

Distributional notes on *Gibbula cineraria* (Linnaeus, 1758), *Pseudosetia turgida* (Jeffreys, 1870) and *Haliella stenostoma* (Jeffreys, 1858) in Russian part of the Barents Sea (Gastropoda)

Ivan O. NEKHAEV

Murmansk Marine Biological Institute, Russian Academy of Sciences, Vladimirskaya str. 17,
Murmansk 183010, Russia; inekhaev@gmail.com;

ABSTRACT. New findings of three gastropod species in Russian waters are discussed. Both *Gibbula cineraria* and *Pseudosetia turgida* were previously reported in Russian faunistic literature but absent in recent one. *Haliella stenostoma* is reported for the first time from the Russian waters. Brief species descriptions are provided.

The studies of gastropod distribution along the Murman Coast of the Barents Sea were conducted since the 19-th century. The early data were summarized by S.M. Herzenstein [1885] who recorded 80 species for the region. Since Herzenstein's paper there were not any special studies of entire marine gastropod fauna in the coastal waters of Kola Peninsula. Recent studies of certain groups distribution were made by Yu.I. Kantor [1981] for Buccinidae, A.I. Granovitch *et al.* [2004] for *Littorina* and A.V. Martynov *et al.* [2006] for Opisthobranchia. Moreover, intensive studies of coastal molluscan fauna led to discovery of a number species new for Russia. This paper continues describing interesting gastropod findings from the Murman Coast.

Materials and Methods

Material for this study was collected during the period of 2007-2010 in intertidal and subtidal zones of the Russian part of the Barents Sea. In intertidal zone material was collected by hand and then fixed by 75% ethanol. Subtidal samples were taken with a 0.1 van Veen grab, initially preserved in 4% formalin and later transferred to 75% ethanol. Material was studied using by MBS-10 and Carton SPZT50 stereomicroscopes. The majority of photos were taken with DMC-510 eyepiece camera. The SEM studies were made by CamScan-4.

Results

Vetigastropoda

Trochoidea Rafinesque, 1815

Trochidae Rafinesque, 1815

Gibbula cineraria (Linnaeus, 1758) (Fig 1 A-D)

Trochus cinerarius Linnaeus, 1758: 758.

Material: 5 specimens, Bolshoy Aynov Isl., Varangerfjord, 69°50.062'N, 031°33.175'E, tide pool, 31.05.2008; 2 specimens, Bolshoy Aynov Isl., Varangerfjord, lower intertidal zone, 69°50.441'N, 031°35.054'E, 9.06.2008; 1 specimen, the same locality, 15.06.2008; 11 specimens, Bolshoy Aynov Isl., Varangerfjord, 69°50.032'N, 031°33.698'E, tide pool, 19.06.2008; 1 specimen, Yarnishnaya Bay, 14 m depth, 69°07.783'N, 36°00.599'E, 03.06.2009, R/V *Dalnie Zelentsy*; 6 specimens, Barents Sea, Liinahamari vicinity, Zapadnaya Malonemetskaya Bay, 69°42.420'N, 31°23.493'E, intertidal zone, September 2012; 4 specimens, Barents Sea, Bolshaya Volokovaya bay, 12-15 m depth, September 2012; 42 specimens, Clifden area, Connemara, Ireland, September 2011.

Shell is solid, opaque, dome-shaped. The whorls are irregularly flattened. Apical angle is about 80-100°. Young specimens are discoid with more obtuse apical angle. The shell surface is gray with reddish or brownish waved oblique bands. There are about 30-40 bands on the body whorl. The coloration is poorly visible in dry shells. The spiral sculpture consists of flat spiral ribs divided by narrow groove, about 10-12 spiral ribs on the body whorl and 12-14 ribs on the shell base. The embryonic shell is light-colored, smooth, consists of 1.4-1.6 whorls, usually eroded. The axial sculpture consists only of prosocline growth lines. Umbilicus is narrow, oval, deep. The aperture is rhomboid. Inner lip thickened; outer lip thin with dark and white strips inside. Inner shell surface is nacreous. Operculum is spiral, rounded, brownish.

The largest found specimen from the Russian part of the Barents Sea has a shell height 11.4 mm, shell width – 13.1 mm, whorls number is 5.3.

Distribution: In Atlantic *G. cineraria* is distributed from Morocco to Northern Norway [Fretter, Graham, 1977; Poppe, Goto, 1991]. It is common along the Norway coast, but live animals were not found in East Finnmark [Høisæter, 2009].

Ecology: On the Bolshoy Aynov Island *G. cineraria* inhabits lower tidal zone and tide pools, usually

lives under stones and among the algae *Fucus* spp. and *Ascophyllum* sp. In Yarnishnaya and Bolshaya Volokovaya bays it was found down to 15 m depth on sand and stones. In England it was found down to 130 m depth [Fretter, Graham, 1977].

Remarks: This species was previously reported from Ura Bay [Knipowitsch, 1900] but not mentioned in recent Russian faunistic and taxonomic literature [Galkin, 1955; Golikov, 1995; Golikov *et al.*, 2001; Kantor, Sysoev, 2006].

G. cineraria on the Murman Coast may be confused with *G. tumida* (Montagu, 1803) (Fig. 1 E-G), which may be easily distinguished by stepped whorls, smaller size and less clear color bands on the shell surface. *G. tumida* is absent in intertidal zone, but subtidally both species may occur sympatrically.

Littorinimorpha
Rissoidea Gray, 1847
Rissoidae Gray, 1847

Pseudosetia turgida (Jeffreys, 1870)
(Fig 2)

Rissoa turgida Jeffreys, 1870: 445.

Material: 26 specimens +15 empty shells, Barents Sea, 142 m depth, 69°59.495'N, 33°32.826'E, 19.08.07, R/V *Dalnie Zelentsy*; 4 specimens +9 empty shells, Barents Sea, 144 m depth, 70°00.162'N, 33°30.304'E, 11.08.2010, R/V *Fridtjof Nansen*.

Shell small, conical, generally smooth, white. The whorls are moderately convex with deep suture. The last whorl is more than half of the shell, apex is obtuse, apical angle is about 80°. The adult axial sculpture consists of only straight growth lines. The spiral striation of teleoconch consists of poorly visible frequent spiral lines on the upper part of the whorls, one thin but noticeable spiral rib started from the upper part of the aperture and numerous more poorly visible ribs are below it. The protoconch has 1.7-1.8 whorls. The embryonic sculpture usually consists of 10-15 broadly spaced, interrupted, poorly visible lines and sometimes by bow-shaped axial lines between them. In my material protoconch often corroded. The aperture is oval with obtuse angle. Inner lip is rounded. The umbilicus is relatively wide.

Shell height of adult specimen is about 1.7-2.1 mm, shell width 1.0-1.3 mm, whorls number is 4-4.5.

Distribution: From the coast of Northern Spain to the Barents Sea [Warén, 1996]. In Norway it is distributed along entire coast except East Finnmark [Høisæter, 2009]. This species was not mentioned in recent Russian faunistic and taxonomic literature [Golikov, 1995; Golikov *et al.*, 2001; Kantor, Sysoev, 2006].

Ecology: In my material *P. turgida* was only

found in one location on 142-144 m depth, on sandy and silty bottom with stones. Highest number and biomass were observed in 2007 and were 52±3.6 specimens per m² and 0,068±0.013 g per m² respectively.

Remarks: *P. turgida* was previously reported from the Barents Sea by Russian authors [Bryazgin *et al.*, 1981], but it is unclear whether this species was found in Russian waters or in Norway only.

Filatova and Zatsepin [1948] recorded *Boreo-cingula globulus* (Møller, 1842) for Russian Arctic. Unfortunately material on which this record was based is lost [Kantor, Sysoev, 2006]. Warén [1972] suggested that all records of *B. globulus* from Scandinavia belongs to *Elachisina globuloides* (Warén, 1972) which is very similar in shell shape with *P. turgida*. So, it is likely that the record of the *B. globuloides* in Russia may belong to *P. turgida*.

Pseudosetia turgida in the Barents Sea may be confused with *Obtusella tumidula* (G.O. Sars, 1878) and differs from it by very weak teleoconch and protoconch sculpture. *O. tumidula* has very distinct frequent spiral lines on protoconch and teleoconch whorls.

Heterobranchia
Eulimoidea Philippi, 1853
Eulimidae Philippi, 1853

Haliella stenostoma (Jeffreys, 1858)
(Fig 3)

Eulima stenostoma Jeffreys, 1858: 128 p. Pl. V fig 7 a-b.

Material: 1 specimen, Barents Sea, 144 m depth, 70°00.162'N, 33°30.304'E, 11.08.2010, R/V *Fridtjof Nansen*.

Shell is tall, very slender, glossy, relatively solid, smooth, semitransparent. Apex is obtuse, apical angle is about 20°. Body whorl is about 45% of shell height. Whorls are relatively flat divided by indistinct oblique sutures. Coloration is from brownish on the upper whorls to white and light blue on the body whorl. Growth lines are orthocline, poorly marked. Protoconch is cup-shaped. Aperture is very tall, oval with acute angle in the upper part. Umbilicus is closed.

Shell height is 11.0 mm, shell width – 2.5 mm, whorls number is about 9.5.

Distribution: From the Mediterranean to North Norway except Finnmark [Fretter, Graham, 1982; Høisæter, 2009].

Ecology: Was found on 144 m depth on sandy and silty bottom with stones together with *P. turgida*. Within distribution area was found at 70-3000 m [Fretter, Graham, 1982].

Discussion

Recently molluscan fauna of Russian Barents Sea region was supplemented by a number of new-

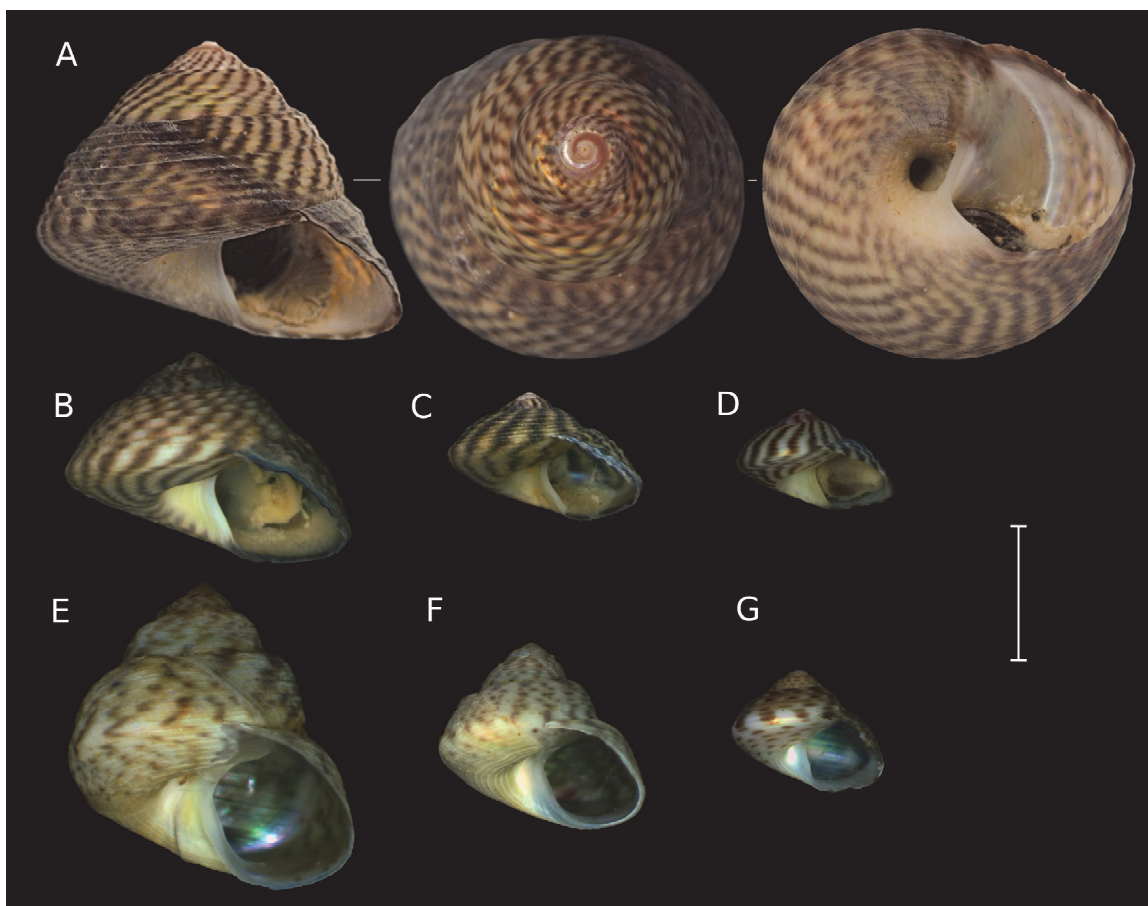


FIG. 1. *Gibbula cineraria* (A-D) and *G. tumida* (E-G) from the Murman coast, scale bar 5 mm.

РИС. 1. *Gibbula cineraria* (A-D) и *G. tumida* (E-G) с побережья Мурмана, масштабная линейка 5 мм.

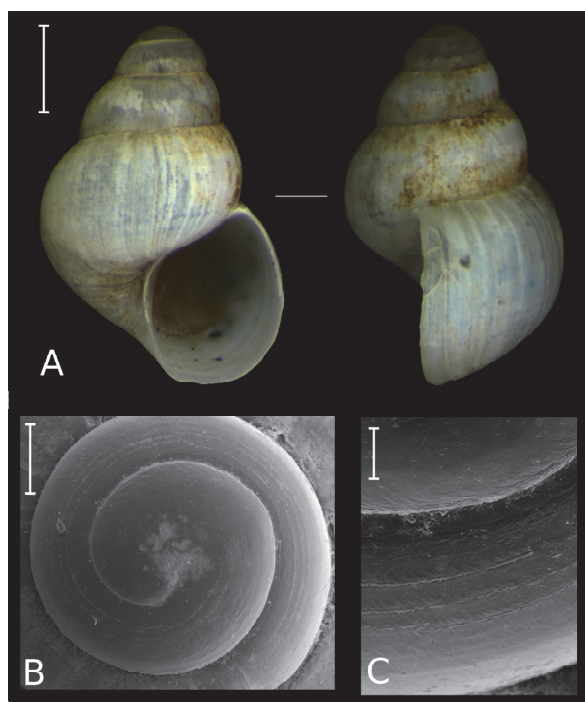


FIG. 2. *Pseudosetia turgida* from the Murman coast, A – general view of the shell, B, C – protoconch details, scale bars: A – 0.5 mm, B – 0.1 mm, C – 0.02 mm.

РИС. 2. *Pseudosetia turgida* с Мурманского побережья, А – общий вид раковины, В, С – протоконх, масштабные линейки А – 0,5 мм, В – 0,1 мм, С – 0,02 мм.

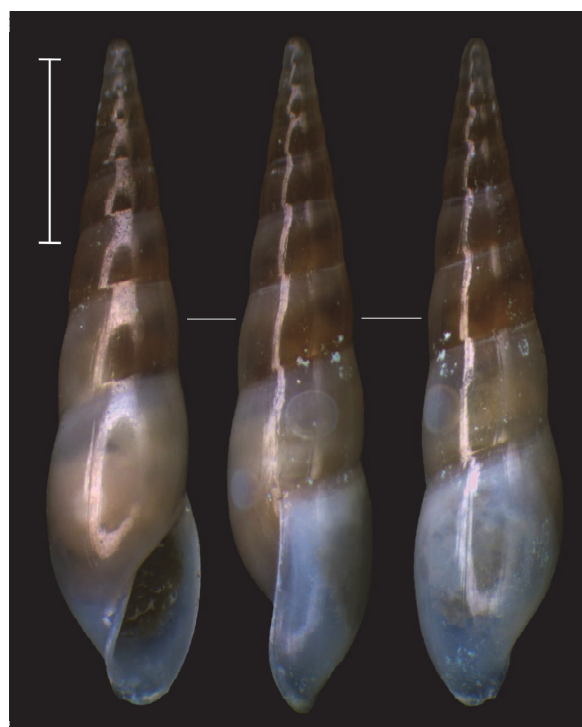


FIG. 3. *Haliella stenostoma* from the Murman coast, scale bar 3 mm.

РИС. 3. *Haliella stenostoma* с Мурманского побережья, масштабная линейка 3 мм.

ly recorded gastropod species [Granovitch *et al.*, 2004; Martynov *et al.*, 2006; Kantor *et al.*, 2008; Chaban, Nekhaev, 2010; Nekhaev, 2011; Nekhaev, Kantor, 2012]. Discovery of 3 *Littorina* species in coastal waters of Kola Peninsula is due to recent taxonomical revision of the genus [Granovitch *et al.*, 2004]. Majority of the remaining authors suggest that the new species records may be caused by current climatic changes. This hypothesis seems very likely because all the newly recorded species inhabit relatively warm waters near the adjacent coast of Norway.

On the other hand, not all of the new findings of species may be due to climatic changes. The first record of *Gibbula cineraria* in Murman coast [Knipowitsch, 1900] was made in the end of “little Ice Age” when mean temperatures were lower than now. Probably area of this species has not changed significantly since Knipowitsch’s research, but due to its rarity *G. cineraria* was confused with *G. tumida* or not found by subsequent researchers.

Pseudosetia turgida also is not common in the Murman coast and may be confused with some other rissoid species (remarks under the species). Nevertheless it was found together with two more newly recorded species *Thesbia nana* (Lovén, 1846) [Nekhaev, Kantor, 2012] and *Haliella stenostoma* [this paper] on the 2nd station of standard transect “Kola Meridian” which was regularly studied during last century. Moreover, there are no similar species to *H. stenostoma* in Russian Barents Sea waters. Npteworthy, that occurrence of this species in Murman coast was speculated by Herzenstein [1885]. Anyway, the hypothesis of extension of the range due to climatic changes is likely for *Haliella stenostoma*.

On the other hand, our knowledge about species distribution is based mainly on the published data. The species is not considered as a part of fauna of any region if the data about the species record is not published. Therefore taxonomists should be encouraged to publish distributional data for all examined species.

Acknowledgments

I wish to express my gratitude to Dr. Anders Warén (Stockholm, Sweden), who confirmed my identifications of both *Pseudosetia turgida* and *Haliella stenostoma*, to Dr. Bas Payne (Drewsteignton, UK), who gave me material on *Gibbula cineraria* from Ireland and Yuri Deart (Moscow, Russia) for the samples of *Gibbula cineraria* from Bolshaya Volokovaya Bay and Liinahamary vicinity. Also I am grateful to Dr. Pavel Parkhaev (Moscow, Russia) for the assistance in SEM study of *P. turgida*. Special thanks to the administration of Kandalaksha State Natural Reserve for the opportunity to collect snails in the Bolshoy Aynov Island.

References

- Bryazgin V.F., Denisenko N.V., Denisenko S.G., Kalyuzhnyi E.E., Ryzhov V.M. 1981. *Animals and plants of the Barents Sea*. Apatity, 188 pp. [In Russian].
- Chaban E.M., Nekhaev I.O. 2010. *Retusa pellucida* (Brown, 1828) (Gastropoda: Opisthobranchia: Cephalaspidea) from the Barents Sea – a new species for the fauna of Russian Arctic seas. *Zoosystematica Rossica*, 19(2): 196-204.
- Filatova Z.A., Zatsepin V.I. 1948. Classis Gastropoda. In: N.S. Gaevskaya (ed.). *Guidebook to fauna and flora of the northern seas of the USSR*. Sovetskaya Nauka, Moscow, 352-401 [In Russian].
- Fretter V., Graham A. 1977. The prosobranch molluscs of Britain and Denmark. Part 2 – Trochacea. *Journal of Molluscan Studies*, supplement 3: 39-100.
- Fretter V., Graham A. 1982. The prosobranch molluscs of Britain and Denmark. Part 7 – “Heterogastropoda” (Cerithiopsacea, Triforacea, Epitoniacea, Eulimacea). *Journal of Molluscan Studies*, supplement 11: 363-435.
- Galkin Yu.I. 1955. Gastropod molluscs trochids of Far Eastern and northern seas of the USSR (Family Trochidae). *Opredeliteli po faune SSSR, izdavaemye zoologicheskimi institutami Akademii nauk SSSR*, 57, 131 pp. [In Russian].
- Golikov A.N., Sirenko B.I., Chaban E.M. 2001. Class Gastropoda. Subclass Pectinibranchia. In: Sirenko B.I. (ed.). *List of species of free-living invertebrates of Eurasian and Arctic seas and adjacent deep waters. Explorations of the fauna of the seas*, 51(59): 104-108.
- Golikov A.N. 1995. *Shell-bearing gastropods of the Arctic*. Colus, Moscow, 108 pp.
- Granovitch A.I., Mikhailova N.A., Znamenskaya O., Petrova Yu.A. 2004. Species complex of mollusks of the genus *Littorina* (Gastropoda: Prosobranchia) from the eastern Murman coast. *Zoologicheskij Zhurnal*, 83(11): 1305-1316 [In Russian].
- Herzenstein S.M., 1885. Beiträge zur Kenntnis der Fauna der Murmanküste und Weissen Meeres. *Trudy Spb Obshestva Estestvoispytateley*, 16(2): 635-814 [In Russian].
- Høisæter T. 2009. Distribution of marine, benthic, shell bearing gastropods along the Norwegian coast. *Fauna norvegica*, 28: 5-106.
- Jeffreys J.G. 1858. Gleanings in British Conchology. *Annals and Magazine of Natural History*, 3(2): 117-133.
- Jeffreys J.G. 1870. Norwegian Mollusca. *Annals and Magazine of Natural History*, 4(5): 438-448.
- Kantor Yu.I. 1981. Species composition and distribution of the gastropods of the family Buccinidae of the eastern Murman. *Zoologicheskij Zhurnal*, 60(8): 1145-1150 [In Russian].
- Kantor Yu. I., Rusyaev S. M., Antokhina T.I. 2008. Going eastward – climate changes evident from gastropod distribution in the Barents Sea. *Ruthenica*, 18(2): 51-54.
- Kantor Yu. I., Sysoev A.V. 2006. *Marine and brackish water Gastropoda of Russia and adjacent countries: an illustrated catalogue*. KMK Scientific Press Ltd., Moscow, 371 pp., 140 pl.

- Knipowitsch N. 1900. *Zur Kenntniss der geologischen Geschichte der Fauna des Weissen und Murman-Meeres. (Postpliocene Mollusken und Brachiopoden)*. St.Petersburg. C.Birkenfeld W, 169 S.
- Linnaeus C. 1758. *Systema naturae per renga tria naturae secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Impensis Direct. Laurentii Salvii, Holmiae, Tome I. Animalia, 823 pp.
- Martynov A.V., Korshunova T.A., Savinkin O.V. 2006. Shallow-water opisthobranch molluscs of the Murman coast of the Barents Sea, with new distributional data and remarks on biology. *Ruthenica*, 16(1-2): 59-72.
- Nekhaev I.O. 2011. Two species of parasitic molluscs new for Russian Seas. *Ruthenica*, 21(1): 69-72.
- Nekhaev I.O. Kantor Yu.I. 2012. First record of *Thesbia nana* (Lovén, 1846) (Gastropoda: Conoidea) in Russian waters. *Ruthenica*, 22(2): 51-54.
- Poppe G.T. and Goto Y. 1991. *European Seashells. Volume 1 (Polyplacophora, Caudofoveata, Solenogastrea, Gastropoda)*. Verlag Christa Hemmen, Wiesbaden, 352 pp.
- Warén A. 1972. *Cingula globuloides* sp.n. (Gastropoda: Prosobranchia) from Northern Atlantic. *Zoologica scripta*, 1: 191-192.
- Warén A. 1996. New and little known Mollusca from Iceland and Scandinavia. Part. 3. *Sarsia*, 81: 197-245.

Заметки о распространении *Gibbula cineraria* (Linnaeus, 1758), *Pseudosetia turgida* (Jeffreys, 1870) и *Haliella stenostoma* (Jeffreys, 1858) в российских водах Баренцева моря (Gastropoda)

И.О. НЕХАЕВ

Мурманский морской биологический институт РАН,
ул. Владимирская, 17, Мурманск 183010;
inekhaev@gmail.com

РЕЗЮМЕ. Обсуждаются новые находки трёх видов брюхоногих моллюсков в российских водах. *Gibbula cineraria* (Linnaeus, 1758) и *Pseudosetia turgida* (Jeffreys, 1870) ранее уже были отмечены в российской фаунистической литературе, но отсутствуют в новых сводках. *Haliella stenostoma* (Jeffreys, 1858) отмечена впервые для России. Для всех видов приведены краткие диагнозы.

