

Leptochiton tahitiensis sp. nov. (Mollusca: Polyplacophora: Leptochitonidae) from the Society Islands, Polynesia

Leptochiton tahitiensis sp. nov. (Mollusca: Polyplacophora: Leptochitonidae) с островов Общества, Полинезия

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Abstract. A new chiton species, *Leptochiton tahitiensis* sp. nov., is described from Polynesia. The new species differs from other congeners in the structure of granules of tegmentum, in dorsal scales and teeth of radula.

Резюме. Описан новый вид хитонов *Leptochiton tahitiensis* sp. nov. из Полинезии, который отличается от других видов рода структурой гранул тегмента, дорсальными чешуйками и зубами радулы.

Key words: chitons, Pacific Ocean, Tahiti, Leptochitonidae, *Leptochiton*, new species

Ключевые слова: хитоны, Тихий океан, Таити, Leptochitonidae, *Leptochiton*, новый вид

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Introduction

The Society Islands are located in the middle of the Pacific Ocean, far from the areas with the greatest biodiversity, so we cannot expect a large number of species there. Indeed, near these islands only five species of chitons have been found: *Rhyssoplax perviridis* (Carpenter, 1865), *Lucilina nigropunctata* (Carpenter, 1865), and *Plaxiphora kamehamehae* Ferreira et Bertsch, 1979 near the Tahiti Island; *Lucilina pacifica* (Leloup, 1981) and *Weedingia mooreana* Kaas, 1988 near the Moorea Island (Carpenter, 1865; Ferreira & Bertsch, 1979; Leloup, 1981; Kaas, 1988; Kaas & Van Belle, 1990; Kaas et al., 2006).

The genus *Leptochiton* Gray, 1847 is the most widely distributed genus of the order Leptochi-

tonida. It includes more than 100 described species (Kaas & Van Belle, 1985, 1987, 1990, 1994; Kaas et al., 2006; Saito, 1997, 2001; Sirenko, 2001, 2015, 2016, 2018; Sigwart & Sirenko, 2012; and others).

The aim of this article is to describe another new species of the genus *Leptochiton* collected near the Society Islands. The species is known from only a single specimen but possesses unique morphological features.

Material and methods

Philippe Bouchet have loaned me the only specimen of the genus *Leptochiton* from Tahiti, collected by the French TARASOC (TARAVA seamounts and SOCIETY Island) expedition in 2009.

The body parts selected for study under a scanning electron microscope (SEM) were boiled in 7% KOH for five minutes, and then boiled twice in fresh water. Then several valves (valves I, V, VII and VIII), half of the radula and a portion of the girdle were examined with a FEI Quanta 250 SEM. The rest of the radula and girdle were dried and slide-mounted in Canada balsam for examination under a light microscope.

The holotype of *Leptochiton tahitiensis* sp. nov. is deposited at NMHN.

The following abbreviations are used: MNHN – Muséum national d'Histoire naturelle, Paris, France; ZIN – Zoological Institute, Russian Academy of Sciences, St Petersburg, Russia.



Fig. 1. *Leptochiton tahitiensis* sp. nov., holotype. Dorsal view (A); lateral view (B).

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 Linnaeus, 1767) = *Leptochiton asellus* (Gmelin, 1791) fide Lovén, 1846, subsequent designation by Gray, 1847.

Distribution. Worldwide; Carboniferous–Recent.

***Leptochiton tahitiensis* sp. nov.**
(Figs 1–4)

Holotype. Adult chiton (No. MNHN-IM-2007-39265), **French Polynesia**, *Society Islands*, Tahiti Island, 17°47'S, 149°23'W, depth 450–720 m (oceanographic cruise TARASOC, station DW 3489, 23 Oct. 2009).

Note. In the holotype, all valves except seventh and eighth are damaged. The specimen is now disarticulated and consists of the following parts: SEM stubs of the valves I, V, VII, VIII, a part of the perinotum and radula; the slide-mounted parts of the perinotum and radula; and a vial with other valves.

Diagnosis. Chiton of small size; valves low elevated, subcarinated. Intermediate valves broadly rectangular. Tegmentum covered with flattened, oval granules arranged uniformly and quincuncially; granules with fine concentric lines and eleven pores of aesthetes. Dorsal scales obtusely pointed, with eight or nine double ribs. Central tooth of radula very short and strongly narrowed in middle; major lateral tooth with sharply pointed unicuspid head. Nine gills per side arranged from valve VI to anus.

Description. Holotype small (body length 6.5 mm), valves low elevated (dorsal elevation 0.38 mm), subcarinated, not beaked. Colour of tegmentum and girdle white.

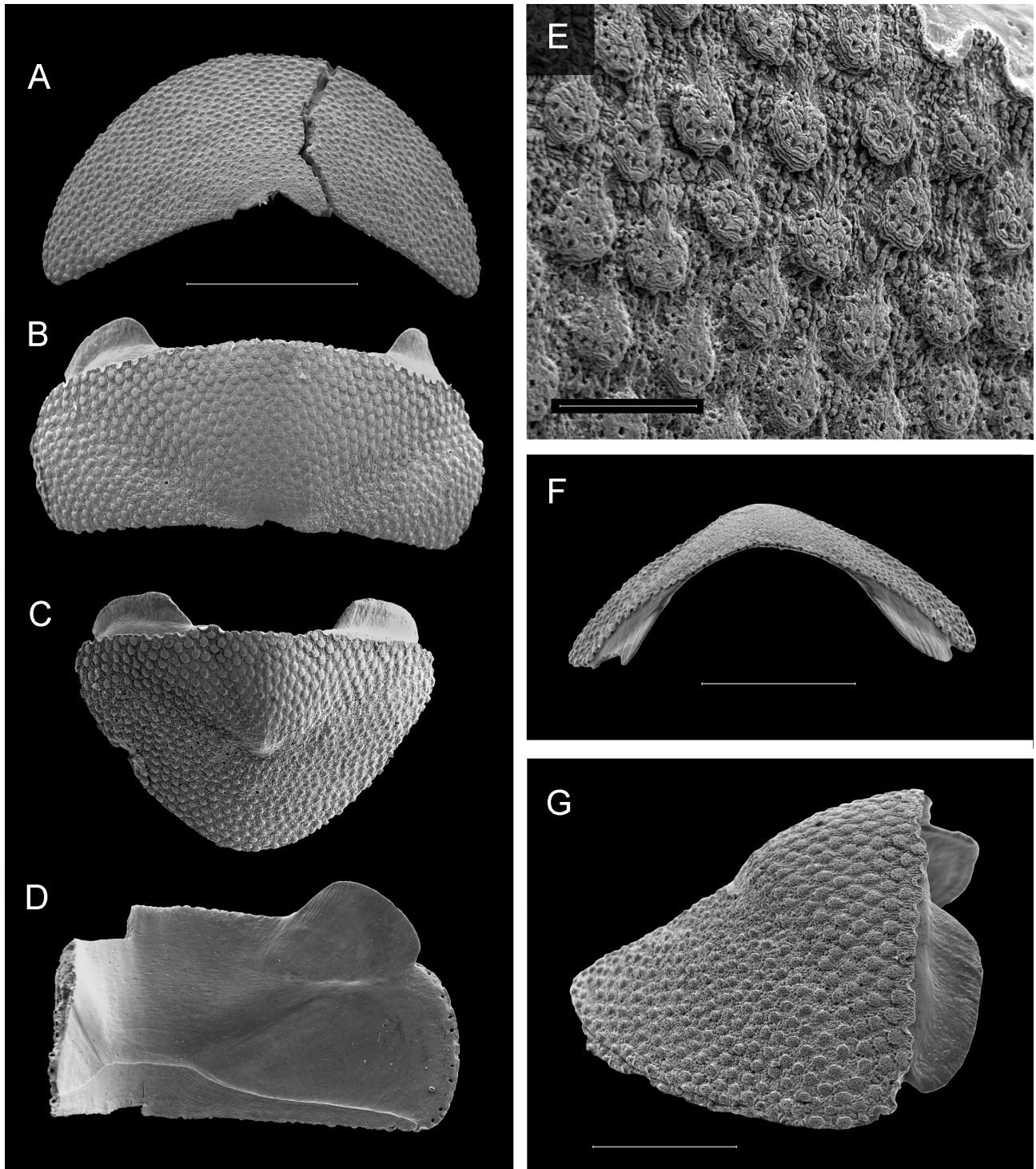


Fig. 2. *Leptochiton tahitiensis* sp. nov., holotype. Valve I, dorsal view (A); valve VII, dorsal view (B); valve VIII, dorsal view (C); half of valve V, ventral view (D); valve VII, sculpture of tegmentum in central area (E); valve VII, rostral view (F); valve VIII, lateral view (G). Scale bars: 1 mm (A–D, F); 100 μ m (E); 500 μ m (G).

Head valve semicircular, with V-shaped posterior margin. Intermediate valves rectangular, short and wide. Their anterior margin slightly convex;

posterior margin nearly straight, not beaked; lateral margins rounded; lateral areas slightly raised. Tail valve roughly triangular in outline, narrower

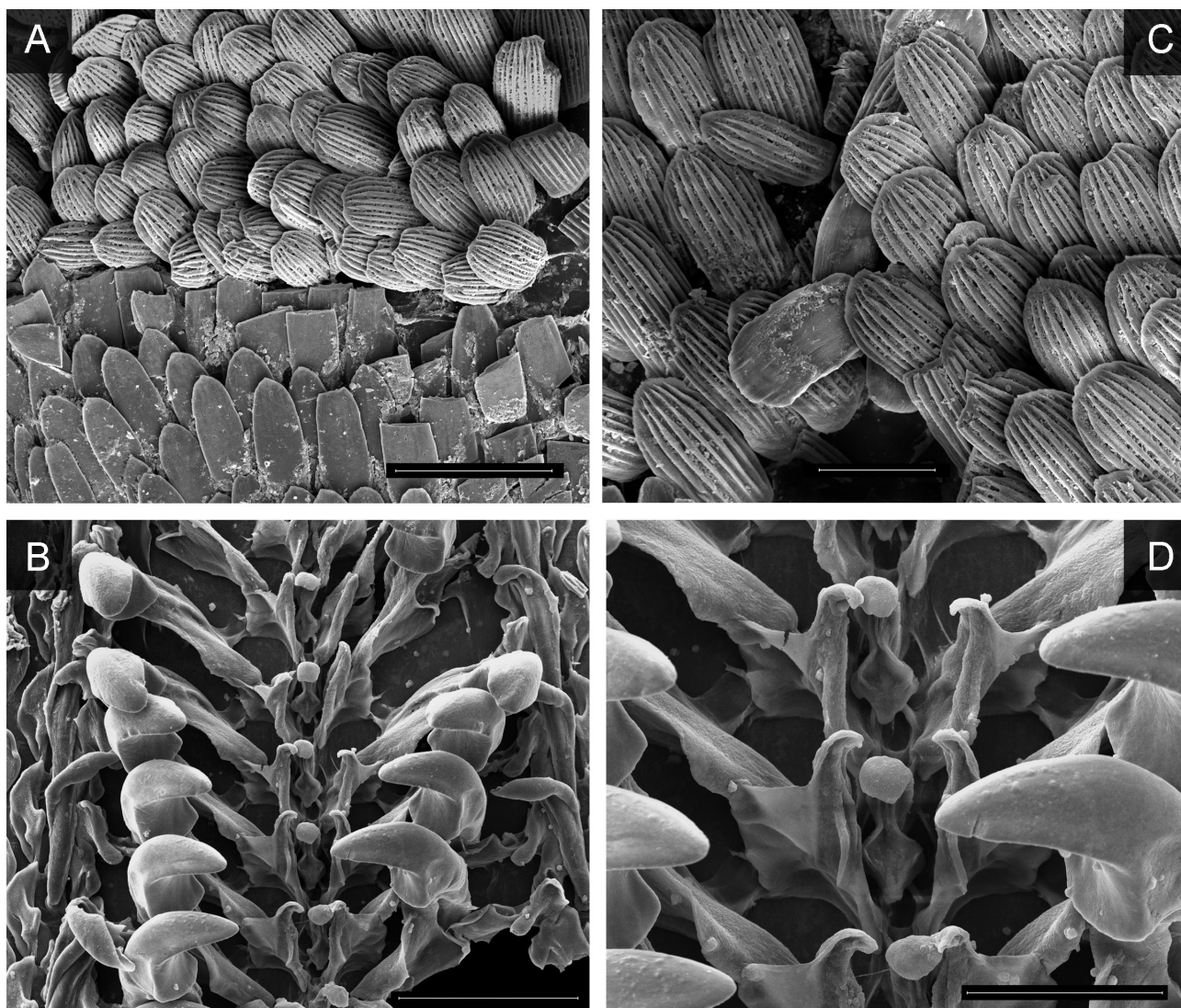


Fig. 3. *Leptochiton tahitiensis* sp. nov., holotype. Dorsal and ventral scales (A); central teeth of radula (B, D); dorsal scales (C). Scale bars: 100 μm (A, B); 50 μm (C, D).

than head valve; anterior mucro not prominent; antemucronal slope slightly convex; postmucronal slope weakly concave.

Tegmentum uniformly sculptured with quincuncially arranged, flattened, oval granules; each granule with fine concentric lines; one megal aesthete and ten micraesthetes around; all aesthete pores of approximately equal size.

Articulamentum weakly developed; apophyses small, widely separated, triangular in valves II–VII, more or less trapezoidal in tail valve.

Girdle moderately wide relative to valves, about 0.5 mm wide near valve V, dorsally densely covered with blunt pointed scales (80 \times 46 μm) with eight or nine partly double ribs. Interseg-

mental areas with long needles (up to 150 \times 17 μm) embedded in chitinous cups, in the shape of “Ringschaftnadeln” sensu Thiele (1908). Marginal fringe composed of slender spicules, up to 85 \times 15 μm , with four or five longitudinal ribs. Ventrally, girdle covered with elongate, smooth and bluntly pointed scales (up to 78 \times 25 μm) being larger than dorsal scales.

Radula of holotype 2.5 mm long, with 43 transverse rows of mature teeth. Central tooth of radula very short, strongly narrowed in middle and with large rhomboidal base; major lateral tooth with sharply pointed unicuspid head.

Nine gills on each side extending from valve VI to anus.

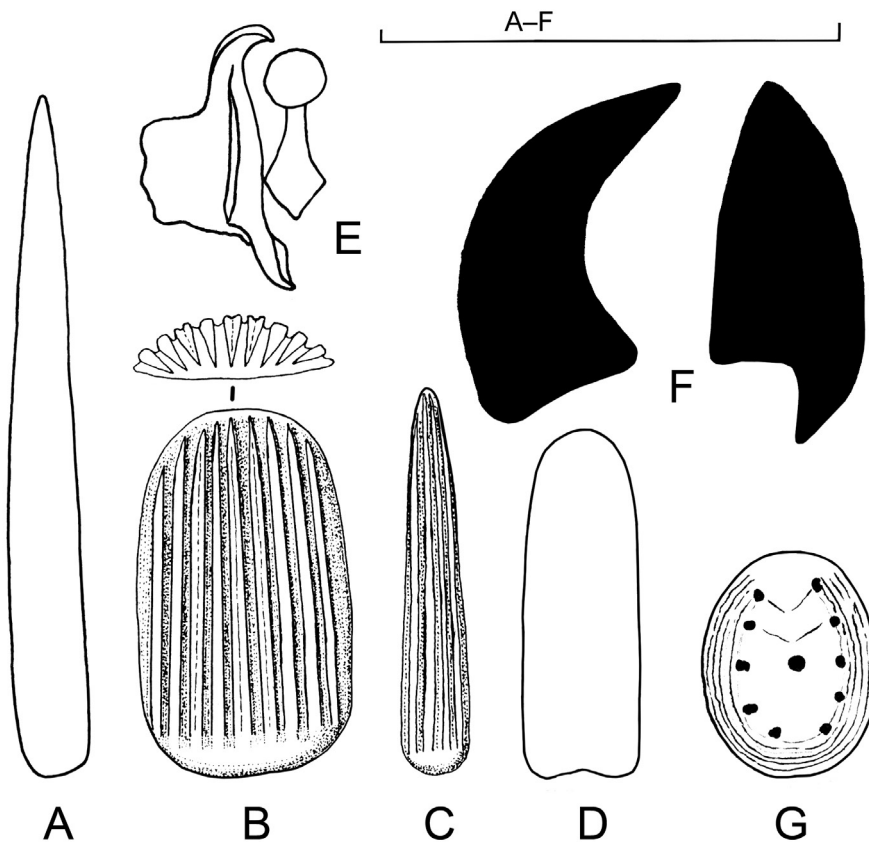


Fig. 4. *Leptochiton tahitiensis* sp. nov., holotype. Sutural needle (A); dorsal scale (B); marginal spicule (C); ventral scale (D); central and first lateral teeth of radula (E); heads of major lateral teeth of radula (F); aesthete group on central area (G). Scale bar: 100 μ m.

Distribution. The species is known only from the type locality, Tahiti Island, depth 450–720 m.

Etymology. Named after Tahiti Island.

Comparison. *Leptochiton tahitiensis* sp. nov. has several unique features that are absent or rare in other species of the genus. The new species has unusual granules with fine concentric lines; the central teeth of the radula are very short, strongly narrowed in the middle and with the large blade and rhomboidal base; the tail valve is triangular in shape. The new species is slightly similar to some species of *Leptochiton belknapi* Dall, 1878 group (*L. taiwanensis* Sirenko, 2018 occurring near Taiwan and *L. mutschkeae* Sirenko, 2015 occurring near Chile) (Sirenko & Sellanes, 2015), which also have the quincuncially arranged granules on the tegmentum, and the unicuspid head of major lateral teeth of the radula. *Leptochiton tahitiensis* sp. nov. can be distinguished from the species of

this group by the smaller and narrower central teeth of the radula, by eleven aesthetes in the tegmental granules (vs five in *L. mutschkeae* and six in *L. taiwanensis*), and by eight or nine ribs on the dorsal scales (vs two in *L. mutschkeae* and 14–16 in *L. taiwanensis*).

The new species is similar to *L. gascognensis* Kaas et Van Belle, 1985 occurring near Europe, in having the narrow central teeth and the unicuspid head of major lateral teeth of the radula (Carmona Zalvide & Urgorri, 1999), but differs from it in the quincuncially arranged granules on the central area of tegmentum (vs longitudinal rows in *L. gascognensis*), by eleven aesthetes in the tegmental granules (vs five in *L. gascognensis*), and by eight or nine ribs on the dorsal scales (vs 14–16 in *L. gascognensis*).

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