

Apparent mimicry of marine flatworm and nudibranch

Subjects: Marine flatworm, *Pseudoceros* sp. (Platyhelminthes: Polycladida: Pseudocerotidae) [Fig. 1]; Nudibranch, *Gymnodoris impudica* (Mollusca: Gastropoda: Gymnodorididae) [Fig. 2].

Subjects identified by: Contributor, with Gan Bin Qi, Marcela Bolaños & Rene Ong.

Location, date and time: *Pseudoceros* sp. - Singapore Strait off Pulau Satumu; 9 December 2014; 1058 hrs [Fig. 1]; *Gymnodoris impudica* - Singapore Strait off Pulau Sudong; 25 January 2015; 1514 hrs [Fig. 2].

Habitat: Coral reef, between 4 and 6 m depth.

Observers: Contributor, with Gan Bin Qi, Marcela Bolaños & Rene Ong.

Observation: The marine flatworm, *Pseudoceros* sp. (Fig.1) and the nudibranch, *Gymnodoris impudica* (Fig. 2) exhibit similar color patterns. Both are translucent white with orange spots randomly distributed over their dorsal surfaces and an orange marginal line around their bodies.

Remarks: The striking similarity in colour pattern of these two species suggests mimicry of the apparently aposematic colour pattern to gain a defensive advantage by warning predators of their poisonous or unpalatable features (Miyazawa et al. 1987; Tullrot & Sunberg 1991). It is unclear whether the marine flatworm is mimicking the nudibranch, or the other way round. The toxicity of these two subjects need to be investigated in order to know which one is the toxic model and which is the harmless imitator (Batesian mimicry), or if both are poisonous (Müllerian mimicry).

Another marine flatworm, *Pseudoceros imitatus*, is known to mimic the colour pattern of the conspicuous and toxic nudibranch *Phyllidiella pustulosa* (Newman et al., 1994). It is a good example of the implication of mimicry between Polycladida and Nudibranchia.

The featured polyclad belongs to an undescribed species of *Pseudoceros* (Gan Bin Qi, personal communication).

References:

- Miyazawa, K., J. K. Jeon, T. Noguchi, K. Ito & K. Hashimoto, 1987. Distribution of tetrodotoxin in the tissues of the flatworm *Planocera multitentaculata* (Platyhelminthes). *Toxicon*. 25: 975–980.
- Newman, L. J., L. R. G. Cannon & D. J. Brunckhorst, 1994. A new flatworm (Platyhelminthes: Polycladida) which mimics a phyllodood nudibranch (Mollusca, Nudibranchia). *Zoological Journal of the Linnean Society*. 110: 19–25.
- Tullrot, A. & P. Sunberg, 1991. The conspicuous nudibranch *Polycera quadrilineata*: aposematic coloration and individual selection. *Animal Behaviour*. 41: 175–176.

Note: This is a contribution of the **Singapore Comprehensive Marine Biodiversity Survey** conducted by the Tropical Marine Science Institute, National University of Singapore and the National Parks Board.

Contributor: **Tan Yee Keat**

Contact address: tmstyk@nus.edu.sg



Fig. 1. Marine flatworm, *Pseudoceros* sp. from off Pulau Satumu.



Fig. 2. Nudibranch, *Gymnodoris impudica* from off Pulau Sudong.

Photographs by Tan Yee Keat