

La Conchiglia

The Shell



A new subspecies of *Pustularia mauiensis* (Burgess 1967)

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Pustularia mauiensis is a small member of the genus with a restricted distribution in the Hawaiian chain. It is characterized by the absence of dorsal pustules, unstained, coarse teeth and callused extremities (see LORENZ 1999). Usually, there are no distinct dorsal or basal blotches. Aberrant specimens showing traces of dorsal blotching were already known to BURGESS (1985) who interpreted them as indications of the close relationship between *bistrinotata* and *mauiensis*. Such shells, however, were rare exceptions, and the markings were pale and inconspicuous. Recently, a population of shells with intense dorsal, terminal, and even basal blotching was discovered by David WATTS and David WOODMAN. Further anatomical and conchological differences prove them as separate from typical *mauiensis* at least on the level of a subspecies. The new population is described in honor of its discoverer.

Pustularia mauiensis watsi ssp. nov.

Material: eighteen live-collected specimens, sixteen of which chosen as types. Measurements are given in parentheses below: length x width x height, number of labral teeth : number of columellar teeth.

Holotype (11.6 x 7.2 x 6.6 mm, 22:18; coll. MHN Paris); Paratype 1 (11.3 x 7 x 6.2 mm, 18:16; coll. Lorenz); Paratype 2 (11.3 x 6.8 x 6.2 mm, 23:18; coll. Lorenz); Paratype 3 (12 x 7.6 x 6.6 mm, 22:18; coll. Lorenz); Paratype 4 (13.6 x 8.2 x 7.3 mm, 24:21; coll. Lorenz); Paratype 5 (11.5 x 7.4 x 6.5 mm, 20:19; coll. Lorenz); Paratype 6 (11 x 7.1 x 5.9 mm, 19:15; coll. HNC); Paratype 7 (11.2 x 7.3 x 6.4 mm, 19:17; coll. MHN Paris); Paratype 8 (12.3 x 7.7 x 6.7 mm, 20:16; coll. Woodman); Paratype 9 (11.5 x 7.2 x 6.4 mm, 20:19; coll. Watts); Paratype 10 (11.6 x 7.3 x 6.3 mm, 22:18; coll. Chiapponi); Paratype 11 (10.9 x 6.7 x 5.9 mm, 22:18; coll. Corley); Paratype 12 (12.4 x 7.8 x 6.8 mm, 26:18; coll. Lorenz); Paratype 13 (11.6 x 7.4 x 6.4 mm, 20:16; coll. Lorenz); Paratype 14 (11.6 x 7.3 x 6.5 mm, 21:18; coll. Lorenz); Paratype 15 (11.3 x 7.1 x 6.1 mm, 22:18; coll. Lorenz).

Description

Shell: globular, smooth, heavy, with rostrated, elegantly margined extremities. Aperture narrow, gently curved posteriorly. Teeth fine, equally extending labrally. On columellar side, they cross the base along the extremities and are shortened abruptly along the mid-basal-third. The base is rather callused and plain white; the teeth are unstained. The dorsal ground color is orange-yellow. There are three darker dorsal blotches of orange-brown, and numerous coarse brown spots on dorsum and margins. The extremities are distinctly blotched with dark brown on both sides. Those blotches extend towards the margins. In the paratype specimens darker basal blotches are occasionally found (e.g. No. 4 and 5).

Largest specimen: 13.6 mm, smallest: 10.9 mm. Shell formula (after SCHILDER & SCHILDER 1938): 12(63)28:23.

Animal: The mantle of *m. watsi* ssp. nov. is rather thick, with a brown ornamentation encircling small whitish wart-like papillae. There are several larger, short, beaded papillae stained with conspicuous white spots rising from the mantle encircled by small groups of paler spots. The siphon is short, translucent and stained with darker stripes basally. The siphonal edge is beaded but unstained. The foot is grayish, without darker ornamentation.

Type locality

P. mauiensis watsi ssp. nov. is known only from a restricted area in the north of Maui where it occurs in fairly shallow water down to approx. 20 m. It lives under rocks and coral slabs in rather murky water (WOODMAN, pers. comm.). Typical *mauiensis* are not found alongside the population described herein, and single specimens of *watsi* are not known from any of the *mauiensis mauiensis* populations scattered around Maui and Hawaii.

Discussion

The new subspecies differs from the nominate *mauiensis* (shell formula: 13(61)25:22) by the darker pigmentation of the extremities apparent in all specimens, the dark and



Plate 1:

- Fig. 1:** *P. m. mauiensis*: 13.0 mm, Oahu, Hawaii
Fig. 2: *P. m. mauiensis*: 12.1 mm, Oahu, Hawaii, blotched specimen
Fig. 3: *P. m. mauiensis*: 13.2 mm, Oahu, Hawaii, dark pigmented specimen
Fig. 4: *P. m. mauiensis*: 11.6 mm, Oahu, Hawaii, freshly collected specimen
Fig. 5: *P. m. watti*, holotype: 11.6 mm
Fig. 6: *P. m. watti*, Paratype 5: 11.5 mm, dark pigmented specimen
Fig. 7: *P. m. watti*, Paratype 4: 13.6 mm, specimen with distinct basal blotches
Fig. 8: *P. m. watti*, Paratype 8: 12.3 mm, callous specimen



1



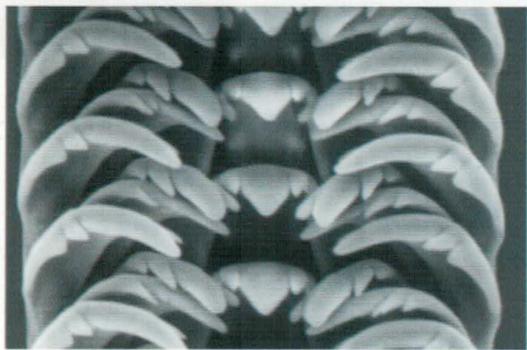
2



3

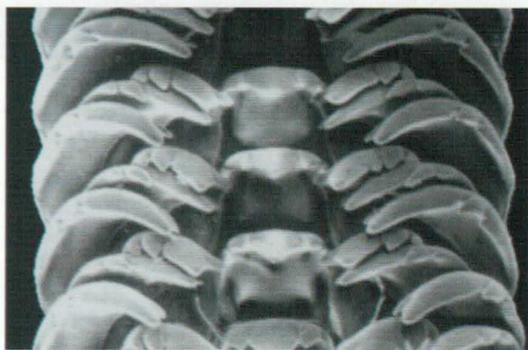


4



100µm

5



100µm

6

Plate 2:

Fig. 1: *P. m. maviensis*, living animal

Fig. 2: *P. m. maviensis*, detail of anterior with siphon

Fig. 3: *P. m. watsi*, living animal

Fig. 4: *P. m. watsi*, detail of anterior with siphon

Fig. 5: *P. m. maviensis*, SEM photo of radula (photo: H. Bradner)

Fig. 6: *P. m. watsi*, SEM photo of radula (photo: H. Bradner)

conspicuous dorsal blotches, and the larger, more numerous lateral spots. The teeth are slightly finer and significantly more numerous labrally. The extremities of *m. watsi* ssp. nov. are less callused and the shells appear more globular and inflated than in typical *mauiensis*, an impression supported by the somewhat greater width/length ratio (63% compared to 61% in typical *mauiensis*). The mantle of *m. watsi* is similar to that of typical *mauiensis*, except for a denser, darker brown ornamentation also found on the siphon, and slightly longer, more numerous papillae in the specimens examined. No significant radula differences were found.

During the relatively short history of the Hawaiian Islands, the family Cypraeidae has been subject to a high level of speciation processes. Not only have several endemic species developed (e.g. *Cribrarula gaskoinii*

Reeve 1846, *Staphylaea semiplota* Mighels 1845, *Pustularia mauiensis*), but also remarkable individual variability within a restricted geographical distribution can be observed, indicating high genetic variability. The status as subspecies or even species of some of the extreme variations is still being debated. In *semiplota* and *gaskoinii*, an unusual variability in size is noted, both species range from 9 to 30 mm, the degree of marginal callosity is also very variable. In *P. mauiensis*, size and shape hardly vary. No typical individuals of *mauiensis mauiensis* were reported within the restricted range of *m. watsi* in the north of Maui, and apart from darker color, other morphological differences can be observed between them. Therefore, it is unlikely that the population of *watsi* represents an extreme individual variation of *mauiensis* and is therefore proposed as a subspecies.

References

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