
**New and rare species of the genus *Lepidozona*
(Mollusca: Polyplacophora)
from the South China, East China and the Philippine seas**

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urn:lsid:zoobank.org:pub:A9A6472B-D918-43AA-A2B7-0FC458AE7A68

For the first time, two species of the genus *Lepidozona* Pilsbry, 1892, *L. cristiaensi* Van Belle, 1982 and *L. bisculpta* (Carpenter in Pilsbry, 1892), were recorded from the waters of Vietnam. Two deep water species, *Lepidozona acostata* **sp. nov.**, from Vietnam and Taiwan, and *L. excellens* **sp. nov.**, from the Philippine Sea are described as new to science. Previous division of the genus *Lepidozona* into two subgenera – *Lepidozona* s.s. and *Tripoplax* Berry, 1919 – is not supported because of the presence of a transitional form between the species of the subgenera.

Key words: Polyplacophora, *Lepidozona*, taxonomy, new species, abnormal chiton, Pacific Ocean, South China Sea, East China Sea, Philippines Sea.

**Редкие и новые виды рода *Lepidozona*
(Mollusca: Polyplacophora)
из Южно-Китайского, Восточно-Китайского
и Филиппинского морей**

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Впервые найдены во вьетнамских водах два вида рода *Lepidozona* Pilsbry, 1892: *L. cristiaensi* Van Belle, 1982 и *L. bisculpta* (Carpenter in Pilsbry, 1892). Два глубоководных вида *Lepidozona acostata* **sp. nov.**, из вод Вьетнама и Тайваня и *L. excellens* **sp. nov.** из Филиппинского моря описываются как новые для науки. Деление рода *Lepidozona* на два подрода *Lepidozona* s.s. и *Tripoplax* Berry, 1919 не поддерживается, из-за наличия переходных форм между видами этих подродов.

Ключевые слова: Polyplacophora, *Lepidozona*, таксономия, новый вид, аномальный хитон, Тихий океан, Южно-Китайское, Восточно-Китайское и Филиппинское моря.

There are 57 available names for species and subspecies of the genus *Lepidozona* Pilsbry, 1892 in the world oceans [Kaas, Van Belle, 1987; Strack, 1991; Clark, 2000, 2008; Saito, 2013; Sirenko, 2013]. A number of these require revision and do not conform to the morphological understanding of the genus *Lepidozona*. *Lepidozona beui* O'Neill,

1987 belongs to genus *Stenosemus* Middendorff, 1847 because it has no notch between the jugal plate and apophyses, has dorsal spicules (not scales), and these spicules are arranged regularly in a quincunx. *S. beui* is similar to a colorful congener, *S. merweae* from South Africa [Sirenko, 2016]. The genus *Lepidozona* included two established subgenera: *Lepidozona* s.s. and *Tripoplax* Berry, 1919 [Kaas, Van Belle, 1987]. Clark [2008] elevated *Tripoplax* to full generic status. According to Clark [2008], the genus *Tripoplax* is «characterized by fine tegmental sculpturing, relatively small girdle scale (~300 µm), and multiple slits in the insertion plates of the intermediate valves». In my opinion, the tegmental sculpture is very varied in species assigned to both subgenera. The same holds true for the size of the girdle scales. In *Tripoplax*, girdle scales range in size from 170–480x105–350 µm, and in *Lepidozona* from 90–414x72–500 µm. Indeed, most species which were taken into the subgenus *Lepidozona* have single-slitted insertion plates on the intermediate valves and most species which were taken into the subgenus *Tripoplax* have multi-slitted insertion plates. However, according to Kaas and Van Belle [1987], Clark [2008], and the author's own unpublished data, there are from 1 to 2–3 slits in the insertion plates in several species assigned to the genus or subgenus *Tripoplax* as well as in *Lepidozona* s.s.: *Tripoplax cowani* Clark, 2008, *Lepidozona* (*Tripoplax*) *kobjakovae kobjakovae* (Jakovleva, 1952), *L. (T.) kobjakovae kamchatkana* Sirenko, 1975, *L. (T.) andrijashevi* (Jakovleva, 1952), *L. (T.) lindbergi* (Jakovleva, 1952), *L. (T.) thielei* Sirenko, 1975, *L. (T.) ima* Sirenko, 1975, *Lepidozona* (*Lepidozona*) *serrata* (Carpenter, 1864), *L. (L.) willetti* (Berry, 1917), *L. (L.) nipponicus* (Berry, 1918), *L. (L.) multigranosa* Sirenko, 1975. Clark [2008] mentioned that all members of *Tripoplax* are cold northern or deep water inhabitants, and members of *Lepidozona* inhabit warmer, temperate to tropical waters, at depths of 400 m or less. But at least two species of the subgenus *Lepidozona* (*L. (L.) retiporosa* (Carpenter, 1864) and *L. (L.) interfossa* Berry, 1917) live in cold waters at depths down to 600–1463 m. Taking into account the above-mentioned information, I think there is no reason to divide the species of the genus *Lepidozona* into two subgenera.

The genus *Lepidozona* sensu lato has a worldwide distribution, mainly in northern Pacific Ocean, along Asian and American coasts, down to Chile in South America, and in the northern Indian Ocean. Deep water fauna of the genus is not adequately explored. To partially fill this gap in knowledge, the author has described material of four rare species of the genus *Lepidozona*, including two previous undescribed.

Material and methods

The specimens examined here were collected in seven expeditions: R/V *Odyssey*, cruise 33 in 1984, near south Vietnam and cruise 34 in 1985 in the Philippine Sea; N/O *Fishery Researcher 1*, Taiwan in 2000 and 2001, the fishing boat *Chung Tung Long No. 26* in 2001, near Taiwan; and three expeditions of the Russian-Vietnamese Tropical Centre along coast of Vietnam in 2012, 2013 and 2014.

Specimens were prepared for scanning electron microscope (SEM). They were boiled in 7% KOH for 10–15 minutes, then boiled twice in fresh water. Several valves (usually the valves I, IV, V and VIII), a large section of the radular ribbon and a portion of the girdle were then chosen for a scanning electron microscope FEI SEM Quanta 250 Scan. The rest of the radula and the girdle were dried and put in Canada balsam for examination under the light microscope.

Abbreviations: BL – body length; stn – station; spm(s) – specimen(s); IEE RAS – A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia; MNHN – Muséum national d’Histoire naturelle, Paris; ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Taxonomy

Class **POLYPLACOPHORA** Gray, 1821

Subclass **LORICATA** Schumacher, 1817

Order **CHITONIDA** Thiele, 1910

Family **Ischnochitonidae** Dall, 1889

Genus *Lepidozona* Pilsbry, 1892

Type species. *Chiton mertensii* Middendorff, 1847, by monotypy.

Genus distribution and range. The northern Pacific and northern Indian Oceans and there is one species in Peruvian and Chilean waters. Miocene – Recent.

Lepidozona christiaensi Van Belle, 1982

Figs. 1–3

Lepidozona (Lepidozona) christiaensi Van Belle, 1982: p. 471, figs. 1/1–16; Kaas, Van Belle, 1987, p. 251, fig. 113, map 35.

Type material. The Natural History Museum, London, UK (formerly, BMNH), NHMUK 198244.

Type locality. China, Hong Kong, outside Tolo Channel.

Material examined. **South China Sea:** Vietnam, near Danang, 16°11.802' N, 108°10.593' E, sample 37, SCUBA, 5–12 m, on *Pinna* sp., 1 spm., BL 10 mm, 16.05.2012, leg. O. Savinkin; Hon Cau Island, 11°13.322' N, 108°49.866' E, sample 152, SCUBA, 12–13 m, in sand, 1 intermediate valve, 14.05.2013, leg. B. Sirenko; sample 227, SCUBA, 7 m, in sand, tail valve, 07.05.2014, leg. S. Grebelniy.

Distribution. This material represents the first records of the species in Vietnam which enlarges its range from Hong Kong (22°22' N) south to Hon Cau Island (11°13' N), depth 7–12 m.

Remarks. The whole specimen collected near Danang has 14 gills arranged from valve IV to valve VII, slit formula 13/1/13, radula 2.1 mm long with 30 transverse rows of mature teeth. The gut content containing detritus and foraminifers. The studied specimen has more various marginal spicules than in type specimen [Van Belle, 1982]. Marginal

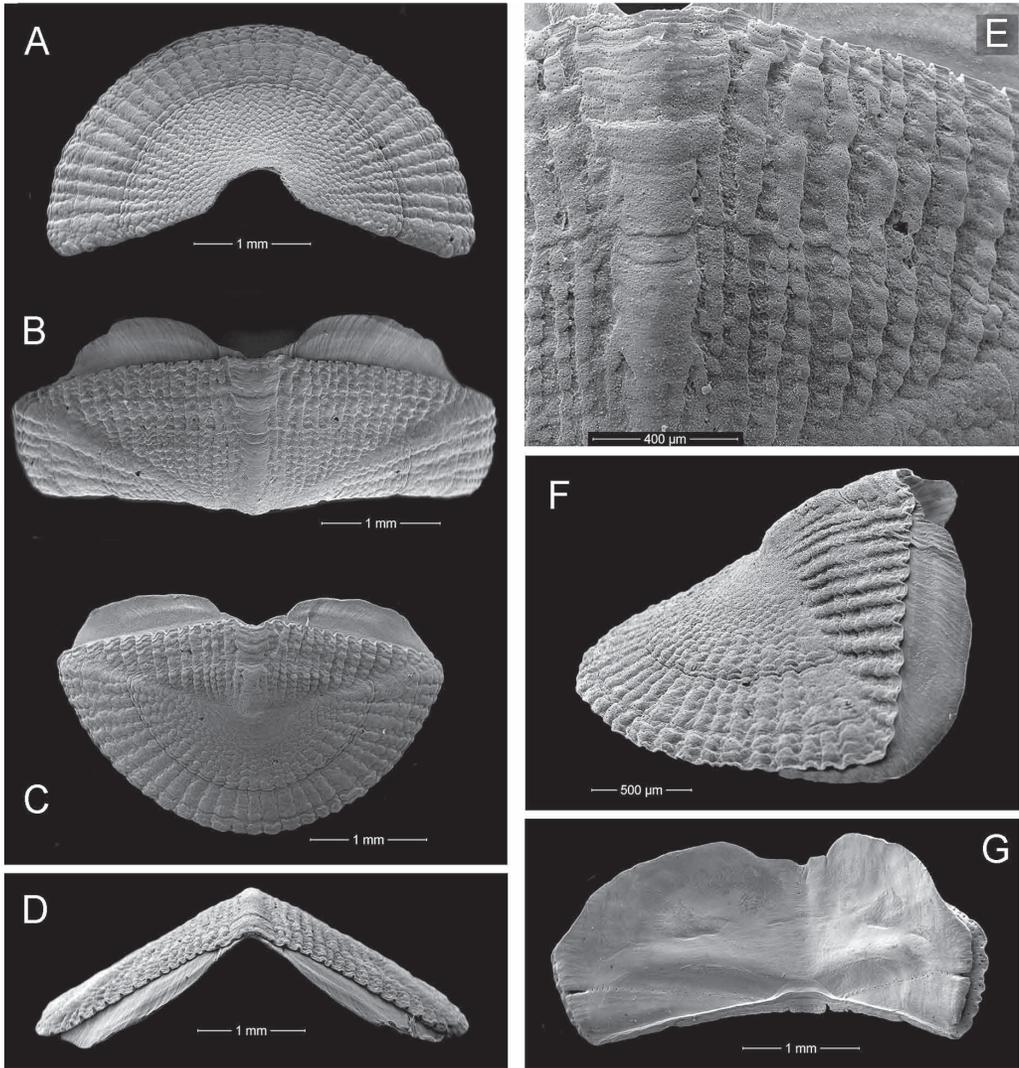


Fig. 1. *Lepidozona christiaensi*, BL 10 mm, Vietnam, 5–12 m, on *Pinna* sp; **A** – valve I, dorsal view; **B** – valve V, dorsal view, **C** – valve VIII, dorsal view; **D** – valve V, rostral view; **E** – valve V, detail of tegmentum in central area; **F** – valve VIII, lateral view; **G** – valve IV, ventral view.

fringe composed of different flattened spicules, grooved in two directions (feather-like) (40–67x20–24 μm), wedge shaped, obliquely grooved spicules (56x20 μm), and small, numerous, blunt-topped spicules (48x12 μm) with six longitudinal ribs on upper half. All marginal spicules embedded in a short chitinous sheath.

The species is well distinguished from other species of the genus *Lepidozona* by sculpture of tegmentum with keel in the jugal area and tridentate blade of major lateral tooth of radula.

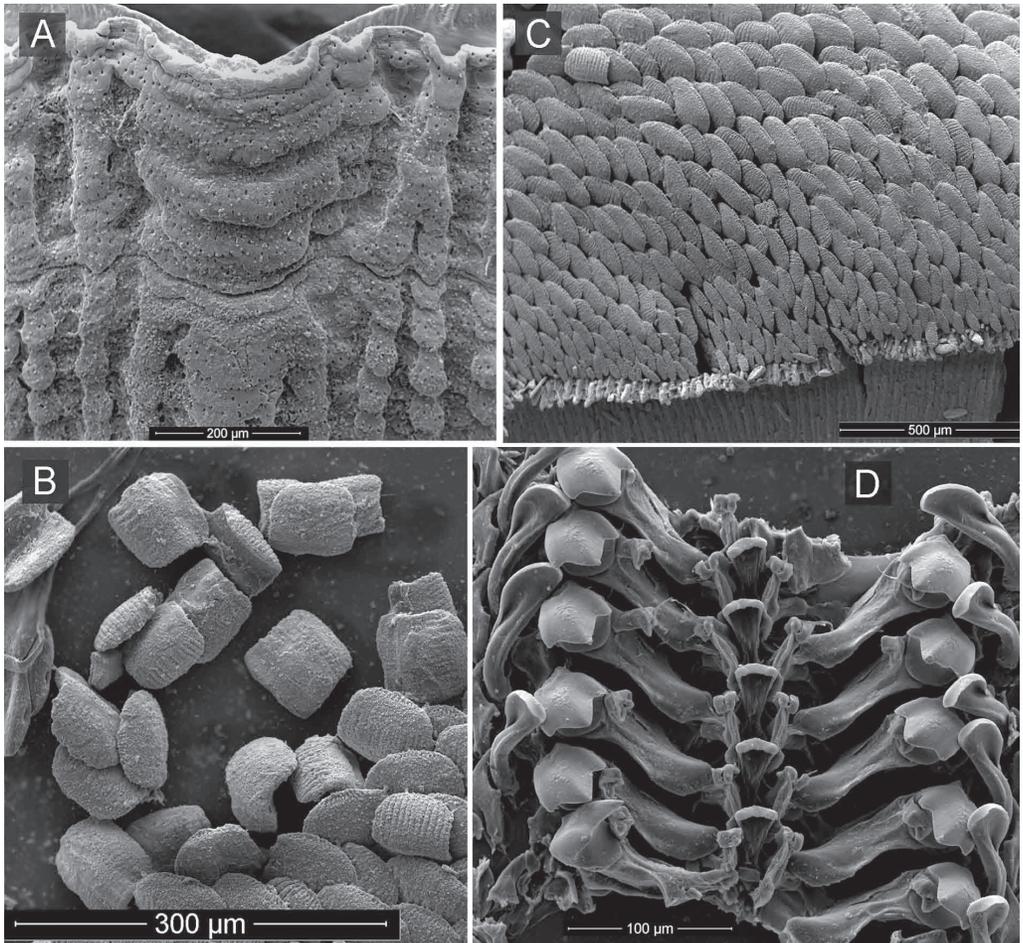


Fig. 2. *Lepidozона christiaensi*, BL 10 mm, Vietnam, 5–12 m, on *Pinna* sp; **A** – valve V, detail of tegmentum in jugal area; **B** – dorsal scales; **C** – dorsal scales, marginal spicules and ventral scales; **D** – radula.

Lepidozона bisculpta (Carpenter in Pilsbry, 1892)

Figs. 4–7, 15A–C

Ischnochiton bisculptus Carpenter in Pilsbry, 1892: p. 119; Pilsbry, 1894, p. 83, pl. 17, figs. 60–61; Ferreira, 1978, p. 39.

Ischnochiton (Lepidozона) bisculptus Carpenter in Pilsbry, 1892: Leloup, 1941, p. 4, fig. 3, pl. 2, fig. 1.

Lepidozона bisculpta (Carpenter in Pilsbry, 1892): Ferreira, 1974, p. 164; Kaas, Van Belle, 1980, p. 17.

Lepidozона (Lepidozона) bisculpta (Carpenter in Pilsbry, 1892): Kaas, Van Belle, 1987, p. 227, fig. 103, map 43; Yum, 1988, p. 15; Choe, Yum, 1989, p. 263.

Type material. Smithsonian Institution, US National Museum, USNM 24117.
Type locality. China, Hong Kong.

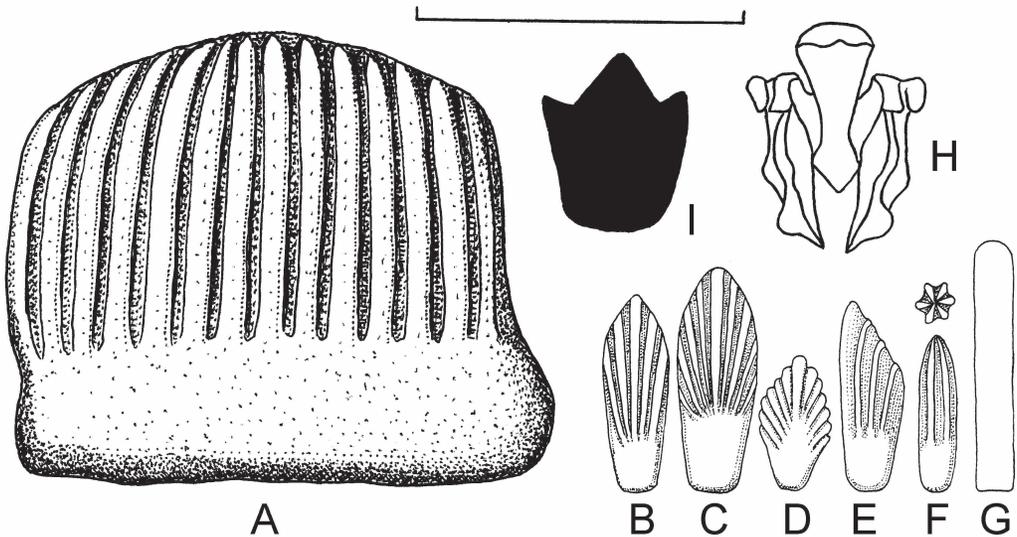


Fig. 3. *Lepidozona christiaensi*, BL 10 mm, Vietnam, 5–12 m, on *Pinna* sp; **A**–dorsal scale, **B–F** – marginal scales and spicules; **G** – ventral scale; **H** – central and first lateral tooth of radula; **I** – head of major lateral teeth of radula. Scale bar 100 μ m.

Material examined. South China Sea, Tonkin Gulf: sample 192, 21°02'09" N, 107°33'35.4" E, SCUBA, 6–7 m, on old corals embedded in sand, 2 spms, BL 4–9 mm, 03.04.2014, leg. B. Sirenko; sample 200, 21°04'21.9" N, 107°33'34.3" E, SCUBA, 16–20 m, on stones and old shell, 18 spms, BL 1.6–9 mm, 06.04.2014, leg. B. Sirenko; sample 204, 20°50'47.5" N, 107°19'19.7" E, SCUBA, 17–20 m, on stones and old shell, 1 spm, BL 8.5 mm, 07.04.2014, leg. B. Sirenko; sample 205, 20°50'47.5" N, 107°19'19.7" E, SCUBA, 12–15 m, on old shells, 1 spm, BL 17.5 mm, 07.04.2014, leg. B. Sirenko; sample 206, 20°53'58.6" N, 107°19'39.4" E, SCUBA, 17–19 m, on old shells and stones, 1 spm, BL 7.0 mm, 07.04.2014, leg. B. Sirenko; Hon Me Island; sample 215, 19°21'42.7" N, 107°19'19.7" E, SCUBA, 6 m, on *Pinna* sp., 1 spm, BL 12.5 mm, 16.04.2014, leg. B. Sirenko; **Taiwan:** N/O *Fishery Researcher I*, TAIWAN 2000, stn CP 2, 23°38.4' N, 119°53.3' E, 85 m, 2 spms, BL 7–10 mm, 27.07.2000, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 4, 23°15.9' N, 119°50.9' E, 129 m, 1 spm, BL 13 mm, 30.07.2000, leg. Ph. Bouchet, Richer, IRD and Chan.

Distribution. This is the first report of this species for Vietnam and Taiwan. *L. biscalpta* is known from west coast of Korea, Qingdao, China, Hong Kong and Vietnam.

Remarks. The studied specimen (Tonkin Gulf, sample 200), BL 8.0 mm has 20 gills ranged from valve III to valve VII, slit formula 11/1/9, radula 2.4 mm long with 26 transverse rows of mature teeth. Like previous species the specimen has more complicated composition of marginal scales than in Kaas and Van Belle [1987]. Marginal fringe composed of 5 different elements: slightly bent, smooth needles (160x15 μ m),

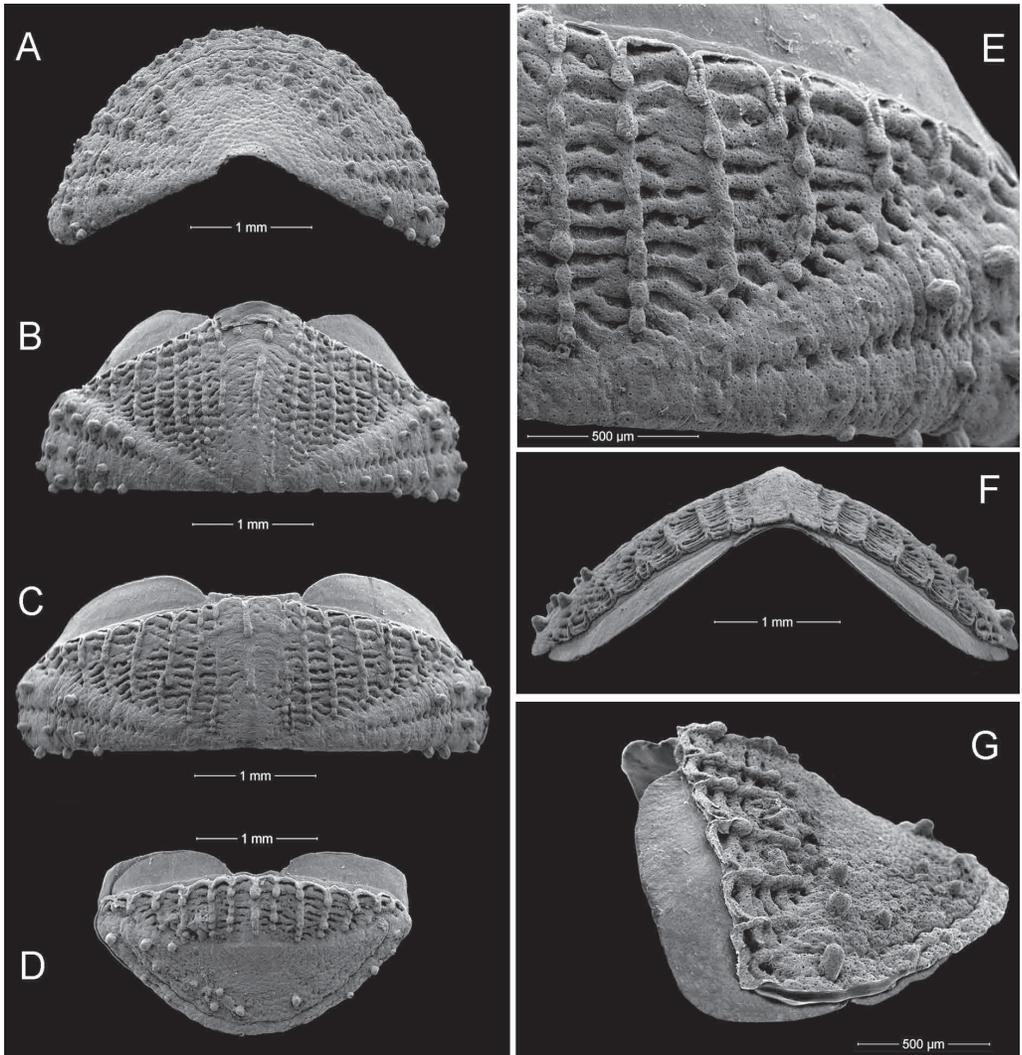


Fig. 4. *Lepidozона biscalpta*, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **A** – valve I, dorsal view; **B** – valve II, dorsal view; **C** – valve V, dorsal view, **D** – valve VIII dorsal view; **E** – valve V, detail of tegmentum in central area; **F** – valve V, rostral view; **G** – valve VIII, lateral view.

mounted on a chitinous sheath, flattened spicules, grooved in two directions (feather-like) ($86 \times 26 \mu\text{m}$), wedge shaped, obliquely grooved spicules ($80 \times 31 \mu\text{m}$), small, numerous, blunt-topped spicules ($48 \times 12 \mu\text{m}$) with longitudinal ribs on top and short obtuse scales ($42 \times 30 \mu\text{m}$).

Two specimens from Tonkin Gulf (samples 200 and 206) have abnormal number of valves: 7 valves in specimen with BL 8.0 mm and 5 valves in specimen with BL 7 mm.

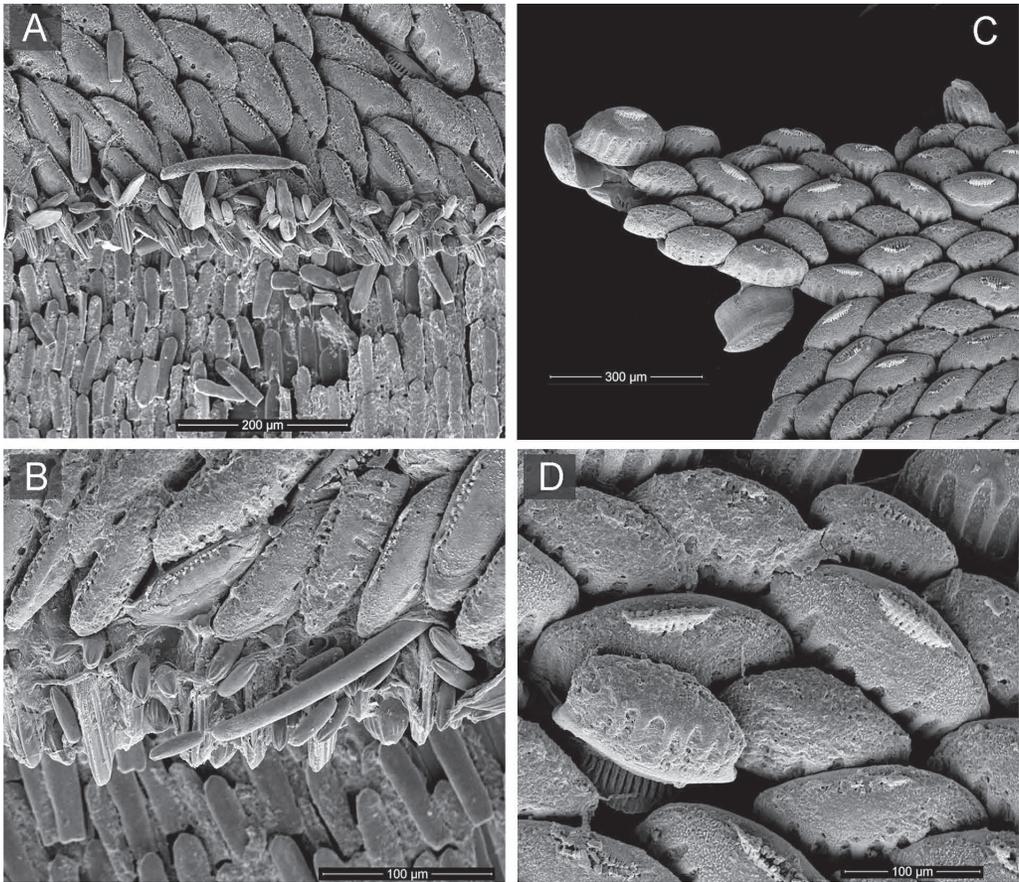


Fig. 5. *Lepidozона bisculpta*, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **A, B** – dorsal scales, marginal spicules, scales and ventral scales; **C, D** – dorsal scales.

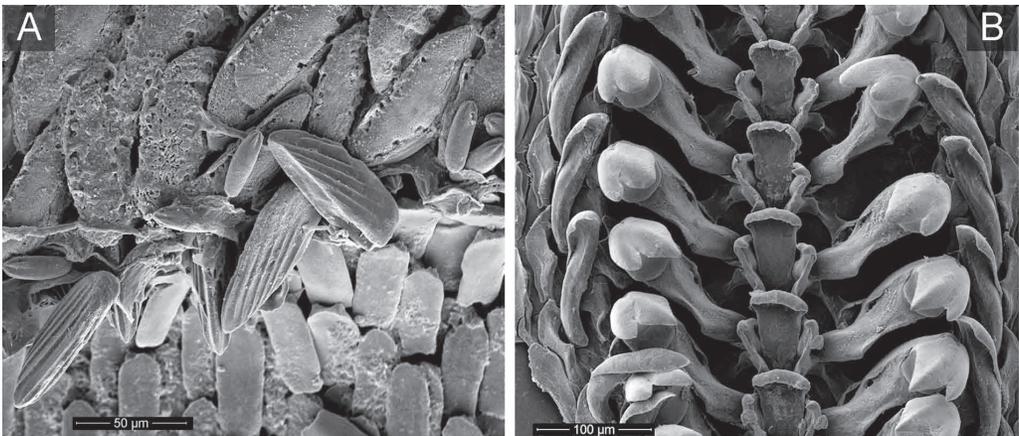


Fig. 6. *Lepidozона bisculpta*, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **A** – dorsal scales, marginal spicules, scales and ventral scales; **B** – radula.

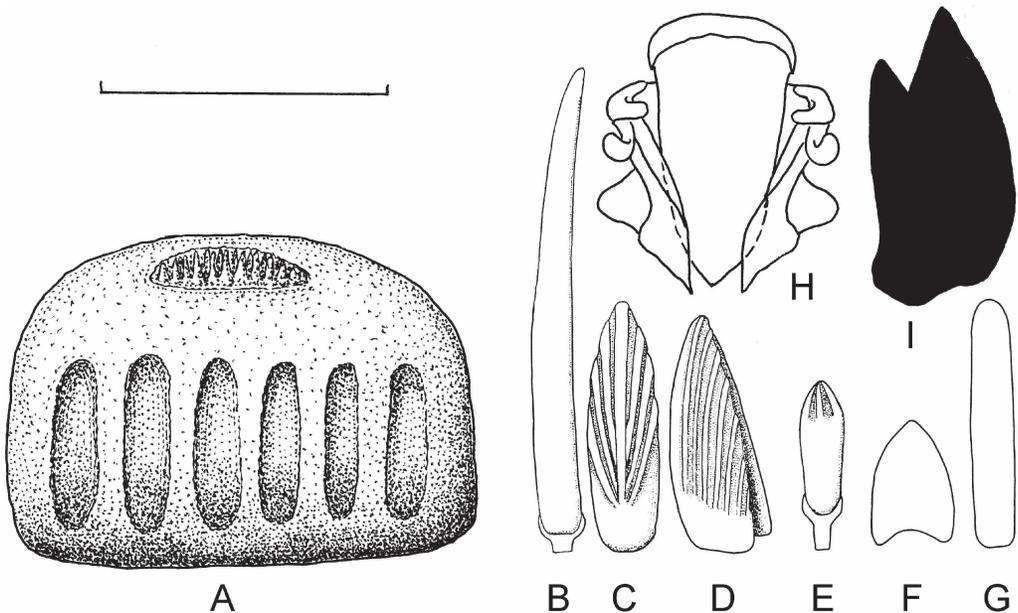


Fig. 7. *Lepidozона biscalpta*, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; A – dorsal scale; B–F – marginal needles, scales and spicules; G – ventral scale; H – central and lateral teeth of radula; I – head of major lateral tooth of radula. Scale bar 100 μ m.

L. biscalpta is very similar to *L. coreanica* (Reeve, 1847) and differs from the latter by absence of radial ribs in head valve and having 7–9 longitudinal ribs in dorsal scale (vs. 17–20 riblets in *L. coreanica*).

Lepidozона acostata Sirenko sp. nov.

Figs. 8–10, 15D, E

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Type material. Holotype (ZISP no. 2293), now disarticulated, consisting of mount of part of girdle and radula, vail with valves, part of radula and part of girdle, and 1 paratype (ZISP 2294).

Type locality. South China Sea, 10°33' N, 109°43' E, depth 310 m.

Etymology. The name is Latin for 'without ribs', in reference to the head valve which has no radial ribs.

Material examined. **South China Sea, near Vietnam**, R/V *Odissey*, trawl 159, 10°33' N, 109°43' E, depth 310 m, holotype (ZISP no. 2293), BL 8.0 mm, 1 paratype (ZISP 2294), BL 4.5 mm, 24.09.1984, leg. B. Sirenko; **Taiwan**: TAIWAN 2001, Fishing Boat *Chung Tung Long No. 26*, stn CP 72, 24°52.3' N, 122°04.5' E, depth 760 m, 1 spm, BL 7 mm, 06.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 76, 24°56.5' N,

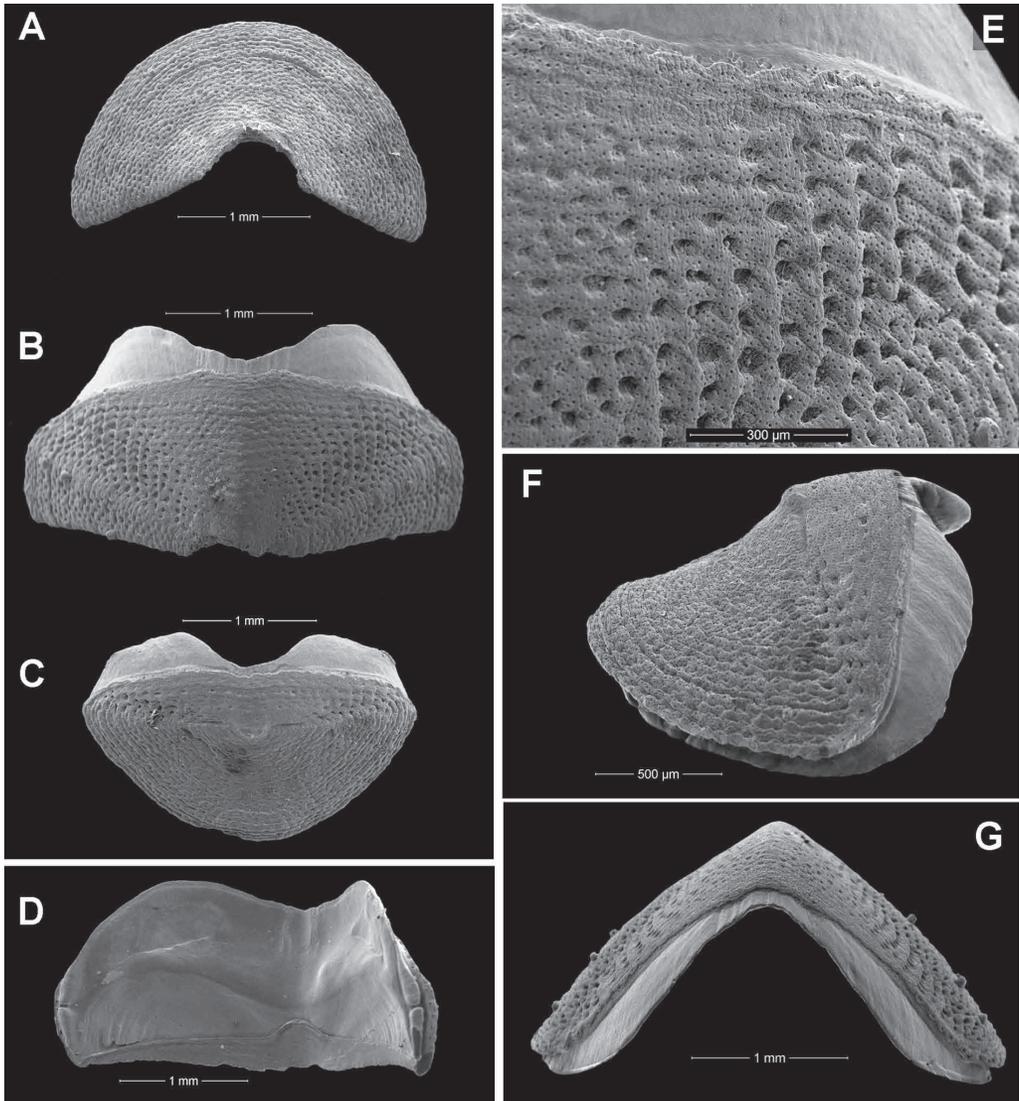


Fig. 8. *Lepidozona acostata*, holotype, BL 8 mm, south Vietnam, R/V *Odissey*, trawl 59, 310 m, on sunken wood; **A** – valve I, dorsal view; **B** – valve V, dorsal view, **C** – valve VIII, dorsal view; **D** – valve V, ventral view; **E** – valve V, detail of tegmentum in central area; **F** – valve VIII, lateral view; **G** – valve IV, rostral view.

122°01.5' E, depth 115–170 m, 1 spm, BL 11 mm, 07.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 79, 24°50.4' N, 121°59.9' E, depth 145–200 m, 1 spm, BL 9 mm, 08.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 89, 24°53.6' N, 122°01.4' E, depth 310–420 m, 2 spms, BL 4.5–12.0 mm, 09.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 91, 24°50.6' N, 122°01.4' E, depth 400 m,

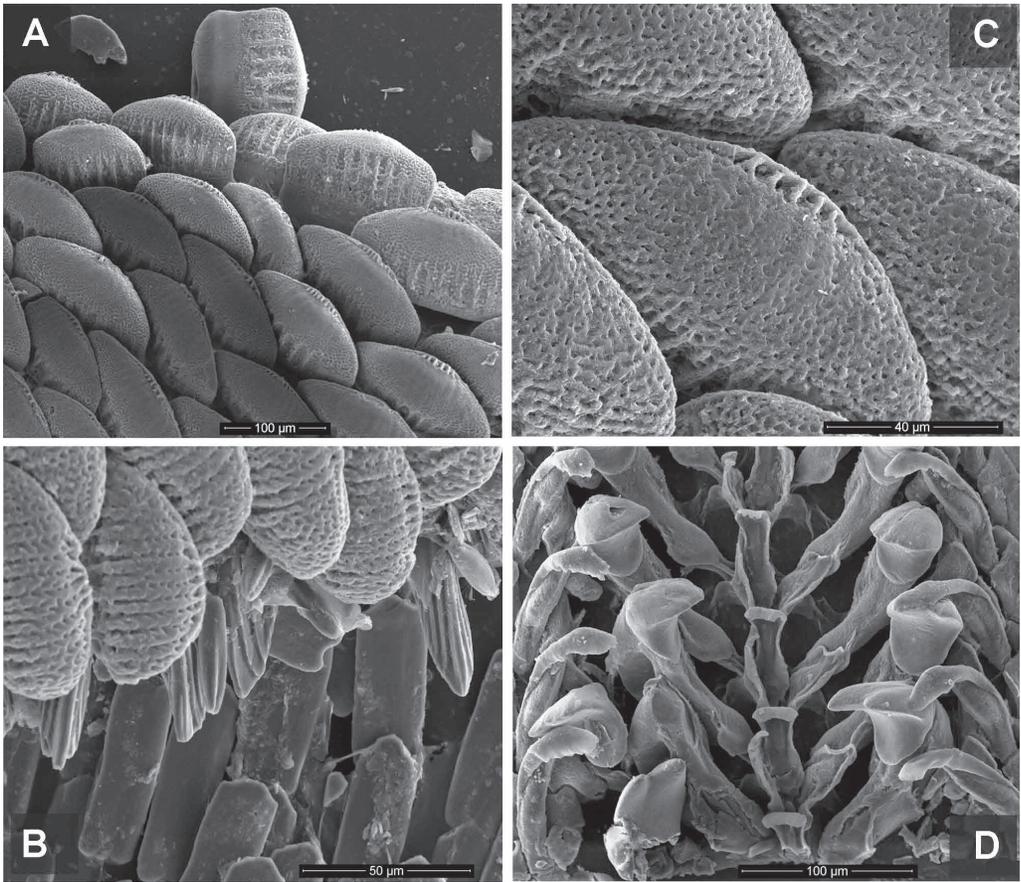


Fig. 9. *Lepidozона acostata*, holotype, BL 8 mm, south Vietnam, R/V *Odissey*, trawl 59, 310 m, on sunken wood; **A**, **C** – dorsal scales; **B** – dorsal scales, marginal spicules and scales, ventral scales; **D** – radula.

6 spms, BL 7–11 mm, 10.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 98, 24°54.2' N, 122°02.9' E, depth 362–400 m, 2 spms, BL 6.5–11 mm, 18.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 107, 24°48.2' N, 122°11.3.0' E, depth 335–420 m, 4 spms, BL 4–6 mm, 20.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 109, 24°48.3' N, 122°84.0' E, depth 246–256 m, 6 spms, BL 6–11 mm, 20.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 109, 24°48.3' N, 122°84.0' E, depth 246–256 m, 6 spms, BL 6–11 mm, 20.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 110, 24°48.3' N, 122°04.0' E, depth 316–350 m, 4 spms, BL 10–12 mm, 20.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan; stn CP 115, 24°53.9' N, 122°02.0' E, depth 381–440 m, 3 spms, BL 9–10 mm, 21.05.2001, leg. Ph. Bouchet, Richer, IRD and Chan.

Distribution. South China Sea, near Vietnam, and East China Sea, near Taiwan, 170–760 m.

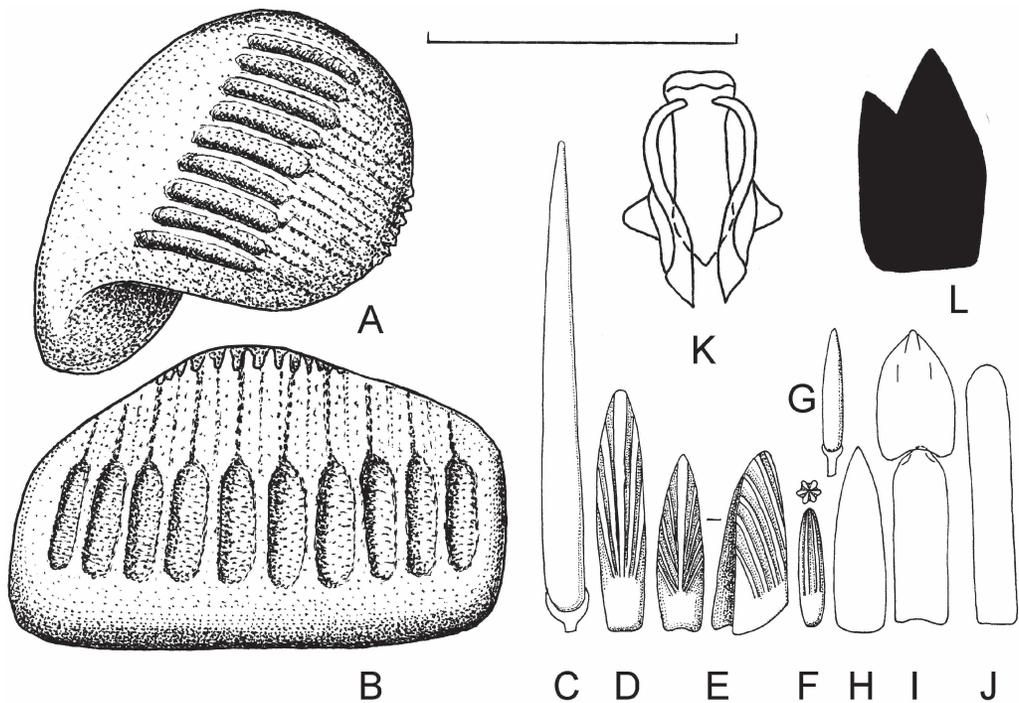


Fig. 10. *Lepidozona acostata*, **holotype**, BL 8 mm, south Vietnam, R/V *Odissey*, trawl 59, 310 m, on sunken wood; **A, B** – dorsal scales; **C–I** – marginal needle, scales and spicules; **J** – ventral scale; **K** – central and lateral teeth of radula; **L** – head of major lateral tooth of radula. Scale bar 100 μ m.

D i a g n o s i s. Animal of small size, oval, moderately raised, carinated, valves not beaked. Head valve without radial ribs, sculptured with granules arranged quincuncially, lateral areas of intermediate valves sculptured like head valve and bearing up to 3 small rounded tubercles. Apophyses connected with rather long, not interrupted jugal plate. Postmucronal slope of tail valve convex. Dorsal scales with 9–12 obsolete ribs and with a very short striated, nipple-like prolongation near the top. Central tooth of radula narrow, bulging at the base, narrowed in the middle, distally widening to a strong convex blade, head of major lateral tooth bidentate, outer denticle rather smaller than inner one.

D e s c r i p t i o n. Holotype 8.0x4.6 mm, valves moderately elevated (dorsal elevation 0.56), carinated, not beaked. Color of tegmentum uniform cream to pale yellow, peppered with brown spots.

Head valve semicircular, slightly wider than tail valve, hind margin widely V-shaped, notched in the middle, tegmentum sculptured with very small, shallow pits arranged in a random manner. Intermediate valves broadly rectangular, front margin concave in the jugal part, convex at the pleural parts which are somewhat narrowing towards the sides, side margins slightly rounded, posterior margin about straight, central areas sculptured with small shallow pits arranged in a random manner in jugal part and in longitudinal rows in pleural parts, lateral areas weakly raised, sculptured with

flattened diagonal rib ornamented with 2–3 round, elevated pustules. Tail valve with anterior mucro, antemucronal slope slightly convex, postmucronal slope little concave, antemucronal area sculptured like central area of intermediate valve, postmucronal area sculptured like head valve.

Articulamentum white, smooth, apophyses small, triangular, connected across the shallow sinus by a short, concave, distally slightly denticulated jugal plate, slit formula 10/1/9, slit rays indicated, not prominent, teeth short.

Girdle narrow (0.7 mm wide near valve V), dorsally covered with slightly bent, small, obsolete longitudinally ribbed (9–12 ribs) scales (167x130) with a very short, striated nipple-like prolongation near the top. Marginal spicules of several kinds: long smooth needles (155x14 µm), flattened spicules, grooved in two directions (feather-like) (80x18 µm), wedge-shaped, obliquely grooved spicules (58–60x23 µm), numerous, small, blunt-topped spicules (40x10 µm), small, narrow, smooth spicules (40x8 µm), bluntly pointed, smooth scales (60x20 µm) and triangle scales with one short rib on top. All marginal spicules embedded in a short chitinous sheath. Ventrally girdle covered with long rectangular scales (85x13 µm).

Radula of holotype 2.7 mm long with 31 transverse rows of mature teeth. Central tooth elongate, slightly pinched in the middle, widening to a strong blade, major lateral tooth with sharply pointed bidentate head, interior denticle the longest.

Fourteen gills per side arranged from valve IV to valve VII.

R e m a r k s. The new species is very similar to *Lepidozona reevei* Kaas et Van Belle, 1987 from «Japan», but differs from it by having tegmentum sculptured with very small, shallow pits arranged in a random manner (vs. tegmentum sculptured with numerous obsolete, radial riblets in *L. reevei*), central areas sculptured with small shallow pits arranged in a random manner in jugal part and in longitudinal rows in pleural parts (vs. central areas with numerous, very fine, longitudinal, interrupted grooves in *L. reevei*), flattened diagonal rib of intermediate valve ornamented with 2–3 round, elevated pustules (vs. no pustules in *L. reevei*), anterior mucro (vs. central mucro in *L. reevei*). Moreover *L. reevei* is twice the size (up to 24 mm) of *L. acostata* sp. nov. (up to 12 mm).

An intermediate valve of a specimen from the Suruga Bay, illustrated in Saito [1997] (Fig. 13) is very similar to *L. acostata* sp. nov. and may belong to it. In that case the type locality of *L. reevei* will be in question; the vague locality «Japan» was provided at the commercial purchase of the type material by the original authors and was considered with reservation [Kaas, Van Belle, 1987].

Lepidozona excellens Sirenko sp. nov.

Figs. 11–14, 15F

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T y p e. The holotype (ZISP no. 2295), now disarticulated consisting of mount of part of girdle and radula, vail with valves, part of radula and part of girdle, and 3 paratypes (ZISP 2296).

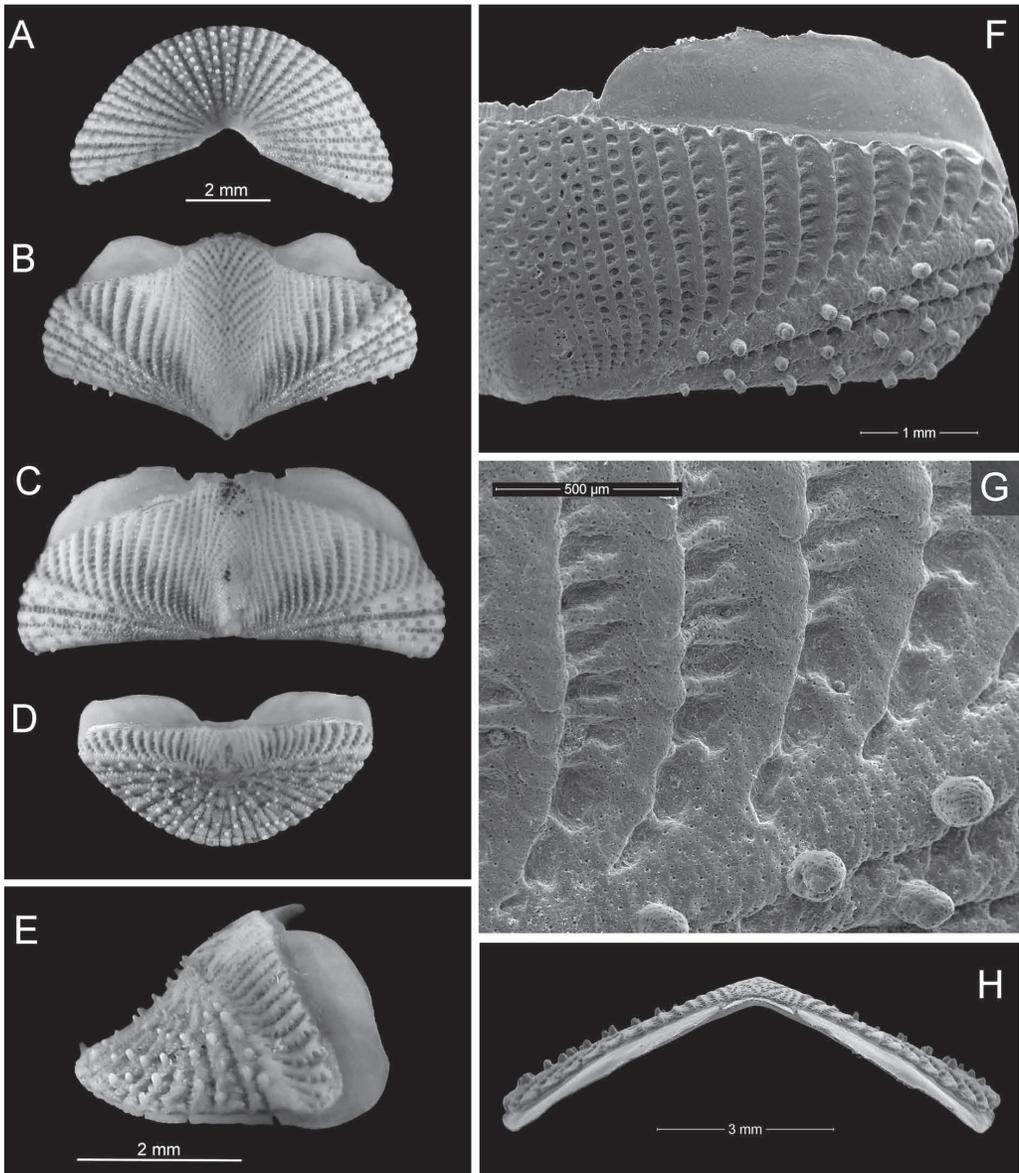


Fig. 11. *Lepidozonia excellens*, holotype, BL 18.0 mm, Philippine Sea, R/V *Odissey*, stn 37, 380–420 m; **A** – valve I, dorsal view; **B** – valve II, dorsal view; **C** – valve V, dorsal view, **D** – valve VIII dorsal view; **E** – valve VIII, lateral view; **F** – valve VII, detail of tegmentum in jugal, central and lateral areas; **G** – valve VII, detail of tegmentum in, central and lateral areas; **H** – valve V, rostral view.

Type locality. Philippine Sea, 26°46' N, 135°4' E, depth 380–420 m.

Etymology. The name is Latin for splendid sculpture of tegmentum.

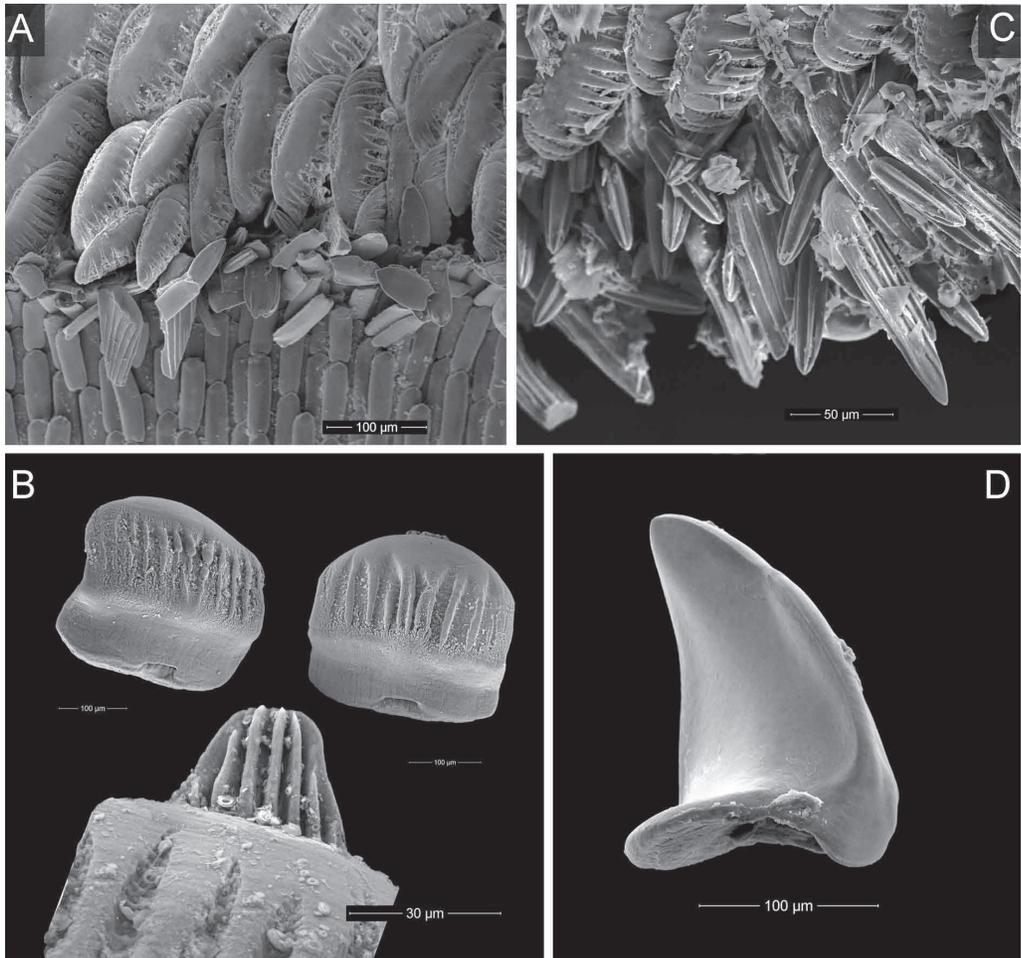


Fig. 12. *Lepidozona excellens*, **holotype**, BL 18.0 mm, Philippine Sea, R/V *Odissey*, stn 37, 380–420 m; **A, C** – dorsal scales, marginal spicules, scales and ventral scales; **B** dorsal scales; **D** – head of major lateral tooth of radula.

Material examined. Philippine Sea, 26°46' N, 135°4' E, depth 380–420 m, R/V *Odissey*, stn 37, holotype (ZISP no. 2295), BL 18.0 mm, 3 damaged paratypes (ZISP no. 2296), BL 18–24 mm, 04.02.1985, leg. M. Kolesnikov.

Distribution. Known only from the type locality.

Diagnosis. Animal of moderate size, oval, little raised, carinated, valves not beaked, except valve II. Head valve sculptured with well elevated radiating ribs, each rib composed of round pustules, central areas of intermediate valves with about 20 longitudinal elevated inwardly curving ribs, interstices decidedly latticed, jugal part of valve II with a feather-like figure, formed by forwardly diverging riblets. Postmucronal slope of

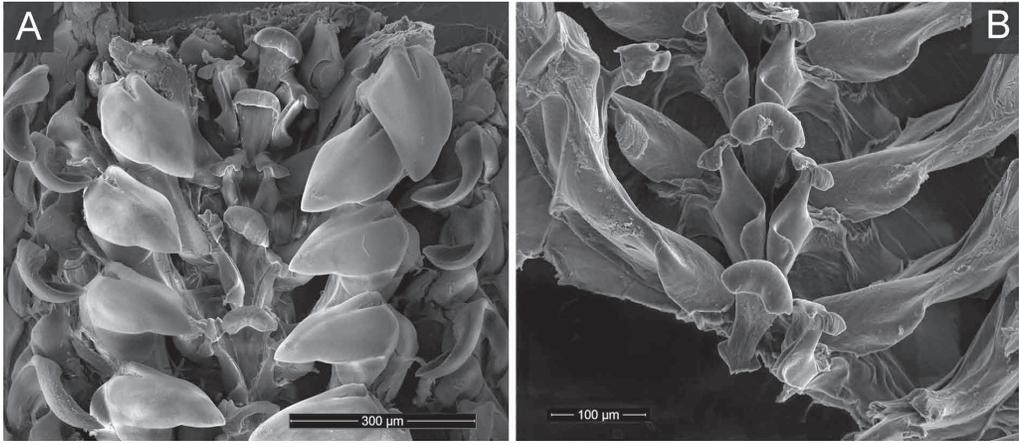


Fig. 13. *Lepidozона excellens*, holotype, BL 18.0 mm, Philippine Sea, R/V *Odissey*, stn 37, 380–420 m; A, B – radula.

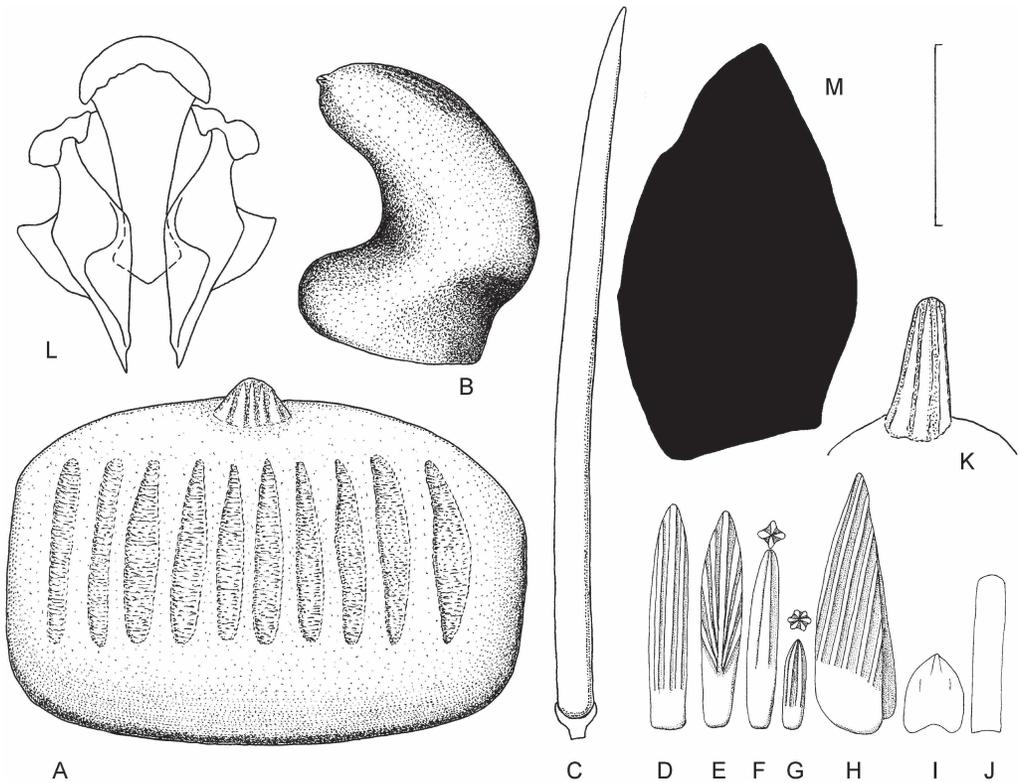


Fig. 14. *Lepidozона excellens*, holotype, BL 18.0 mm, Philippine Sea, R/V *Odissey*, stn 37, 380–420 m; A, B – dorsal scales; C–I – marginal needle, scales and spicules; J – ventral scale; K – nipple projection on dorsal scale; L – central and lateral teeth of radula; M – head of major lateral tooth of radula. Scale bar 100 µm.

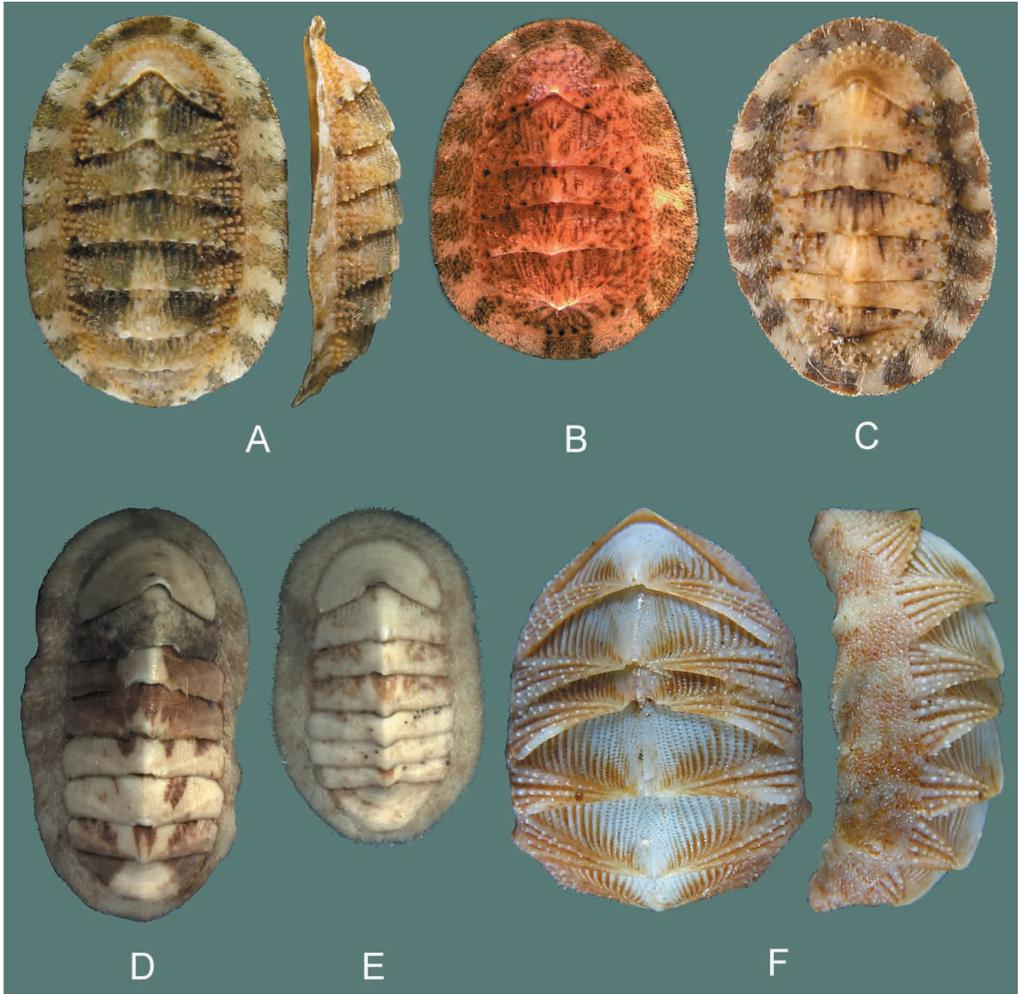


Fig. 15. Color images of species of genera *Lepidozona*. **A** – *Lepidozona bisculpta*, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **B** – *Lepidozona bisculpta*, with 5 valves, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **C** – *Lepidozona bisculpta*, with 7 valves, BL 8 mm, Vietnam, Tonkin Bay, 6–7 m, on old corals; **D** – *Lepidozona acostata*, holotype, BL 8 mm, south Vietnam, R/V *Odissey*, trawl 59, 310 m, on sunken wood; **E** – *Lepidozona acostata*, paratype, BL 8 mm, south Vietnam, R/V *Odissey*, trawl 59, 310 m, on sunken wood; **F** – *Lepidozona excellens*, holotype, BL 18.0 mm, Philippine Sea, R/V *Odissey*, stn 37, 380–420 m.

tail valve convex. Dorsal scales bent, with 9–11 narrow ribs and with a short, striated, nipple-like prolongation near the top. Central tooth of radula narrow, distally widening to a strong convex blade, head of major lateral tooth unidentate.

Description. Holotype of moderate size, BL 18.0 mm, valves low elevated (dorsal elevation 0.27), carinated, not beaked. Color of tegmentum bluish white in central portion of intermediate valves and creamy in other areas and girdle.

Head valve semicircular, slightly wider than tail valve, posterior margin widely V-shaped, notched in the middle, tegmentum sculptured with well elevated radiating ribs, each rib composed of round pustules, Intermediate valves broadly rectangular, front margin concave in the jugal part, and splayed laterally, anterior margin of the jugal part clearly forwardly produced, side margins slightly rounded, posterior margin about straight, central areas sculptured with about 20 longitudinal elevated inwardly curving ribs per side, interstices decidedly latticed, jugal part of valve II with a feather-like figure, formed by forwardly diverging riblets, lateral areas visibly raised, sculptured with 5–6 well elevated diagonal bifurcated ribs ornamented with round, elevated pustules. Tail valve with anterior mucro, antemucronal slope straight, postmucronal slope little concave, antemucronal area sculptured like central area of intermediate valve, postmucronal area sculptured like head valve.

Articulamentum white, with two creamy streaks radiating from the apices, smooth, apophyses wide, semi-oval, connected across the shallow sinus by a short, concave, slightly denticulated jugal plate, weakly notched at the sides, slit formula 10/1/10, slit rays hardly indicated, teeth sharp, eaves very narrow, solid.

Girdle of moderate width, 0.7 mm wide near valve V, (width of the valve 12 mm), dorsally covered with slightly bent, small, obsoletely longitudinally ribbed (10–11 ribs) large scales (270x300), some of them with a striated, nipple-like prolongation near the top. Marginal spicules of several kinds: long smooth needles (400x20 μm), flattened spicules (130x22 μm) with 2–3 longitudinal ribs on dorsal side, flattened spicules grooved in two directions (feather-like) (122x24 μm), spicules with 4 longitudinal ribs around whole spicule (103x18 μm), short spicules (52x12 μm) with 6 longitudinal ribs around whole spicule, wedge-shaped, obliquely grooved spicules (150x47 μm), and short, triangle scales with one small rib on top. Ventrally girdle covered with long rectangular scales (90x18 μm).

Radula of holotype 7.3 mm long with 28 transverse rows of mature teeth. Central tooth of radula narrow, distally widening to a strong convex blade, head of major lateral tooth unidentate.

Twenty-eight gills per side arranged from valve II to valve VIII.

Gut contained mainly detritus, a few foraminiferans and sand.

Remarks. The new species is similar to *Lepidozona clathrata* (Reeve, 1847) from the Gulf of California and *L. cooperi* (Carpenter in Dall, 1879) from the western coast of North America in the sculpture of their tegmentum. The new species differs from both those species in having an anterior mucro of the tail valve (vs. central in *L. clathrata* and *L. cooperi*), the jugal part of valve II with a feather-like figure (vs. with wedge-like figure in *L. clathrata* and *L. cooperi*), and inwardly curving longitudinal ribs in pleural parts of intermediate valves (vs. straight longitudinal ribs in *L. clathrata* and *L. cooperi*). Moreover *L. excellens* sp. nov. has dorsal scales with longitudinal ribs (vs. practically smooth in *L. clathrata*).

Acknowledgements

I would like to thank Philippe Bouchet (MNHN) for the loan of specimens, Temir Britayev (IEE RAS), Oleg Savinkin (IEE RAS), Sergey Grebelny (ZISP) and our Vietnamese and Russian colleagues from the Russian-Vietnamese Tropical Center who help me to collect material; Mihael Blikshiteyn (Portland, Oregon, USA) for polishing my English, Alexey Miroljubov (ZISP) for his technical assistance with SEM procedures, an anonymous reviewer who improved my manuscript and Galina Kuznetsova (ZISP) who prepared the digital plates.

References

- Choe B.L., Yum S.S. 1989. Marine invertebrate fauna of Oeyon Islands // Report on the Survey of Natural Environment in Korea. N 8. P. 257–278.
- Clark R.N. 2000. Three new chitons of the genus *Lepidozona* Pilsbry, 1892 (Polyplacophora: Ischnochitonidae) from the Aleutian Islands // *Nemouria*. Occasional Papers of the Delaware Museum of Natural History. N 42. P. 1–16.
- Clark R.N. 2008. Two new chitons of the genus *Tripoplax* Berry, 1919 from the Monterey Sea Canyon // *American Malacological Bulletin*. V. 25. P. 77–86.
- Ferreira A. 1974. The genus *Lepidozona* in the Panamic Province, with the descriptions of two new species (Mollusca: Polyplacophora) // *Veliger*. V. 17, N 2. P. 162–180.
- Ferreira A. 1978. The genus *Lepidozona* (Mollusca: Polyplacophora) in the temperate eastern Pacific, Baja California to Alaska, with the description of a new species // *Veliger*. V. 21, N 1. P. 19–44.
- Kaas P., Van Belle R.A. 1980. Catalogue of Living Chitons. Rotterdam: W. Backhuys. 144 p.
- Kaas P., Van Belle R.A. 1987. Monograph of Living Chitons. Vol. 3. Suborder Ischnochitonina: Ischnochitonidae: Chaetopleurinae, and Ischnochitoninae. Leiden: E.J. Brill/W. Backhuys. 302 p.
- Leloup E. 1941. Quatre Ischnochitons de Tsingtao (Chine) // *Bulletin du Musée royal d'Histoire naturelle de Belgique*. V. 7, N 18. P. 1–15.
- Pilsbry H.A. 1892–1894. Monograph of the Polyplacophora // G.W. Tryon. *Manual of Conchology*. Philadelphia: Academy of Natural Sciences. Vol. 14. P. 1–128, pls. 1–30 [1892]; P. 129–350, pls. 31–68 [1893]; Vol. 15. P. 1–64, pls. 1–10 [1893]; P. 65–133, pls. 11–17 [1894].
- Saito H. 1997. Deep-sea chiton fauna of Suruga Bay (Mollusca: Polyplacophora) with description of six new species // *National Science Museum Monographs*. N 12. P. 31–58.
- Saito H. 2013. A new species of *Lepidozona* (Mollusca, Polyplacophora, Ischnochitonidae) from Okinawa Trough, East China Sea // *Bulletin of National Museum of Nature and Science, Series A*. V. 39, N 1. P. 5–10.
- Sirenko B.I. 2013. Class Polyplacophora // *Check-List of Species of Free-Living Invertebrates of the Russian Far Eastern Seas*. B.I. Sirenko (Ed.). St. Petersburg: Zoological Institute, Russian Academy of Sciences. P. 8–12. (Explorations of the Fauna of the Seas. V. 75(83)).
- Sirenko B.I. 2016. Two new rare chitons of the genus *Stenosemus* (Mollusca: Polyplacophora: Ischnochitonidae) // *Zoosystematica Rossica*. V. 25, N1. P. 3–12.
- Strack H.L. 1991. Description of a new *Leptochiton* from the Azores and of a new *Lepidozona* from Vietnam // *Bulletin du Muséum National d'Histoire Naturelle de Paris, 4e série*. V. 13A, N 1–2. P.49–59.
- Van Belle R.A. 1982. Supplementary notes on Hong Kong chitons (Mollusca: Polyplacophora) // *Proceedings of the First International Marine Biology Workshop, Hong Kong*. Hong Kong: Hong Kong Univ. Press. P. 469–483.
- Yum S.S. 1988. Classification and distribution of the Korean Polyplacophora (Mollusca): M.Sc. Thesis. Suwon: Sung Kyun Kwan University. 104 p.