

New record of the predatory snail *Gulella io* in Singapore

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Subjects: *Gulella io* (Mollusca: Gastropoda: Streptaxidae).

Subjects identified by: Chan Sow-Yan, Lau Wing Lup and Tan Siong Kiat.

Location, date and time: Two locations on Singapore Island –

1) Pasir Ris, Sungei Api Api Park; 7 September 2020; 1136 hrs.

2) Toa Payoh town, Lorong 4; 12 October 2020; 1330 hrs.

Habitat:

1) Back mangrove in urban residential area (Fig. 1). Beside footpath on the underside of a damp leaf among leaf litter, sheltered by the landward side of back mangrove vegetation.

2) Urban parkland in residential area of high-rise concrete buildings. On a grass patch, among discarded bricks beneath an African sandalwood (*Baphia nitida*) hedge behind a rubbish collection centre (Fig. 2).

Observers: Chan Sow-Yan and Lau Wing Lup.



Fig. 2. Undergrowth beside footpath near back mangrove at Pasir Ris.



Fig. Hedge behind rubbish collection centre at Toa Payoh housing estate.

Observations: Two separate observations –

1) At Pasir Ris, three dead shells (two adults and a juvenile) were found together with dead shells of terrestrial micro land snails such as *Pupisoma dioscoricola* and *Liardetia samoensis* (Fig. 3). No live specimens of *Gulella io* were encountered.



Fig. 3. At Pasir Ris, one of three *Gulella io* shells (circled in red) was found on underside of a dead leaf together with dead shells of, *Pupisoma dioscoricola* (circled in yellow) and *Liardetia samoensis* (circled in green).

2) At Toa Payoh, two live examples *Gulella io* (an adult and a juvenile) were found under a brick at the base of the hedge (Fig. 4, 5 & 6).

Remarks: *Gulella io* is native to Africa (Steffek, 2007) but has been known to disperse passively and anthropogenically via crops and ornamental plants (Dörge et al., 1999). It occurs as an alien species in heated greenhouses in central Europe (Verdcourt, 1979; Dörge et al., 1999), United Kingdom (Preece & White, 2012), and France (LeMaire & Gerriet, 2014). This species has not been recorded in Malaysia and Indonesia (see Van Benthem Jutting, 1950; Van Benthem Jutting, 1961; Vermeulen & Whitten, 1998; Vermeulen, 2007; Vermeulen et al., 2015; Phung et al., 2017). It is herein documented as a new record in Singapore (see Ho, 1995; Tan & Woo, 2010; Tan et al., 2012) and is the second introduced molluscivorous land snail to be recorded there after its congener *Gulella bicolor*.



Fig. 4. Live adult *Gulella io* snail (left) on underside of a red brick. Juvenile specimen (right) under bricks among organic debris. Photographs by Lau Wing Lup

Gulella io resembles *Gulella bicolor*, but live animals can be distinguished by colour. *Gulella io* has a white foot, reddish-orange tentacles, and a grey area around its eye-spots (Fig. 4 & 5). *Gulella bicolor* has a yellow foot, yellow tentacles and its eye spots are not surrounded by a grey area (Fig. 5).



Fig. 5. Lateral views of a live *Gulella bicolor* (left) and *Gulella io* (right), noting differences in shell shape and body colouration. Photographs by Lau Wing Lup

The shell of *Gulella io* generally has a cylindrical, pupiform and elongated outline, with a dome-shaped apex, shallow suture, largely smooth shell sculpture, and no umbilicus. However, on one of the adult shells observed here, ribs are present on the last whorl. Adult specimens have a round aperture with four teeth of different shapes and sizes. Juvenile specimens tend to have either no teeth or fewer, less pronounced ones. The peristome is thick and flared. The columellar is deeply situated in the shell's interior. Adult specimens have up to five slightly convex whorls. In comparison, the shell of *Gulella bicolor* is more elongated and tapered (Fig. 6).

Both shells and animals in the featured observations match the illustrations and descriptions of Verdcourt (1974) and LeMaire & Gerriet, (2014).

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Fig. 6. A live *Gulella io* (top) and a dead *Gulella bicolor* shell (bottom) found under the same brick at Toa Payoh. Note the difference in shell shape. Photograph by Lau Wing Lup