

Grey bonnet preying on sand dollar at Changi

Subjects: Grey bonnet, *Phalium glaucum* (Mollusca: Gastropoda: Cassidae);
Cake sand dollar, *Arachnoides placenta* (Echinodermata: Clypeasteroidea: Clypeasteridae).

Subjects identified by: Tan Siong Kiat.

Location, date and time: Singapore Island, off Changi coast, near National Service Resort and Country Club; 6 July 2016; 0621 hrs.

Habitat: Estuarine. Sandy intertidal flats exposed by early morning low tide.

Observers: Contributors.

Observation: A grey bonnet snail with shell height of 81 mm was found half-buried on a sandbar at the fringe of the ebbing water. When the animal was flipped, a sand dollar was found gripped in its foot (Fig. 1). Upon inspection of the sand dollar, a bored hole is clearly visible (Fig. 2) and apparently dissolved around the edges (Fig. 3).

Remarks: It is well known that members of the family Cassidae feed exclusively on sand dollars and sea urchins. However feeding is seldom observed in the field, and the prey species of most helmet and bonnet snails (as cassids are commonly called) remain undocumented, and whether certain species are preferred is unknown. It is likely that most cassids are opportunistic predators that will feed on whichever echinoid species is more common or encountered at their respective localities or preferred habitat (see Abbott, 1968; Hughes & Hughes, 1981; Tewfik & Scheuer, 2013).

Cassids possess gland ducts that discharge a secretion rich in sulphuric acid to dissolve and penetrate the tests of their victims (Abbott, 1968; Hughes & Hughes, 1981). Perhaps aided by the radula, the test of their echinoid prey may be bored through in a few minutes (Abbott, 1968; Hughes & Hughes, 1981). Empty tests of echinoids (notably *Salmacis sphaeroides*) bearing bore holes are occasionally encountered in Singapore. However, apart from the prey species herein recorded, grey bonnets attacking or feeding on other echinoids do not appear to have been witnessed thus far.

The featured grey bonnet (as well as its sand dollar prey) was collected and deposited in the Lee Kong Chian Natural History Museum at the National University of Singapore under the catalogue number ZRC.MOL.7634.

References:

- Abbott, R.T., 1968. The helmet shells of the world (Cassidae). Part 1. *Indo-Pacific Mollusca*. 2(9): 7–202.
Hughes, R. N. & H. P. I. Hughes, 1981. Morphological and behavioural aspects of feeding in the Cassidae (Tonnacea, Mesogastropoda). *Malacologia*. 20: 385–402.
Tewfik, A. & B. Scheuer, 2013. Ecology of the King Helmet, *Cassis tuberosa* (L.), in South Caicos. *Caribbean Naturalist*. 2: 1-10.

Contributors: **Tan Heok Hui** & **Tan Siong Kiat**

Contact addresses: heokhui@nus.edu.sg (H. H.Tan), nhmtsk@nus.edu.sg (S. K. Tan)



Fig. 1. Ventral view of the grey bonnet with its sand dollar prey gripped in its foot.



Fig. 2. Ventral view of sand dollar showing a hole on its test penetrated by the grey bonnet snail.

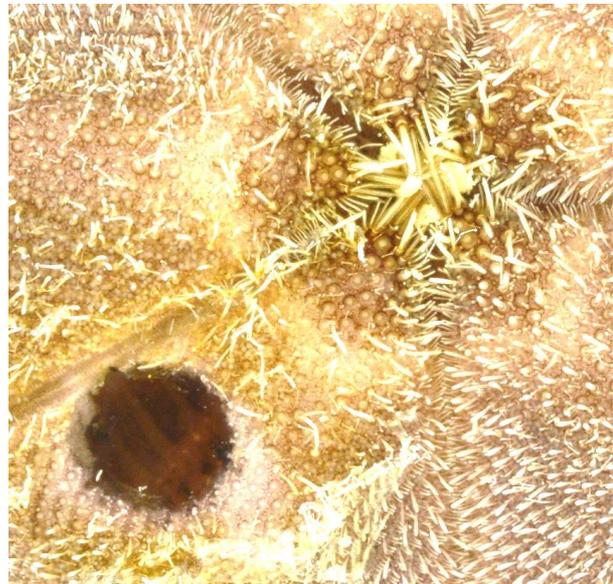


Fig. 3. Close up view of the hole through which the structure of the inner wall of the test is visible.

Photographs by Tan Heok Hui