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The genus *Eumetula* (Gastropoda: Caenogastropoda: Cerithiopsidae) in north European waters, with the description of a new species from the upper continental slope off Norway

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Eumetula vitrea, *a new species of Cerithiopsidae, is described from the upper continental slope outside western Norway. The taxonomic status of the* Eumetula *species complex is discussed. While* Eumetula arctica *is a shelf species rarely found in sub-zero waters,* E. vitrea *is one of a group of species supposedly found only in negative temperature or water fluctuating between negative and positive temperatures (below ~570 m) in the bathyal around the Norwegian Sea.*

Keywords: Gastropoda, new species, upper continental slope, Norway, Cerithiopsidae, *Eumetula*, *Eumetula arctica*, *Eumetula bouvieri*, *Eumetula vitrea*

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INTRODUCTION

This is the third article in a series describing the gastropod fauna of the bathyal and abyssal of the Norwegian Sea. The first two are a reappraisal of *Cerithiella danielsseni* (Friele) (Høisæter, 2009b) and an overview of the total fauna of shell-bearing gastropods (Høisæter, 2010). The material is mainly but not exclusively from the slope off Norway, where several undescribed species and species not previously recorded from Norwegian waters were found (Høisæter, 2009a, 2010). Among these were six specimens of a so far unknown species of *Eumetula*, a genus supposed to be represented in Scandinavian waters by *Eumetula arctica* (Mørch, 1857) only.

MATERIALS AND METHODS

This review is based mainly on specimens and shells of *Eumetula* found in some 80 samples (nine of which contained specimens of *Eumetula*) collected by Torleiv Brattegard and Jon-Arne Sneli during their 30 Norwegian Sea cruises with RV 'Håkon Mosby' in the 1980s, and some 30 shells of *Eumetula* in 10 samples from the Norwegian North Atlantic Expedition, 1876–1878 (NNAE) (Friele & Grieg, 1901). All museum material of *Eumetula arctica* from the collections of the Zoological Museum of the University of Bergen (ZMBN) was studied as well. The 'Håkon Mosby' specimens were mostly sampled with a modified Rothlisberg–Pearcy (RP)-sledge (Brattegard & Fosså, 1991), designed for collecting hyperbenthic fauna, but well suited also for the smaller and less heavy epibenthos. This material was preserved in buffered formalin and later transferred to 80% ethanol (thus unsuited for molecular analysis). The material from the NNAE was caught with dredge or trawl with 'swabs'. Some specimens of *Eumetula arctica* from the coast of mid-Norway collected during 1968 to 1971 are also included. All material mentioned is deposited at the ZMBN. For further details, see Høisæter (2010).

The ocean traditionally called the Norwegian Sea has long been known to geophysicists as the Nordic Seas, in which the Norwegian Sea *sensu stricto* is just one of three ocean basins. For simplicity I use Norwegian Sea throughout as a collective.

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SYSTEMATICS

Family CERITHIOPSIDAE H. & A. Adams, 1853
Genus *Eumetula* Thiele, 1912

Eumetula Thiele 1912: 305—type species, by monotypy: *Eumetula dilecta* Thiele, 1912, Antarctic.
Eumeta Mørch, 1870: 208 (not *Eumeta* Walker, 1855)—type species, by monotypy: *Cerithium arcticum* Mørch, 1857, Greenland.
Laskeya Iredale, 1918: 30—new name for *Eumeta* Mørch.

DIAGNOSIS

Shell tall, slender, conical, from around 5 to 12 mm long. Dominating sculpture regular axial ribs, but sometimes also with spiral cords or striae of varying strength. Aperture with wide, but very short siphonal canal. Radula with formula 2 + 1 + 1 + 1 + 2, central and laterals with numerous sharp cusps.

REMARKS

Thiele (1929) regarded *Laskeya* as a subgenus of *Eumetula* while Bouchet & Warén (1993) after having examined the radula of *E. dilecta* found the differences between *E. dilecta* and *E. arctica* to be of specific value only. So far a single species, *E. arctica*, has been recorded from the north-east Atlantic. Bouchet & Warén (1993) include two deep water species from the southern part of the north-east Atlantic (south of 45°N), in *Eumetula*, one of which, *E. bouvieri* (Dautzenberg & Fischer, 1896) is rather similar to *E. arctica*. Kantor & Sysoev (2006) illustrate a species, *E. striata* Gulbin, 1982 from the north-western Pacific, and two species of *Furukawaia* Kuroda & Habe, 1961, from the Japan Sea in the north-western Pacific very similar to *E. arctica*. In this article I only treat material from the Norwegian Sea and the north-east Atlantic north of 60°N, all other information is taken from the literature.

Eumetula arctica (Mørch, 1857)
(Figures 1, 4A)

Turritella? *costulata* Møller, 1842: 83 (not *T. costulata* Borson, 1825, Potiez & Michaud, 1838, nor Mighels & Adams, 1842); Schiøtte & Warén, 1992: 9
Cerithium (*Bittium*) *arcticum* Mørch, 1857: 82, nom. nov. for *Turritella costulata* Møller, 1842.
Cerithiopsis costulata Møller—Jeffreys, 1867; G.O. Sars, 1878: 189; Norman, 1893; Friele & Grieg, 1901; Norman, 1902.
Cerethiopsis costulata [sic.] Møll—Norman, 1879.
Eumeta costulata (Möller)—Thiele, 1912.
Eumetula (Laskeya) costulata (Möller)—Thiele, 1929.
Eumetula costulata (Möller)—Fretter & Graham, 1982; Graham, 1988.
Eumeta arctica (Mörch)—Iredale, 1915.
Laskeya arctica (Mørch, 1857)—Marshall, 1978.
Eumetula arctica (Mørch, 1857)—Hubendick & Warén, 1972; Høisæter, 1986, 2009a; Smith & Heppell, 1991; Schiøtte & Warén, 1992; Bouchet & Warén, 1993; Schiøtte, 2005; Sneli *et al.*, 2005.

TYPE MATERIAL

Two syntypes (lectotype designated by Schiøtte & Warén, 1992: 9, figure 65) ZMUC GAS-128.

TYPE LOCALITY

West Greenland, not specified (in Møller, 1842). The two syntypes from off Sukkertoppen, south-west Greenland, at

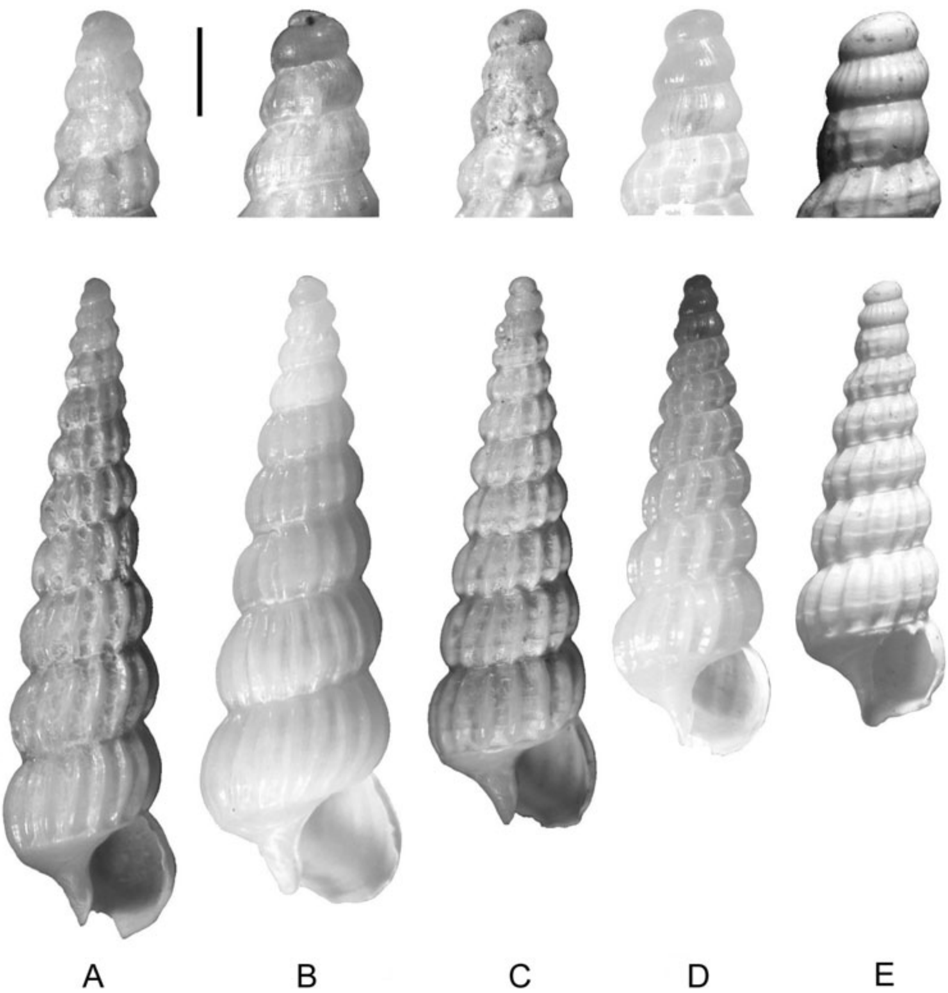

Fig. 1. Five specimens of *Eumetula arctica* showing the variability of the species. (A) From the shelf/slope break at 543 m; (B) from the slope south of Iceland at 1542 m; (C) from a fjord in mid-Norway, 200–180 m; (D) from the Iceland–Faroe Ridge at 400 m; (E) from the shelf south-west of Jan Mayen, 481 m. Shells to scale, the longest 7.2 mm. Scale bar = 0.5 mm.

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approximately 65°42′N. According to Mørch (1857), from 65 fathoms (around 120 m).

DESCRIPTION

Shell (based on shell from 543 m, 62°20′N, Figure 1A) semi-transparent, white, tall slender cylindro-conic (7.2 × 1.9 mm). Apical angle ~16°, with 11–12 whorls of which 2.5 belong to the protoconch. Sculpture dominated by slightly opisthocline axial costae, around 16 on the body whorl. Spiral sculpture confined to two low ridges, most marked on the three or four upper teleoconch whorls. A terminal ridge below the costae on the body whorl. Aperture with a wide siphonal notch. No umbilicus. A narrow spiral keel encircles the base ending at the lower edge of the siphonal notch. Protoconch of 2.5 whorls, the upper smooth, the next with dense axial riblets, diameter around 335 μm. Radula and operculum illustrated in Bouchet & Warén (1993: figures 1282, 1292 respectively).

REMARKS

This species concept is based on two syntypes in the Zoological Museum in Copenhagen, of which 'the best' was chosen as lectotype (Warén, personal communication). Presumably these syntypes are the same as the specimens Mørch (1857) refers to as having been collected by Holbøll from 65 fathoms off Sukkertoppen. The lectotype is long (9.3 mm) and narrow with the protoconch missing. Any information on the substrate or water temperature for the type locality is lacking. In view of the discovery of a new species from the upper slope around the Norwegian Sea, the validity of the name *E. arctica* for the Scandinavian shelf form is open to discussion (see Discussion below).

MATERIAL SEEN

See Table 1.

In addition to the specimens listed in Table 1, around 150 shells from the Norwegian coast and fjords from the Bergen area (around 60°N) and northwards to 69°N.

DISTRIBUTION

According to Bouchet & Warén (1993) *E. arctica* is common all around Iceland, western and eastern Greenland and along the North American shelf as far south as New England. Schiøtte (2005) discusses a record from northern Greenland, and concludes that it most likely is based on a misidentification. Gulliksen *et al.* (1999) report a single specimen from Jan Mayen, but none from Spitsbergen or Bear Island. According to Kantor & Sysoev (2006) the Russian distribution stretches from the Barents Sea and White Sea, as far east as the Chuckchi Sea. They figure a shell from 446 m at 81°N in the Kara Sea. As the protoconch is missing on the illustrated specimen this might be either an *E. arctica* or the species described below. On the European side the species is distributed from the Barents Sea along all the Norwegian coast south to and well into Skagerrak in 100–500 m, as well as around the Faroes. According to Jeffreys (1867) it is very rare in fine muddy sand in 120–150 m in Shetland. According to Sneli *et al.* (2005) it is found between 149 m and ~600 m on the shelf east and south-east of the Faroes, and from ~500 to 710 m on the slope south-west of the Faroes. In none of these stations were sub-zero water temperatures measured (or estimated), the lowest temperature estimated was 0.1°C at 678 m on the south-eastern slope of the Faroe Bank. The results from BIOFAR indicate that east and south of the Faroes, the preferred habitat for this species is on or near the shelf-break (300–600 m). According to G.O. Sars (1878) it should be present in Oslofjorden and on the western and northern coasts but not on the south coast of Norway ('Ora meridion. Norv.'). According to Hubendick & Warén (1972) and Hansson (2003) it is found in the northern parts of Swedish Skagerrak, but has not been found alive during the last century. The species was not found by G.O. Sars in East Finnmark, but it was reported from that area later by Norman (1902). In my material from the Norwegian shelf there are only four specimens of which the northernmost is from Gratangen, 68°42′N, rocky bottom at 100–125 m. Shells were moderately common however, (altogether 170 shells) most of them found on the outer coast between 64°25′ and 65°10′N, mostly between 80 and 200 m but occasionally shallower, as a lot of 46 shells from a dredge haul from 80–30 m on the outer coast at 64°57′N, shows. Two specimens (and three shells) from 471 m in a local depression outside Sognefjorden shows that it is present also in the Norwegian Trench, although it was not found in either the 1971 or the 1988 investigations in Fensfjorden in which the outermost stations were in the Norwegian Trench (see Høisæter, 2009a). Six specimens in a sample from 543 m on the shelf break just north of the Norwegian Trench indicate that this locality at present might be a favourable habitat for the species. In this sample it was found together with several of the species classified as 'ecotone species' (i.e. species living in the thermocline with fluctuating positive and negative temperatures) in Høisæter (2010). One NNAE shell from 781 m on the slope west of Spitzbergen at 78°N, and one from 481 m at 70°41′N, just south of Jan Mayen are the only 'Arctic' shells I have seen. My material also includes a few specimens from 400 m on the Iceland–Faroe Ridge and from 1542 m on the slope south of Iceland. Whether all of these belong to the same species is an open question (see below).

VARIABILITY

Few authors have commented on the geographical variability of this species, and most illustrations and descriptions are based on specimens or shells from the coast of Norway. These all more or less conform to Figure 1A, and the description above. The lectotype from the west coast of Greenland (Figure 6) is the only illustrated shell showing any significant deviation. The shell is long, although lacking all of the protoconch and possibly a few postlarval whorls, it still measures 9.3 mm. G.O. Sars (1878) illustrates a shell of 11 mm, but remarks that all the (few) living specimens he had seen were far smaller. This agrees with my experience that the species rarely exceed 7.5 mm in length. A single shell from the North Sea in the collection of ZMBN is 7.6 mm. As many of the empty shells recorded by G.O. Sars (1878) from Lofoten and Hammerfest might be very old it is not inconceivable that shells from 8 to 11 mm are true Arctic forms. However, the drawing of the 11 mm shell in G.O. Sars looks more like the smaller specimens from the Norwegian coast than the lectotype. In addition to the size, the lectotype diverges from the shells from the coast of Norway in being more cylindrical (hard to quantify because of the missing protoconch), with deeper suture, deeper 'valleys' between axial costae, and while the body whorl merges gradually with the columella in a concave curve in the 'Norwegian' coast/shelf form, the

Table 1. Material of *Eumetula arctica* studied. Empty shells are marked 'd' in the table. Station numbers for the 'Håkon Mosby' cruises are of the form 'yy. mm. dd. no'. Temperatures included if measured at the time of sampling.

Station number	Depth m	Latitude	Longitude	Temp	Nos	Museum label
Håkon Mosby 83.06.06.1	1542	62°28′N	14°13′W	3.4°C	2	
Håkon Mosby 83.06.07.1	574	63°35′N	12°51′W	3.3°C	15d	
Håkon Mosby 83.06.07.2	400	64°26N′	11°10′W	−0.2°C	1 (+1d)	
Håkon Mosby 81.08.17.11	471	60°52′N	04°21′E	5.9°C	2	
Håkon Mosby 83.06.17.2	543	62°20′N	01°25′E	1.9°C	6	
Vøringen, Husøy	80–120	61°00′N	04°30′E		2d	ZMBN 21678
Vøringen station 255	624	68°41′N	15°40′E	6.5°C	5d	ZMBN 21675
Vøringen station 195	196	70°55′N	18°38′E	5.1°C	2 (+5d)	ZMBN 21673
Vøringen station 290	349	72°27′N	20°51′E	3.5°C	1 (+2d)	ZMBN 21676
Vøringen station 359	761	78°02′N	09°25′E	0.8°C	1d	ZMBN 21677
Vøringen station 173 b	550	69°10′N	14°50′E		1d	ZMBN 21671
Vøringen station 237	481	70°41′N	10°10′W	−0.3°C	1d	ZMBN 21674
Michael Sars 1904 Station 281	107	58°34′N	03°06′E	6.4°C	1d	ZMBN 14488
Michael Sars 1906 Station 27	123				4 (+1d)	ZMBN 14586
Michael Sars 1906 Station 284	190	61°43′N	01°15′E	7.2°C	2	ZMBN 15224
20 km west of Sognefjorden					1d	ZMBN 68084
Ast 5241, Foldvik in Gratangen, rocky bottom	110–125	68°42′N	17°28′E		1	
T 70064, Bremsnesfjorden, between Klubbneset and Stavneset, stones, gravel and sand	200–180	63°07′N	07°41′E		1 (+4d)	
E 291-65, Nordre Brattholmen, stones, rock and coral rubble	120–135				1	
E 138-67, outside Korsfjorden	~300	60°7.5′N			1	

body whorl appears to meet the columella at an 120° angle in the lectotype (Figure 6).

Figure 1 illustrates that the shell varies in several other respects as well, as in details and size of the protoconch, density of axial sculpture and distinctness of the spiral sculpture. Much of this variability seems to be geographical and/or bathymetrical. Especially two shells with especially large protoconchs, one from 1542 m south of Iceland (Figure 1B) and one from south of Jan Mayen (Figure 1E) are different from the coast/shelf form. Specimens from the Iceland–Faroe Ridge (Figure 1D) seem to be rather more transparent, with more 'protruding' spiral lirae and a flatter protoconch than those from Norwegian waters. Without a much more extensive material available it is impossible to exclude the possibility that more than one species are involved here.

Eumetula vitrea sp. nov.
(Figures 2, 3, 4B–E)

Cerithiopsis costulata Møll—Friele & Grieg, 1901 (in part); *Eumetula* sp. nov.—Høisæter, 2009a, 2010.

TYPE MATERIAL
Holotype (ZMBN 86301) and four paratypes (ZMBN 86302, 86303) from two stations, both at 62°30′N 1°44′E, 602 m and 604 m. The temperature at the type locality measured at two occasions was −0.9°C (1981.08.16) and +1.1°C (1982.01.21) respectively.

ETYMOLOGY
From Latin *vitreus* meaning glassy, vitreous. Referring to the transparent, glassy shell of the species.

DESCRIPTION
Shell (holotype, Figure 2) glossy, transparent, tall, fusiform (7.95 × 2.5 mm). Apical angle ~18°, with 10.5 convex whorls, suture deep. Sculpture dominated by (on body whorl) 16 distinct, opisthocline, wide axial costae with wide and deep interspaces. A strong spiral cord just above the suture, best seen on the body whorl, otherwise partly or entirely concealed by the next whorl. Four evenly spaced, irregular, white, incised, narrow spiral lines overriding the axial ribs. First few teleoconch whorls with a squarish outline, in later whorls the axial ribs have an undulating outline, with three to four 'humps' to each rib (Figure 2B & C). Additional microscopic spirals together with microscopic growth lines throughout the spaces between ribs gives the glossy surface a 'gridded' aspect in reflected light. A very narrow (and indistinct) spiral keel running up from the left lower edge of the siphonal notch, and crossing the upper third of the columella. Protoconch (Figure 2D) with ~2.5 bulbuous, inflated smooth whorls. Apex equally wide, at 525 µm, as second whorl.

MATERIAL SEEN
See Table 2

DISTRIBUTION
With a single exception (a specimen from 1588 m on the slope north of Iceland, see below) the new species has only been found in a narrow depth zone with temperatures fluctuating between negative and positive values. In the area here sampled, this is around 600 m. It was not found in any of more than 70 samples from depths beyond 650 m on the slope off Norway (Høisæter, 2010). Among the NNAE material identified by Friele & Grieg (1901) as *Cerithiopsis costulata* (= *E. arctica*), one shell from their Station 124 (640 m at 66.5°N), and two from the rich shell bank Station 192 (1187 m, 69.5°N), as well as a juvenile shell identified as *Cerithiella* in the latter sample, turned out to belong to the new species. This latter station is well known to harbour a mixture of empty shells from shallower slope waters as well as shells of species actually living at the locality (Friele & Grieg, 1901).

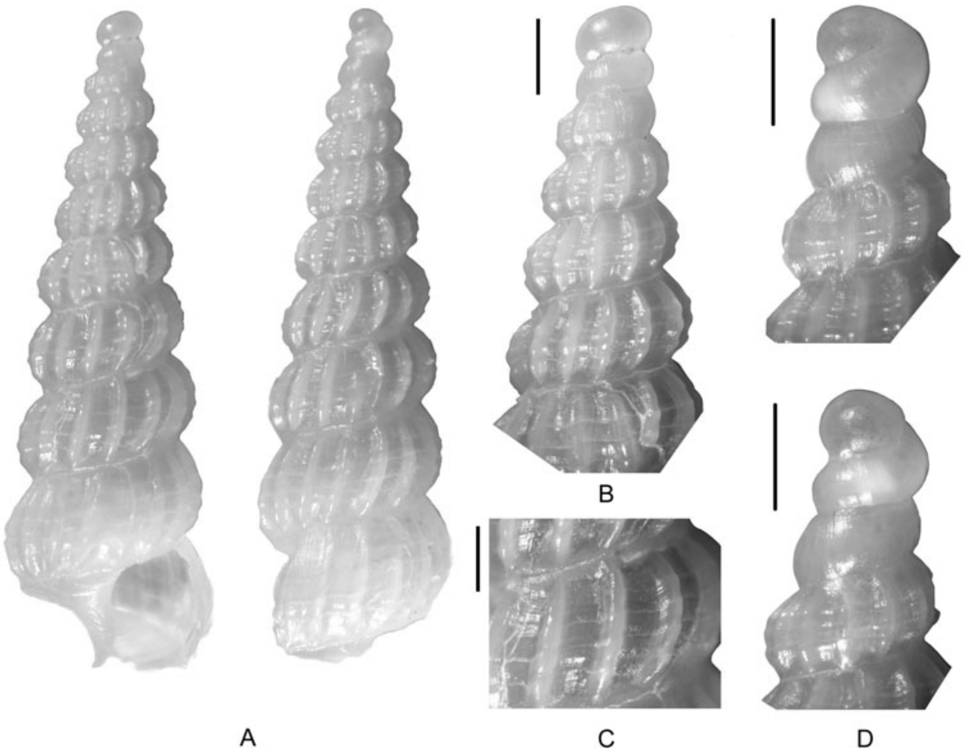

Fig. 2. *Eumetula vitrea* sp. nov., holotype 7.95 mm long. Scale bars = 0.5 mm.

VARIABILITY

The single specimen from the slope north of Iceland (Figures 3D & 4D) diverge from the holotype in several details. The shell appears to be thinner, the ribs are sharper and more numerous, and the terminal spiral cord is not covered by next whorl. There are only two thin spiral lines on each whorl and the axial ribs are evenly curved (no visible 'humps'). The second protoconch whorl is proportionally larger than in the type material. Except for this specimen, the most variable part of the shell of *E. vitrea* is the size of the protoconch. While the majority of my 11 specimens had apical diameters of between 525 and 575 μm, the total

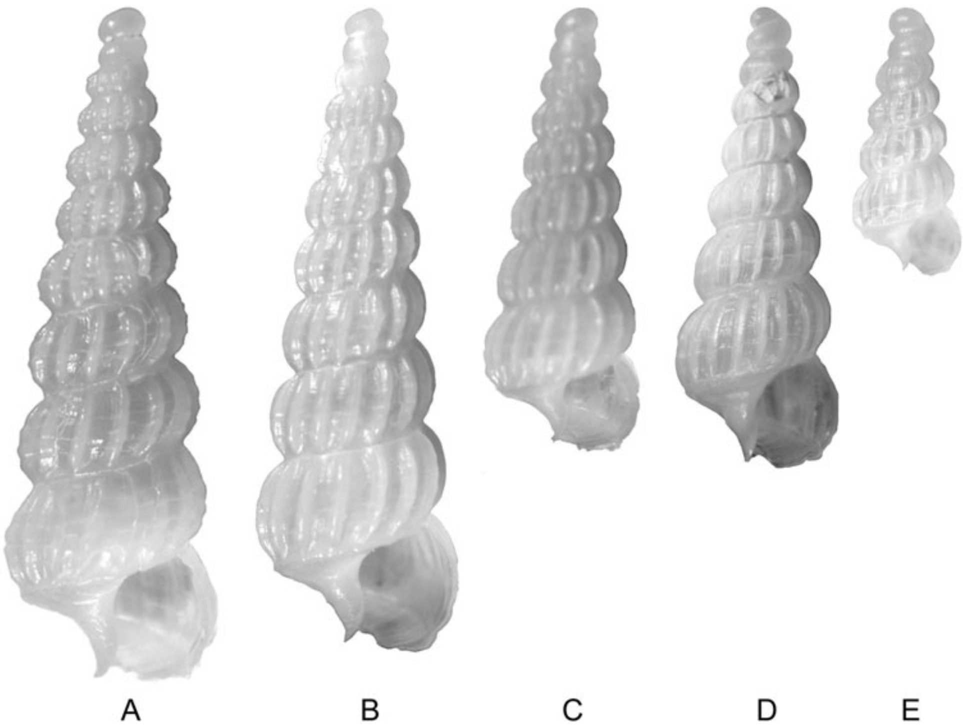

Fig. 3. Five specimens of *Eumetula vitrea* showing the variability of the species. All except (D) from the same locality at ~600 m at 62.5°N. Specimen (D) from 1588 m at roughly 69°N, north of Iceland. Shells to scale, the longest (the holotype) 7.95 mm.

Table 2. Material of *Eumetula vitrea* studied. Empty shells are marked 'd' in the table. Station numbers for the 'Håkon Mosby' cruises are of the form 'yy. mm. dd. no'.

Station number	Depth m	Latitude	Longitude	Temp.	Nos	Museum label
Håkon Mosby 84.05.23.5	576	62°30′N	02°14′E	−0.8°C	1	
Håkon Mosby 81.08.16.9	602	62°29′N	01°45′E	−0.9°C	1	ZMBN 86303
Håkon Mosby 82.01.21.2	604	62°30′N	01°43′E	1.1°C	1	ZMBN 86301
Håkon Mosby 82.01.21.2	604	62°30′N	01°43′E	1.1°C	3	ZMBN 86302
Vøringen station 124	640	66°41′N	06°59′E	−0.9°C	1d	ZMBN 21670
Vøringen station 192	1187	69°46′N	16°15′E	−0.7°C	2d	ZMBN 21672
Håkon Mosby 84.03.15.2	1588	68°54′N	14°14′W	−0.9°C	1	

range was 460 to 745 μm. In spite of this considerable size variation there is no overlap with *E. arctica*, whose protoconch diameter ranges from 320 to 440 μm. The undulating outline of the ribs varies from quite obvious (in the majority of the shells) to barely perceptible.

REMARKS

This is the species called *Eumetula* sp. nov. in Høisæter (2009a, 2010). Compared to *E. arctica*, *E. vitrea* is around 30% longer at same number of whorls, and while the whorls of *E. vitrea* are twice as wide as high, the corresponding ratio is around 1.7 to 1.8 in *E. arctica*. The whorls of *E. vitrea* are more convex and with deeper suture. The shell is much more glassy and transparent, and has a larger and more bulbous protoconch. The conical shape (Figure 4) and the axial sculpture on whorl 2 of the *E. arctica* protoconch clearly separates the two. The basal keel which is usually distinct in *E. arctica* (see e.g. figure 1343 in Bouchet & Warén, 1993) is less obvious in *E. vitrea*. The less undulating axial ribs in *E. arctica* also serve to distinguish the two species. Maximum diameter of the shell as a function of shell height is consistently larger for *E. vitrea* and at least for the available material, much less variable (Figure 5).

DISCUSSION

As the apical whorls are missing on the lectotype of *E. arctica* (Figure 6), the possibility that the lectotype rather belongs to the new slope species described above, than to the well known 'Norwegian' shelf and coast species, cannot be excluded outright. The apical angle, which in the lectotype is around 14°, argues against such a possibility. The whorls are also less convex and the suture is shallower than in the slope species. However, the lectotype is much larger than any of the more than 150 shells of the 'Norwegian' shelf/coast form I have seen. This might be due to the well known tendencies of Arctic forms to be larger and heavier than their boreal conspecifics. Thus the most likely conclusion is that if the lectotype of *E. arctica* from West Greenland should be conspecific with any of the two species described and discussed above, it is the shelf and coast form from Scandinavian waters. The possibility that both the slope species and the shelf and coast form are specifically different from *E. arctica* cannot be excluded.

Many species that live exclusively on the shelf (above 400–500 m) north of the Wyville-Thomson Ridge are found deeper down, on the slope south of this barrier (see e.g. the discussion in Høisæter, 2009b). Probably this distribution pattern is due

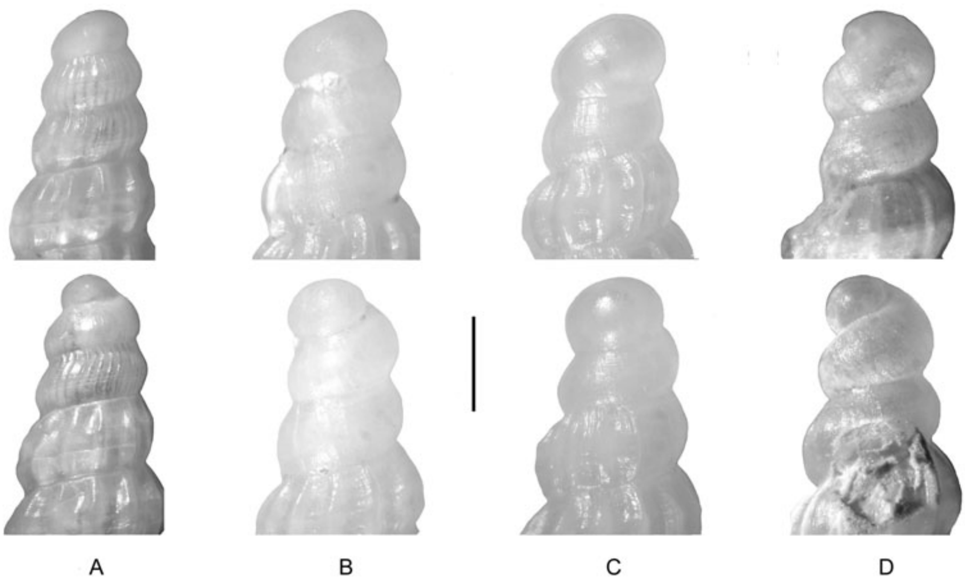

Fig. 4. Protoconchs of (A) *Eumetula arctica* (from 471 m outside Sognefjorden) and (B–D) of specimens of *E. vitrea* with protoconchs of various sizes (B and C) from ~600 m on the upper slope, and (D) from 1588 m on the Kolbeinsey ridge north of Iceland. Scale bar = 0.5 mm.

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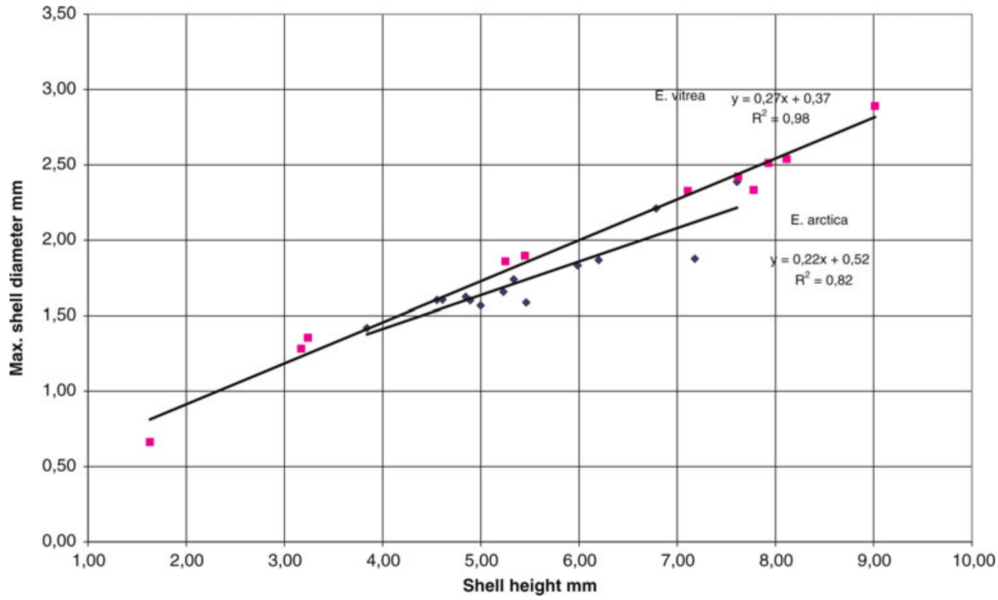

Fig. 5. Scatterplot of shell width as a function of shell height for *Eumetula arctica* and *E. vitrea*; with linear trend lines and R^2.

to the sub-zero water temperature, which excludes these species from deeper water in the north. *Eumetula arctica* might belong in this category. In the Norwegian Sea, the species is a typical 'shelf species' apparently never found deeper than the shelf/slope break. Further south in the North Atlantic, I have specimens down to 1540 m on the slope, and according to Bouchet & Warén (1993) it is found down to 1629 m south of Iceland (shells only). Most records

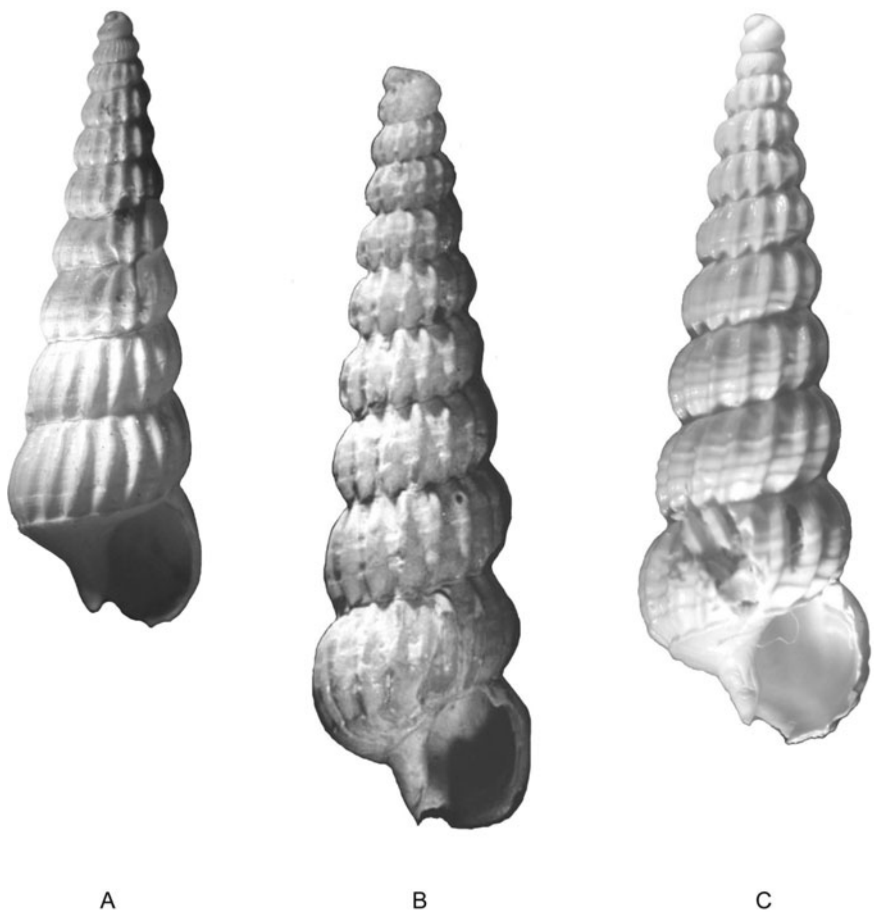

Fig. 6. Photographs of (A) the 'Norwegian' shelf/coast form (from 107 m in the North Sea), (B) the lectotype of *Eumetula arctica* and (C) the longest of eleven shells of *Eumetula vitrea*. The three approximately to scale, the lectotype of *E. arctica*, 9.3 mm, the specimen of *E. vitrea*, 9.0 mm.

are from depths of less than 1000 m though. Further south in the North Atlantic, south of 44°N, *E. arctica* is replaced by *E. bouvieri* (Dautzenberg & Fischer, 1896) (see figures 1336–1340 in Bouchet & Warén, 1993). According to Bouchet & Warén this species diverges from *E. arctica* by having a very blunt protoconch, thus having a more cylindrical, less pointed shell, and with spiral sculpture (if present) of broad, poorly demarcated cords rather than sharp incised lines. Specimens in my material from the Iceland–Faroe Ridge and from the shelf south-east of Jan Mayen (Figure 1D, E) share some but not simultaneously all of these characters. Very few specimens or shells of *Eumetula arctica* have been recorded from the upper slope south of 60°N (e.g. not reported by Olabarria (2006) from the Porcupine Seabight at around 50°N), and only future studies can show whether *E. arctica* and *E. bouvieri* live side by side, or if there is a gradual or abrupt change from one to the other somewhere in the latitudinal 'gap'.

Three species looking similar to *Eumetula arctica*, i.e. *E. striata* Gulbin, 1982, *Furukawaia fukuiensis* Kuroda & Habe, 1961 and *F. habei* Golikov & Gulbin, 1978 have been described from the northern Pacific. From the limited information available, it is impossible to tell how *Eumetula* and *Furukawaia* are supposed to differ, and closer studies might show the two genera to be synonymous (a view shared by Bouchet & Warén, 1993; Marshall, 1978). According to Hasegawa (2000) *F. fukuiensis* is found in grantiid sponges at a depth of 100 to 200 m.

The photograph in Kantor & Sysoev (2006) of an 8 mm long shell called *E. arctica* from the Kara Sea might be of *E. vitrea*, a theory supported by the depth (446 m) and temperature (permanently sub-zero) at the locality. It is definitely more similar to the holotype of *E. vitrea* than to the lectotype of *E. arctica*. The photographs of *F. fukuiensis* in Hasegawa (2000) show a gastropod with many of the characteristics that distinguish *E. vitrea* from *E. arctica*, a large swollen protoconch, glassy transparent shell and fairly wide conical shell shape (the photograph of a shell called *F. fukuensis* in Kantor & Sysoev (2006) has a pointed, *E. arctica* type protoconch, and is definitely not the same as the shell illustrated in Hasegawa (2000)). Another photograph in Kantor & Sysoev, of *Embrionalia embrionalis* Golikov, 1988 from 25 m in the Okhotsk Sea, shows a rather poorly preserved shell of the same general shape, size and protoconch type as *E. vitrea*. The type localities of these shells make it highly unlikely that they should be senior synonyms of *E. vitrea*, however.

Eumetula vitrea has so far not been recorded from waters shallower than 576 m (a single specimen). It also seems to be confined to a narrow depth zone where the water temperature fluctuates between −0.9 °C and +1.0 °C (the temperature measured to +1.1°C at 604 m, see Table 2, is unusually high for that depth (cf. figure 2 in Høisæter, 2010) and might be in error). While neither *E. arctica* nor *E. vitrea* seem to be anywhere common, both apparently have their preferred habitat near the shelf break. At the very thoroughly sampled area just north of the Norwegian Trench (~62°30′N ~1°45′E), in a sample from 543 m, six specimens out of 103 of altogether 21 species belong to *E. arctica*. Similarly *E. vitrea*, with five specimens out of 460 of altogether 33 species, seems to be most common in depths around 600 m. In none of the six samples in question did the two species occur together. This might be an example of the distribution of sibling species on both sides of the thermocline on the slopes of the Norwegian Seas, where deep-water with negative temperatures meet warmer Atlantic water at around 500–700 m depth. Similarly *Cerithiella danielsseni* replaces *C. metula* on the slope below the thermocline (Høisæter, 2009b). The distribution of *E. vitrea* appears to be more restricted than that of *C. danielsseni*, as not a single specimen has been recorded in the some 30 samples from around 650 m to 1600 m on the slope off Norway (Høisæter, 2010). *Cerithiella danielsseni* on the other hand has its main distribution from 750 to 800 m with occasional specimens down to 2170 m. The only shells of *E. vitrea* from this depth-range are the ones from the shell bank at 1187 m from the NNAE (see above).

The use of *Eumetula* as genus name for the north-east Atlantic species is not convincing. In my opinion the use of the same genus name for species from both the northern and the southern cold water region, is rarely justified (see e.g. Koufopanou *et al.*, 1999). However, *Eumetula* has been used consistently for the northern species for close to a century, and probably should be used unless *E. arctica* is demonstrated to be generically different from *E. dilecta*, in which case *Laskeya* is to be used for the northern species.

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