
Description of two new species of *Callochiton* (Mollusca: Polyplacophora) from Vietnam and Tonga

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ABSTRACT. Two new species of the genus *Callochiton* are described: *C. sonchaensis* sp. nov. from Vietnam and *C. tongaensis* sp. nov. from Tonga. They differ from other congeneric species in having a different number, shape, size and arrangement of grooves on the pleural areas of the intermediate and tail valves, the number of slits, the size of the dorsal spicules, and sometimes the coloration of the girdle. Absence of *Callochiton* in the Caribbean Sea and along the coasts of Central and North Americas was, perhaps, due to late advancement of species from this genus into the Tethys from the regions near Gondwana.

Introduction

Kaas and Van Belle [1985] considered only two genera from the family Callochitonidae - *Callochiton* Gray, 1847 and *Eudoxochiton* Shuttleworth, 1853. Sirenko [2008] added one more genus — *Vermichiton* Kaas, 1991. There are more than 40 recent species of the genus *Callochiton* and further three species are grouped into the related genera *Eudoxochiton* and *Vermichiton* [Kaas, Van Belle, 1985, 1990; Dell Angelo, Palazzi, 1994; Schwabe, 1998; Schwabe, Ruthensteiner, 2001; Schwabe, Sliker, 2001; Schwabe, 2003; Kaas *et al.*, 2006; Sirenko, 2008, 2012; Dell Angelo *et al.*, 2010, 2012].

It is important to note that several more genera and subgenera were described in the family Callochitonidae (see Taxonomy). They were later declared to be junior synonyms of the genus *Callochiton* [Van Belle, 1983; Kaas, Van Belle, 1985]. One of them (*Acutoplax* Cotton et Weeding, 1939 with type species *Callochiton mayi* Torr, 1912) was recently reestablished as the subgenus of *Callochiton* by Schwabe [2003] due to the peculiar feature of the girdle. (“Along the marginal border of the girdle, a series of 3-5 radially arranged, curved ringshaft needles are found, which are symmetrically and not randomly arranged as in other members of *Callochiton*”) [Schwabe, 2003]. Schwabe [2003] added two more species: *Callochiton (Acutoplax) princeps* Carpenter in Pilsbry, 1892 and

undescribed species in a subgenus from New Zealand. It is very likely that as details of the anatomy of callochitonids are obtained, the taxonomic status of such subgenera as *Trachyradsia* Carpenter MS, Dall, 1878; *Icoplax* Thiele, 1893 and *Paricoplax* Iredale et Hull, 1929 will be reestablished. *Icoplax* includes several species that are found in the Antarctic seas and near South America. *Trachyradsia* contains only the type species, which inhabits waters near south Africa. *Paricoplax* also is monotypic and is found near Australia and New Zealand. Presence of many species of callochitonids in Southern Hemisphere perhaps suggests the Gondwana origin of this group of chitons. Absence of callochitonids in the Caribbean region and along the Pacific coasts of the Central and North Americas can be explained by the late advancement of callochitonids into the Tethys. First callochitonid fossil was found in the Australian Oligocene and later the European Miocene [Van Belle, 1981], when Atlantic Ocean was likely rather wide, which prevented their advancement from Tethys into the Caribbean and westward.

Undoubtedly, it is necessary to make a revision of the genus *Callochiton*, but for the time being, I will consider this genus as described by Kaas and Van Belle [1985]

Most callochitonids inhabit tropical waters, but several species are found in rather cold natal and glacial Antarctic regions. Species of the genus *Callochiton* belong to the group of chitons that are an intermediate between primitive and developed groups of chitons, according to Buckland-Nicks and Hodgson [2000] and Buckland-Nicks [2008], who found major differences in the morphology of spermatozooids of callochitonids compared to the other groups of the order Chitonida, and to Okusu *et al.* [2003], who conducted a molecular study.

Currently, 68 species of chitons are known from the area around Vietnam [Sirenko, 2016], four of which belong to genus *Callochiton*: *C. multidentatus* (Carpenter in Pilsbry, 1892), *C. subsulcatus* Kaas and Van Belle, 1985, *C. longispinosus* Leloup, 1952 and *C. dawydoffi* Sirenko, 2012. I here de-

scribe a new, fifth, species from the waters of Vietnam.

Chitons of Tonga have been studied less than the chitons from its nearest islands, Fiji and Samoa. Currently, 17 species of chitons are known from Fiji [Schwabe *et al.*, 2008], (including one species of the genus *Callochiton*, *C. neocaledonicus* Kaas et Van Belle, 1990) and 12 species of chitons are known from Samoa [Schwabe, Sliker, 2001; Schwabe *et al.*, 2008] (including two species of *Callochiton*, *C. bayeri* Schwabe, 1998 and *C. mu-muena* Schwabe et Sliker, 2001). However, only three species of chitons from Tonga had been described in literature [Kaas *et al.*, 2006]. Several years ago I received five samples of chitons collected near the Tonga islands by P. Bouchet, A. Warén and B. Richer de Forges during Compagne BORDAU 2 in 2000. These samples contained four species of chitons: *Leptochiton* cf. *perscitus* Kaas, 1991, *Loricella* sp., *Craspedochiton* sp. and *Callochiton* sp. Thus, now seven species of chitons are known for Tonga and a species of the genus *Callochiton* is described here as new to science.

Materials and methods

Specimens studied here were collected by the author during the expeditions of the Russian-Vietnamese Tropical Centre along the coast of Vietnam in 2013 and 2017, and by the French expedition – BORDAU 2 on the R/V *Alis* in 2000 in the Polynesian Tonga region.

Specimens selected for a scanning electron microscopy (SEM) study were boiled in 7% KOH for 10-15 minutes, and then boiled twice in fresh water. Then several valves (usually valves I, 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 Canada balsam for examination under a light microscope.

Abbreviations: BL – body length. IEE RAS – A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia. IRSN – Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium. MNHN – Muséum National d'Histoire Naturelle, Paris. Stn. – station. ZISP – Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia.

Taxonomy

Class Polyplacophora Gray, 1821

Subclass Neoloricata Bergenhayn, 1955

Order Chitonida Thiele, 1909

Family Callochitonidae Plate, 1901

Genus *Callochiton* Gray, 1847

Type species: *Chiton laevis* of Montagu, 1803, non Pennant, 1777 (= *Chiton septemvalvis* Montagu, 1803), subsequently designated by Gray, 1847.

= *Clathropleura* Tiberi, 1877; *Trachyradsia* Carpenter MS, Dall, 1878; *Stereochiton* Carpenter MS, Dall, 1882; *Icoplax* Thiele, 1893; *Scrobicoplax* Iredale et Hull, 1929;

Paricoplax Iredale et Hull, 1929; *Quaestiplax* Iredale et Hull, 1929; *Acutoplax* Cotton et Weeding, 1939; *Ocellochiton* Ashby, 1939 [after Van Belle, 1983].

Genus distribution and range: NE to South Atlantic Ocean, Indian Ocean, West Pacific Ocean from Japan to Australia and New Zealand, SE Pacific, Antarctica. Miocene-Recent.

Callochiton sonchaensis sp. nov.

(Figs 1-3, 6 A, B, C)

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Type material. Holotype (ZISP 2297) now disarticulated, consisting of mount of part of girdle and radula, vial with valves, part of radula and part of girdle, and 3 paratypes (ZISP 2298, 2299, 2300).

Type locality. South China Sea, Vietnam, Son Cha Island, 16°13.534'N, 108°12.201'E, depth 8-12 m.

Etymology. Named after the Son Cha Island.

Material examined. South China Sea, Vietnam, Son Cha Island, stn. 98, 16°12.887'N, 108°11.906'E, depth 10-15 m, on dead shells, paratype (ZISP 2299), BL – 6.0 mm, leg. B. Sirenko 16.04.2013; stn. 100, 16°13.534'N, 108°12.201'E, depth 8-12 m, on barnacles, holotype (ZISP 2297), BL – 7.5 mm and paratype (ZISP 2298), leg. B. Sirenko 17.04.2013; stn. 101, 16°13.534'N, 108°12.201'E, depth 8-13 m, on barnacles, paratype (ZISP 2300), BL – 7.5 mm, leg. B. Sirenko 17.08.2013.

Distribution. South China Sea, near Vietnam, Son Cha Island, 8-12 m.

Diagnosis. Animal of small size, BL up to 7.5 mm. Intermediate valves subcarinate, slightly beaked, little more than twice as wide as long. Pleural areas with six deep, squarish to rectangular grooves along the edge of lateral areas on each side, two outer grooves reaching anterior margin of intermediate valves. Articulation of intermediate valves with one slit on each side. Mucro of tail valve slightly anterior.

[**Диагноз.** Животное мелких размеров, длина тела до 7,5 мм. Промежуточные щитки слегка килеватые, с небольшим клювом, их ширина немногим более чем в 2 раза превышает их длину. Плевральные поля с 6 глубокими квадратными или прямоугольными желобками вдоль края боковых полей на каждой стороне, два самых внешних желобка достигают передний край промежуточных щитков. Вентральная часть промежуточных щитков с 1 разрезом на каждой стороне. Мукро хвостового щитка немного впереди.]

Description. Holotype small, body length 7.5 mm, width 5.8 mm, oval, moderately elevated (dorsal elevation of valve V 0.34), subcarinated, side slopes slightly convex, valves slightly beaked. Color of tegmentum and girdle dark vinous, shining.

Head valve somewhat less than semicircular, smooth. Intermediate valves broadly rectangular, anterior margin sinuate, concave in jugal area, con-

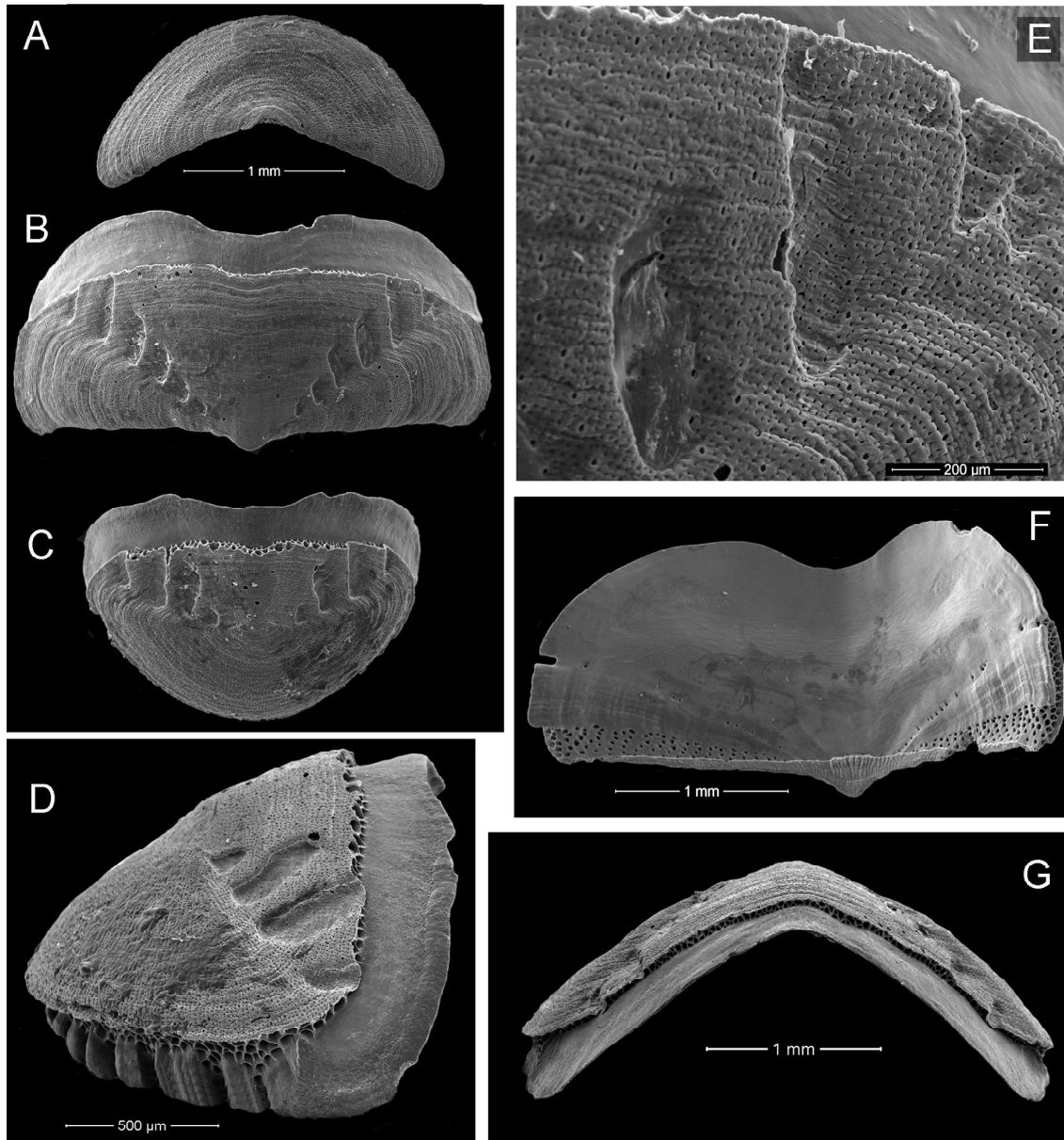


FIG. 1. *Callochiton sonchaensis* sp. nov., South China Sea, Vietnam, Son Cha Island, holotype (ZISP 2297), BL – 7.5 mm. A. Valve I, dorsal view. B. Valve V, dorsal view. C. Valve VIII, dorsal view. D. Valve VIII, lateral view. E. Valve V, tegmentum sculpture in central area. F. Valve IV, ventral view. G. Valve V, rostral view.

РИС. 1. *Callochiton sonchaensis* sp. nov., Южно-Китайское море, Вьетнам, о. Шон Ча, голотип (ZISP 2297), длина тела 7,5 мм. А. Щиток I, с дорсальной стороны. В. Щиток V, с дорсальной стороны. С. Щиток VIII, с дорсальной стороны. D. Щиток VIII, вид сбоку. E. Щиток V, скульптура тегмента на центральном поле. F. Щиток IV, с вентральной стороны. G. Щиток V, вид с рострума;

vex in pleural areas; side margins somewhat rounded, posterior margin concave at both sides of protruding apex; lateral areas slightly raised, smooth with gently visible concentric growth lines; pleural areas with six rather deep, broad, longitudinal grooves along edge of lateral areas on each side, only two outer grooves reaching anterior margin. Grooves squarish to rectangular in form, longest at extreme edge, getting shorter inwards, and dying out before they reach jugum, interstices of about equal width. Tail valve slightly narrower than head

valve, semicircular, front margin evenly convex, mucro slightly anterior, not swollen, antemucronal area sculptured like central area of intermediate valves with 4 deep longitudinal rectangular grooves: postmucronal area slightly convex, smooth, front part of antemucronal area elevated.

Articulamentum light brown, apophyses wide, rounded, connected across jugum by narrow lamina, insertion plates short, slit formula 8/1/12, teeth obtuse, slit rays clearly indicated, eaves spongy.

Girdle moderately wide, width of each side 2.5

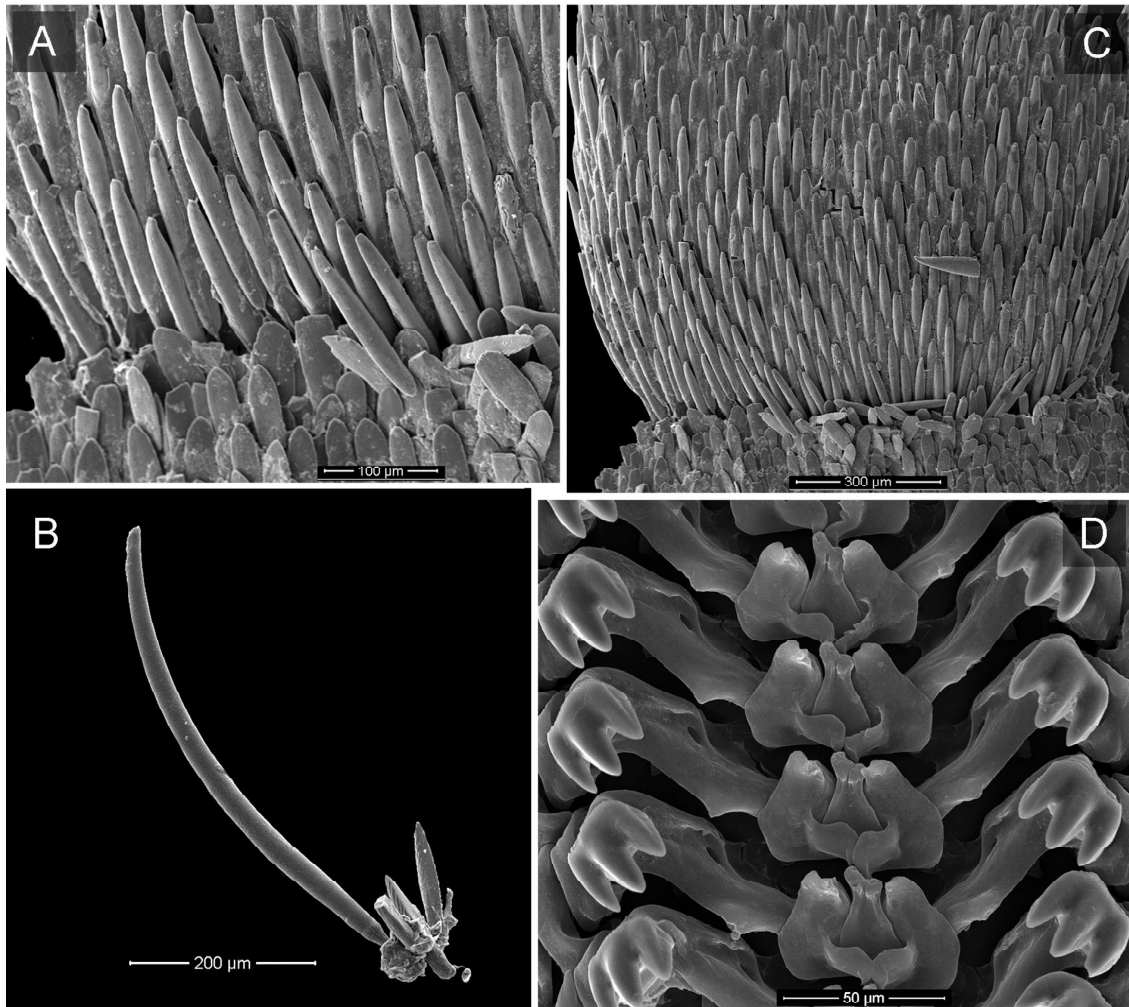


FIG. 2. *Callochiton sonchaensis* sp. nov., South China Sea, Vietnam, Son Cha Island, holotype (ZISP 2297), BL – 7.5 mm. **A, C.** Dorsal and marginal spicules and ventral scales. **B.** Ringshaft-needle and marginal spicules. **D.** Radula.

РИС. 2. *Callochiton sonchaensis* sp. nov., Южно-Китайское море, Вьетнам, голотип (ZISP 2297), длина тела 7,5 мм. **A, C.** Дорсальные и маргинальные спикулы и вентральные чешуйки. **B.** Дорсальная игла и маргинальные спикулы. **D.** Радула.

times less than width of valve IV, coloured like tegmentum, dorsally clothed with long, straight, smooth, inwardly directed, obtusely pointed spicules $180\text{--}200 \times 22 \mu\text{m}$. On outer half of girdle there are rows of slender, curved ringshaft-needles $520 \times 25 \mu\text{m}$. There is a marginal fringe of straight, bluntly pointed dorsoventrally flattened spicules $120 \times 21 \mu\text{m}$ with fan-like sculpture on dorsal side. Ventrally girdle clothed with radiating rows of smooth, elongate, pointed scales $100 \times 30 \mu\text{m}$.

Radula of holotype is 2.3 mm long, of 28 rows of mature teeth. Central tooth rather short, basally extended with broad blade, first lateral teeth slightly longer than central one and below with wing-like extension, which partly covers shaft of central tooth, major lateral teeth with strong tridentate cusp, inner denticle slightly shorter than others.

Holotype with 18 gills on each side extending from valve II to valve VII.

Remarks. It is interesting to note the ontogenetic variability of the tegmentum structure, as well as the colour variation of tegmentum and the girdle. Pleural areas of the intermediate valves of smaller paratypes (ZISP 2299, 2300), have only four longitudinal grooves along the edge of the lateral areas on each side, and only one outer groove reaching the anterior margin of the valve. None of the types have similar colours. Both the tegmentum and the girdle of the holotype are dark vinous. The tegmentum of the head and tail valves and the surrounding them girdle are dark vinous and the rest is light yellow with apical areas of vinous and with narrow black bands to the sutures in the paratype (ZISP 2299). The paratype (ZISP 2300) is brick-red. The tegmentum and girdle of the paratype (ZISP 2298) are brick-red with white sides of valves II and VII and with yellow bands next to all sutures except the sutures of valves I/II and VII/VIII where bands are white.

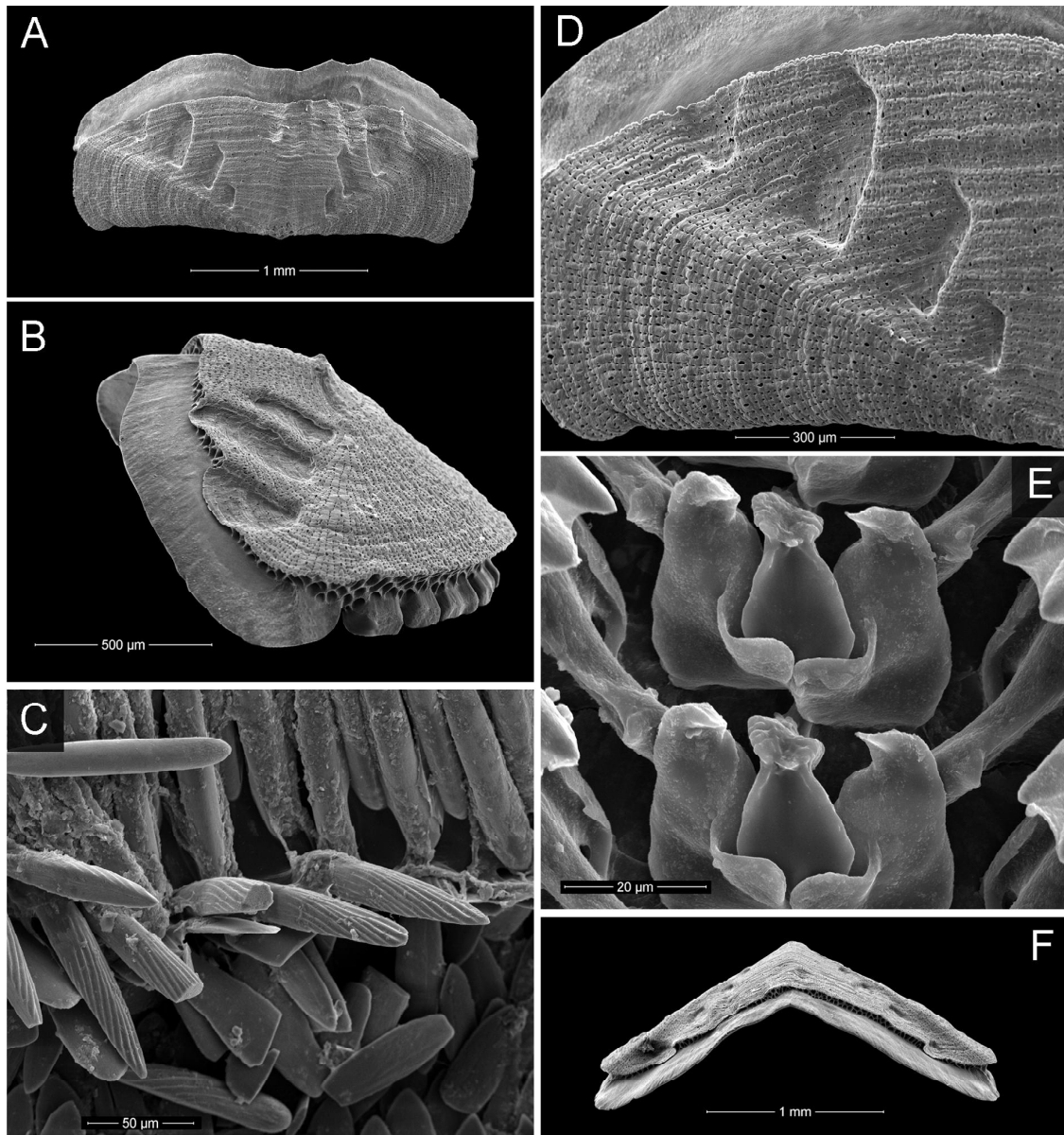


FIG. 3. *Callochiton sonchaensis* sp. nov., South China Sea, Vietnam, paratype (ZISP 2298), BL – 5.0 mm (A, B, D-F) and paratype (ZISP 2299), BL – 6.0 mm (C). A. Valve V, dorsal view. B. Valve VIII, lateral view. C. Ringshaft-needle, dorsal and marginal spicules and ventral scales. D. Valve V, tegmentum sculpture in central area. E. Central and first lateral teeth of radula. F. Valve V, rostral view.

РИС. 3. *Callochiton sonchaensis* sp. nov., Южно-Китайское море, Вьетнам, паратип (ZISP 2298), длина тела 5,0 мм (A, B, D-F) и паратип (ZISP 2299), длина тела 6,0 мм (C). A. Щиток V, с дорсальной стороны. B. Щиток VIII, вид сбоку. C. Дорсальная игла, дорсальные и маргинальные спикулы и вентральные чешуйки. D. Щиток V, скульптура тегментума на центральном поле. E. Центральные и промежуточные зубы радулы. F. Щиток V, вид с роstrума.

Callochiton sonchaensis sp. nov. is similar to *C. klemioides* Leloup, 1937, *C. subsulcatus* Kaas et Van Belle, 1985, *C. schilfi* Schwabe et Ruthensteiner, 2001, *C. sulcatus* Nierstrasz, 1905, *C. cinabaris* Kaas et Van Belle, 1985, *C. cupreus* Dell Angelo, Prella, Sosso et Bonfitto, 2012, *C. dawydoffi* Sirenko, 2012, *C. clausadeae* Kaas and Van Belle, 1985 and *C. tongaensis* sp. nov.

I compared new species with photograph of the holotype of *C. klemioides* (from India) and descrip-

tion. *C. sonchaensis* sp. nov. differs from the latter in having larger and almost square or rectangular grooves on the pleural areas of intermediate valves (vs. round pits in *C. klemioides*) and by absence of blackish bands at the sutures of valves I/II and VII/VIII.

Comparison of new species with photograph of lectotype and description of *C. sulcatus* (from Indonesia) showed that this species differs from *C. sonchaensis* sp. nov. in having smaller and narrower

grooves and broader interstices in pleural areas of intermediate valves, sharply pointed and larger dorsal spicules (275 x 40 µm in *C. sulcatus* and 180-200 x 22 µm in *C. sonchaensis* sp. nov.), and posterior mucro (*vs.* anterior in *C. sonchaensis* sp. nov.).

I compared new species with the photograph of the holotype and description of *C. cinnabaris* (from Papua-New Guinea). New species differs from the latter in having deeper, shorter and broader grooves and narrower interstices in pleural areas of intermediate valves and larger dorsal spicules (180-200 x 22 µm in *C. sonchaensis* sp. nov. and 166 x 12 µm in *C. cinnabaris*), numerous, easily visible shell eyes (*vs.* inconspicuous in *C. sonchaensis* sp. nov.).

C. sonchaensis sp. nov. differs from *C. subsulcatus* (Indonesia) in having deeper, broader and more numerous grooves in pleural areas of intermediate valves, and smooth dorsal spicules (longitudinally grooved in *C. subsulcatus*).

From *C. schilfi* (Indonesia) the new species differs in arrangement of grooves in pleural areas of intermediate valves. In *C. sanchaensis* sp. nov. row of grooves reach the diagonal ridges of the lateral area (*vs.* row never reaches in *C. schilfi*). The grooves of *C. sanchaensis* sp. nov. are deeper and broader than in *C. schilfi*. The apophyses are connected by concave lamina in the new species (*vs.* V-shape in *C. schilfi*).

New species differs from *C. cupreus* (from Indian Ocean) in arrangement of row of grooves in the central area of intermediate valves. In new species row of grooves reaches the diagonal ridges of lateral area (*vs.* row never reaches in *C. cupreus*). *C. sanchaensis* sp. nov. has lower elevation of intermediate valves than *C. cupreus* (0.34 in *C. sanchaensis* sp. nov. and 0.5-0.55 in *C. cupreus*). The central tooth of radula of the new species is narrower than in *C. cupreus*.

C. sonchaensis sp. nov. differs from *C. dawydoffi* (from Vietnam) in having two outer grooves at the pleural area reaching the anterior margin of the intermediate valves (*vs.* 4 outer grooves in *C. dawydoffi*). The grooves of the new species are shorter and wider than the grooves of *C. dawydoffi*. The lateral areas of *C. dawydoffi* are raised prominently and at a steep incline, whereas they rise slightly in the new species.

C. sonchaensis sp. nov. differs from *C. clausadeae* (from Madagascar) in having broader grooves in pleural areas, larger and obtusely pointed dorsal spicules (180-200 x 22 µm in new species and 100 x 20 µm sharply pointed dorsal spicules in *C. clausadeae*), smooth tegmentum in the central area (*vs.* central area with elongate granules, arranged in longitudinal rows in *C. clausadeae*) and elevated front part of antemucronal area.

C. sonchaensis sp. nov. differs from *C. tongaensis* sp. nov. (from Tonga) in having narrower

intermediate valves, longer grooves in the pleural areas, two outer grooves reaching the anterior margin of the intermediate valves (*vs.* one outer groove reaching the anterior margin of the intermediate valves in *C. tongaensis* sp. nov.).

Callochiton tongaensis sp. nov.
(Figs 4, 5, 6 D)

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Type material. Holotype (MNHN IM-2000-33127) now disarticulated, consisting of mount of part of girdle and radula, vial with valves, part of radula and part of girdle.

Type locality. Pacific Ocean, Tonga, 18°41'S, 174°03'W, depth 79-82 m (Campagne BORDAU 2, R/V *Alis*, stn. CP1582, 13.06.2000, leg. P. Bouchet, A. Warén and B. Richer de Forges).

Etymology. Named after the Tonga Islands.

Distribution. Only the type locality.

Diagnosis. Animal of small size. Intermediate valves short and wide, more than three times as wide as long, low elevated, subcarinate, little beaked. Pleural areas with six deep, short grooves along edge of lateral areas on each side, one outer groove reaching anterior margin of intermediate valves. Ventral part of intermediate valves with one slit on each side. Mucro of tail valve anterior.

[**Диагноз.** Животное мелких размеров. Промежуточные щитки короткие и широкие, их ширина более чем в 3 раза превышает их длину, слегка килеватые, с небольшим клювом. Плевральные поля с 6 глубокими короткими желобками вдоль края боковых полей на каждой стороне, один самый внешний желобок достигает передний край промежуточных щитков. Вентральная часть промежуточных щитков с 1 разрезом на каждой стороне. Мукро хвостового щитка переднее.]

Description. Holotype small, 8.5 x 6.0 mm. Valves low elevated (dorsal elevation of valve V 0.24), subcarinated, side slopes slightly convex, valves beaked. Colour of tegmentum pale roseate.

Head valve semicircular, damaged, sculpture of fine, quincuncially arranged granules and microscopical radiating striae, growth line obsolete, shell eyes numerous. Intermediate valves short, wide, rectangular, anterior margin sinuate, concave in jugal area, convex at pleural areas; side margins rounded, posterior margin slightly concave at both sides of prominent apex; lateral areas little raised, sculptured like head valve; pleural areas with six deep, short grooves along lateral areas edge on each side; only one outer groove reaching anterior margin, others shortening towards jugum, interstices 1.5-2 times as wide as grooves. Tail valve slightly less wide than head valve, semicircular, front margin evenly convex, mucro anterior, slightly swollen;

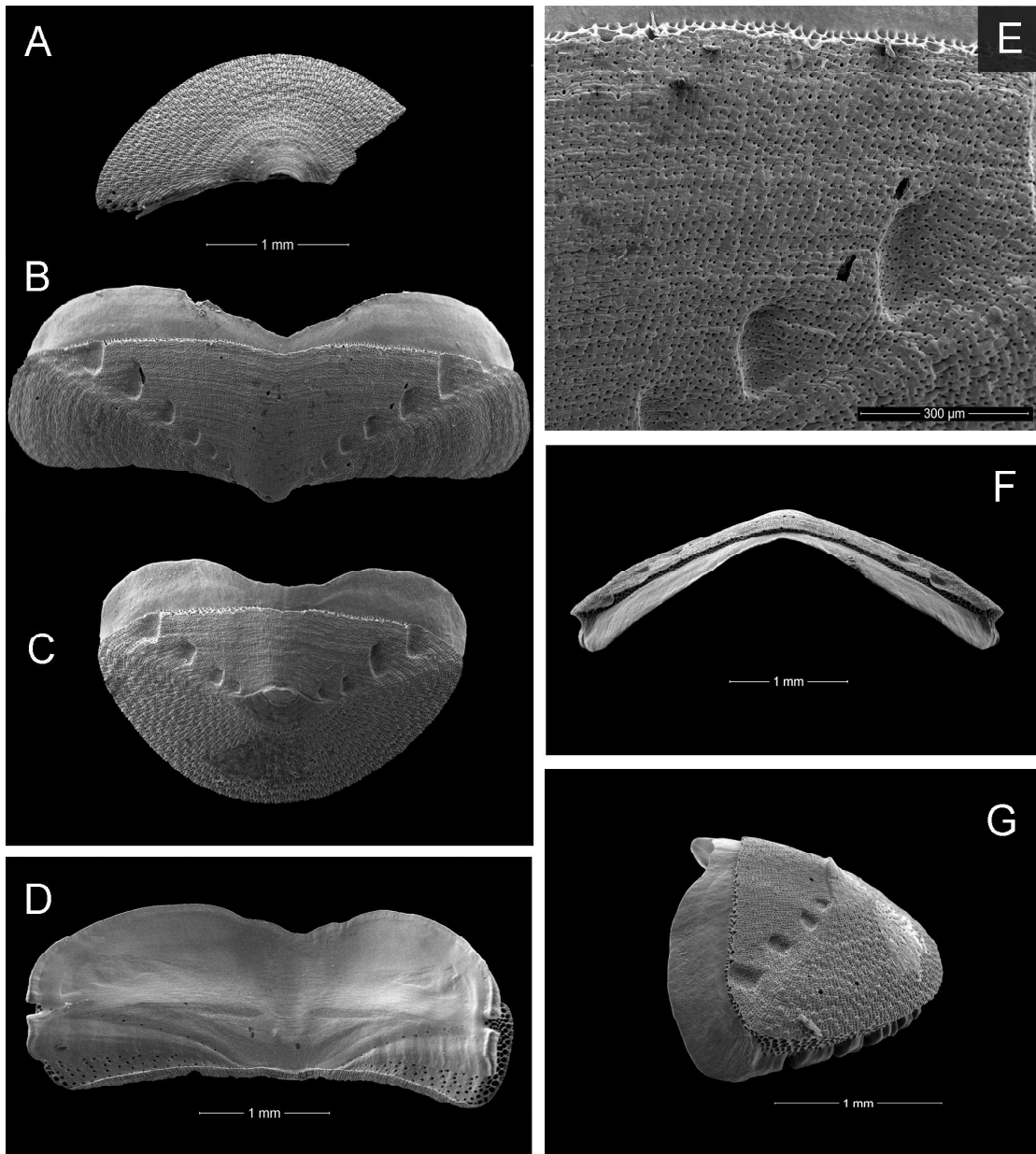


FIG. 4. *Callochiton tongaensis* sp. nov., Pacific Ocean, Tonga, holotype (MNHN), BL – 8.5 mm. **A.** Valve I, dorsal view. **B.** Valve V, dorsal view. **C.** Valve VIII, dorsal view. **D.** Valve IV, ventral view. **E.** Valve V, tegmentum sculpture in central area. **F.** Valve V, rostral view. **G.** Valve VIII, lateral view.

РИС. 4. *Callochiton tongaensis* sp. nov., Тихий океан, Тонга, голотип (NMHN), длина тела 8,5 мм. **A.** Щиток I, с дорсальной стороны. **B.** Щиток V, с дорсальной стороны. **C.** Щиток VIII, с дорсальной стороны. **D.** Щиток IV, с ventральной стороны. **E.** Щиток V, скульптура тегментума на центральном поле. **F.** Щиток V, вид с рострума. **G.** Щиток VIII, вид сбоку.

antemucronal area sculptured like central area of intermediate valves with four deep longitudinal rectangular grooves, postmucronal area sculptured like head valve.

Articulamentum pinkish, apophyses wide, short, rounded, connected across jugum by rather wide, slightly concave lamina, insertion plates short, slit formula 14/1/11, teeth obtuse, slit rays clearly indicated, eaves spongy, insertion teeth with thickened edge.

Girdle wide, width of each side 3 times less than width of valve V, ivory, without bands, dorsally covered with long, smooth, inwardly directed, spicules 160-200 x 35 μm , and near outer margin several white, slightly bent, smooth, single-cupped ringshaft-needles 420 x 21 μm . There is a marginal fringe of straight, dorso-ventrally flattened spicules 120 x 19 μm with feather-like sculpture on dorsal side. Ventral scales smooth, elongate, pointed, measuring 45-50 x 26 μm .

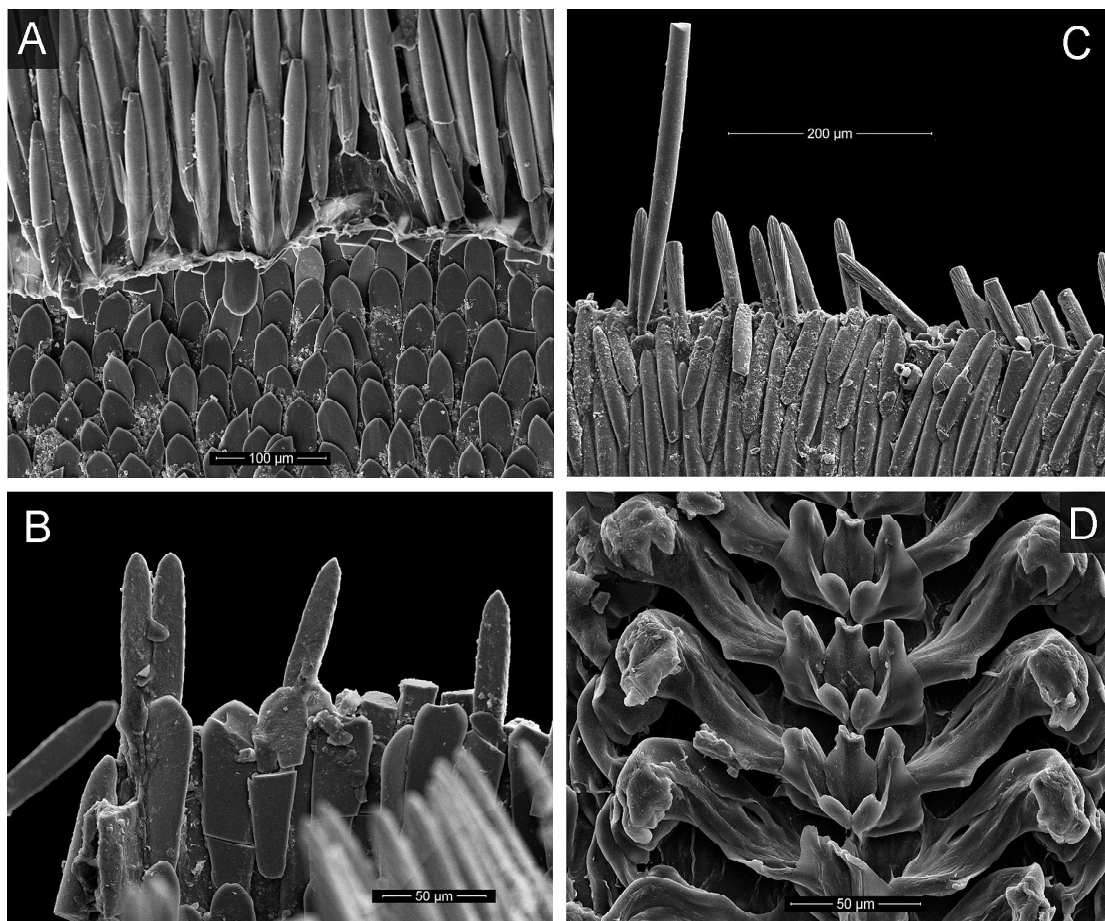


FIG. 5. *Callochiton tongaensis* sp. nov., Pacific Ocean, Tonga, holotype (NMHN), BL – 8.5 mm. **A.** Dorsal spicules and ventral scales. **B.** Ventral scales and marginal spicules, ventral view. **C.** Ringshaft-needle, marginal and dorsal spicules dorsal view. **D.** Radula.

РИС. 5 *Callochiton tongaensis* sp. nov. Тихий океан, Тонга, голотип (NMHN), длина тела 8,5 мм. **A.** Дорсальные спикулы и вентральные чешуйки. **B.** Вентральные чешуйки и маргинальные спикулы с вентральной стороны. **C.** Дорсальная игла, маргинальные спикулы и вентральные чешуйки, вид сверху. **D.** Радула.

Radula of holotype with short central and first lateral teeth. Central tooth tulip-shaped with basally extended shaft and rather broad ring-like blade, first lateral tooth slightly longer than central one, with small blade and basally wing-like extension which covers base of central tooth, major lateral teeth with tridentate cusp, central denticle somewhat larger than others.

Holotype with 18 gills on each side extending from valve III to valve VIII.

Remarks. *Callochiton tongaensis* sp. nov. is similar to *C. dawydoffi*, *C. sonchaensis* sp. nov., *C. klemioides* Leloup, 1937, *C. longispinosus* Leloup, 1952, *C. klemi* Ashby, 1926 and *C. mumuena* Schwabe et Sliker, 2001.

The new species differs from *C. dawydoffi* (from Vietnam) in having wider valves, the width of valve V 3.5 times less than the length of the valve (vs. 2.5 times in *C. dawydoffi*); the lateral area slightly raised (vs. prominently and sharply raised in *C. dawydoffi*); and only one groove reaching the

anterior margin of the intermediate valve (vs. 4 grooves in *C. dawydoffi*).

Callochiton klemioides (from India) differs from *C. tongaensis* sp. nov. in having 3-4 grooves at the pleural area of the intermediate valves (vs. 6 grooves in *C. tongaensis* sp. nov.), narrower valves, width of valve V 2.5 times less than the length of the valve (vs. 3.5 times in *C. tongaensis* sp. nov.) and black bands at both sides next to the suture of valves I/II and VII/VIII (vs. no bands in *C. tongaensis* sp. nov.).

C. longispinosus (from north of South China Sea) differs from *C. tongaensis* sp. nov. in having 3 grooves in pleural areas of intermediate valves (vs. 6 grooves in *C. tongaensis* sp. nov.), outer groove not reaching the anterior margin of the valve (vs. outer groove reaching the anterior margin in *C. tongaensis* sp. nov.), and the insertion teeth not thickened at the edge (vs. insertion teeth thickened at the edge in *C. tongaensis* sp. nov.).

C. tongaensis sp. nov. differs from *C. klemi* (which is known from a single damaged intermedi-

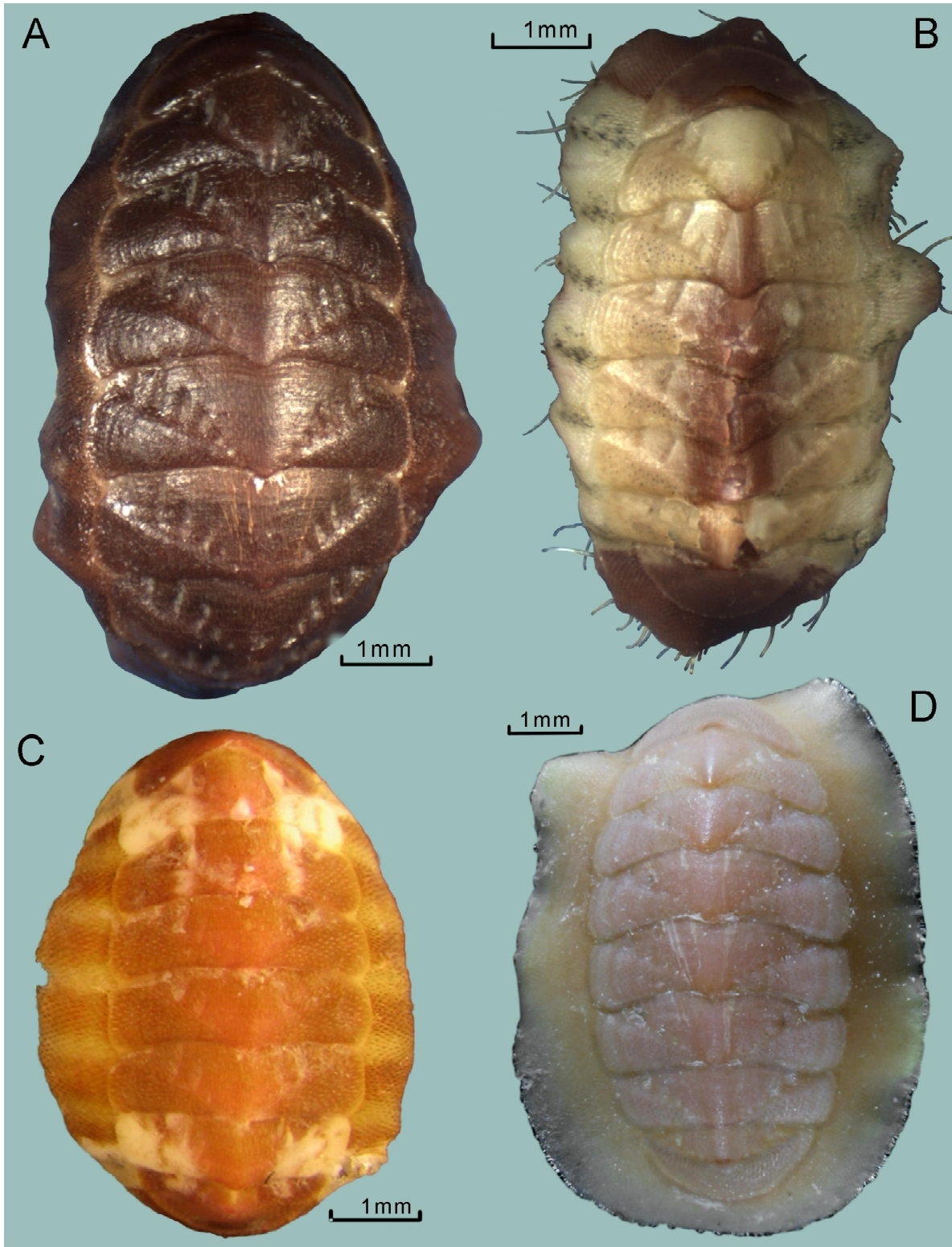


FIG. 6. Colour images of species of genera *Callochiton*. **A.** *Callochiton sonchaensis* sp. nov., holotype (ZISP 2297), BL 7.5 mm, Vietnam, 8-12 m. **B.** *Callochiton sonchaensis* sp. nov., paratype (ZISP 2299), BL 6.0 mm, Vietnam. **C.** *Callochiton sonchaensis* sp. nov., paratype (ZISP 2298), BL 6.0 mm, Vietnam. **D.** *Callochiton tongaensis* sp. nov., holotype (NMHN), BL 8.5 mm, Pacific Ocean, Tonga, 79-82 m.

РИС. 6. Цветные фотографии видов рода *Callochiton*. **A.** *Callochiton sonchaensis* sp. nov., голотип (ZISP 2297), длина тела 7,5 мм, Вьетнам, 8-12 м. **B.** *Callochiton sonchaensis* sp. nov., паратип (ZISP 2299), длина тела 6,0 мм, Вьетнам. **C.** *Callochiton sonchaensis* sp. nov., паратип (ZISP 2298), длина тела 6,0 мм, Вьетнам. **D.** *Callochiton tongaensis* sp. nov., голотип (NMHN), длина тела 8,5 мм, Тихий океан, Тонга, 79-82 м.

ate valve from south Australia), by having one slit on intermediate valves (vs. 2-3 slits in *C. klemi*) and shorter valve.

New species differs from *C. mumuena* (from Western Samoa) in having more grooves in pleural area of valve V (5 grooves in *C. mumuena* and 6 in *C. tongaensis* sp. nov.), in spite of smaller body length in the new species, longer dorsal spicules (160-200 µm in new species and 140 µm in *C. mumuena*) The row of grooves in new species reaches the diagonal ridges of lateral area (vs. does not reach in *C. mumuena*). Slope of postmucronal area straight in new species and concave in *C. mumuena*.

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Описание двух новых видов *Callochiton* (Mollusca: Polyplacophora) из Вьетнама и Тонга

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В статье описываются два новых вида хитонов рода *Callochiton*. Один из них, *C. sonchaensis* sp. nov. из Вьетнама, а второй *C. tongaensis* sp. nov. из Тонга. Они отличаются от других родственных видов количеством, формой и размером борозд на плевральных полях промежуточных и хвостового щитков раковины, количеством разрезов инсерционных пластинок и цветом перинотума. Отсутствие видов рода *Callochiton* в Карибском море и вдоль тихоокеанского побережья центральной и северной Америки, возможно, вызвано поздним проникновением видов рода в океан Тетис из районов близких к Гондване.