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A new small chiton (Mollusca: Polyplacophora) from Guadelupe

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Leptochiton guadelupei **sp. nov.** from near Guadelupe in western Atlantic is described. The new species differs from other western Atlantic species of the genus *Leptochiton* by having a unique sculpture of tegmentum in the form of concentric rows of granules and the unidentate cusp of the major lateral tooth of radula, which has a deep longitudinal groove on each side.

Key words: chiton, *Leptochiton*, Leptochitonidae, new species, western Atlantic.

Маленький новый хитон (Mollusca: Polyplacophora) из Гваделупы

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Представлено описание *Leptochiton guadelupei* **sp. nov.** из западной Атлантики у Гваделупы. Новый вид отличается от других западно-атлантических видов рода *Leptochiton* уникальной скульптурой тегментума в форме концентрических рядов зерен и однозубцовым наконечником крючковой пластинки радулы, которая имеет глубокие продольные борозды на каждой стороне.

Ключевые слова: хитон, *Leptochiton*, Leptochitonidae, новый вид, западная Атлантика.

Chitons of the genus *Leptochiton* Gray, 1847 in western Atlantic are still poorly studied. Information about these species may be obtained from a number of papers [Dall, 1889; Pilsbry, 1892–1894; Boone, 1928; Castellanos, 1951; Kaas, 1972, 1994; Righi, 1973; Kaas, Van Belle, 1985; Mayhew, Cole, 1995; Kaas et al., 2006; Sirenko, 2006, 2015a, b; Güller et al., 2015].

Only 11 species of the genus are recorded in this large area (*Leptochiton alveolus* (Lovén, 1846) and *L. arcticus* (G.O. Sars, 1878) from the northeastern and northwestern Atlantic; *L. medinae* Plate, 1899, *L. kerguelensis* Haddon, 1886, *L. laurae* Schwabe et Sellanes, 2010 and *L. antarcticus* Sirenko, 2015 from southwestern Atlantic; *L. pergranatus* Dall, 1889, *L. micropustulosus* Kaas, 1994 and *L. binghami* (Boone, 1928) from the Gulf of Mexico and the Caribbean Sea; *L. darioi* Righi, 1973 and *L. sanmatiensis* Güller, Liuzzi et Zelaya, 2015 from the central part of western Atlantic). We are

currently aware of three species of *Leptochiton* from the tropical waters of the western Atlantic, and they all live in the lower subtidal or in the upper bathyal zones. A new species, discovered by a French expedition off the coast of Guadeloupe, was no exception. It inhabits waters of 80 m deep. I provide here its description.

Material and methods

The specimen from Guadelupe was kindly placed at my disposal by Dr. Philippe Bouchet (MNHN) and it was collected by the French expedition Campagne KARUBENTHOS 2012. Specimens selected for a scanning electron microscopy (SEM) study were boiled in 7% KOH for 7–10 minutes, and then boiled twice in fresh water. Then several valves (valves I, II, IV, V and VIII), half of the radula and a portion of the girdle were chosen for a scanning electron microscope FEI SEM Quanta 250 Scan. The rest of the radula and girdle were dried and put in Canadian balsam for examination under a light microscope.

Abbreviations: BL – body length; MNHN – Muséum National d'Histoire Naturelle, Paris, France; stn. – station; ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Taxonomy

Class **POLYPLACOPHORA** Gray, 1821
Subclass **NEOLORICATA** Bergenhayn, 1955
Order **LEPIDOPLEURIDA** Thiele, 1909
Family **Leptochitonidae** Dall, 1889
Genus *Leptochiton* Gray, 1847

Type species. *Chiton cinereus* Montagu, 1803 (non Linne, 1767) = *Leptochiton asellus* (Gmelin, 1791) fide Lovén, 1846, subsequent designation by Gray, 1847.

Genus distribution. Worldwide, Carboniferous – Recent.

Leptochiton guadelupei Sirenko sp. nov.
Figs. 1–4

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Type material. Holotype (MNHN IM-2013-67001) now disarticulated consisting of SEM stub of valves I, II, V, VIII, part of perinotum and radula, mount of part of perinotum and radula and vial with other valves.

Type locality. Western Atlantic, off Guadelupe: Est Petite Terre, Campagne KARUBENTHOS 2012, stn. GD61, 16°11.97′ N, 61°03.96′ W, depth 80 m, BC5071, 26.05.2012.

Etymology. Named after Guadelupe.

D i s t r i b u t i o n. Known only from the type locality.

D i a g n o s i s. Animal very small. Valves moderately elevated, carinated, not beaked. Lateral areas raised. Tail valve with mucro anterior. Pleural parts of central areas with well raised oval granules arranged in concentric as well in longitudinal rows.

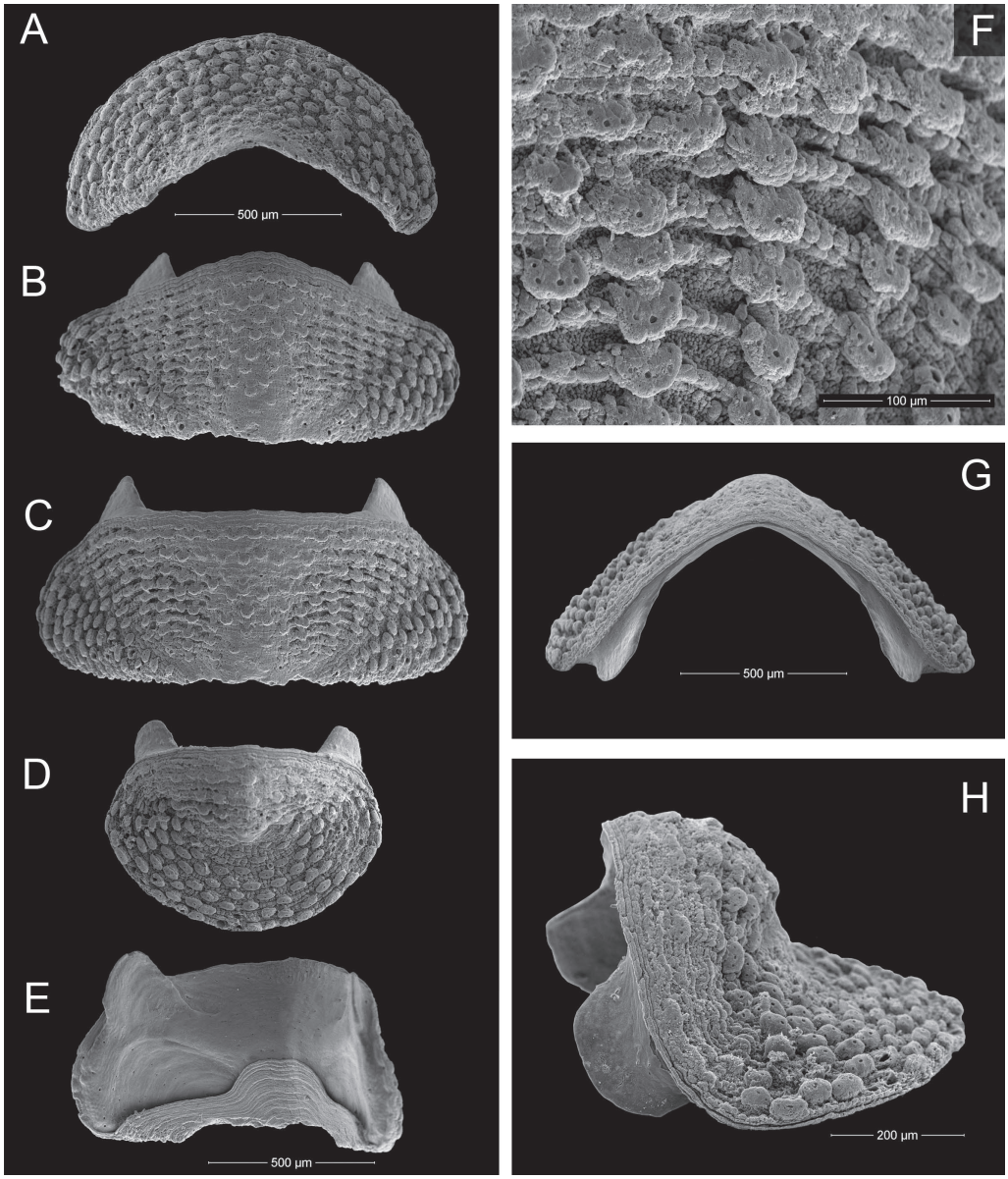

Fig. 1. *Leptochition guadelupei*, **holotype** (MNHN IM-2013-67001), BL 2.0 mm; **A** – head valve, dorsal view; **B** – valve II, dorsal view; **C** – valve V, dorsal view; **D** – tail valve, dorsal view; **E** – valve V, ventral view; **F** – surface of tegmentum in central area; **G** – valve V, rostral view; **H** – tail valve, lateral view.

Head valve, lateral areas of intermediate valves and postmucronal area of tail valve with similar granules arranged quincuncially. Each granule with one megalaesthete and four micraesthetes. Dorsal scales wide, obtusely pointed, with 16–17 distinct, double ribs, interstices very narrow. Radula with numerous transverse rows of very small teeth. Major lateral teeth of radula with unidentate cusp, which has deep longitudinal groove on each side.

D e s c r i p t i o n. Holotype very small, BL about 2.0 mm, elongate-oval, moderately elevated (elevation ratio in valve V 0.45). Valves rather thick for the genus, carinated, not beaked. Color of tegmentum white.

Head valve semicircular, wider than tail valve. Intermediate valves broadly rectangular, short and wide, anterior and posterior margins nearly straight, not beaked, lateral margins rounded. Lateral areas raised. Tail valve high, transversely elliptical with anterior mucro, antemucronal area convex, postmucronal area deeply concave.

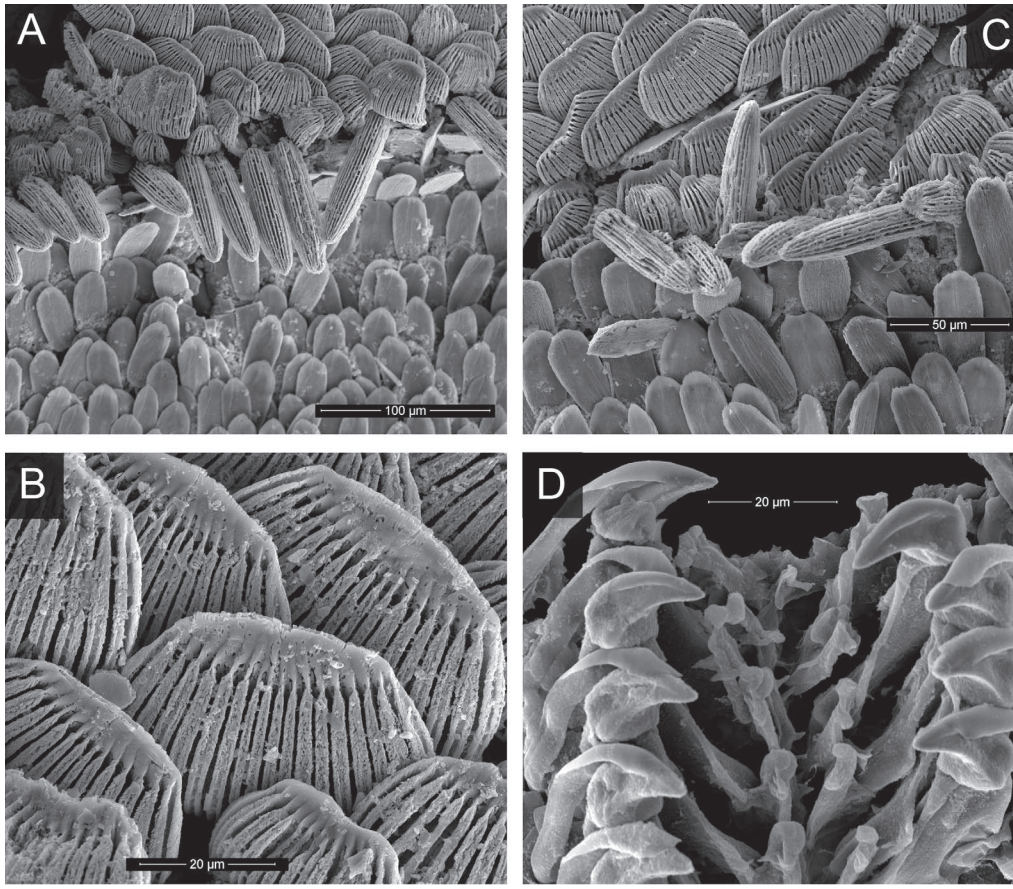

Fig. 2. *Leptochition guadelupei*, **holotype** (MNHN IM-2013-67001), BL 2.0 mm; **A**, **C** – dorsal scales, marginal spicules and ventral scales; **B** – dorsal scales; **D** – part of radula.

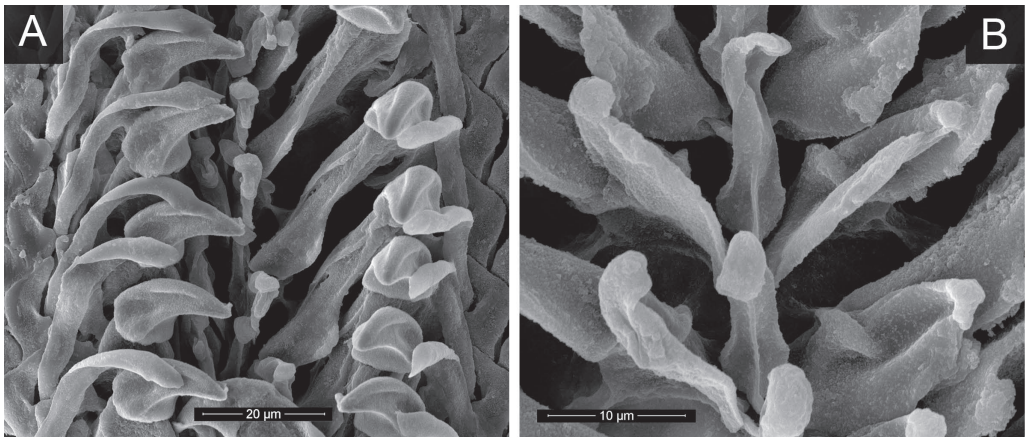

Fig. 3. *Leptochition guadelupei,* **holotype** (MNHN IM-2013-67001), BL 2.0 mm; **A** – part of radula; **B** – central and first lateral teeth of radula.

Tegmentum sculptured with well raised oval granules arranged in more or less quincuncial pattern on head valve, the lateral areas of intermediate valves and on the postmucronal area of tail valve, in longitudinal as well in concentric rows on pleural parts of central areas of intermediate valves and on antemucronal area of tail valve. Jugal areas with flattened granules arranged in a random manner. Each granule has one megalaesthete and four micraesthetes.

Articulamentum well developed, apophyses small and widely separated.

Girdle very narrow, covered with wide and obtusely pointed dorsal scales (50x50 µm) with 16–17 distinct double ribs. Sutures between valves armed with few long and ribbed spicules (210x22 µm). Marginal spicules elongate (110x18 µm) with 6–7 distinct ribs arranged around the spicule. Ventral scales in central part pointed, smooth (42x18 µm) those near margin have 4–5 short, weak ribs on the distal half in ventral side.

Radula of the holotype 0.7 mm long with about 40 transverse rows of mature teeth. Central teeth bulbose near the point base, distal half narrow, first lateral teeth with a narrow cusp and an outward projecting wing, major lateral teeth with unidentate cusp, which has deep longitudinal groove on each side.

The gills were not counted as the specimen was dry and curled up.

R e m a r k s. New species differs from other species of genus *Leptochiton* known from the western Atlantic (*L. alveolus*, *L. medinae*, *L. pergranatus*, *L. binghami*, *L. darioi*, *L. micropustulosus* and *L. compostellanum*) by having unique sculpture of tegmentum in the form of concentric rows of granules and unidentate cusp of major lateral tooth of radula, which has deep longitudinal groove on each side.

L. guadelupei sp. nov. is more similar to the eastern Atlantic species of the genus *Leptochiton* (*L. leloupi* Kaas, 1979 and *L. tenuis* Kaas, 1979). Both are from the Bay of Biscay. The new species differs from the other ones by having 16–17 double ribs

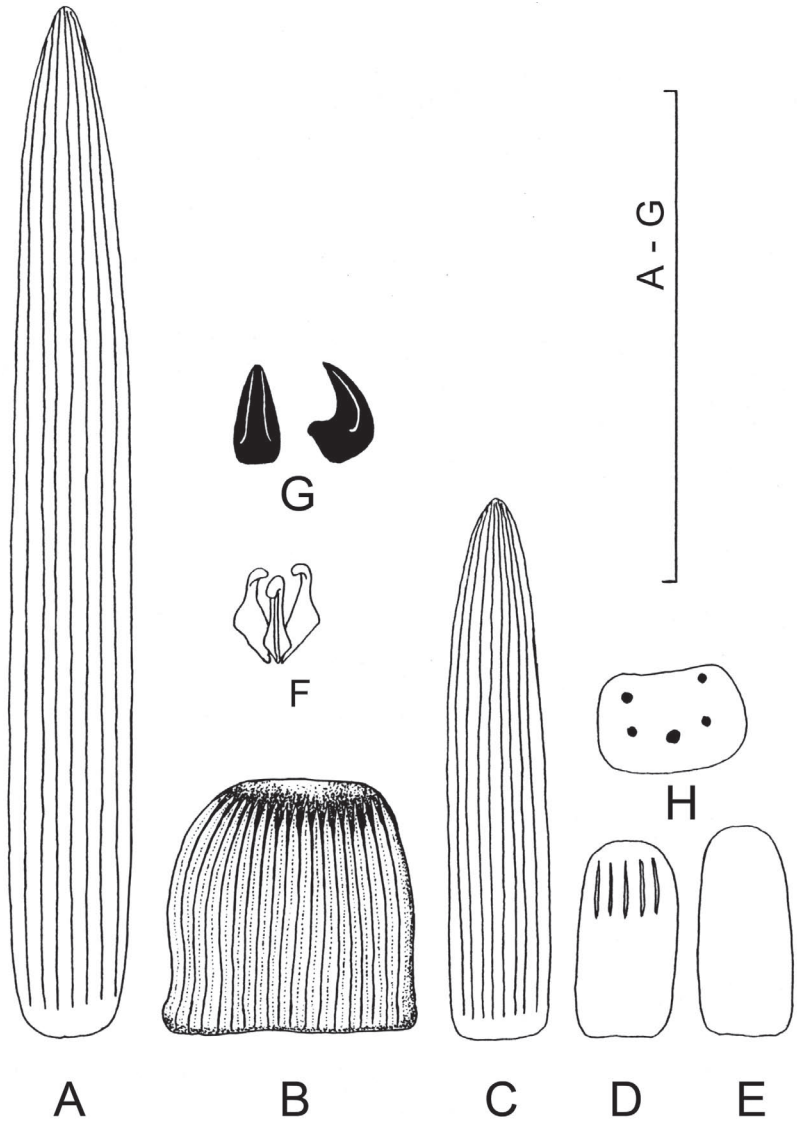

Fig. 4. *Leptochition guadelupei*, **holotype** (MNHN IM-2013-67001), BL 2.0 mm; **A** – sutural needle; **B** – dorsal scale; **C** – marginal needle; **D** – ventral scale near margin; **E** – ventral scale in middle part; **F** – central and first lateral teeth of radula; **G** – heads of major lateral teeth of radula; **H** – aesthete group on central area. Scale bar 100 μm.

on dorsal scales (vs. 12–14 single ribs in *L. leloupi*), the anterior mucro (vs. about central in *L. leloupi*), pleural parts of the central areas with well raised oval granules arranged in concentric and longitudinal rows (vs central areas with rather widely separated longitudinal chains of irregularly shaped tubercles mostly composed of several

granules cemented together in *L. leloupi*). The new species differs from *L. tenuis* by having broader dorsal scales 50 μm long, 50 μm wide, with 16–17 double ribs on the dorsal scales (vs. 60–70 μm long, 35–40 μm wide with 10–12 single ribs in *L. tenuis*), the anterior mucro (vs. the mucro behind the center in *L. tenuis*), carinated valves (vs. not carinated in *L. tenuis*). *L. guadelupei* is also similar to *L. hiriensis* Schwabe et Lozouet, 2006 from Rapa Island, southern Pacific by the sculpture of tegmentum, but differs by having the unidentate cusp of the major lateral tooth of radula, which has a deep longitudinal groove on each side (vs. tridentate cusp in *L. hiriensis*), 16–17 distinct double ribs (vs. up to 15 simple ribs in *L. hiriensis*) and the high tail valve with the anterior mucro (vs. the low tail valve with the central mucro in *L. hiriensis*).

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