

New Singapore record of toothless pupa snail, *Pupisoma dioscoricola*

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Subjects: Toothless pupa snail; *Pupisoma dioscoricola* (Mollusca: Gastropoda: Valloniidae).

Subjects identified by: Chan Sow-Yan and Lau Wing Lup.

Locations, dates and time: Singapore Island, Toa Payoh, Sensory Park; 23 May 2020, around 1630 hrs (Fig. 1).

Habitats: Urban parkland, in concrete planter boxes (Fig. 2-5).

Observer: Lau Wing Lup.

Observations At least 10 examples of this diminutive snail were found in close proximity to each other, roosting on the inner and outer walls of concrete planter boxes (Fig. 1), in the shelter of wooden benches, water jasmine or shuimei (*Wrightia religiosa*) plants and other shrubs and trees. The white-painted walls have textured, bumpy surfaces, covered with moss and algae (Fig. 1-3). These diminutive snails, each no larger than 3 mm diameter, were on the walls in both wet and dry weather conditions. Most of the live specimens were covered with algae and other organic debris and resemble specks of ash, pepper seeds or insect droppings (Fig. 3).



Fig. 1. Toa Payoh Sensory Park, where *Pupisoma* snails were found on the mossy wall (red rectangle) of planter boxes grown with shuimei (*Wrightia religiosa*).



Fig. 2. A roosting snail compared with a human fingernail.

Photographs by Lau Wing Lup

Remarks: Both *Pupisoma dioscoricola* and its family Valloniidae are herein documented as new records for Singapore (e.g. Tan & Woo, 2010).

All specimens herein featured conform to illustrations and descriptions of *Pupisoma dioscoricola* (formerly as *Pupisoma orcula* or *Ptychopatala orcula*) shells by Benthem Jutting (1952), Vermeulen & Whitten (1998) and Foon et al (2017) (Fig. 3-5). The yellowish brown shell has a sub-globose conical outline, appears thin and translucent, and has a silky sheen on its surface. The apex is obtuse and the earlier whorls appear pockmarked. The radial sculpture consists of irregular spaced ribs and riblets throughout the subsequent whorls, but these do not extend to the umbilicus area (Fig. 4). Adult specimens have three to four-and-a-half strongly convex whorls. The shell's outer lip is slightly expanded, sharp and thin. The aperture is sub-circular and toothless (Fig. 4). The whitish columellar region is dilated and reflected over the very narrow, slit-like umbilical crevice which is closed in most specimens. Under high magnification, the shell's peripheral whorl and basal side have very fine spiral lines that appear less obvious than the whorl axial ribs. The animal's flesh is pale grey and its inner organs are dark brown and dark green. Two dark grey bands extend from the

dorsal body onto the two eye stalks. Black eyes are located on the ends of short eye-stalks and lower sensory tentacles are absent (Fig. 5).

Pupisoma dioscoricola was inferred to have been discovered on the leaves of yam (*Dioscorea* sp.) (Pilsbry, 1920-1921) and described from Jamaica by C. B. Adams (1845). Since then, the species was found in the USA from South Carolina to southern Florida, and from southern Texas down to Brazil (Solem, 1964), Ecuador (Pilsbry, 1920-1921), the Galapagos Islands (Pilsbry, 1927-1935) and Argentina (Rumi et al, 2010). Across the Atlantic, it has been recorded as *Pupisoma orcula* (see Benson, 1850) in Africa, India, Thailand, Malaysia, the Philippines and Indonesia (Benthem-Jutting, 1952; Solem, 1964; Maassen, 2001; Foon et al, 2017), to Australia and Pacific islands such as New Caledonia and Micronesia (Solem, 1964; Vermeulen & Whitten, 1998).

Because the featured specimens are in disturbed and anthropogenic habitats, and because Singapore falls within the geographic range of *Pupisoma dioscoricola*, it is unknown if the local examples were introduced. It is believed that these snails have been widely transported to various parts of the world on their host plants, having escaped detection and survived quarantine (Pilsbry, 1920-1921). *Pupisoma dioscoricola* is highly adaptable, and known to thrive in a wide variety of habitats and on various soil types. It has been found in primary and secondary forests, savanna, as well as disturbed environments such as plantations, roadsides, and grass fields (Vermeulen & Whitten, 1998).

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Fig. 3. Three snails coated with snail droppings and dried mud (left), algae (middle), sand grains and dirt (right). Photographs by Lau Wing Lup

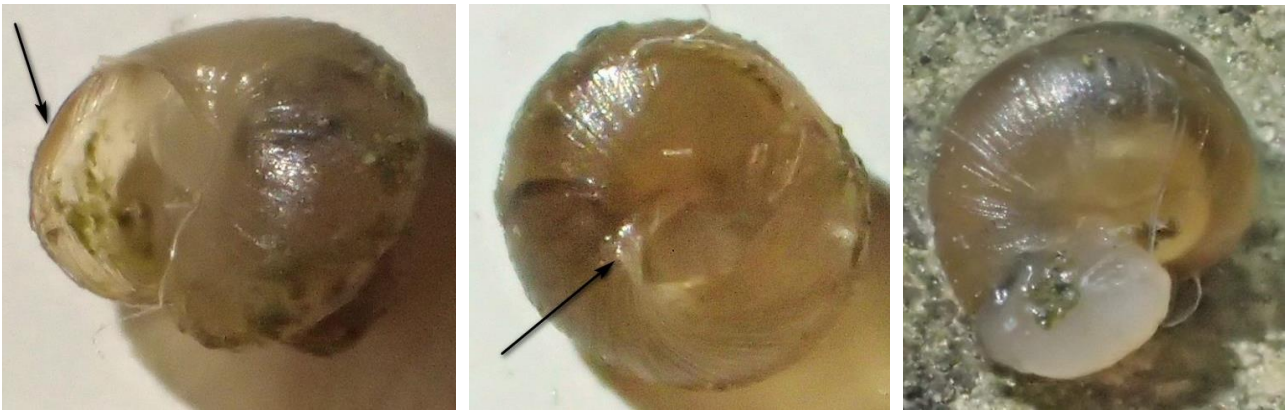


Fig. 4. Apertural view of retracted snail with arrow pointing at the round aperture formed by thin and sharp peristome (middle). Basal view of the same shell with arrow pointing to the reflected columellar margin (middle). Underside of a shell, showing growth ribs and riblets that do not extend to the umbilical area (right).



Fig. 5. Views of the emerged animal. Note pale grey flesh with two dark grey stripes on the dorsum to the eye stalks (left). A crawling specimen showing the foot (middle). Frontal view of a crawling snail showing the absence of shorter sensory tentacles near its mouth.

Photographs by Lau Wing Lup