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New findings of the *Plicifusus* species in the Russian Arctic (Neogastropoda: Buccinidae)

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ABSTRACT. Three species, attributed to buccinid genus *Plicifusus*, had been previously known from the Arctic: *Plicifusus kroeyeri* (Møller, 1842), *P. johanseni* Dall, 1919, and *P. rodgersi* (Gould, 1860). Study of museum collections and recently obtained material from the Laptev and East Siberian seas resulted in discovery of *Plicifusus maehirai* Tiba, 1980, previously known from the Northern Pacific, and *Plicifusus* sp., which probably belongs to an undescribed species. *P. johanseni* has been found in the Russian waters for the first time. Lectotype of *P. johanseni* has been designated.

Introduction

Only three buccinid species, attributed to *Plicifusus* Dall, 1902, have been known from the Arctic: *Plicifusus kroeyeri* (Møller, 1842), *P. johanseni* Dall, 1919, and *P. rodgersi* (Gould, 1860) [MacGinitie, 1959; Kantor, Sysoev, 2006; Sirenko, 2009; Kosyan, Kantor, 2012; Merkuljev, 2015].

The morphological description and synonymy of the type species of the genus *P. kroeyeri*, were provided in a revision by Kosyan and Kantor [2012]. The radula of *P. rodgersi* was published by Sirenko [2009] under the name *P. mcleani*, which was reduced to a junior synonym of *P. rodgersi* by Merkuljev [2015]. *P. johanseni* was one of the last species of the genus, described by W.H. Dall. The type material was represented by two dead specimens with strongly eroded, partly broken shells, hardly allowing species identification. Few later findings of *P. johanseni* were identified erroneously, as it was shown by Kantor and Sysoev [2006]. A number of authors listed the species as valid [Abbott, 1974; Baxter, 1987; Kantor, Sysoev, 2006]. Kosyan and Kantor [2012] also considered it valid but due to poor condition of the syntypes and lack of better material expressed uncertainty in whether the species was recent or fossil. Clark [2016], based on fresh material from the Chuckchi Sea, finally established the species as valid and Recent.

In this paper, we recorded one more species of *Plicifusus* inhabiting the Arctic – *P. maehirai* Tiba, 1980, and provide morphological description for *P. johanseni* and *Plicifusus* sp., which is probably a new species.

Material and methods

The material on *Plicifusus johanseni* and *P. maehirai* was collected during the recent cruise of R/V *Dalnie Zelentsy* in summer of 2015. The material on *Plicifusus* sp. was obtained from the Zoological Institute of RAS. Also lectotype of *Fusus kroeyeri* stored in Zoological Museum of the University of Copenhagen was studied.

The gross anatomy was investigated using light microscope, radulae were separated from buccal mass, transferred into diluted bleach and kept for several minutes until soft tissues were dissolved, washed in distilled water, air dried and examined in TESCAN scanning electron microscope.

Abbreviations of the depositories: **CMNML**, Canadian Museum of Nature, Ottawa, Canada; **UKM**, Sea and Shell Museum [Umi-to-kai-no-myujiamu: UKM] in Rikuzentakata City, Iwate Prefecture, Japan; after the Tsunami in 2011, the collections were removed to the temporary facility of the Rikuzentakata City Museum; **USNM**, National Museum of Natural History, Smithsonian Institution, Washington DC, USA; **ZIN**, Zoological Institute of Russian Academy of Sciences; **ZMUC**, Zoological Museum of the University of Copenhagen, Denmark.

Abbreviations on the figures: **adg**, opening of anterior duct of digestive gland; **AL**, aperture length, **an**, anus; **ao**, anterior aorta; **aoe**, anterior oesophagus; **bm**, buccal mass; **cg**, capsule gland; **cm**, columellar muscle; **ct**, ctenidium; **dg**, digestive gland; **eye**, eye; **fo**, female orifice; **ft**, foot; **gl**, gland of Leiblein; **H**, height of the shell, **h**, height of the last whorl; **hd**, head; **int**, intestine; **kd**, kidney; **lfl**, longitudinal fold on inner stomach wall; **mo**, mouth opening; **nr**, nerve ring; **oeo**, oesophageal opening; **odn**, odontophore nerves; **op**, operculum; **os**, osphradium; **p**, penis; **pma**, posterior mixing area; **poe**, posterior oesophagus; **pr**, proboscis; **prp**, propodium; **prr**, proboscis retractors; **rd**, rhynchodaeum; **re**, rectum; **rs**, rhyn-

chostome; **s**, siphon; **sd**, salivary duct; **sg**, salivary gland; **sp**, seminal papilla; **st**, stomach; **va**, vagina; **vl**, valve of Leiblein.

Systematics

Order Neogastropoda
Family Buccinidae Rafinesque, 1815
Subfamily Colinae Gray, 1857

Genus *Plicifusus* Dall, 1902

Plicifusus Dall, 1902: 40.

Plicifusus johanseni Dall, 1919
(Figs 1 B-E, 2, 3 A-B, 4)

Plicifusus johanseni Dall, 1919: 4A, 6A, 9A, 21A, pl. 3. – Kantor, Sysoev, 2006: pl. 99I. – Sirenko 2009: 130, fig. 85. Kosyan, Kantor, 2012: 76, fig. 16C. – Clark, 2016: 76-77, figs 25-26.

Lectotype (here designated): USNM 27475a.

Paralectotype: CMNML 004117.

Type locality: Icy Cape, Alaska (from original publication). The type locality of paralectotype: Beaufort Sea, Alaska, Point Barrow sandspit, 71º21'N, 156º12'W, Arctic Research Laboratory Expedition, sta. 24, washed up on a beach.

Material examined. Laptev Sea, 76°18.2'N, 142°21.9'E, 17 m, R/V *Dalnie Zelentsy*, st. A-26, 21.08.2014 (spm. no. 1, male, radula examined). Laptev Sea, 74°55.6'N, 119°15.5'E, 23 m, R/V *Dalnie Zelentsy*, st. O-29, 02.10.2014 (spm. no. 2, male, dissected).

Shell elongate-fusiform, rather thin, fragile, covered with adhering light-beige or olive periostracum, with rather long straight or slightly left-recurved siphonal canal (Fig. 1 B-D). Aperture broadly oval, its height about 0.5 shell height. Upper whorls eroded, axial sculpture on other whorls of closely spaced, S-curved, slightly or moderately opisthocline axial ribs, up to 15 on last whorl. Spiral sculpture of well pronounced flattened ribs, separated by alternating deep and shallow grooves, about 30 in total on penultimate whorl. Measurements: no. 1. H 45.5 mm, h 31.9 mm, AL 24 mm; no. 2. H 34.7 mm, h 24.1 mm, AL 17.7 mm.

Soft body **(no. 2).** Head (Fig. 2A, hd) contracted, with thick tentacles. Small black eyes on lobes at base of tentacles. Operculum oval (Fig. 2B), with terminal nucleus. Mantle with medium long muscular siphon (Fig. 2C, s). Ctenidium spans 0.75, osphradium – 0.5 of mantle length. Ctenidium twice broader than osphradium. Rectum opens in middle of mantle length. Hypobranchial gland not developed. Penis (Fig. 2D) laterally flattened and strongly contracted. Seminal papilla (sp) large, cone-shaped, surrounded by circular fold of skin, seminal orifice on bended top of papilla.

Digestive system. Proboscis completely retracted (Fig. 2E). Multiple proboscis retractor muscles follow ventro-laterally along rhynchodaeum from basal part of proboscis to its uppermost section, and attach to lateral walls of body haemocoel on both sides of rhynchodaeum (Fig. 2E, prr). Buccal mass occupies whole length of proboscis, attached in its base by multiple muscular bands of odontophore reractors. Well noticeable medial retractor of radula starts from basal part of radular sac. **Radula** equals to odontophore in length. Radula of spm. no. 1 (Fig. 3A) is about 400 μm wide (1.67% of AL), no. 2 – 350 μm (1.98% of AL). In spm. no. 1, rachidian with 3 cusps of unequal length: median cusp longest, right marginal cusp – shorter, left marginal cusp reduced. Rachidian of spm. no. 2 (Fig. 3B) with three equal in length cusps, with median cusp thinnest. Lateral teeth similar in both specimens, with three cusps, median shortest.

Anterior oesophagus before passing through nerve ring makes several twists. Valve of Leiblein large, inflated (Fig. 2E, vl). Posterior oesophagus and anterior aorta equal in diameter (Fig. 2E, poe, ao). Salivary glands of medium size, separate, oval, situated on both sides of nerve ring (Fig. 2E, sg). Salivary ducts rather thick, weakly twisted, running along anterior oesophagus (Fig. 2E, sd). Large gland of Leiblein (gl) situated parallel to posterior oesophagus and aorta (ao), opening into oesophagus by rather long thin duct immediately behind nerve ring.

Stomach occupies approximately ½ of whorl. Posterior mixing area well developed, comprising 1/3 of entire stomach length (Fig. 2 G, F, pma), lined with tall transverse folds. Posterior oesophagus opens into stomach ventrally. Opening of anterior duct of digestive gland (adg) very large, situated near intestine opening. Longitudinal fold on inner stomach wall present. Rest of inner stomach wall lined by transverse folds, replaced by longitudinal ones closer to intestine. Outer stomach wall lined by tall transverse folds. Opening of posterior duct of digestive gland hidden deeply in oeosophageal opening (oeo).

Distribution: Alaska, between WNW of Cape Krusenstern (67°30.54'N, 165°52.28'W) and North of Barrow (71°31.42'N, 157°23.25'W), and as far north as 72°30.63'N, 166°50.26'W, NW of Icy Cape, at depths of 38-91 m [Clark, 2016]; Laptev Sea, 17-23 m (Fig. 4).

Remarks. In the original description, Dall [1919] did not select holotype among two specimens collected from two close but different localities in Alaska, and thus both of them must be considered syntypes. He noted, that "The expedition collected a dilapidated specimen at Point Barrow, but I have drawn up the description from the better preserved individual in the collection of the US National Museum". This better preserved specimen was "collected at Icy Cape, Alaska, by Capt. Everett Smith in 1871", who presented it to the USNM. In the internet database of USNM the specimen USNM

FIG. 1. Shells of *Plicifusus*. **A**. Lectotype of *Fusus kroeyeri*, ZMUC-GAS-61, 68 mm, Western Greenland. **B**. Lectotype of *P. johanseni*, USNM 27475a, H 54.2 mm (photo taken from USNM website), Icy Cape, Alaska. **C**. Paralectotype of *P. johanseni*, CMNML 004117, Point Barrow, Alaska. **D**. *P. johanseni,* spm. no.1, st. A-26, 76°18.2'N, 142°21.9'E, 17 m, H 45.5 mm (radula on Fig. 3**A**). **E**. *P. johanseni,* spm no. 2, st. O-29, 74°55.6'N, 119°15.5'E, 23 m, H 34.7 mm (anatomy on Fig. 2, radula on Fig. 3**B**). Scale bar 10 mm.

РИС. 1. Раковины *Plicifusus*. **A**. Лектотип *Fusus kroeyeri* ZMUC-GAS-61, 68 мм, западная Гренландия. **B**. Лектотип *P. johanseni* USNM 27475a, H 54.2 мм (фото с сайта USNM), Icy Cape, Аляска. **C**. Паралектотип *P. johanseni* CMNML 004117, Point Barrow, Аляска. **D**. *P. johanseni,* экз. №1 со ст. A-26, 76°18.2'N, 142°21.9'E, 17 м, H 45.5 мм. **E**. *P. johanseni,* экз. № 2 со ст. O-29, 74°55.6'N, 119°15.5'E, 23 м, H 34.7 мм (анатомия на Рис. 2, радула на Рис. 3**B**). Масштабный отрезок – 10 мм.

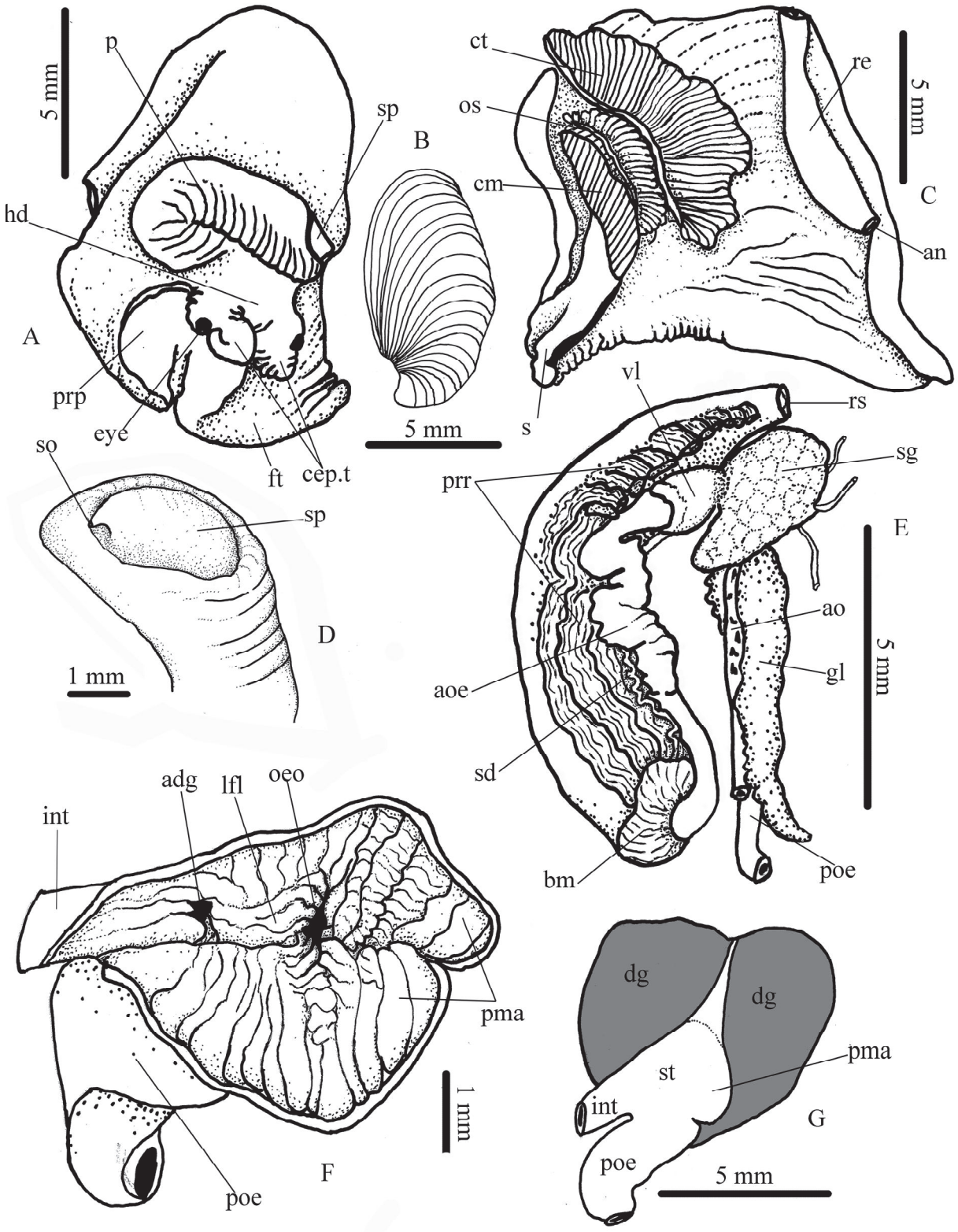

FIG. 2. Anatomy of *Plicifusus johanseni* no. 2 (shell on Fig. 1**E**, radula on Fig. 3**B**). **A**. Cephalopodium, front view. **B**. Operculum. **C**. Mantle. **D**. Upper section of penis. **E**. Foregut, right lateral view. **F**. Stomach, opened dorsally. **G**. Stomach, general view.

РИС. 2. Анатомия *Plicifusus johanseni* № 2 (раковина на Рис. 1**C**, радула на Рис. 3**B**). **A**. Мягкое тело, вид спереди. **B**. Крышечка. **C**. Мантия. **D**. Верхняя часть пениса. **E**. Передний отдел пищеварительной системы, вид справа. **F**. Желудок, вскрытый с дорсальной стороны. **G**. Желудок, общий вид.

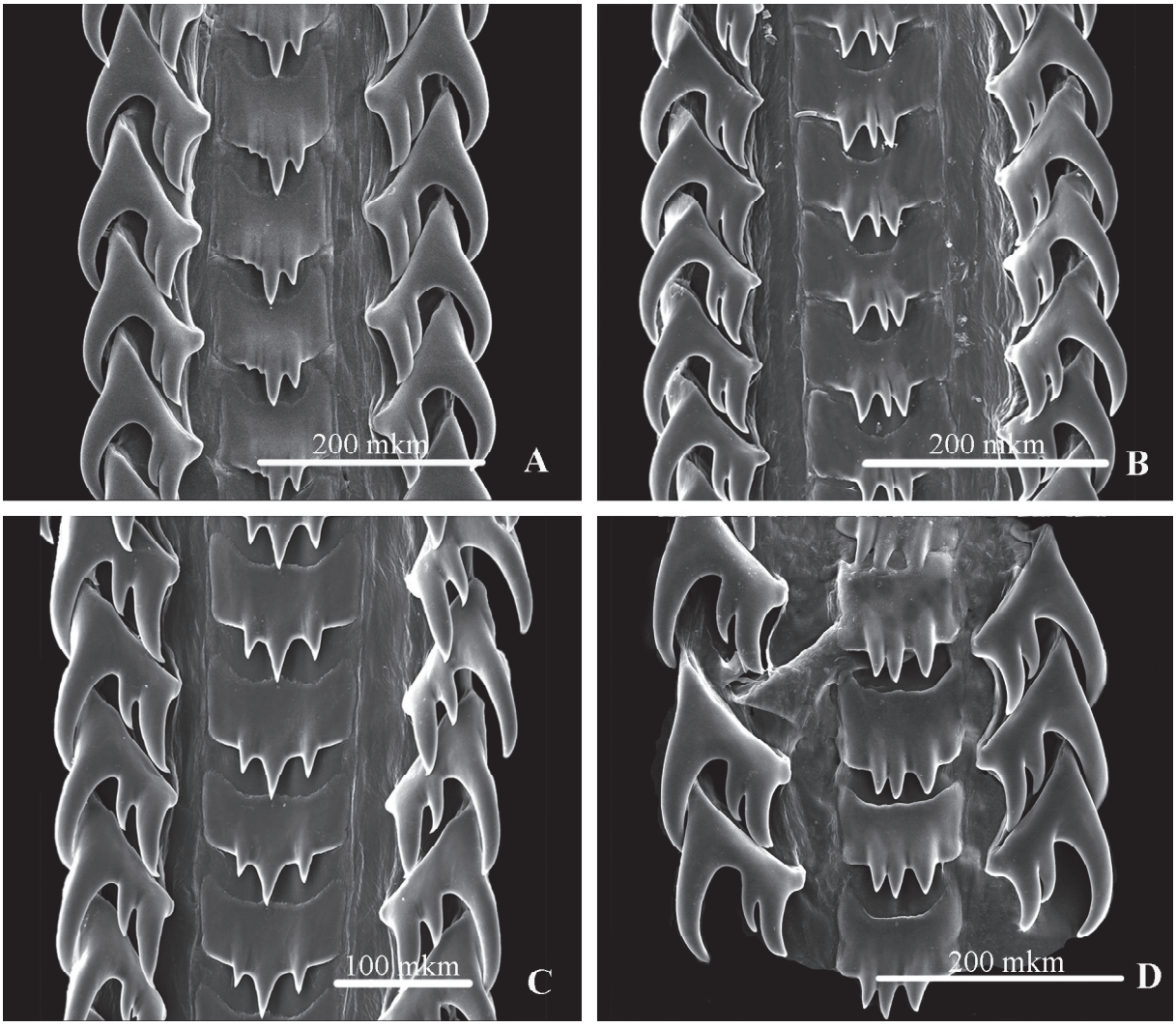

FIG. 3. Radulae of *Plicifusus*. **A**. *P. johanseni* no. 1 (shell on Fig. 1**D**). **B**. *P. johanseni* no. 2 (shell on Fig. 1**E**, anatomy on Fig. 2). **C**. *P. maehirai* no. 1 (shell on Fig. 5**B**). **D**. *P. maehirai* no. 2 (shell on Fig. 5**C**).

РИС. 3. Радулы *Plicifusus*. **A**. *P. johanseni* № 1 (раковина на Рис. 1**D**). **B**. *P. johanseni* № 2 (раковина на Рис. 1**E**, анатомия на Рис. 2). **C**. *P. maehirai* № 1 (раковина на Рис. 5**B**). **D**. *P. maehirai* № 2 (раковина на Рис. 5**C**).

27475a, on which the Dall's description was based, is obviously erroneously referred to as holotype and moreover, its locality is given erroneously: Point Barrow instead of Icy Cape. To avoid further misconception, we designate this specimen, USNM 27475a (Fig. 1B) with shell length 52 mm, as lectotype, and specify the type locality of the species as Icy Cape. Consequently, we designate the second specimen, collected at Point Barrow and kept at the Canadian Museum of Nature (CMNML 004117), as paralectotype (Fig. 1C).

Though general shell shape, sculpture and radula morphology of the whelks, found in the Laptev Sea, are typical for *Plicifusus* [Kosyan, Kantor, 2012], they are rather difficult to be attributed to any of known *Plicifusus* species. The shells possess peculiar shell shape with flattened periphery of the whorls as well as strongly S-curved axial ribs, and are close to North Pacific *P. scissuratus* Dall, 1918. But *P. scissuratus* is known from relatively warm waters of Hokkaido and Southern Kurile Islands, and hardly may be found in the Arctic Ocean. From circumpolar *P. kroeyeri* (Møller, 1842) (Fig. 1A) our shells differ in the pattern of spiral sculpture, consisting of less frequent and more prominent spiral cords. From *P. rodgersi* (Gould, 1860) – another species of *Plicifusus,* which is found in the Arctic Ocean (the Chuckchi Sea) – it differs in shell shape and sculpture. *P. johanseni* was described from Alaska, which is rather close to the locality of our shells and much closer in hydrological conditions than the locality of *P. scissuratus*. Shell shape, spiral sculpture of medium frequent, prominent ribs, alternately bifurcated in median sec-

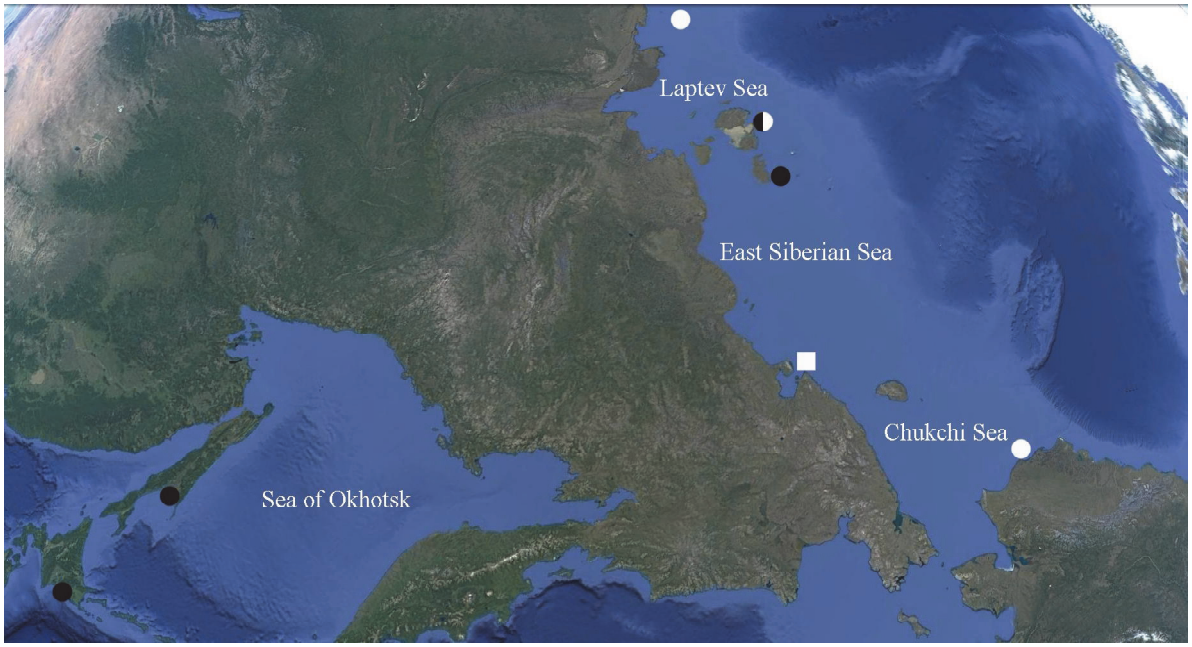

FIG. 4. Distribution of *Plicifusus johanseni* (white circles), *P. maehirai* (black circles) and *Plicifusus* sp. (white square).

РИС. 4. Распространение *Plicifusus johanseni* (белые кружки), *P. maehirai* (черные кружки) and *Plicifusus* sp. (белый квадрат).

tion of the whorl, and shape of axial ribs (when visible) of the type of *P. johanseni* are also similar to specimens from the Laptev Sea.

Dall [1919] considered *Plicifusus johanseni* as conchologically the most similar to *Aulacofusus esychus* (Dall, 1907). But, besides absence of axial ribs, *A. esychus* significantly differs in foregut and stomach anatomy [Kosyan, Kantor, 2013]. Clark [2016] described fresh shells of *P. johanseni,* collected near the type locality (Alaska) and noted [p. 76-77], that it may be distinguished from *P. kroeyeri* by: "(1) smaller, more slender shell; (2) very fine, uniform spiral lirae, compared to *P. kroeyeri* which has fine incised lines, becoming spaced further apart on the base; (3) fewer, more consistent number of axial ribs, 12-14 compared with typically 18-28 (very rarely fewer) in *P. kroeyeri* of the same size; and (4) the axial ribs of *P. johanseni* are less prominent than those of *P. kroeyeri*, typically (but not always) becoming faint or absent on the penultimate whorl." This description does not completely coincide with ours: the number of spiral ribs in our specimens is about 30 (30 – in type specimen of *P. johanseni*, 40 – in Clark's shells and 60 (Fig. 1A) – in type specimen of *P. kroeyeri*); the axial ribs are as prominent as in *P. kroeyeri* and do not become faint or absent on the last whorl. Nevertheless, we prefer to attribute our specimens to *P. johanseni*, considering variation of spiral and axial sculpture as intraspecific.

Plicifusus maehirai Tiba, 1980
(Figs 3C-D, 4, 5)

Plicifusus maehirai Tiba, 1980: 75, pl. 22, figs. 1-6. – Tiba, Kosuge. 1980: 33-34. – Kosyan, Kantor, 2012: 66, fig. 9A-D, fig. 10.

Plicifusus obtusatus Golikov in Golikov, Scarlato, 1985: 404, fig. 5. – Alexeev, 2003: 91, pl. XXXI-5. – Kantor, Sysoev, 2006: 197, pl. 100 L.

Types: Holotype of *Plicifusus maehirai* – UKM 33233 (R13263) (Fig. 5A), holotype of *Plicifusus obtusatus* – ZIN 33732/1.

Type localities: *Plicifusus maehirai* – off Kushiro, eastern Hokkaido; *P. obtusatus* – Terpeniya Bay, Sakhalin Island, 53 m.

Material examined. Laptev Sea, 76°18.2'N, 142°21.9'E, 17 m, R/V *Dalnie Zelentsy*, st. A-26, 21.08.2014 (spm. no. 1, female). Laptev Sea, 75°17.4'N, 151°10.4'E, 15 m, R/V *Dalnie Zelentsy*, st. A-8, 22.08.2014 (spm. no. 2, male dissected).

Shell broad-fusiform, with medium-thick, with rather fragile walls, covered with adhering beige periostracum, with rather long straight siphonal canal (Fig. 5). Aperture broad oval, its height comprises about 0.5 shell height. Upper whorls eroded, axial sculpture on other whorls of closely spaced, slightly S-curved orthocline axial ribs, 16-18 in number on last whorl. Spiral sculpture of well pronounced flattened cords, separated by alternating deep and shallow grooves, about 25 in total on penultimate whorl. Measurements: no. 1. H 41.8

FIG. 5. Shells of *Plicifusus maehirai*. **A**. Holotype, UKM 33233 (R13263), off Kushiro, eastern Hokkaido, H 36.8 mm. **B**. Spm. no. 1, Laptev Sea, 76°18.2'N, 142°21.9'E, 17 m, H 41.8 mm (radula on Fig. 3**C**). **C**. Spm. no. 2, Laptev Sea, 75°17.4'N, 151°10.4'E, 15 m, H 44.7 mm (radula on Fig. 3**D**). Scale bar 10 mm.

РИС. 5. Раковины *Plicifusus maehirai*. **A**. Голотип UKM 33233 (R13263), Куширо, восточный Хоккайдо, H 36.8 мм. **B**. Экз. № 1 из моря Лаптевых, 76°18.2'N, 142°21.9'E, 17 м, H 41.8 мм (радула на Рис. 3**C**). **C**. Экз. № 2 из моря Лаптевых, 75°17.4'N, 151°10.4'E, 15 м, H 44.7 мм (радула на Рис. 3**D**). Масштабный отрезок – 10 мм.

mm, h 31.7 mm, AL 24 mm; no. 2. H 44.7 mm, h 33.4 mm, AL 26.3 mm.

Soft body morphology the same as described by Kosyan and Kantor [2012].

Radulae of spms no. 1 and 2 about 300 μm wide (1.25% and 1.14% of AL respectively). Rachidian teeth tricuspid, intermediate cusps in spm. no. 1 significantly longer (Fig. 3C) or equal (Fig. 3D) to marginal ones; lateral teeth tricuspid with narrower and shorter intermediate cusp.

Distribution: Northern part of the Sea of Japan, Southern Kurile Islands, the Sea of Okhotsk, Eastern Kamchatka, 25-200 m; Laptev Sea, 15-17 m (Fig. 4).

Remarks. The above described specimens have been found in the same samples with *P. johanseni*, comparing to which they have definitely more inflated whorls and less attenuated shells. From another similar arctic species – *P. kroeyeri,* they differ in significantly lesser spiral cords, from *P. rodgersi* – in shell shape with well defined siphonal canal and more pronounced axial sculpture. Conchologically our specimens are much closer to the boreal *P. maehirai,* which has been previously known only from the North Pacific, in northern part of the Sea of Japan, Sea of Okhotsk and eastern Kamchatka [Kosyan, Kantor, 2012]. The radulae of our specimens differ from illustrated radulae of *P. maehirai* from southern Sakhalin and northern part of the Sea of Okhotsk [Kosyan, Kantor, 2012: fig. 11A-D] in significantly longer intermediate cusps of central teeth. The reason may be geographic variability. Assuming that *P. maehirai* is found in the Arctic, its distribution appears to be very wide, probably circumpolar. Such wide distribution is known for a number of Colinae [*Colus islandicus* (Mohr, 1786), *Anomalosipho altus* (S.Wood, 1842), *Aulacofusus*

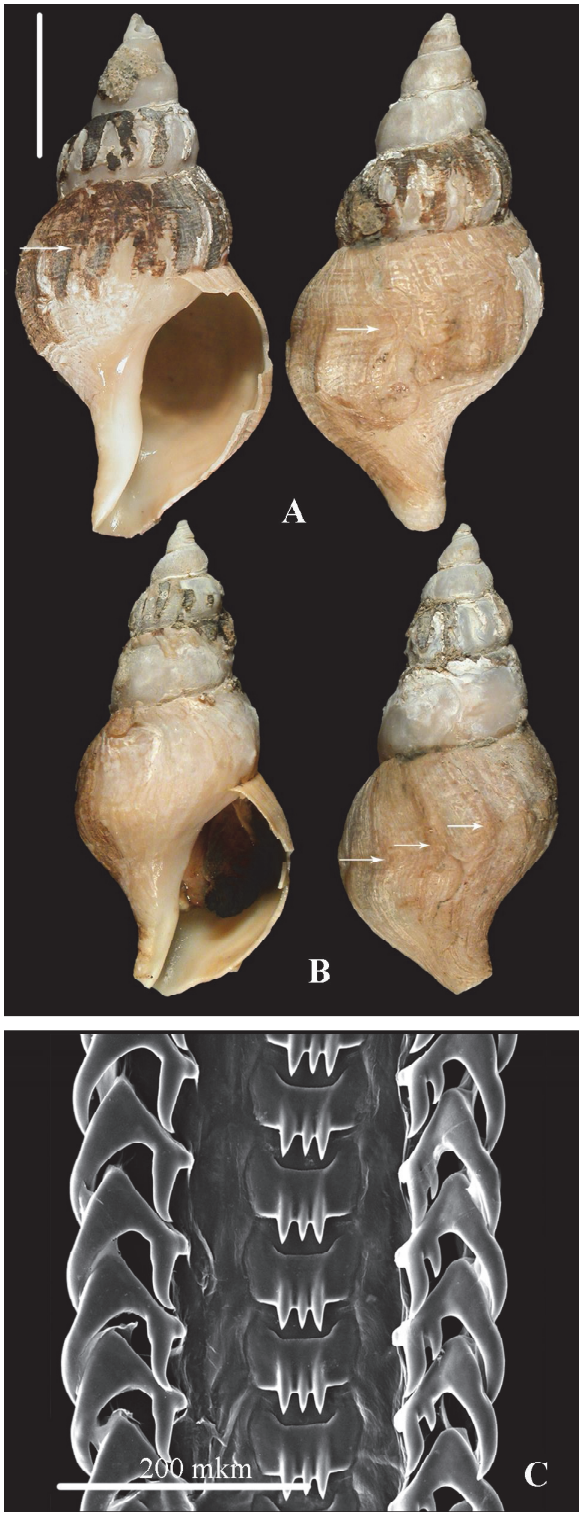

FIG. 6. *Plicifusus* sp. East-Siberian Sea, 70°10'N, 170°37'E – 70°11'N, 166°52'E, 24 m. **A**. Shell of spm. no. 1, H 36.8 mm (anatomy on Fig. 7). **B**. Shell of spm. no. 2, H 33.7 mm. Scale bar 10 mm. Arrows point to sharp bends of axial ribs. **C**. Radula of spm. no. 1 (anatomy on Fig. 7).

РИС. 6. *Plicifusus sp.* из Восточно-Сибирского моря, 70°10'N, 170°37'E – 70°11'N, 166°52'E, 24 м. **A**. Раковина экз. № 1, H 36.8 мм (анатомия на Рис. 7). **B**. Раковина экз. № 2, H 33.7 мм. Масштабный отрезок – 10 мм. Стрелки указывают на характерные резкие изломы осевых складок. **C**. Радула экз. № 1 (анатомия на Рис. 7).

brevicauda (Deshayes, 1832)] and congeneric *P. kroeyeri*.

Plicifusus sp.
(Figs 4, 6-7)

Material examined. East-Siberian Sea, 70°10'N, 170°37'E – 70°11'N, 166°52'E, 24 m, Icebreaker *Severniy Polyus*, st. 39(44), 30.09.1946 (2 spms, no. 1 dissected).

Shell wide-fusiform, rather thick-walled, covered with adhering beige to brown periostracum, with rather short, slightly left-recurved siphonal canal (Fig. 6 A-B). Aperture oval, its height comprises about 0.5 shell height. Upper whorls eroded, axial sculpture on other whorls represented by widely spaced, slightly or moderately opisthocline axial ribs, generally S-curved with characteristic sharp bend in upper part of shell whorl, up to 12 on last whorl. Spiral sculpture of well pronounced flattened cords, separated by deep and wide grooves (half of rib's width) in younger specimen, becoming shallow and narrow in older specimens, about 25 in number on penultimate whorl. Measurements: no. 1. H 36.8 mm, h 25.8 mm, AL 20.6 mm (female); no. 2. H 33.7 mm, h 22 mm, AL 16.5 mm (female); no. 3. H 20.9 mm, h 15.8 mm, AL 12.6 mm (female).

Soft body. Head (Fig. 7B, hd) with medium long tentacles. Small black eyes situated on lobes at base of tentacles. Operculum oval (Fig. 7A), with terminal nucleus. Mantle with rather long muscular siphon (Fig. 7D, s). Ctenidium spans 0.8, osphradium – 0.5 of mantle length. Ctenidium twice broader than osphradium. Rectum situated dorsally of capsule gland and opens in middle of mantle length. Hypobranchial gland not developed. Capsule gland medium large, 0.5 mantle length, with vagina situated ventrally on its top (Fig. 7D, cg). Female orifice (fo) narrow and elongated.

Digestive system. Proboscis partly retracted. Multiple proboscis retractor muscles follow laterally along rhynchodaeum and attach to lateral walls of body haemocoel at basal part of proboscis (Fig. 7C, prr). Buccal mass occupies $^{2}/_{3}$ of proboscis length and attached to its walls by multiple muscular bands of odontophore reractors. **Radula** equals to odontophore in length. Radula of spm. no. 1 (Fig. 6C) about 300 μm wide (1.46% of AL). Rachidian with 3 cusps of equal length. Lateral teeth normally with three cusps, median shortest. Intermediate cusps on lateral teeth in right longitudinal row absent.

Valve of Leiblein large, inflated (Fig. 7C, vl). Salivary glands of medium size, separate, rounded, situated on both sides of nerve ring (Fig. 7E, sg). Salivary ducts medium thick, running along anterior oesophagus (Fig. 7C, sd). Posterior oesophagus convoluted (Fig. 7C, poe). Large and thick gland of Leiblein situated parallel to posterior oesophagus (Fig. 7C, gl).

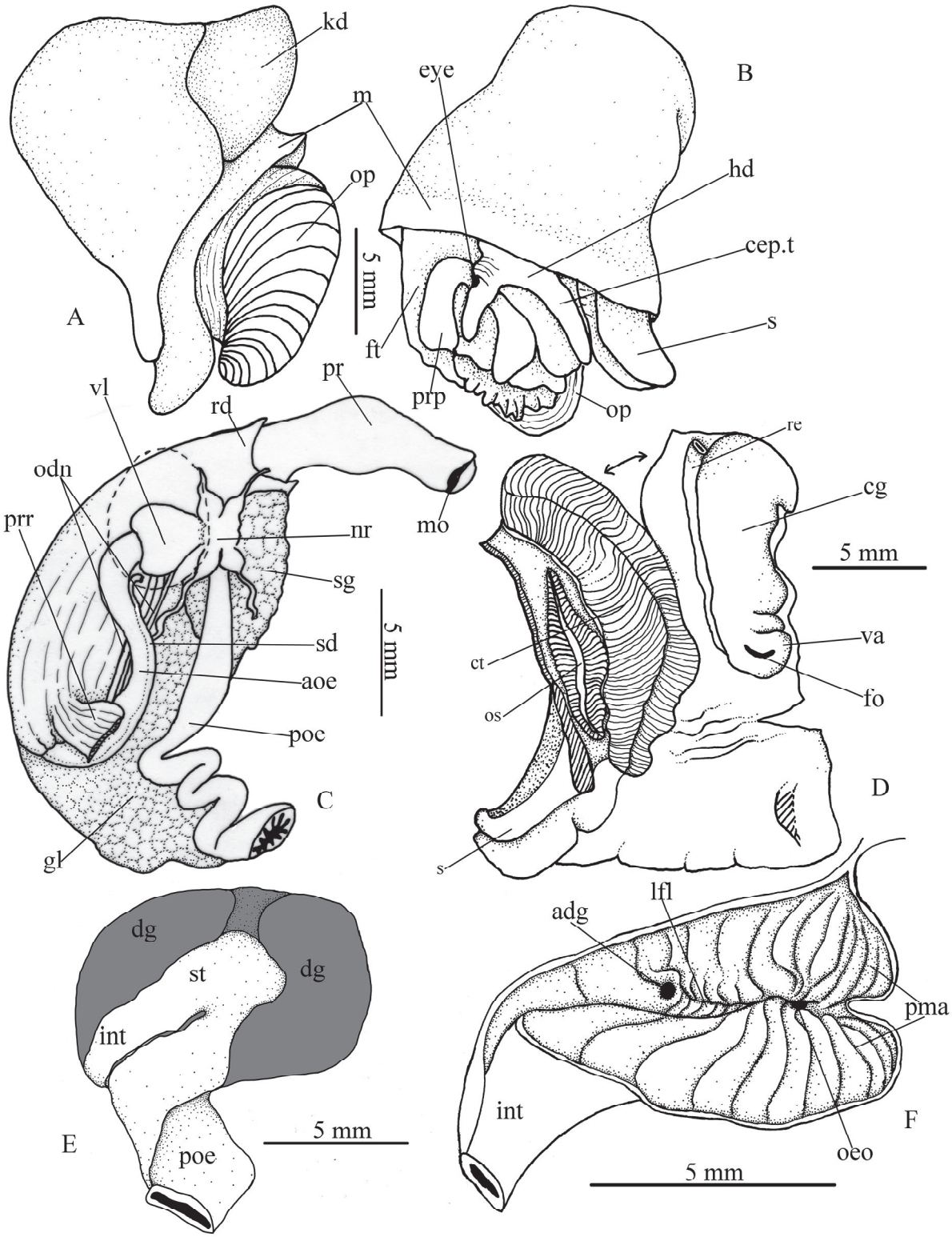

FIG. 7. Anatomy of *Plicifusus* sp. no. 1 (shell on Fig. 6**A**, radula on Fig. 6**C**). **A**. Cephalopodium, ventral view with operculum. **B**. Cephalopodium, dorsal view. **C**. Foregut, ventral-lateral view, right salivary gland removed. **D**. Mantle. **E**. Stomach, general view. **F**. Stomach, opened dorsally.

РИС. 7. Анатомия *Plicifusus sp*. № 1 (раковина на Рис. 6**A**, радула на Рис. 6**C**). **A**. Цефалоподиум, вид с вентральной стороны с крышечкой. **B**. Цефалоподиум с дорсальной стороны. **C**. Передний отдел пищеварительной системы, вентро-латеральный вид, правая слюнная железа удалена. **D**. Мантия. **E**. Общий вид желудка. **F**. Желудок, вскрытый с дорсальной стороны.

Stomach occupies approximately 1/3 of whorl (Fig. 7E). Posterior mixing area well developed, comprising 1/4 of entire stomach length (Fig. 7F, pma); it lined by tall transverse folds. Posterior oesophagus opens into stomach ventrally. Opening of anterior duct of digestive gland (adg) very large, situated near to intestine opening. Longitudinal fold on inner stomach wall (lfl) present, lined by low frequent transverse folds. Rest of inner and outer stomach wall lined by tall transverse folds. Opening of posterior duct hidden deep in oeosophageal opening.

Remarks. General shell shape and sculpture as well as morphology of the soft body and radula of the examined molluscs are typical for *Plicifusus*, but identification of the species is difficult. From the most similar species *P. rodgersi* and *P. johanseni, Plicifusus* sp. differs in its peculiar axial sculpture of rare S-curved axial ribs with characteristic sharp bend in upper part of shell whorl, as well as a wider shell shape and less attenuated spire. *Plicifusus* sp. differs from *P. kroeyeri* in less frequent spiral and axial sculpture and lower axial ribs. We have only two hardly damaged specimens in our disposal and prefer not to describe a new species until more material is available.

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Новые находки видов *Plicifusus* в российской Арктике (Neogastropoda: Buccinidae)

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РЕЗЮМЕ. Ранее из Арктики было известно только три представителя рода *Plicifusus*: *Plicifusus kroeyeri* (Møller, 1842), *P. johanseni* Dall, 1919 и *P. rodgersi* (Gould, 1860). Изучение музейных коллекций, а также недавних сборов из моря Лаптевых и Восточно-Сибирского моря выявило присутствие в регионе ещё двух видов: *Plicifusus maehirai* Tiba, 1980, известного ранее из северной Пацифики и *Plicifusus* sp., вероятно, нового для науки вида. *P. johanseni* впервые отмечен для российской фауны. Выделен лектотип *P. johanseni*.