



# Multiple observations of the sea anemone *Phyllodiscus semoni* Kwietniewski, 1897 (Actiniaria: Aliciidae) from Sabah, Borneo represent first records for Malaysia

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## ABSTRACT

The stinging sea anemone *Phyllodiscus semoni* is recorded from Malaysia for the first time. This species exhibits high morphological variation, and morphotypes resembling dead coral rock, soft and stony corals and algae have been documented. Correct identification and information on local occurrences of *Phyllodiscus* is important, since this species is armed with venom-laden nematocysts that are hazardous to humans. In situ photographs of the specimens encountered in Malaysian Borneo are provided and their morphotypes are discussed.

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## 1. Introduction

The sea anemone *Phyllodiscus semoni* Kwietniewski, 1897 is an iconic inhabitant of Indo-West Pacific coral reefs. This species is a master of camouflage and mimicry, not only in colour and pattern, but also in shape and form. Many morphotypes have been recorded for this species including morphs resembling dead coral rock, soft and stony corals, and algae (Hoeksema and Crowther, 2011). The large variety in morphotypes complicates identification of this species, and records of *P. semoni* are still rather sparse (Den Hartog, 1997; Hoeksema and Crowther, 2011). Information about the regional occurrence of this species is important; *Phyllodiscus* possess some of the most dangerous venoms for humans. Their sting can induce severe dermatitis and, rarely, renal failure (Mizuno et al., 2007).

Known records of *P. semoni* in the Indo-West Pacific include: Ari Atoll in the Maldives (Erhardt and Knop, 2005), various locations in the Philippines (Gosliner et al., 1996) and Indonesia (Gosliner et al., 1996; Den Hartog, 1997; Coleman, 2000; Erhardt and Knop, 2005; Hoeksema and Crowther, 2011), Milne Bay in Papua New Guinea (Halstead, 2000), Okinawa in Japan (Mizuno et al., 2007),

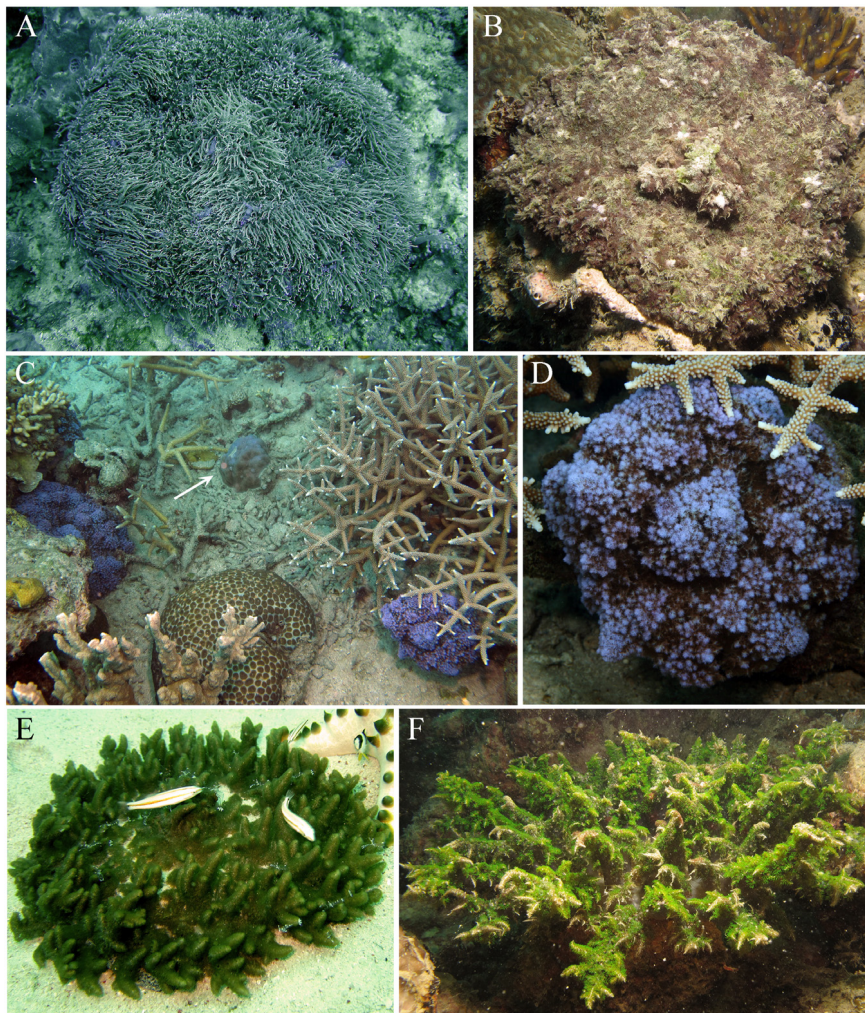
off Townsville in Australia (Shick et al., 1991), and New Caledonia (Laboute and de Forges, 2004; listed as *Alicia rhadina* Haddon and Shackleton, 1893). In addition there is a possible record from southern Vietnam (see discussion in Hoeksema and Crowther, 2011). Missing from this list of records is Malaysia, a country home to large, diverse coral reefs and part of the so-called Coral Triangle (Affendi and Rosman, 2011). Here we report the first observations of *P. semoni* in Malaysian waters and discuss their morphotypes (Fig. 1).

## 2. Material and methods

The East Malaysia state of Sabah contains more than 75% of Malaysian reefs (Burke et al., 2002), and the highest concentration of reefs can be found in the north and southeast of Sabah. Observations of *P. semoni* were made during the Semporna Marine Ecological Expedition (SMEE) 2010, and a reconnaissance trip to Semporna in 2009 prior to SMEE 2010 in southeast Sabah, as well as during the Tun Mustapha Park Expedition (TMPE) 2012 in north Sabah (Fig. 2). Background information on the expeditions, including detailed maps and localities visited can be found in Van der Meij and Hoeksema (2013), Waheed and Hoeksema (2013) and Waheed et al. (2015). *P. semoni* specimens were photographed when encountered during the research dives, but no specimens were collected.

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**Fig. 1.** *Phyllodiscus semoni* observations in Malaysian Borneo. **A** a *P. semoni* morphotype resembling *Briareum* soft coral at Darby Bank (Semporna area), **B** an algae covered dead coral rock morphotype at Simaggot (Kudat area), **C–D** *P. semoni* morphotypes resembling *Litophyton* soft coral at Belaruan (Kudat area) (note the blue *Porites* coral in the centre of the image C (arrowed)), **E** a *Sinularia* soft coral mimic at Tanjung Pantau Pantau (Semporna area), **F** a *P. semoni* specimen resembling a green algae morph at Sibaliu N (Kudat area). Photo credits: **A** Z Waheed, **B–C, F** SET van der Meij, **D** BT Reijnen, **E** SGA Draisma.

### 3. Results and discussion

We recorded *P. semoni* from five localities in Sabah, Borneo, which represent the first published accounts of this species in Malaysia. Three new records of *P. semoni* come from the Kudat area at the northern tip of Borneo in the Sulu Sea (Fig. 2(A)). The waters north of the town of Kudat are part of a marine park, Tun Mustapha Park (TMP), gazetted in 2016. TMP is home to the second largest coral reef area in Sabah, and has high levels of marine biodiversity (Waheed et al., 2015). New species have been discovered in the area in recent years (Chen, 2015; Van der Meij, 2017), highlighting the importance of the marine park.

In TMP *P. semoni* was encountered at three localities: Simaggot (07°02'34"N 117°27'58"E), Sibaliu N (07°11'33"N 117°23'38"E) in the east of the park, and Belaruan (07°01'50"N 117°00'41"E) within the South Banggi Channel in between Banggi Island and the mainland. The single specimen at Simaggot resembles algae covered dead coral rock (Fig. 1(B), compare fig. 7E in Hoeksema and Crowther, 2011), whereas the single specimen at Sibaliu N is a green algae morph (Fig. 1(F), compare p. 229 in Erhardt and Knop, 2005). The latter is reminiscent of a dead branching coral covered in green turf algae. The more common green turf algae found on reefs include *Bryopsis* J.V. Lamouroux (1809) (usually *B. pennata* J.V. Lamouroux, 1809), *Caulerpa verticillata* J. Agardh (1847), and

*Chlorodesmis* W.H. Harvey and J.W. Bailey (1851) species (most notably *C. fastigiata* (C. Agardh) S.C. Ducker (1969) and *C. hildebrandtii* A. Gepp and E.S. Gepp (1911)). On damaged reefs blooms have been reported for the genus *Trichosolen* Montagne (1861) as well (Pauly et al., 2011). The *P. semoni* morph at Sibaliu N is similar in appearance to these common turf algae species. At Belaruan three different sized, bluish *P. semoni* specimens were observed (Fig. 1(C)–(D)), which could be mistaken for *Litophyton* Forskål (1775) soft coral. The blue coral in the centre of the picture (Fig. 1(C), arrowed) is a *Porites* Link (1807) stony coral. All three TMP sites at which *P. semoni* was discovered are exposed to the dominant wind direction. Simaggot and Sibaliu N are rather shallow with a maximum depth of ca. 20 m depth, whereas Belaruan reaches at least 30 m depth. The latter locality is located in the channel between Banggi Island and the mainland where strong currents can be present.

Two of the new records of *P. semoni* are observations from the Semporna area in the southeast of Sabah (Fig. 2(B)). Semporna is located in the Sulawesi Sea and is known for its remarkably high marine biodiversity (Waheed and Hoeksema, 2013). Parts of the Semporna reefs are located in the Tun Sakaran Marine Park (TSMP), which was gazetted in 2004. A specimen of *P. semoni* with a morphotype resembling a *Briareum*

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