

Biodiversity Record: A population of the snail, *Tarebia granifera*, many with deformed shells

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Subjects: Quilted melania, *Tarebia granifera* (Mollusca: Gastropoda: Thiaridae).

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

Location, date, and time: Singapore Island, Punggol Park; 6 October 2023; around 1007 hrs.

Habitat: Freshwater pond within urban parkland (Fig.1), with shallow and relatively clear water.

Observer: Lau Wing Lup.

Observation: Numerous live examples were observed in shallow water along the bank. Thirteen specimens (shell height 17 to 25 mm) were randomly picked out and examined (Fig. 2). All of them had shells that exhibited varying degrees of erosion. One example had a pearl-like calcareous growth on the shell inner lip, as well as a loose, round, smooth, and orange-white pearl of about 1.5 mm diameter embedded in its mantle (Fig. 3). Other live individuals exhibited shell deformation such as 1) lips that are irregularly shaped or with slits (Fig. 10), 2) sutures that are deeply channeled or with round holes (Fig. 9), 3) disruptions of colour pattern (Fig. 6), 4) wavy markings (Figs. 3 & 4), 5) partially open umbilicus (Fig. 7), 6) crooked spire (Fig. 4), 7) inflated body whorl relative to the spire (Fig. 8), and 8) scalariform (not tightly coiled) last whorl (Fig. 7). Specimens were noted to have pinkish feet (Fig. 11), which is atypical as this species usually has a foot that is grey with yellow and blackish pigments (Brandt, 1974). Shells devoid of periostracum tend to be a lighter shade of brown or greenish yellow, and a mottled pattern is present on the whorls of some specimens.

Remarks: *Tarebia granifera* is believed to be native to South and Southeast Asia and some islands in the Western Pacific. It has become widely invasive in the tropics in Africa, the Mediterranean region, and the Middle East, as well as the Americas. The spread has been attributed to the aquarium trade, or even dispersal by birds (Yin et al., 2022), which eat them and void them later in other locations (Appleton et al., 2009). It was first recorded in Singapore as an introduced species by Chan (1996) as *Melanooides granifera*.

A population of *Tarebia granifera* with a large proportion of individuals exhibiting abnormalities on their shell appears to be unusual, and thus interesting. These may have been caused by environmental or perhaps genetic factors, but which factors were involved here could not be determined by general observation.

Elsewhere, in Africa, Appleton et al. (2009) recorded two misshapen *Tarebia granifera* specimens from a sample of 749 individuals (0.3% of sample) collected from the Nseleni River in KwaZulu-Natal, in July 2006. Their body whorls were unusually inflated relative to their spires. They were also smaller (shell height 10.9 and 15.4 mm) compared to the specimens featured here.

Literature cited:

Appleton CC, Forbes AT & Demetriades NT (2009) The occurrence, bionomics and potential impacts of the invasive freshwater snail *Tarebia granifera* (Lamarck, 1822) (Gastropoda: Thiaridae) in South Africa. Zoologische Mededelingen, 83: 525–536.

Brandt RAM (1974) The non-marine aquatic Mollusca of Thailand. Archiv fur Molluskenkunde, 105: 1–423.

Chan SY (1996) Some freshwater gastropods of Singapore. Of Sea and Shore, 18: 184–187.

Yin N, Zhao S, Huang X-C, Ouyang S & Wu X-P (2022) Complete mitochondrial genome of the freshwater snail *Tarebia granifera* (Lamarck, 1816) (Gastropoda: Cerithioidea: Thiaridae), Mitochondrial DNA Part B, 7:1, 259–261.

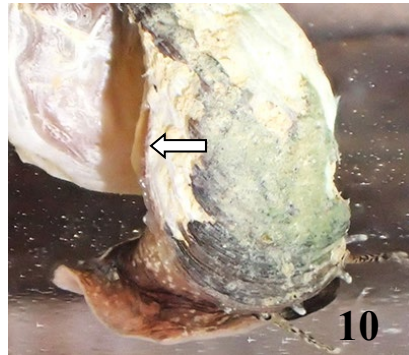


Fig. 1. Pond in Punggol Park with a population of *Tarebia granifera* consisting of a high proportion of aberrant individuals.
 Fig. 2. Abapertural view of the sample of 13 snails, all with deformities on their shells. Space between black bars is 1mm.
 Fig. 3. Abapertural view of shell with wavy markings, and in which a pearl (indicated by arrow) was found. Note abnormal wavy pattern on corroded spire and channelled suture on the last whorl of the shell.
 Fig. 4. Apertural view of shell with crooked spire and abnormal wavy pattern on surface.
 Fig. 5. Abapertural view of shell with eroded surface.
 Fig. 6. Abapertural view of shell with disruption of colour pattern.
 Fig. 7. Apertural view of shell with partially open umbilicus (indicated by arrow).
 Fig. 8. Abapertural view of shell with colour pattern disruption and inflated body whorl relative to the spire.
 Fig. 9. Aperture of shell showing channelled suture with holes.
 Fig. 10. Aperture of shell showing slit (indicated by arrow) near the last whorl suture.
 Fig. 11. Ventral view of live snail showing the head and pinkish foot.
 (Photographs by: Lau Wing Lup).