Ruthenica, 2015, vol. 25, No. 3: 77-87.
Published online September 11, 2015.

http: www.ruthenica.com

Notes on the abyssal genus *Fusipagoda* Habe et Ito, 1965 (Neogastropoda: Buccinidae) from the North Pacific

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urn:lsid:zoobank.org:pub:354FB6A1-5519-4CF1-B9CA-F8056A2A5E77

ABSTRACT. On the basis of the newly available material, the previously monotypical genus *Fusipagoda* was revised. In addition to the type species, *Mohnia exquisita*, two more were attributed to the genus – *Colus sapius* and *Mohnia corbis*. A new species, *Fusipagoda* ***itohabei*** **sp. nov.**, is described.

A monotypic genus *Fusipagoda* Habe et Ito, 1965 was established for *Mohnia exquisita* Dall, 1913, the species with rather unusual shell shape, described from Alaska and seldom mentioned in literature since the original description. The original generic diagnosis was provided in Japanese only and was based exclusively on conchological characters. Below we provide the translation (due to courtesy of Dr. Kazunori Hasegawa):

"Fusipagoda gen. nov.

Type species: *Mohnia exquisita* Dall

Shell small, spire elevated stepwise, with strongly angulated shoulder. Number of whorls *ca*. 6, concave between suture and spiral cord at angulated shoulder on each whorl, and inwardly concave part between two distinct spiral cords at shoulder and base; numerous fine spiral ribs present at base of body whorl, number of ribs variable among specimens. Aperture egg-shaped, with tapering and inclined siphonal canal. Outer lip curved, and bent corresponding to spiral cord.

Remarks: The present genus is characterized by the presence of a strong spiral cord at shoulder, which forms a distinct shape looking like piling up boaters, and easily distinguished from other species groups."

Currently several specimens of the type species became available to us, allowing to study the soft-body anatomy, clarify the scope of the genus and to include several more species in it, all dwelling at abyssal depths. The present paper describes shells, radulae morphology and soft body anatomy of three known species, attributed by us to *Fusipagoda*, as well as one new deep-water species.

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Materials and methods

The material for the study is housed in the collections of the P.P. Shirshov Institute of Oceanology of Russian Academy of Sciences (IO RAS). The radula of the holotype of *Mohnia corbis* Dall, 1913 from the collections of National Museum of Natural History, Smithsonian Institution (USNM) was examined due to the courtesy of Dr. Ellen Strong. Radulae were extracted by gross dissection, cleaned using diluted bleach (NaOCl), rinsed in distilled water, air-dried, coated with gold and examined using Tescan Scanning Electron Microscope TS5130 in A.N.Severtzov Institute.

Abbreviations on figures: **aoe**, anterior oesophagus; **cep.t**, cephalic tentacles; **cm**, columellar muscle; **ct**, ctenidium; **dg**, digestive gland; **gl**, gland of Leiblein; **hd**, head; **int**, intestine; **kd**, kidney; **mo**, mouth opening; **n**, nerves; **nr**, nerve ring; **op**, operculum; **os**, osphradium; **p**, penis; **pma**, posterior mixing area; **poe**, posterior oesophagus; **pr**, proboscis; **prp**, propodium; **prr**, proboscis retractors; **rd**, rhynchodaeum; **re**, rectum; **s**, siphon; **sd**, salivary duct; **sg**, salivary gland; **sp**, seminal papilla; **ssp**, additional seminal papilla; **vl**, valve of Leiblein.

Conventions: **AL**, aperture length; **H**, height of the shell; **h**, height of the last whorl; **IO**, P.P. Shirshov Institute of Oceanology of Russian Academy of Sciences; **R/V**, research vessel; **USFC**, United States Fishery Commission; **USNM**, National Museum of Natural History, Smithsonian Institution, Washington DC, USA; **ZIN**, Zoological Institution of Russian Academy of Sciences, St.-Petersburg, Russian Federation**; ZMMU** – Zoological Museum of Moscow State University, Russian Federation.

Systematics

Order Neogastropoda Wenz, 1938
Family Buccinidae Rafinesque, 1815
Subfamily Colinae Gray, 1857

Genus *Fusipagoda* Habe et Ito, 1965

Habe, Ito, 1965: 21.

Type species: *Mohnia exquisita* Dall, 1913 (by original designation).

Diagnosis. **Shell** elongated-fusiform, attaining

nearly 40 mm (usually about 20 mm) in height, thin-walled, with pronounced strongly or moderately angulated shoulder, variously sculptured, in most species by widely spaced, high, sharp (*F. exquisita*), rounded (*F. corbis* and *F.* ***itohabei*** **sp. nov.**) or flattened on top (*F. sapia*) in profile spiral cords; axial sculpture represented only by growth lines. Last whorl is slightly less than $^2/_3$ of shell length, with well-defined, medium-short, slightly left turned siphonal canal. Aperture not high, about $^1/_3$-$^1/_2$ of shell length; operculum oval with subspiral nucleus. Central tooth of radula with wide arcuate basal plate and 3-5 sharp radially situated cusps. Lateral teeth bear three cusps with the shortest intermediate one.

Fusipagoda may be distinguished from other Colinae genera by conchological and opercular characters. From *Neptunea* Röding, 1798, *Colus* Röding, 1798, *Plicifusus* Dall, 1902, *Aulacofusus* Dall, 1918, and *Latisipho* Dall, 1916 it differs in smaller size and operculum with subspiral nucleus; from *Retifusus* Dall, 1916 and *Retimohnia* McLean, 1995 – in the absence of axial sculpture; from most similar *Pararetifusus* Kosuge, 1967 – in radular morphology (lateral teeth with unequal in size three cusps in *Fusipagoda* versus nearly equal cusps in *Pararetifusus*).

Fusipagoda exquisita (Dall, 1913)

(Figs 1; 2 A-F; 3; 4)

Mohnia exquisita Dall, 1913: 502-503; Dall, 1921: 92, pl. 10, figs 10-11; Kosuge, 1972: pl. 17, fig. 6.
Fusipagoda exquisita. – Habe, Ito, 1965: 21-22.

Lectotype (here designated): USNM 111047 (Fig. 1 A); paralectotype, USNM 635696 (the same locality).

Type locality: USFC, sta. 4766, 52º38'N, 174º49'W, off Koniugi Islands, Aleutians, 3230 m.

Material examined: 4 lots, 28 spms. IO, R/V *Vityaz*, sta. 524, 55°52'N, 164°8'E, 4382 m (2 spm examined, no. 1 dissected). IO, R/V *Vityaz*, sta. 618, 57°3'N, 168°30'E, 3875 m (20 spm., nos 2-3 dissected). IO, R/V *Vityaz*, sta. 539, 58°39'N, 177°43'E, 3812 m (2 spms). IO, R/V *Vityaz*, sta. 1410, 54°25'N, 171°24'E, 3954 m (4 spms).

Description. **Shell** thin-walled, off-white, covered by light-beige or olive periostracum, elongated fusiform, always with eroded protoconch and upper teleoconch whorls (Fig. 1). Shell of medium size for genus, with strongly angulated shoulder marked by high sharp in profile spiral keel. Another pronounced keel is situated on/or slightly below shell periphery, rarely smaller additional keel is between two major ones (Fig. 1C). Weaker spiral cords (5-7) can be present between the keels. Shell base and siphonal canal with 11-14 subequal low spiral closely spaced spiral cords. Axial sculpture is limited to growth lines. Last whorl comprises about $^2/_3$ of shell length, with well-defined, medium-short, slightly left curved siphonal canal. Aperture not high, less than $^1/_2$ of shell length.

Measurements: no. 1. H 23.5 mm, h 15.7 mm, AL 10.7 mm; no. 2. H 32.7 mm, h 21.4 mm, AL 15.3 mm; no. 3. H 33.9 mm, h 21.0 mm, AL 15.0 mm .

Soft body: $1^1/_2$ body whorls were extracted from the shell. Mantle spans *ca* one whorl, kidney – $^1/_2$. Head small, with short contracted tentacles lacking eyes. Foot contracted, propodium medium-wide, separated by deep propodial groove. Operculum large, oval, with subspiral nucleus (Fig. 3 A-B). Mantle almost square in shape, siphon short, contracted. Osphradium wide, equal to ctenidium (both about $^1/_3$ of mantle width), occupies $^4/_5$ length of ctenidium. Rectum about half-length of mantle (Fig. 2 C).

Reproductive system. Penis with two seminal papillae, situated on its distal end: one of normal size, cone-shaped, with male orifice on top, and another twice smaller, obviously teratologic (Fig. 2D, ssp). Both papillae are encircled by skin fold.

Digestive system. Proboscis is retracted within rhynchodaeum. Several bands of proboscis retractor muscles attach to ventral part of body haemocoel and follow ventrally of rhynchodaeum into proboscis (Fig. 2F, prr). Buccal mass spans entire proboscis length; radula of no. 1 is 400 μm wide (2.61% of AL), rachidian with 5 cusps, outer ones much shorter and narrower, than three central ones, median cusp 1.5 times longer, that the others (Fig. 3A). The basal plate deeply notched anteriorly. Lateral teeth tricuspid, with intermediate cusp much narrower and shorter than outer cusps. Radula of no. 2 is 300 μm wide (2% of AL), rachidian with three cusps, median slightly longer than outer ones; lateral teeth are as in no. 1 (Fig. 3B). Radula of no. 3 is 250 μm wide (2.34% of AL). Rachidian with 5 cusps, outer ones slightly shorter and narrower, than three central ones, median cusp slightly longer and narrower than two neighbor cusps. (Fig. 3C). Anterior oesophagus rather thick, valve of Leiblein small, inflated. Nerve ring large; posterior oesophagus widens towards stomach. Gland of Leiblein rather large, following along posterior oesophagus, terminating in ampoule. Salivary glands small, rounded, situated on both sides of proboscis; salivary ducts medium-thick, slightly coiled, following along anterior oesophagus (Fig. 2 E-F).

Stomach not studied.

Distribution: Bering Sea, Aleutian Islands, 3230-4382 m (Fig. 4).

Remarks. In the original description Dall (1913) mentioned two specimens, although provided the measurements for only one of them. He also stated that in one specimen there are "one or two minor keels and numerous faint spirals" between two major keels. In the latter publication (1921) Dall provided illustrations of both specimens with measurements. He noted as "typical" the smaller speci-

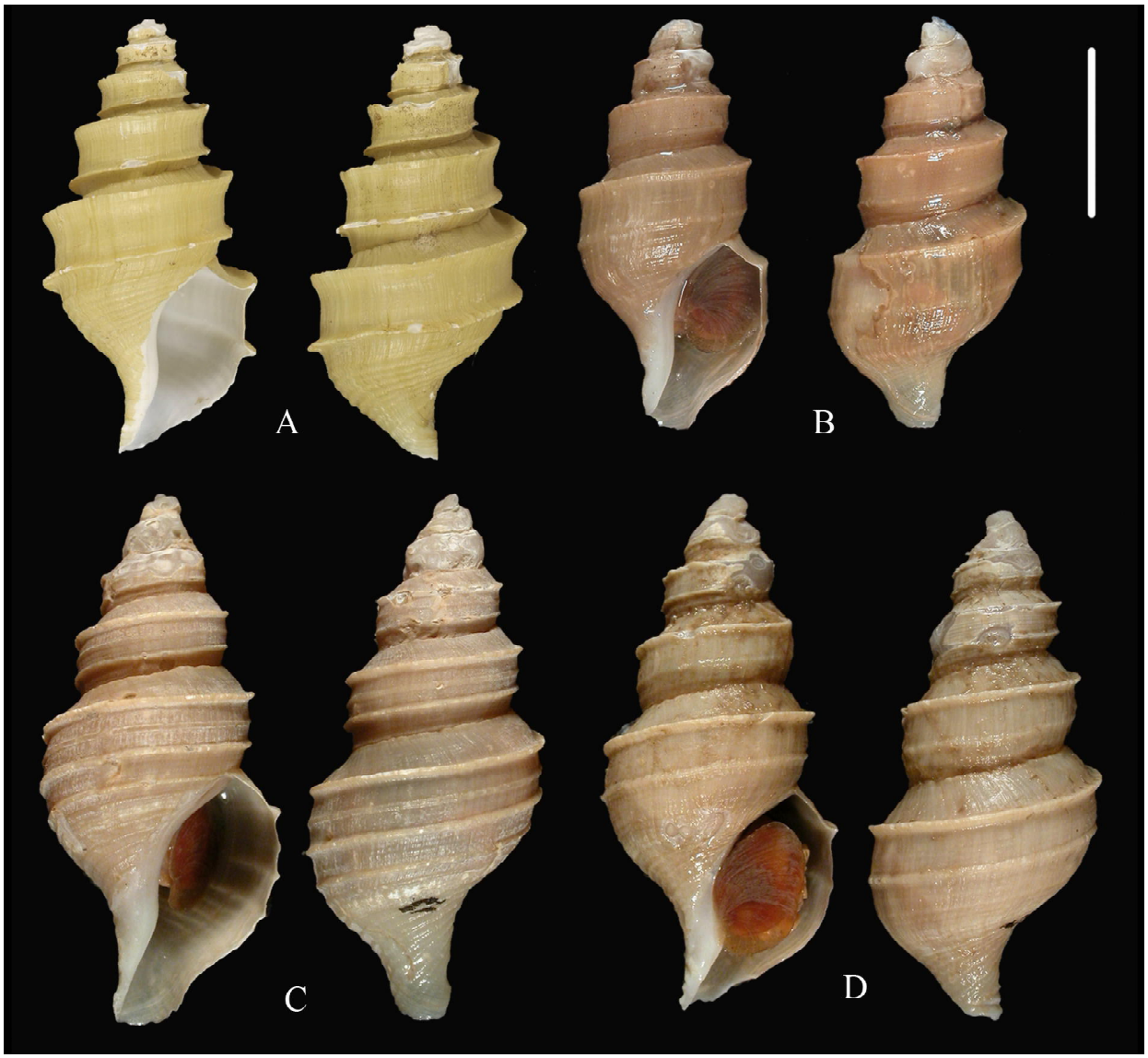

FIG. 1. Shells of *Fusipagoda exquisita*: A – lectotype of *Mohnia exquisita* Dall, 1913, USNM 111047, 52º38 N, 174º49 W, off Koniugi Islands, Aleutians, 3230 m, H 26.7 mm; B – no. 1, 55°52'N, 164°8'E, 4382 m, H 23.5 mm (radula – on Fig. 3A); C-D – nos. 2, H 32.7 mm (anatomy – Fig. 2 A-F, radula – Fig. 3B) and 3, H 33.9 mm (radula – Fig. 3C) respectively, 57°3'N, 168°30'E, 3875 m. Scale bar – 10 mm.

РИС. 1. Раковины *Fusipagoda exquisita*: A – лектотип *Mohnia exquisita* Dall, 1913, USNM 111047, 52º38 N, 174º49 W, off Koniugi Islands, Алеутские острова, 3230 м, высота раковины 26,7 мм; B – № 1, 55°52'N, 164°8'E, 4382 м, высота раковины 23,5 мм (радула – на Рис. 3A); C-D – № 2, высота раковины 32,7 мм (анатомия – Рис. 2 A-F, радула – Рис. 3B) и № 3, высота раковины 33,9 мм (радула – Рис. 3C) соответственно, 57°3'N, 168°30'E, 3875 м. Масштабный отрезок –10 мм.

men (shell height 26.7 mm) with two keels on the last whorl, the other specimen with additional cord was marked as *Mohnia exquisita* var. (shell height 31 mm). The first specimen, although with wrong measurements (31 mm, obviously taken from the original description) was illustrated by Kosuge (1972: pl. 17, fig. 6) and is here designated as lectotype (Fig. 1 A).

The species is rather variable in terms of spiral sculpture, and different height of the major spiral keels produces rather different shell outline (compare, eg. Figs 1A and 1B). Two of our specimens, no. 1 from sta. 524 (Fig. 1B) and no. 3 from sta. 618 (Fig. 1D) do not possess minor cords between main keels, while no. 2 (Fig. 1C) does. Spiral keels of specimens nos. 2 and 3 are less elevated than in the Dall's specimens, and the profile of the whorl is more rounded.

Fusipagoda sapia (Dall, 1919), comb. nov.

(Figs 2 G-L, 4, 5 A-C, 6 A-B)

Colus (Aulacofusus) sapius Dall, 1919: 317; Dall, 1921: 94; Dall, 1925: 14, pl. 2, fig. 10, pl. 26, fig. 9; Kosuge, 1972, pl. 15, fig. 6; Kosyan, Kantor, 2013: 27.
Pararetifusus sapius. – Sirenko *et al*., 2013: 161.

Lectotype (here designated): USNM 122597. Neither in the original description, nor later Dall stated

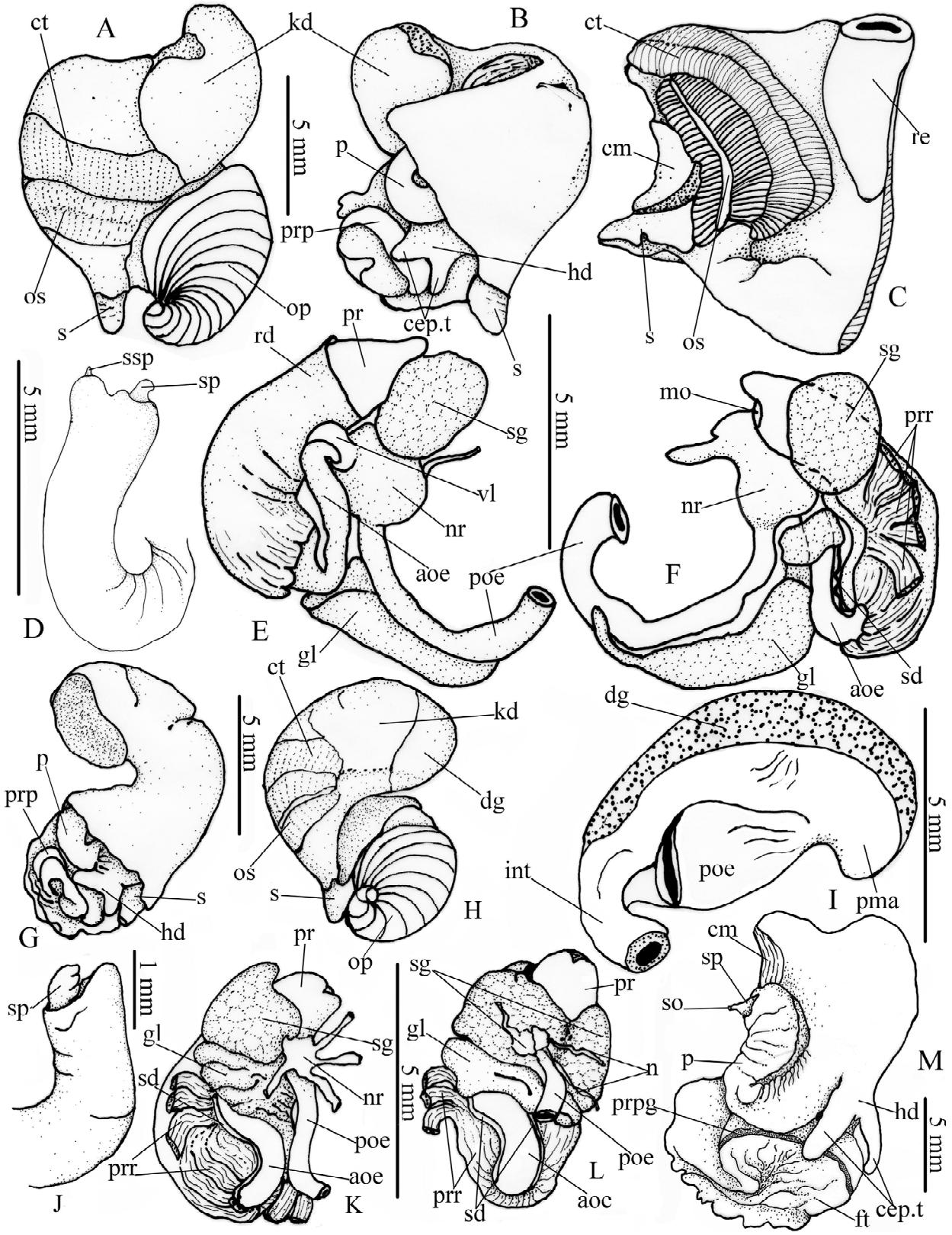

FIG. 2. Anatomy of *Fusipagoda:* A-F – *F. exquisita* (no. 2, shell on Fig. 1C, radula on Fig. 3B), G-L – *F. sapia* (no. 1, shell on Fig. 5B, radula on Fig. 6A), M – cephalopodium of holotype of *F. **itohabei*** **sp. nov.** (shell on Fig. 5E, radula on Fig, 7A). A-B, G-H – soft body; C – mantle; D, J – penis; E-F, K-L – foregut; I – stomach. Abbreviations on the figure in the text.

РИС. 2. Анатомия *Fusipagoda:* A-F – *F. exquisita* (№ 2, раковина на Рис. 1C, радула на Рис. 3B), G-L – *F. sapia* (№ 1, раковина на Рис. 5B, радула на Рис. 6A), M – цефалоподиум голотипа *F. **itohabei*** **sp. nov.** (раковина на Рис. 5E, радула на Рис. 7A). A-B, G-H – мягкое тело; C – мантия; D,K – пенис; E-F, K-L – передний отдел пищеварительной системы; I – желудок. Расшифровка сокращений – в тексте.

how many specimens he had in his possession. According to the Recommendation 73F of ICZN on avoidance of assumption of holotype, we consider the single retaining specimen as syntype and designate it herein as lectotype.

Type locality: USFC, sta. 2859, southwest of Sitka, Alaska, 55°20'N, 136°20'W, 2869 m.

Material examined. IO, R/V *Vityaz*, sta. 6135, 53°32'N, 163°22'W, 2930 m (24 spm., nos 1-2 dissected); ZIN, R/V *Toporok,* st. 15, Sea of Okhotsk, W from Iturup Island, 45°03.3'N, 146°12.7'E, 2850 m, 25.08.1948 (7 specimens).

Description. **Shell** thin, white under light-beige periostracum; elongated-fusiform, small for genus (slighly exceeding 22 mm), with angulated shoulder, sculptured by closely spaced, high, flattened on top in profile spiral cords (6-7 on penultimate whorl). On shell periphery the cords are similar in size, while on shell base and siphonal canal they diminish in size and become closer spaced abapically and can be nearly obsolete on the siphonal canal (Figs 5 A-B). Axial sculpture is represented only by growth lines. Last whorl comprises about $^{2}/_{3}$ of shell length, with well-defined, medium long, slightly left curved siphonal canal. Aperture not high, about $^{1}/_{2}$ of shell length, broadly oval (Fig. 5 A-C).

Measurements: no. 1. H 18.7 mm, h 12.8 mm, AL 9.0 mm; no. 2. H 22.3 mm, h 15.5 mm, AL 10.4 mm.

Soft body: $1^{1}/_{5}$ whorls extracted. Mantle spans $^{4}/_{5}$ whorl, kidney – $^{2}/_{5}$. Head small, with short contracted tentacles lacking eyes. Foot contracted, propodium narrow, separated by deep propodial groove. Operculum large, oval, with subspiral nucleus (Fig. 2 H). Mantle is of the same morphology as in *F. exquisita*.

Reproductive system. Penis with large seminal papilla, situated on its distal end in deepening, close to the margin. Papilla is encircled by fold of skin (Fig. 2J).

Digestive system. Proboscis is retracted within rhynchodaeum. Proboscis retractors attach to ventral part of body haemocoel and follow ventrally of rhynchodaeum into proboscis (Fig. 2 K-L). Buccal mass spans entire proboscis length. Radula of no. 1 is 250 μm wide (2.40% of AL), rachidian bears 3 equally short sharp cusps, situated on arcuate basal plate (Fig. 6A), additional indistinct denticle is at the left to outer main cusp. Lateral teeth tricuspid in the left row, with intermediate cusp shorter and thinner than other cusps, situated closer to inner cusp; lateral teeth in the right row bicuspid, although very short intermediate cusp can be present, fusing with inner cusp. Radula of no. 2 is 300 μm wide (3.3% of AL), rachidian with 5 cusps, outer ones slightly shorter and narrower, than three central ones, median cusp slightly narrower than two neighboring cusps; lateral teeth are tricuspid with narrower and shorter intermediate cusp, situated closer to inner cusp (Fig. 6B). Anterior oesophagus

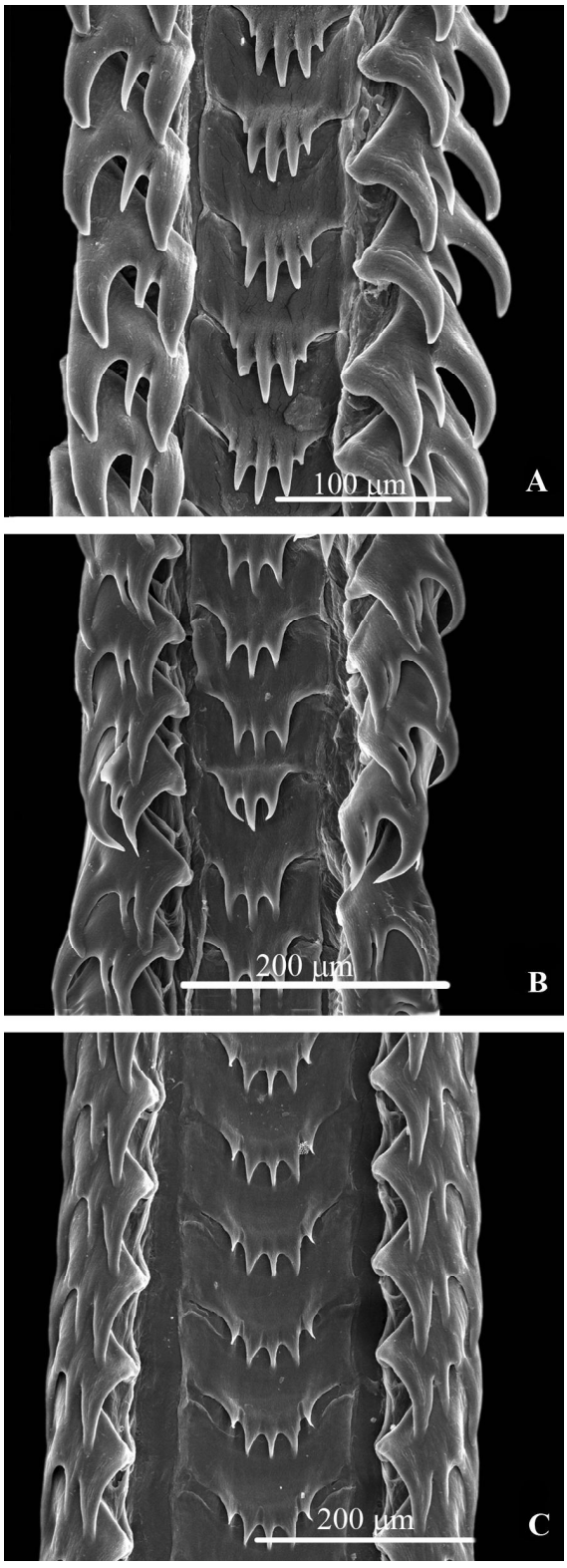

FIG. 3. Radulae of *Fusipagoda exquisita*. A – no. 1 (shell on Fig. 1B); B – no. 2 (shell on Fig.1C, anatomy on Fig. 2A-F); C – no. 3 (shell on Fig. 1D).

РИС. 3. Радулы *Fusipagoda exquisita*. А – № 1 (раковина на Рис. 1B); B – № 2 (раковина на Рис. 1C, анатомия на Рис. 2 A-F); C – № 3 (раковина на Рис. 1D).

wide; nerve ring medium large. Gland of Leiblein rather large (Fig. 2K, gl), situated beneath nerve ring and following along posterior oesophagus; valve

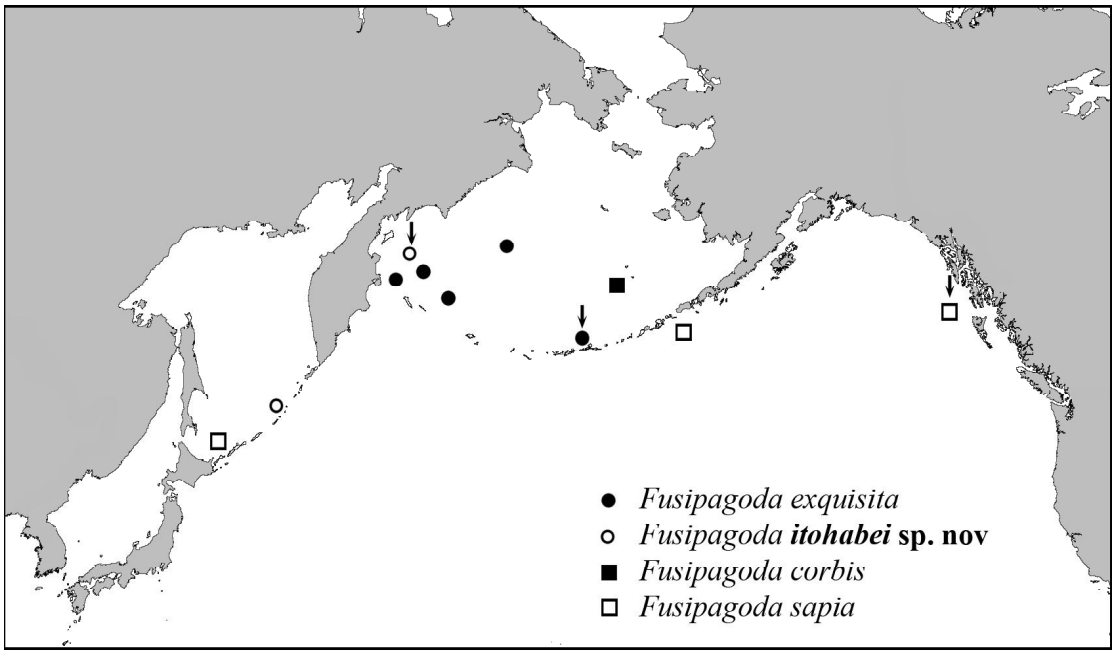

FIG. 4. Distribution of species of *Fusipagoda*. Arrows point to type localities.

РИС. 4. Распространение видов *Fusipagoda*. Стрелками отмечены типовые местонахождения.

of Leiblein small (covered by salivary gland and not figured). Salivary glands medium-large, rounded, situated on both sides of nerve ring; salivary ducts medium-thick, almost straight, following along anterior oesophagus (Fig. 2 K-L). Stomach spans about ½ of the whorl; posterior oesophagus near entering the stomach wide, but abruptly narrowed to a small oesophageal opening. Posterior mixing area small, but well noticeable (Fig. 2I).

Distribution: from Alaska, along Aleutians Islands to South Kurile Islands, 2850-2930 m (Fig. 4).

Remarks. Although at the first glance, *Colus sapius* looks rather different from *F. exquisita* due to presence of numerous spiral cords, the general shell shape, absence of axial sculpture, operculum with subspiral nucleus and similar radula are shared with *F. exquisita*. The combination of subspiral operculum and absence of axial folds is also found in *Pararetifusus* (to which the species was attributed by Sirenko *et al*. [2013]) and *Mohnia*, but the radula precludes its inclusion in any of them. Radula of *Pararetifusus* is characterized by the lateral teeth with subequal in size cusps [Kosyan, 2006], while in *Mohnia* the central tooth is with a single cusp, while the lateral ones are bicuspid [Bouchet, Warén, 1985: fig. 482].

F. sapia differs from *F. exquisita* in more numerous, flattened in profile spiral cords, and by a larger seminal papilla. Both specimens examined by us are from the same sample, but spm no. 1 is more similar to holotype in its shell shape and sculpture. In spm. no. 2, the shell is more thick and spiral cords are wider than in holotype and no. 1.

Fusipagoda corbis (Dall, 1913), comb. nov.
(Figs 4, 5 D, 6 C-D)

Mohnia corbis Dall, 1913: 501-502; Dall, 1921: 91, pl. 12 fig. 10; Kosuge, 1972: pl. 12, fig. 1.

Lectotype (here designated): USNM 225383. Neither in the original description, nor later Dall stated how many specimens he had in his possession. According to the Recommendation 73F of ICZN on avoidance of assumption of holotype, we consider the single retaining specimen as syntype and designate it herein as lectotype.

Type locality: Bering Sea, south of Pribiloff Islands, 55º23'N, 170º31'W, 3241 m.

Material examined: holotype.

Description. **Shell** thin, fragile, off-white, covered by light-olive periostracum, elongated-fusiform, with eroded protoconch and upper teleoconch whorls (Fig. 5D). Shell large for genus, with slight-

РИС. 5 (на противоположной странице). Раковины *Fusipagoda*: A – лектотип *Aulacofusus sapius* Dall, 1919, к юго-западу от Ситки, Аляска, 55°20'N, 136°20'W, 2869 м, высота раковины 22 мм; B-C – раковины *F. sapia* № 1 (высота раковины 18,7 mm) и № 2 (высота раковины 22,3 mm) соответственно (№ 1: анатомия на Рис. 2 G-L, радула на Рис. 6A; № 2: радула на Рис. 6B); D – голотип *Mohnia corbis* Dall, 1919, к югу от островов Прибылова, 55º23'N, 170º31'W, 3241 м, высота раковины 29,9 mm (радула на Рис. 6 C-D); E-G – раковины *F. itohabei* **sp.nov.**, E – голотип, 57º43'N, 167º23'E, 3661 м, высота раковины 39,3 мм (анатомия на Рис. 2M, радула на Рис. 7A), F – паратип, типовое местонахождение, высота раковины 37,1 mm (радула на Рис. 7B), G – № 1, 48º49.5'N, 153º06.5'E, 2901 м, высота раковины 28,5 мм (радула на Рис. 7C). Масштабный отрезок 10 мм.

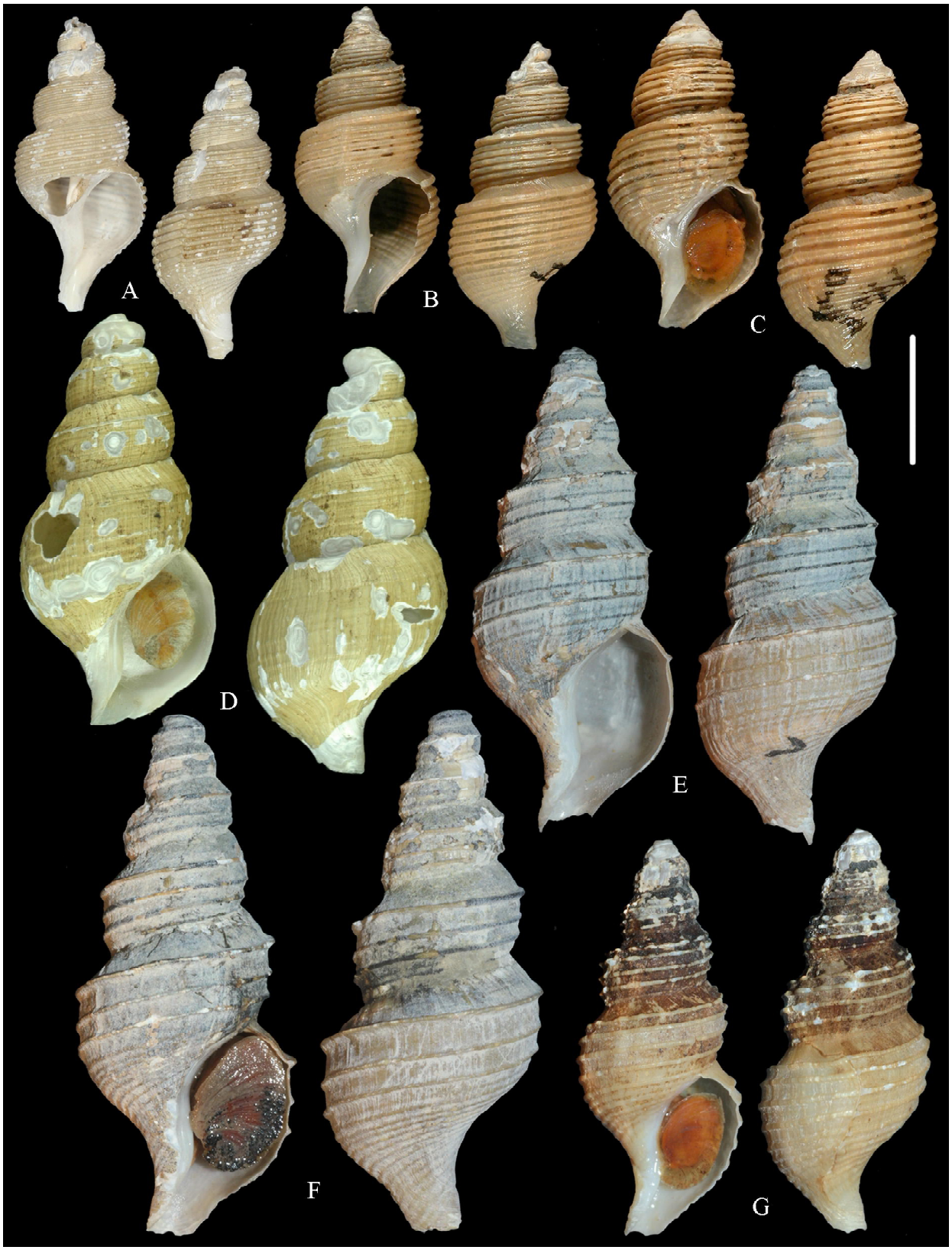

FIG. 5. Shells of *Fusipagoda*: A – lectotype of *Aulacofusus sapius* Dall, 1919, southwest of Sitka, Alaska, 55°20'N, 136°20'W, 2869 m, H 22 mm; B-C – shells of *F. sapia* nos. 1 (H 18.7 mm) and 2 (H 22.3 mm) respectively (no. 1: anatomy on Fig. 2 G-L, radula on Fig. 6A; no. 2: radula on Fig. 6B); D – holotype of *Mohnia corbis* Dall, 1919, south of Pribiloff Islands, 55º23'N, 170º31'W, 3241 m, H 29.9 mm (radula on Fig. 6 C-D); E-G – shells of ***F. itohabei* sp.nov.**, E – holotype, 57º43'N, 167º23'E, 3661 m, shell height 39.3 mm (anatomy on. Fig. 2M, radula on Fig. 7A), F – paratype, type locality, H 37.1 mm (radula on Fig. 7B), G – no. 1, 48º49.5'N, 153º06.5'E, 2901 m, H 28.5 mm (radula on Fig. 7C). Scale bar 10 mm.

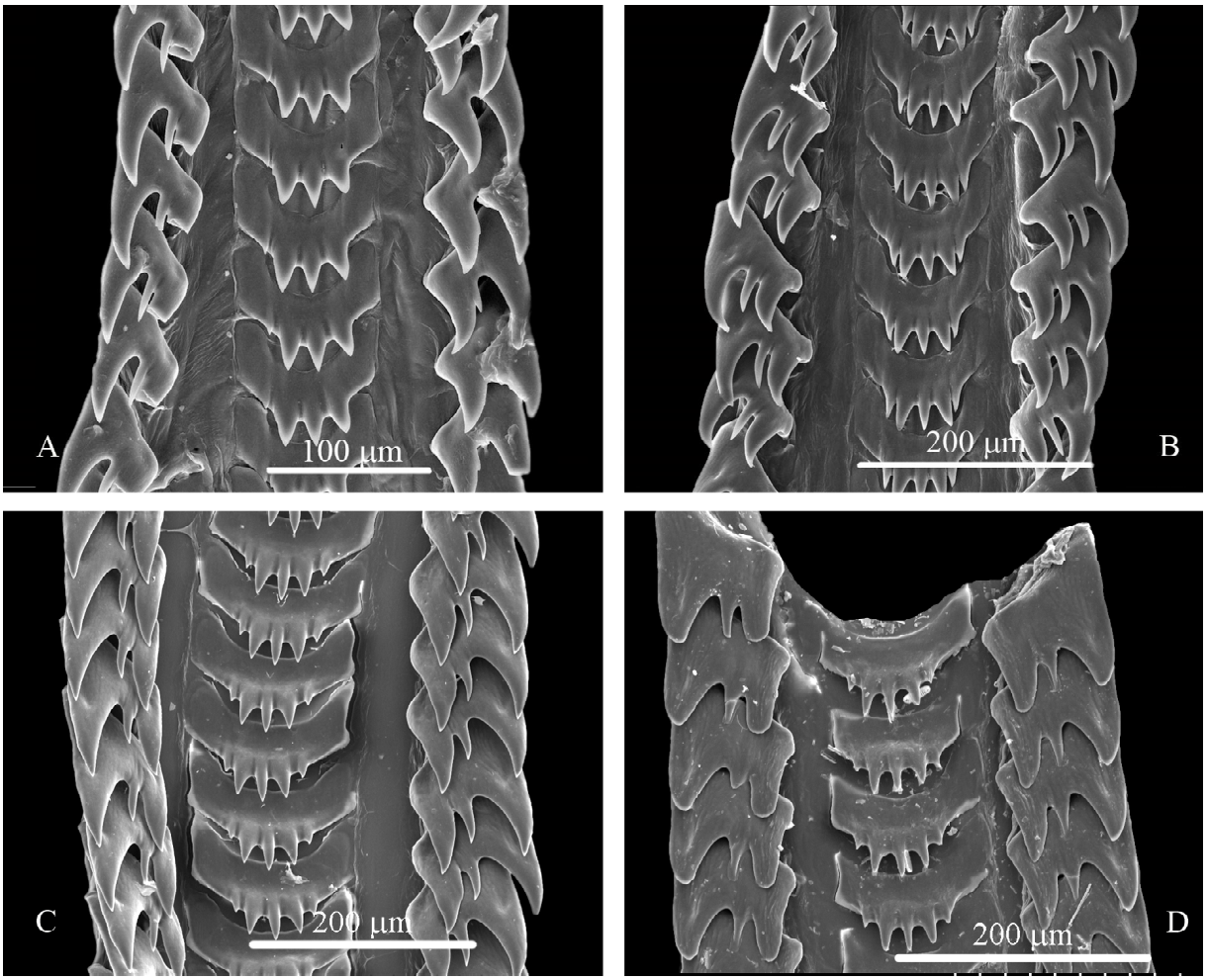

FIG. 6. Radulae of *Fusipagoda.* A-B – *F. sapia*: A – no. 1 (shell on Fig. 5B, anatomy on Fig. 2 G-L); B – no. 2 (shell on Fig. 5C); C-D – *F. corbis,* holotype (shell on Fig. 5D).

РИС. 6. Радулы *Fusipagoda.* A-B – *F. sapia*: A – № 1 (раковина на Рис. 5B, анатомия на Рис. 2 G-L); B – № 2 (раковина на Рис. 5C); C-D – *F. corbis*, голотип (раковина на Рис. 5D).

ly angulated shoulder. Spiral sculpture of low rounded on top cords, covering entire shell surface, except siphonal canal. There are about 6 weak spiral cords between suture and shoulder on penultimate whorl and 10 strong cords on the rest of the whorl, sometimes alternated with low weak cords. Shell base and siphonal canal smooth. Axial sculpture is limited to growth lines. Last whorl comprises slightly more than $^2/_3$ of shell length, with well-defined, short siphonal canal. Operculum oval with subspiral nucleus. Measurements: H 29.9 mm, h 19.3 mm, AL 13.13 mm.

Radula (Fig. 6 C-D) is 380 μm wide (2.90% of AL), rachidian with 5 cusps, outer ones much shorter and narrower, than three central ones, of which median cusp narrower and slightly longer than the others. Lateral teeth tricuspid, with intermediate cusp much shorter and narrower than outer cusps.

Distribution: the species is known from the type locality only.

Remarks. The shell of *Mohnia corbis* is most divergent from other species, attributed herein to *Fusipagoda*. The shell is characterized by shorter siphonal canal than in any other *Fusipagoda* spp., as well as in less pronounced spiral sculpture. Nevertheless, the similar to other species operculum type, as well as the radula, suggest the affinities of the *M. corbis* with other species of *Fusipagoda.* The species differs from others of the genus by low spiral cords and short siphonal canal.

The original label is marked as **Type**, therefore the status of the specimen must be considered as holotype.

Fusipagoda ***itohabei*** **sp. nov.**

(Figs 2 M; 4; 5 E-G; 7)

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Holotype: ZMMU Lc-40340, paratype: ZMMU Lc-40341.

Type locality: western part of the Bering Sea, 57º43'N, 167º23'E, 3661 m.

Material examined: R/V *Vityaz*, sta. 1604, 57º43'N, 167º23'E, 3661 m (3 spm., holotype and paratype dissected). IO, R/V *Vityaz*, sta. 149, 48º49.5'N, 153º06.5'E, 2901 m (1 spm., no. 1 dissected).

Etymology: the species is named in honor of the authors of the genus *Fusipagoda*, Japanese malacologists T. Habe and K. Ito.

Description. **Shell** large for the genus (up to 40 mm), thin and fragile, not translucent, elongated fusiform, with high spire and medium long, well defined, slightly left curved siphonal canal (Fig. 5 E-G). Protoconch and upper teleoconch whorls eroded in all specimens, teleoconch consists of approximately 5 remaining whorls (holotype). Teleoconch whorls evenly convex; with slowly increasing diameter. Periostracum beige or brown, shell under periostracum white. Sculpture of widely spaced, narrow, slightly elevated rounded on top spiral cords (4-5 on the penultimate whorl), which become closer spaced on shell base and siphonal canal, and weak spiral ribs between the cords (about 2-3 between each pair of cords); axial sculpture represented only by growth lines. Last whorl not high, about $^1/_2$ of shell length. Aperture about $^1/_3$ of shell length, oval, tapering posteriorly; outer lip evenly rounded, slightly concave in the transition to siphonal canal. Inner lip concave, smooth, covered with thin callus, not extending to parietal part. Operculum large, oval with subspiral nucleus.

Measurements: holotype H 39.3 mm, h 25.4 mm, AL 18.3 mm; paratype H 37.1 mm, h 24 mm, AL 16.1 mm; no. 1. H 28.5 mm, h 19.0 mm, AL 13.6 mm.

[**Диагноз:** раковина крупная для рода (до 40 мм), тонкостенная и хрупкая, непрозрачная, удлиненно-веретеновидная, с высоким завитком и умеренно-длинным, хорошо обособленным, слегка изогнутым влево сифональным выростом (Рис. 5E-G). Протоконх всех экземпляров эродирован, сохраняется до 5 оборотов телеоконха (голотип). Обороты телеоконха равномерно-выпуклые, их диаметр медленно нарастает. Периостракум бежевый или коричневый, раковина под периостракумом белая. Скульптура представлена широко-расставленными, слегка приподнятыми округлыми сверху спиральными килями (4-5 на предпоследнем обороте), становящимися более частыми около сифонального выроста, и мелкими слабо-выраженными спиральными ребрышками между ними (по 2-3 между каждой парой килей); осевая скульптура представлена только линиями нарастания. Последний оборот невысокий, составляет около половины высоты раковины. Устье – около $^1/_3$ высоты раковины, овальное, сужающееся к шву оборота; наружная губа слабо вогнута в месте перехода в сифональный канал. Внутренняя губа гладкая, покрыта тонким каллусом, не заходящим на париетальную часть оборота. Крышечка большая, овальная, с субспиральным ядром.

Размеры: голотип H 39.3 мм, h 25.4 мм, AL 18.3 мм; паратип H 37.1 мм, h 24 мм, AL 16.1 мм; № 1. H 28.5 мм, h 19.0 мм, AL 13.6 мм.]

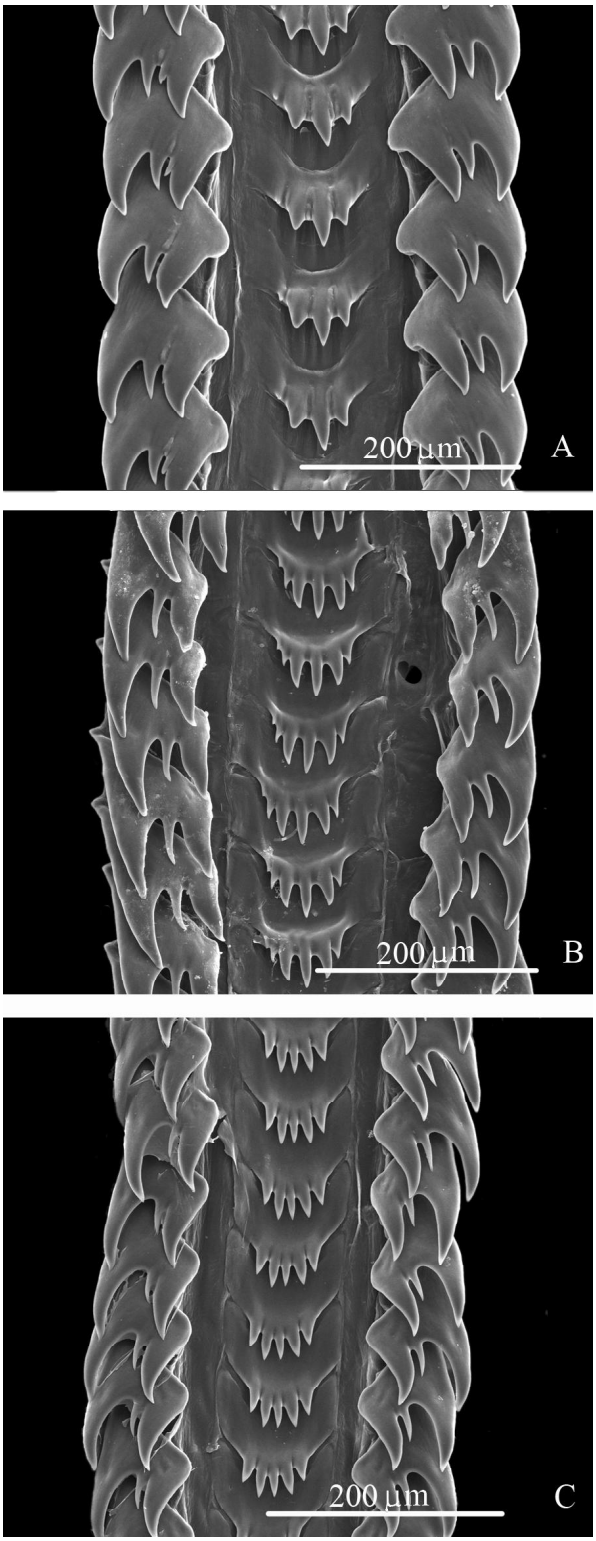

FIG. 7. Radulae of *Fusipagoda* ***itohabei*** sp.nov: A – holotype (shell on Fig. 5E, cephalopodium on Fig. 2M); B – paratype (shell on Fig. 5F); C – no. 1 (shell on Fig. 5G).

РИС. 7. Радулы *Fusipagoda* ***itohabei*** sp.nov: A – голотип (раковина на Рис. 5E, цефалоподиум на Рис. 2M); B – паратип (раковина на Рис. 5F); C – № 1 (раковина на Рис. 5G).

Soft body: 1.5 whorls extracted. Mantle spans 0.8 whorl, kidney 0.4. Head small, with long thick tentacles lacking eyes (Fig. 2M). Foot contracted,

Table 1. Comparative features of similar to *Fusipagoda* genera of Colinae.

Genus	Opercu-l um nucleus	Spiral sculpture	Axial sculpture	Radula	Penis papilla	Distribution, bathymetry	Source
Fusipagoda	subspiral	widely spaced, high sharp or rounded and flattened spiral cords	absent	rachidian with 3-5 cusps, laterals with 3 cusps and very small intermediate cusp	medium-large	N Pacific, 2900-4400 m	This paper
Pararetifusus	subspiral and terminal	widely spaced sharp or rounded spiral cords	absent	rachidian normally with 3 cusps, laterals with 3 cusps, equal in size	absent	N Pacific, 130-1400 m	Kosyan, 2006
Mohnia	subspiral	multiple flattened spiral cords	present or absent	rachidian with 1-3 cusps, laterals with 2-3 cusps, intermediate one the smallest	?	N Atlantic, Arctic Ocean	Bouchet, Warén, 1986; Lus, 1981
Retimohnia	subspiral	multiple flattened spiral cords	usually present	rachidian with 3-6 cusps, laterals with small intermediate cusp	medium-large	N Pacific, 120-2500 m (mostly > 1000 m)	original unpub-lished data
Retifusus	terminal	multiple fattened spiral cords	present in all species but one	rachidian with 3-6 cusps, laterals with 3 equal in sizes cusps	usually small	N Pacific, 15-1400 m (mostly < 400 m)	Kosyan, Kantor, 2014

propodium narrow, separated by deep propodial groove. Penis with medium-sized conical seminal papilla encircled by fold of skin, with small rounded male orifice on attenuated apex. Mantle is of the same morphology as in *F. exquisita*.

Digestive system. Foregut has the same anatomy as in *F. exquisita*, and not figured. Proboscis retracted within rhynchodaeum. Proboscis retractors attach to lateral parts of body haemocoel and follow ventrally of rhynchodaeum into proboscis. Buccal mass occupies entire proboscis length. Radula of holotype is about 400 μm wide (2.19% of AL), rachidian with arcuate basal plate, bears 3 well-defined sharp cusps, of which median is the largest, and one rudimentary denticle adjoining the left outer cusp (Fig. 7A). Lateral teeth tricuspid, with short stout cusps, intermediate shorter and thinner than other cusps. Radula of paratype is 400 μm wide (2.48% of AL), rachidian bears 5 unequal in length short cusps (median the longest), and one rudimentary denticle adjoining the left outer cusp; lateral teeth are tricuspid, with longer outer cusps (Fig. 7B). Radula of no. 1 is 300 μm wide (2.21% of AL), rachidian bears 5 cusps, of which median is slightly shorter, than others; lateral teeth similar to paratype (Fig. 7C). Anterior oesophagus wide, nerve ring medium-large. Gland of Leiblein rather large, situated beneath nerve ring and following along posterior oesophagus. Valve of Leiblein of the same size as nerve ring, oval. Salivary glands medium-large, rounded, situated on both sides of nerve ring; salivary ducts medium-thick, slightly twisted, following along anterior oesophagus separately from its wall. Stomach not studied.

Distribution: western part of the Bering Sea, north and middle Kurile Islands, 2901-4130 m (Fig. 4).

Remarks. The new species is most similar to *F. exquisita.* Likewise, its spiral sculpture consists of widely spaced elevated spiral cords, but these cords are more frequent and less elevated, than in *F. exquisita*. The spire is more attenuated than in *F. exquisita*. Specimen no. 1 possesses more frequent spiral cords with smoothened nodules on crossings with incremental lines, and somewhat more attenuated spire; so, we prefer not to include it into the type series.

Discussion

The genus *Fusipagoda* was proposed for *Mohnia exquisita* Dall, 1913, and until now had been monotypic. *Aulacofusus sapius* Dall, 1919 has recently been excluded from the original genus *Aulacofusus* based on completely different anatomy, radula structure and operculum with subspiral nucleus, and tentatively attributed to *Pararetifusus* Kosuge, 1967 [Kosyan, Kantor, 2013]. *F. exquisita*, *F. sapia, F. corbis* and a new species *F.* ***itohabea*** **sp. nov**. share similar characters, which are spiral sculpture, consisting of rare spiral cords, operculum with subspiral nucleus, and similar shape of radular teeth: rachidian with arcuate basal plate and 3-5 radially situated cusps, and lateral teeth with short and thin intermediate cusps. As a result we consider these four

species as belonging to the same genus *Fusipagoda*. All three examined in this respect species of *Fusipagoda* lack probably due to abyssal habitat. The number of spiral cords within *Fusipagoda* is increasing in the following way (counted on the penultimate whorl): 2-3 widely spaced and sharpened spiral cords of *F. exquisita*, 4-5 low and rounded in profile cords of ***F. itohabei* sp. nov.**, 6-7 wide and flattened in profile spiral cords of *F. sapia*, separated by equal in width deep grooves; 10 low, sharpened in profile and separated by twice wider interspaces cords of *F. corbis*. Thus, *F. **itohabei* sp. nov**., due to morphology of the spiral sculpture, is more similar to the type species *F. exquisita* and to less extent to *F. corbis*, than to *F. sapia*.

By its spiral sculpture and operculum with subspiral nucleus, *Fusipagoda* is very similar to another deep-water North-Pacific genus, *Pararetifusus* Kosuge, 1967, but clearly differs from it by morphology of lateral teeth of radula (Table 1). It is also notable, that all known species of *Pararetifusus* possess eyes and live in a wide range of depths (130-1500 m) [Kosyan, 2006], while *Fusipagoda* is found only beneath 2900 m. Probably, the presence of eyes in *Pararetifusus* is connected with relatively recent adaptation to bathyal habitat. Radula and penis morphology of *Fusipagoda* reminds those of some *Retimohnia* species, which also possess subspiral opercula (Table 1), but absence of axial ribs and characteristic spiral sculpture of *Fusipagoda* stand it separately from *Retimohnia*. The differences from other related genera are shown in the Table 1.

Acknowledgments

The authors are grateful to Dr. A.V. Gebruk, Dr. E.M. Krylova and T.A. Savilova for access to collections and databases of the Institute of Oceanology, to N.N. Surovenkova for help with the scanning microscopy, to B.I. Sirenko for valuable comments.

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Об абиссальном роде *Fusipagoda* Habe et Ito, 1965 (Neogastropoda: Buccinidae) из северной части Тихого океана

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РЕЗЮМЕ. На основании вновь полученного материала был ревизован изначально монотипический род *Fusipagoda*. Помимо типового вида, *Mohnia exquisita*, к роду отнесены два других вида, описанных Доллом — *Colus sapius* и *Mohnia corbis*. Описан новый вид *Fusipagoda **itohabei* sp. nov.** с северных Курильских островов и западной части Берингова моря.