

Three new Costellariidae species (Gastropoda) described from French Polynesia

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ABSTRACT. Three new Costellariidae species are described from French Polynesia (Society Islands and Tuamotus), *Vexillum (Pusia) bacchetti* n.sp., *Vexillum (Pusia) gourgueti* n.sp., and *Vexillum (Costellaria) bouteti* n.sp.

INTRODUCTION

After years of collecting work done in the field by many French Polynesian collectors, many new species have been identified by us from that region of the South Pacific Ocean. A few of those species are described herein.

Abbreviations

MNHN: Muséum national d'Histoire naturelle, Paris, France
NHMUK: Natural History Museum, United Kingdom, London, England

Methods

Measurements given are listed in order of shell length, width and aperture length in millimeters.

SYSTEMATICS

Family **COSTELLARIIDAE** MacDonald, 1860
Genus *Vexillum* Röding 1798
Subgenus *Pusia* Swainson 1840
Type species by monotypy: *Mitra microzonias* Lamarck = *Vexillum (Pusia) microzonias* (Lamarck 1811). Caribbean, Recent.

Vexillum (Pusia) bacchetti n. sp.
Figs 1-2

Vexillum (Pusia) consanguineum – Salvat & Rives, 1975: 340, fig. 303; Salvat & Rives, 1984: 121, pl. 27, fig. 6 (not *Mitra consanguinea* Reeve, 1845).
Vexillum (Pusia) lautum – Pechar, Prior & Parkinson, 1980: pl. 51, fig. 5 (not *Mitra lauta* Reeve, 1845).

Vexillum (Pusia) adamsi – Robin & Martin, 2004: 26, pl. C-19, 2 text figures (not *Mitra adamsi* Dohrn, 1861).

Vexillum cf. *adamsi* – Tröndlé & Boutet, 2009: 36 (not *Mitra adamsi* Dohrn, 1861) (Tröndlé, pers. com.).

Type material. Holotype MNHN 25000 (Figs 1-2): Pueu, Tahiti, under coral blocks, reef barrier, interior of lagoon. Size: 13.1 x 6.7 x 7.5 mm, ex Robert Gourguet collection 58.21A-1.

Paratype 1: Pueu, Tahiti, under coral blocks, reef barrier, interior of lagoon. Size: 12.8 x 7.3 x 7.3 mm, Robert Gourguet collection 58.21A-2.

Paratype 2: Pueu, Tahiti, under coral blocks, reef barrier, interior of lagoon. Size: 12.4 x 6.8 x 6.7 mm, Robert Gourguet collection 58.21A-3.

Paratype 3: Arue, Tahiti, outer slope of reef, barrier lagoon, 15-20 meters. Size: 11.8 x 5.9 x 6.0 mm, Michel Boutet collection.

Paratype 4: Tahiti, no collection data. Size: 12.6 x 6.9 x 6.7 mm, Michel Boutet collection.

Paratype 5: Toahotu, Tahiti, under dead coral; Acropora; small Spongia & shells, 1-3 meters. Size: 13.3 x 6.6 x 6.8 mm, leg. G. Busson, ex Hans Turner collection, Richard Salisbury collection.

Paratype 6: Toahotu, Tahiti, under dead coral; Acropora; small Spongia & shells, 1-3 meters. Size: 9.8 x 5.3 x 5.0 mm, leg. G. Busson, ex Hans Turner collection, Richard Salisbury collection.

Paratype 7: Faaone lagoon, Tahiti, on reef, 1-2 meters. Size: 10.9 x 6.4 x 6.6 mm, Manfred Herrmann collection.

Paratype 8: Faaone lagoon, Tahiti, on reef, 1-2 meters. Size: 11.1 x 6.2 x 6.5 mm, Manfred Herrmann collection.

Paratype 9: Tahiti. Size: 12.0 x 6.3 x 6.2 mm, Günter Stossier collection.

Paratype 10: Papeete, Tahiti, subtidal sand pockets on reef at night, 1981. Size: 11.2 x 6.2 x 6.7 mm, Manfred Herrmann collection.

Type locality. Pueu, Tahiti, Society Islands, French Polynesia.

Habitat. Under coral rubble, intertidal to 20 meters.

Distribution. Known only from the Society Islands, French Polynesia.

Description. Shell small, to approximately 13 mm in length, thick, ovate-fusiform in shape, surface dull. Protoconch missing, teleoconch of 6 - 7 rounded whorls; suture shallow but distinct, early whorls sculptured with 19-21 close-set, small rounded axial ribs which become more widely spaced and larger on each successive whorl; interspaces between axial ribs sculptured with microscopic shallow spiral grooves, bisected by fine axial grooves, forming a striated sculpture. Body whorl sculptured with 14 or 15 axial ribs but otherwise of the same sculpture as early whorls, lower portion of the body whorl with 3 or 4 raised pustulate spiral cords separated by a spiral groove; aperture moderately wide, outer lip smooth and gently curved, lirations deep within aperture, very fine and difficult to see; aperture canal short, wide with very shallow siphonal notch; aperture slightly longer than half shell length; columella with 4 columellar folds, decreasing in size toward anterior end.

Color pattern: whorls red, axial ribs red to orange, with spiral row of cream-colored spots on tops of axial ribs near periphery of shell; ribs terminate on lower body whorl in distinct cream-colored spots on tops of 3 or 4 pustulate spiral cords; columella and interior of aperture cream colored, tinged with orange.

Discussion. *Vexillum (Pusia) baccheti* n. sp. is most closely related to *Vexillum (Pusia) consanguineum* (Reeve, 1845) (Figs 3-4). It differs from that species in having a narrower shell, higher and sharper axial ribs with fine sculpture in interspaces of axial ribs over entire shell, darker in color, with cream colored spots on ribs rather than white spots seen in *V. consanguineum* ribs. This new species is restricted in its range to French Polynesia.

It has also been confused by Robin and Martin (2004, plate C-19) with the endemic Hawaiian species *Vexillum (Pusia) adamsi* (Dohrn, 1861) (Figs 5-6). It differs in being smaller, *V. adamsi* reaches 18 mm in size, sculptured with 2 to 3 large rows of pustulate spiral cords on the rostrum near the base of the shell, and having a red color pattern. It should also be compared to *Vexillum (Pusia) lautum* (Reeve, 1845) (Figs 7-8) from which it differs in sculpture and color pattern. *Vexillum lautum* has a pattern of white axial spikes alternating across the center of the body whorl.

Only when the shell has faded to red is there any issue with separating the two species.

Etymology. *Vexillum (Pusia) baccheti* is described in honor of Philippe Bacchet, famous marine life photographer.

Vexillum (Pusia) gourgueti n. sp.
Figs 9-10

Vexillum (Pusia) pisolinum – Salvat & Rives, 1975: 340, fig. 302; Salvat & Rives, 1984: 120, pl. 27, fig. 3 (not *Mitra pisolina* Lamarck, 1811).

Vexillum (Pusia) cremans – Turner, Hans, 1989: 15, 32, pl. 7, fig. 24 (not *Mitra cremans* Reeve, 1845).

Vexillum cremans – Tröndlé & von Cosel, 2005: 307; Tröndlé & Boutet, 2009: 36 (not *Mitra cremans* Reeve, 1845) (Tröndlé, pers. com.).

Type material. Holotype MNHN 25002 (Figs. 9-10): Baie de Omoa, Fatu Hiva, Marquesas Islands. Size: 13.1 x 6.3 x 6.9 mm, ex Michel Boutet collection.

Paratype 1: Secteur de Takai, Takapoto Atoll, Tuamotus. External flat reef, intertidal, under dead block coral, Size: 11.2 x 6.0 x 6.2 mm, Michel Boutet collection.

Paratype 2: Secteur de Takai, Takarua, Tuamotus. Under dead coral blocks, intertidal, flat reef. Size: 12.0 x 7.0 x 6.5 mm, Robert Gourguet collection.

Paratype 3: Secteur de Takai, Takarua, Tuamotus. Under dead coral blocks, intertidal, flat reef. Size: 10.0 x 5.5 x 5.2 mm, Robert Gourguet collection.

Type locality. Takai, Takarua, Tuamotu Archipelago, French Polynesia

Habitat. Intertidal under dead coral blocks, in shallow water.

Distribution and habitat. Tuamotu Archipelago and Marquesas Islands (French Polynesia).

Description. Shell small, to approximately 13 mm in length, thick, ovate-fusiform in shape, surface dull. Protoconch missing, teleoconch of 6 - 7 rounded whorls; early whorls sculptured with 11 or 12 close-set, beaded axial ribs, suture distinct; axial ribs on later whorls become more widely spaced, smoother and larger on each successive whorl; interspaces between axial ribs sculptured with narrow and shallow spiral grooves. Body whorl sculptured by 11 or 12 widely spaced, smooth axial ribs, interspaces with narrow microscopic, shallow spiral grooves. Lower portion of body whorl nearly smooth with 4-6 flat or slightly rounded spiral cords, each spiral cord delineated by increasingly deeper and wider spiral grooves; aperture moderately wide, outer lip thin and gently curved, lirations deep within the aperture, very fine and difficult to see; aperture canal short, wide with very shallow siphonal notch; aperture equal to or

slightly longer than half shell length; columella with 4 columellar folds, decreasing in size anteriorly.

Color pattern: Shell brown, early whorls beaded with a pattern of square white and brown spots, later whorls with mostly white axial ribs with brown streaks in interspaces between axial ribs, body whorl with white spots on each axial rib near suture and a distinct band of spots around periphery of shell, lower body whorl with 1 to 3 small spiral cords, intermittently spotted with white, base of body whorl where axial ribs terminate with large white pustulate cords streaked with brown; columella, siphonal fasciole and interior of aperture white, outer lip occasionally semi-transparent showing color pattern from exterior of body whorl.

Discussion. *Vexillum (Pusia) gourgueti* is similar to *V. (Pusia) cremans* (Reeve, 1845) (Fig. 11) and *V. (Pusia) pisolinum* (Lamarck, 1811) (Figs 12-13). *Vexillum gourgueti* differs from both these species in color pattern and sculpture. *Vexillum cremans* is a dark brown shell with widely separated axial ribs, light colored spots at the termination of the axial ribs near the suture and fine, close-set, undulating spiral cords across the upper portion of the body whorl which override the axial ribs. The lower body whorl is cream colored and ornamented with widely spaced spiral cords. *Vexillum cremans* has been considered by authors (Cernohorsky, 1970 and Turner, 2001) as a synonym of *V. pisolinum* but it differs in sculpture. *Vexillum pisolinum* is a much smoother shell with wide-set axial ribs, fine deep axial grooves in the interspaces on the upper body whorl and strong axial ribs extending nearly to the base of the shell. *V. cremans* was described by Reeve (1844-1845). The syntypes are deposited in NHMUK. One of them is pictured here (Fig. 11). The lectotype of *V. pisolinum* was designated and pictured by Cernohorsky (1969).

Etymology. *Vexillum (Pusia) gourgueti* is described in honor of Robert Gourguet who first brought this species to the attention of the authors.

Genus *Vexillum* Röding, 1798

Subgenus *Costellaria* Swainson, 1840

Type species by monotypy: *Mitra rigida* Swainson, 1821 = *Mitra semifasciata* Lamarck, 1811 = *Vexillum (Costellaria) semifasciatum* (Lamarck, 1811) Recent, Indo-Pacific

Vexillum (Costellaria) bouteti n. sp.

Figs 14-15

Vexillum rusticum – Tröndlé & Boutet, 2009: 37 (not *Mitra rustica* Reeve, 1845) (Tröndlé, pers. com.).

Type material. Holotype MNHN 25003 (Figs 14-15): Punaauia, Tahiti, outer slope of the barrier reef, 20-30 meters. Size: 16.2 x 6.6 x 7.9 mm, ex Michel Boutet collection.

Paratype 1: Arue, Tahiti, outer slope of the barrier reef, 60 meters, dead collected. Size: 13.2 x 5.5 x 6.6 mm (slightly immature), Robert Gourguet collection 58.16B.

Paratype 2: Arue, Tahiti, outer slope of barrier reef, 50-60 meters. Size: 14.5 x 5.4 x 6.4 mm (slightly immature), Michel Boutet collection.

Paratype 3: Tahiti, divers 30-50 meters. Size: 15.2 x 6.0 x 7.6 mm, Manfred Herrmann collection.

Paratype 4: Tahiti, divers 30-50 meters. Size: 14.4 x 5.8 x 7.2 mm, Richard Salisbury collection.

Type locality. Punaauia, Tahiti, Society Islands, French Polynesia.

Habitat. Outer slope of barrier reef, 20-60 meters.

Distribution. Known only from the Society Islands.

Description. Shell medium sized, to approximately 16 mm in length, relatively thin, fusiform in shape, surface crenulated. Protoconch broken, remaining whorl transparent glassy white, teleoconch of 8 whorls; early whorls with 10-12 axial ribs, with 2 or 3 spiral grooves in the interspaces, later whorls developing shoulder with spiked knob just above first spiral groove, suture distinct and undulating; later whorls with 10-12 axial ribs, area below suture sloped forming turreted shoulder sculptured with tiny microscopic axial riblets. A large spiked knob ornaments each rib, with 2 or 3 deep, almost punctate spiral grooves below knob; body whorl sculptured with 9 or 10 strong raised axial ribs, with 8 or 9 deep punctate spiral grooves in interspaces of axial ribs, toward base of shell, appearing near first columellar fold is a sunken area, wherein axial ribs become thin and eventually terminate, area marked by deep concave areas between the diminishing axial ribs, axial ribs and spiral cords nearly of similar size, forming a fenestrate sculpture with depressed, rectangular, pit-like depressions. Aperture narrow, length half or less of total shell length, outer lip smooth and straight, slightly flared at base, lirations deep within the aperture, columella with 4 or 5 columellar folds decreasing in size anteriorly. Siphonal canal slightly recurved toward dorsal side in adult shells.

Color pattern: shell white, with a distinctive interrupted brown band on subsutural ramp, an indistinct faint row of tiny brown spots near periphery of shell and an interrupted brown spiral band emerging near largest columellar fold. Columella, siphonal fasciole, and interior of aperture uniformly white.

Discussion. This species is most similar to *Vexillum (Costellaria) lucidum* (Reeve, 1845) (Figs 16-17) but differs in being sculptured with a wide sloping subsutural ramp and knobby shoulders. The early whorls are white, ornamented with two distinct brown

bands, one below the suture and one on the lower body whorl. Body whorl axial ribs are widely spaced and bisected by deep spiral grooves.

Etymology. *Vexillum (Costellaria) bouteti* is described in honor of Michel Boutet who first brought this species to the attention of the authors.

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Figures 1-17

Note: Shell sizes below are given in millimeters in the order length, width and aperture length.

1-2. *Vexillum (Pusia) bacchetti* n. sp. Holotype: Pueu, Tahiti, under blocks, reef barrier, interior of lagoon. Size: 13.1 x 6.7 x 7.5 mm, ex Robert Gourguet collection 58.21A-1, MNHN 25000, Paris; **3-4.** *Vexillum (Pusia) consanguineum* (Reeve, 1845): Orote Cliffs, Orote Point, Guam, Feb 21, 1974, leg. Jim Rodgers. Under rocks at surge line. Size: 13.3 x 7.2 x 7.0 mm, Richard Salisbury collection; **5-6.** *Vexillum (Pusia) adamsi* (Dohrn, 1861): Off Lahaina, Maui, Hawaiian Islands, September 1978, leg. Andy Adams. In rubble, 3 meters (10 feet). Size: 18.2+ x 9.2 x 9.5 mm (+ means early whorls missing). Photo by Andy Adams. Richard Salisbury collection; **7-8.** *Vexillum (Pusia) lautum* (Reeve, 1845): Apra Harbor, Guam June 1972, leg. Richard Salisbury In rocks at surge line. Size: 13.4 x 7.9 x 7.1 mm, Richard Salisbury collection; **9-10.** *Vexillum (Pusia) gourgueti* n. sp. Holotype: Baie de Omoa, Fatu Hiva, Marquesas Islands. Size: 13.1 x 6.3 x 6.9 mm, ex Michel Boutet collection, MNHN 25002, Paris; **11.** *Vexillum (Pusia) cremans* (Reeve, 1845) syntype: St. Nicolas, Island of Zebu [Cebu], Philippines; 1845, (from Original Description) Under stones at low water. Size: 15.8 mm. Photo Courtesy of John Wolff, Syntype BMNH 1967731; **12-13.** *Vexillum (Pusia) pisolinum* (Lamarck, 1811): Kwajalein Atoll, Marshall Islands, 1978, leg. Andy Adams. In rubble, on reef. Size: 13.7 x 7.2 x 6.8 mm. Photo by Andy Adams, Richard Salisbury collection; **14-15.** *Vexillum (Costellaria) bouteti* n. sp. Holotype: Punaauia, Tahiti. Outer slope of the barrier reef, 20-30 meters. Size: 16.2 x 6.6 x 7.9 mm, ex Michel Boutet collection, MNHN 25003, Paris; **16-17.** *Vexillum (Costellaria) lucidum* (Reeve, 1845): Gorco Fuel Piers, Apra Harbor, Guam March 16, 1974, leg. Richard Salisbury, in silt on top of coral and rocks, 1.5 meters (5 feet), scuba. Size: 16.0 x 6.0 x 7.8 mm, Richard Salisbury collection.

