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# *Lepidochitona cubensis* sp. nov. (Mollusca: Polyplacophora) from coastal waters of Cuba, Caribbean Sea

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**ABSTRACT.** A new shallow-water species *Lepidochitona cubensis* sp. nov. collected in the Caribbean Sea off Cuba in sea grass *Thalassia testudinum* is described. This chiton is closest to the species *L. bullocki* with which it forms a separate group within the genus, differing from other species of the genus by the presence of small square grooves on tegmentum of valves.

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*Lepidochitona cubensis* sp. nov. (Mollusca: Polyplacophora) из прибрежных вод Кубы, Карибское море.

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**РЕЗЮМЕ.** Описан новый мелководный вид *Lepidochitona cubensis* sp. nov., собранный в Карибском море у берегов Кубы, в поясе морской травы *Thalassia testudinum*. Этот хитон наиболее близок к виду *L. bullocki* с которым образует внутри рода отдельную группу, отличающуюся от других видов рода наличием мелких квадратных углублений на тегментуме щитков.

Ríos, 2015, which was described from Florida coast is also a closely related species to this group. This article describes a fifth species of this genus collected in the Caribbean Sea off the coast of Cuba.

## Material and methods

The only specimen of the new species was collected during Soviet-Cuban expedition in 1968, near Cuba, Punta Colombo, Pinos Island, Caribbean Sea. It was prepared for the study under the scanning electron microscopy (FEI SEM Quanta 250) and light microscopy (Leica MZ 9.5) by using the method described in Sirenko [2023].

**Abbreviations:** BL, body length. ZIN, Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia.

## Taxonomy

Class Polyplacophora Gray, 1821

Subclass Neoloricata Bergenhayn, 1955

Order Chitonida Thiele, 1909

Suborder Acanthochitonina Bergenhayn, 1930

Superfamily Mopalioidae Dall, 1889

Family Tonicellidae Simroth, 1894

Genus *Lepidochitona* Gray, 1821

**Type species.** *Chiton marginatus* Pennant, 1777 (= *Chiton cinereus* Linnaeus, 1767), by monotypy.

**Genus distribution.** Mediterranean Sea, north-eastern Atlantic Ocean, Caribbean Sea and adjacent western Atlantic Ocean, Pacific coast near Central America, south Atlantic and Indian oceans.

## Introduction

Compared to many other tropical waters, the Caribbean Sea can be classified as an area with a relatively well-studied shallow water fauna. This is facilitated by the presence of a large number of scientific organizations in the countries surrounding the sea. Sirenko and Anseeuw [2021] estimated that about 50 papers mentioning Caribbean chitons one way or another have been published since the well-known publication of Piet Kaas [1972]. To date, there are 53 species of chitons in the Caribbean Sea, including four species of the genus *Lepidochitona*: *L. liozonis* (Dall et Simpson, 1901); *L. rosea* Kaas, 1972; *L. rufoi* Garsía-Ríos, 2010; *L. bullocki* Garsía-Ríos, 2011. *Lepidochitona pseudoliozonis* Garsía-

*Lepidochitona cubensis* sp. nov.  
(Figs 1–5)

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**Type material.** Holotype (ZIN 2588), now disarticulated consisting of SEM stub of valves I, II, V, VIII, part of perinotum and radula, and vial with other valves,

**Type locality.** Caribbean Sea, Cuba, Pinos Island, Punta Colombo, intertidal, sand, in sea grass *Thalassia testudinum*.

**Etymology.** Named after Cuba.

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

**Diagnosis.** Chiton of very small size, elongate oval. Valves moderate elevated, carinated, beaked, lateral area not raised, mucro anterior, postmucronal slope slightly concave. Tegmentum smooth, with rather rare small square grooves located mainly in the anterior part of the valves, except for the tail valve, where there are no grooves at all. Slit formula: 10/1–2/13. Girdle covered with small cylindrical and bluntly pointed spicules, among them, rare scattered tufts with 1, 2 rare 3 bent short needles. Central and first lateral teeth of radula with rounded blade, head of major lateral teeth of radula with three blunt denticles. Holotype with 8 gills from each side.

**Description.** The single specimen has a deformity (depression) which is visible on all valves. This depression probably occurred during the growth of the mollusk and is the result of an external influence, so it is not considered in the description of the species. Holotype (BL 5.0 mm) with elongate oval body. Shell moderately elevated (dorsal elevation 0.33), back carinated, valves beaked. Color of tegmentum light brown, mottled with brown spots.

Head valve semicircular, posterior margin widely V-shaped. Intermediate valves short, width 2.5 times exceeds length, front margin slightly concave in the jugal part, straight and somewhat obliquely posteriorly directed in the lateral parts, side margins rounded, hind margin concave at both sides of the distinctly beaked apex, lateral areas not raised. Tail valve semicircular, slightly narrower than the head valve, front margin concave in the jugal part and straight in pleural part, mucro anterior, postmucronal slope slightly concave.

Tegmentum smooth, with concentric growth lines and with rather rare, small, square grooves located mainly in the anterior part of the valves, except for the tail valve, where there are no grooves at all. Microaesthetes are arranged in longitudinal lines on central areas of intermediate valves, on antemucronal area of tail valve, and in radial lines on head valve, on lateral areas of intermediate valves and postmucronal area of tail valve.

Articulamentum moderately developed, white, very porous. Apophyses broadly and irregularly

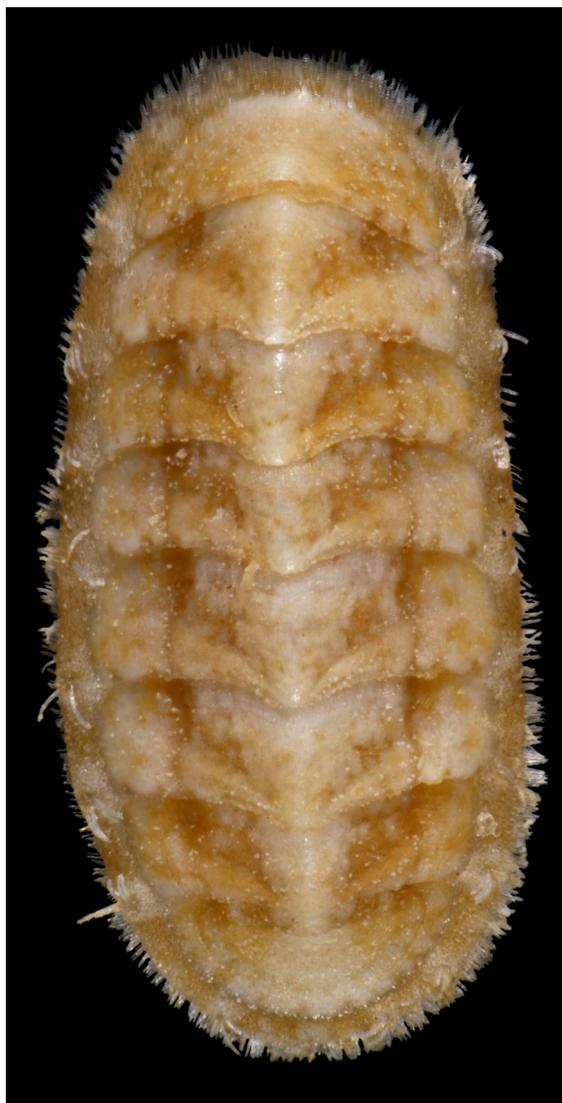


FIG. 1. *Lepidochitona cubensis* sp. nov., holotype, (ZIN 2588), BL 5.0 mm, Caribbean Sea, Pinos Island.

РИС. 1. *Lepidochitona cubensis* sp. nov., голотип, (ZIN 2588), BL 5,0 мм, Карибское море, о. Пинос.

triangular with rounded top, the width of jugal sinus less the width of apophyses. Slit formula 10/1–2/13, slits rather wide, slit rays present in all valves, fine, eaves spongy, porous.

Girdle rather narrow, width 250  $\mu$ m near valve V, brownish, dorsally covered with small cylindrical and bluntly pointed spicules (25–30  $\times$  10  $\mu$ m), among them, rare scattered tufts with 1, 2 rare 3 bent needles (75–200  $\times$  8–12  $\mu$ m). Marginal elements of two kinds: fringe of elongate, straight, longitudinally ribbed in dorsal side, sharply pointed needles (130  $\times$  12–13  $\mu$ m) and one row of long, smooth, rectangular scales (70  $\times$  20  $\mu$ m). Ventral part of girdle covered with smooth, lanceolate scales (34–45  $\times$  11  $\mu$ m).

Radula 1.5 mm long with 22 rows of mature teeth. Central tooth length is 2.5 times its width, first lateral

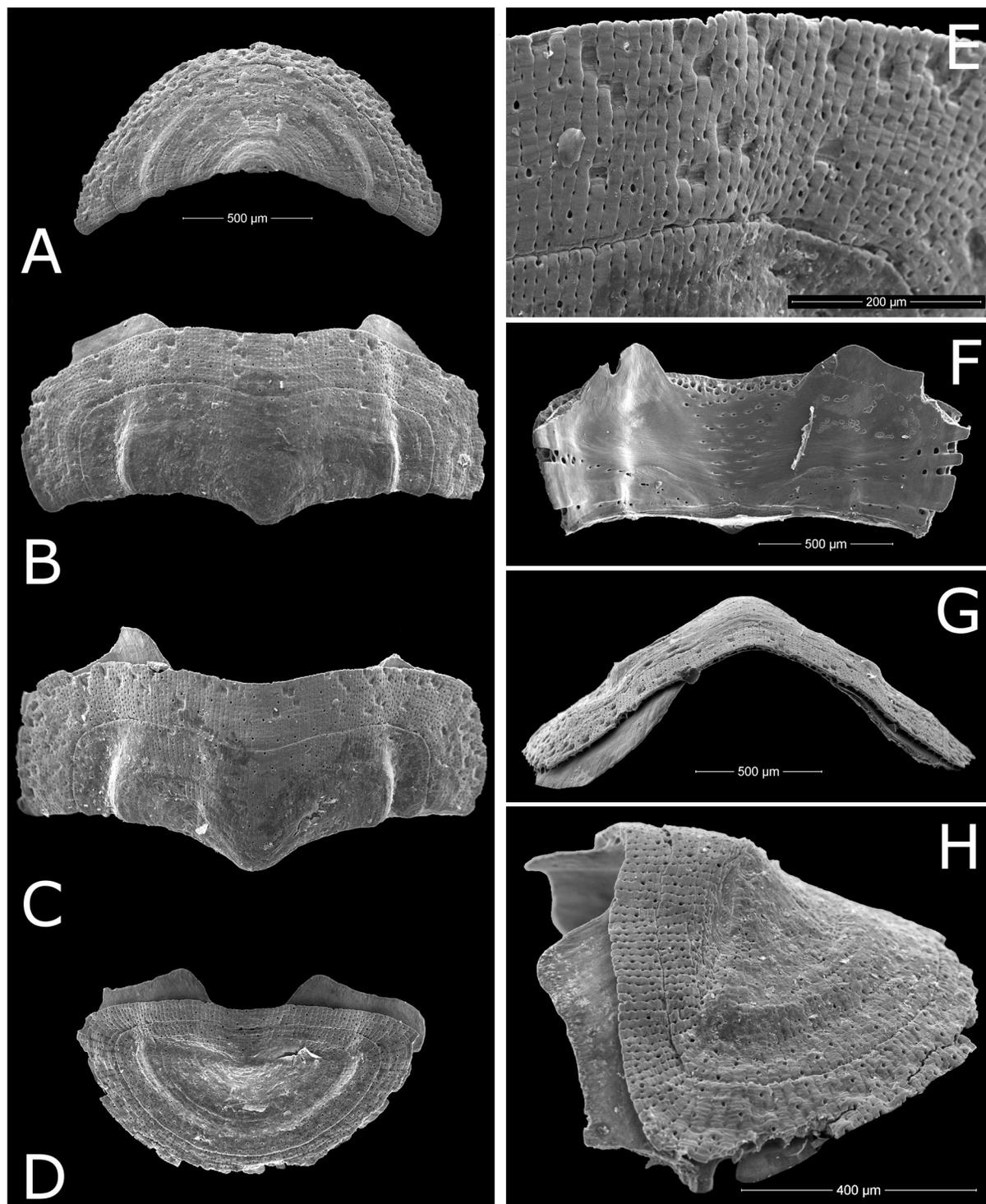


FIG. 2. *Lepidochitona cubensis* sp. nov., holotype (ZIN 2588), BL 5.0 mm. **A.** Head valve, dorsal view. **B.** Valve II, dorsal view. **C.** Valve V, dorsal view. **D.** Valve VIII, dorsal view. **E.** Valve V, tegmentum sculpture in central area. **F.** Valve IV, ventral view. **G.** Valve IV, frontal view. **H.** Valve VIII, lateral view.

РИС. 2. *Lepidochitona cubensis* sp. nov., голотип (ZIN 2588), BL 5,0 мм. **A.** Головной щиток, вид сверху. **B.** Щиток II, вид сверху. **C.** Щиток V, вид сверху. **D.** Щиток VIII, вид сверху. **E.** Щиток V, скульптура тегмента на центральном поле. **F.** Щиток IV, вид снизу. **G.** Щиток V, вид спереди. **H.** Щиток VIII, вид сбоку.

teeth elongate, wing-shaped with rounded blade, major lateral teeth with tridentate cusp, denticles rather blunt, central denticle slightly larger, distal part of large uncinal teeth with wide fringe.

Eight gills on each side, arranged from valves IV–VII.

**Remarks.** As already mentioned the genus includes species with smooth and granular tegmentum.

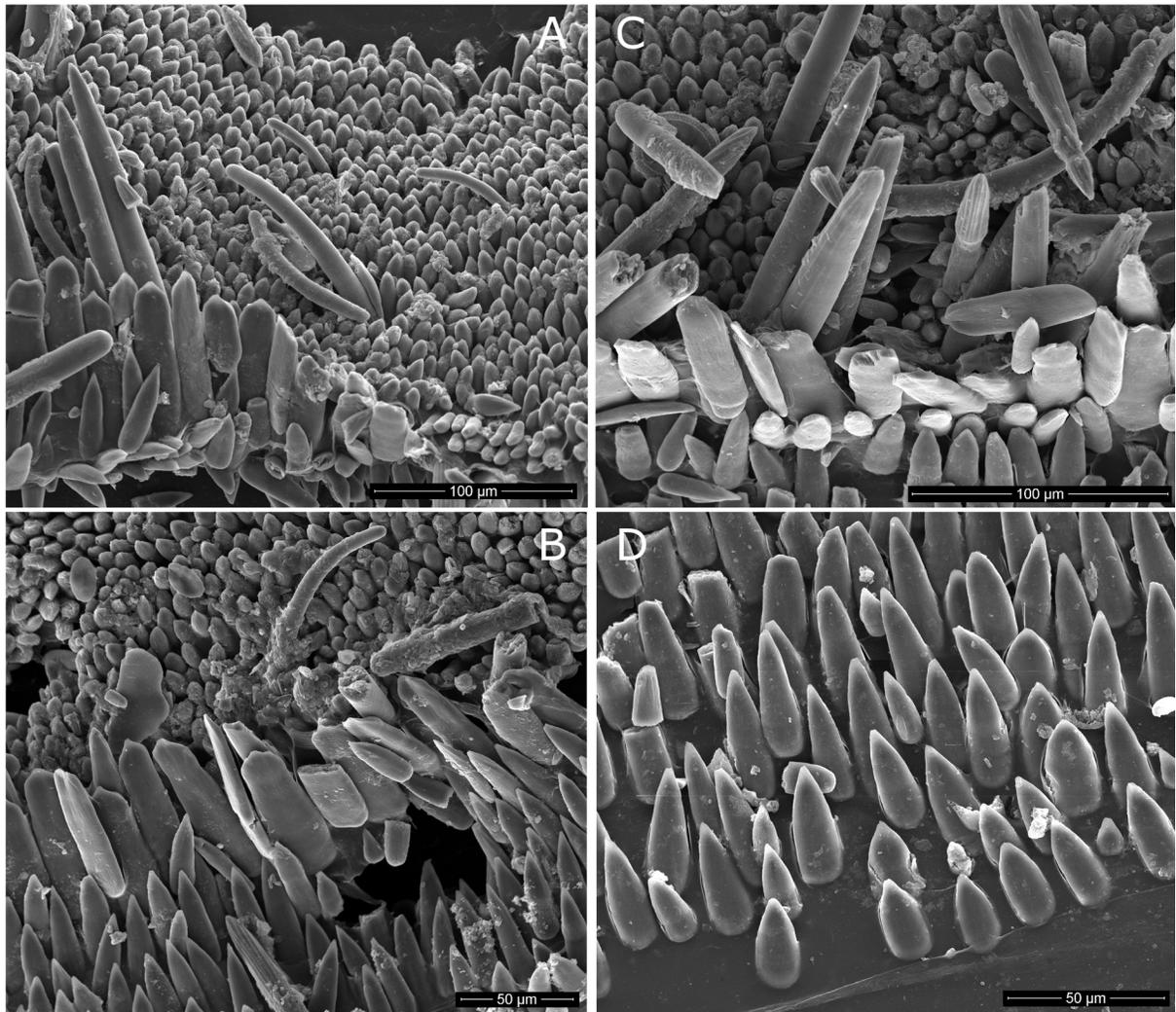


FIG. 3. *Lepidochitona cubensis* sp. nov., holotype (ZIN 2588), BL 5.0 mm. A-C. Dorsal spicules and needles, marginal needles and scales and ventral scales. D. Ventral scales.

РИС. 3. *Lepidochitona cubensis* sp. nov., голотип (ZIN 2588), BL 5,0 мм. А-С. Дорсальные спикулы и иглы, маргинальные иглы и чешуйки, вентральные чешуйки. D. Вентральные чешуйки.

*Lepidochitona cubensis* sp. nov. and *L. bullocki* can be referred to the intermediate group of chitons of this genus in which granules on tegmentum are formed as a result of appearance of square zones on margins as was noted by Garsí-Ríos [2011]. In the new species areas of granular tegmentum only begin to form on anterior margins of valves, while in *L. bullocki* most of the tegmentum and especially the lateral area are already covered with granules. The new species differs from *L. bullocki*, not only by more developed granular surface of tegmentum, but also by a number of other morphological characters: 1) dorsal needles are scattered singly or in tufts of 2–3 needles (vs. up to 10 needles in each tuft are located in the sutures in *L. bullocki*); 2) slit formula of new species 10/1–2/13 (vs. 9/1/16 in *L. bullocki*); 3) 8 gills (vs. 11–13 in *L. bullocki*); 4) intermediate valves are carinated (vs. rounded in *L. bullocki*); 5)

square grooves are absent in the tail valve (vs. present in *L. bullocki*); 6) denticles of the cusp of major lateral teeth are rather blunt (vs. the denticles sharp in *L. bullocki*). It should be noted that the sizes of the compared specimens of both species were similar, which excludes the influence of age variability. The new species is distinguished from all other species of the genus *Lepidochitona* except *L. bullocki* by the presence of square grooves in the tegmentum of valves.

There are 6 species of the genus *Lepidochitona* in the Caribbean region, including the Florida coast, of which 3 species (*L. rosea*, *L. liozonis*, and *L. pseudoliozonis*) have smooth tegmentum, 1 species (*L. rufoi*) has granular tegmentum, and the two species *L. bullocki* and *L. cubensis* sp. nov. occupy an intermediate position. The new species appears to be closer to species with smooth tegmentum in tegmentum

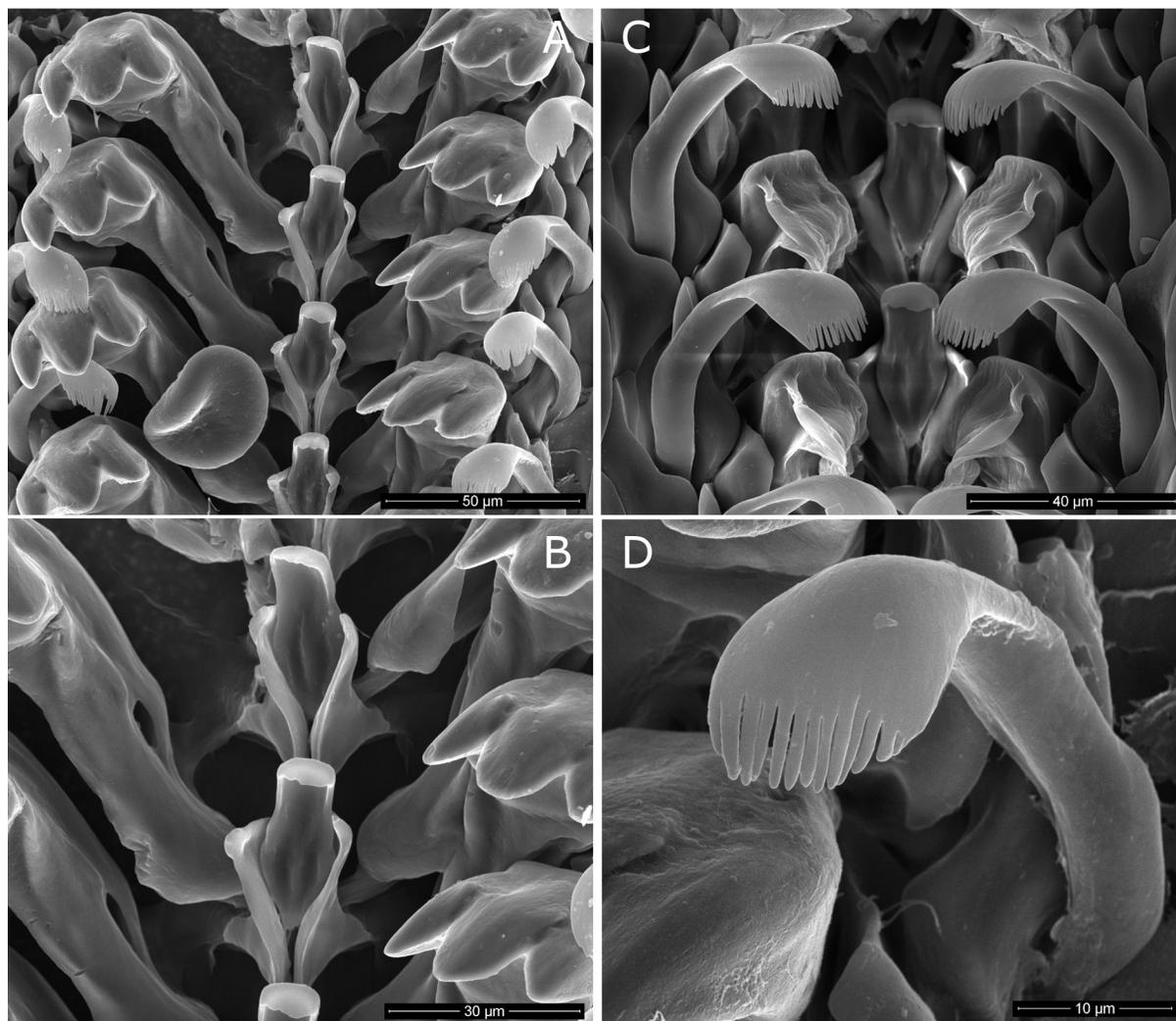


FIG. 4. *Lepidochitona cubensis* sp. nov., holotype (ZIN 2588), BL 5.0 mm. **A.** Radula. **B.** Central, first lateral and major lateral teeth of radula. **C.** Central, first lateral major lateral and uncinal teeth of radula. **D.** Uncinal tooth of radula.

РИС. 4. *Lepidochitona cubensis* sp. nov., голотип (ZIN 2588), BL 5,0 мм. **A.** Радула. **B.** Центральный, первый боковой и крючковой зубы радулы. **C.** Центральный, первый боковой, крючковой и унциальный зубы радулы. **D.** Унциальный зуб радулы.

sculpture than *L. bullocki*, as most of the tegmentum is smooth, excluding a small part of the surface where square grooves occur and no grains at all.

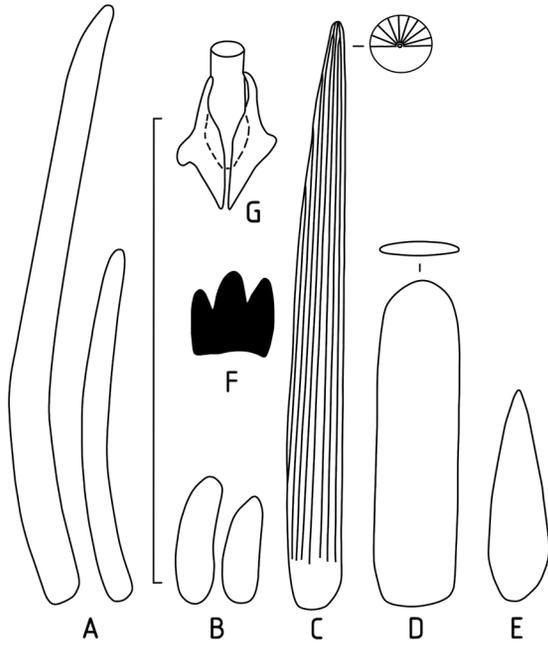
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FIG. 5. *Lepidochitona cubensis* sp. nov., holotype (ZIN 2588), BL 5.0 mm. **A.** Dorsal needles. **B.** Dorsal spicules. **C.** Marginal needle. **D.** Marginal scale. **E.** Ventral scales. **F.** Cusp of major lateral teeth of radula. **G.** Central and first lateral tooth of radula. Scale bar 100  $\mu$ m.

РИС. 5. *Lepidochitona cubensis* sp. nov., голотип (ZIN 2588), BL 5,0 мм. **A.** Дорсальные иглы. **B.** Дорсальные спикулы. **C.** Маргинальная игла. **D.** Маргинальная чешуйка. **E.** Вентральная чешуйка. **F.** Наконечник крючкового зуба. **G.** Центральный и первый латеральный зубы радулы. Масштабная линейка 100 мкм.

