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New records of gadilid molluscs from the southwestern Barents Sea (Scaphopoda: Gadilidae)

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ABSCTRACT. The findings of living specimens of two gadilid scaphopods – *Cadulus subfusiformis* (M. Sars, 1865) and *Pulsellum lofotense* (M. Sars, 186) in the coastal waters of Kola Peninsula (SW Barents Sea) are described. *Cadulus subfusiformis* was previously known from the region only by single empty shell; *Pulsellum lofotense* was recorded previously without exact locality and was not listed in the modern literature concerning the Russian fauna.

The species diversity of scaphopod molluscs of the Barents Sea is relatively low. Only two species – *Siphonodentalium lobatum* (Sowerby, 1860) and *Antalis entalis* (Linnaeus, 1758) were found during the first investigations of the region [Herzenstein, 1885; Derjugin, 1915; 1924]. Three more species – *Antalis agilis* (M. Sars in G.O. Sars, 1872), *Antalis occidentalis* (Stimpson, 1851) and *Pulsellum lofotense* (M. Sars, 1865) were listed in the review of Arctic Scaphopoda by Zatsepin [1948]. Ivanov and Zarubina [2004] in a study based on voluminous material stored in the Russian museums confirmed presence of living *Siphonodentalium lobatum, Antalis agilis* and *Antalis entalis* in the Barents Sea, whereas no specimens of *Pulsellum lofotense* were found and only few empty shells of *Antalis occidentalis* were presented. Also the empty shell of *Cadulus subfusiformis* which was not previously known from the Barents Sea was reported.

Recent investigations in the coastal waters of Kola Peninsula lead to finding of living specimens of *Cadulus subfusiformis* as well as to discovery of *Pulsellum lofotense* (M. Sars, 1865). The aim of this note is to describe these findings.

Materials and Methods

Material was collected during the annually monitoring studies of benthic communities along the standard transect "Kola Section". The samples were taken using by 0.1 van Veen grab and sieved over 1 mm sieve. Samples were initially fixed in 4% formaldehyde and were transferred into 75% ethanol after the manual sorting in the laboratory.

Both *Cadulus subfosiformis* and *Pulsellum lofotense* were collected from almost the same locality during the cruises of R/V *Vilnius* from clay bottom at 147-152 m. A single living specimens of *Cadulus subfusiformi*s were found at 69°59.575'N 33°31.074'E, 9 Aug. 2013, and at 70°00.066'N, 33°29.800' E, 9 Aug. 2012. Three living specimens of *Pulsellum lofotense*, were taken at 69°59.762'N, 33°29.744'E, 12 Aug. 2011. Also lots with 13 living specimens of *Antalis entalis* (Linnaeus, 1758) (68°31.85'N, 38°44.73'E, 30 July 2008) and 7 living specimens of *Siphonodentalium lobatum* (Sowerby, 1860) (70°54.165'N, 37°00.117'E, 7 Aug. 2007) were used for comparison with species discussed in the present study.

Results

Scaphopoda
Gadilida Starobogatov, 1974
Gadilidae Stoliczka, 1868

Cadulus Philippi, 1844

Cadulus subfusifromis (M. Sars, 1865)
(Fig. 1 A-B)

Shell small, slender, white, smooth, semitransparent. Ventral side is nearly straight, dorsal side is curved. Both posterior and anterior ends narrowed, anterior aperture is slightly wider than posterior. Maximal diameter is at the middle part of the shell. Sculpture is absent; in one specimen the white opaque bands are visible. Shell length of the specimens found are 2.8 and 2.6 mm.

Distribution. The reported distribution of that species include a wide area along the East Atlantic Coast from the Mediterranean and Spain to the British Isles, the Faroes, Iceland, and Scandinavia [Knudsen, 1949; Sneli *et al*., 2005; Martínez–Ortí, Cádiz, 2012]. The previously reported north-easternmost findings of living specimens were from the coastal waters of the Troms and the Western Finnmark [Høisæter *et al*., 1997; Ivanov, Zarubina,

2004]. A single empty shell was reported from the SW part of the Barents Sea (71°10'N 33°15'E) [Ivanov, Zarubina, 2004] which is close to locality reported in the present study.

Pulsellidae Boss, 1892
Pulsellum Stoliczka, 1868

Pulsellum lofotense (M. Sars, 1865) (Fig. 1 D-F)

Shell is small, white, usually semitransparent, evenly curved, generally conical in shape. Shell diameter slightly and evenly increasing with the maximum near the anterior aperture. Sculpture is absent except the oblique growth lines. Shell length of the specimens found are 4.8, 4.2 and 3.8 mm.

Distribution. The species is known from the Mediterranean, Spain, to the British Isles, West Greenland, the Faroes and Scandinavia [Sneli *et al*., 2005; Öztürk, 2011; Martínez–Ortí, Cádiz, 2012]. Previous reliable north-easternmost locality was Western Finnmark [Høisæter *et al*., 1997].

Remarks. *Pulsellum lofotense* was previously reported from the SW part of the Barents Sea, without mentioning the exact locality and examined material [Zatsepin, 1948]. The material belonging to that species was not found during the recent revision of the collections of Russian museums [Ivanov, Zarubina, 2004] and hence *Pulsellum lofotense* was not listed in the recent reviews of the Russian fauna [Ivanov, 2001; 2005].

Pulsellum lofotense have the smallest size among the scaphopod species with similar shell shape known from the Barents Sea. It differs from the juveniles of *Siphonodentalium lobatum* in lower increasing of shell diameter (Fig. 1 C). The shells of young specimens of *Antalis entalis* are almost straight (Fig. 1 G), not curved like in *Pulsellum lofotense.*

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Новые находки гадилид на юго-западе Баренцева моря (Scaphopoda: Gadilidae)

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РЕЗЮМЕ. Описаны находки живых экземпляров двух видов лопатоногих моллюсков – *Cadulus subfusiformis* (M. Sars, 1865) и *Pulsellum lofotense* (M. Sars, 186) из прибрежных вод Кольского полуострова (юго-запад Баренцева моря). *Cadulus subfusiformis* был известен из региона только по единичной находке пустой раковины, *Pulsellum lofotense* был указан ранее без сведений о точном местонахождении и не упоминается в современной литературе, посвящённой фауне России.

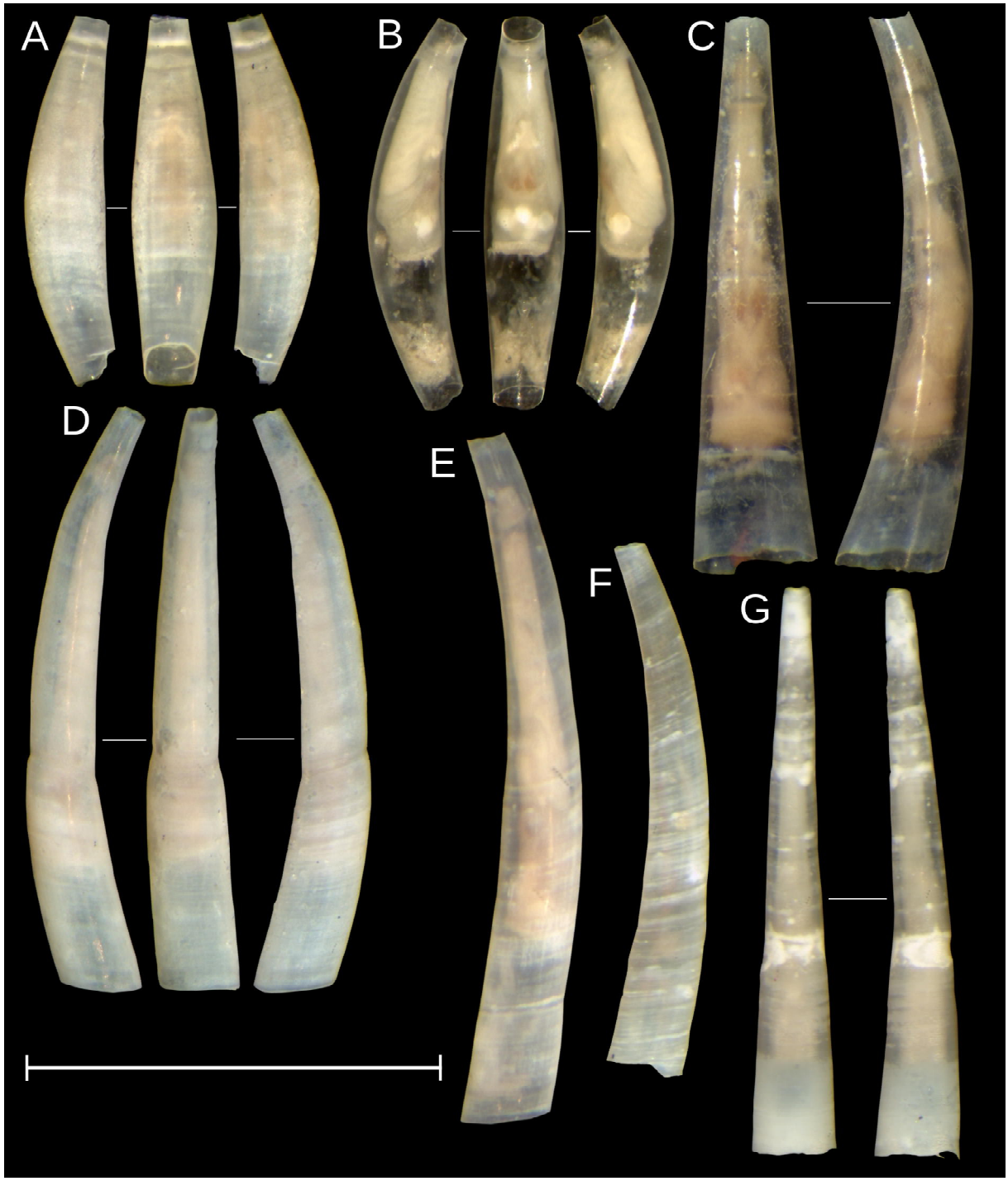

Fig. 1. Shells of Scaphopoda from the Barents Sea: A – *Cadulus subfusiformis*, 9 Aug. 2013, 69°59.575' N 33°31.074' E; B – *Cadulus subfusiformis*, 9 Aug. 2012, 70°00.066' N, 33°29.800' E; C – juvenile of *Siphonodentalium lobatum*, 7 Aug. 2007, 70°54.165'N, 37°00.117'E; D-F – *Pulsellum lofotense,* 12 Aug. 2011, 69°59.762' N, 33°29.744' E; G – juvenile of *Antalis entalis*, 30 July 2008, 68°31.85' N, 38°44.73' E.

Рис. 1. Раковины Scaphopoda из Баренцева моря: A – *Cadulus subfusiformis*, 9 августа 2013, 69°59.575' N 33°31.074' E; B – *Cadulus subfusiformis*, 9 августа 2012, 70°00.066' N, 33°29.800' E; C – молодой экземпляр *Siphonodentalium lobatum*, 7 августа 2007, 70°54.165'N, 37°00.117'E; D-F – *Pulsellum lofotense,* 12 августа 2011, 69°59.762' N, 33°29.744' E; G – молодой экземпляр *Antalis entalis*, 30 июля 2008, 68°31.85' N, 38°44.73' E.