BSc

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Contents

Abstract

The diversity and distribution of bryozoan communities are little known from polar regions. The recent cruise “MSM86 Vesteris Seamount” by the RV MARIA S. MERIAN collected numerous samples of benthic organisms, including abundant bryozoans. The bryozoan diversity of samples from three seamounts, Vesteris Seamount, Southern Seamount and Boyd Seamount, located close to Central Greenland Basin, north to Jan Mayen Island, and in the Mohns Ridge was studied. These localities range from 257-1209m depth where effusive and pyroclastic rocks are dominant in shallow waters and dropstone and mud are found in higher depths. In total, 33 bryozoan species were identified in this study, with eleven remaining in open nomenclature possibly representing new species. The findings from Vesteris complement first surveys from previous studies, whereas bryozoans from the Southern and Boyd Seamounts are described for the first time. Similar to previous reports, *Palmiskenea skenei* (Ellis & Solander, 1786), remains the most dominant cheilostome in all Seamounts. Additionally, this study suggest that the Southern seamount presents a bryozoan community with more affinities to the North Atlantic fauna, while Vesteris and Boyd Seamount show similarities to arctic communities.

Zusammenfassung

Die Vielfalt und Verbreitung der Bryozoengemeinschaften ist aus den Polarregionen wenig bekannt. Die jüngste Kreuzfahrt „MSM86 Vesteris Seamount“ des FS MARIA S. MERIAN sammelte zahlreiche Proben benthischer Organismen, darunter zahlreiche Bryozoen. Die Bryozoenvielfalt der Proben von drei Seamounts, Vesteris Seamount, Southern Seamount und Boyd Seamount, die sich in der Nähe des zentralen Grönlandbeckens, nördlich der Insel Jan Mayen und im Mohns Ridge befinden, wurde untersucht. Diese Fundstellen reichen von 257 bis 1209 m Tiefe, wo in seichten Gewässern effusives und pyroklastisches Gestein vorherrscht und in höheren Tiefen Tropfstein und Schlamm zu finden sind. Insgesamt wurden in dieser Studie 33 Bryozoenarten identifiziert, von denen elf in der offenen Nomenklatur möglicherweise neue Arten darstellen. Die Ergebnisse von Vesteris ergänzen erste Untersuchungen aus früheren Studien, während Bryozoen aus den Southern Seamounts und Boyd Seamounts zum ersten Mal beschrieben werden. Ähnlich wie in früheren Berichten bleibt Palmiskenea skenei (Ellis & Solander, 1786) das dominanteste Cheilostomata in allen Seamounts. Darüber hinaus legt diese Studie nahe, dass der südliche Seamount eine

Bryozoengemeinschaft mit größerer Affinität zur nordatlantischen Fauna aufweist, während Vesteris und Boyd-Seamounts Ähnlichkeiten mit arktischen Gemeinschaften aufweisen.

1.Introduction

Although over 21000 species of plants, fungi and animals have been described from the Arctic fauna there is still considerable lack of knowledge on polar biodiversity. The arctic marine environment is amongst the most thermally stable on Earth, but responding to climate change and an increasing demand for Arctic resources are contributing to further human activities with subsequent consequences for Arctic biodiversity (Xavier et al,2016). Hence, knowledge about local faunas is important in order to monitor future changes. Several, mostly taxonomical studies on Arctic bryozoans were previously conducted (e.g. Kluge, 1975; Bader & Schäfer,2005; Dick et al. 2005; Denisenko 2022), and with over 300 species the phylum represents one of the largest macrofauna.

Bryozoa, a phylum of colonial aquatic suspension feeders, comprises over 6,000 recent and over 15,000 fossil species (Bock & Gordon 2013). They are divided into 3 clades: Phylactolaemata, Stenolaemata and Gymnolaemata. Phylactolaemata are sole freshwater inhabitants, Stenolaemata marine, and Gymnolaemata can be found in both aquatic systems. Furthermore, Gymnolaemata is divided in two groups - paraphyletic Ctenostomata and monophyletic Cheilostomata. Phylactolamaeta is a small group of less than 100 species with specific horseshoe-shaped lophophore, soft body wall and free encapsulated buds – statoblasts (Schwaha,2021). From several extinct clades, Cyclostomata is the only living representative of Stenolaemata. Taxonomy of cyclostomes is mainly based on characters of their calcified cystid. Once highly specious, cyclostomes experienced a due mass extinction at the end of the Cretaceous and are now outnumbered by Gymnolaemata (Taylor,2000). Approximately 11190 recent and extinct gymnolaemate species are so far described (https://www.bryozoa.net/diversity.html). Most of them represent cheilostomes, calcified bryozoans that possess many taxonomic characters such as spines or avicularia. A smaller group of about 350 species belong to ctenostomes – bryozoans lacking mineralized skeletons.

Several seamounts, steeply rising underwater mountains, are located in Arctic waters. They are very important marine habitats that provide resources for many species (Rogers,2004). The present study is part of a one-month cruise investigation of Arctic seamounts. The goal of this research program was to map the sea floor, conservation and distribution modelling of arctic

species, but primarily for a better understanding of the biodiversity of three different seamounts in the Arctic waters: Vesteris Seamount , Boyd and Southern Seamount. All three of them are in the Greenland Sea and neighboured by Iceland and Norway.

Most of the cruise samples have been taken from Vesteris Seamount, which is situated in the centre of the Greenland Sea. Most of the year, surface waters of the Vesteris Seamount are covered with ice except for July and August. Therefore, low temperatures (0 to 1° C) and a salinity of 34.5‰ are often constant during the whole year. Vesteris used to be a volcano with Holocene activity but is inactive more recently. It consists of two different substrate structures: Effusive and pyroclastic rocks at depth lower than 300m and mud with drop stones at depth greater than 1000 m. Boyd seamount, the most distant seamount of all three, located at the eastern side of Greenland Sea and much closer to the Mohns Ridge, was so far never previously studied. As inactive volcano, it has three domains: a smooth and soft summit area; a long and steep southeastern slope with erosional gullies and finally a hummocky and hard terrain. The Southern Seamount is located south of the Greenland Sea and is the southernmost of the three seamounts. Unlike the Vesteris Seamount, the Southern Seamount has not been active in the Pleistocene. It is characterized by a thick sedimentary layer containing numerous igneous and sedimentary drop stone coverage (Bach et al,2019).

During the program it has been discovered that these seamounts provide home for many benthic species such as sponges, molluscs, tube worms and others. Studies on the sponge diversity of all sampled localities showed a high number of the bryozoan taxa which together with sponges play an important role in creating bottom structures providing substrate for other marine organisms. Hence, these discoveries set a foundation for further research of Arctic bryozoan biodiversity, but also stress the need for better understanding of different communities and their connection to each other. So far, Arctic bryozoans have been extensively studied (e.g Kluge,1975; Kuklinski & Taylor,2009; Kuklinski,2002), but only a single report briefly described communities of the Vesteris Seamount (Henrich et al. 1992).

The rich sampling coverage over different depths allows to investigate the vertical transect of all three Seamounts and to compare the bryozoan diversity according to different depths and possible current-related effects. Furthermore, we aim to contribute to the present knowledge of biodiversity, biogeographic patterns, diversity and connectivity of the benthic Arctic communities.

2.Material and Methods

The research program of RV MARIA S. MERIAN cruise MSM86 was conducted from 18. August- 17. September, 2019. Four locations were sampled during the cruise with three targeted in the current investigation: Vesteris Seamount, Southern Seamount and Luise Boyd Seamount (Fig.1). Samples were taken with the ROV MARUM-SQUID (at Vesteris Seamount) and a TV-guided grab (in all 3 Seamounts). Also, photographs and images were taken to characterize the habitat. Samples studied were collected in 14 localities at depth ranges from 257m – 1209m (Vesteris Seamount 257m- 960m; Louise Boyd 665m - 1209m, Southern Seamount 536m – 733m) (Table 1). Benthos of the Vesteris Seamount consists of vesicular alkali basalts and scoria, hyaloclastites and ashes, while some shallower parts are dominated by volcaniclastic rocks, where bryozoan and sponge communities are particularly dominant. From 52 samples, 12 sampling points were investigated in this study: five from Vesteris,4 from Boyd and 3 from the Southern Seamount (Table 1). Samples were primarily fixed with formaldehyde and later transferred to 90% alcohol. All samples were examined in the lab using a Leica WILD M3C stereomicroscope. Specimens were sorted, labelled and kept in alcohol while selected specimens were cleaned by bleaching (Approx. 4%) and dried to be examined with a scanning electron microscope (SEEM). A FEI Inspect S50 SEM with back-scattered electron detector in low-vacuum mode was used. Additionally, images of the specimens (in alcohol and dried as well), were done with a HIROX RH2000 digital microscope. Besides collected specimens, type specimens from the Natural History Museum from Oslo (NHMO) were studied from SEM pictures. Colonies and single zooids were measured using the software ImageJ on the SEM photographs. Furthermore, figures were produced with Inkscape program.

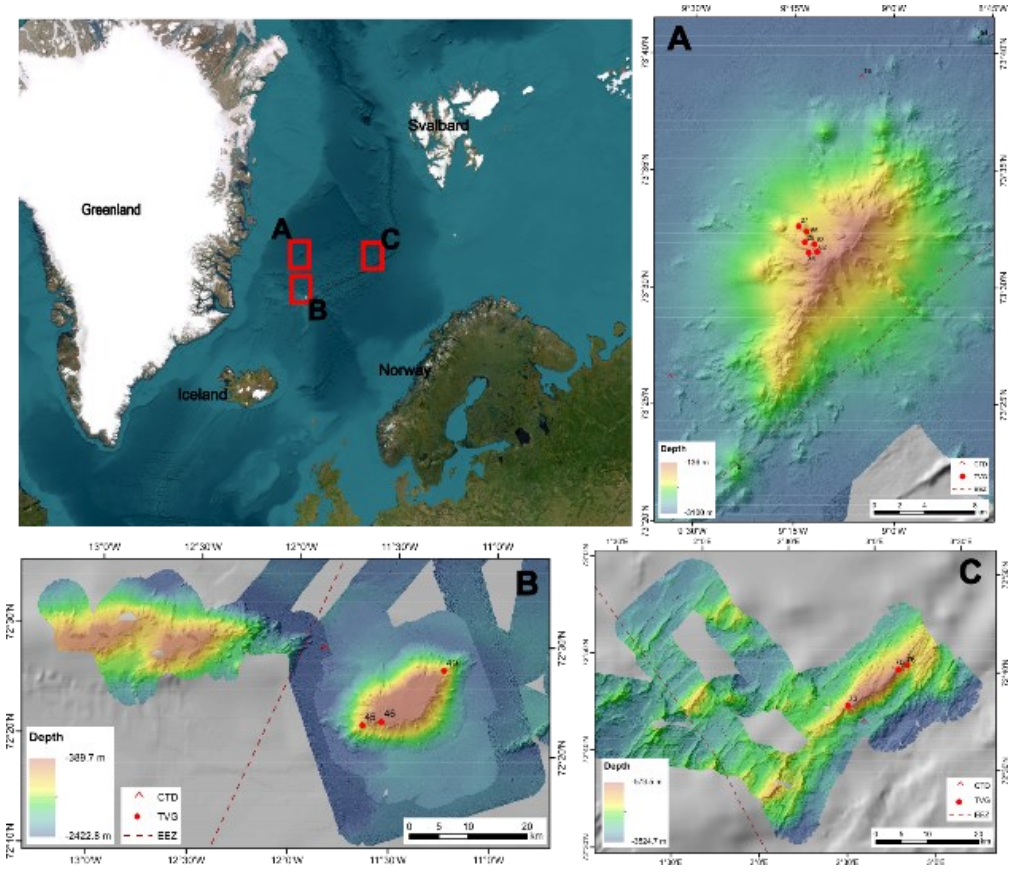

Fig.1 Three investigated Seamounts: A. Vesteris, B. Southern and C. Louise Boyd

Table 1. Data of the sampling's points in all locations.

Stn. no.	Stn. no.	Area	Date	Lat. sample	Long. Sample	Depth sample [m]
MSM86_027	027	Vesteris	24.8.2019	73,54460	-9,23746	960
MSM86_028TVG	028	Vesteris	24.8.2019	73,53227	-9,22136	575
MSM86_036TVG	036	Vesteris	25.8.2019	73,52440	-9,19388	257
MSM86_045TVG	045	Southern Seamount	28.8.2019	72,37362	-11,65278	704
MSM86_046TVG	046	Southern Seamount	28.8.2019	72,38015	-11,55470	536
MSM86_049TVG	049	Southern Seamount	28.8.2019	72,46070	-11,25200	733
MSM86_062TVG	062	Vesteris	1.9.2019	73,52707	-9,19139	363
MSM86_063TVG	063	Vesteris	1.9.2019	73,53064	-9,19663	538
MSM86_065TVG	065	Vesteris	1.9.2019	73,53738	-9,21263	793
MSM86_070TVG	070	Boyd Seamount	3.9.2019	72,71159	2,97134	851
MSM86_072TVG	072	Boyd Seamount	3.9.2019	72,68110	2,86169	716
MSM86_073TVG	073	Boyd Seamount	3.9.2019	72,66516	2,66459	827
MSM86_076TVG	076	Boyd Seamount	4.9.2019	72,71210	3,04002	1209
MSM86_077TVG	077	Boyd Seamount	4.9.2019	72,67805	2,82573	665

3. Results

Taxonomic account

Order **Cheilostomata** Busk, 1852

Family **Electridae** Stach, 1937 (1851)

Genus ***Electra*** Lamouroux, 1816

***Electra* sp.**

(Fig.2;Table 2)

Material examined: Southern Seamount: MSM86_045 and MSM86_049.

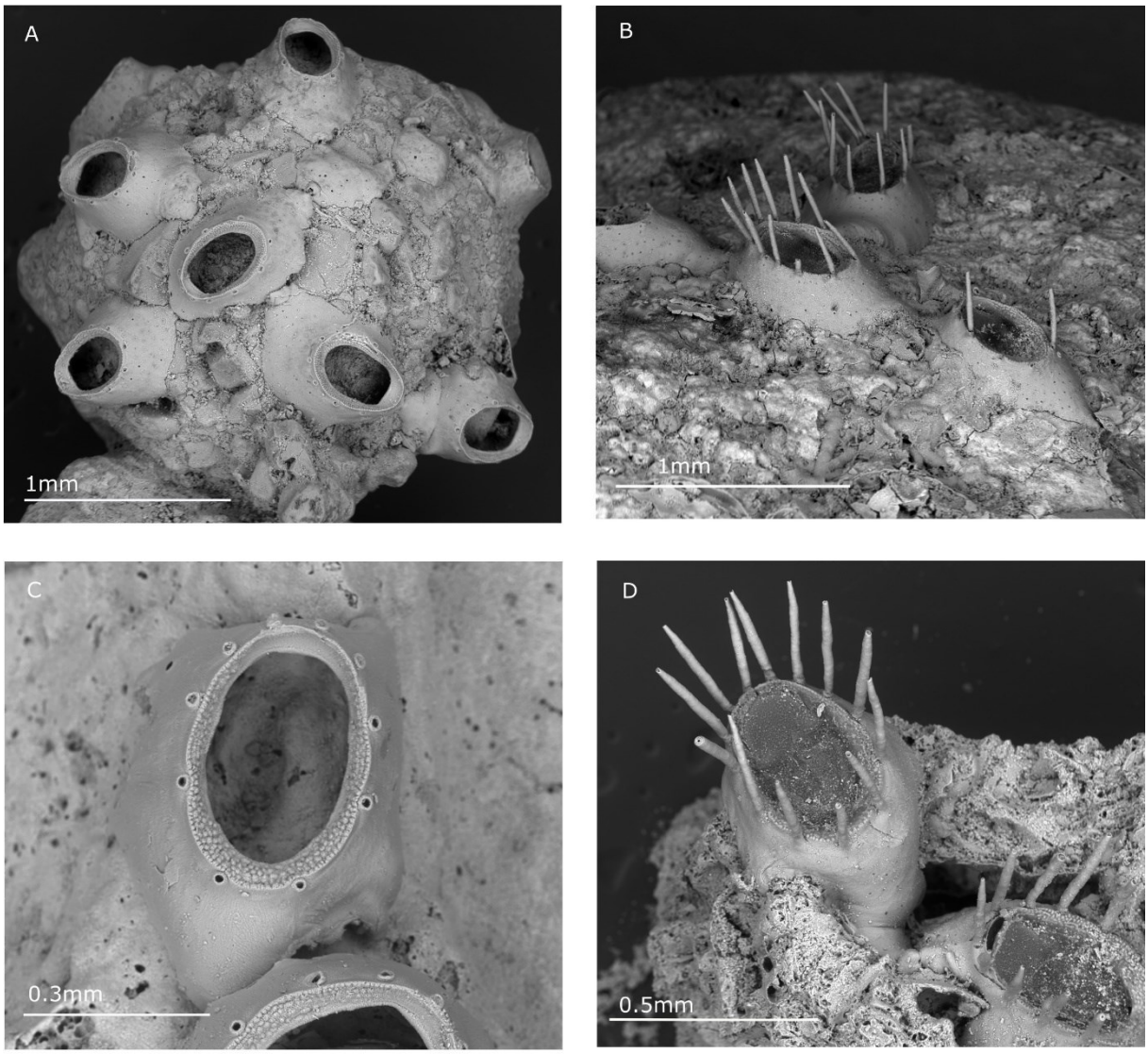

Fig. 2. *Electra* sp- A. General view of the colony. B. Zooids in lateral view. C. Autozooid in frontal view with broken spines. D. Zooids with frontal membrane and periopesial spines.

Description

Colony encrusting, uniserial, each autozooid bud three new zooids, one distal, and two lateral, one at each side. Autozooid oval, slightly pyriform with the proximal part narrow. Gymnocyst smooth, bigger proximally, narrow and sloping, almost vertical laterally, with a lot of small circular frontal pseudopores. Frontal area with a narrow gymnocyst, coarse proximally and laterally, smooth distally. Opesia longer than wider, with the distal border almost straight. Ten to twelve spines surrounding the frontal membrane. Ovicells and ancestrula not observed.

Remarks

Scarce material of this species could be studied. For this reason, we leave it in open nomenclature. In any case, in the best of our knowledge, we didn't find any species with the group of character that is presented in our material.

Table 2. Measurements (in mm) of *Electra* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.781	0.0751	0.622	0.891	15
Autozooid width	0.468	0.0542	0.354	0.549	15
Opesia length	0.313	0.0367	0.245	0.364	15
Opesia width	0.192	0.0215	0.162	0.226	15
Frontal wall length	0.421	0.0381	0.344	0.459	15
Frontal wall width	0.270	0.0243	0.227	0.318	15

Distribution

Currently only known from Southern Seamount.

Family **Calloporidae** Norman, 1903

Genus ***Callopora*** Gray, 1848

Callopora lineata (Linnaeus, 1767)

(Fig.3;Table 3)

Flustra lineata Linnaeus, 1767 :1301;

*Membranipora lineata :*Hincks, 1880a : 143, pl. 19, f.ig 3-6; Levinsen, 1894 : 60, pl. V, fig. 1-3;

*Callopora lineata :*Norman, 1903a : 589, pl. XIII, fig. 2;Kluge,1975: 343,fig.170; Hayward & Ryland, 1998: 158, figs 39, 42A.

Material examined: Vesteris: MSM86_036.

Description

Colony encrusting, forming irregular sheet. Autozooids oval to irregularly polygonal, slightly elongated. Opesia occupying the larger part of the frontal surface with a proximal gymnocyst

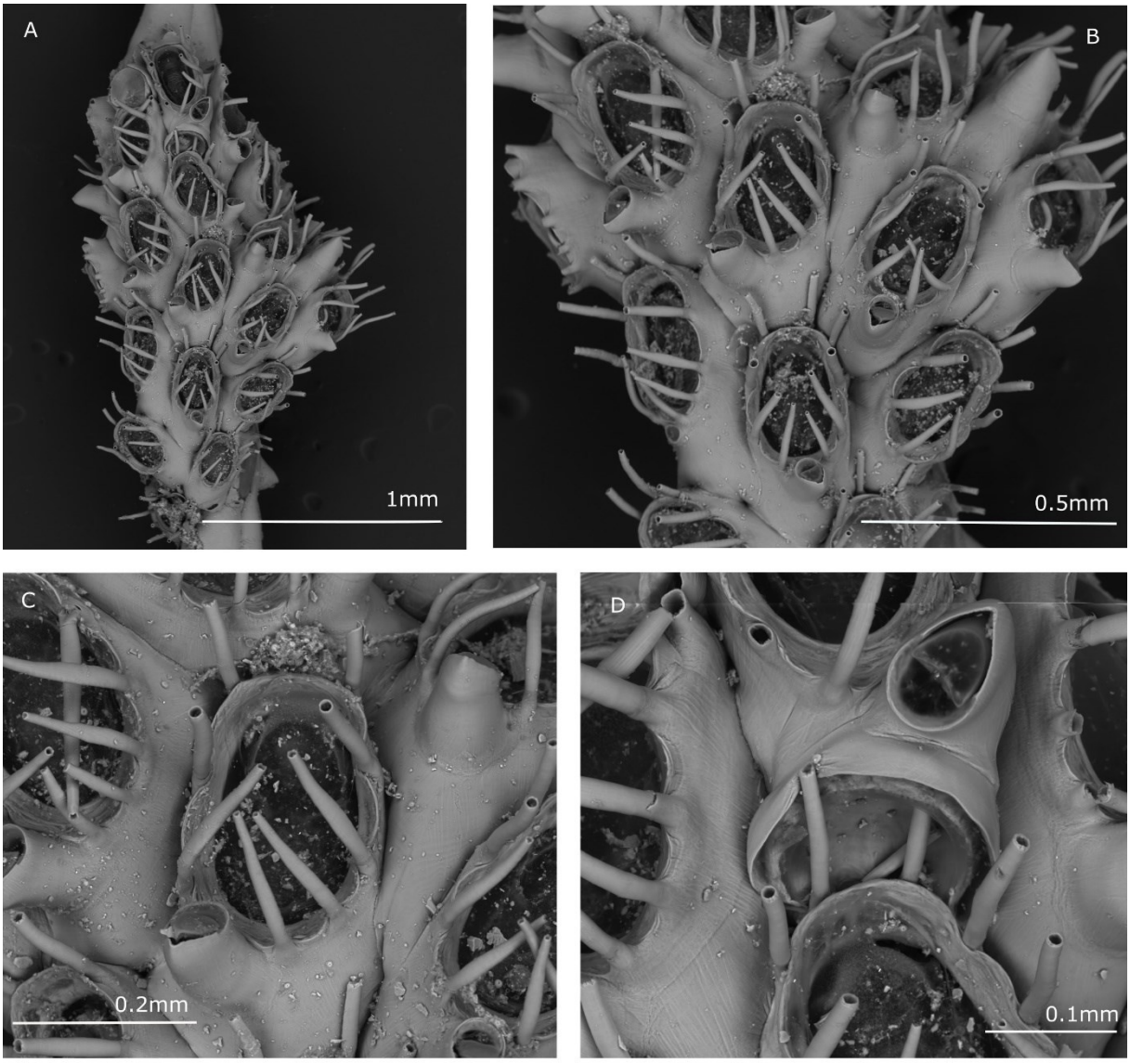

Fig.3.*Callopora lineata.* A-B. General view of the colony. C. Zooid in frontal view with suboral avicularia and spines. D. Detail of an ovicell with avicularium.

smooth and variable in size. Cryptocyst also smooth, narrow and with raised margins as a rim

around the opesia, slightly more developed proximally. Nine to twelve cylindrical spines arranged around the frontal membrane. Spines erect, slightly tilted towards aperture, but never closing it completely. One avicularium per zooid situated on the proximal gymnocyst, with tubular cystid, raising the triangular rostrum usually directed proximally. Ovicells globular, large, although not completely developed in studied specimens. Ovicell with avicularium associated with same morphology as gymnocystidal avicularium but with rostrum directed distally. Ancestrula with nine spines, smaller than autozooids but with similar morphology.

Remarks

The small and encrusting specimens are coincident with previous descriptions of this species (Kluge,1975, Hayward & Ryland, 1998). The species is characterized as encrusting with oval zooids, poorly developed gymnocyst and with small frontal avicularium. When ovicells are present, they have distal avicularia. There is a resemblance to *Tegella arctica* (d'Orbigny,1853), but Kluge (1975) described zooids arranged in rows with one to 3 pairs of spines on the lateral margins of the frontal membrane, both of the characters which do not appear in our specimens. Also, *T. arctica* often possess frontal avicularia surrounded by a thick wall with conical shape, which contrasts with our findings. The studied specimens were found encrusting on other bryozoans, but it is reported to be found on shells, algae and other objects. Species can be found at depth of 0-378m, at temperature of -1.9-4.78 ºC in salinity of 31.80-34.83 o/oo (Kluge,1975). Our specimens were found at a depth of 257m.

Distribution

Laptev, East Siberian, Chukotsk, Bering, and Okhotsk seas, and in the waters of Labrador and western Greenland (Kluge,1975) Barents Sea (M. Sars, 1851; Smitt, 1868a, 1879a, 1879b; Urban, 1880; Vigelius, 1881-82; Bidenkap, 1900a; Waters, 1900; Norman, 1903a; Kuznetsov, 1941, Kluge,1975), White Sea (Smitt, 1879b; Bidenkap, 1900a; Kluge, 1908a; Gostilovskaya, 1957), Kara Sea (Smitt, 1879b; Nordgaard, 1912b,Kluge,1975), northern coast of North America (Osburn, 1923, 1932, 1936), Labrador (Packard, 1863, 1866-69; Hincks, 1877a), western Greenland (Smitt, 1868c; Hincks, 1877a; Kluge, 1908b; Levinsen, 1914; Osburn, 1936), Gulf of St. Lawrence (Dawson, 1859; Whiteaves, 1901), eastern Greenland (Kirchenpauer, 1874; Levinsen, 1916), Jan Mayen Island (Lorenz, 1886), in the boreal region along the eastern coast of the Atlantic Ocean from northern Norway to the Mediterranean Sea (Joliet, 1877; Hincks, 1880a; Levinsen, 1894; Calvet, 1902; Nordgaard, 1918; Borg, 1930a), along the western coast of the Atlantic Ocean from New Scotland to Woods Hole (Osburn,

1912, 1933), and on the eastern coast of the Pacific Ocean, near northern Alaska (Robertson, 1900).

Table 3. Measurements (in mm) of *Callopora lineata* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.449	0.0465	0.374	0.515	12
Autozooid width	0.220	0.0411	0.164	0.320	10
Frontal membrane length	0.279	0.0350	0.193	0.329	14
Frontal membrane width	0.179	0.0217	0.142	0.209	13
Opesia length	0.229	0.0177	0.189	0.259	11
Opesia width	0.133	0.0112	0.111	0.144	11
Avicularium length	0.075	0.0165	0.055	0.114	10
Avicularium width	0.048	0.0096	0.038	0.060	6
Ovicell length	0.174				1
Ovicell width	0.172				1

Family **Pyrisinellidae** di Martino & Taylor, 2012

Genus ***Microblestrum*** Gordon, 2014

***Microblestrum* sp.**

(Fig.4;Table 4)

Material examined: Southern Seamount: MSM86_045.

Description

Colony encrusting, multiserial, unilaminar. Autozooid slightly longer than wider, distinguished by interzooidal furrow. Gymnocyst smooth, wider in proximal part of zooid, and narrow in lateral walls. Cryptocyst granular, flat, surrounded by a narrow raised crenulated rim, with a pair of oval slit-like lateral opesiules. Opesia D-shaped, with the proximal border slightly raised and almost straight. Six articulate spines in the gymnocystal margin around the aperture.

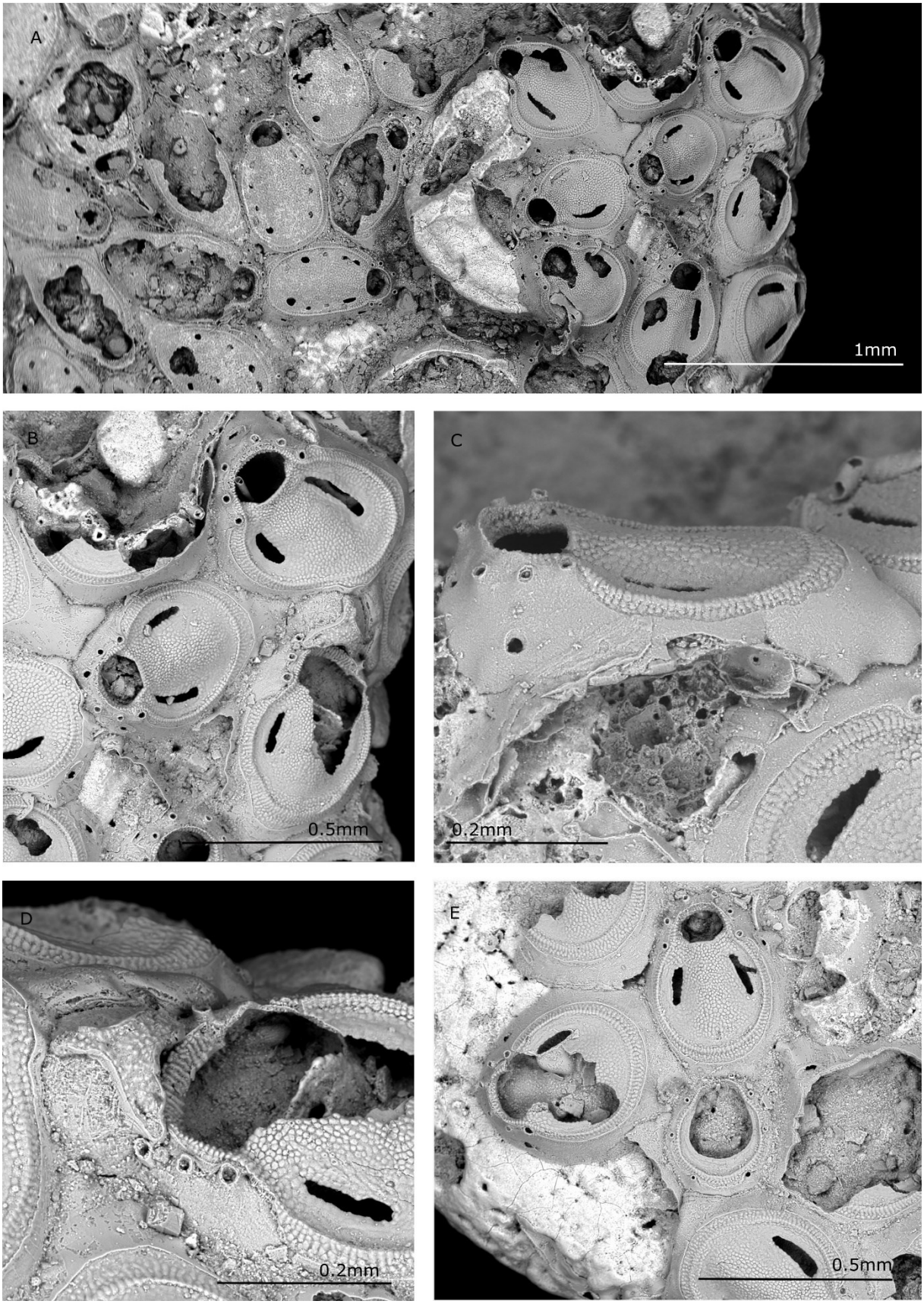

Fig.4.*Microblestrum* sp. A. General view of 2 colonies: *Ristedtia vestiflua* and *Microblestrum*. B.Autozooids in frontal view. C. Autozooid in lateral view. D. Ovicellate zooid. E. Ancestrula.

Ovicell hyperstomial, smooth and imperforated with a triangular frontal exposure of granular endooecium. Ancestrula tatiform. With a smooth narrow gymnocyst and a narrow proximal and lateral cryptocyst surrounded by a crenulate rim. Opesia long occupying most of the frontal area. Eight spines surrounding the frontal area of the ancestrula.

Table 4. Measurements (in mm) of *Microblestrum* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.578	0.1213	0.316	0.718	12
Autozooid width	0.407	0.0562	0.264	0.480	12
Orifice length	0.107	0.0292	0.072	0.181	10
Orifice width	0.124	0.0219	0.094	0.161	10

Remarks

Only one species is known in the genus, *Microblestrum imitator* Gordon, 2014 from a locality in the south of the Macquarie Ridge in the Pacific Ocean. Our specimens present characters described by this genus and is distinguishable from other similar genera by the presence of spines, opesia not trifoliate, with opesiules slit-like, and ovicell hyperstomial, imperforated with a triangular frontal exposure of endooecium. Our specimens are distinguished from *M. imitator* by longer opesiules and a smaller ovicell with a granular and more visible endooecium. Our specimens represent a new species that will be described in the near future.

Distribution

Species found in only one locality of the Southern Seamount.

Genus ***Ramphonotus*** Norman, 1894

Ramphonotus septentrionalis (Kluge, 1906)

(Fig.5;Table 5)

Membranipora flemingii forma *trifolium* Smitt 1868a: 367 (part 1), t. XX, f.40;
Membranipora flemingii var. septentrionalis: Kluge 1906:38, fig. I;
Amphiblestrum septentrionalis Kluge 1975:362,fig.185;Hayward 1994:182, fig.1;
Ramphonotus septentrionalis: Rosso & Taylor 2002:36.

Material examined: Vesteris; MSM86_036.

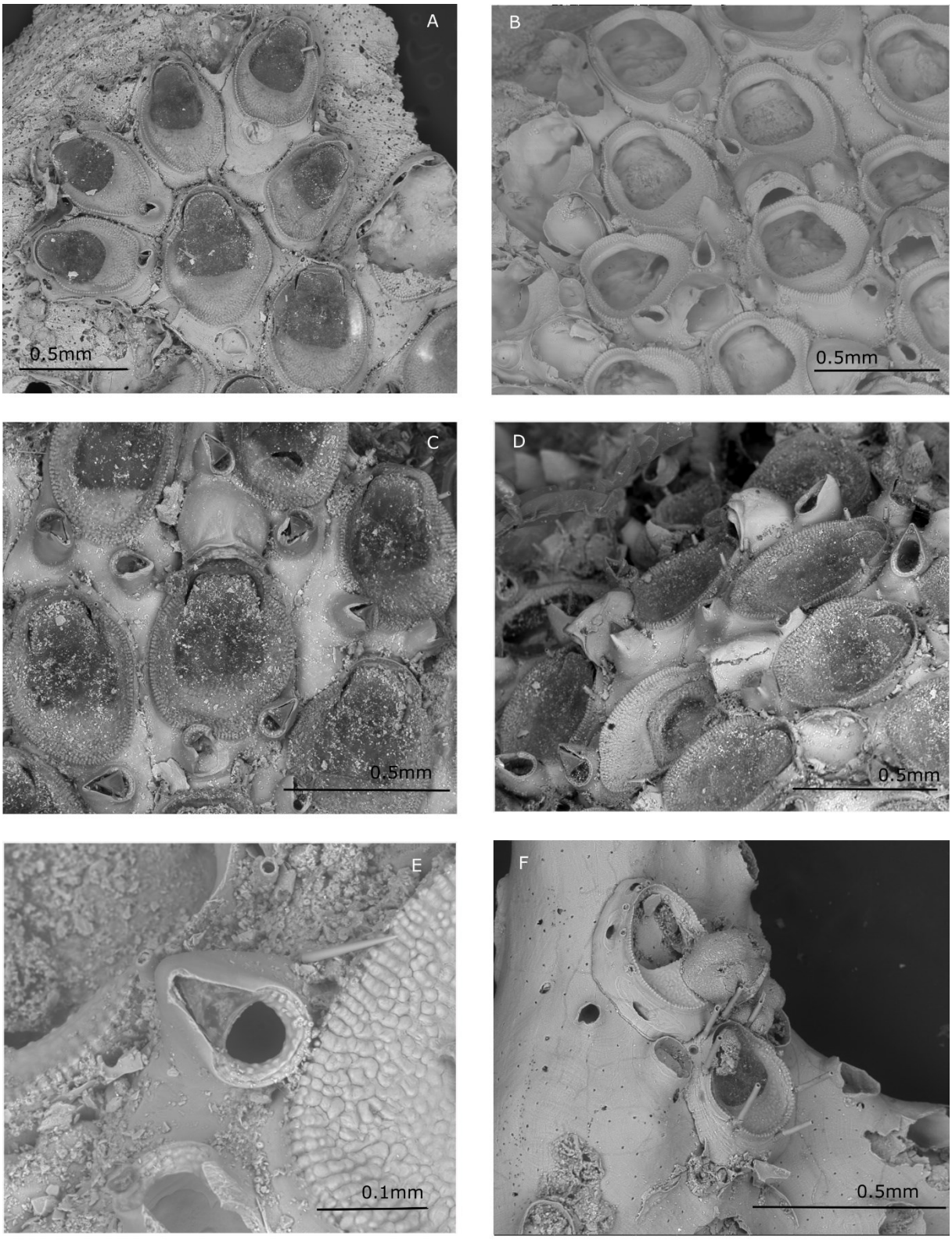

Fig.5 *Ramphonotus septentrionalis*. A-B. General view of the colony. C. Colony in frontal view with an ovicell and avicularium. D. Colony in lateral view with spines and ovicells. E. Detail of avicularim. F. Ancestrula and first zooid.

Description

Colony encrusting, unilaminar, multiserial. Autozooids broad, oval to pyriform with greatest width in proximal third, well separated by grooves. Mural rim oval, finely crenulated. Opesia occupying great part of the frontal surface, oval to subquadranglar until two thirds, sometimes slightly broader at proximal half. Crystocyst granular, narrow and almost vertical distally and bending lateral, proximally larger and flatter. Gymnocyst smooth, proximally more development and partly obscured by avicularium. Autozooids with four distal spines, persisting also in ovicellate zooids. Periancestrular zooids with eight spines. Ovicell globular, longer then wide, calcified ectooecium with a narrow proximal granular area not calcified. Majority of zooids with single gymnocystal columnar avicularium situated proximal or proximolateral, sharp end of mandible directed proximally or laterally. Otherwise, two proximal avicularia with mandibles pointing in different directions. One avicularium with similar morphology always associated with ovicell and located distally. Ancestrula lightly smaller that autozooids but with similar morphology, surrounded by nine spines.

Remarks

Specimens correspond to published descriptions and figures of *Amphiblestrum septentrionalis* (Kluge,1975, Hayward, 1994) which was first described by Kluge (1975) from the Siberian and Barents Sea as well as in Greenland. We show the ancestrula of the *R. septentrionalis* for the first time. The species is reported to encrust other bryozoans, shells, stones and polychaetes, at depths from 10 to 175m under temperatures ranging from -1.02 to 3.6°C (Kluge,1975). Our specimens were found growing on polychaete tubes, shells and other bryozoans at depth of 257 m.

Table 5. Measurements (in mm) of *Ramphonotus septentrionalis*. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Gymnocyst length	0.714	0.0956	0.577	0.950	29
Cryptocyst length	0.531	0.5558	0.451	0.666	29
Opesia length	0.321	0.0357	0.280	0.413	18
Opesia width	0.275	0.0311	0.242	0.328	14
Cryptocyst width	0.365	0.0815	0.212	0.497	24
Gymnocyst width	0.514	0.1195	0.363	0.781	23

Avicularium length	0.123	0.0497	0.073	0.249	17
Avicularium width	0.091	0.0765	0.050	0.301	15
Ovicell length	0.241	0.0285	0.212	0.294	8
Ovicell width	0.248	0.0234	0.226	0.285	7

Family **Doryporellidae** Grischenko, Taylor & Mawatari, 2004

Genus ***Doryporellina*** Grischenko, Mawatari & Taylor, 2000

***Doryporellina* sp.**(Ryland 1963)

(Fig.6; Table 6)

Material examined: Southern Seamount: MSM86_045; Vesteris: MSM86_065; Boyd: MSM86_077.

Description

Colony encrusting, multiserial. Autozooids rhombic to oval in shape separated by distinct burrows. One distal, one disto-lateral and one lateral pore chamber in the lateral walls of zooids. Gymnocystidian frontal wall with reticulate ornamentation covering all surface. Opesia distal with D-shape but with the proximal margin also curved, reduced almost to the operculum size and with the distal margin raise. Two to three pairs of spines disto-lateral to opesia; two to three additional pairs on lateral marginal wall, commonly one pair distal and rest in lateral walls, directed out the zooid. Avicularia not present. Ovicells hyperstomial, acleithral, rounded, slightly longer than broad, with same reticulate ornamentation of frontal wall. Ancestrula not observed.

Remarks

Doryporellina is currently considered as a monospecific genus with *Doryporellina reticulata* (Ryland, 1963) the only known species. This species was recorded from areas nor far away of our specimens (Norway, Rockall and Spitsbergen); nevertheless some differences are present in our specimens: a distal pore chamber and only a single distolateral one, whereas *D. reticulata* has one distal and a pair of distolateral chambers. The frontal ornamentation is formed by wider lines of at least two lines of beads, and is more simple in *D. reticulata*. The distal border of the opesia is always raised to form a laminar distal border in our specimens, and the proximal border

is always concave, whereas the thickening is lacking in *D. reticulata*. Spines are more numerous in our specimens compared to *D. reticulata*.

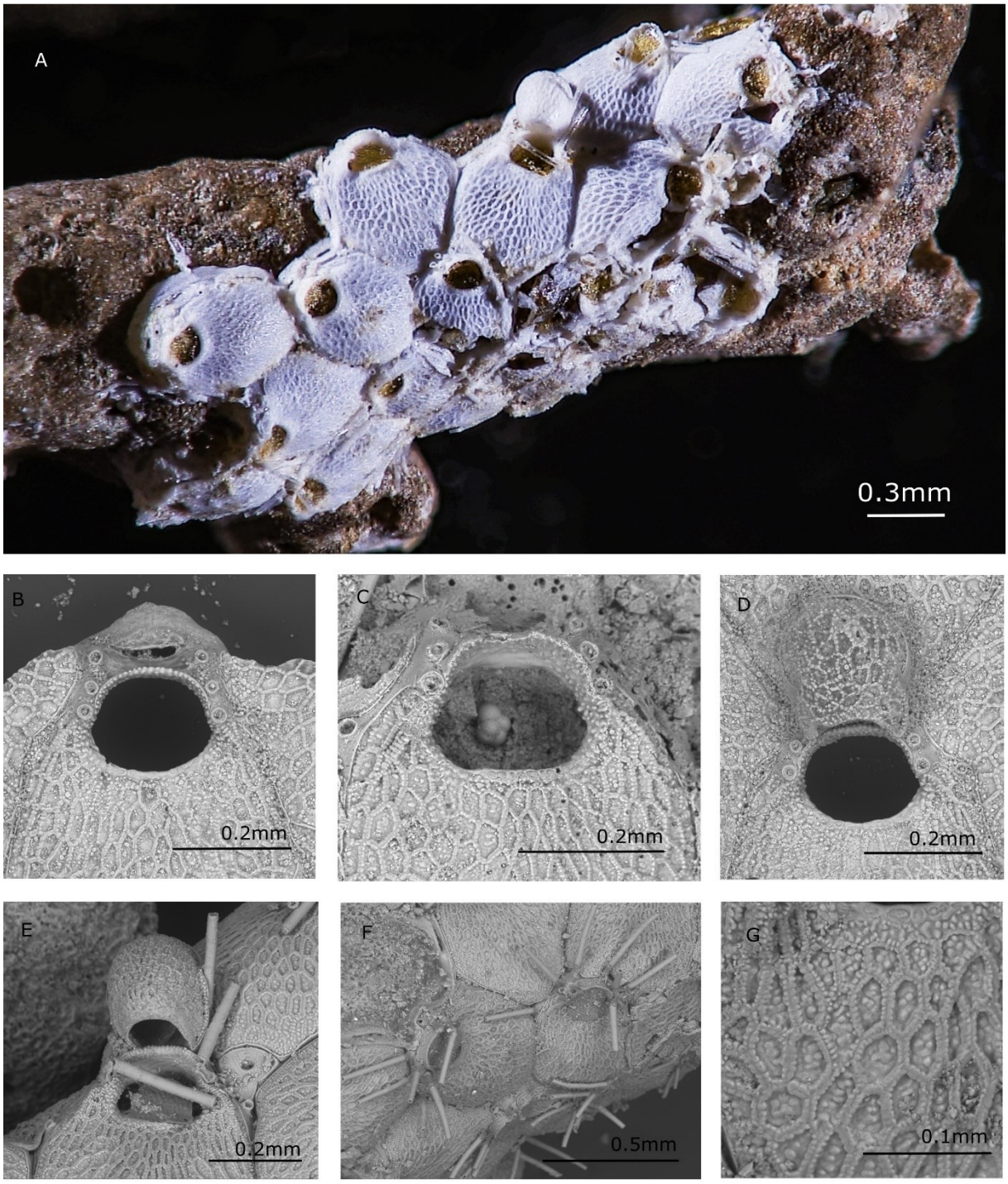

Fig.6. *Doryporellina* sp. A. General view of the encrusting colony. B-C. Different shapes of primary orifices. D-F. Autozooid with ovicell. F. Zooids with oral spines. G. Detail of frontal membrane.

Our specimens were found growing on other bryozoans, shells and stones at depth of 665-793m. Formal description will follow in the near future.

Distribution

Species found in the three studied seamounts.

Table 6. Measurements (in mm) of. *Doryporellina* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.633	0.0673	0.494	0.754	24
Autozooid width	0.501	0.1207	0.362	0.942	21
Orifice length	0.167	0.0153	0.143	0.205	24
Orifice width	0.188	0.0302	0.128	0.234	22
Ovicell length	0.258	0.0355	0.234	0.313	5
Ovicell width	0.257	0.0393	0.204	0.289	4

Family **Pyrisinellidae** Di Martino & Taylor, 2012

Genus ***Ristedtia*** Matsuyama, Martha, Scholz & Hillmer, 2017

Ristedtia vestiflua Matsuyama, Martha, Scholz & Hillmer, 2017

(Fig.7;Table 7)

Megalopora rigens: Bader & Schäfer 2005: 273, fig.M;

Ristedtia vestiflua Matsuyama, Martha, Scholz & Hillmer 2017: 1249, fig.1A-F.

Material examined: Vesteris: MSM86_028, MSM86_036, MSM86_062, MSM86_063; Southern Seamount: MSM86_045, MSM86_046, MSM86_049.

Description

Colony encrusting, unilaminar and multiserial forming circular sheets with autozooids arranged in alternating series and spiral. Autozooids irregular oval, with narrow smooth gymnocyst lateral walls slightly raised, framing an evenly granular cryptocyst that is flat or slightly convex, gently rising distally to form proximal border of opesia and perforated by 6 to 10 opesiules arranged proximal to the border. Opesia small, D-shaped, with proximal border raised and almost straight. Opesia surrounded by six long lateral and distal spines. Sometimes, 1-2 pairs of spines on lateral cryptocyst. Avicularia interzooidal, with triangular pointed mandible and granulate proximal cryotocyst. Ovicell globular, with smooth calcified ectooecium forming a

medial carina and with triangular proximal exposure of endooecium. Ovicell often associated with distal avicularium. Ancestrula tatiform, similar in size than

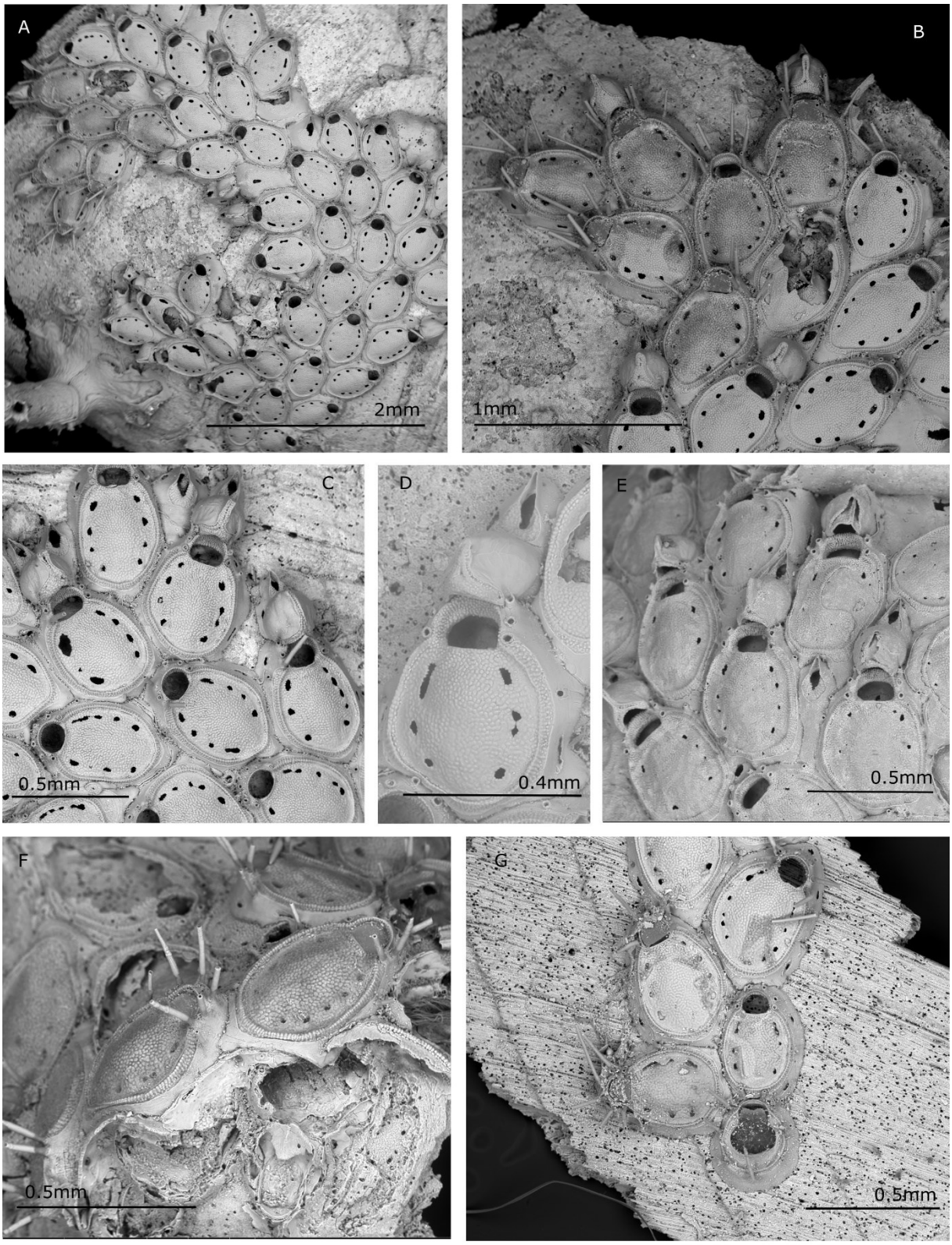

Fig 7. *Ristedtia vestiflua*. A. General view of the colony. B-C. Colony in frontal view. D. Ovicellate zooid with distal spine. E. Zooids with intermediate spine. F. Zooids in lateral view. G. Ancestrula.

zooids and 9 spines, four surrounding aperture and five around lateral and proximal border of frontal membrane. Marginal gymnocyst, smooth and cryptocyst granular. Opesia large, pear-shaped or trifoliate.

*Remark*s

Ristedtia was a new genus recently described by Matsuyama et al. (2017) collected at the Vesteris seamount and previously identified as *?Megapora rigens* (Busk) (Henrich et al. 1992, Bader & Schäfer, 2005). Since there are only two reports, not much is known about the genus and the species. It is characterized by encrusting colonies, narrow and whole zooid surrounding the gymnocyst, small D-shaped opesia and oral spines. All of these characters are present in collected specimens. Colonies are found encrusting other bryozoans, polychaetes, or molluscs, at a depth of 363–575m in the Vesteris Seamount, and 536-733m in the Southern Seamount located in Greenland Sea. Ambient temperature during sampling was close to 0 °C and salinity was around 34.8 $^{oo}/_{o}$.

Distribution

Recorded previously only from Vesteris Seamount (Henrich et al. 1992, Matsuyama et a. 2017), in the present study we found specimens in 4 localities of the Vesteris and for first time, in three localities of the Southern Seamount.

Table 7. Measurements (in mm) of *Ristedtia vestiflua* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.611	0.0820	0.316	0.701	26
Autozooid width	0.388	0.0733	0.204	0.537	26
Orifice length	0.116	0.0135	0.094	0.145	26
Orifice width	0.137	0.0136	0.109	0.172	26
Cryptocyst width	0.337	0.0471	0.138	0.388	26
Avicularium length	0.128	0.0226	0.092	0.162	8
Avicularium width	0.080	0.0059	0.072	0.086	4
Ovicell length	0.196	0.0085	0.185	0.206	6
Ovicell width	0.207	0.0099	0.198	0.223	6

Family **Candidae** d'Orbigny, 1851

Genus ***Aquiloniella*** Vieira, Spencer Jones, Winston, Migotto & Marques, 2014

Aquiloniella orientalis (Kluge, 1955)

(Fig 8;Table8)

Scrupocellaria scabra var. paenulata forma orientalis Kluge, 1955b : 106, t. XXII, fig. 4;Kluge,1975:458,fig.241; *Aquiloniella orientalis*: Vieira et al,2014:12,fig.11C-D.

Material examined: Southern Seamount: MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073 and MSM86_077.

Description

Colony erect, zooids arranged in two rows, branching dichotomously, and long internodes with more than 16 zooids. Autozooids elongated, with smooth proximal gymnocyst and opesia extending along half of zooidal length, with a narrow granular cryptocyst. No oral spines. Scutum well developed, laminar, covering the frontal membrane, even larger distally, convex, growing close from inner distal border of opesia. Scutum with proximal border round and distal almost straight. Large frontal avicularium on proximal gymnocyst at level of scutum of contiguous zooid and directed to this zooid; when ovicell present, always associated to one avicularium. Rostrum triangular and cystid globular. Other smaller triangular avicularia in outer distal border of zooids. Large vibraculum on back of zooids, giving zig-zag pattern, with a longer triangular vibracular chamber and the pointed tip growing over neighbouring zooids. Ovicells globular, hyperstomial, ectooecium smooth with central irregular fenestra not calcified. Ancestrula not observed.

Remarks

The species resembles species from the genus *Tricellaria* with similar position of the zooids in erect colonies and the presence of a scutum. Nevertheless, *Aquiloniella* is characterized by the presence of large frontal avicularia and more importantly vibraculum which are always absent in *Tricellaria*. The material corresponds to figures and descriptions of *A. orientalis* (Kluge,1975, Vieira et al, 2014). The studied species were found at a depth of 363-851m, while Kluge (1975) reports species living at a depth of 65-91m.

Fig.8. *Aquiloniella orientalis.* A. General view of the colony. B. Ovicellate zooids. C. Detail of scutum and lateral avicularium. D. Detail of vibracula.

Table 8. Measurements (in mm) of *Aquiloniella orientalis* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.811	0.0508	0.736	0.879	12
Autozooid width	0.190	0.0195	0.142	0.219	12
Ovicell length	0.368	0.0667	0.249	0.454	13

Distribution

East Siberian Sea, north and northeast of Novosibirsk Island and Far East seas (Kluge,1975). In the present study it was recorded from the Southern and from the Boyd Seamount.

Genus ***Notoplites*** Harmer, 1923

Notoplites normani (Nordgaard, 1900)

(Fig.9, 10; Table 9)

Menipea normani Nordgaard,1900:4,pl.I,fig.2-8;

Notoplites normani: Kluge,1946:195;1975:448,fig.234.

Fig.9.*Notoplites normani*. A. General view of the colony. B. Zooids in frontal view. C. Zooids in basal view. D. Autozooid with suboral avicularium. E-F. Ovicellate zooids. G. Basal avicularia. H-I. Ancestrula in lateral view and rhizooid.

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_036, MSM86_062, MSM86_063, MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_076 and MSM86_077.

Description

Colony erect, delicate, dichotomously branching, jointed, anchored to substrate by tubular rhizoids growing from proximal basal wall of some autozooids. Internode often with five to seven zooids disposed in two series, each produced distolaterally from proximal autozooid, showing uniserial appearance. Autozooids elongated, proximal part tubular and distal part dilated, turned outwards, with oval opesia occupying one-third of the whole zooid length, oblique to branch axis. Opercula distal, occupying one fourth of the frontal membrane length. Smooth, narrow and sloping cryptocyst. External disto-lateral rim of the autozooid with one to five long spines, jointed basally. Axial zooids in branch with single medial spine. Small basal or latero-basal avicularium with triangular mandibles in all zooids. Frontal long columnar avicularium present in some autozooids, with triangular mandible overarching the frontal membrane. Ovicell elongated with smooth surface, central oval fenestra of uncalcified ectooecium and proximal border elevated forming a cap. Ancestrula small, sac-shaped, opesia in distal part, surrounded by 12 spines and attached to the substrate by two rhizoids produced from basal side, at level where first zooid is budded. Single zooid budded from ancestrula followed by biserial branching.

Table 9. Measurements (in mm) of *Notoplites normani* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.818	0.0993	0.597	0.977	23
Autozooid width	0.123	0.0264	0.064	0.186	28
Orifice length	0.327	0.0412	0.150	0.388	28
Orifice width	0.161	0.0329	0.016	0.205	28
Suboral avicularium length	0.187	0.0797	0.060	0.250	9
Basal avicularium length	0.045	0.0066	0.033	0.056	15
Ovicell length	0.376	0.0537	0.296	0.412	4
Ovicell width	0.234	0.0191	0.220	0.247	2

Remarks

Hayward & Ryland (1978) regarded *N. normani* as a synonym of *N. evocatus* (Jullien, 1882). This was accepted by different authors (Hayward & Ryland, 1998, Souto et al. 2011) but other authors continued to treat it as separate species (Henrich, 1992; Bader & Schäfer,2005). Comparison of type specimens stored in the Natural History Museum of Oslo (Fig.10) was

Fig.10.*Notoplites normani* (type). A. General view of the colony. B. Colony in frontal view. C. Colony in basal view; basal avicularia. D. Detail of ovicell and frontal avicularium.

conducted and also compared with the redescription and figures from type material of *N. clausus* done by Souto et al. (2011). *Notoplites normani* shows a proportionally slenderer zooid that *N. clausus*, which in turn has a more developed cryptocyst with granular surface. The small lateral avicularium is common in *N. clausus* and is always more laterally than in *N. normani*, which has it on all zooids, in a position more basal and smaller in size. According to this revision we propose the separation of both species. Morphological characters of the specimens collected during this study agree with the morphology of the type material of *N. normani* stored in Oslo. Specimens of this species can be found at a depth of 184- 698m, at temperatures of -1.48-1.5 ^{o}C and salinities of 34.63-34.93 $^{o}/_{oo}$ (Kluge,1975). The analysed specimens were found at a depth of 257-1209m.

Distribution

Species found in Barents and Kara seas (Kluge,1975) and Norwegian Sea (Nordgaard, 1900, 1905, 1907c, 1918). In the present work specimens were recorded in Vesteris and Southern Seamount.

Notoplites smittii (Norman, 1868)

(Fig.11; Table 10)

Cellularia tarnata forma duplex: Smitt, 1868a : 283, t. 16, figs. 25,26;
Menipea duplex: Levinsen, 1887 : 309, pl. 26, figs 1,2;
Membranipora smitti Norman, 1868 : 241;
*Scrupocellaria smitti :*Waters, 1900 : 57, pl. 7, fig. 8-11;
Notoplites smitti: Kluge,1975:447,fig.233.

Material examined: Southern Seamount: MSM86_045, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073 and MSM86_077.

Description

Colony erect, dichotomously branching, formed by alternating zooids arranged in two or three rows, attached to substrate by rhizoids. Autozooids long with smooth proximal gymnocyst and opesia oval occupying half of the zooid length. Cryptocyst highly reduced to short raised laminae mainly in proximal part, with smooth surface. One thin articulated spine on inner distolateral margin of opesia. Big frontal triangular avicularia situated in proximal gymnocyst, close to opesia border. Mandible triangular, elevated by small columnar cystid. Lateral triangular avicularium on outer side of zooids, situated in distal corner. Ovicell large, globular,

longer than wide, with smooth ectooecium, and central elongated fenestra of non-calcified ectooecium. Ancestrula not observed.

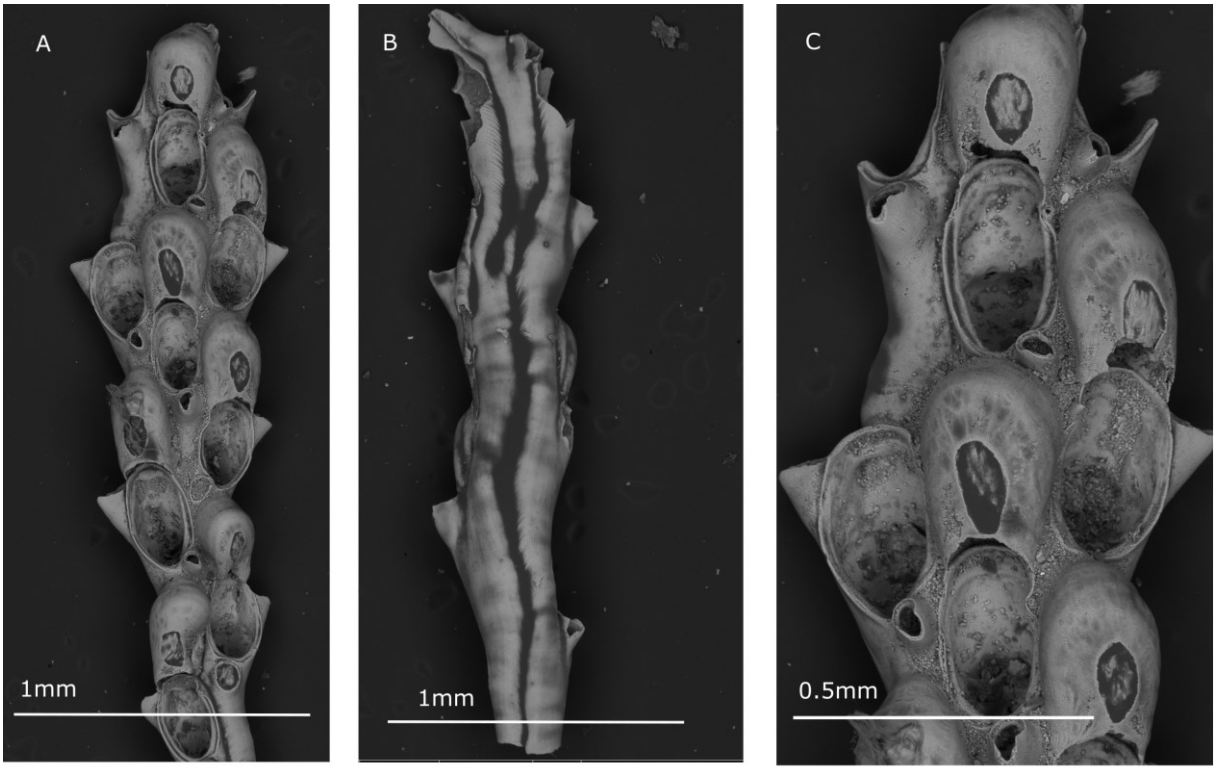

Fig.11.*Notoplites smitti*. A. General view of the colony. B. Colony in basal view. C. Ovicellate zooid.

Remarks

The species corresponds to descriptions and figures from literature (Norman,1868; Kluge,1975) with the exception of the presence of spines. Kluge (1975) mentioned in some cases the absence of oral spines, which corresponds to the studied specimens. The species is erect, dichotomously branching with an oval opesia, narrow cryptocyst and a frontal avicularium. An additional lateral avicularium is present. *Notoplites smitti* does not possess vibracula or a scutum as previously noted. It can be found growing on other bryozoans at a depth of 1.5-698m, temperatures of -1.4-2.2 ºC and salinities of 31.44-34.94 ‰ (Kluge,1975). Specimens were found growing on polychaetes, at a depth of 363-851m.

Distribution

Davis Strait (Kluge,1975), Barents Sea (Smitt, 1868a; Marenzeller, 1877; Bidenkap, 1897, 1900a; Waters, 1900; Andersson, 1902,Kluge,1975), Kara Sea (Smitt, 1879a; Levinsen, 1887; Nordgaard, 1912b; Kluge, 1929,1975), Laptev Sea (Kluge, 1929,1975), northern coast of North

America (Osburn, 1923), Davis Strait (Norman, 1906), and eastern Greenland (Kirchenpauer, 1874; Andersson, 1902). Samples in this study were from Southern and Boyd seamounts.

Table 10. Measurements (in mm) of *Notoplites smitti* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.467	0.1044	0.104	0.467	7
Autozooid width	0.151	0.0247	0.025	0.163	7
Orifice length	0.316	0.0224	0.022	0.339	7
Orifice width	0.174	0.0238	0.024	0.179	7
Ovicell length	0.320	0.0262	0.026	0.320	5
Ovicell width	0.204	0.0161	0.016	0.204	5

Genus ***Tricellaria*** Fleming, 1828

Tricellaria gracilis **(**Van Beneden, 1848)

(Fig.12;Table 11)

Cellarina gracilis Van Beneden, 1848: 73, Figs. 1 and 2

Cellularia ternata forma gracilis: Smitt, 1868a : 283, 308, t. 16, fig. 17-23;

Menipea ternata: Osburn, 1912 : 222, pl. 21, fig. 19;

Tricellaria gracilis: Osburn, 1950: 124, pl. 14, Figs. 3 and 4; Androsova, 1958: 122, Fig. 35; Kluge et al., 1959: 211; Kluge, 1975: 452, fig.236; Kubanin, 1975a: 118; Gontar, 1980: 8; Grischenko, 2013: 176, fig.1L.

Material examined: Vesteris: MSM86_036, MSM86_062 and MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049.

Description

Colony erect, branches straight, divided dichotomously at regular intervals with autozooids disposed in two alternating series. Autozooids elongated with curved distal edge and distal oval opesia that occupies one third of total length of zooid. Proximal gymnocyst smooth. One disto--lateral small spine in some zooids at proximal border of operculm on external margin. Scutum from internal margin, variable in size, larger in ovicellate zooids, sub-oval, with distal margin

almost straight and slight raised in ovicellate zooids. Small avicularia lateral, with triangular rostrum. Frontal avicularia absent. Ovicell longer than wide, subspherical with central,

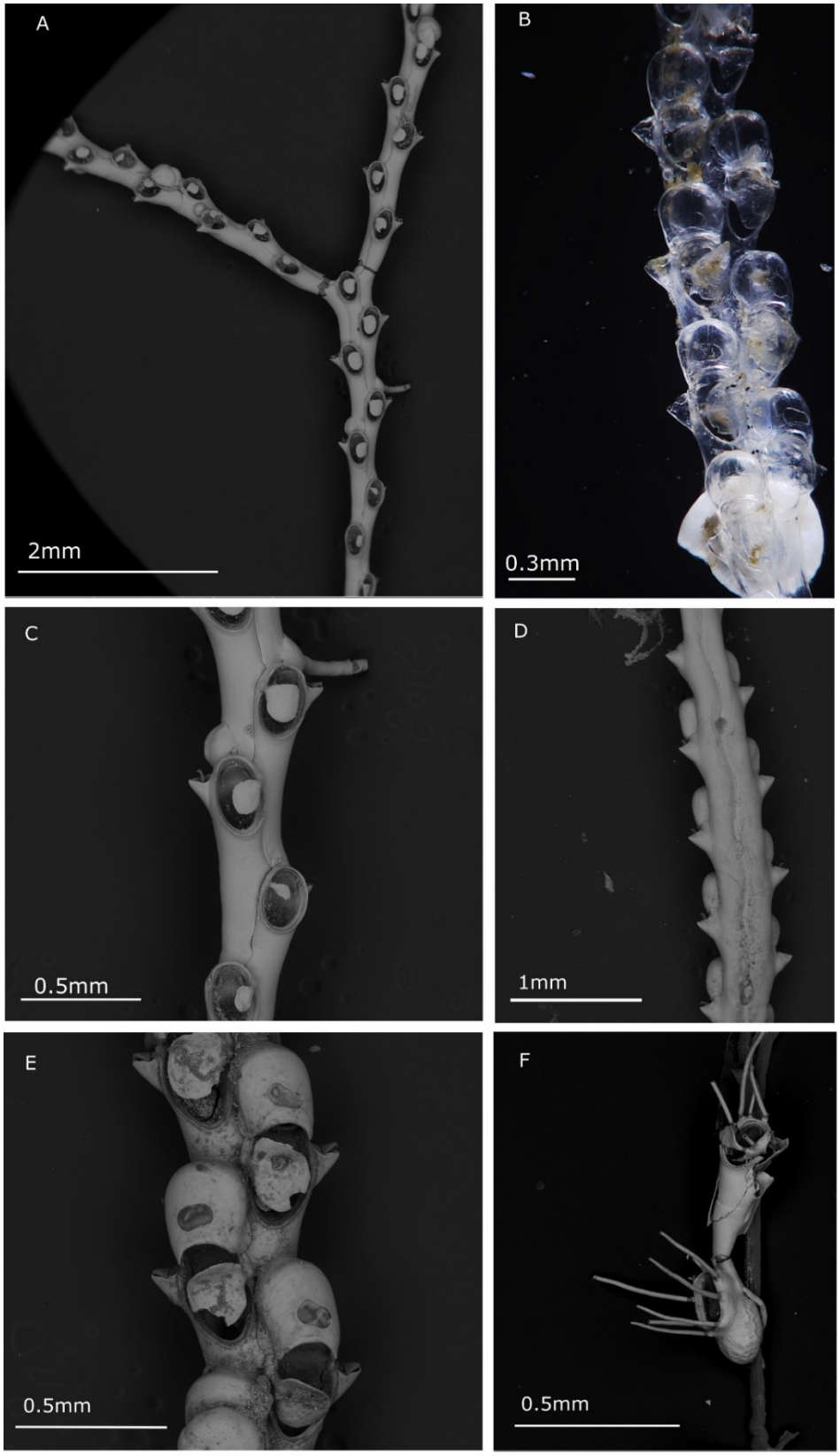

Fig.12. *Tricellaria gracilis*. A. General view of the colony. B-C. Colony in frontal view. D. Colony in basal view. E. Ovicellate zooids with scutum and lateral avicularia. F. Ancestrula.

transversal oval fenestra of uncalcified ectooecium. Ancestrula with up to 10 long marginal spines. Orifice oval, two-thirds of ancestrula. First zooid with up to 8 long spines and scutum. Scutum about one-third of the orifice size.

Remarks

The studied material corresponds to Kluge's (1975) description of *Tricellaria gracilis*. Typical erect, dichotomously branching specimens, with oval opesia and triangular scutum. While in reports from Kluge (1975) the sporadic presence of frontal avicularia is mentioned, it was never found in our material. Up to three spines was observed whereas in our specimens only one small spine was observed. The species can be found at depths of 0 to 869m, at temperatures from -1.61-5.6ºC (in the White Sea up to 14 ºC) in salinities of 34.23 to 43.99 ‰ (in the White Sea 26.09-33.80 ‰) living on shells, stones and other bryozoans (Kluge,1975). The analysed specimens were found at depths from 257-1209 m, growing on other bryozoans.

Table 11. Measurements (in mm) of *Tricellaria gracilis* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.771	0.2066	0.462	1. 151	19
Autozooid width	0.149	0.0323	0.087	0.205	19
Orifice length	0.310	0.0365	0.255	0.363	21
Orifice width	0.193	0.0182	0.161	0.221	20
Avicularium length	0.070	0.0119	0.052	0.086	13
Ovicell length	0.297	0.0093	0.288	0.312	5
Ovicell width	0.246	0.0165	0.225	0.276	7
Ancestrula length	0.364				1
Ancestrula frontal membrane length	0.214				1

Distribution:

The species was found in the Barents, Kara, Laptev, East Siberian, Chukotsk, Bering, and Okhotsk seas, and in the waters off Labrador, eastern and western Greenland, and the Gulf of St. Lawrence (Kluge,1975). Furthermore in Barents Sea (M. Sars, 1851; Smitt, 1868a, 1879b; Marenzeller, 1877; Urban, 1880; Vigelius, 1881-82; Nordgaard, 1896, 1905, 1907a, 1923; Bidenkap, 1897, 1900a, 1900b; Norman, 1903a; Kluge in Deryugin, 1915; Grieg, 1925;

Kuznetsov, 1941), White Sea (Gostilovskaya, 1957), Kara Sea (Smitt, 1879a; Levinsen, 1887; Nordgaard, 1923; Kluge, 1929), East Siberian Sea (Kluge, 1929; Nordgaard, 1929), Archipelago of the Canadian Islands (Busk, 1880; Nordgaard, 1906a), Hudson Bay (Osburn, 1932), western Greenland (Smitt, 1868c; Hennig, 1896; Norman, 1906; Kluge, 1908b; Levinsen, 1914; Osburn, 1919), Gulf of St. Lawrence (Hincks, 1880a), eastern Green- land (Kirchenpauer, 1874; Levinsen, 1914, 1916), Jan Mayen Island (Lorenz, 1886), Iceland (Nordgaard, 1924), western Norway (Smitt,1968a;Nordgaard, 1918), and Skagerrak (Smitt, 1868a). The studied specimens were collected from two of the seamounts, Vesteris and Boyd.

Family **Cribrilinidae** Hincks, 1879

Genus ***Cribrilina*** Gray, 1848

Cribrilina watersi Andersson, 1902

(Fig.13; Table 12)

Cribrilina punctata: Waters, 1900: 62, pl. 8, fig 22;

C. punctata var. watersi Andersson, 1902 : 540;

Cribrilina watersi: Kluge 1975:475 Fig. 251; Bishop 1987: 9, figs 13,14;Bishop 1994: 235,figs 34-47.

Material examined: Vesteris: MSM86_028, MSM86_036, MSM86_062, MSM86_063 and MSM86_065; Southern Seamount: MSM86_046, MSM86_049.

Description

Colony encrusting, unilaminar, forming irregular patch. Autozooids small oval or rectangular, slightly elongated. Frontal shield consisting of six to eight pairs of costae, with two or four haphazardly placed, lumen pores the costae and three or four intercostal spaces between each successive costa. Orifice bordered proximally by thickened orificial bar, with a medial mucro, two lumen pores. Secondary orifice oval, transversal. One flat and generally bifurcate medial oral spine. Paired avicularia situated laterally of suboral bar, elevated, tilted and directed laterally to centre of zooid, with a bulbous cystid; triangular rostrum. Ovicell short, wider than long, with smooth calcified ectooecium, and proximal medial transverse fenestra, sometimes reduced to suture. Ancestrula similar to autozooids but slightly smaller.

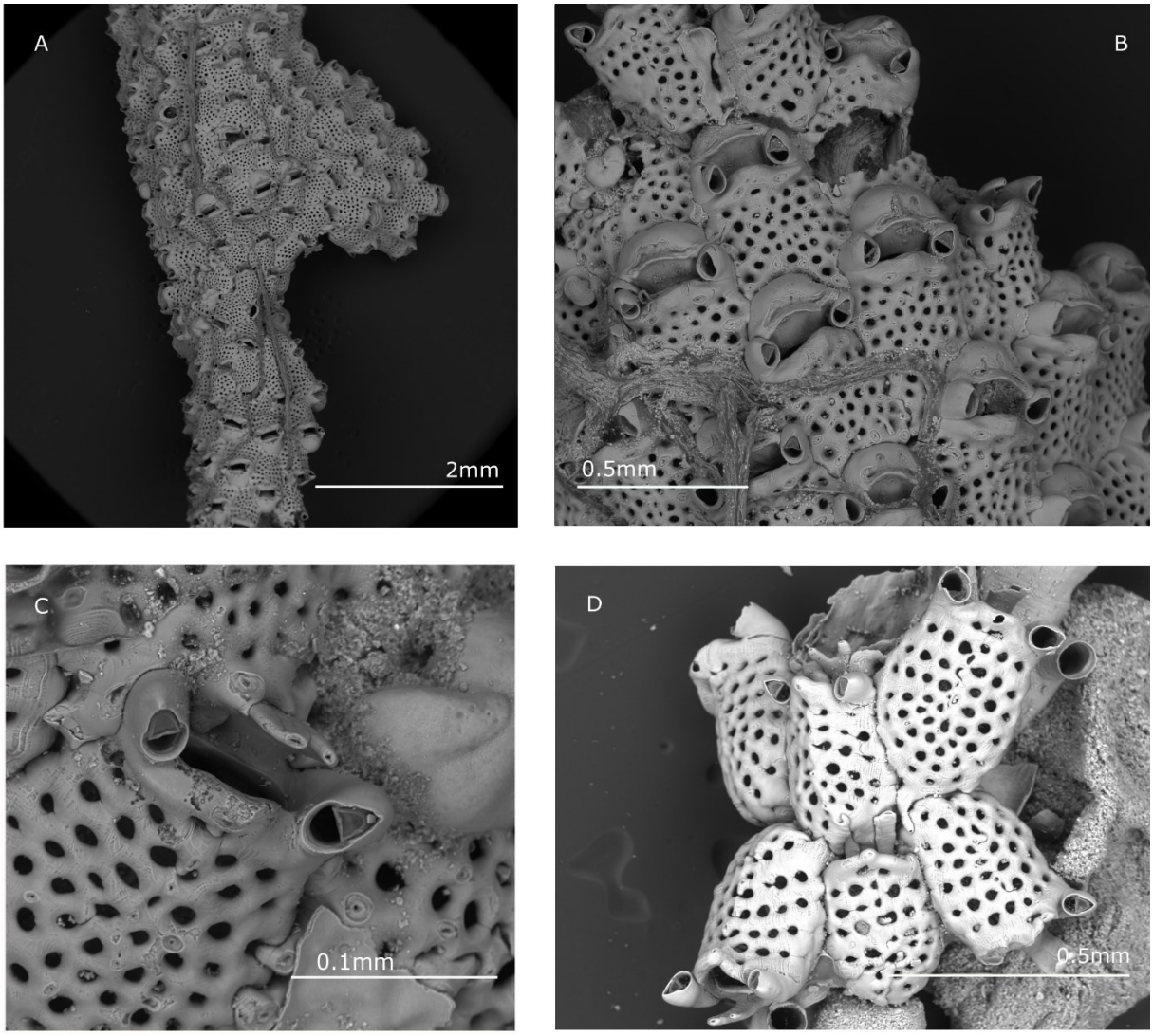

Fig.13.*Cribrillina watersi*. A. General view of the colony. B. Ovicellate colony in frontal view. C. Primary orifice with lateral oral avicularia and flattened spines. D. Small growing colony, with central ancestrula.

Remarks

A highly abundant species at the Vesteris seamount. This species was described and figured from several authors (Kluge,1975; Andersson,1902; Bishop,1994). The studied material was found encrusting on other bryozoans at depths of 257-793m. Other reports found it growing on shells, molluscs, polychaetes and stones. Species appear at depths of 50-698m, at temperatures of -1.7-4.5 ºC and salinities of 34.27-34.90 ‰ (Kluge,1975).

Table 12. Measurements (in mm) of *Cribrillina watersi* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.478	0.0770	0.348	0.478	30
Autozooid width	0.299	0.0298	0.236	0.299	29
Orifice width	0.146	0.0195	0.110	0.146	21
Avicularia length	0.067	0.0091	0.046	0.067	43
Avicularia width	0.039	0.0093	0.024	0.039	40
Ovicell length	0.125	0.0375	0.084	0.125	6
Ovicell width	0.254	0.0266	0.217	0.254	6

Distribution

Norwegian Sea, Barents Sea, Kara Sea, Laptev Sea and East Siberian Sea (Kluge,1975; Andersson,1902; Bishop,1994). The present study found very abundant specimens at the Vestris Seamount but some colonies were collected also from the Boyd Seamount.

Family **Celleporidae** Johnston, 1838

Genus ***Turbicellepora*** Ryland, 1963

Turbicellepora nodulosa (Lorenz, 1886)

(Fig.14; Table13)

Cellepora nodulosa Lorenz, 1886 : 96 (14), t. VII, fig. 14-15;Nordgaard, 1905 : 172, pl. III, f.ig. 21-24; Kluge, 1906 : 48, fig. 5; 1975 : 678, fig. 391; Hayward, 1978: 582, figs 4 C, D, 17.

Material examined: Southern Seamount: MSM86_045, MSM86_046 and MSM86_049.

Description

Colony encrusting forming nodular growths on filamentous or cylindrical substrates, multiserial. Autozooids irregular with different orientation in colony; frontal wall with small, inconspicuous, marginal pores. Primary orifice oval, wider than long with very small and wide proximal sinus, condyles small, blunt. Low peristome, thin, surrounding orifice but more development proximally by the presence of an avicularium. Avicularium suboral, with a columnar cystid variable in size; rostrum lightly pointed, rounded triangular, directed proximo-laterally. Ovicell oval, hyperstomial, smooth, slightly flattened proximally with few (2-4)

irregular pseudopores, sometimes obscured by secondary calcification covering part of ovicell. Ancestrula elongated, with circular opesia surrounded by 8 spines.

Remarks

Turbicellepora nodulosa was described as encrusting species with large zooids, round orifice with broad arcuate sinus. Additionally, it possesses triangular mandibles and sharp spines (Hayward,1978; Kluge,1975). These descriptions and figures are coincident with the observed specimens. Species occur on tubes of annelids, shells, other bryozoans and hydroids at depths of 1.5-733m, at temperatures of -1.7-12.5 ºC and salinities of 27.22-34.96 ‰. The observed specimens were found growing on polychaetes and other bryozoans at depths of 536-733m.

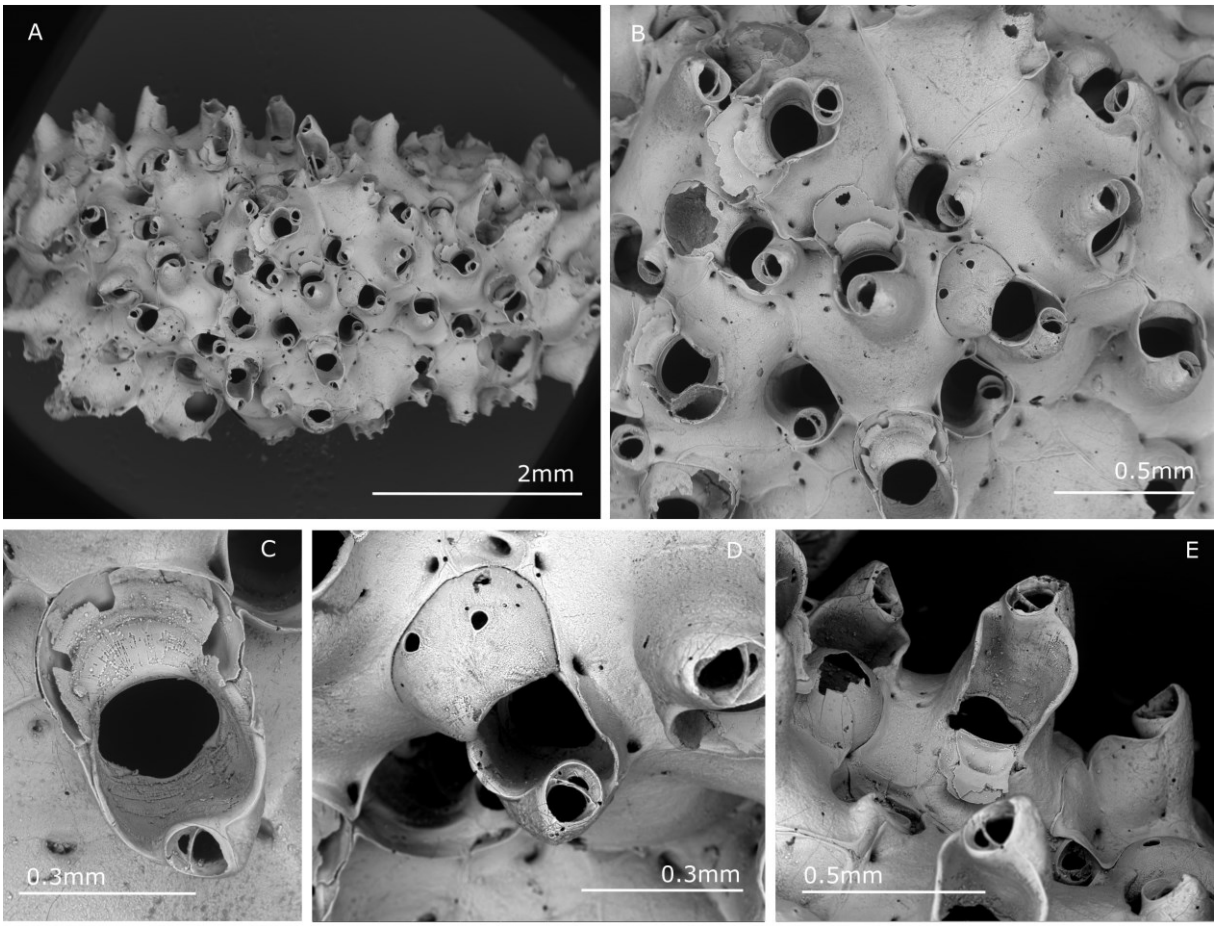

Fig.14.*Turbicellepora nodulosa*. .A. General view of the colony. B. Colony in frontal view. C. Primary orifice with suboral avicularia. D. Ovicellate zooid. E. Detail of the peristome with suboral avicularia.

Table 13. Measurements (in mm) of *Turbicellepora nodulosa* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.752	0.0725	0.670	0.837	4
Autozooid width	0.680	0.1734	0.477	0.680	4
Orifice length	0.255	0.0135	0.238	0.267	4
Orifice width	0.271	0.0446	0.228	0.271	4
Avicularium length	0.102	0.0204	0.082	0.102	4
Ovicell length	0.338				1
Ovicell width	0.213				1

Distrubution

East Siberian seas, in the Davis Strait, and off eastern Greenland (Kluge,1975), Barents Sea (Smitt, 1868b, 1879b; Marenzeller, 1877; Urban, 1880; Nordgaard, 1896, 1905, 1912a, 1918; Bidenkap, 1897, 1900a, 1900b;? Waters, 1900; Andersson, 1900, Kluge, 1906,1926; Kluge in Deryugin, 1915), White Sea (Gostilovskaya, 1957), Kara Sea (Smitt, 1879a; Levinsen, 1887; Nordgaard, 1912b; Kluge, 1929), Laptev Sea (Kluge, 1929,1975), eastern Greenland (Andersson, 1902; Nordgaard, 1907a; Levinsen, 1914), Jan Mayen Island (Lorenz, 1886), and northern Norway (Nordgaard, 1905, 1918). Only found in the Southern Seamount during the present work.

Family **Bryocryptellidae** Vigneaux, 1949

Genus ***Palmiskenea*** Bishop & Hayward, 1989

Palmiskenea aquilonia Hayward, 1994

(Fig.15;Table 14)

Palmiskenea aquilonia Hayward, 1994: 192, figs 6 C-D.

? *Porella plana:* Kluge 1975: 558, fig. 307.

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_036, MSM86_062, MSM86_063, MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073, MSM86_076 and MSM86_077.

Description

Colony erect, multiserial, cylindrical, irregularly branched, formed by rows between three or

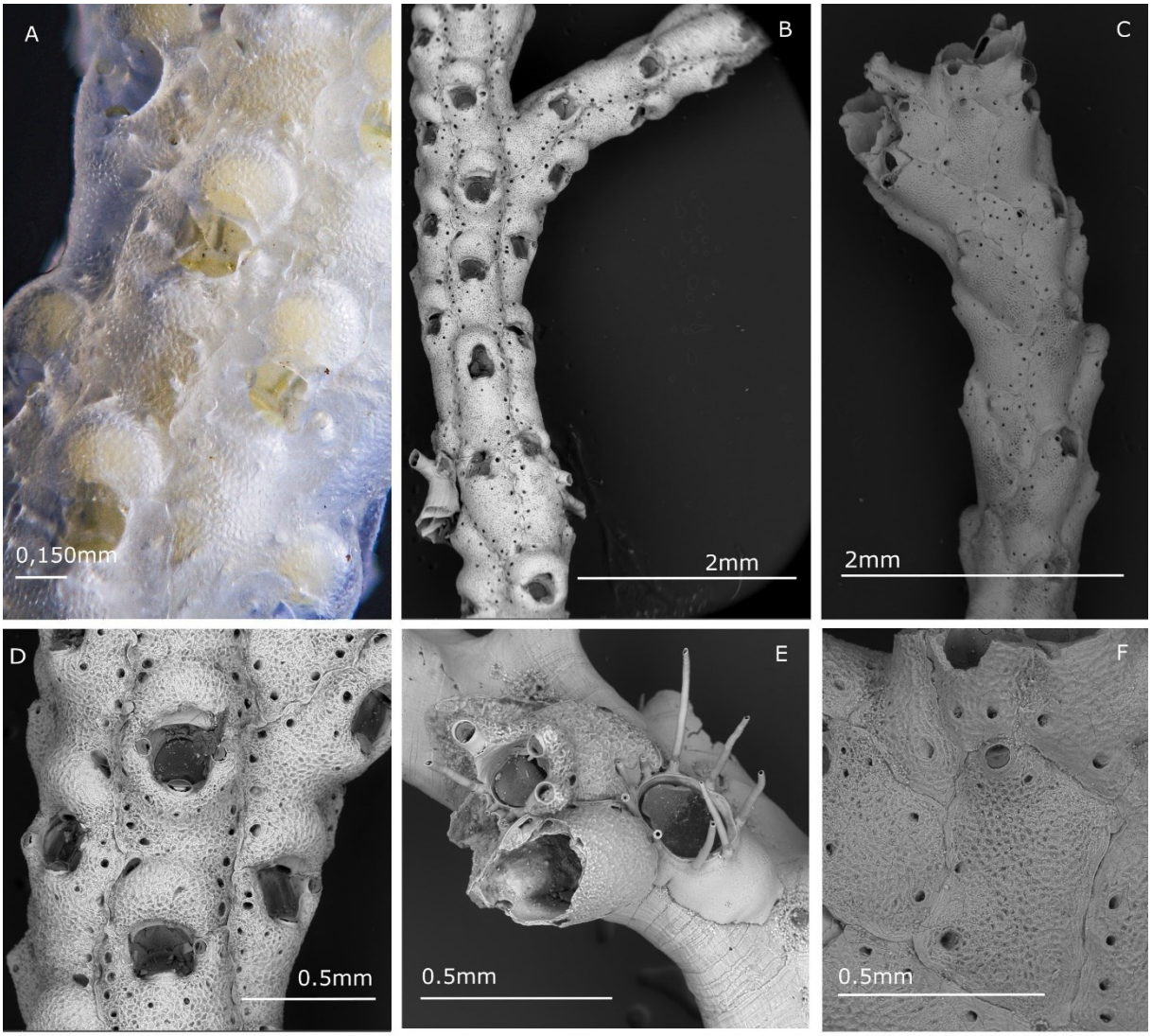

Fig.15. *Palmiskenea aquilonia*..A-B General view of the ovicellate colony. C. Autozooids in basal view. D. Primary orifice with ovicells and suboral avicularia. E.Ancestrula and growing colony. F. Kenozooid with avicularia.

four zooids. Autozooids rectangular, separated by well visible sutures, although less distinct borders in later ontogeny, covered by thickened secondary calcification. Frontal wall convex, granular, with single series of rounded marginal pores. Orifice circular, with proximal border concave obscured by suboral avicularium, with small rounded condyles. Three oral and rounded avicularia associated to peristome, central avicularia larger, inside of secondary aperture, oval almost in perpendicular plane to orifice. Two smaller situated laterally of orifice, more raised in peristome. Peristome thick and low, with a series of circular pores slightly smaller than marginal pores. In later ontogeny, additional avicularia appear on frontal surface mainly around orifice, up to seven avicularia were counted around orifice. Ovicells hyperstomial, globose,

wider than long, with small pseudopores close to orifice but often covered by secondary calcification with rugose appearance, identical to frontal wall. Ancestrula smooth with nine spines. Orifice bell shaped. First zooids lacking secondary calcification similar to other zooids, with longer avicularia. Lateral avicularia long and central located on elongated sharp part of aperture.

Table 14. Measurements (in mm) of *Palmiskenea aquilonia* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.894	0.1658	0.616	1. 209	16
Autozooid width	0.437	0.0502	0.381	0.530	10
Orifice length	0.212	0.0221	0.158	0.247	15
Orifice width	0.211	0.0292	0.152	0.241	8
Oral avicularium width	0.090	0.0161	0.066	0.119	7
Lateral avicularium width	0.047	0.0070	0.038	0.061	11
Ovicell length	0.252	0.0274	0.215	0.302	13
Ovicell width	0.423	0.0088	0.408	0.431	5
Kenozooid length	0.652	0.0905	0.588	0.716	2
Kenozooid width	0.402	0.0085	0.396	0.408	2
Kenozooid avicularium length	0.057	0.0040	0.061	0.053	3
Ancestrula length	0.474				1
Ancestrula opesia length	0.270				1
Ancestrula opesia width	0.183				1

Remarks

Palmiskenea aquilonia described by Hayward (1994) from specimens from Faroe Islands is distinguished from other species of *Palmiskenea* by the proportions of the orifice, and by its oval suboral avicularia larger than the lateral rounded avicularia. Besides of these differences, *Palmiskenea plana* (Hincks, 1888) has flat colonies with a primary orifice wider than long with large rounded condyles. Our specimens agree morphologically with the description of Hayward (1994), nevertheless in one specimen additional avicularia were observed around the orifice in later astogeny. This character was not originally described. The development of additional avicularia in later astogeny also was described for *P. plana* (Hincks, 1888, as *Porella skenei* var. *plana*) and subsequent records from different localities (Hayward & Ryland, 1999). Kluge

(1975) described *Porella plana* from cylindrical colonies with similar morphology that our material, including the description of additional avicularia, so it is probable that his description corresponds to *P. aquilonia*. Species can be found at depths of 75-698m, temperatures of -1.63-4.25 ^{o}C and salinities of 34.27-34.96 $^{o}/_{oo}$ (Kluge,1975). The studied specimens were found at depths of 257-1209m.

Distribution

Barrents (Kluge, 1962; Smitt,1868b, 1879b; Bidenkap,1897, 1900a; Nordgaard,1900,1905, 1907b,1918; Waters,1900) and Kara seas (Kluge,1975; Smitt,1879a), waters off Labrador and western (Kluge,1975; Norman,1906; Levinsen,1914) and eastern Greenland (Kluge,1975; Kirchenpauer, 1874; Andresson, 1902), Gulf of St.Lawrence (Whiteaves,1901), Iceland (Nordgaard, 1942), eastern Iceland (Nordgaard, 1907b), northern Norway (Nordgaard, 1905), western Norway (Sars,1851,1863a; Nordgaard,1912a,1918), Skagerrak and Kattegat (Smitt,1868b; Levinsen,1894; Marcus 1940), Laptev sea (Kluge,1975), Barents Sea (Nordgaard,1912a) and western coast of France (Joliet,1877; Fischer,1970). Found in the all three seamounts in the current study.

Palmiskenea skenei var. ***tridens*** (Busk, 1859) (Ellis & Solander, 1786)
(Fig.16; Table 15)

Eschara skenei var. tridens Busk, 1856b : 33, pi. I, f. 3;
Porella skenei var. tridens Waters,1900 : 80, pi. II, f. 6-7;
Palmicellaria skenei var. tridens Nordgaard, 1905: 169, pL IV, f. 12; Kluge, 1975:566,fig.312.

Material examined: Vesteris: MSM86_028, MSM86_036, MSM86_062, MSM86_063; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073, MSM86_076 and MSM86_077.

Description

Colony erect, multiserial, dichotomously branching. Autozooids elongated arranged in straight rows; frontal shield convex, finely granulated with rounded marginal pores disposed all along autozooid margin. Primary orifice D-shaped, with proximal margin straight, although obscured by development of suboral avicularia; and with two distal spines not visible in later ontogeny. Primary orifice surrounded by well developed peristome. Suboral avicularium relatively large, oval, with rostrum slightly denticulate, included in peristome, middle pointed, raised

protuberance with rugose surface. Two additional protuberances at each side of orifice, with smaller oval avicularium. Ovicell hyperstomial, partially immersed in distal zooid, wider than long, smooth surface of ectooecium with at least three pseudopores close to proximal border, partially covered by secondary calcification of distal zooids, giving a granulate appearance, inconspicuous, roundish and small – wider than long, with slightly granulated surface. Ancestrula tatiform, with smooth gymnocyst and distal opesia surrounded by 9 long spines. First budded zooid smaller than normal autozooids but with granulated surface, oral distal spines and all three avicularia present.

Remarks

The studied material resembles descriptions of several species of the genus *Palmiskenea*: *Pamicellaria skenei* (Ellis and Solander, 1786) and *Palmicellaria skenei* var. *tridens* (Busk,1856) both now accepted as *Palmiskenea skenei* (Ellis & Solander, 1786) and finally *Palmiskenea plana* (Hincks, 1888). Both *Palmiskenea* species are described similarly as erect colonies, with marginal pores and one pair lateral aviclaria as well as one at the margin of the secondary orifice. For *P.plana* was noted that secondary calcification covers avicularia, which does not occur in our specimens. While *P. plana* of the body wall resembles our specimens before thickening (marginal pores present, 2 lateral avicularia and one central on base of the rostrum), we rather suggest its closer resemblance to *P. skenei*. In our opinion the variety described here should be proclaimed as a species, because of constant differences to the original description of *P. skenei*. Specimens can be found at depths of 3.6-1000m in salt concentrations of 34-35 $^{o}/_{oo}$ and temperature ranges from -1.2-3.5 ^{o}C (Kluge,1975). The observed specimens were found at depths from 257-1209m.

Distribution

Barents (Kluge,1975; Smitt,1868b,1879b; Bidenkap,1897,1900a; Nordgaard,1900, 1905, 1907b, 1918; Waters,1900) and Kara seas (Kluge,1975; Smitt,1879a), western (Kluge,1975; Norman,1906; Levinsen,1914) and eastern Greenland (Kluge,1975; Kirchenpauer,1874; Andresson,1902), Gulf of St. Lawrence (Whiteaves,1901), Iceland (Nordgaard,1942), eastern Iceland (Nordgaard,1907b), northern Norway (Nordgaard,1905), western Norway (Sars,1851,1863a; Nordgaard,1912a,1918), Iceland (Nordgaard,1905,1918), eastward of Iceland (Nordgaard,1907b). Very abundant species in the three seamounts.

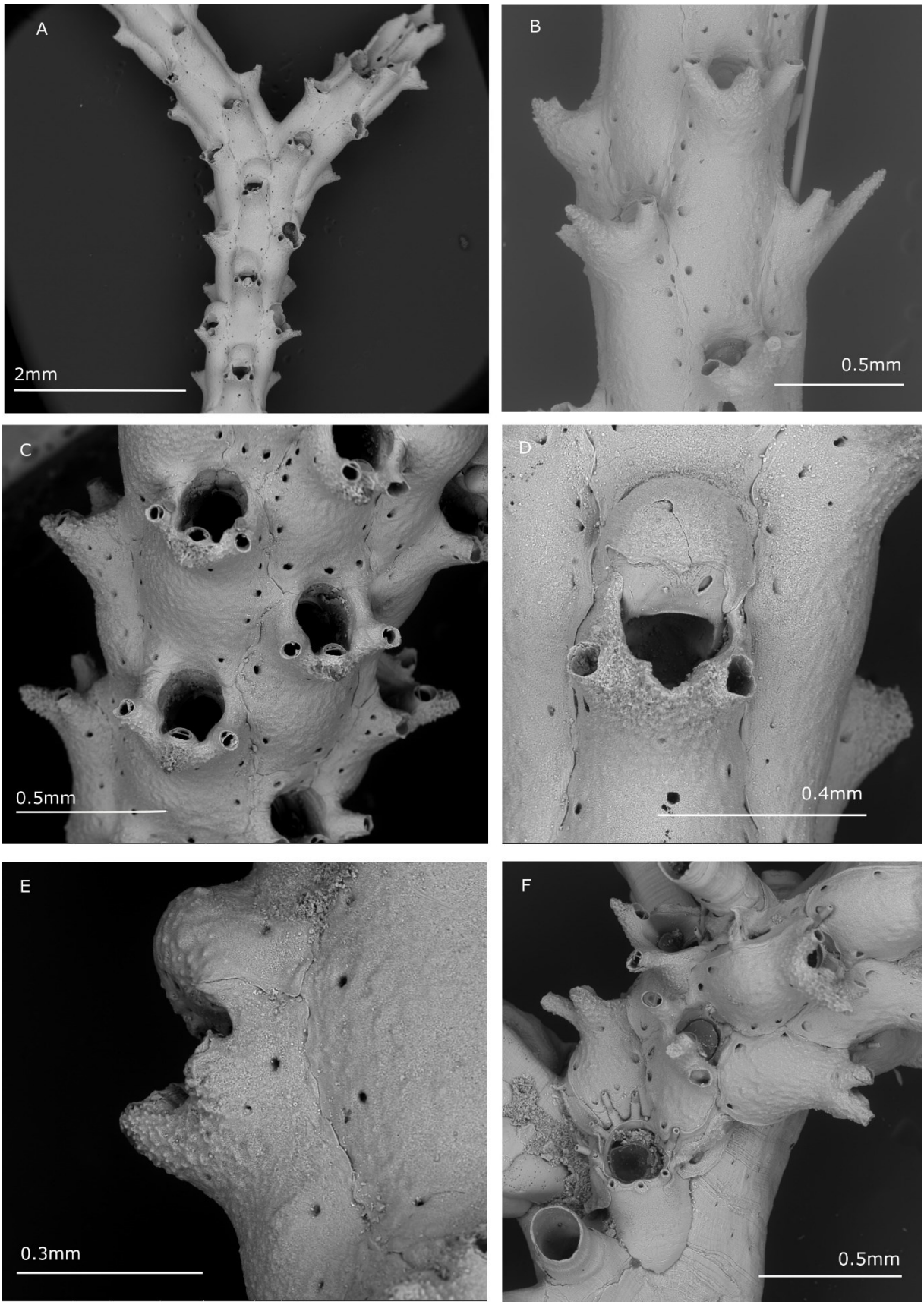

Fig.16.*Palmicellaria skenei* var. t*riden*s. A. General view of the colony. B. Autozooids in frontal view. C. Primary orifice with suboral avicularia. D. Ovicellate zooid. E. Same, in lateral view. F. Ancestrula, growing colony

Table 15. Measurements (in mm) of *Palmicellaria skenei* var. t*riden*s (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.733	0.2280	0.393	1. 086	11
Autozooid width	0.316	0.0754	0.182	0.404	7
Orifice width	0.198	0.2213	0.050	0.518	6
Lateral avicularium width	0.046	0.0114	0.027	0.063	13
Frontal avicularium width	0.042				1

Genus ***Porella*** Gray, 1848

Porella peristomata (Nordgaard, 1905)

(Fig.17; Table 16)

Phylactella peristomata Nordgaard, 1905: 170, pl. V, f. 28-31;
Smiltina perisromata: Kluge, 1975:518, fig. 278; 1975:518.
Porella peristomata Kluge, 1906 : 41, f. 2. Hayward, 1994: 189, Figs 6A, B.

Material examined: Southern Seamount: MSM86_045, MSM86_046 and MSM86_049.

Description

Colony encrusting, unilaminar, forming flat sheets. Autozooids long, hexagonal, frontal shield lightly convex lightly coarse, separated by thin sutures. Primary orifice wider than long, with short and wide lyrula, occupying two-third of proximal border, and distal border finely denticulate; without condyles. Four distal, oral, thin spines in early ontogeny. Suboral avicularium oval enclosed by peristome. Peristome laminar, thin, surrounding proximal and lateral border of orifice, with a row of two to four pores at proximal base. Peristome more developed in ovicellate zooids, obscuring avicularium. Ovicell partially immersed in distal zooid, imperforate, with same coarse surface of frontal wall of zooids, with proximal cap laterally of peristome. Ancestrula not observed.

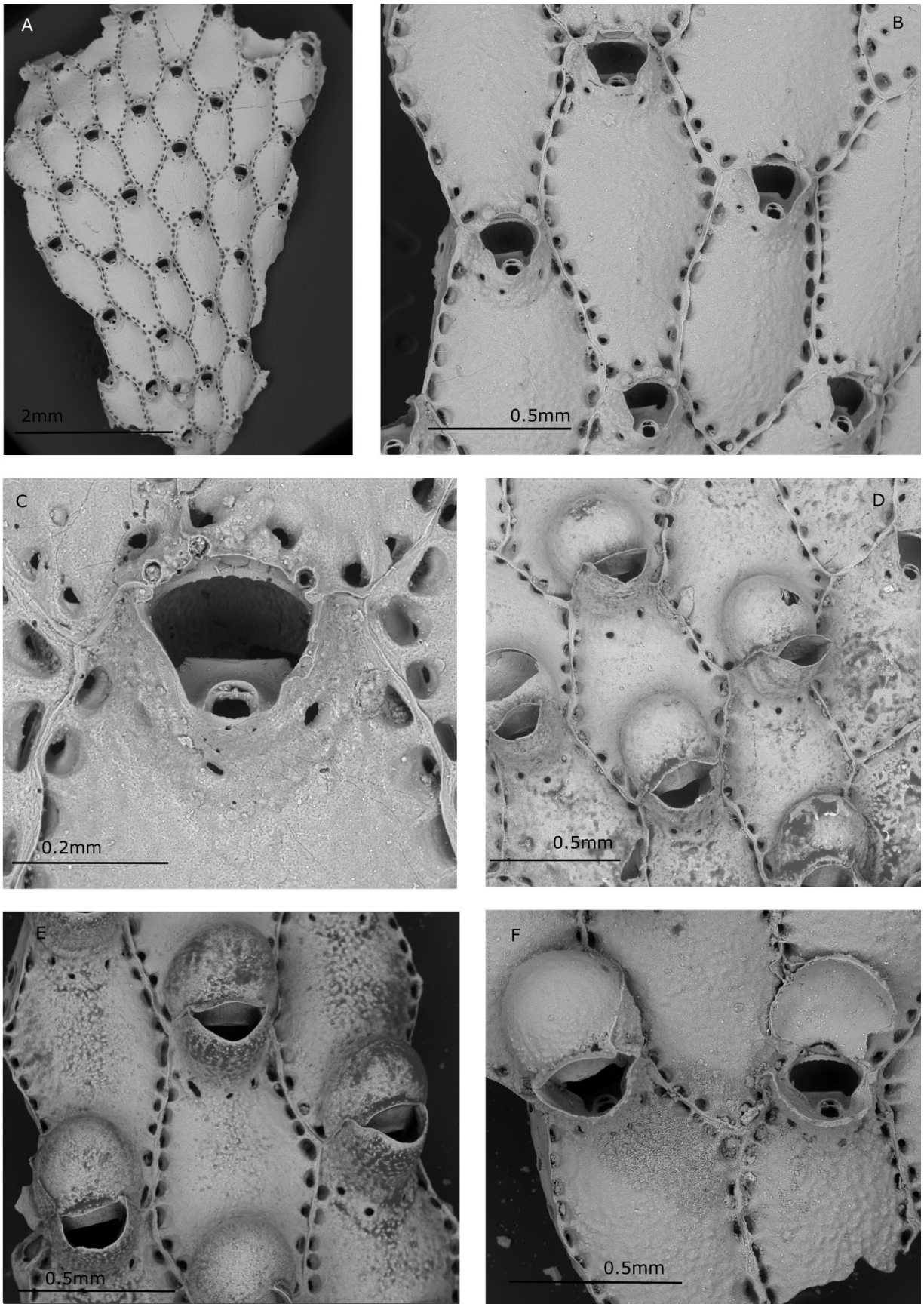

Fig.17.*Porella peristomata*. A. General view of the colony. B. Zooids in frontal view. C. Detail of the primary orifice with distal denticules, distal oral spines and oral avicularia. D-E. Ovicellate zooids with longer peristome. F. Detail of condyles and sinus.

Remarks

Kluge (1975) described *Smittina peristomata* (Nordgaard,1905) as small colony of zooids of rhombic shape, 4-6 distal marginal spines, an oval avicularium with a broad avicularian chamber between the lobes of the peristome (peristome with 3-5 basal pores). While this description fully fits our species, this species was renamed as *Porella peristomata* and described as much larger species (Figures and descriptions of Hayward,1994). We suggest revision of Kluge's specimens in order to determine specific differences. Species occur on shells and other bryozoans, at temperatures of -1.4-3.9 ºC, salinities of 34.27-34.90 $^{o}/_{oo}$ and depth of 73- 630m (Kluge,1975). Specimens were found growing on other bryozoans and polychaetes, at depths range of 536-733m.

Table 16. Measurements (in mm) of *Porella peristomata* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.949	0.1062	0.795	1. 122	20
Autozooid width	0.546	0.0611	0.414	0.645	20
Orifice length	0.146	0.0240	0.108	0.186	8
Orifice width	0.208	0.0437	0.162	0.282	16
Ovicell length	0.286	0.0265	0.234	0.330	9
Ovicell width	0.398	0.0297	0.353	0.444	9
Avicularium width	0.048	0.0177	0.030	0.063	7

Distribution

Eastern Iceland, the Barents Sea, the Kara Sea, Alaska (Dick et al,2005) and the subarctic northeast Atlantic (Kluge,1975). Only recorded from Southern Seamount in the present work.

***Porella* sp.**

(Fig.18; Table 17)

Material examined: Vesteris: MSM86_036.

Description

Colony encrusting, multiserial. Autozooids oval to hexagonal in shape, frontal shield convex, slightly wrinkled, with row of variable number of rounded areolar marginal pores. Primary

orifice semicircular, longer than wider, with proximal border straight and obscured by oral avicularia. Small blunt condyles. Two to four oral distal spines in early ontogeny. Peristome

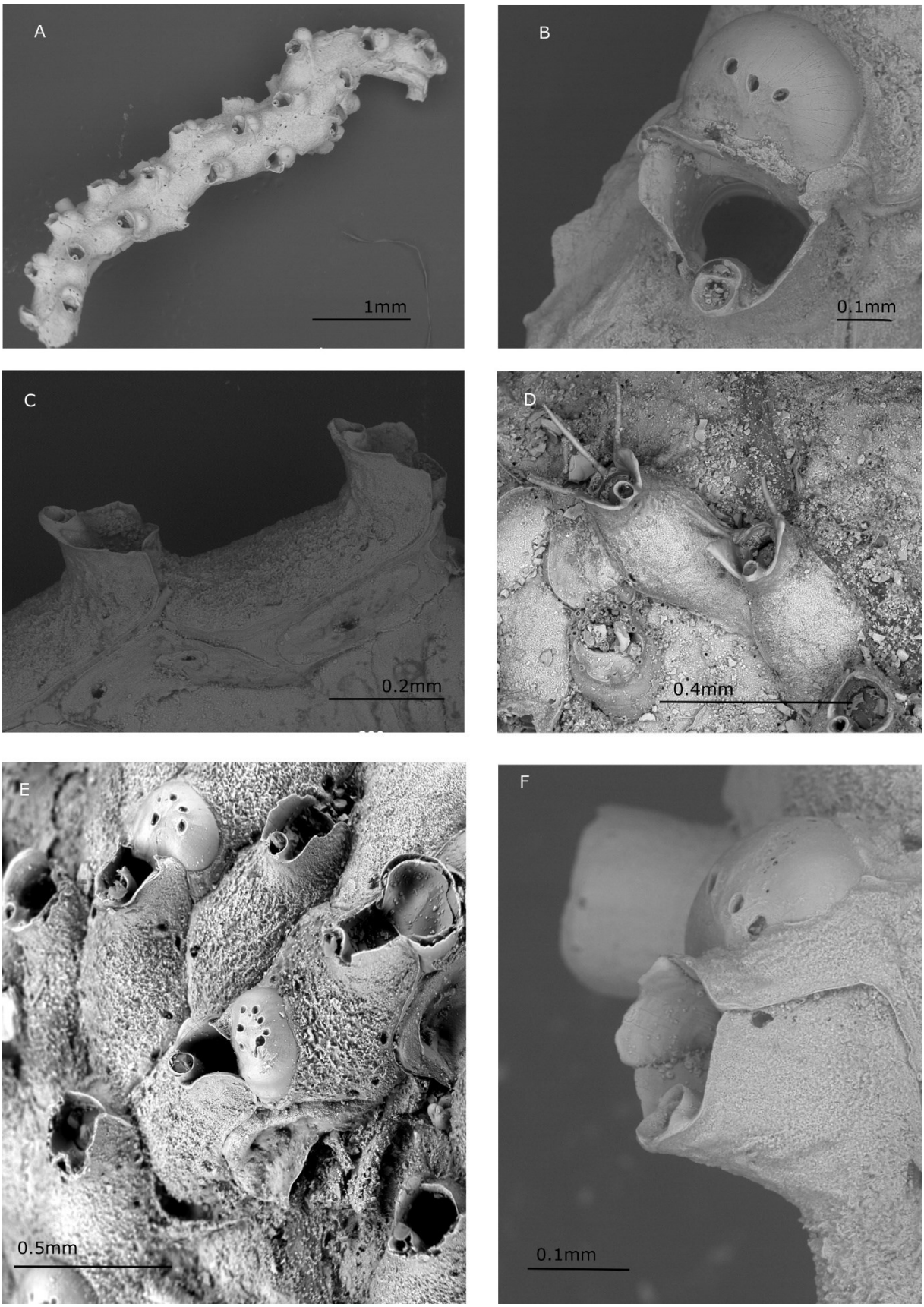

Fig.18.*Porella* sp. A. General view of the colony. B. Primary orifice with suboral avicularia; ovicell. C. Zooids in lateral view. D. Zoids with three spines in frontal view. E. Colony with ovicells. F. Zooids in lateral view.

laminar surrounding orifice; proximally and laterally formed from the frontal wall of zooid and distally by proximal wall of distal zooid, leaving a lateral suture. Suboral avicularium internal of peristome, with rostrum oval over level of peristome margin. Ovicells hyperostomial, partially immersed in distal zooid, surface smooth with variable number of irregular central pseudopores, laterally covered by calcification of distal or lateral zooids forming a cap as continuation of peristome, close to proximal border of ovicell.

Remarks

Characters of the studied specimens are not in agreement to other species of *Porella* described from the Atlantic and Arctic waters. To our knowledge the present specimens belong to a new species of *Porella*, and hence is left in open nomenclature in the present work.

Distribution

Specimens recorded from only one locality of Vesteris Seamount.

Table 17. Measurements (in mm) of *Porella* sp. (SD. standard deviation; Min.minimum; Max. maximum;N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.530	0.0923	0.351	0.663	17
Autozooid width	0.295	0.0576	0.159	0.373	20
Orifice length	0.160	0.0155	0.130	0.189	17
Orifice width	0.133	0.0617	0.048	0.184	9
Suboral avicularium length	0.047	0.0064	0.037	0.056	12
Suboral avicularium width	0.039	0.0030	0.034	0.042	6
Ovicell length	0.180	0.0066	0.173	0.186	3
Ovicell width	0.216	0.0070	0.209	0.223	3
Ancestrula length	0.317				1
Ancestrula width	0.239				1
Ancestrula frontal membrane length	0.204				1
Ancestrula frontal membrane width	0.165				1

***Porella* sp 2**

(Fig.19; Table 18)

Material examined: Southern Seamount: MSM86_045 and MSM86_049.

Description

Colony encrusting, forming small sheets. Autozooids small, oval to hexagonal, with a slightly coarse frontal wall, few marginal areolar pores and zooids separated by a clear suture.

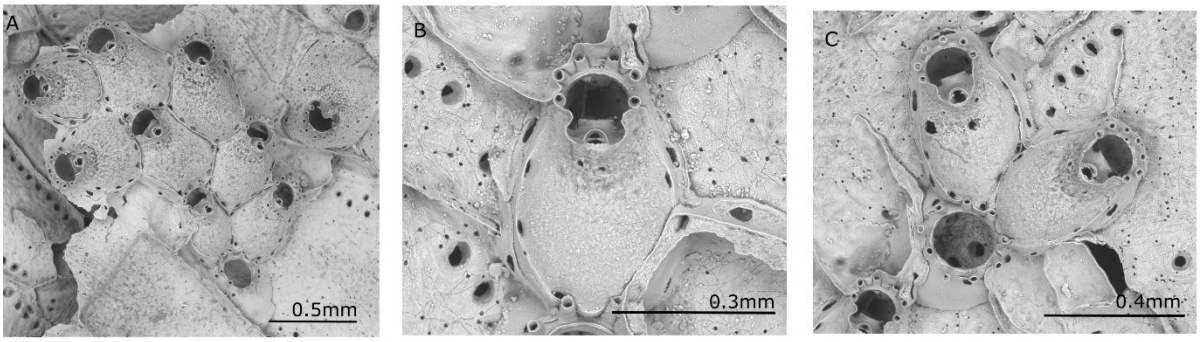

Fig.19.*Porella* sp.2 A. General view of the colony. B. Zooid with primary orifice, condyles and distal oral spines. C. Ancestrula.

Primary orifice semi-circular, slightly wider than long, with distal border with small denticles, proximal border with wide lyrula occupying almost entire proximal margin. Peristome laminar, low surrounding proximal and lateral part of orifice. Avicularium suboral included in peristome, oval, small, with complete thin crossbar. Five to seven oral spines. Ancestrula tatifom, with smooth gymnocyst larger proximally and narrow laterally. Opesia circular, without cryptocyst and surrounded by nine spines.

Remarks

The lack of important characters, such as the ovicell, and the fact that our material is formed only by small colonies leads us to leave this species in open nomenclature. However, the characters present such as the avicularium shape, morphology of the primary orifice and the type of front wall, allow us to place our specimens in the genus *Porella*. These characters also are different from the other species of the genus *Porella* present in this work.

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Table 18. Measurements (in mm) of *Porella* sp.2 (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.491	0.0791	0.079	0.627	14
Autozooid width	0.351	0.0602	0.060	0.463	14
Orifice length	0.137	0.0178	0.018	0.143	14
Orifice width	0.142	0.0175	0.017	0.168	14
Avicularium width	0.035	0.0083	0.008	0.041	11

Distribution

Specimens was collected only in the Southern Seamount.

Family **Exochellidae** Bassler, 1935

Genus ***Escharoides*** Milne Edwards, 1836

Escharoides bidenkapi (Kluge, 1946)

(Fig.20;Table 19)

Peristomella bidenkapi Kluge, 1946, 200, pl. 2, fig. 6;

*Escharoides jacksoni (*Waters, 1900): Hayward and Ryland, 1999, 116, fig. 33;

Escharoides bidenkapi; Kluge 1975, 690, fig. 400; Hayward and Ryland, 1978, 150, figs. 5A, 5B*;* Kuklinski et at,2007:221, fig.2.

Material examined: Southern Seamount: MSM86_045, MSM86_046 and MSM86_049.

Description

Colony encrusting, forming thick sheet. Autozooids irregular large, separated by deep grooves. Frontal surface finely granulated, surrounded by single row of numerous marginal pores. Primary orifice orbicular with distal margin almost straight with coarse granulations. Peristome projecting from frontal wall, with three longitudinal denticles, one central more developed and two lateral. Four oral spines, two united between peristome and distal margin and two in medial position. Two big triangular avicularia at each side of orifice, directed distolaterally, with tip slightly hooked, avicularia chamber with two or four basal pores. Ovicells hyperstomial, globular, large, with granular wall as frontal wall of zooid. Ancestrula tatiform, with smooth

proximal gymnocyst and cryptocyst reduced to narrow lamina; surrounding by 13 spines. Periancestrular zooids with six oral distal spines and smaller avicularia.

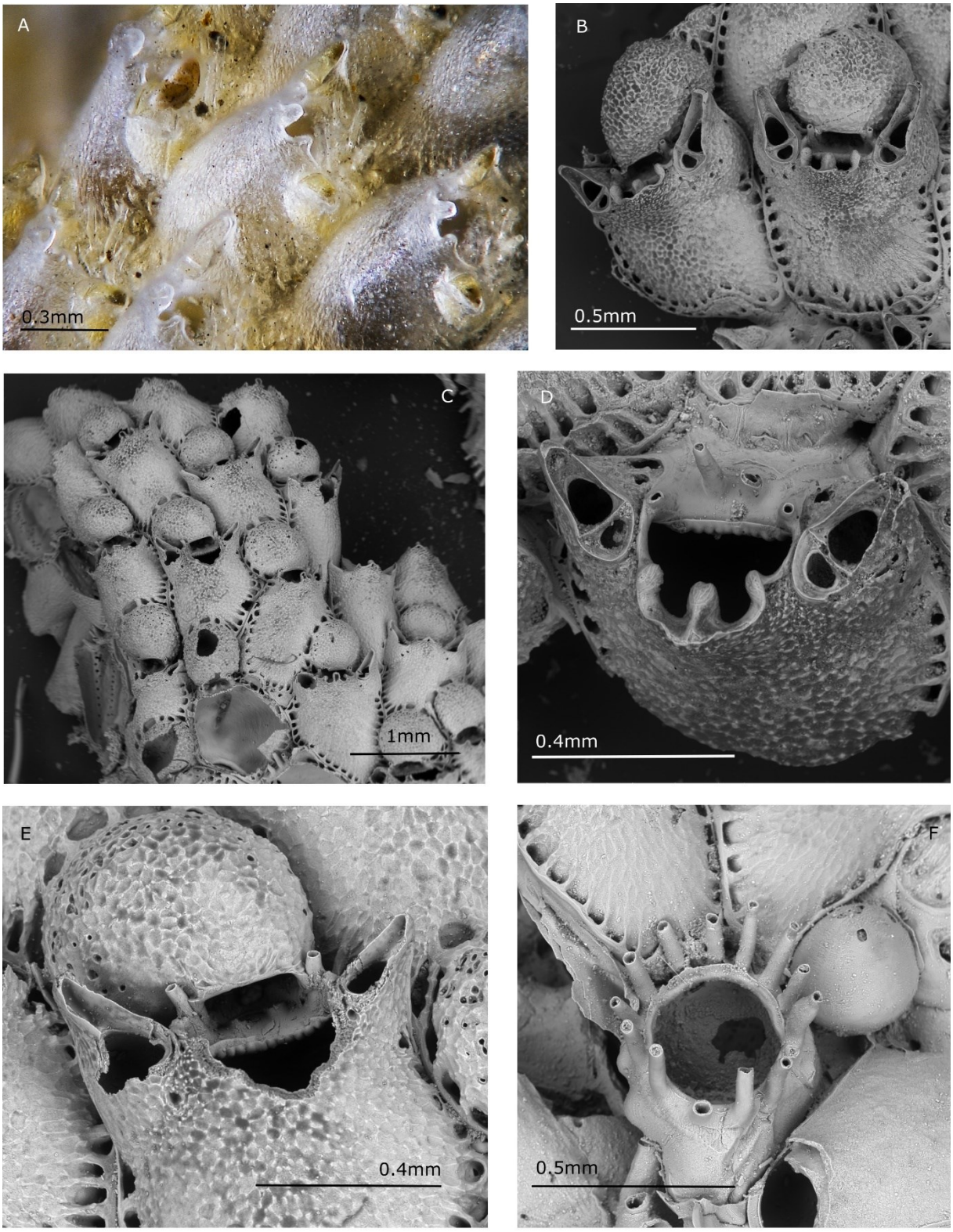

Fig.20. *Escharoides.bidenkapi* A., C. General view of the colony. B. Ovicellate zooids. D. Denticulate distal border of the primary orifice, proximal dental spine; details of oral spines and lateral oral avicularia. E. Same, with an ovicell. F .Ancestrula.

Table 19. Measurements (in mm) of *Escharoides.bidenkapi* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.814	0.2109	0.598	1. 173	10
Autozooid width	0.712	0.1437	0.474	0.839	8
Orifice length	0.332	0.0028	0.330	0.334	2
Orifice width	0.328	0.0296	0.286	0.363	8
Avicularium length	0.207	0.0284	0.185	0.278	9
Ovicell length	0.431	0.0596	0.372	0.533	10
Ovicell width	0.535	0.0511	0.470	0.597	8

Remarks

The observed specimens fully match the morphological characteristics given for *Escharoides bidenkapi* (Kluge,1946, Kuklinski,2007) characterized as an unilaminar, encrusting species with four distal oral spines, a short round denticule in the centre of the peristome (on the outer side), one pair of avicularia at sides of the peristome. Species are found at depths of 11-1000m, at temperatures of 1.68-3.95 ºC and salinities of 34.27-35.01 ‰ (Kluge,1975). They occur on stone, other bryozoana, shells of brachiopods. The analysed specimens are growing on polychaetes, stones and other bryozoans at depths of 536 -733m.

Distribution

Kara, Laptev, and East Siberian seas (Kluge,1975) Barents Sea (Smitt, 1868b; Bidenkap, 1900a; Nordgaard, 1900, 1918; Kluge,1975), Jan Mayen Island (Andersson, 1902), the Norwegian Sea up to 62°30′ n. 1. (Nordgaard, 1907b), northern fiords of Norway (Nordgaard, 1905, 1918) and temperate Atlantic (Hayward and Ryland 1978). This species was only identified in samples from the Southern Seamount.

Family **Escharellidae** Levinsen, 1909

Genus ***Escharella*** Gray, 1848

Escharella labiata (Boeck in Smitt, 1868)

(Fig.21; Table 20)

Discopora coccinea f. labiata Boeck in Smitt, 1868: 27,175, t.27,fig.176;

Phylactella grandis Hincks,1880b: 280,pl.15,figs.4-5;

Escharella labiate Nordgaard,1905:170 (Part.),pl.IV, f.25-26; Levinsen, 1916: 451,pl.XX,figs.3-9;

Phylactella labiat: Kluge, 1975: 507, fig. 272;
Escharella labiate: Hayward, 1994: 185, fig 2C, D.

Material examined: Southern Seamount: MSM86_045 and MSM86_049.

Description

Colony encrusting, unilaminar. Autozooids oval to hexagonal, and slightly raised in distal portion. Frontal shield finely granulated, strongly convex, with row of marginal pores all around border. Primary orifice semi-circular, obscured by peristome, almost vertical in relation to frontal wall, with straight proximal border and condyles blunt and small. Five to six oral spines in distal position, with only two in ovicellate zooids. Peristome strongly developed, as prolongation of frontal wall from proximal border of orifice, together with elevation of distal part zooid forming tubular peristome with narrow oval secondary orifice in transverse direction, distally with oral spines. Ovicells large, hyperstomial, globular, imperforate and finely granulated. Ancestrula small oval with distal margin raised, surrounded by 10 thin spines along lateral and distal margin, three thicker spines proximally. Frontal membrane takes most part of ancestrula length, cryptocyst granulated, opesia oval occupying half of frontal membrane.

Remarks

The studied material mostly corresponds to descriptions provided by Hayward (1994) and Kluge (1975, as *Phylactella labiata*). This species has deep peristomes, four to six oral, distal spines and a single series of small, marginal pores. An important distinguishing character to other species of *Escharella* is the lack of a lyrula and small, round condyles. The analysed specimens found at depths of 704m and 733m. They live on other bryozoans.

Distribution

East Atlantic, Lofoten Islands, Faroe Islands (Kluge, 1975; Hayward 1994) and from the Southern Seamount in the present study.

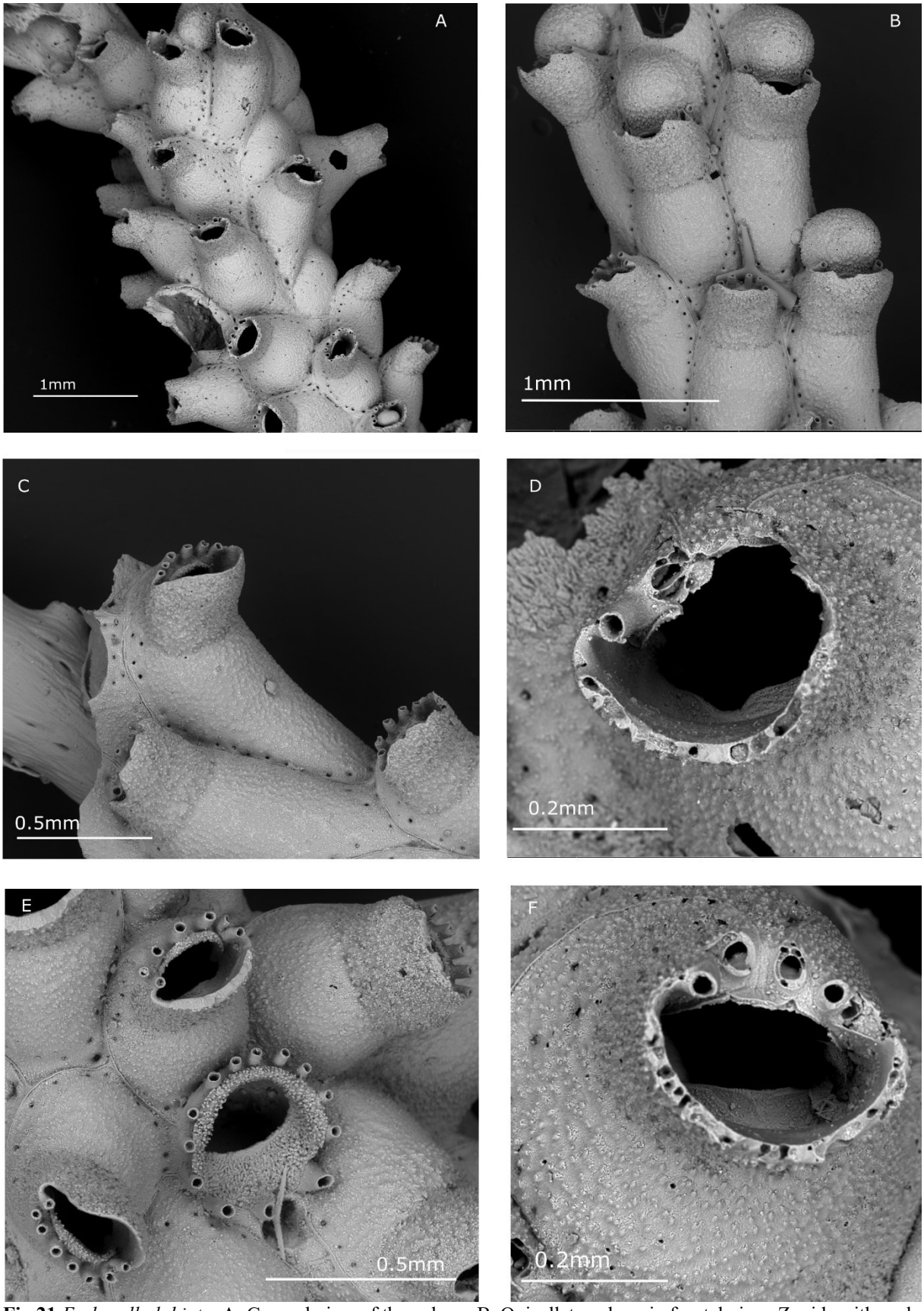

Fig.21.*Escharella labiata*. A. General view of the colony. B. Ovicellate colony in frontal view. Zooids with oral spines in lateral view. D, F. Primary orifice with sinus and condyle. E. Ancestrula.

Table 20. Measurements (in mm) of *Escharella labiata* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.946	0.2054	0.435	1. 130	18
Autozooid width	0.523	0.0796	0.383	0.645	9
Orifice length	0.213	0.0276	0.193	0.232	2
Orifice width	0.311	0.0588	0.203	0.370	9
Ovicell length	0.373	0.0506	0.321	0.422	3

Escharella macrodonta Levinsen, 1916

(Fig.22;Table 21)

Escharella macrodonta Levinsen, 1916, pl. XXIV, fig. 1-2; Kluge, 1946 : 197, fig. 3;Kluge,1975:497,fig.264.

Material examined: Southern Seamount: MSM86_045 and MSM86_049.

Description

Colony encrusting, forming unilaminar sheets. Autozooids oval to hexagonal, separated by distinct grooves. Frontal wall convex, finely granulated, with small marginal pores arranged in single row proximally, in some zooids two rows latero-distally. Pore chambers large, oval distributed laterally and distally. Primary orifice semi-circular wider than long with distinctive rounded condyles, proximal border with well development lyrula. Lyrula either with two sharp ends or anvil-shaped. Proximal secondary orifice thick, convex lip with short conical or triangular morphology. Eight articulate oral spines in non-ovicellate and ovicellate zooids. Ovicells hyperstomial globular, surface finely granulated. Ancestrula with oval opesia, proximal and lateral gymnocyst broad and smooth, cryptocyst proximally well developed, granulated. Frontal wall surrounded by nine spines.

Remarks

The specimens found in Arctic waters resemble species of two closely related genera*:* *Escharella* Gray,1848 and *Hemicyclopora* Norman,1894. Based on descriptions from Kluge (1975), *Escharella macrodonta* Levinsen,1916 is categorized by medium-sized zooids, eight oral spines, one to three tows of marginal pores, high and narrow lyrula, which broadens

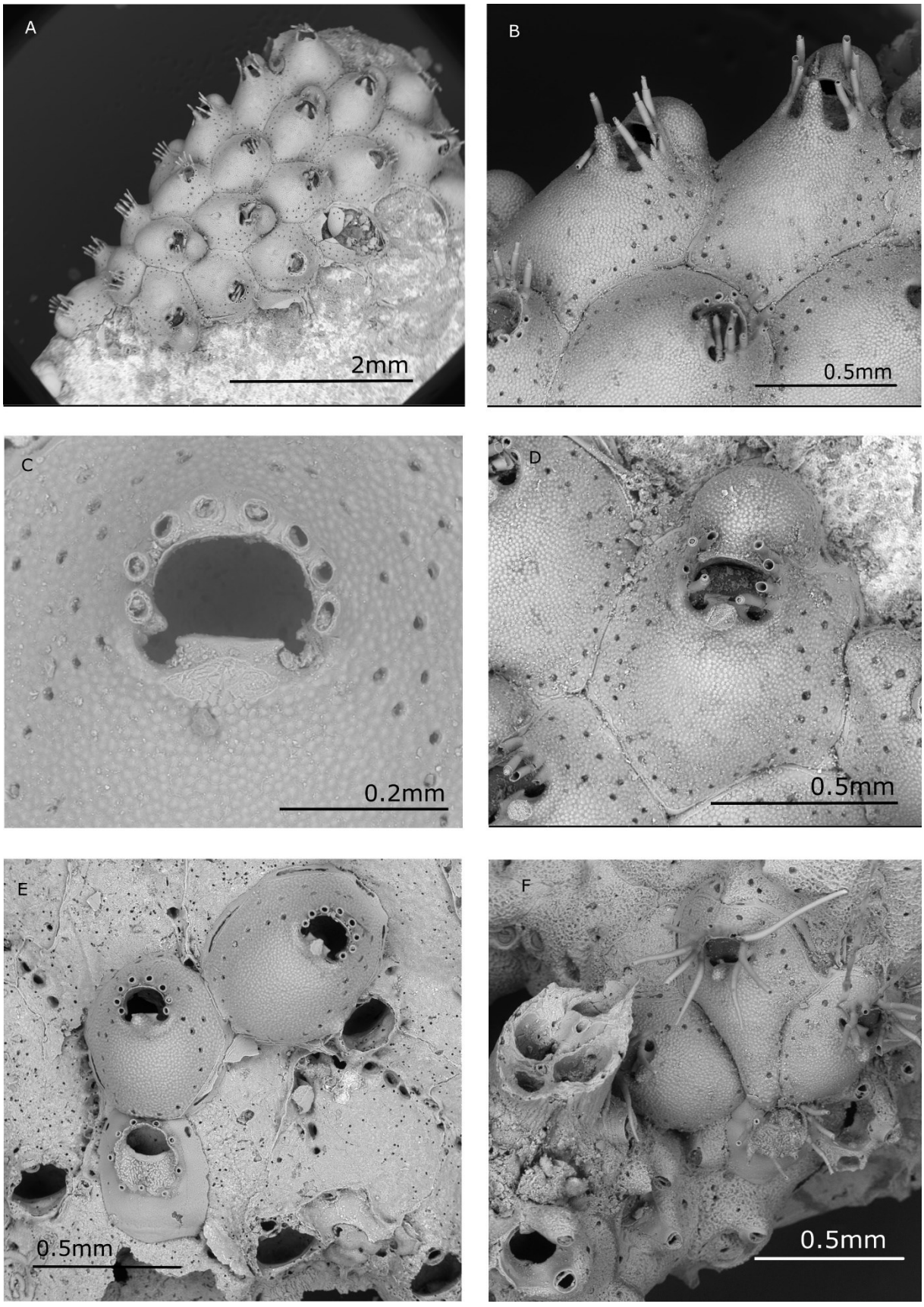

Fig.22. *Escharella macrodonta*.A. General view of the colony. B. Colony in lateral view. C. Detail of an orifice with condyles and a sinus; broken oral spines. D. Ovicellate zooids. E. Ancestrula. F. Zooids with spines and umbo.

towards the free end. Furthermore, Kluge (1975) describes *E. macrodonta* with very little or not at all developed mucro. This character strongly differs in our species which appears rather long. In our material, a mucro was often broken or growing, and its shape required the observation on a high number of colonies. This might be the case with Kluge's (1975) specimens, necessitates the revision of the original material. In comparison, *Escharella macrodonta* appears flatter than *Hemicyclopora labrata*, but this character can be wrongly interpreted (Harward, 1994). In the original descriptions of Hayward, *H. labra* has hexagonal zooids, up to 3 rows of marginal spines, triangular condyles, and a rectangular proximal lip. Additionally, *H. labra* is categorized by six oral spines and a rectangular proximal lip while our specimens possess eight oral spines and a triangular, elongated proximal lip. The species can be found at depths of 81-733m.

Table 21. Measurements (in mm) of *Escharella macrodonta* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.850	0.0874	0.697	1. 039	22
Autozooid width	0.683	0.0704	0.562	0.791	21
Orifice length	0.149	0.0149	0.115	0.175	21
Orifice width	0.197	0.0221	0.147	0.238	21
Lyrula width	0.111	0.0159	0.079	0.144	19
Ovicell length	0.262	0.0361	0.171	0.292	9
Ovicell width	0.331	0.0246	0.297	0.365	9

Distribution

East Siberian Sea (Kluge,1975), Northeastern Greenland (Levinsen,1916) and in the Southern Seamount in this study.

***Escharella* sp.**

(Fig.23; Table 22)

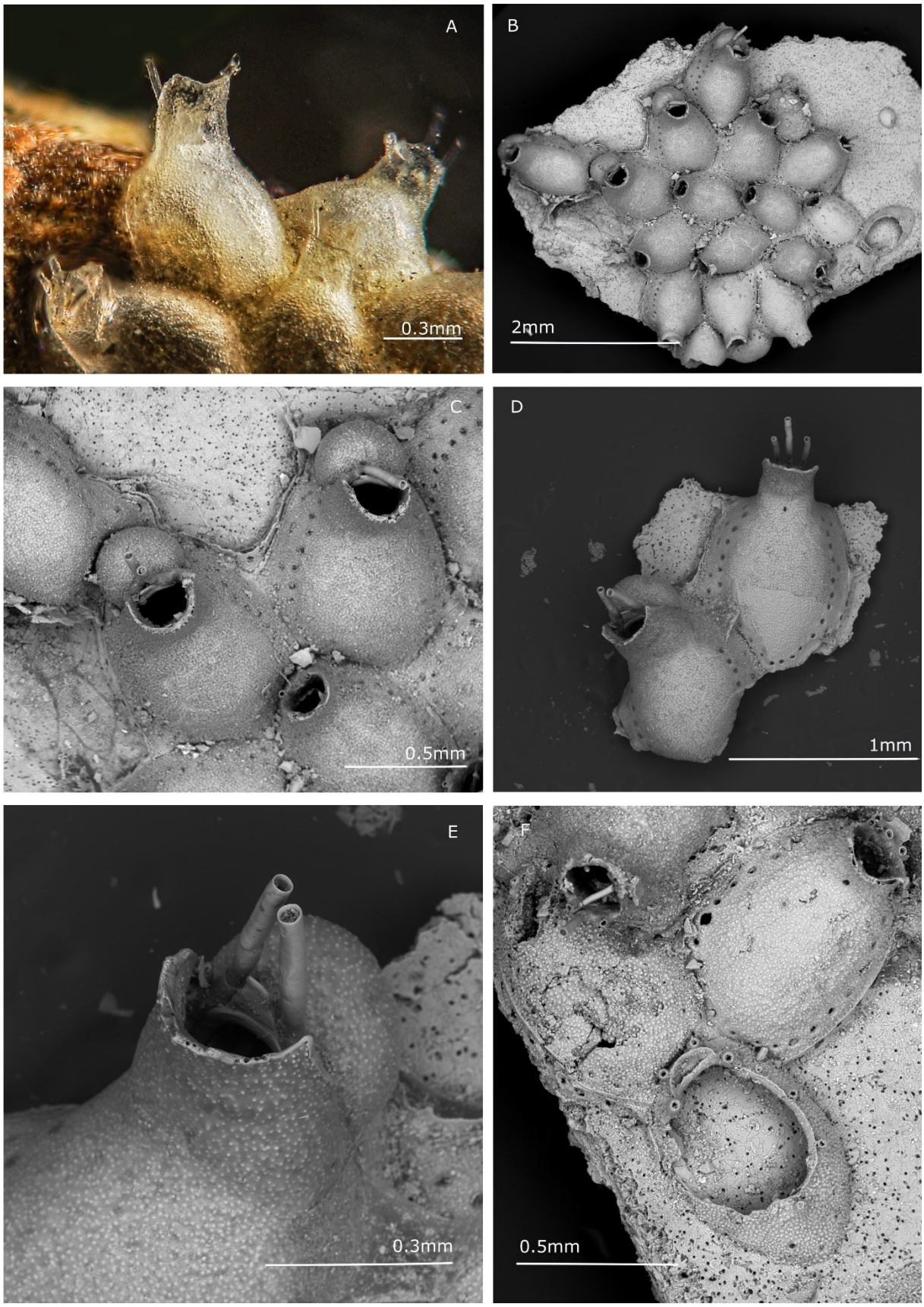

Fig.23. *Escharella* sp. A-B. General view of the colony. C. Colony with ovicells. D. Fragment of the colony, oral spines and ovicell. E. Detail of an orifice with oblique and flat oral spines; ovicell. F. Fragment of ancestrula.

Material examined: Southern Seamount: MSM86_036 and MSM86_063.

Description

Colony encrusting unilaminar, multiserial. Autozooids oval to hexagonal, frontal shield strongly convex, finely granulated, with rounded marginal pores, arranged in one row in proximal and proximo-lateral part, two in distolateral part. Primary orifice tilted in respect to frontal wall, obscured by peristome. Peristome proximal well development, laminar, closing aperture at level of oral spines, secondary orifice oval transversal. Three distal spines, two in ovicellate zooids, thicker than in non-ovicellate zooids. Oecium kenozooecial, Ovicell rounded, with smooth, flat and triangular central denticle, with frontal wall finely granulated as zooidal frontal wall. Ancestrula tatiform without clear cryptocyst, frontal membrane surrounded by nine or ten spines.

Remarks

The morphological characteristics of our specimens resemble Jullien's species *Escharella longicolis*, recorded from the NW of the Iberian Peninsula, Golf of Biscay and Strait of Gibraltar (Harmelin & d'Hondt, 1992, Reverter-Gil & Fernandez-Pulpeiro, 1999). Nevertheless, some differences are also notable. Our specimens are characterized by smaller zooids, more and relatively larger marginal pores, and the presence of only three spines in non-ovicellate zooids. The number of spines in *E. longicolis* is four, and consistent in ovicellate zooids, whereas our specimens only show two spines in ovicellate zooids. The number of spines in *Escharella* had been indicated to be an important feature for differentiation of species (Souto et al. 2007, Harmelin & Rosso, 2023). According to these differences we think that our specimens are a new species. The few specimens are found at a depth of 257m.

Distribution

Only recorded from the Southern Seamount.

Table 22. Measurements (in mm) of *Escharella* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.856	0.1324	0.550	1. 170	22
Autozooid width	0.666	0.0879	0.494	0.827	21
Orifice width	0.217	0.0251	0.180	0.255	8
Ovicell length	0.313	0.0396	0.262	0.348	4
Ovicell width	0.392	0.0301	0.352	0.416	4
Ancestrula frontal membrane length	0.595				1
Ancestrula opesia length	0.489				1

Family **Tessaradomidae** Jullien, 1903

Genus ***Tessaradoma*** Norman, 1869

Tessaradoma boreale **(Busk, 1860)**

(Fig.24;Table 23)

Quadricellaria gracilis Sars, 1863a: 153;

*Anarthropora borealis:*Smitt, 1868b : 8, 67, pl. 24, f.ig 25-29;

Onchopora borealis: Busk, 1860 : 213, pl. 28, fig. 6-7;

Tessaradoma boreale: Smitt, 1873 : 32, pl. 6, fig. 143-145;

Porina borealis: Hincks, 1880a : 229, pl. 31, f.ig. 4-6;

Tessaradoma gracile: Jullien and Calvet, 1903 : 74, pl. 3, f. 4, pl. 14, f. 2; Marcus, 1940 : 222, fig. 113; Kluge, 1975: 634, fig.365.

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_036, MSM86_062, MSM86_063, MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073, MSM86_076 and MSM86_077.

Description

Colony erect, rigid, with straight, cylindrical branches and dichotomously branching. Branches formed by alternating rows of autozooids arranged back-to-back. Autozooids variable in size, separated by sutures later covered by secondary calcification; frontal shield with longitudinally aligned wrinkles, slightly convex. Distal part of zooid tubular peristome; a single row of round

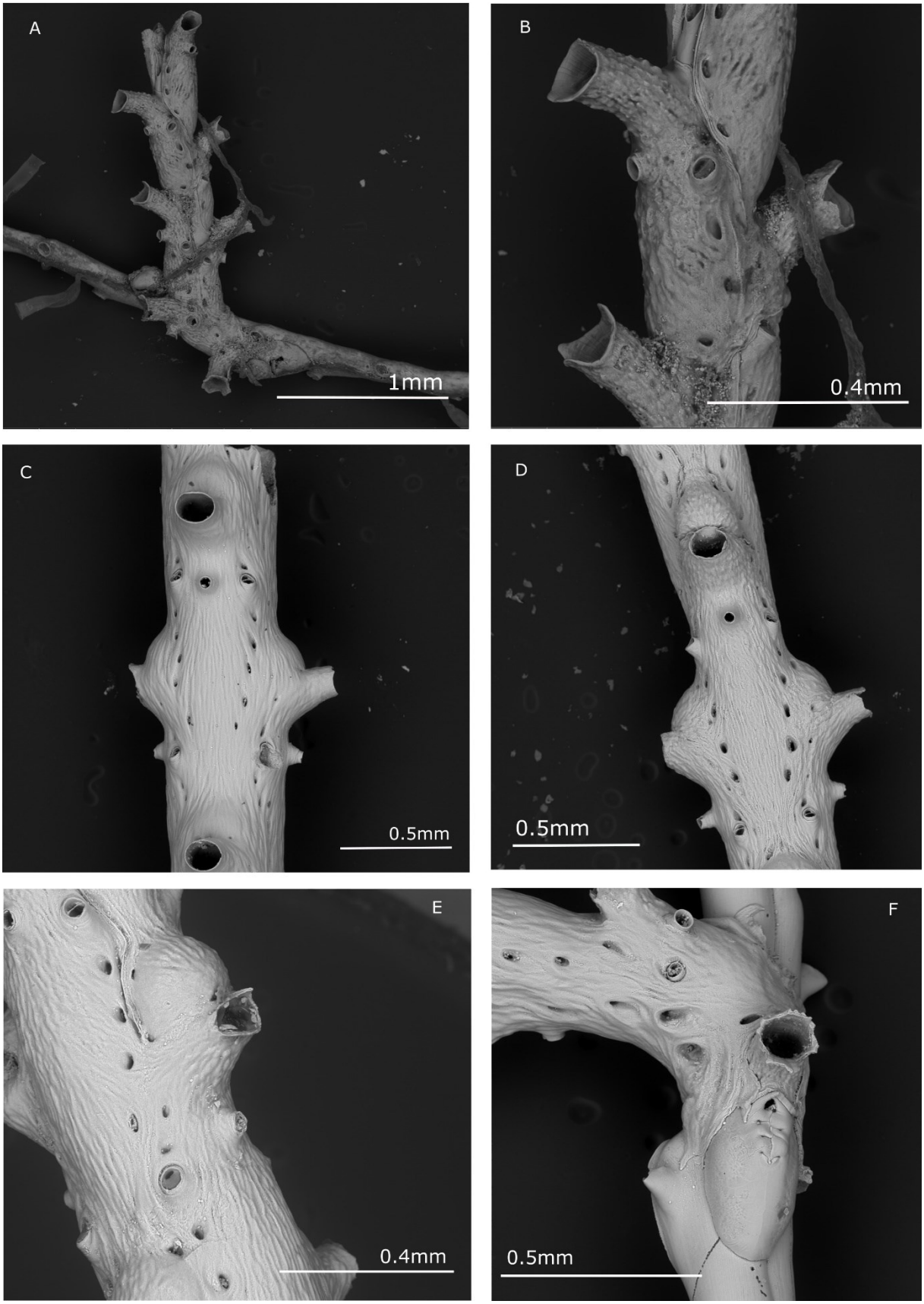

Fig.24.*Tessaradoma boreale*. A. General view of young, growing colony. B. Zooids in lateral view. C. Zooids in frontal view. D. Ovicellate zooids. E. Ovicellate zoid in lateral view; lateral avicularia. F. Ancestrula.

or oval marginal areolar pores, central tubular spiramen in distal third of the frontal wall. Primary orifice obscured by long peristome, secondary orifice on top of tubular peristome rounded or transversally oval. Ovicell peristomial, with visible part globular, wider than long, ectooecium membranous and endooecium calcified with ornamentation as of frontal wall. Avicularia adventitious, oval, variable in size, generally small, paired, at each marginal side at level of spiramen; rostrum short semi-elliptical, crossbar complete. Ancestrula oval-elongate, proximal part formed by smooth gymnocystal wall, joined centrally by suture formed by non-articulated mural spines and two distally raised costae. Distal portion as tubular peristome of cryotcystidian wall. Single zooid budded distally.

Table 23. Measurements (in mm) of *Tessaradoma boreale.* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	1. 071	0.3364	0.539	1. 481	19
Autozooid width	0.443	0.0660	0.329	0.500	5
Orifice length	0.106	0.0197	0.079	0.134	12
Orifice width	0.121	0.0165	0.087	0.153	15
Avicularium length	0.045	0.0068	0.033	0.055	16
Avicularium width	0.037	0.0120	0.024	0.052	4
Spiramen width	0.038	0.0107	0.016	0.058	17
Ovicell length	0.196	0.0389	0.164	0.225	5
Ovicell width	0.226				1
Ancestrula length	0.618				1
Ancestrula orifice length	0.122				1
Ancestrula orifice width	0.128				1

Remarks

From seven species assigned to the genus *Tessaradoma*, *T. boreale* is categorized by erect colonies with tubular peristome and frontal spiramen (Hayward & Rland, 1999; Souto et al. 2016). *Tessarodoma boreale* is a widely reported species from the south Atlantic, tropics and until the Artic, from very variable depths (50 to 3700 m) (Cheetham, 1972; Hayward & Ryland 1999; Souto et al. 2016). According to this wide distribution and some variability in the

material, Winston (2005) suggested that *T. boreale* is a species complex and in need of revision. The analysed specimens occur at depths of 257-1209m.

Distrubution

Barents Sea (M.Sars,1863a; Smitt,1868b; Nordgaard,1900,1918; Kluge,1975), Norway (M.Sars,1851,1863a; Nordgaard, 1906b,1907b, 1918, 1927; Norman, 1894), Skagerrak (Smitt, 1868b; Silen, 1936), Shetland Islands (Busk, 1860; Norman,1869), western Greenland (Levinsen,1914), Florida (Smitt,1873), the Azores and Portugal (Smitt,1873; Julien and Calvet,1903), Antilles (Busk,1886), Kara and Laptev seas (Kluge,1975). It is an abundant species collected in the three seamounts of the present study.

Family **Smittinidae** Levinsen, 1909

Genus ***Smittina*** Norman, 1903

Smittina minuscula (Smitt, 1868)

(Fig.25; Table 24)

Escharella porifera forma *minuscula* Smitt, 1868: 9, pl. 24, f. 33-35

Smittina minuscula Nordgaard, 1906: 28, pl. 3, f. 46-47; Kluge, 1975: 516, fig. 277

Material examined: Vesteris: MSM86_036.

Description

Colony encrusting, multiserial, with zooid rows straight and oblique. Autozooids oval to rhombic separated by suture between slightly raised ridges, frontal shield slightly convex, with numerous rounded pseudopores, each encircled by low indistinct rim giving funnel-like appearance. Primary orifice semicircular, wider than long with broad lyrula occupying half of proximal length and with small condyles. Peristome thin, laminar, surrounding primary orifice, formed proximally from autozooidal frontal shield and distally from frontal shield of, at least, one distal zooid, suture visible. Distal peristome more developed in ovicellate zooids. Two oral spines often obscured by secondary calcification. Suboral avicularium raised and part of peristome, slightly tilted towards orifice; circular rostrum, slightly angulated in relation to proximal part of avicularium. Ovicells hyperstomial, partially immersed in distal zooid, surface granulate, sometimes with central-proximal pore. Ancestrula not observed.

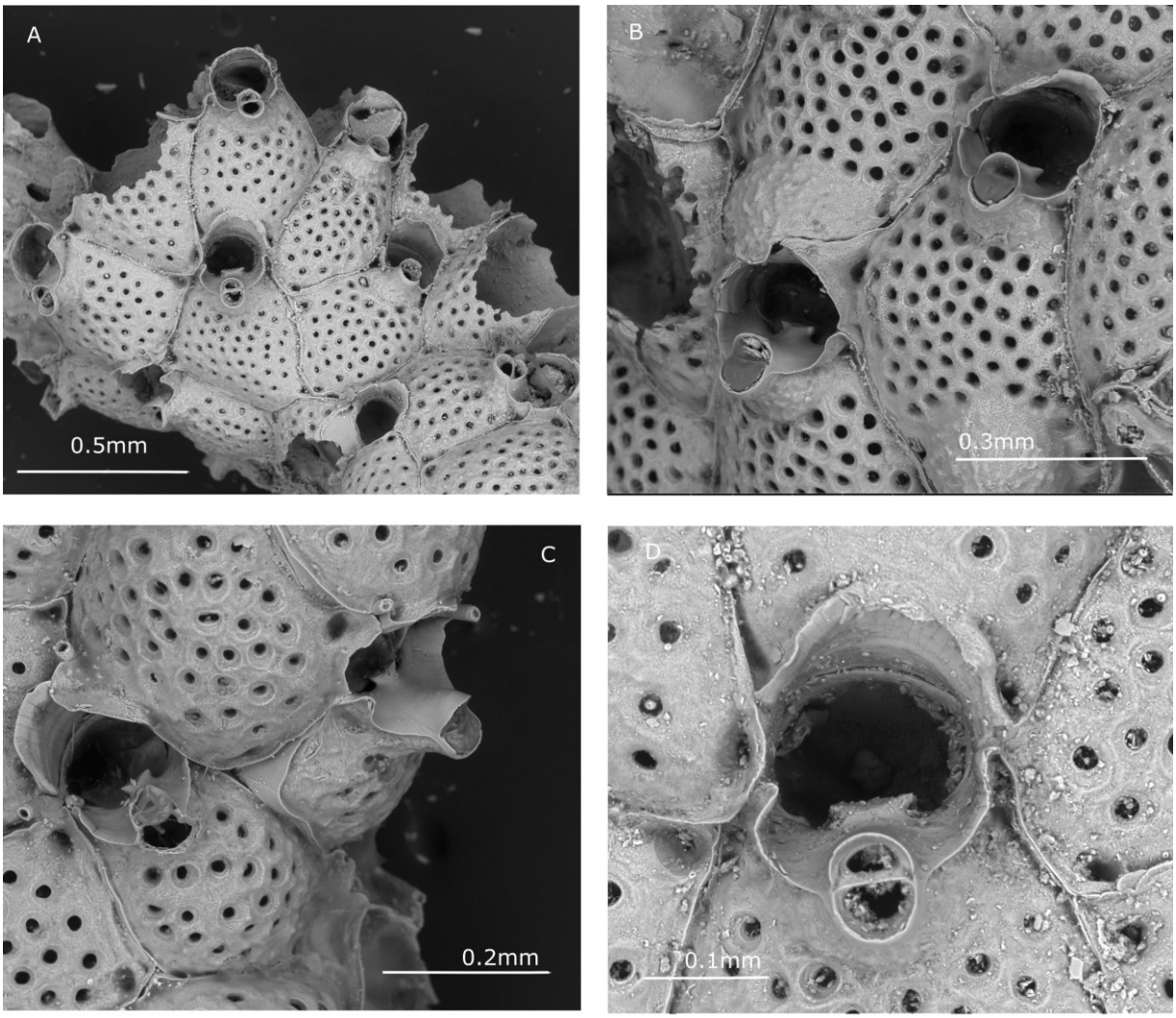

Fig.25. *Smittina minuscula*. A. General view of the colony. B,. Zooids in frontal view; ovicells. C. Detail of the dstal, oral spines, sinus and oral avicularia.

Remarks

There are no recent descriptions of this species, but our material agree with the morphological features of the type specimens are displayed in Kuklinski et al. (Iopan.gda.pl). Additional data is provided by Smitt (1868), Nordgaard, (1906), and Kluge (1975). The analysed specimens were found at a depth of 257m, growing on other bryozoans. Kluge (1975) reported the species growing on algae, bryozoans, acorn barnacles and molluscs shells at depths of 6-288m, temperatures from -1.62 to 3.2 ºC in salt concentrations of 32,86-34.83 $^{o}/_{oo}$.

Table 24. Measurements (in mm) of *Smittina minuscula.* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.549	0.0781	0.360	0.710	21
Autozooid width	0.352	0.0594	0.213	0.425	17
Orifice length	0.165	0.0253	0.130	0.235	18
Orifice width	0.176	0.0307	0.124	0.223	15
Avicularia length	0.071	0.0121	0.046	0.084	13
Avicularia width	0.057	0.0075	0.046	0.070	13
Ovicell length	0.233	0.0283	0.213	0.253	2
Ovicell width	0.233				1
Ancestrula length	0.316				1
Ancestrula frontal membrane length	0.197				1
Ancestrula opesia length	0.158				1
Ancestrula frontal membrane width	0.209				1
Ancestrula opesia width	0.107				1

Distribution

This species was found in the Barents, Kara, Laptev, Chukotsk, and Bering seas, and in the waters off western Greenland (Kluge,1975). Also it is reported in Barents Sea (Smitt, 1868b, 1879b; Bidenkap, 1900a; Kluge in Deryugin, 1915; Nordgaard, 1923), White Sea (Gostilovskaya, 1957), Kara Sea (Smitt, 1879a; Nordgaard, 1912b), Laptev Sea (Kluge, 1929), Archipelago of the Canadian Islands (Nordgaard, 1906a), Hudson Bay (Osburn, 1932), western Greenland (Norman, 1906; Kluge, 1908b; Levinsen, 1914; Osburn, 1919), Gulf of St. Lawrence (Whiteaves, 1901), eastern Greenland (Levinsen, 1916), Iceland (Nordgaard,1924), Finmark (Smitt,1868;Nordgaard,1918). Only found in one locality of the Vesteris Seamount in this study.

Genus ***Smittoidea*** Osburn, 1952

Smittoidea glaciata (Waters, 1900)

(Fig. 26, Table 25)

Porella glaciata Waters, 1900 : 78; Nordgaard, 1905 : 168; 1907b : 13; 1912a : 21;Levinsen, 1914 : 593;

*Smittina glaciata :*Kluge, 1946 : 203, t. II, fig. 8;Kluge,1975:519,fig.279.

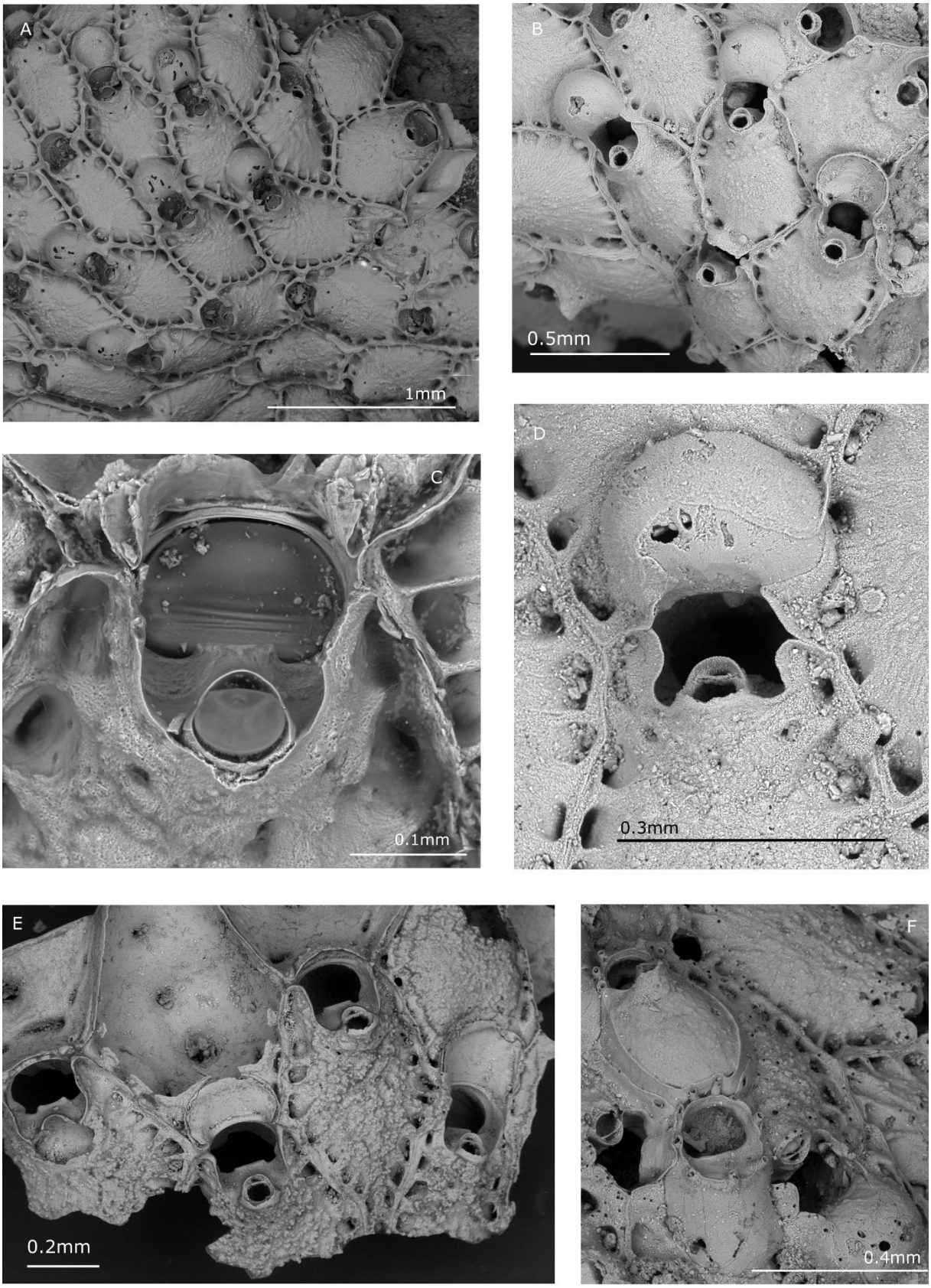

Fig.26. *Smittoidea glaciata*. A. General view of the colony. B. Colony in frontal view. C. Primary orifice with sinus and oral avicularia. D. Ovicellate zooid. E. Detail of the sinus with condyles. F. Ancestrula.

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_036, MSM86_062, MSM86_063 and MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049.

Description

Colony encrusting, unilaminar forming regular sheets. Autozooids hexagonal to rhombic slightly elongated and separated by thin, raised sutures. Frontal wall slightly convex, granulate with numerous marginal areolae bordered by depressions of frontal wall. Primary orifice barely visible from secondary orifice, oval to semicircular, wider than long; distal border weakly denticulated and proximal border bearing a more or less broad lyrula and small condyles located at lateral margin. Two to four oral spines in early ontogeny, basis covered by calcification and peristome. Peristome laminar well developed proximally and laterally; and less distally of orifice; with a row of two to four pores in basal portion. Suboral avicularia inside peristome, oval. Ovicell hyperstomial, round; smooth ectooecium with two or three irregular pseudopores, overgrown laterally and distally by secondary calcification. Ancestrula tatifom with eight spines surrounding the frontal membranous, opesia occupying more than half of frontal area, bell shaped.

Table 25. Measurements (in mm) of *Smittoidea glaciata.* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.673	0.1269	0.211	0.907	25
Autozooid width	0.468	0.0943	0.243	0.652	21
Orifice length	0.182	0.0221	0.149	0.243	19
Orifice width	0.167	0.0373	0.058	0.211	16
Suboral avicularium width	0.057	0.0098	0.033	0.073	20
Ovicell length	0.197	0.0325	0.093	0.245	21
Ovicell width	0.254	0.0317	0.206	0.308	16

Remarks

The analysed encrusting colonies show the same morphological characters of *Smittoidea glaciata* as described: frontal surface flatter, avicularium chamber raised, with 2/3 pores in its wall. Also, round, oval avicularium in plane of the orifice. The peristome is poorly developed.

All the characters were present in the observed specimens. The material was found encrusting other bryozoans and shell fragments at depths of 257- 793m. Species found at depths of 55-410m, at temperatures of -1.48-0.82 ºC and salinities of 34.65-34.92 $^{o}/_{oo}$ (Kluge,1975).

Distribution

The species was found in Barents Sea (Waters, 1900; Kluge,1975) and Kara Sea (Kluge,1975). In the present study specimens were recorded from the Vestris and Southern seamounts.

***Smittoidea* sp.**

(Fig, 27; Table 26)

Material examined: Southern Seamount: MSM86_045 and MSM86_046.

Description

Colony encrusting, unilaminar, multiserial forming large flat sheets. Autozooids elongated, rectangular to hexagonal in shape, very long, almost flat and separated by distinct sutures. Frontal shield finely granulated to smooth, with numerous, closely spaced, circular, marginal pores. Primary orifice semi-circular, slightly wider than long, lyrula with straight distal margin, occupying one third of proximal border; distal border denticulate; condyles thin, pointed and downcurved. No oral spines. Peristome low and thin, with narrow, medio-proximal notch. Avicularium suboral, situated immediately proximal to peristomial notch; acute triangular rostrum directed proximally, with wide crossbar and one pair of pores in frontal wall at each side. Large ovicell, longer than wide, smooth ectooecium with numerous, small, irregular, pores. Ancestrula not observed.

Remarks

Specimens studied are characterized by long zooids, with long ovicells and acute suboral avicularium. This species resembles in several characters to the artic species *Smittoidea exilis* Hayward, 1994, which also had large zooids, but a smaller suboral avicularium with until four associated frontal pores, and a shorter rounded ovicell.

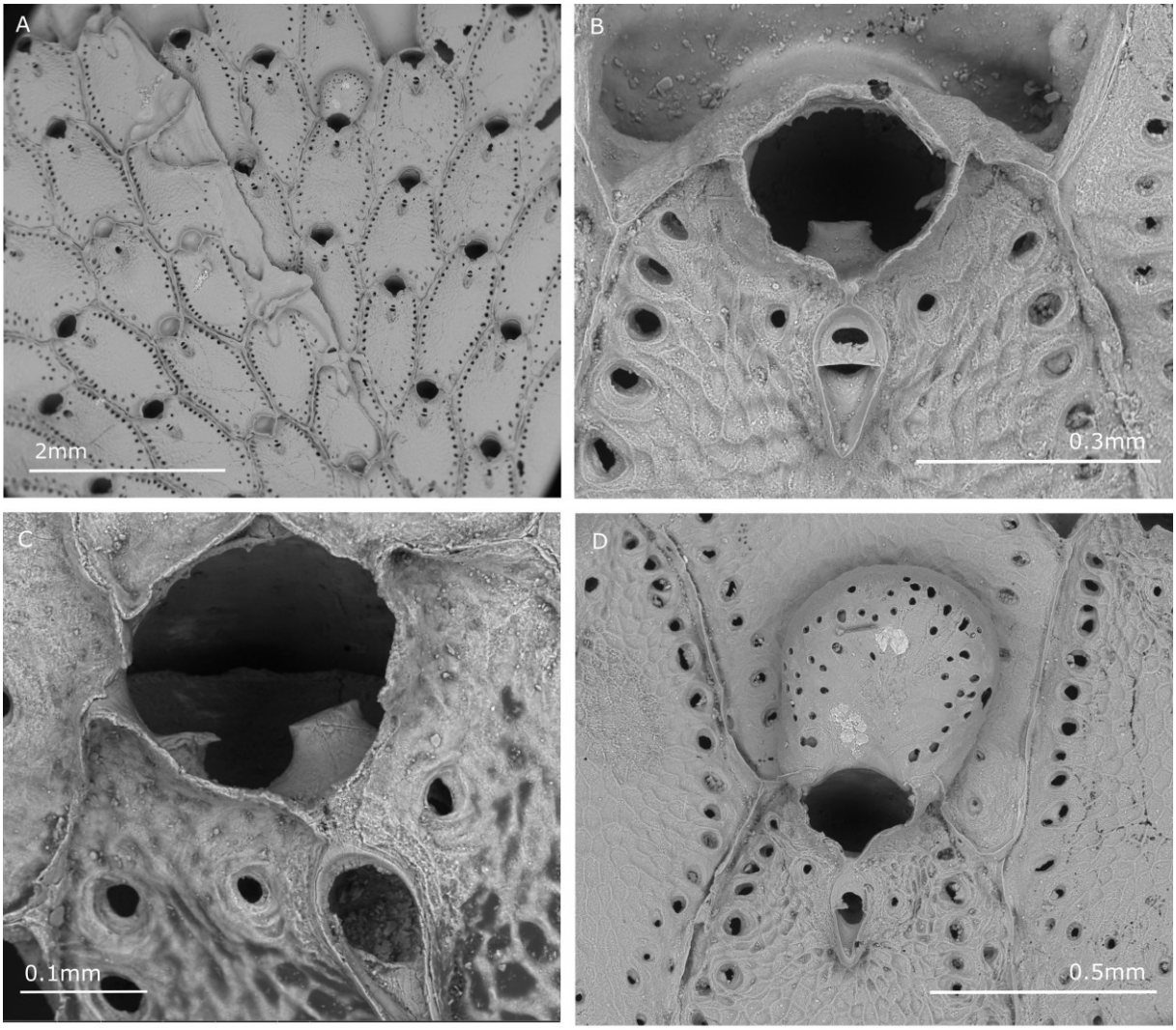

Fig.27. S*mittoidea* sp. A. General view of the colony. B. Zooid with denticulate distal border of the primary orifice; sinus, suboral avicularia. C. Detail of the condyle. D. Ovicellate zooid.

Table 26. Measurements (in mm) of *Smittoidea* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	1. 442	0.1590	1. 117	1. 837	20
Autozooid width	0.798	0.1101	0.618	0.980	20
Orifice length	0.216	0.0363	0.138	0.279	21
Orifice width	0.223	0.0243	0.176	0.282	21
Avicularium length	0.529	0.0364	0.483	0.586	6
Avicularium width	0.482	0.0561	0.424	0.579	6
Ovicell length	0.159	0.0322	0.091	0.211	16
Ovicell width	0.048	0.0082	0.031	0.059	16

Genus ***Pseudoflustra*** Bidenkap, 1897

Pseudoflustra anderssoni Kluge, 1946

(Fig. 28;Table 27)

Pseudoflustra anderssoni Kluge 1946: 198, pl. 2, fig. 5; Kluge 1975: 538 fig. 294; Kluge 1975: 538, fig. 294. Kuklinski et al. 2013: 10, fig 6A-D.

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_036, MSM86_062, MSM86_063, MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073 and MSM86_077.

Description

Colony erect formed initially by cylindrical branches with four rows of zooids along the central axis, and increasing number of rows of zooids distally until becoming flat bifoliate branches; attached to substrate by clusters of chitinous rhizoids originating as tubular prolongation of

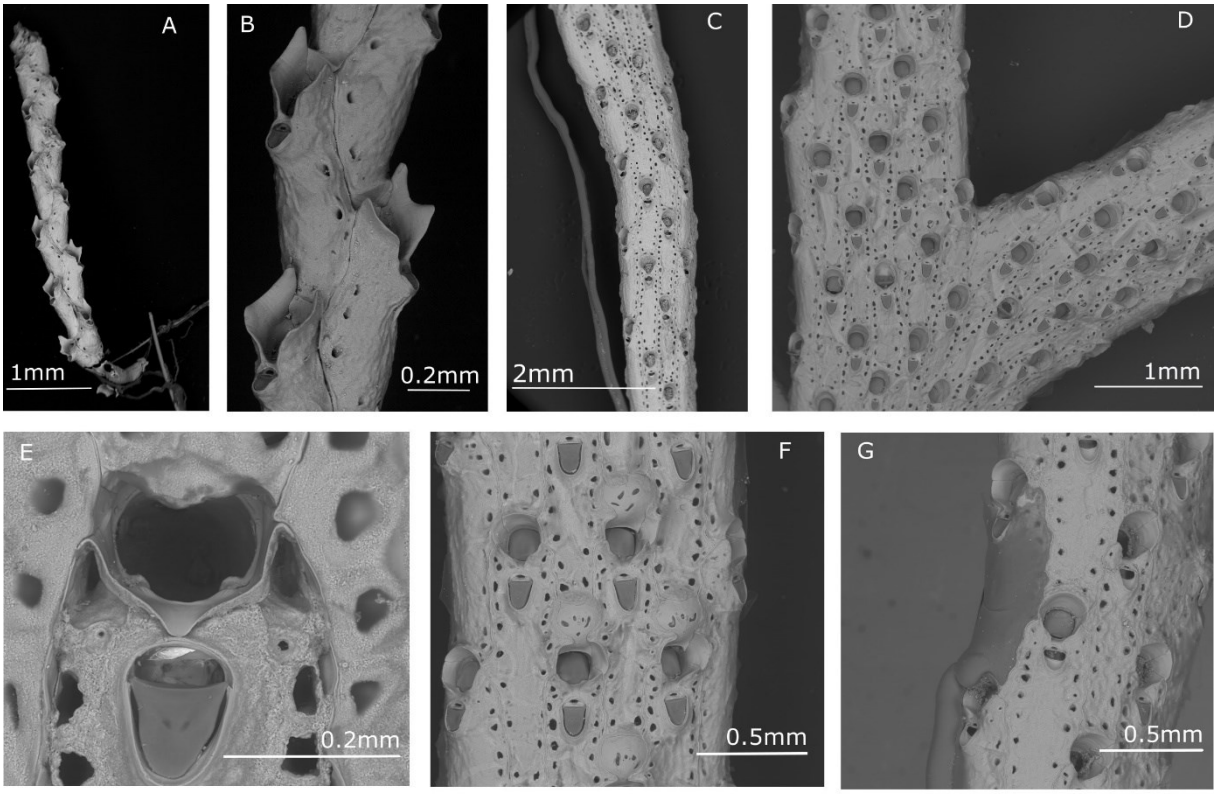

Fig.28.*Pseudoflustra anderssoni* A. Development of the young colony. B. Young colony in frontal view, C.General view of developed colony with a rhizoioid. D. Branches of developed colony in frontal view. E. Detail of the primary orifice with condyles and large suboral avicularium. F. Ovicellate zooids. G. Colony with origin of the rhizoid.

frontal cuticle of autozooids. Autozooids elongated, rectangular with frontal shield flat or slight smooth or finely granular and oval or elongated with numerous areolar marginal pores. Primary orifice slightly wider than long, with shallow and wide proximal sinus and small rectangular condyles. Cormidial peristome, formed distally and laterally by neighbouring zooids. Pseudosinus present proximally of frontal avicularium. Frontal avicularium directly suboral in contact with secondary orifice, oval, rostrum with rounded tip and directed proximally; proximal opesia of avicularium reduced by calcification of crossbar and distal opesia cover by a calcified shield. Ovicell hyperstomial, globular, smooth ectooecium with scattered irregular pores, calcification of surrounding zooids overgrowing laterally and distally. Ancestrula not observed but periancestrular zooids smaller than autozooids, with suboral frontal avicularim but with big laminar peristome, highly developed laterally, but missing distally.

Remarks

Kuklinski et al. (2013) revised the genus *Pseudoflustra* and characterized it by erect colonies which are attached to the substrate by rhizoids. The frontal wall possesses marginal pores, cormidial orifice with condyles. Species lack oral spines, but are categorized by a suboral avicularium and globular ovicells. Additionally, Kuklinski et al (2013) differentiate *P. anderssoni* from other genus members by the presence of a cryptocyst, a sinus in the primary orifice and the presence of a suboral avicularium. Species were found at depths of 39-820m at temperatures of -1.45-3.5 ºC and salinities of 34.07-34.92 ₒ/ₒₒ (Kluge,1975). Observed specimens were found at depths of 257-960m.

Table 27. Measurements (in mm) of *Pseudoflustra anderssoni*. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	1. 179	0.1933	1. 179	1. 602	29
Autozooid width	0.326	0.0466	0.326	0.443	29
Orifice length	0.216	0.0298	0.216	0.279	29
Orifice width	0.201	0.0219	0.201	0.245	29
Avicularium length	0.146	0.0188	0.146	0.182	29
Avicularium width	0.098	0.0279	0.098	0.129	29
Ovicell length	0.234	0.0279	0.234	0.286	9
Ovicell width	0.311	0.0135	0.311	0.326	3

Distribution

Greenland, the Barents, Kara, Laptev and East Siberian seas, and the Gulf of St. Lawrence (Kluge, 1975; Kuklinski et al., 2013). This species was identified from all three studied seamounts.

Family **Bitectiporidae** MacGillivray, 1895

Genus ***Hippomonavella*** Canu & Bassler in Bassler, 1934

Hippomonavella borealis (Waters, 1900)

(Fig. 29; Table 28)

Lepralia borealis Waters 1900:73, p1.8, figs 4-6;
Hippodiplosia borealis: Kluge, 1975:607, fig. 346;
Hippomonavella borealis: Hayward,1994:201, fig. llB.

Material examined: Southern Seamount: MSM86_045 and MSM86_046.

Description

Colony encrusting unilaminar forming flat sheets. Autozooids rhombic, separated by well visible sutures, frontal shield delicately granulated and elongated porous along margin. Primary orifice completely distal, circular, proximal border slightly arched and convex, with small rounded condyles. Two to four oral spines present in early ontogeny, quickly covered by secondary calcification. Suboral avicularium small, rounded, almost perpendicular to frontal wall. Ovicell recumbent on distal zooid, circular, flattened frontally, with smooth ectooecium covered by numerous irregular pseudopores. Margin of ovicell covered by rugose secondary calcification forming a rim. Ancestrula not observed.

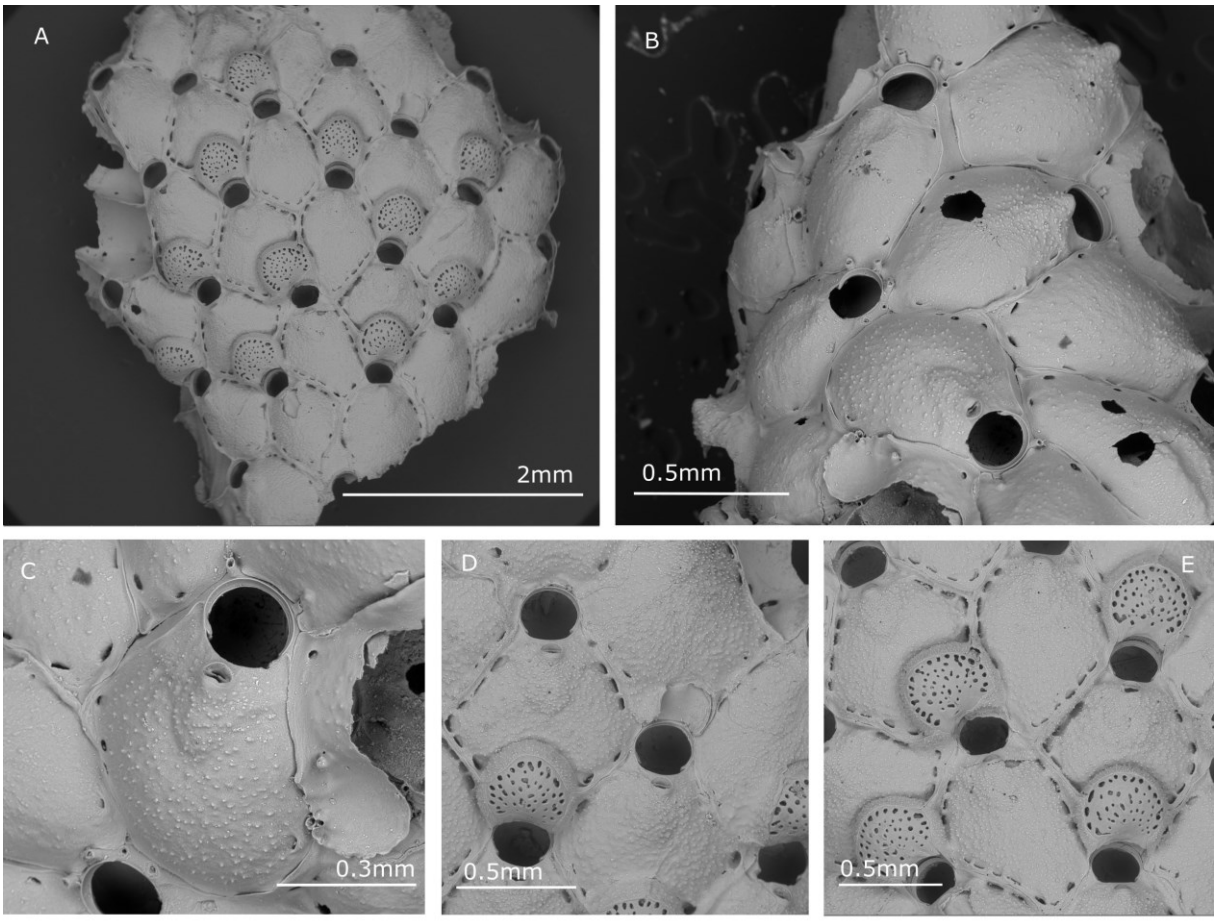

Fig.29.*Hippomavella borealis*. A-B. General view of the colony. C. Autozooid with primary orifice with 2 distal oral spines and suboral avicularia. D-E. Ovicellate colony.

Table 28. Measurements (in mm) of *Hippomavella borealis*. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.889	0.1459	0.656	1. 100	29
Autozooid width	0.636	0.1384	0.355	0.975	29
Orifice length	0.181	0.0284	0.145	0.255	18
Orifice width	0.229	0.0166	0.206	0.273	19
Avicularium width	0.071	0.0127	0.055	0.102	12
Ovicell length	0.389	0.0289	0.329	0.428	12
Ovicell width	0.441	0.0258	0.386	0.471	10

Remarks

Hippomonavella borealis was originally described by Waters (1900). The colonies are encrusting, with rhombic zooids, granulated frontal with marginal pores, small suboral

avicularium and large raised ovicell with numerous pores. Our specimens correspond to these previous descriptions (Waters,1900; Kluge,1975; Hayward,1994). The presence of oral spines was not recorded in the original description by Waters (1900). Hayward (1994) specifically points out the lack of spines in this species and Kluge (1975) also didn't mention the presence or absence of spines. Nevertheless, in our material up to four (most commonly two) spines were observed in early ontogeny, but quickly covered by secondary calcification. This could explain their lack in previous descriptions. The species can be found at depths of 54- 512m growing on shells and stones (Kluge,1975). The analysed specimens were found growing on other bryozoans at depths of 536 and 704m.

Distribution

Barents (Waters,1900; Kluge,1975), Faroe Islands and Kara Sea (Kluge,1975). Observed in this study only from the Southern Seamount.

Genus ***Schizomavella*** Canu & Bassler, 1917

Schizomavella porifera (Smitt, 1868)

(Fig. 30; Table 29)

Escharella porifera forma typica Smitt, 1868b : 9, 70, pl. 24, fig. 30-32;
Lepralia porifera: Hincks, 1877a: 102, pl. 10, fig. 1-2;Waters, 1900 : 75, pl. 8, fig. 14-15;
Smittia landsborovii forma porifera: Hincks, 1888: 225;Osburn, 1912 : 245;
Schizoporella porifera: Kluge, 1975: 588, fig.329; Powell,1968: 253, pl. 3, fig. 9; Winston and Hayward, 2012: 131, fig. 85; Taylor, 2021:79, fig.6F-H.

Material examined: Vesteris: MSM86_036, MSM86_062 and MSM86_063.

Description

Colony encrusting, multiserial with zooids arranged in regular rows. Autozooids rhombic in shaped and separated by deep margins. Frontal shield smooth, lightly convex, with numerous pores along entire surface, one row of narrow elongated areolar pores. Primary orifice rounded, slightly wider than long; proximal border with shallow and wide sinus, with straight proximal margin, and small condyles. Up to four distal, hollow, oral spines. Primary orifice surrounded proximally and laterally, from the first pair of spines, by small, fine and raised peristome. Single, frontal oral avicularium almost perpendicular to frontal wall situated proximally of

sinus. Ovicell acleithral, prominent and globular with the exposed ectooecium perforate

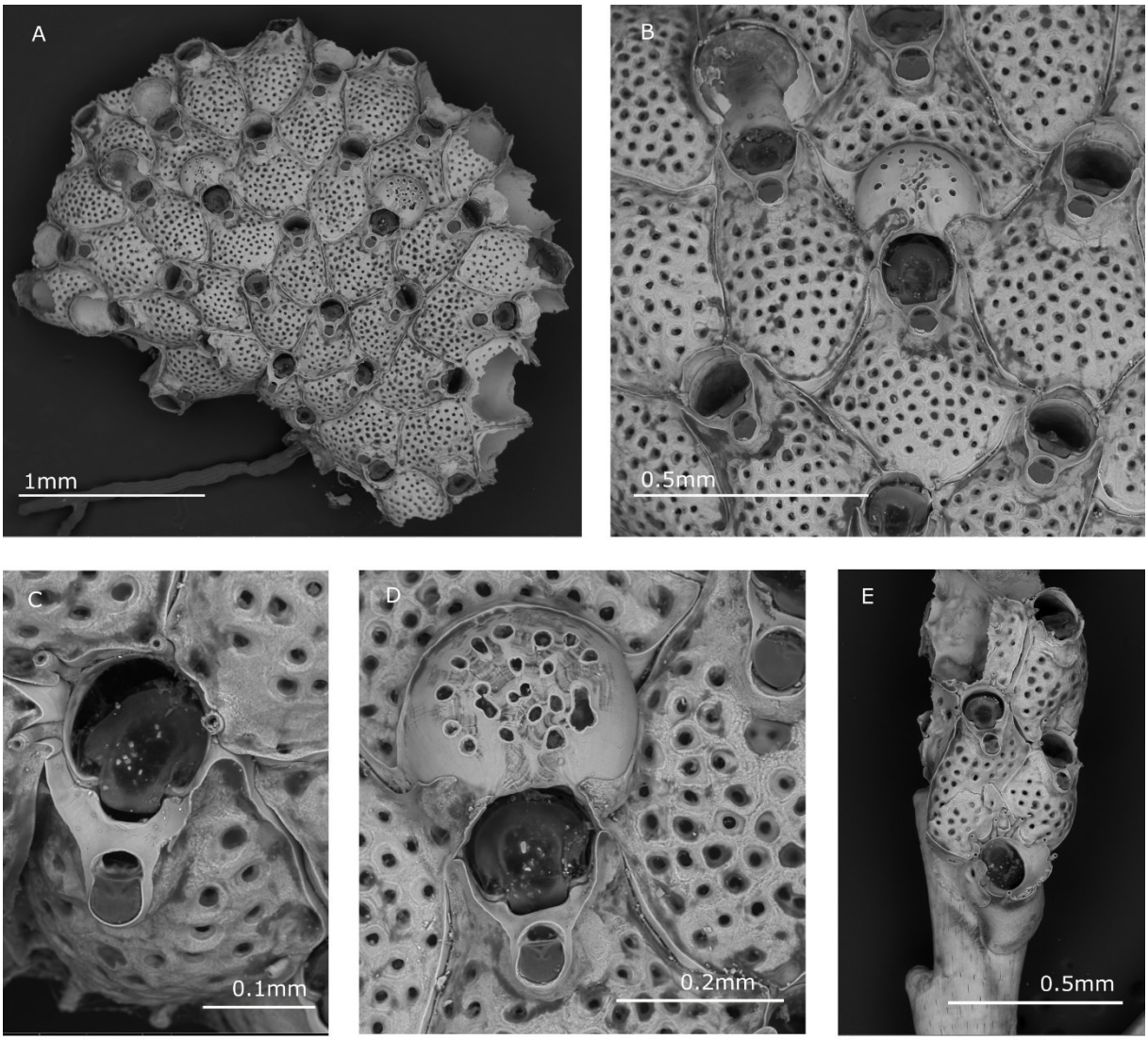

Fig.30.*Schizomavella porifera.* A General view of the colony. B. Colony in frontal view. C. Zooid with operculum, distal oral spines and oral avicularia. D. Ovicellate zooid. E. Ancestrula

by small round, central pseudopores. Secondary calcification only covering latero-proximal area of ovicell. Ovicellate zooids with primary orifice slightly larger than autozooids Ancestrula with distal oval opesia surrounded by smooth cryptocyst raised proximally and surrounded by nine spines.

Remarks

Few small, encrusting colonies were found that correspond to the description of *Schizomavella porifera* (Kluge,1975; Smitt, 1868, Hincks, 1877). The species is characterized by rhombic zooids with a frontal surface entirely covered by small pores, a roundish orifice, two sharp condyles and a small, round avicularium behind the sinus. Reports show them growing on algae,

shells and stones at depths of 5-360m .Temperatures where they could be found ranges between -1.9-6.3 ºC and salinities from 34.10-34.90 ‰ (Kluge,1975). The analysed specimens were found growing on other bryozoans and polychaetes at depths of 257-538m.

Table 29. Measurements (in mm) of *Schizomavella porifera* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.534	0.0570	0.397	0.620	25
Autozooid width	0.411	0.0734	0.275	0.534	25
Orifice length	0.151	0.0142	0.112	0.167	16
Orifice width	0.171	0.0087	0.148	0.187	23
Avicularium length	0.056	0.0095	0.039	0.078	20
Avicularium width	0.052	0.0092	0.039	0.069	18
Ovicell length	0.211	0.0114	0.198	0.228	5
Ovicell width	0.260	0.0104	0.245	0.272	5

Distribution

Kara, Laptev and Bering seas, Baffin Bay (Kluge,1975), Barents Sea (Smitt, 1868b, 1879b; Nordgaard, 1896, 1918; Bidenkap, 1900b; Waters, 1900; Kluge, 1906,1975; Kluge in Deryugin, 1915; Kuznetsov, 1941), White Sea (Smitt, 1879b; Kluge in Deryugin, 1928; Gostilovskaya, 1957), Archipelago of the Canadian Islands (Nordgaard, 1906a), ?Hudson Bay and Labrador (Osburn, 1913, 1932), western Greenland (Smitt, 1868c; Norman, 1876, 1903b, 1906; Hincks, 1877a; Vanhöffen, 1897; Kluge, 1908b; Levinsen, 1914; Osburn, 1936), eastern Greenland (Levinsen, 1916), Gulf of St. Lawrence (Hincks, 1892; Whiteaves, 1901; Norman, 1903), Iceland (Nordgaard, 1924), Jan Mayen Island (Lorenz, 1886), and northern Norway (Smitt, 1868b; Nordgaard, 1905, 1918). Observed in this study only from Vesteris Seamount.

Family **Escharinidae** Tilbrook, 2006

Genus ***Escharina*** Milne Edwards, 1836

***Escharina* sp.**

(Fig.31;Table 30)

Material examined: Vesteris: MSM86_036 and MSM86_062.

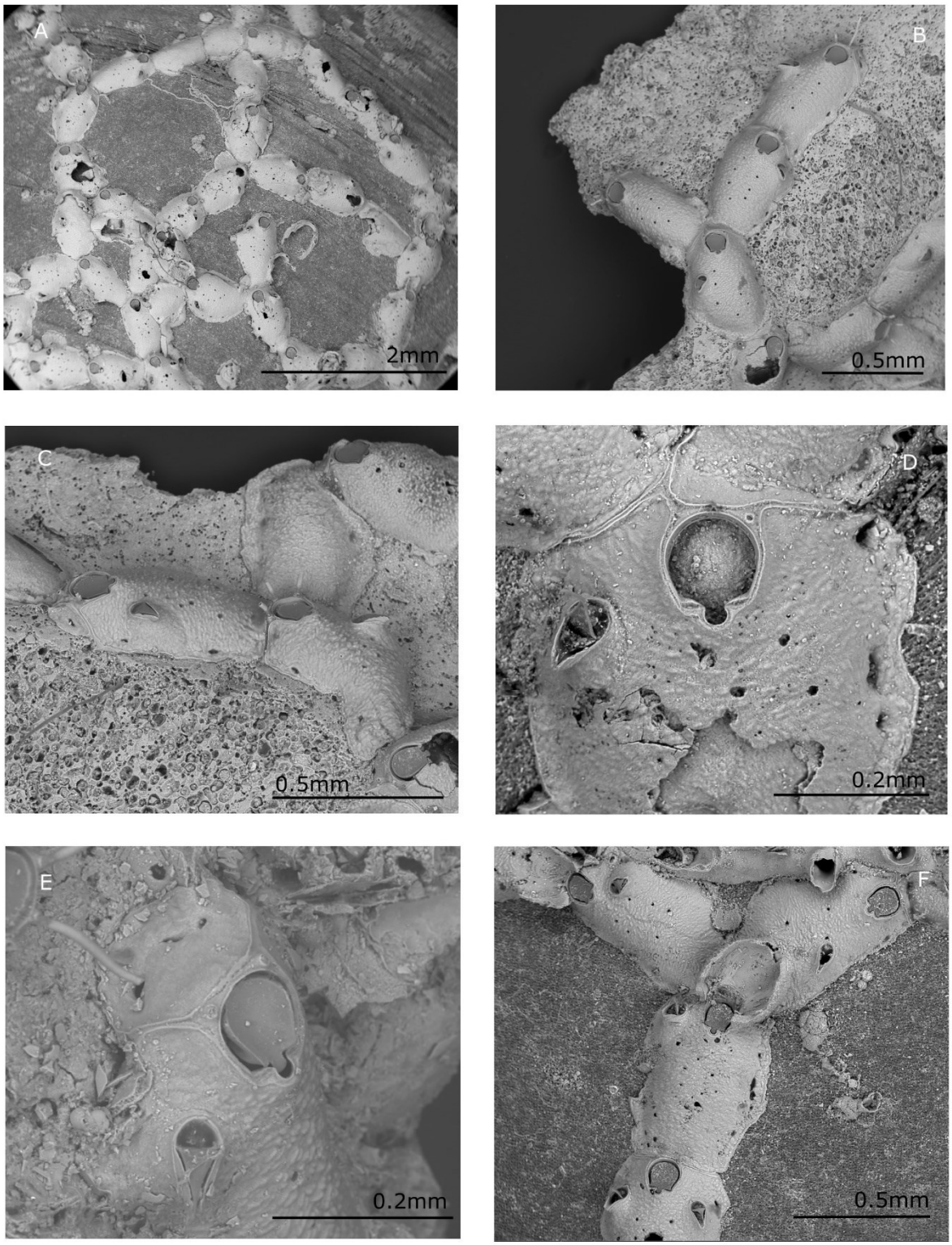

Fig.31.*Escharina* sp. A. General view of the colony. B. Zooids in frontal view. C. Zooids in lateral view. D. Autozooid with lateral avicularia. E. Same; detail of operculum and 2 distal spines.

Description

Colony encrusting, formed by uniserial lines of autozooids, irregularly bifurcating. Autozooids oval, elongated and convex. Frontal shield finely granulated, perforated by five to eight scattered minutes pores and between three to five marginal pores chambers on each side, three on distal wall. Orifice subcircular, longer that wide, with a narrow U-shaped sinus at proximal margin. Small condyles occupying proximal margin at each side of sinus. Two or three distal oral spines. Single or paired (one at each side) lateral avicularia always present, rostrum triangular slightly raised distally and directed to latero-proximal to proximal. Two broken ovicells observed, hyperstomial and round, big, without pores. Ancestrula not found.

Remarks

Reverter-Gill & Souto (2015) redescribed type of *Alysidota alderi* Busk, 1856 which is now assigned as *Escharina alderi* (Busk, 1856) which resembles the observed specimens. The type material is described as uniserial or unilaminar, multiserial with oval to hexagonal autozooids. Frontal shield granular with 25 pores, slightly horseshoe-shaped with U-shaped sinus. While the orifice characters and zooid's shape are very similar, there are few characters that are disagreeing. Reverter-Gill & Souto (2015) mention the absence of spines, while in our material few distal oral spines were found. Additionally, the number of pores is inconsistent with the revised species. In our samples, the number of frontal pores never exceeded ten. Also, avicularia as rare contrary to our findings, potentially being related to multiseriality of their specimens. Kluge's (1975) description of *Escharina alderi* states a similar number of pores to our specimens and the presence of 1-2 lateral avicularia in uniserial samples, which resembles material from the Southern Seamount. The analysed specimens were found encrusting polychaetes and shells. Other reports note their presence on rocks as well. Species can be found at depths of 257-538m.

Distribution

Species only recorded from the Vesteris Seamount.

Table 30. Measurements (in mm) of *Escharina* sp. (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.621	0.0481	0.529	0.694	19
Autozooid width	0.383	0.0407	0.261	0.426	18
Orifice length	0.107	0.0102	0.094	0.129	14
Orifice width	0.111	0.0118	0.092	0.135	14
Avicularium length	0.089	0.0177	0.068	0.122	10
Avicularium width	0.048	0.0148	0.029	0.068	5

Escharina sp.2

(Fig. 32; Table 31)

Material examined: Southern Seamount: MSM86_045 and MSM86_046.

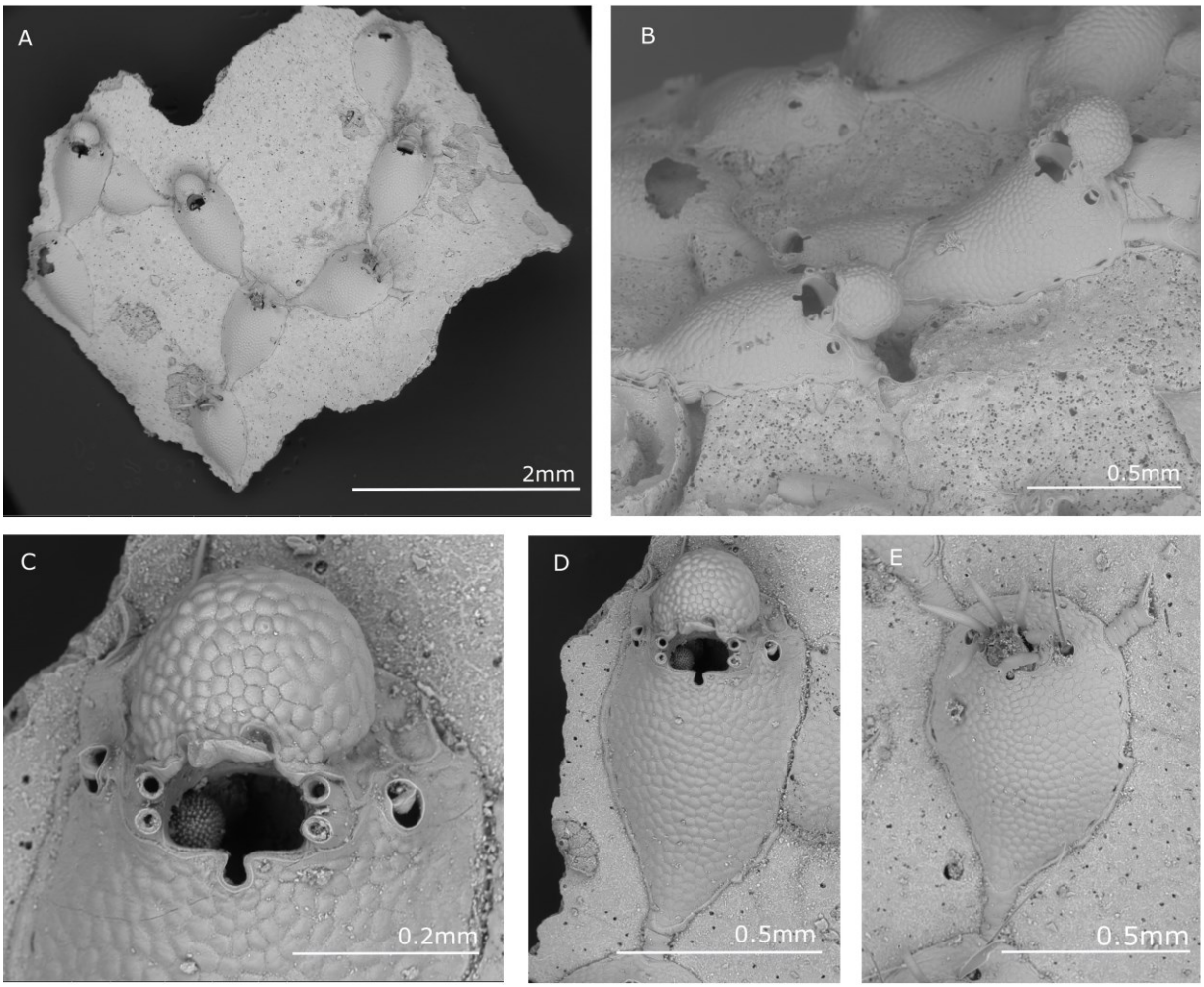

Fig.32.*Escharina sp.2*. A. General view of the colony. B. Colony in lateral view. C-D. Ovicellate zooid. E. Zooid with long mandibles and oral spines.

Description

Colony encrusting with uniserial runner-like growth pattern, dichotomously branching from distal part of autozooid. Autozooids large, pyriform, with wider portion distally. Frontal wall cryptocystidean, convex, granulate with polygonal ornamentation, low number of small marginal septular pores. Gymnocyst visible proximally in tubular connection to proximal zooid, laterally forming a narrow lateral wall. Orifice D-shaped, narrow deep sinus at proximal border; slightly larger in ovicellate zooids. Six hollow articulate oral spines, four in ovicellate zooids. Oecium kenozooidal. Ovicell round, calcified ectooecium with ornamentation as frontal wall of zooids, smooth proximal median mucro. Pair of small avicularia lateral of orifice, oval with distal border truncated to accommodate setiform long mandible, and raised medially at level of calcified crossbar. Ancestrula not observed.

Remarks

The characteristics of the analysed specimens fit well to the description for the genus *Escharina*, among other things by the cryptocystidian wall with few marginal perforations, highly reduced gymnocyst, orifice sinuate, adventitious avicularia sometimes with setiform mandibles, ovicell hyperstomial and imperforate (Hayward & Ryland, 1999, Berning et al. 2008), which were all present in our specimens.

Some similarities are found to *Schizoporella thompsoni* described by Kluge (1975) from eastern Greenland. Although the description is not very detailed, the general morphology is corresponding in several characters to the observed specimens, such as the shape of the colony and zooids, the morphology of the orifice with a similar sinus and same number of spines. Nevertheless, avicularia are missing, but were very constant in our specimens, one pair by zooid. It is not mentioned whether the ovicell is imperforate or perforate, but the figure indicates imperforate. With these characters *S. thompsoni* should not be included in the genus *Schizoporella*, whose frontal wall and ovicell has pores. Kluge's specimen is probably not well defined and corresponds to the same species of our analysed specimens. Kluge's original specimens need to be studied for verification. The species can be found at depths of 450m, growing on stones (Kluge,1975). The analysed specimens were found growing on stones, shells, polychaetes and other bryozoans at depths of 536 and 733m.

Table 31. Measurements (in mm) of *Escharina* sp.2 (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.963	0.1141	0.760	1. 169	25
Autozooid width	0.507	0.0457	0.409	0.581	19
Orifice length	0.095	0.0182	0.062	0.131	22
Orifice width	0.135	0.0184	0.090	0.179	21
Avicularium length	0.046	0.0070	0.034	0.063	26
Avicularium width	0.024	0.0054	0.012	0.034	25
Ovicell length	0.224	0.0290	0.194	0.254	4
Ovicell width	0.269	0.0028	0.267	0.271	2

Distribution

Specimens only described from the Southern Seamount.

Family **Phidoloporidae** Gabb & Horn, 1862

Genus ***Phidolopora*** Gabb & Horn, 1862

***Phidolopora* sp.**

(Fig.33;Table 32)

Material examined: Vesteris: MSM86_028, MSM86_036, MSM86_062 and MSM86_063.

Description

Colony erect, fenestrate, highly variable number of zooids between branches. Zooids long, in longitudinal alternating series of two (mostly) or three zooids, separated by raised sutures. Frontal shield smooth or finely granulated, convex with only two marginal pores situated in proximal half. Primary orifice obscured by peristome with raised margin, semi-circular or V-shaped proximal border. Orifice oval, sinus at proximal end. Primary orifice with small, sharp teeth at distal end. Large frontal avicularium not common but when present large, on frontal wall with triangular rostrum and complete crossbar, pointing latero-proximal or proximal, covers large part of zooid. Kenozooids often present as small, rhombic or oval zooids with finely granulated frontal shield. Single, central flat, small avicularia present. Ovicells hyperstomial, globular, on distal zooid relatively far away of maternal orifice. Proximal border of ovicell aa sharp central denticle. Ancestrula not observed.

Remarks

Morphological characters of the studied specimens do not fully agree with any of the species described in the genus *Phidolopora. Phidolopora elongata* fits most closely, but the differences merit a separate species. *P. elongata* has erect colonies with a larger number of longitudinal series of autozooids with up to 11 zooids by series. Zooids possess a proportionally shorter peristome and large frontal avicularia, which is very rare in our specimens. Therefore, we think that our specimens could correspond to an undescribed species.

Fig.33.*Phidolopora sp*..A. General view of the ovicellate colony. B. Zooids in frontal view. C. Autozooid with well developed peristome; ovicell. D. Detail of the zooid with avicularia.

Distribution

Samples of this species were only recorded from Vesteris Seamount.

Table 32. Measurements (in mm) of *Phidolopora* sp.(SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.154	0.7921	0.229	0.954	24
Autozooid width	0.041	0.3039	0.247	0.370	16
Orifice width	0.009	0.1339	0.113	0.147	11
Avicularium length	0.015	0.3003	0.285	0.314	3
Avicularium width	0.010	0.1310	0.123	0.142	3

Phidoloporidae genus and species indeterminate

(Fig.34; Table 33)

Material examined: Vesteris: MSM86_027, MSM86_028, MSM86_062, MSM86_063, MSM86_065; Southern Seamount: MSM86_045, MSM86_046, MSM86_049; Boyd: MSM86_070, MSM86_072, MSM86_073 and MSM86_076.

Description

Colony erect with cylindrical branches consisting of four rows of autozooids with aperture directed frontally and laterally, with basal side free of apertures; attached to substrate by irregularly shaped and well calcified kenozooids. Autozooids elongated, with cryptocystidiam frontal wall with longitudinally aligned wrinkles; single frontal pore, small and circular, situated in proximal third of autozooid. Crystocyst highly reduced, only marginal. Pseudospiramen at peristomial border and suture. Primary orifice obscured by long peristome. Peristome formed by two lateral laminae centrally fused and defining central drop-shaped pseudospiramen. Suboral avicularium, sporadic, missing in many autozooids, dimorphic, with triangular rostrum perpendicular to zooidal frontal wall and directed distally; or spatulate, large, with rounded rostrum and directed proximolaterally. Ovicell longer than wide, slightly flat frontally, smooth or slightly wrinkled calcified endooecium, and membranous ectooecium, calcified in a very narrow rim laterally and distally of margin, covered by walls of distal and lateral zooids. Ancestrula unknown, firsts zooids smaller with very large laminar peristome with prickly border.

Remarks

The analysed specimens are left in open nomenclature and assigned only to the family Phidoloporidae because more thorough studies will be necessary. The observed specimens were found at depths of 363-1209m, growing on other bryozoans.

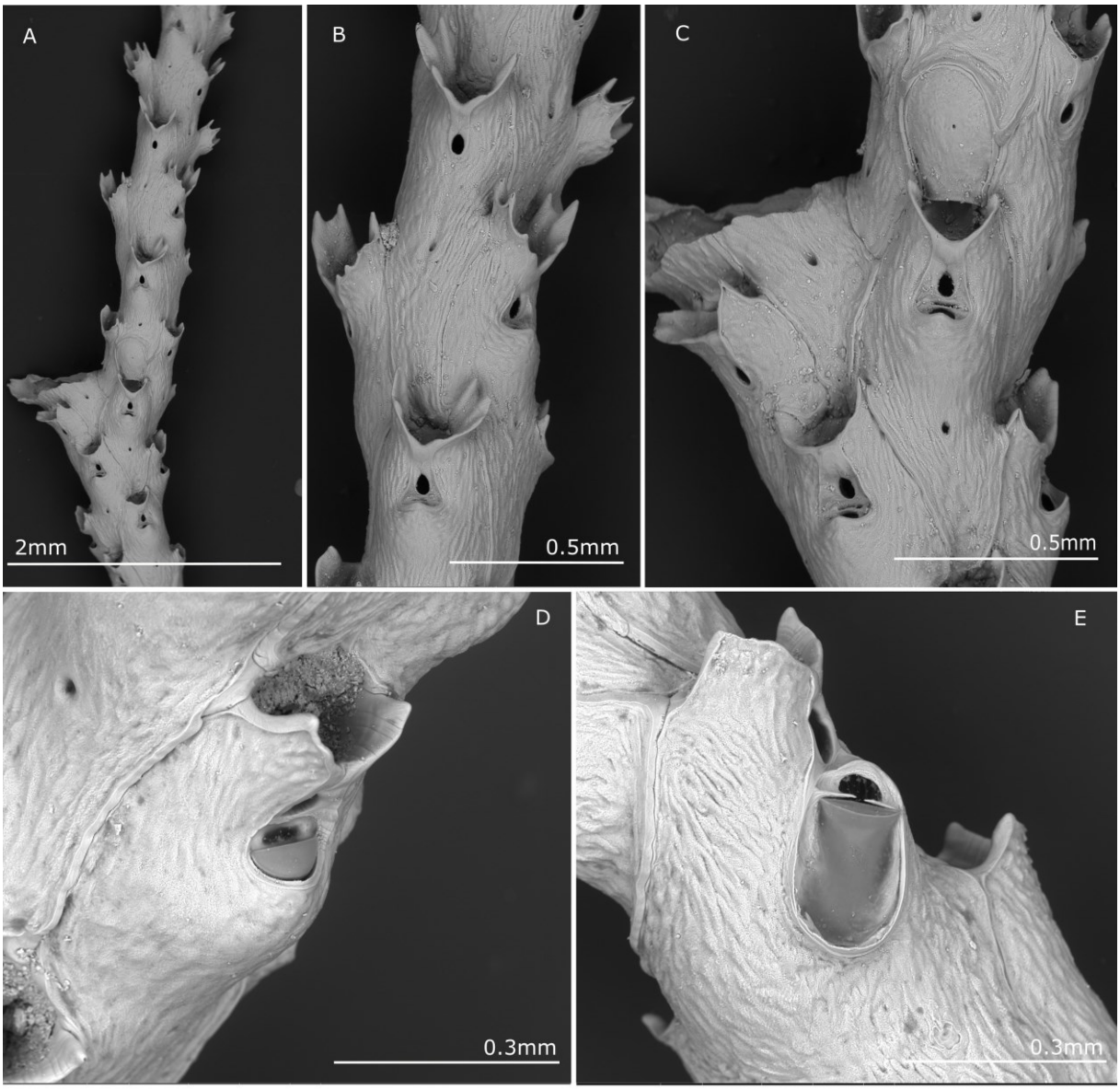

Fig.34. Phidoloporidae. A. General view of the colony. B. Zooids in frontal view. C. Ovicellate zooid in frontal view. D. Detail of orifice and peristome; suboral avicularia. E. Lateral avicularia.

Distribution

This species was collected from all three studied seamounts.

Table 33. Measurements (in mm) of Phidoloporidae (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.916	0.1731	0.599	1. 251	22
Autozooid width	0.355	0.0549	0.296	0.492	11
Orifice width	0.197	0.0260	0.163	0.249	15
Oral avicularium width	0.072	0.0269	0.053	0.091	2
Lateral avicularium length	0.282				1
Lateral avicularium width	0.182				1
Porus length	0.047	0.0106	0.024	0.075	19
Ovicell length	0.308	0.0149	0.284	0.331	10
Ovicell width	0.244	0.0251	0.211	0.269	4

Genus ***Reteporella*** Busk, 1884

Reteporella vitta Denisenko, 2022

(Fig. 35; Table 34)

Material examined: Southern Seamount: MSM86_045, MSM86_046 and MSM86_049.

Description

Colony erect, reticulate, with lacy appearance, anastomosed branches forming a funnel, fixed to substrate by kenozooidal laminae. Autozooids elongated, occasionally delimited by sutures disappearing in some zooids when covered by calcification. Frontal shield convex covered by reticulate ornamentation, with two to four rounded pores situated laterally but separate from zooidal margin. Primary orifice semicircular, wider than long, proximally obscured by peristome; proximal border straight and distal border formed by smooth rim. Oral spines in young colony parts, but mostly absents; up to three pairs of spines at each side of orifice. Peristome covers half of orifice, formed by two central lobules, with pseudosinus. Suboral oval avicularium on larger peristomial lobule, complete crossbar and directed proximally. 0 to three frontal avicularia sometimes on frontal surface, slightly larger than suboral avicularia. Other

small avicularia on kenozooids of aboral sides and on kenozooids of basal portion of the colonies. Complete ovicells and ancestrula not observed.

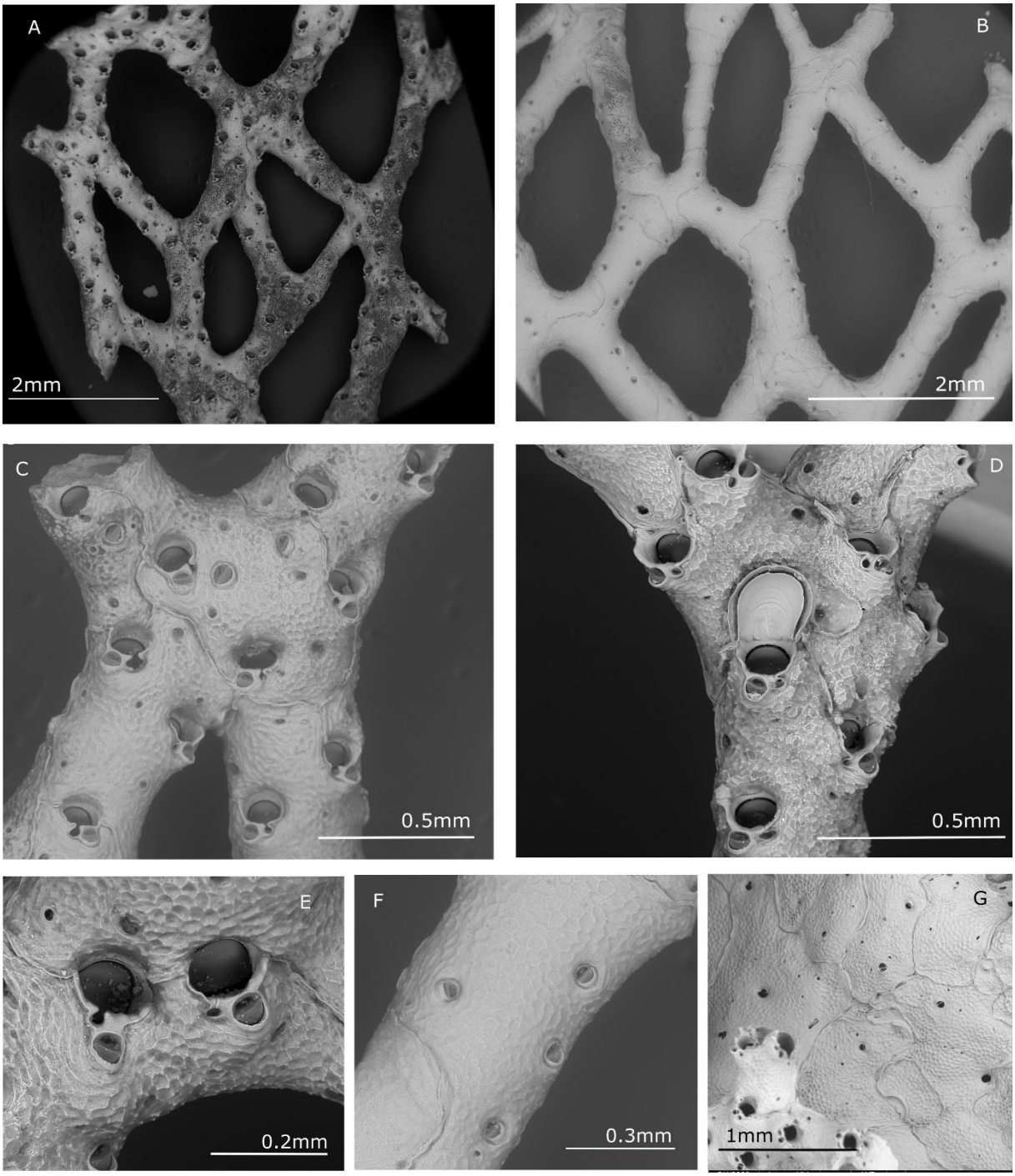

Fig.35.*Reteporella vitta*. A. General view of the colony. B. Colony in the basal view. C. Zooids in frontal view. D. Detail of an ovicell (fragment). E. Zooids with opened and closed operculum; suboral avicularia. F. Kenoozoids with avicularia. G. Basal part of the colony.

Remarks

Few samples of *R. vitta* were found. The species strongly resembles *R. watersi* (Nordgaard, 1907) which Denisenko (2022) describes as rather robust, two to three times smaller than *R. vitta* and with dull surface. The arrangement of zooids resembles more *R. vitta* with 1-3 autozooid rows in the colony. In contrast, *R. watersi* possesses series of 3-5 autozooids rows. Additionally, Denisenko (2022) distinguishes *R. watersi* with hidden avicularian chamber and the one in *R. vitta* is prominent and clearly raised above the frontal autozooidal surface. The original description shows that oral spines were not observed, which were observed in the current study in young colonies. Species occur at depths of 536,704 and 733m.

Distribution

Reteporella vitta is recorded previously from only one locality in the Southeast of Greenland (Denisenko, 2022). Present paper represents the first record of the species after the original description and recorded from a northern locality in the Southern Seamount.

Table 34. Measurements (in mm) of *Reteporella vitta* (SD. standard deviation; Min. minimum; Max. maximum; N. number of measurements).

	MEAN	SD	MIN	MAX	N
Autozooid length	0.610	0.0704	0.462	0.748	25
Autozooid width	0.362	0.0727	0.262	0.495	17
Orifice length	0.114	0.0104	0.091	0.129	22
Orifice width	0.134	0.0087	0.120	0.151	25
Suboral avicularium width	0.067	0.0283	0.048	0.146	20
Lateral avicularium length	0.091	0.0136	0.073	0.120	10
Lateral avicularium width	0.063	0.0075	0.046	0.073	10

4.Discussion

A total number of 33 cheilostome species were identified from the three Seamounts, with 11 of them remaining in open nomenclature. The latter are most likely undescribed species. They were not named in this text follow the rules of the International Code of Nomenclature

Zoological, nevertheless for some of the species, a more detailed study of the specimens and comparative work with collection material will be necessary.

The bryozoan diversity was only previously studied in the Vesteris Seamount where only 14 cheilostome species were recorded (Henrich et al. 1992, Bader & Schäfer, 2005; Matsuyama et al. 2017) whereas 19 species were identified from this locality in the current study (Table 35). At least 10 species had not been noted previously recorded before (for example *Doryporellina* sp.). Comparatively, the current survey increases the known cheilostome diversity for Vesteris by approximately 50 %.

Bryozoan communities from the other two seamounts were never studied before. In the present work, 21 species of Cheilostomata were recorded for the Southern Seamount and nine species for the Boyd Seamount. In total seven species were found at all three seamounts (*T. boreale, P. anderssoni* etc). Four species were found to co-occur at the Vesteris and Southern Seamount (*C.watersi, S.glaciata* etc) and two (*Notoplites smitti* and *Aquiloniella orientalis*.) at the Southern Seamount and the Boyd Seamount. From the bryozoan species diversity observed in the Southern Seamount (25 spp), 12 were unique to that Seamount.

Bader & Schäfer (2005) found that the Arctic bryozoan fauna shows a low degree of endemism caused by genera with many species, which corresponds with the data obtained in the current study. The lack of known cheilostomes is not surprising, since little research with taxonomical propose has been recently conducted in artic waters (Kluge,1962; Hayward,1994; Bader & Schäfer,2005; Matsuyama et al. 2017). The bryozoan community of the Southern Seamount seems to show more similarities to bryozoans that occur in more southern parts, such as the northeast Atlantic deep-waters (Hayward,1994; Souto et al. 2016, Souto & Albuquerque, 2019).

Two species were encountered the first time after their original description. Matsuyama et al. (2017) described *Ristedtia vestiflua* from the Vesteris, which had not been recorded afterwards. In the present material, plentiful of *Ristedtia vestiflua* was studied from the very same Seamount. Additionally, *Ristedtia* was found in the Southern Seamount and appears to be one of the dominant encrusting species for this Seamount. *Reteporella vitta* was also never recorded after its recent original description (Denisenko, 2022) from the Southeast of Greenland, and it is here recorded from a more northern locality, the Southern seamount.

The most dominant cheilostome at all three Seamounts is *Palmiskenea aquilonia*, whereas the second most common *Palmiskenea skenei* was reported as the most dominant at Vesteris Seamount (Bader & Schäfer 2005, Matsuyama et al. 2017). Since large colonies were usually left in the sea during sampling and only fragments were collected, it is uncertain whether true differences in the abundance of these two species exist. Similar to *Palmiskenea, Tricellaria*

gracilis (Van Beneden,1848) is a highly abundant cheilosotome at all three Seamounts. Moreover, the encrusting species *Smittoidea glaciata* (Waters, 1900) appears to be dominant in Vesteris and Southern Seamount, while it is absent in Boyd. In contrast to previous reports (Bader & Schäfer,2005) encrusting Cheilostomata are frequent at Vesteris. Their number gradually decreases with greater depths, but never completely ceases, as for instance *Smittoidea glaciata* (Waters, 1900) is relatively abundant in deep waters. Species at Boyd Seamount are often erect forms, with the exception of a single fragment of *Doryporellina* sp. Possible explanation why less encrusters were found at Boyd is du lack of hard substrate on which bryozoans could attach and grow. Similar to Vesteris, the Southern Seamount is inhabited more often by encrusting cheilostomes. While our research adds to our understanding of the bryozoan communities in Vesteris and offers novel knowledge on the Boyd and Southern Seamount, we suggest that additional research should be done to complete the data on polar bryozoan communities.

5.Acknowledgments

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Table .35. Species Distribution in three Seamounts.

	Vesteris					Boyd					Southern S.		
sp (Cheilostomes)	**36**	**62**	**63**	**28**	**27**	**76**	**73**	**70**	**77**	**72**	**49**	**46**	**45**
Electra sp.											x		x
Callopora lineata			x										
Microblestrum sp.													x
Ramphonotus septentrionalis	x												
Doryporellina sp.									x				x
Ristedtia vestiflua	x	x	x	x							x	x	x
Aquiloniella orientalis							x	x	x	x	x	x	
Notoplites normani	x	x	x	x	x	x		x	x	x	x	x	x
Notoplites smitti							x	x	x	x	x		x
Tricellaria gracilis	x	x									x	x	x
Cribrilina watersi	x	x	x	x							x	x	
Turbicellepora nodulosa											x	x	x
Aquiloniella orientalis							x	x	x	x	x	x	
Palmiskenea skenei var. *tridens*	x	x	x	x		x	x	x	x	x	x	x	x
Porella peristomata											x	x	x
Porella sp.	x												
Porella sp.2											x		x
Escharoides bidenkapi											x	x	x
Escharella labiata											x		x
Escharella macrodenta											x		x
Escharella sp.	x		x										
Tessaradoma boreale	x	x	x	x	x	x	x	x	x	x	x	x	x
Smittina minuscula	x												
Smittoidea glaciata	x	x	x	x	x						x	x	x
Smittoidea sp.												x	x
Pseudoflustra anderssoni	x	x	x	x	x		x	x	x	x	x	x	x
Hippomonavella borealis												x	x
Schizomavella porifera	x	x	x										
Escharina sp.	x		x										
Escharina sp.2												x	x
Phidelopora sp.	x	x	x	x									
Phidelporidae		x	x	x	x	x	x	x		x	x	x	x
Reteporella vitta											x	x	x

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