

Box jellyfish of the genus *Morbakka* in Singapore

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Subjects: *Morbakka* sp. (Cnidaria: Cubozoa: Carybdeida: Carukiidae).

Subjects identified by: Iffah Iesa.

Locations, date and time: Sentosa Island at Fort Siloso Beach on 11 June 2016; Singapore Strait at Tanah Merah on 24 May 2013.

Habitats: Marine. Sandy beach (Sentosa) and subtidal shore with muddy substrate (Tanah Merah).

Observers/collectors: Lifeguard at Sentosa and a team from the Comprehensive Marine Biodiversity Survey (CMBS).

Observations: The specimens from the two featured records are deposited in the Zoological Reference Collection (ZRC) of the Lee Kong Chian Natural History Museum, at the National University of Singapore.

1. In the evening of 11 June 2016, a large example of 8.5 (bell height) by 7.0 (bell width) cm was found stranded on the sand at Fort Siloso Beach on Sentosa Island by Mr. Quek (lifeguard at Siloso Beach) and handed to Nicholas W. L. Yap. The collector had held the jellyfish by the bell with his bare hands. Found without tentacles, the jellyfish was preserved in a formalin fixative and catalogued as ZRC.CNI.1019 (Fig. 1). A tissue sample was extracted from its lappet for molecular work.

2. A large, 7.2 (bell height) by 4.5 (bell width) cm box jellyfish was collected at Tanah Merah (TB 58) on 24 May 2013 at around 1100 hrs by a team from the Comprehensive Marine Biodiversity Survey (CMBS). It was found on a subtidal shore with muddy substrate, and is catalogued as ZRC.CNI.1328 (Fig. 2). Tissue was not extracted from this specimen.

Remarks: The characteristic box-shaped swimming bell (viewed from the top), four rhopalial niches or ‘eyes’ (Fig. 3) and presence of nematocysts (Fig. 4) in the gastric cavity reveal the featured subjects to be members of the class Cubozoa. The frown-shaped rhopalial niche (Fig. 3), heavily branched velarial canals (Fig. 5), partial tentacle attachments on the pedalia with a single tentacle per corner, present on the specimens, are characteristics of the family Carukiidae and the genus *Morbakka*.

Two species are presently recognised in the genus *Morbakka* - *Morbakka fenneri* Gershwin (2008) and *Morbakka virulenta* (Kishinouye, 1910). To tell them apart, it is required to scrutinise the shape, angle and breadth of rhopalial horns (Bentlage *et al.*, 2012). However, these characters on the two featured examples are not obvious enough to identify down to species level. For better diagnosis, the types of nematocysts from tentacles and dissected views of the gastric phacellae should also be examined.

The family Carukiidae is not new to the Indo-Pacific region (Bentlage *et al.*, 2012). *Morbakka* sp. has been found along the Straits of Malacca, Peninsular Malaysia and the Philippines (Mohammed Rizman-Idid *et al.*, 2016). *Morbakka virulenta* more specifically can be found in Honshu, Japan (Bentlage *et al.*, 2012); and *Morbakka fenneri* has been recorded from various locations in Queensland and New South Wales, Australia (Gershwin, 2008). The featured examples appear to be the first records of the genus *Morbakka* in Singapore.

Another species of box jellyfish, *Tripedalia cystophora*, was recently recorded from Singapore (Iesa, 2017).



Fig. 1. Lateral view of specimen of *Morbakka* sp. from Sentosa (ZRC.CNI.1019).



Fig. 2. Lateral view of example of *Morbakka* sp. from Tanah Merah (ZRC.CNI.1328).



Fig. 3. An 'eye' of a box jellyfish: example of rhopalium niche of a *Morbakka* sp. (ZRC.CNI.1328) with a frown-shaped ostium. Scale = 1 mm.



Fig. 4. Example of discharged nematocyst collected from the manubrium of a *Morbakka* sp. (ZRC.CNI.1019). Scale = 5 micro-metres.

Photographs by Iffah Iesa

Box jellyfishes are known to be highly venomous to humans. *Morbakka fenneri* is classified as an Irukandji jellyfish, being able to elicit systematic symptoms similar to the Irukandji Syndrome (Fenner, 1986, 1991, 1997), and is termed as a 'mild Irukandji' (Gershwin, 2008). Even so, a serious sting can result in heart failure (see Little et al., 2006). Reactions from jellyfish stings vary depending on several factors such as duration and surface area of exposure to tentacles, area of affected body part, and individual's susceptibility and reaction to envenomation (Lakkis et al., 2015). It is, however, unknown if the *Morbakka* sp. found in the Straits of Malacca and around Singapore are deadly to humans.



Fig. 5. Heavy branching of velarial canals of *Morbakka* sp. (ZRC.CNI.1019). Scale = 10 micro-metres. Photograph by Iffah Iesa

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