

## *Stenosemus undatopleuralis* sp. nov. (Mollusca: Polyplacophora) from Northeast Pacific

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**ABSTRACT.** Described is a new species of the genus *Stenosemus* from the Gulf of Alaska. It differs from the other species of this genus from the Northeast Pacific by having longitudinal undulating folds in the pleural areas of the intermediate valves, flattened, smooth dorsal calcareous corpuscles on perinotum and rectangular central teeth of radula.

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*Stenosemus undatopleuralis* sp. nov. (Mollusca: Polyplacophora) из северо-восточной Пацифики

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**РЕЗЮМЕ.** Описан новый вид рода *Stenosemus* из залива Аляска. Новый вид отличается от других видов этого рода, обитающих в северо-восточной Пацифике, наличием волнистых, продольных складок на плевральных полях промежуточных щитков, уплощенными, гладкими дорсальными известковыми корпускулами на перинотуме, прямоугольными центральными зубами радулы.

### Introduction

*Stenosemus* is the most geographically widespread and one of the most species diverse chiton genus. Its representatives can be found in the Arctic and Antarctic waters, from intertidal to bathyal zones, in boreal and natal waters. At lower latitudes, they can be found at large depths. Throughout their range, these species live at temperatures below 14°–15°C. According to WoRMS, a total of 26 species have been described for this genus, most of which live in the Pacific Ocean. Of the 6 known species from the northern Pacific, 5 species have been described from the western area: *Stenosemus albus* (Linnaeus, 1767); *S. golikovi* Sirenko, 1994; *S. sharpi* (Pilsbry, 1896); *S. kolesnikovi* Sirenko, 1994 and *S. moskalevi* Sirenko, 2016 [Kaas, Van Belle, 1990; Sirenko, 1994; 2013;

2016]. Of these 6 known species, 4 species are also found in the eastern area: *S. albus*; *S. golikovi*; *S. sharpi* and *S. stearnsii* (Dall, 1902) [Kaas, Van Belle, 1990; Clark, 2002]. The new species, described below, equalizes the number of *Stenosemus* species in both parts of the northern Pacific.

### Material and methods

The only specimen of the new species was collected during 45 cruise of R/V *Vitjaz* near North America. It was prepared for the study under the scanning electron microscopy (FEI SEM Quanta 250) and light microscopy (Leica MZ 9.5) by using common method described in Sirenko [2016].

**Abbreviations:** BL, body length. IEE RAS, A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia. ZIN, Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia. WoRMS, World Register of Marine Species.

### Taxonomy

Class Polyplacophora Gray, 1821  
Subclass Loricata Schumacher, 1817  
Order Chitonida Thiele, 1909  
Family Ischnochitonidae Dall, 1889  
Genus *Stenosemus* Middendorff, 1847

**Type species.** *Chiton albus* Linnaeus, 1767, by subsequent designation by Winckworth, 1926.

= *Lophyrus* G.O. Sars, 1878 (non *Lophyrus* Poli, 1791, nom. null.); *Chondropleura* Thiele, 1906; *Lepidopleuroides* Thiele, 1928; *Lophyrochiton* Jakovleva, 1952

**Genus distribution.** Worldwide, intertidal to 4572 m. Miocene-Recent.

*Stenosemus undatopleuralis* sp. nov.  
(Figs 1–5)

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**Type material.** Holotype (ZIN 2454), damaged, now disarticulated, consisting of mounts of shell, perinotum and radula.

**Type locality.** Northeast Pacific, Gulf of Alaska, 55°23.7'N, 134°12.0'W, 532 m (R/V *Vityaz*, cruise 45, station 6126, «Ocean» grab).

**Etymology.** The specific name is two Latin objectives *undatus* (undulating) and *pleuralis*, reflecting pleural areas of intermediate valves are undulating.

**Distribution.** Only known from the type locality.

**Diagnosis.** Animal of small size, BL of the holotype 6.0 mm, oval, shell rather elevated, distinctly carinated, intermediate valves not beaked, pleural areas of intermediate valves with longitudinal undulating folds. Lateral areas weakly raised. Aesthete pores arranged in radiating rows on head valve, lateral areas of intermediate valves and postmucronal areas. Jugal plates absent. Slit formula 14/1–2/16. Girdle dorsally covered with juxtaposed, flattened, slightly bent, smooth spicules with pit on top. Central teeth of radula long, rectangular, major lateral teeth

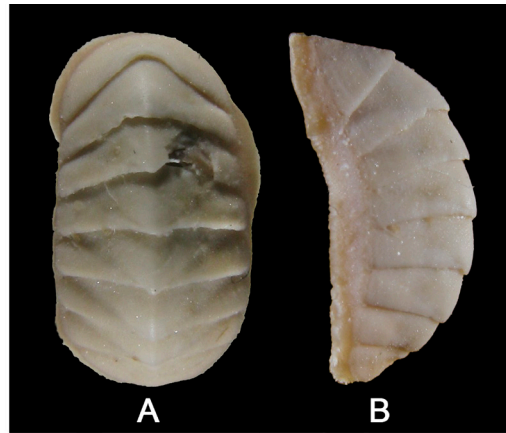


FIG. 1. *Stenosemus undatopleuralis* sp. nov., holotype (ZIN 2454), Gulf of Alaska, northeast Pacific, BL–6.0 mm. **A.** Whole specimen, dorsal view. **B.** Whole specimen, lateral view.

РИС. 1. *Stenosemus undatopleuralis* sp. nov., голотип (ZIN 2454), Залив Аляска, северо-восточная Пацифика, BL–6.0 мм. **A.** Целый экземпляр, вид сверху. **B.** Целый экземпляр, вид сбоку.

of radula with a bidentate head, main denticle long and sharply pointed, accompanied by a very small outer denticle.

**Description.** Holotype small, body length 6.0 mm, all valves broken. Valves moderately elevated, carinated, not beaked. Color of tegmentum in

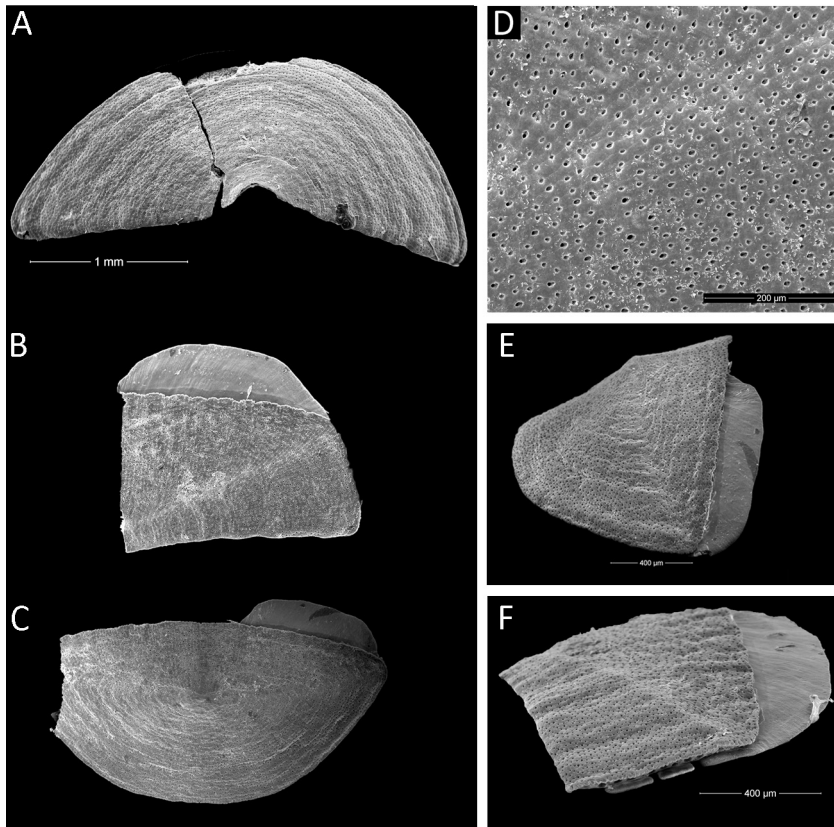


FIG. 2. *Stenosemus undatopleuralis* sp. nov., holotype. **A.** Head valve I, dorsal view. **B.** Part of intermediate valve, dorsal view. **C.** Tail valve, dorsal view. **D.** Intermediate valve, sculpture in central and lateral areas. **E.** Tail valve, lateral view. **F.** Part of intermediate valve, sculpture in lateral area and in pleural part of central area

РИС. 2. *Stenosemus undatopleuralis* sp. nov., голотип. **A.** Головной щиток, вид сверху. **B.** Часть промежуточного щитка, вид сверху. **C.** Хвостовой щиток, вид сверху. **D.** Промежуточный щиток, скульптура бокового поля и плевральной части центрального поля. **E.** Хвостовой щиток, вид сбоку. **F.** Часть промежуточного щитка, скульптура бокового поля и плевральной части центрального поля.

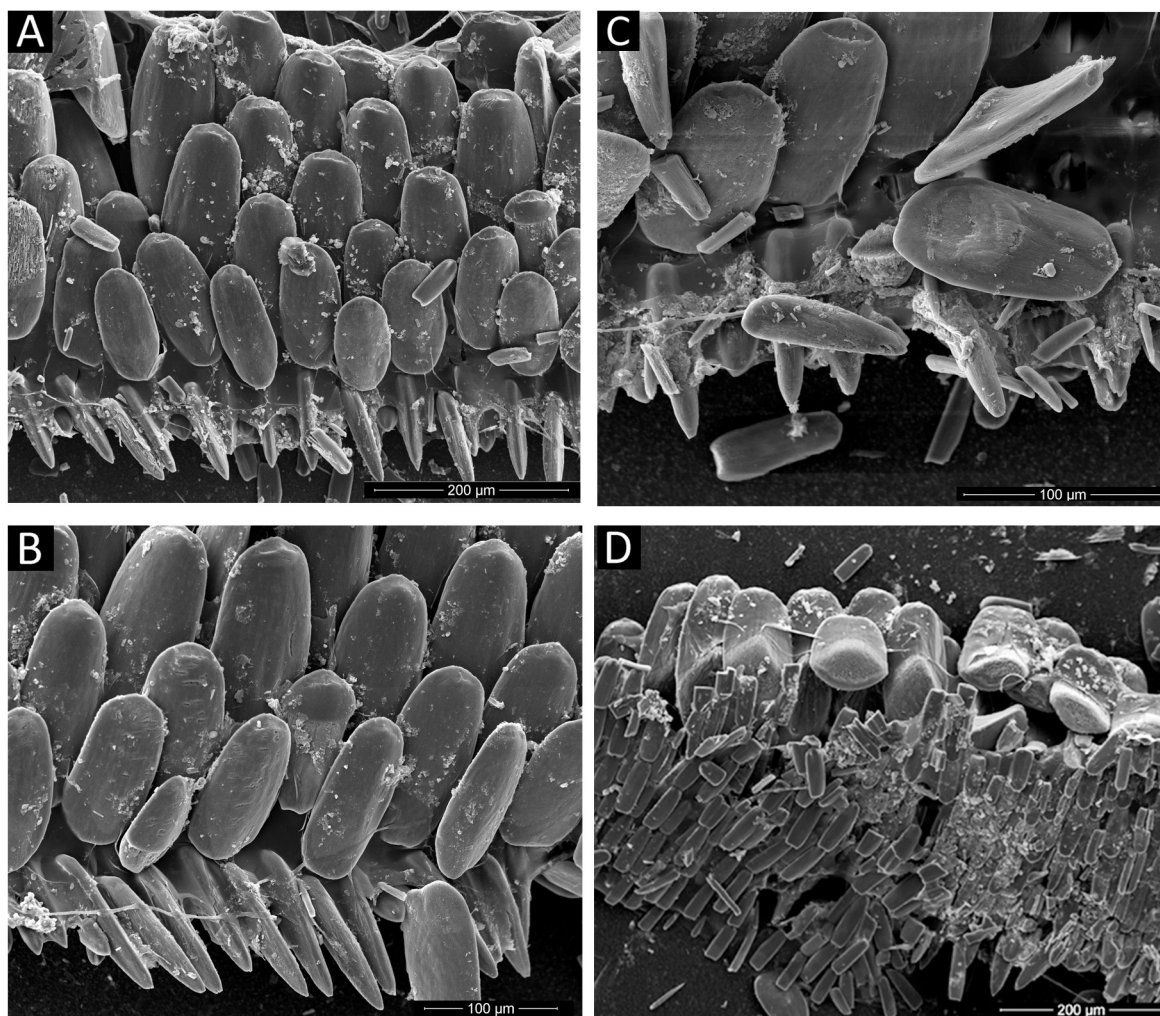


FIG. 3. *Stenosemus undatopleuralis* sp. nov., holotype. A, B. Dorsal calcareous corpuscles and marginal spicules. C, D. Dorsal calcareous corpuscles, marginal spicules and ventral scales.

РИС. 3. *Stenosemus undatopleuralis* sp. nov., голотип. А, В. Дорсальные известковые корпускулы и маргинальные спикулы. С, D. Дорсальные известковые корпускулы, маргинальные спикулы и ventральные чешуйки.

preservation white, slightly rose. Head valve semi-circular, posterior margin widely V-shaped, clearly notched in the middle, sculptureless, except for some faint concentric growth line. Intermediate valves broadly rectangular, front margin slightly convex, side margins and posterior margin straight, lateral areas weakly raised, pleural part of central areas with longitudinal undulating folds, lateral areas sculptured like head valve. Tail valve noticeably smaller than head valve, mucro anterior, little elevated, anterior and posterior slopes slightly concave, postmucronal area sculptured like head valve.

Articulamentum thin, translucent, apophyses short and wide, jugal plate absent, insertion plates short, slit formula 14/1–2/16, teeth sharp, slit rays weakly perceptible, eaves very narrow with rare, small pores.

Girdle relatively narrow, about 0.2 mm in width near valve V, covered dorsally with juxtaposed, flat-

tened, slightly bent, smooth calcareous corpuscles with pit on top (110–200 x 53–75 μm). Marginal fringe composed of two kinds of spicules: small one (40 x 8 μm) on bristle (up to 60–80 μm) and much longer, smooth sharply pointed spicules (100–114 x 20 μm). Ventrally the girdle is covered with radiating rows of short, rectangular scales (70 x 26 μm).

Radula of the holotype is 1.9 mm long and comprising 34 transverse rows of mature teeth. Central tooth somewhat longer than wide, rectangular with small blade, first lateral teeth wing-shaped, major lateral teeth of radula with a bidentate head, main denticle long and sharply pointed, accompanied by a very small outer denticle.

Holotype with twenty three gills on each side, extending from valve III to valve VIII.

**Remarks.** The new species differs from other species of the genus inhabiting in Northeast Pacific by absence of jugal plate, by having pleural areas

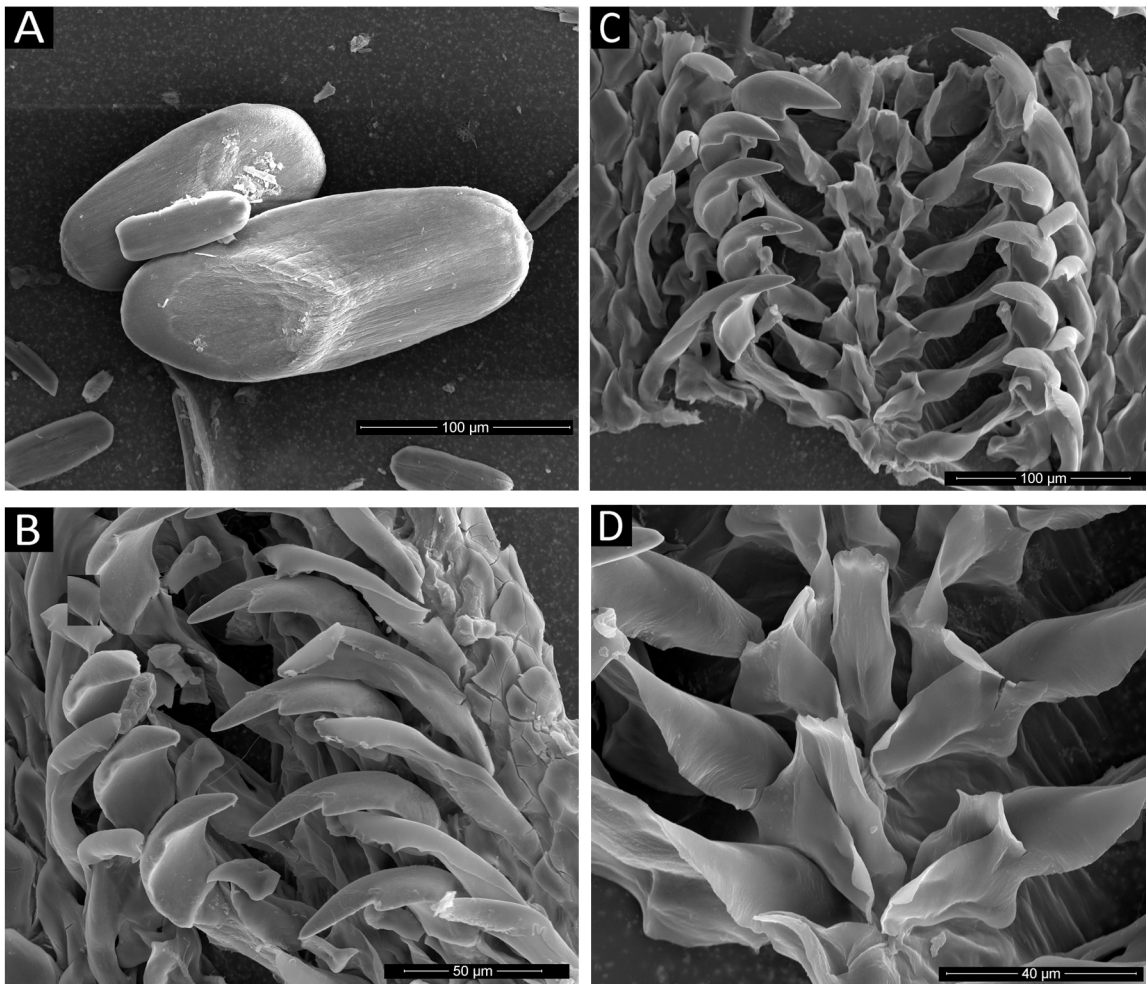


FIG. 4. *Stenosemus undatopleuralis* sp. nov., holotype. **A.** Dorsal calcareous corpuscles and ventral scales. **B, C.** Middle part of radula. **D.** Central and first lateral teeth of radula.

РИС. 4. *Stenosemus undatopleuralis* sp. nov.,. **A.** Дорсальные известковые корпускулы и маргинальные спикулы. **B, C.** Средняя часть радулы. **D.** Центральные и первые латеральные зубы радулы.

of intermediate valves with longitudinal undulating folds, flattened and smooth dorsal calcareous corpuscles, rectangular central teeth of radula.

*Stenosemus undatopleuralis* sp. nov. is most similar to *S. stearnsi*, differing from the latter in the absence of sculpture on areas of the tegmentum with the exception of pleural part of central area, and the different shape of dorsal calcareous corpuscles and ventral scales, as well as in the presence of marginal spicules.

The new species differs from *S. albus*, and *S. sharpi* by having rectangular central teeth of radula (vs. pyriform central tooth in both species), flattened and smooth dorsal calcareous corpuscles (vs. cylindrical and ribbed calcareous corpuscles in both species). Moreover new species has no jugal plate (vs. jugal plate present in both species)

*Stenosemus undatopleuralis* sp. nov. differs from *S. moskalevi*, *S. kolesnikovi* and *S. golikovi* by having bidentate head of major lateral tooth (vs. unidentate

head in the three species), flattened and smooth dorsal calcareous corpuscles (vs. cylindrical in *S. moskalevi* and *S. golikovi*, and ribbed in *S. kolesnikovi*). Moreover new species has no jugal plate (vs. jugal plate present in the three species).

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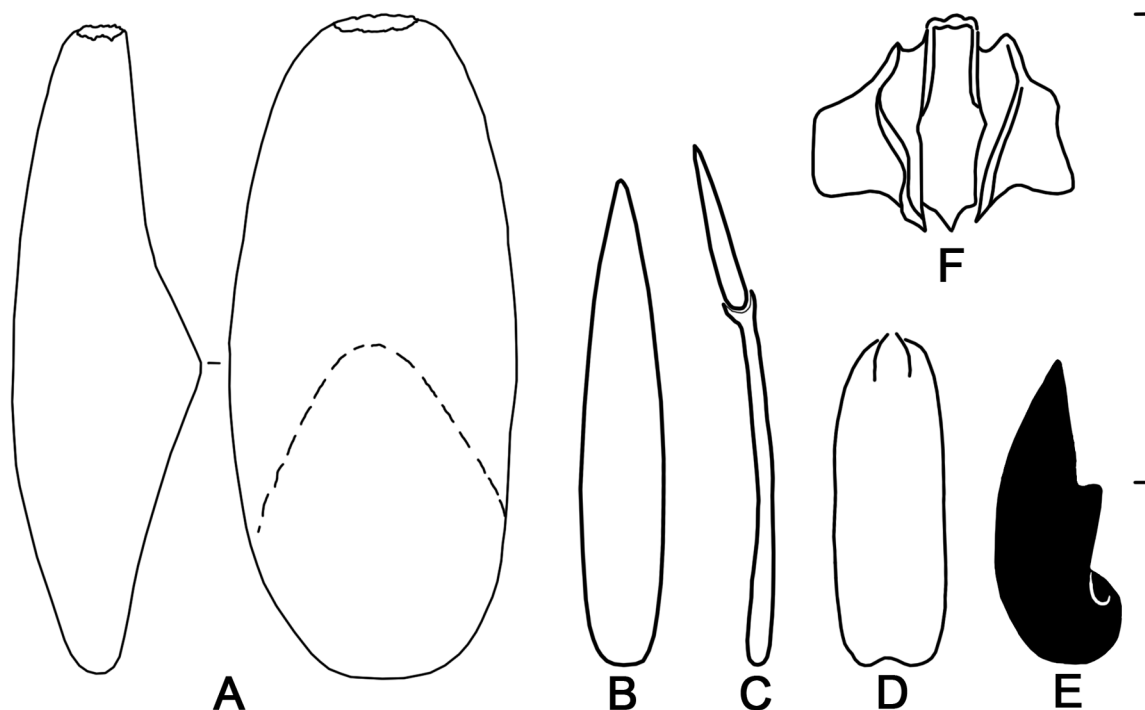


FIG. 5. *Stenosemus undatopleuralis* sp. nov., holotype. **A.** Dorsal calcareous corpuscles. **B.** Marginal spicule. **C.** Bristle with small spicule. **D.** Ventral scale. **E.** Head of major lateral tooth. **F.** Central and first lateral teeth of radula. Scale bar: 100  $\mu$ m.

РИС. 5. *Stenosemus undatopleuralis* sp. nov., голотип. **A.** Дорсальная известковая корпускула. **B.** Маргинальная спикула. **C.** Щетинка с маленькой спикулой. **D.** Вентральная чешуйка. **E.** Наконечник крючковой пластинки радулы. **F.** Центральный и первые латеральные зубы радулы. Масштабная линейка: 100 мкм.

## References

- Clark R.N. 2002. *Stenosemus sharpii* (Pilsbry, 1896). Rediscovery of a forgotten chiton from the Aleutian Islands. *NEMOURIA Occasional Papers of the Delaware Museum of Natural History*, 47: 1–7.
- Kaas P., Van Belle R.A. 1990. *Monograph of living chitons (Mollusca: Polyplacophora). 4, Suborder Ischnochitonina: Ischnochitonidae: Ischnochitoninae (continued). Additions to Vols. 1–3.* E.J. Brill, Leiden, 298 pp.
- Sirenko B.I. 1994. Chitons (Polyplacophora) of the continental slope of the Kurile Islands with a brief review of deep water species of the Russian seas. The fauna of the continental slope of the Kurile Islands. *Explorations of the fauna of the seas*, 46(54): 159–174 [In Russian].
- Sirenko B.I. 2013. Class Polyplacophora. In Sirenko B.I. (Ed) Check-list of species of free-living invertebrates of the Russian Far Eastern seas. *Exploration of the fauna of the seas*, 75(83):148–149.
- Sirenko B.I. 2016. Two new rare chitons of the genus *Stenosemus* (Mollusca: Polyplacophora: Ischnochitonidae). *Zoosystematica Rossica*, 25(1): 3–12.