

Biodiversity Record: New record of the Cuban brown snail, *Zachrysia provisoria*, in Singapore

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Subject: Cuban brown snail, *Zachrysia provisoria* (Mollusca: Gastropoda: Zachrysiidae).

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

Location, date, and time: Singapore Island, Marina Bay, grounds of Gardens by the Bay; 8 November 2024 at around 1430 hrs.

Habitat: Urban parkland on reclaimed land. Among ornamental vegetation.

Observer: Lau Wing Lup.



Fig. 1. Live adult and juvenile Cuban brown snails were found aestivating in leaf litter in the centre of a bird's nest fern. Fig.2. A prowling juvenile *Zachrysia provisoria* and its silvery slime trail (Photographs by: Lau Wing Lup).

Observation: Two live snails, a juvenile of 14 mm shell width and an adult of 26 mm shell width, were found aestivating among fallen leaves within the centre of a bird's nest fern (*Asplenium nidus*). Dead shells were also found in the vicinity.

The shells of adults are 25 to 30 mm wide, and globose in shape, with four to five rapidly expanding convex whorls. There is no umbilicus. The shell is sculptured with fairly regular, low axial ribs, and the body whorl inclines significantly near the aperture. The base is swollen, fairly smooth and shiny. The inner apertural lip is thickened and somewhat reflected. There is a prominent protuberance or notch on the basal lip near columellar insertion. Fresh specimens have a rich, dark tan periostracum, sometimes with brownish axial streaks radiating from the apex, while the apertural lip and columella are white. The aperture appears thick in adult shells but not flared.

The living creature is grey, lighter below and darker above. The front and middle portion of the foot is greyish-white, the back portion is dark bluish black. There are two pairs of tentacles, the ocular tentacles darker. The internal flesh, with yellowish blotches and spots of varying sizes, is visible through the juvenile's translucent shell (see Fig. 5a, b).



Fig.3. Apical view of an adult and juvenile Cuban brown snails. Space between black bars is 1 mm. Fig. 4. Umbilical view of the same adult and juvenile snails. Fig.5. Dorso-lateral view of an emerging juvenile with foot exposed. Fig. 6. Dorsal view of the live snail. Fig. 7. Dorso-lateral view of a live snail. Fig. 8. Frontal view of the head region and its two pairs of tentacles (Photographs by: Lau Wing Lup).

Remarks: *Zachrysia provisoria* is herein recorded as new to Singapore (see Tan & Woo, 2010). The species is likely to have been accidentally introduced via horticultural shipments. The family Zachrysiidae is documented herein for the first time outside the Western Hemisphere. It seems to be confined within the Gardens by the Bay area, and is yet to be noticed in other parts of Singapore (pers. obs.). The Cuban brown snail was earlier recorded on iNaturalist based on a photograph of an individual taken at Gardens by the Bay on 31 July 2024 (see <https://www.inaturalist.org/observations/233093487>), but mis-identified as *Sarika siamensis*. Shells of *Sarika siamensis* (previously *Cryptozona siamensis*) differ from *Zachrysia provisoria* in having a shell with a spiral reddish-brown band, reticulate microsculpture, and an open umbilicus (see Fig. 7).

Zachrysiids are among the largest and most obvious (although not always the most colourful or abundant) land snails in the Neotropics (Borrero & Araujo, 2012), and the genus *Zachrysia* is a group of phytophagous terrestrial snails native to Cuba (Capinera, 2013). In North America, *Zachrysia provisoria* was introduced deliberately into Florida in the early 1900s as a potential food source (Capinera, 2013). It was later inadvertently reintroduced to Florida on nursery stocks in

1955 from the Bahamas (Robinson & Fields, 2004). It has been accidentally exported with horticultural shipments from Florida to countries in the Caribbean (Robinson & Fields, 2004), and was detected as an invasive species in Hawai'i around September 2020 (Ocenar & Matsunaga, 2021). The Cuban brown snail is nocturnal, feeding on a wide variety of ornamentals, vegetables and other crops, as well as native tree species (Robinson & Fields, 2004). It burrows into soil during the day to avoid desiccation, and can be difficult to find. Therefore, it is able to spread easily by accidental transport, or hitchhiking within potted plants. Apart from having a detrimental impact on agriculture, the Cuban brown snail is also a known host of rat lungworm (*Angiostrongylus cantonensis*), which can impact human health (Ocenar & Matsunaga, 2021).



Fig. 9. Two Kelantan glass shells, *Tanychlamys kelantanensis* (bottom row), a worn-out bioluminescent shell, *Quantula striata* (top left), and an equally eroded *Zachrysia provisoria* shell without its periostracum (top right) found under shrubbery in close proximity to one another at Gardens by the Bay. Note differences in shell morphology. Fig. 10. An adult *Sarika siamensis* shell specimen of about 33 mm diameter, from Gardens by the Bay, for comparison. Space between black bars is 1 mm (Photograph by: Lau Wing Lup).

Literature cited:

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