

Barrackpore hive snails, *Kaliella barrakporensis*, in Singapore

Chan Sow-Yan & Lau Wing Lup

chansowyan@gmail.com (Chan), suiseki1984@yahoo.com.sg (Lau)

Subjects: Barrackpore hive snail, *Kaliella barrakporensis* (Mollusca: Gastropoda: Chronidae).

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

Locations, dates and times: Five locations on Singapore Island –

1. Woodlands Street 13, walkway beside residential Block 144; 15 June 2017; around 1500 hrs.
2. Hougang Avenue 10, near Block 450; 21 May 2019; around 2146 hrs.
3. Jalan Kukoh, beside Block 1; 11 July 2019; 1101 hrs.
4. Punggol Park; 21 February 2020; 1815 hrs.
5. Toa Payoh, Sensory Park; 23 May 2020; around 1630 hrs.

Habitats: Urban parkland at all locations.

Observers: Chan Sow-Yan and Lau Wing Lup.

Observations: At all locations, a few live examples were seen each time, usually after rain.

1. At Woodlands Street 13, specimens were seen after rain on brickworks along the walkway and grassy slope (Fig. 1).
2. At Hougang Avenue 10, six individuals were observed crawling on the trunks of young coconut trees about 50 cm above the ground, at night after rain (Fig. 2).
3. At Jalan Kukoh, snails were found at the entrance of a weep hole (Fig. 3) where specimens were seen living sympatrically with other land snails (Fig. 4). One was noted on the underside of a leaf of the curtain creeper, *Vernonia elaeagnifolia* (Fig. 5).
4. At Punggol Park, individuals of this snail were located on the underside of damp and decomposed leaves under the ornamental peacock plant *Calathea makoyana* (Fig. 6), and on the concrete and mossy low wall of a planter box, as well as amongst leaf litter (Fig. 7) under tree.
5. At Toa Payoh Sensory Park, snails were found on white outer wall of concrete planter boxes (Fig. 8), sheltered by trees and shrubs.



Fig. 1. A snail crawling on brickworks beside walkway and grass slope after rain. Note a sea-slug in the foreground.



Fig. 2. Park connector at Hougang Avenue 10 where *Kaliella barrakporensis* were found crawling on trunks of young coconut trees.

Photographs by Lau Wing Lup



Fig. 3. Weep hole where *Kaliella barrakporensis* was found living sympatrically with other snail species.



Fig. 4. Close-up of weep hole where *Kaliella barrakporensis* (circled red) was found near the entrance.



Fig. 5. An individual found roosting on the underside of a curtain creeper (*Vernonia elaeagnifolia*) leaf blade.



Fig. 6. Habitat where *Kaliella barrakporensis* snails were found, amongst leaf litter under peacock plants (*Calathea makoyana*) and on the concrete and mossy low wall of a planter box.

Photographs by Lau Wing Lup

The specimens of *Kaliella barrakporensis* examined have a translucent and thin shell with a silky lustre (Fig. 7). The trochiform pale brown shell has impressed sutures and about six slightly convex, slowly increasing whorls, with a peripheral keel on the last whorl, which is not descending. Several distinct, fine, oblique radial riblets are present on the whorls (Fig. 9). The shell has a simple peristome with a straight and thin outer lip, even in adult specimens, and its aperture is rectangular (Fig. 10). The early whorls appear blackish brown on living snails, while the bottom whorls are dark dirty yellow with darker black brown patches, spots and stripes (Fig. 12). The snail's flesh is mostly blackish grey, with light yellow at some parts, and a dirty pinkish patch on the top, behind the eye stalks on the head. This patch is also clearly seen at the shell's basal side when the animal has retracted into its shell (Fig. 11). The sole and lateral sides of the animal are a lighter shade of grey than its dorsal region.

Remarks: *Kaliella barrakporensis*, described from Kolkata-Barrakpore in west Bengal, India (see Pfeiffer, 1852), is a widespread synanthropic terrestrial snail that has been recorded from tropical East Africa, eastern South Africa, Madagascar, South Asia (including Sri Lanka, Maldives and Bangladesh) and Southeast Asia (including Myanmar and Indonesia), as well as Britain, where it was accidentally introduced in hot-houses (Blanford & Godwin-Austen, 1908; Dey et al, 1985; Herbert & Kilburn, 2004; Verdcourt, 2006; Preece & Naggs, 2014; Vermeulen et al., 2015; Phung et al., 2017; Foon et al., 2017; Gittenberger et al, 2019).



Fig. 7. Snail on a damp decomposed leaf in a planter box. The snail's dark flesh blends well with its dark surroundings.



Fig. 8. An individual observed crawling on mossy concrete planter box after rain in an urban park.

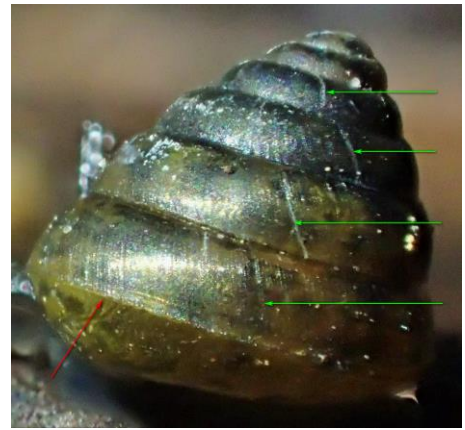


Fig. 9. Close-up of a living example. Note the oblique riblets (green arrows) on the shell surface, and prominent peripheral keel (red arrow) on its last whorl.



Fig. 10. Apertural view of a *Kaliella barrakporensis*. Note the slowly increasing, slightly convex whorls, simple peristome, thin outer lip, and rectangular shape of the aperture.

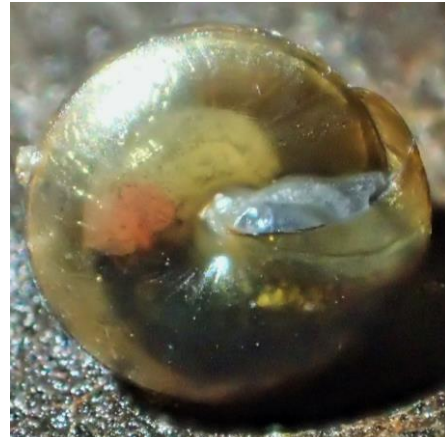


Fig. 11. Basal view. The highly translucent shell allows its flesh to be seen through it.



Fig. 12. Dorsal view of the snail. Note the light dirty pinkish area on the head region.

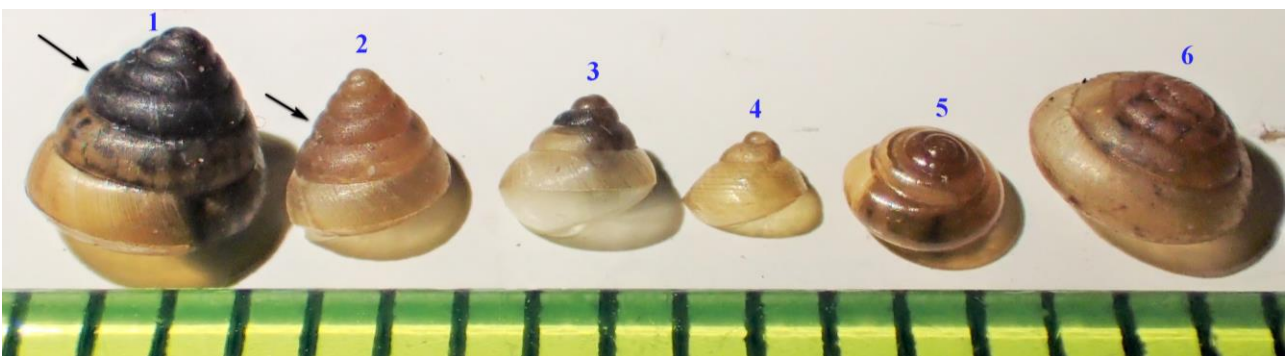


Fig. 13. Some microsnaills of the family Chronidae, and the family Euconulidae found in Singapore. *Kaliella barrakporensis* (1) and *Kaliella microconus* (2) are very similar in shell shape with a peripheral keel positioned very low, but the shell height is noticeably different, and the latter attains a smaller size. The whorls of *Kaliella barrakporensis* (1) are slightly more pronounced and convex than *Kaliella microconus* (2) [black arrows]. The living animal of both species are also dissimilar and are generally found in different habitats. Members of the Euconulidae (3-6) are shown here for comparison, *Liardetia convexiconica* (3) juvenile, *Coneuplecta olivacea* (4), *Liardetia scandens* (5) and *Liardetia samoensis* (6),

Photographs by Lau Wing Lup

Kaliella barrakporensis is one of the larger microsnailes in Singapore, and has the tallest shell height (Fig. 13). However, it is hitherto unrecorded in the local literature (e.g., Lim, 1969; Ho, 1995; Tan & Woo, 2010; Ng et al, 2011; Tan et al, 2012). This could be due to its size and cryptic habits, but it is more likely that previous finds of *Kaliella barrakporensis* have been confused with the similar-looking *Kaliella microconus*, which has a shorter shell stature and appears to be more restricted to forested areas (see Lim et al., 2018). Although Singapore is within its geographical range, it is difficult to ascertain whether *Kaliella barrakporensis* is native there since it occurs in urban areas, and is able to live amongst a wide variety of plants in disturbed habitats. Voucher specimens have been deposited in the Lee Kong Chian Natural History Museum, National University of Singapore, for reference.

References:

- Blanford WT & Godwin-Austen HH (1908) The fauna of British India, including Ceylon and Burma. Mollusca I. Testacellidae and Zonitidae. Taylor and Francis, London. 311 pp.
- Dey A, Barua S & Mitra SC (1985) Mollusca. Records of the Zoological Survey of India, 82 (1-4): 263-274.
- Foon JK, Clements GR & Liew TS (2017) Diversity and biogeography of land snails (Mollusca, Gastropoda) in the limestone hills of Perak, Peninsular Malaysia. ZooKeys, 682: 1-94.
- Gittenberger E, Bastian TR & Groenenberg DSJ (2019) Terrestrial gastropods of the Maldives, all of which are invasive? Journal of Conchology, 43 (4): 1-31.
- Herbert D & Kilburn RN (2004) Field Guide to the Land Snails and Slugs of Eastern South Africa. Natal Museum, Pietermaritzburg. 336 pp.
- Ho WH (1995) A review of the land-snail fauna of Singapore. Raffles Bulletin of Zoology, 43 (1): 91-113.
- Lim RKY (1969) The terrestrial molluscs of Singapore. Unpublished thesis. Department of Zoology, University of Singapore. i-vi + 241 pp.
- Lim WH, Li TJ & Cai Y (2018). Diversity of terrestrial snails and slugs in Nee Soon freshwater swamp forest, Singapore. Gardens' Bulletin Singapore, 70 (Supplement 1): 109-121.
- Ng PK, Corlett RT & Tan HTW (eds.) (2011) Singapore Biodiversity. An Encyclopedia of the Natural Environment and Sustainable Development. Editions Didier Millet and the Raffles Museum of Biodiversity Research, National University of Singapore. 552 pp.
- Pfeiffer L (1852) Descriptions of eighteen new species of land shells, from the collection of H. Cuming, Esq. Proceedings of the Zoological Society, 20: 156-160.
- Phung CC, Yu FTY & Liew TS (2017) A checklist of land snails from the west coast islands of Sabah, Borneo (Mollusca, Gastropoda). ZooKeys, 673: 49-104.
- Tan SK, Chan SY & Clements GR (2012) A Guide to Snails and Other Non-marine Molluscs of Singapore. Singapore Science Centre. 176 pp.
- Tan SK & Woo HPM (2010) A Preliminary Checklist of the Molluscs of Singapore. Raffles Museum of Biodiversity Research, National University of Singapore. 78 pp.
- Preece RC & Naggs F (2014) *Kaliella barrakporensis* (Pfeiffer), a new hot-house alien in Britain. Journal of Conchology, 41 (6): 781-782.
- Verdcourt B (2006) A revised list of the non-marine mollusca of East Africa: Kenya, Uganda and Tanzania, excluding Lake Malawi. Maidenhead. 75 pp. [Self published by the author with additional two pages of errata and corrigenda]
- Vermeulen JJ, Liew TS & Schilthuizen M (2015) Additions to the knowledge of the land snails of Sabah (Malaysia, Borneo), including 48 new species. ZooKeys, 531: 1-139.