

New record of shrimp, *Periclimenes* cf. *obscurus*, on carpet anemone

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Subjects: Tiny carpet anemone shrimp, *Periclimenes* cf. *obscurus* (Crustacea: Decapoda: Palaemonidae); Haddon's carpet anemone, *Stichodactyla haddoni* (Cnidaria: Actiniaria: Stichodactylidae).

Subjects identified by: Jin-Ho Park and Veron Pwa Keay Hoon.

Location and date: Two localities - Johor Strait at Pulau Ubin, Chek Jawa, near viewing jetty; 12 January 2016. Singapore Strait at Semakau Landfill, 8 February 2016.

Habitat: Estuarine at Chek Jawa, and marine at Semakau. At both localities, on intertidal sand-flats, on soft sand substrates.

Observer: Veron Pwa Keay Hoon.

Observation: Examples of the tiny shrimp, *Periclimenes* cf. *obscurus*, no larger than 20 mm in body length, were found on almost all Haddon's carpet anemones (Fig. 1A) inspected at both Chek Jawa and Semakau. Each anemone may host up to 30 shrimps. Most of the shrimps were found hiding beneath the overhanging oral discs, but a few were observed on the surface of the oral discs among the stinging tentacles (Fig. 1B). These shrimps did not swim away even when their host anemone contracts and disappears into the substrate. However, anemones that are entirely exposed to air were not found to have shrimps on them.

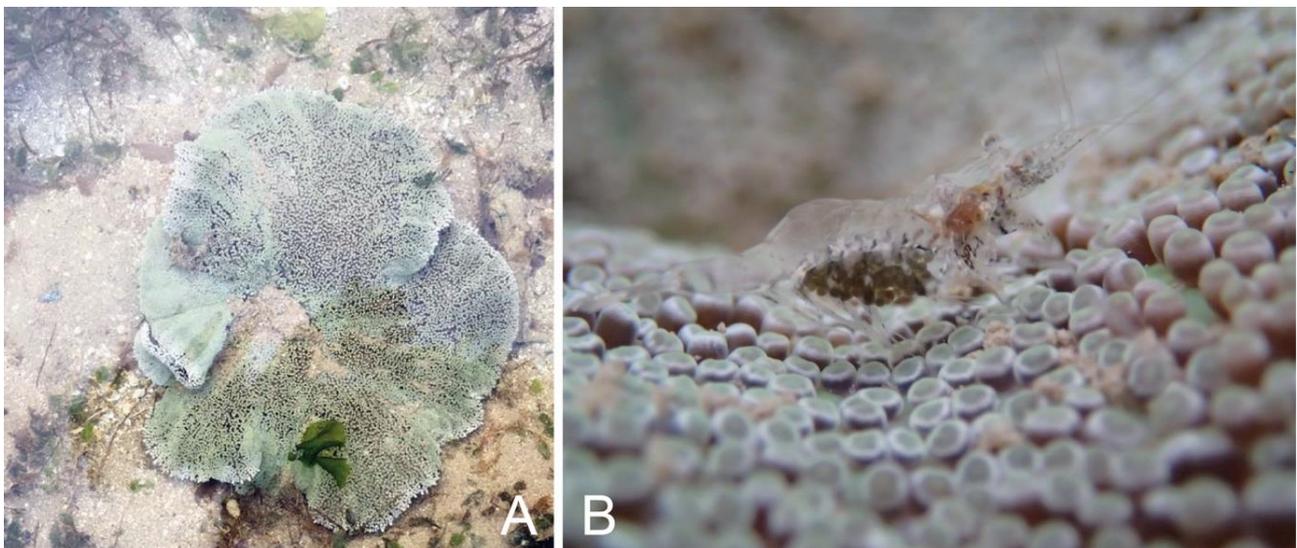


Fig. 1. A. Dorsal view of *Stichodactyla haddoni*, the host carpet anemone, on the sandflat. B. Lateral view of an ovigerous shrimp, *Periclimenes* cf. *obscurus*, in-situ, on the oral disk of a carpet anemone. Photographs by Veron Pwa Keay Hoon

Remarks: The present record shows that the shrimp, *Periclimenes* cf. *obscurus*, inhabits the Haddon's carpet anemone (*Stichodactyla haddoni*), and is the third species of shrimp in Singapore waters known to associate with the carpet anemone. The other two are the five-spot anemone shrimp, *Ancylocaris brevicarpalis* (Fig. 2; Anker & De Grave, 2016; Wild Singapore, 2016, as *Periclimenes brevicarpalis*) and *Ancylomenes holthuisi* (Anker & De Grave, 2016; Toh, 2013 as *Periclimenes holthuisi*). Both *Ancylocaris brevicarpalis* and *Ancylomenes holthuisi* are easily distinguished from *Periclimenes* cf. *obscurus* in being strikingly marked with large white blotches on the back of the abdomen and on the

dorsal surfaces of the tail fan. The shrimp herein identified as *Periclimenes* cf. *obscurus* is reported as ‘tiny carpet anemone shrimp’ and ‘*Periclimenes* sp.’ that lives in carpet anemones on the website of Wild Singapore (2020).

Anker & De Grave (2016) first recorded *Periclimenes* cf. *obscurus* from Singapore with material obtained from the Singapore Strait (between Lazarus and St John’s Islands, Pulau Jong, Raffles Lighthouse, Kusu Island, Terumbu Raya). The shrimps were collected from unidentified gorgonians, soft corals and hydroids, but not anemones. They identified their shrimps based on 1) carpus of second pereopod shorter than palm, and 2) antennal tooth always in a marginal position. It was noted that most specimens have subequal second pereopods, but a few have unequal ones. *Periclimenes* cf. *obscurus* is thus suspected to be a species complex that contains more than one species and a more detailed study is required. *Periclimenes obscurus* was described from Madras Harbour in India (Kemp, 1922 as *Periclimenes (Periclimenes) obscurus*), and shrimps identified as this species are widespread in the Indo-west Pacific from the Persian Gulf to Australia (Anker & De Grave, 2016).

The shrimps obtained from carpet anemones agree with *Periclimenes obscurus* on four key characters by Kemp (1922): (1) carapace with isolated epigastric spine; (2) rostral lamina not deep, with less than 9 dorsal teeth, and one or no ventral tooth; (3) ambulatory pereopods with distinct slender accessory tooth, shorter than unguis; (4) unguis of dactylus of ambulatory pereopods as long as corpus. The present material differs from the original description as follows: cutting edge of fixed finger of major second pereopod with two small but distinct teeth, and a relatively large tooth at proximally and 0.6 of fixed finger length, respectively (versus usually unarmed or an obscure tooth in Kemp, 1922).

It is not known if the *Periclimenes* cf. *obscurus* of the present record is conspecific with those of Anker & De Grave (2016). However, it does represent the first record of shrimps identified as *Periclimenes* cf. *obscurus* living in sea anemones. The contrasting host affiliation between Singapore material and other considered conspecific should be analyzed through detailed morphological and molecular approaches.

Examples of *Periclimenes* cf. *obscurus* taken from carpet anemones are deposited in the Lee Kong Chian Natural History Museum at the National University of Singapore, and in the Oxford University Museum of Natural History in the United Kingdom.

Note: We thank Dr. Sammy De Grave (Oxford University Museum of Natural History) for his valuable comments.

References:

Anker A & De Grave S (2016) An updated and annotated checklist of marine and brackish caridean shrimps of Singapore (Crustacea, Decapoda). Raffles Bulletin of Zoology, Supplement 34 (2): 343–454.

Kemp SW (1922) Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoniinae. Records of the Indian Museum, 24: 113–288.

Toh CH (2013) Shrimps and saddleback anemonefish on carpet anemone off Pulau Hantu. Singapore Biodiversity Records, 2013: 126-127.

Wild Singapore (2016) Wild fact sheets. Commensal shrimps *Periclimenes* sp.* [Accessed 16 November 2020] <http://www.wildsingapore.com/wildfacts/crustacean/othercrust/shrimp/periclimenes.htm>.

Wild Singapore (2020) Wild fact sheets. Tiny carpet anemone shrimp *Periclimenes* sp.* [Accessed 16 November 2020] <http://www.wildsingapore.com/wildfacts/crustacea/othercrust/shrimp/carpet.htm>.



Fig. 2. Dorsal view of a pair of five-spot anemone shrimp (*Ancyllocaris brevicarpalis*) on the oral disc of a Haddon’s carpet anemone (*Stichodactyla haddoni*) at Cyrene Reef on 23 June 2008. Photograph by Kelvin K. P. Lim