

## Description of a new species of *Favartia* (*Pygmaepterys*) (Gastropoda: Muricidae: Muricopsinae) from Hawaii

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**Abstract.** *Favartia* (*Pygmaepterys*) *kernoi* n. sp. is described from Hawaii. It was previously confused with *F. (P.) funafutiensis* (Hedley, 1899) but differs in having a lecithotrophic larval development vs planktotrophic in *F. (P.) funafutiensis*. The new species is compared with other Indo-West Pacific species of *Pygmaepterys*, namely *F. (P.) avatea* Houart & Tröndlé, 2008 from French Polynesia and New Caledonia, *F. (P.) bellini* (D'Attilio & Myers, 1985) from the Philippines and Okinawa, *F. (P.) lifouensis* Houart & Héros, 2012 from New Caledonia and *F. (P.) philcloveri* (Houart, 1984) from the Philippines. It is also briefly compared with the other eleven species from the Indo-West Pacific.

**Résumé.** *Favartia* (*Pygmaepterys*) *kernoi* n. sp. est décrite de Hawaii. L'espèce a été confondue avec *F. (P.) funafutiensis* (Hedley, 1899) mais elle en diffère par son développement larvaire lécithotrophe alors qu'il est planctotrophe chez *F. (P.) funafutiensis*. La nouvelle espèce est comparée avec d'autres espèces de *Pygmaepterys* de l'Indo-Pacifique Ouest, notamment *F. (P.) avatea* Houart & Tröndlé, 2008 de Polynésie française et de Nouvelle-Calédonie, *F. (P.) bellini* (D'Attilio & Myers, 1985) des Philippines et d'Okinawa, *F. (P.) lifouensis* Houart & Héros, 2012 de Nouvelle-Calédonie et *F. (P.) philcloveri* (Houart, 1984) des Philippines. Elle est également brièvement comparée avec les onze autres espèces de l'Indo-Pacifique Ouest.

### INTRODUCTION

*Pygmaepterys* was originally described as a subgenus of *Pterynotus* s.s. for two species: *F. (P.) alfredensis* (Bartsch, 1915), the type species, and *F. (P.) maraisi* (Vokes, 1978), both from South Africa. It was then thought that *Pygmaepterys* was closely related to *Pterynotus*. However, further research based on shell morphology and radula characteristics proved *Pygmaepterys* to be a muricopsine (D'Attilio & Myers, 1985b). The radula characteristics were studied in several species but not in the type species; nevertheless, all these species are strongly related to *F. alfredensis*.

There are currently 24 Recent *Pygmaepterys* species, 16 of which are from the Indo-West Pacific region. The new species is the only one that occurs in Hawaii.

**Terminology used to describe the spiral cords and the apertural denticles (after Merle, 2001 and 2005) (Figs 1-2) (Terminology in parentheses: erratic feature).**

### SPIRAL CORDS

**P:** primary cord; **s:** secondary cord; **IP:** infrasutural primary cord (primary cord on subsutural ramp); **P1:**

shoulder cord; **P2-P6:** primary cords of the convex part of the teleoconch whorl; **s1-s6:** secondary cords of the convex part of the teleoconch whorl (example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.); **ADP:** adapertural primary cord on the siphonal canal; **MP:** median primary cord on the siphonal canal; **ABP:** abapertural primary cord on the siphonal canal.

### APERTURE

**ID:** infrasutural denticle; **D1 to D5:** abapical denticles.

### Repositories

AMS: Australian Museum, Sydney, Australia.

ANSP: Academy of Natural Sciences of Philadelphia, U.S.A.

IRSNB: Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.

MNHN: Muséum national d'Histoire naturelle, Paris, France.

MS: collection Mike Severns.

RH: collection Roland Houart.

SDNHM: San Diego Natural History Museum, California, U.S.A.

USNM: National Museum of Natural History, Washington, D.C., U.S.A.

### Other abbreviations

lv: live collected specimen.

dd: empty shell.

### SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815

Subfamily **MURICOPSINAE** Radwin & D'Attilio, 1971

Genus *Favartia* Jousseaume, 1880

Subgenus *Pygmaeapterys* Vokes, 1978

Type species by original designation: *Murex alfredensis* Bartsch, 1915, South Africa.

**Remarks.** In harmony with the most recent papers (Houart & Tröndlé, 2008; Houart & Rosado, 2008; Houart & Héros, 2012) we will retain *Pygmaeapterys* as a subgenus of *Favartia*, while awaiting further genetic results.

#### *Favartia* (*Pygmaeapterys*) *kernoi* n.sp.

Figs 1-4, 6, 9-14

*Favartia funafutiensis* (Hedley) – Kaicher, 1979: card 2029 (NOT *Murex funafutiensis* Hedley, 1899).

?*Pygmaeapterys funafutiensis* (Hedley) – Vokes and D'Attilio, 1980: Pl. 2, fig. 5a-b (only) (NOT *Murex funafutiensis* Hedley, 1899).

*Pygmaeapterys funafutiensis* (Hedley) – D'Attilio & Myers, 1985a: Figs 7-8, 11, 14; D'Attilio & Myers, 1985b: Figs 4, 5 (NOT *Murex funafutiensis* Hedley, 1899).

**Type material.** Hawaii, dredged off Kihei, Maui, 20°39.180" N, 156°28.598" W to 20°38.650" N, 156°30.494" W, 170 m, December 28, 2012, holotype MNHN 25838, lv, 10.7 mm.

Paratypes: 1 IRSNB IG 32 388/MT 2798, lv, 9.5 mm; 1 RH, dd, 10.5 mm; 1 MS, dd, 11.8 mm; 1 ANSP 451390, dd, 9.9 mm; 1 MS, dd, 8.7, 128 m, November 21, 2012; 1 USNM 1205569., lv, 9.2 mm, 128 m, November 21, 2012; 1 MS, lv, 13.3 mm; 137 m, November 30, 2012; 1 MS, dd, 12.9 mm, 101 m, December 5, 2012; Hawaii, Oahu, Pokai Bay, August 14, 1976, Dredged in sand & coralline algae, 183 m, 1 R. Salisbury, dd, 9.0 mm.

**Type locality.** Hawaii, dredged off Kihei, Maui, 20°39.180" N, 156°28.598" W to 20°38.650" N, 156°30.494" W, 170 m, December 28, 2012.

**Distribution.** Hawaii, Maui and Oahu, live in 101-170 m.

**Description.** Shell large for the subgenus, up to 13.3 mm in length at maturity (paratype MS). Length/width ratio 1.7-1.8. Biconical, broadly ovate, weakly spinose, lightly built, squamous. Subsutural ramp narrow, weakly sloping, slightly concave. Light or dark tan or brown. Aperture glossy, bluish-white. Spire high with 1.5 protoconch whorls and teleoconch up to 5 broadly convex, strongly shouldered, weakly spinose whorls. Suture slightly impressed, partially obscured by axial varices of following whorl. Protoconch moderately large, weakly elongate, whorls rounded, smooth, width 550 µm, height 500 µm (paratype IRSNB). Terminal lip delicate, thin, erect, strongly curved.

Axial sculpture of teleoconch whorls consisting of moderately high, narrow, weakly spinose, lightly webbed varices. Other axial sculpture of very fine, numerous, close-set growth lamellae. First to penultimate whorl with 6 varices; last whorl with 5 or 6. Spiral sculpture of high, strong, rounded, broad, squamous, primary cords and several lirae. First to third whorl with visible P1 and P2, fourth with SP, P1, P2, occasionally P3 covered by next whorl. Last whorl with SP, P1-P6, with small lirae between cords. P2-P4 broadest and highest, approximately of same strength; P1 and P5 slightly lower and narrower; P6 very small, followed by ADP and MP on siphonal canal. Intersection of varices and spiral cords giving rise to small, short spinelets, connected with varical flange, more obvious on last (apertural) varix. P1 spine longest.

Aperture small, ovate; columellar lip narrow, with 3 weak knobs abapically, otherwise smooth; rim very weakly erect abapically, otherwise adherent, with weak, low parietal tooth at adapical extremity; anal notch moderately deep, broad; outer lip erect, with 6 strong denticles within: 1D, D1-D5. Siphonal canal moderately long, 28-30% of total shell length, broad, weakly dorsally recurved, narrowly open.

Operculum and radula unknown.

### Figures 1-8 (scale bars: 500 µm)

1-4. *Favartia* (*Pygmaeapterys*) *kernoi* n. sp.

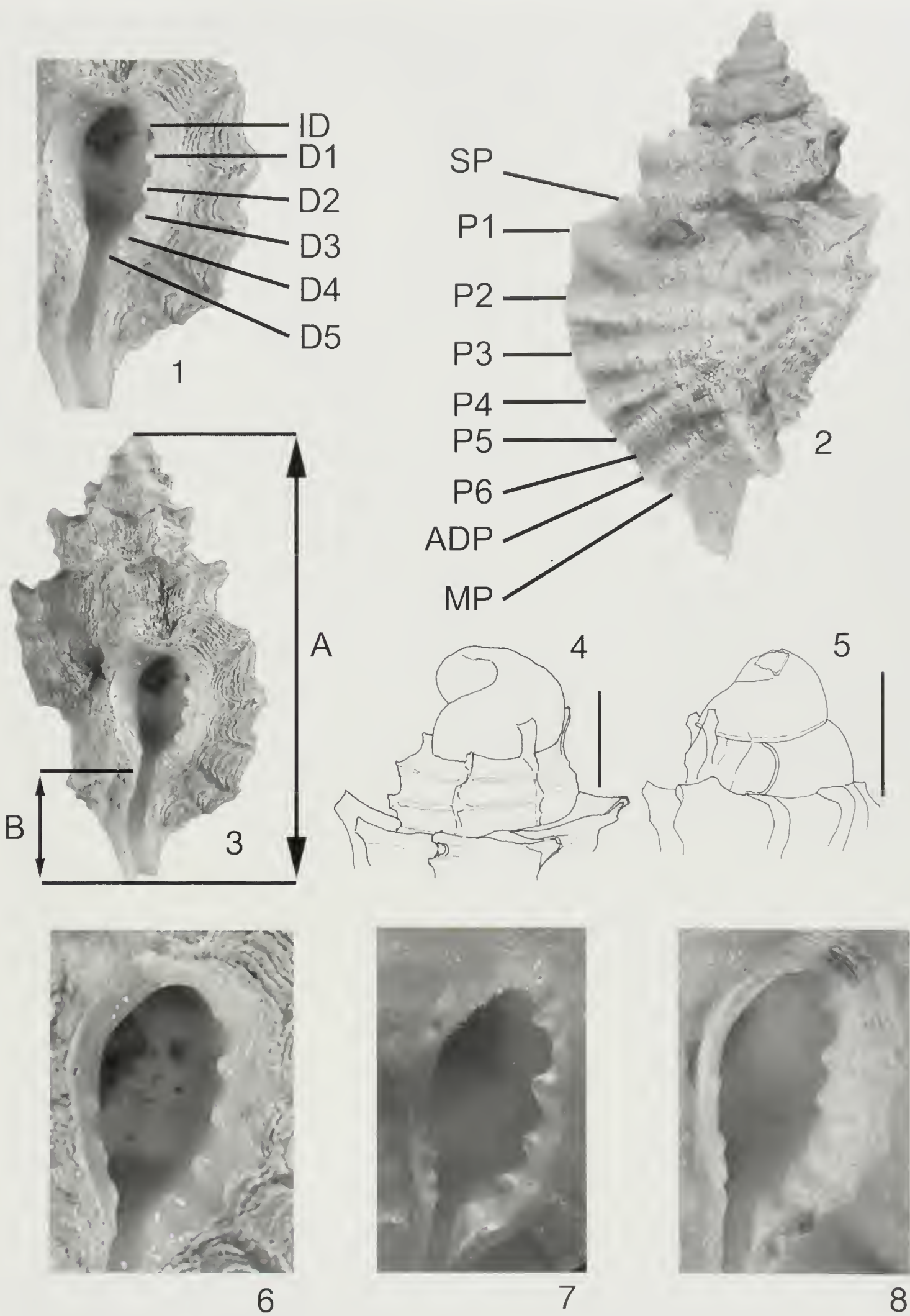
1. Apertural denticles morphology (holotype MNHN 25838.); 2. Spiral cords morphology (paratype RH); 3. Measurements of the shell and siphonal canal (holotype MNHN 25838.); 4. Protoconch (paratype IRSNB IG 32388/MT 2798).

5. Protoconch of *Favartia* (*Pygmaeapterys*) *funafutiensis* (Hedley, 1899), holotype AMS C.006004.

6-8. Morphology of the aperture.

6. *Favartia* (*Pygmaeapterys*) *kernoi* n. sp. (holotype MNHN 25838); 7. *Favartia* (*Pygmaeapterys*) *avatea* Houart & Tröndlé, 2008 (holotype MNHN 20172); 8. *Favartia* (*Pygmaeapterys*) *lifouensis* (holotype MNHN 24174).





**Etymology.** This species is named for Mr. Kern Osterstock, nicknamed "Kerno", in recognition of his generous support and help in developing a system allowing the junior author to dredge to the depths that this species has been shown to inhabit.

**Remarks.** From the sixteen Indo-West Pacific species, three have a last teleoconch whorl with only 3 axial varices and need not be compared further here: *F. (P.) cracentis* (Houart, 1996) from Indonesia, *F. (P.) dondani* (Kosuge, 1984) from the Philippines and *F. (P.) menoui* (Houart, 1990) from New Caledonia.

Six species are confined to the Indian Ocean, namely *F. (P.) alfredensis* (Bartsch, 1915) from Port Alfred, South Africa, *F. (P.) maraisi* (Vokes, 1978) from Northern Transkei, South Africa, *F. (P.) isabellae* Houart & Rosado, 2008 from Madagascar and Mozambique, *F. (P.) adenensis* (Houart & Wranik, 1989), *F. (P.) yemenensis* (Houart & Wranik, 1989) and *F. (P.) paulboschi* Smythe & Houart, 1984 all from the Gulf of Aden, Yemen and Oman. All these species are very different from *F. (P.) kerno*i and need not be compared here either.

The remaining seven species are *F. (P.) avatea* Houart & Tröndlé, 2008 from the Austral Archipelago and New Caledonia, *F. (P.) bellini* (D'Attilio & Myers, 1985) from the Philippines and Okinawa, *F. (P.) circinata* Houart & Héros, 2012, from Taiwan, *F. (P.) funafutiensis* (Hedley, 1899) from the Funafuti Atoll, *F. (P.) kurodai* Nakamigawa & Habe, 1964 from Japan, *F. (P.) lifouensis* Houart & Héros, 2012 from New Caledonia and *F. (P.) philcloveri* (Houart, 1984) from the Philippines.

The shell characters of *Favartia (P.) circinata*, *F. (P.) kurodai* and *F. (P.) philcloveri* differ markedly from those of *F. (P.) kerno*i n. sp.

*Favartia (P.) kerno*i n. sp. was erroneously identified as *F. (P.) funafutiensis*, starting from Kaicher (1979) who illustrated a shell from Pokai Bay, Oahu, Hawaii. The same specimen was illustrated by Vokes &

D'Attilio (1980) and was then also identified as *F. (P.) funafutiensis*, which following the authors only differs in having several small denticles on the inner lip.

Another specimen of *F. (P.) kerno*i n. sp., this one from the Philippines, from the Don Pisor collection was illustrated by D'Attilio & Myers (1985a and 1985b), also as *F. (P.) funafutiensis*. The locality of this last specimen seems very doubtful as no other specimen has been signalized from the Philippines since then, in spite of the extensive dredging that has been performed there since the end of the seventies. The label could have been mixed with that of another species.

The holotype of *Favartia funafutiensis* (Figs 15-16) is a small specimen with 5 teleoconch whorls. It is probably immature, the protoconch is conical with 2+ protoconch whorls (Fig. 5), probably more than 3 (first whorls missing in the holotype) with an abapical keel on the last whorl and a sinusigeral notch, denoting a planktotrophic larval development. The last teleoconch whorl bears 6 varices and 5 low primary cords (P1-P5). P1 is the strongest, P2 and P3 are slightly weaker, similar in size, P4 is smaller, P5 is the smallest. The shoulder is smooth except for axial lamellae. The siphonal canal is short and broadly open. The aperture is small, the columellar lip smooth except for 3 small knobs abapically. There are 4 denticles within the outer lip (D1-D4), D1 is the strongest denticle.

*Favartia funafutiensis* resembles *F. philcloveri* from the Philippines (Fig. 23). However, *F. philcloveri* is larger (with one supplementary teleoconch whorl), has 6 obvious primary spiral cords on the last whorl (P1-P6), secondary cords, and numerous obvious lirae, including 7 or 8 on shoulder. P2, P3 and P4 are the strongest, almost similar in size, P1 is weakly narrower. P5 and P6 are the smallest. The aperture of *F. philcloveri* is comparatively larger with a small parietal tooth, a narrow, obvious ID and D1-D5 (D4-D5 fused).

## Figures 9-23

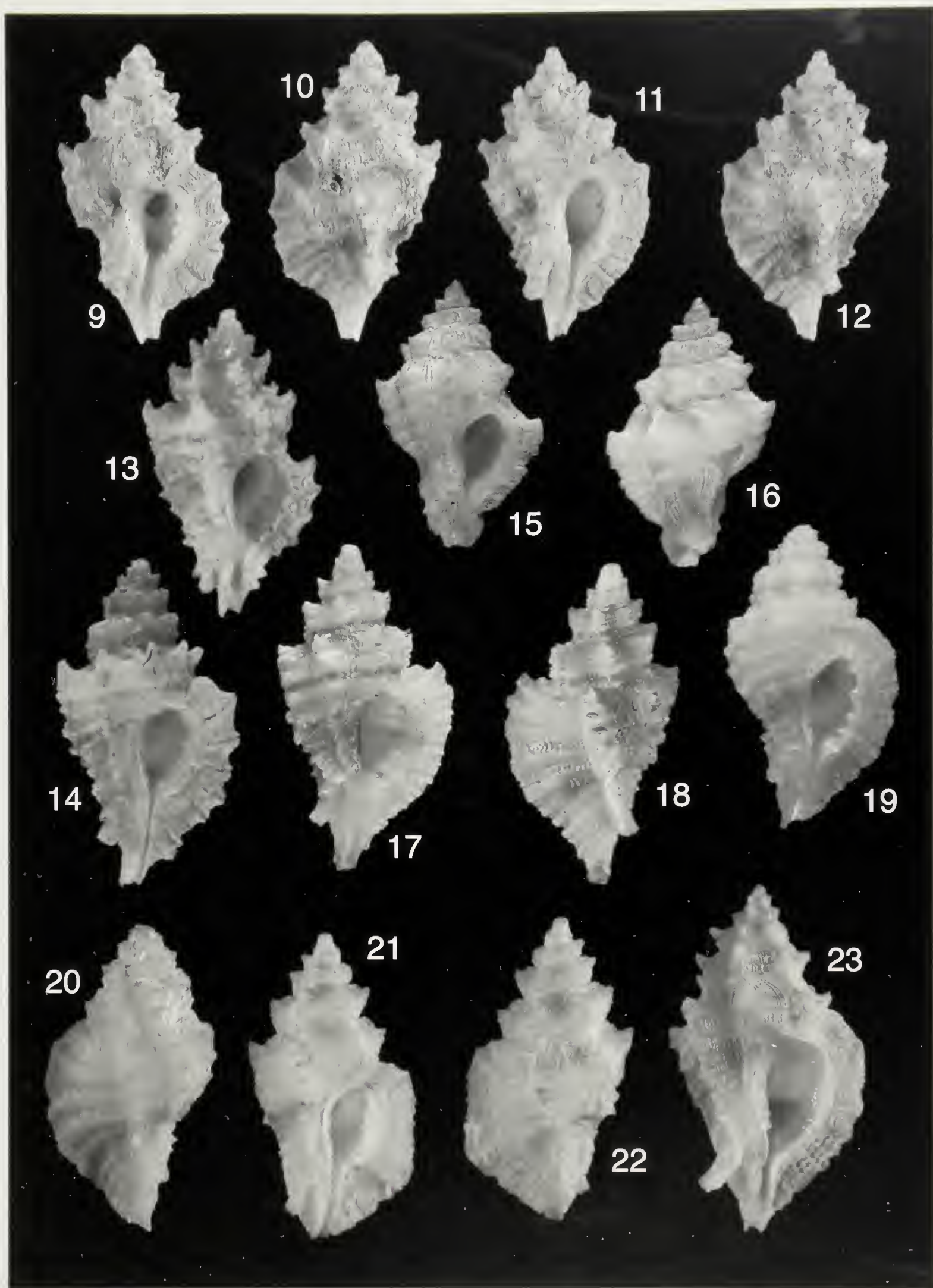
**9-14.** *Favartia (Pygmaeapterys) kerno*i n. sp.

**9-13.** Hawaii, dredged off Kihei, Maui, 20°39.180' N, 156°28.598' W to 20°38.650' N, 156°30.494' W, 170 m.

**9-10.** Holotype MNHN 25838, 10.7 mm; **11-12.** Paratype RH, 10.5 mm; **13.** Paratype IRSNB IG 32388/MT 2798 9.5 mm. **14.** Hawaii, dredged off Kihei, Maui, 20°39.868' N, 156°29.347' W to 20°38.812' N, 156°28.733' W, 128 m, paratype MS, 13.3 mm.

**15-16.** *Favartia (Pygmaeapterys) funafutiensis* (Hedley, 1899), on W slope of Funafuti Atoll, Ellice Group, 8°29' S, 179°4' E, 73-146 m, holotype AMS C. 006004, 8.3 mm; **17-18.** *Favartia (Pygmaeapterys) bellini* (D'Attilio & Myers, 1985), Japan, Okinawa, Ryuku Is, 52 m, holotype SDNHM 83065, 9.9 mm; **19-20.** *Favartia (Pygmaeapterys) avatea* Houart & Tröndlé, 2008, French Polynesia, Austral archipelago, Rimatara, 22°38' S, 152°50' W, 250-280 m, holotype MNHN 20172, 11.2 mm; **21-22.** *Favartia (Pygmaeapterys) lifouensis* Houart & Héros, 2012, New Caledonia, Loyalty Islands, Lifou, Baie du Santal, Shelter Reef, 20°54' S, 167°02' E, 100-120, holotype MNHN 24174, 11.5 mm; **23.** *Favartia (Pygmaeapterys) philcloveri* (Houart, 1984), Bohol, Philippines, RH, 13.4 mm.





Both differ from *F. kernoi* n. sp. by their protoconch morphology and other shell characteristics.

*Favartia* (*P.*) *avatea* (Figs 7, 19-20) also resembles *F. (P.) kernoi* n. sp., however, the protoconch of *F. avatea* remains unknown. It differs in having a less shouldered shell, a broader and more strongly sloping shoulder ramp, weakly lower spiral cords, a more obvious P6 cord and shorter spinelets at intersection of axial and spiral sculpture. *F. (P.) avatea* also differs in having more numerous axial varices: 9 on second whorl, 7 or 8 on third and fourth and 6 on last whorl. The aperture also differs in being larger and more narrowly ovate with a deeper, narrower anal notch and higher, stronger denticles within the outer lip, with D1-D2 fused (Figs 6 and 7).

*Favartia* (*P.*) *lifouensis* (Figs 8, 21-22) differs in having a higher spire, narrower spiral cords, with additional IP, s1, s4, s5 and s6. The siphonal canal is comparatively broader and shorter. The aperture also differs in being more strongly ovate with a narrower, deeper anal notch and in having more obvious inner apertural denticles (Figs 6 and 8).

*Favartia* (*P.*) *bellini* (Figs 17-18) has a more lightly built, narrower shell with a higher spire, narrower and more numerous spiral cords, occasionally with primary and secondary cords of same strength. The apertural denticles in *F. (P.) bellini* are lower and more numerous, occasionally split.

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