

New record of seven marine crabs from Saint Martin's Island of the northern Bay of Bengal, Bangladesh

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Abstract. Habib KA, Sarkar S, Islam MJ. 2021. New record of seven marine crabs from Saint Martin's Island of the northern Bay of Bengal, Bangladesh. *Indo Pac J Ocean Life* 5: 41-49. The present study reports the first occurrence of seven marine crabs species, *Camposcia retusa*, *Conchoecetes artificiosus*, *Cyclodius obscurus*, *Eucrater indica*, *Halimede ochtodes*, *Petrolisthes boscii*, and *Prismatopus aculeatus* collected from Saint Martin's Island, Bangladesh. These species belong to the seven families: Inachidae, Dromiidae, Xanthidae, Euryplacidae, Galenidae, Porcellanidae, and Majidae. Specimens were identified by the examination of morphological characters.

Keywords: Anomura, Brachyura, distribution, morphology

INTRODUCTION

Crabs are decapod crustaceans of the large and diversified group of invertebrate animals with different forms, structures, habits and habitats, and in terms of species richness, they belong to the largest animal phylum, Arthropoda (Oliver 2004; Abbas et al. 2016). Decapod crustaceans are important members of tropical benthic communities, and the Order is predicted to hold around 15000 species under 2700 genera (Hendrickx and Harvey 1999; Vartak et al. 2018). Of all decapods, crabs belong to the infra-order Brachyura and Anomura. Most of the Brachyuran or true crabs can easily be distinguished from the so-called "false crabs" belonging to the infraorder Anomura by having four pairs of well-developed walking legs. In contrast, Anomuran crabs have the fourth (last) pair very short and usually hidden beneath the carapace that is hardly noticeable (Carpenter and Niem 1998).

Brachyuran crabs are the most diverse group and play an important role in benthic communities of marine environments ranging from intertidal to deep waters (Boudreau and Worm 2012; Abbas et al. 2016). The infra-order Brachyura contains approximately 1271 genera and 6793 species worldwide (Ng et al. 2008; De Grave et al. 2009). On the other hand, Anomuran crabs are less diverse than Brachyuran crabs comprising approximately 1383 species worldwide (McLaughlin et al. 2010; Osawa and McLaughlin 2010).

The southern part of Bangladesh is connected with the long coastline of the Bay of Bengal, which is about 710 km (Quader 2010). Saint Martin's Island is the only sedimentary continental island of Bangladesh situated at the southernmost tip of Bangladesh in the northern Bay of Bengal and separated from mainland Cox's Bazar-Teknaf peninsula by a channel of about 9 km wide (Tomascik

1997). Saint Martin's Island is the only coral-associated island in Bangladesh and is considered an ecologically critical area with the richest biodiversity (Upal 2015; Akash and Hossain 2017). Though St. Martin's Island is known as the biodiversity hotspot, identifying most of the fishery's resources is yet to be explored (Hossain and Islam 2006; Haque et al. 2015).

In Bangladesh, there are 58 recorded species of marine and estuarine crabs belonging to different families (Johirul 1976; Shafi and Quddus 1982; Ng et al. 1987; Chowdhury and Hafizuddin 1991; Siddiqui and Zafar 2002; Ahmed et al. 2008; IUCN Bangladesh 2015; Akash and Chowdhury 2017; Akash and Hossain 2017; Habib et al. 2017; Sharifuzzaman et al. 2018; Alam et al. 2020; Chowdhuri et al. 2020). Except for Alam et al. (2020) and Sharifuzzaman et al. (2018), all other literature results from individual survey efforts or opportunistic findings. Due to limited economic potentials (except for estuarine *Scylla* spp.), marine crabs have not been prioritized as an important subject of study in the country's systematic fisheries surveys. While indicating the need for a national effort to survey estuarine and marine crabs, the present study reports the new occurrence and geographic range of one anomuran and six brachyuran crabs collected from Saint Martin's Island, there by determining the under-surveyed and on-studied marine crab fauna of Bangladesh.

MATERIALS AND METHODS

Study area and sample collection

Specimens were collected from local fishermen, local fish markets, and direct hand-picking from the shore of the Saint Martin's Island (20° 34' N - 20° 38.8' N and 92° 18' E - 92° 20.8' E), Bangladesh (Figure 1) on February 2019 to

December April 2020. All the specimens were preserved in an icebox and later brought to the Aquatic Bio-resource Research Lab at Sher-e- Bangla Agricultural University, Dhaka. The specimens were cleaned with brush and freshwater, photographed, and subjected for species-level identification. Specimens were identified to the species level using different identification keys and standard references of Selvakumar and Khan (1993), Galil (2000), Jeyabaskaran et al. (2000), Rajkumar et al. (2009), Castro and Ng (2010), Hiller et al. (2010), Pillai et al. (2013), Trivedi and Vachhrajani (2013), Lasley Jr (2014), Wongissarakul and Jantrarotai (2014), Lasley Jr et al. (2015), Beleem et al. (2016), Silambarasan et al. (2017), Beleem et al. (2017), McLAY and Naruse (2019). The external morphological features of those crabs were distinguished by the following parameters: shape, color, and measurements of the carapace. The carapace length and width measurements were taken using a standard Vernier caliper to the nearest 0.1 millimeters (mm). The carapace length (CL) was measured from the tip of the medial frontal teeth; along the median axis to the posterior border of the carapace. The carapace width (CW) was measured across the widest points, usually found between

the last pair of anterolateral teeth. Teeth on the anterolateral margin of carapace, as well as teeth or ridges of the carapace were also observed.

RESULTS AND DISCUSSION

We have identified seven crab species from seven families for the first time from Bangladesh. Among the seven crab species, *Petrolisthes boscii* (Audouin 1826) from the infra order Anomuran, and five species, *Camposcia retusa* (Latreille 1829), *Conchoecetes artificiosus* (Fabricius 1798), *Cyclodius obscurus* (Hombron and Jacquinot 1846), *Eucrate indica* (Castro and Ng 2010), *Halimede ochtodes* (Herbst 1783), and *Prismatopus aculeatus* (H. Milne Edwards 1834) from the infra-order Brachyura were identified. These species belong to the seven families, Porcellanidae, Inachidae, Dromiidae, Xanthidae, Euryplacidae, Galenidae, and Majidae. Diagnostic characters of all seven species are given below.

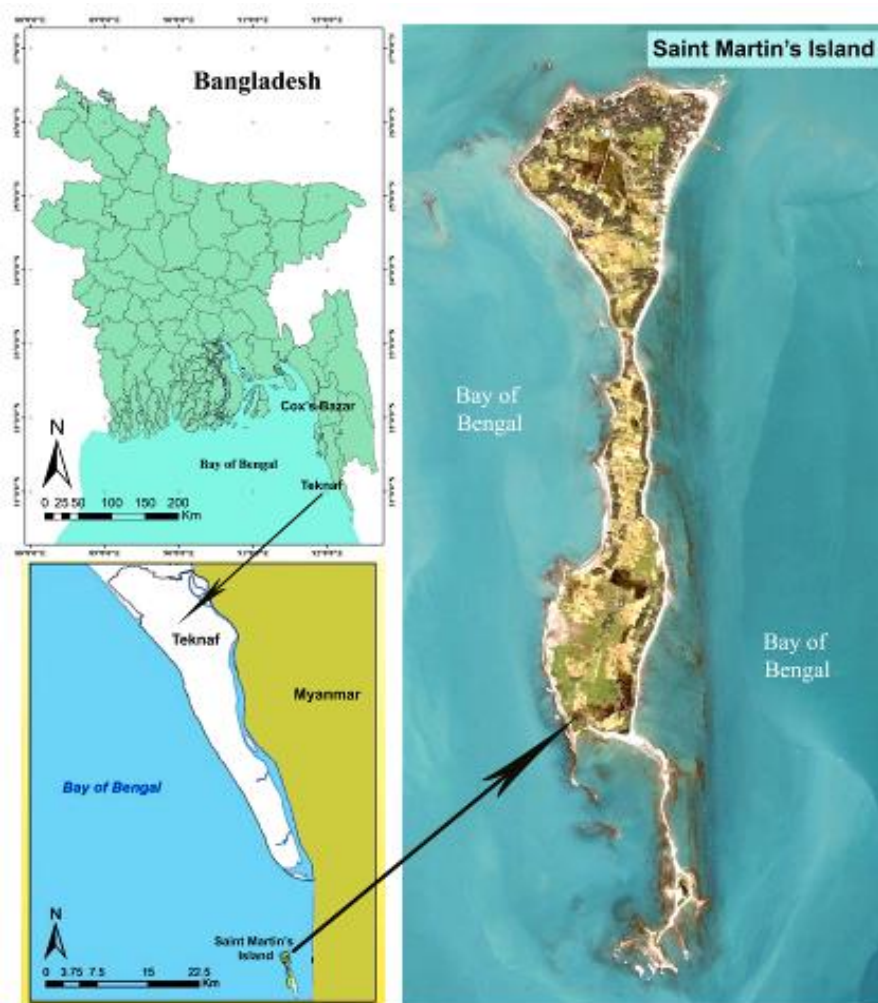


Figure 1. Location of the Saint Martin's Island, Bangladesh from where samples were collected (20° 34' N - 20° 38.8' N and 92° 18' E - 92° 20.8' E)

Infra-order: Anomura MacLeay 1838**Family: Porcellanidae Haworth 1825****Genus: *Petrolisthes* Stimpson 1858****Species: *Petrolisthes boscii* (Audouin 1826) (Figure 2A-2B)***Specimen examined*

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1). One female (Voucher no. C1912SM-03, CL: 10.5 mm, CW: 10.1 mm).

Diagnosis

The carapace is depressed and slightly longer than the width; the surface of the carapace is pubescent and covered with different kinds of flattened granules and striated lines; carapace is rounded in shape along the brachial margins; the front part of the carapace is triangular in shape, and apex is innovated downward. Small acute epibranchial spine present. Eyes are relatively large and located in shallow orbits. Chelipeds are almost equal in size and armature, completely covered with transverse striped lines; merus is somewhat rugose with serrated lobe on anterior margin and with one acute spine; carpus two times longer than width, armed on anterior margin with three broad, serrated teeth proximally and armed on posterior margin with a strong spine distally, followed by two smaller ones; Chelae broad, with transverse striations, outer margin evenly rounded, spineless. Walking legs are covered with hair; carpus spineless; small spine is present on the merus of 1st and 2nd pair of walking legs; no spine is observed on merus of other pairs of walking legs; spinules are present on the posterior end of propodus; dactylus large with curved claws, and inner border of the dactylus have some spinules.

Color

The dorsal surface of the carapace is chocolaty red with white striations, and the ventral surface is maroon.

Habitat

The species is mostly found in the upper intertidal zone, sandy-muddy substratum, in the sand near low watermark or in rocky pools under large steady boulders (Beleem et al. 2016; Mustaqim 1972). It was also reported from shallow water to 18.3 m depth, from rocks, boulders and corals (Lewinsohn 1979). Hiller et al. (2010) found it among boulders in the deeper intertidal and the subtidal water.

Remarks and distribution

The morphological description and coloration pattern of our studied specimen is in agreement with the description of Hiller et al. (2010), Trivedi and Vachhrajani (2013), Beleem et al. (2016). The species is widely distributed in the Indo-west Pacific region; South China Sea, Taiwan, Hong Kong, Korea, Japan, Indonesia, Thailand, Philippines, Australia, Mergui Archipelago, Madagascar, Red Sea, Persian Gulf, Oman, Pakistan, and India (Henderson, 1893; Komai 2000; Siddiqui and Kazmi 2003; Hiller et al. 2010; Prakash et al. 2013; Trivedi and Vachhrajani 2013; Beleem et al. 2016, GBIF.org 2021).

The nearest distribution of this species is south-western part of the Bay of Bengal, India (Hiller et al. 2010). This study confirms the occurrence of *P. boscii* species in the northern Bay of Bengal, Bangladesh.

Brachyura Latreille 1802**Inachidae MacLeay 1838*****Camposcia* Latreille 1829*****Camposcia retusa* (Latreille 1829) (Figure 2C-2D)***Specimen examined*

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1); one specimen (Voucher no. C1903SM-II-09, CL: 29.5 mm, CW: 21.3 mm).

Diagnosis

The whole body is thickly setaceous. Carapace is somewhat triangular in shape, longer than broad, dorsal surface not smooth and thoroughly covered with hair; Eye-stalks are long and slender. Chelipeds short, slender and setaceous; merus is two times longer than carpus; merus and carpus both are denticulated; fingers with tooth throughout in inner margin. Walking legs are thickly setaceous and densely encrusted with sponges, algae, etc. Second walking leg shorter than third one and third walking leg shorter than the fourth one; the fifth leg as long as third; merus and propodus of each walking leg longer than carpus and dactylus; each dactylus with a sharp curved distal end.

Color

Entire carapace brownish; cheliped reddish white.

Habitat

Usually inhabits a muddy area of the lower intertidal zone, coral reefs, rocky weedy bottoms, under big boulders and rocks (Jeyabaskaran et al. 2000; Beleem et al. 2017).

Remarks and distribution

The species is commonly called the decorator crab. It can be differentiated from other closely related species by the tendency to have highly decorated walking legs and a fairly uniform amount of material over the whole carapace (Brooker et al. 2018). The species is widely distributed in Indo-West Pacific (Sakai 1965; Griffin 1966); including India (Andaman and Nicobar Islands, Pearl banks, Gulf of Mannar, Tamil Nadu, and Gujarat) (Alcock 1895; Laurie 1906; Jeyabaskaran et al. 2000; Apel 2001; Roy 2008; Beleem et al. 2017); Pakistan (Tirmizi and Kazmi 1986); Sri Lanka, Cocos Island (Alcock 1895); Philippines (Adams and White, 1850); South Africa, Christmas Island, Gulf of Oman, Indonesia, Japan, Australia (Apel 2001); also distributed in East Africa, Red Sea, Malay Archipelago, eastwards to Samoa and Fiji (McNeill 1968); Mauritius, Chagos Archipelago (Barnard 1950). The nearest location of this species is in Tamil Nadu, the South-western part of Bay of Bengal, India (Roy 2008). Present study confirms the occurrence of *Camposcia retusa* in the northern Bay of Bengal, Bangladesh.

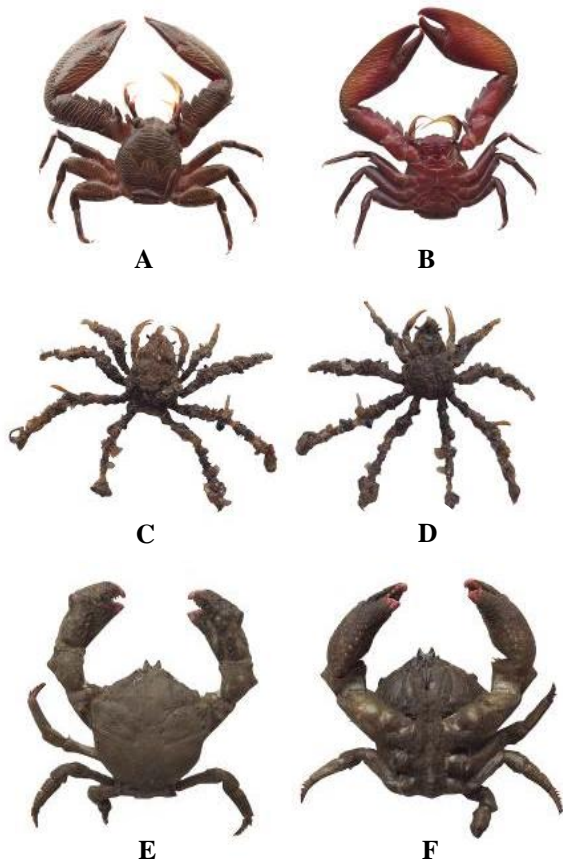


Figure 2. Photographs of *Petrolisthes boscii* (C1912SM-03; CL: 10.5 mm, CW: 10.1 mm): A. dorsal view, B. ventral view; *Camposcia retusa* (C1903SM-II-09, CL: 29.5 mm, CW: 21.3 mm): C. dorsal view, D. ventral view; *Conchoecetes artificiosus* (C1910SM-13, CL: 37.2 mm, CW: 38.9 mm): E. dorsal view, F. ventral view.

Brachyura Latreille 1802

Dromiidae De Haan 1833

***Conchoecetes* Stimpson 1858**

***Conchoecetes artificiosus* (Fabricius 1798) (Figure 2E-2F)**

Specimen examined

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1); one male (Voucher no. C1910SM-13, CL: 37.2 mm, CW: 38.9 mm).

Diagnosis

Carapace pentagonal in shape, slightly wider than long, upper surface of the carapace velvety due to the presence of sponges. Regions are well defined by distinct grooves and tomentum evenly. Frontal, lateral teeth prominent but blunt; supraorbital margin also with a prominent blunt tooth. Anterolateral margin is convex and with two teeth; these anterolateral teeth mark the widest point of the carapace; all margins are granular. Chelipeds are thick and heavy, tuberculate, dactyls of the chelipeds with large notched movable teeth. The upper portion of the propodus with many tubercles including distinctly rounded large one;

carpus and merus are thick and somewhat triangular; carpus with a large rounded tubercle and many other small tubercles. Second to fifth pereopods are slender and not as long as chela. The fourth and fifth pereopods are shorter than the second and third one; Tip of the dactyl of the second and third pereopod is hairy, and dactyl of the fifth pereopod minute. Although the fourth pereopod is absent in our studied specimen, but dactyl of the fourth pereopod is usually hook-shaped and firm.

Color

Due to the coverage of sponges, our specimen is looking black. Fingers of the chelipeds reddish.

Habitat

Inhabits in the muddy bottom with patches of sand and shells (McLAY and Naruse 2019).

Remarks and distribution

It is commonly known as sponge crab and may carry bivalve shells for camouflage (Ahyong et al. 2009; Pillai et al. 2013). The species is widely distributed in the Indo-West Pacific region, including India (East coast - West Bengal, Orissa, Tamil Nadu; West coast - Maharashtra; Islands - Andamans and Nicobars), Pakistan, Sri Lanka, Persian Gulf, Thailand, Singapore, China, Taiwan, Vietnam, Hong Kong, Japan, Cambodia, Australia, South Africa, and Madagascar (Naiyanetr 2007; Roy 2008; Ahyong et al. 2009; Naruse et al. 2014; McLAY and Naruse 2019). The nearest distribution of this species is the northern, southern, and western part of Bay of Bengal (Roy 2008). However, present study confirms the occurrence of *Conchoecetes artificiosus* species in Bangladesh marine waters.

Brachyura Latreille 1802

Xanthidae Macleay 1838

***Cyclodius* Dana 1851**

***Cyclodius obscurus* (Hombron and Jacquinot 1846) (Figure 3A-3B)**

Specimen examined

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1); one male (Voucher no. C1903SM-II-08, CL: 53.8 mm, CW: 69.9 mm).

Diagnosis

Carapace transversely hexagonal in shape and wider than long. Dorsal surface of the carapace is convex and granulated, which looks bulging; regions are defined by broad depressions. Frontal lobe relatively larger than lateral lobes; sub-median lobes joining medially and formed a V-shaped notch. Antero-lateral margins with four teeth excluding the outer supra-orbital tooth; tooth 1 and 2 small and obtuse; tooth 3 and 4 large and acute. Chelipeds are long, nearly equal, stout, and heavy; outer surface smooth and covered with small granules; fingers of the chelipeds black and gaping. Ambulatory legs are shorter than chela and covered with numerous plumose setae; the tip of the dactylus with a long, sharp chitinous spine.

Color

Dorsal surface of the carapace chocolaty brown in color. Chela and ambulatory legs are reddish-brown. The tip of the chelipeds is black.

Habitat

Usually inhabits coral reefs; mostly found in live corals but rarely under dead corals (Roy 2008).

Remarks and distribution

The species can be differentiated from its closely related species *Cyclodius unguates*, by its narrower carapace, more convex gastric region and more projecting lateral lobes (Gordon 1934). The species is distributed in the Indo-West Pacific region, India (Tamil Nadu, Andaman, and Nicobar Islands), Japan, Indonesia, Philippines, Palau, Micronesia, Marshall Islands, South Africa, East Coast of Africa, Djibouti, Red Sea (Egypt), Madagascar, Reunion Island, Mauritius, Seychelles, Europa Island, Hawaii, New Caledonia, Samoa, Tuvalu, Kiribati, Fiji, Australia, and French Polynesia (Roy 2008; Poupin et al. 2013; Lasley Jr 2014; GBIF 2021). The present study confirms the occurrence of *Cyclodius obscurus* species in the northern Bay of Bengal, Bangladesh.

Brachyura Latreille 1802**Euryplacidae Stimpson 1871*****Eucrate* de Haan 1835*****Eucrate indica* (Castro and Ng 2010) (Figure 3C-3D)****Material examined**

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1). One male (voucher no. C1910SM-16, CL: 22.3 mm, CW: 26.7 mm).

Diagnosis

Carapace transversely rectangular in shape, slightly broader than long; dorsal surface convex and smooth. The anterolateral margin of the carapace armed with three teeth, including the external orbital tooth; the second tooth is a bit triangular, and the third anterolateral tooth is large, sharp, and well separated from the 2nd tooth. The fissures on the dorsal orbital margin inarticulate; posterolateral borders of the carapace is relatively long. Walking legs slender and long, without spines.

Color

The entire specimen is somewhat reddish-brown in color because of tiny reddish scattered spots on the frontal part of the carapace and walking legs. Eight irregular, large, red-brown spots present on the median portion of the dorsal surface of carapace, each flanked by two smaller, vertically placed spots.

Habitat

It inhabits 40-60m depth in the marine environment (Silambarasan et al. 2017).

Remarks and distribution

The present male specimen from the Bay of Bengal, Bangladesh agrees well with the previous description of Rajkumar et al. (2009), Castro and Ng (2010) and Silambarasan et al. (2017). The coloration pattern of our specimen is slightly different but agreed with Silambarasan et al. (2017). The species is widely distributed in India, China (coast of the East China Sea to Taiwan Island), the Philippines, Vietnam (Nhatrang Bay), Gulf of Thailand, Malaysia, and Andaman Sea (Sakai 1976; Serène 1981; Dai 1991; Ng et al. 2001; Hsueh et al. 2002; Ng and Davie 2002; Castro and Ng 2010). The nearest distribution of this species is Chennai coast and Parangipettai coast, South-western part of Bay of Bengal, India (Rajkumar et al. 2009; Silambarasan et al. 2017). This study confirms the occurrence of *Eucrate indica* species in the northern Bay of Bengal.

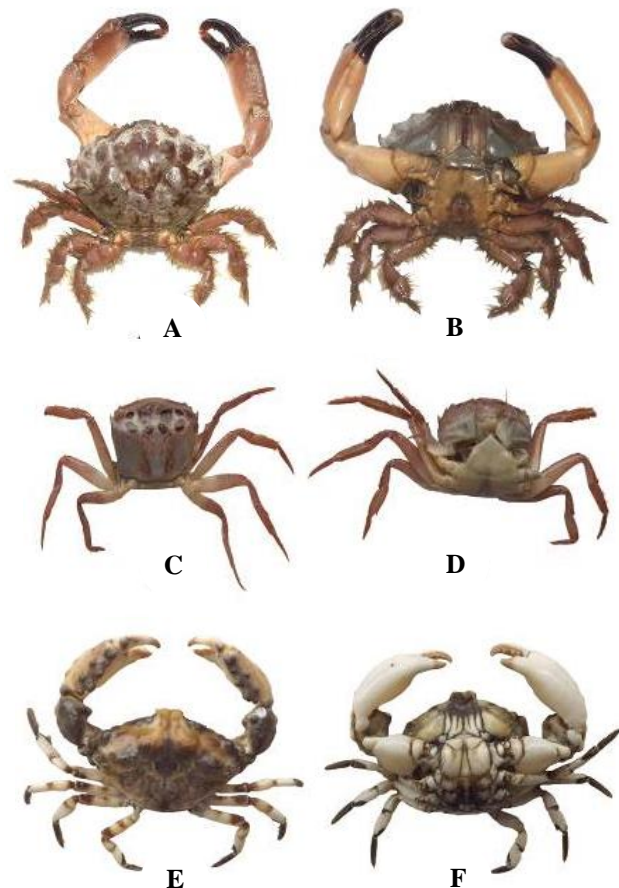


Figure 3. Photographs of *Cyclodius obscurus* (C1903SM-II-08, CL: 53.8 mm, CW: 69.9 mm): A. dorsal view, B. ventral view; *Eucrate indica* (C1910SM-16, CL: 22.3 mm, CW: 26.7 mm): C. dorsal view, D. ventral view; *Halimede ochtodes* (C1910SM-14, CL: 26.5 mm, CW: 34.8 mm): E. dorsal view, F. ventral view.

Brachyura Latreille 1802**Galenidae Alcock 1898****Halimede de Haan 1835****Halimede ochtodes (Herbst 1783) (Figure 3E-3F)***Specimen examined*

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1); one male (Voucher no. C1910SM-14, CL: 26.5 mm, CW: 34.8 mm).

Diagnosis

Carapace broader than long and smooth, dorsal surface convex and glabrous, regions ill-defined, anterior portion of the carapace tubercular, minutely granulated and separated by shallow grooves with each other. Anterolateral margins with distinct, apically granulated, rounded knobs which decrease in size from posterior to anterior. Chelipeds are unequal in shape, and both carry many bulbous knobs or lobes. Upper margin of cheliped merus bearing 4 to 6 bulbous knobs. Carpus irregularly gnarled, smoother, and two bulbous knobs on the interior angle. Upper margin of chela bearing many bulbous knobs; lower external surface and lower margin of chela smooth. Upper margin of dactyl bearing two bulbous knobs.

Color

The dorsal surface of the carapace is creamy and blackish, ventral surface is whitish. The tip of each dactyl of walking legs is black.

Habitat

The species inhabits muddy or sandy substrata in the inshore water (Selvakumar and Khan 1993; Jeyabaskaran et al. 2000).

Remarks and distribution

Halimede ochtodes can be distinguished from its closely related species by the ill-defined posterior regions of carapace; globular knobs bearing antero-lateral margin, upper margin of chela, and nearly smooth lower external surface of the chela (Galil 2000). The species is widely distributed in the Northern half of Australia, Pakistan, India (Madras coast, Parangipettai coast, Gulf of Mannar), Myanmar, Thailand (Gulf of Thailand), Singapore, China (Guangxi, Hainan, Hong Kong), Sagami Bay (Japan), the Philippines, Malay Archipelago, Penang, Indonesia (Dai and Yang 1991; Selvakumar and Khan 1993; Galil 2000; Jeyabaskaran et al. 2000; Davie 2002; Naiyanetr 2007), Cambodia (Naruse et al. 2014), Red sea (Lipej et al. 2017), and the Mediterranean coast of Israel and Egypt (Galil 2000; Lipej et al. 2017). The nearest distribution of this species is -Parangipettai coast and Madras coast, the South-western part of the Bay of Bengal, India (Selvakumar and Khan 1993). The present study confirms the occurrence of *Halimede ochtodes* in the northern Bay of Bengal, Bangladesh.

Brachyura Latreille 1802**Majidae Samouelle 1819****Prismatopus Ward 1933****Prismatopus aculeatus (H. Milne Edwards 1834) (Figure 4A-4B)***Specimen examined*

Saint Martin's Island, Bay of Bengal, Bangladesh (Figure 1); one male (Voucher no. C1903SM-10, CL: 26.8 mm, excluding rostrum; CW: 20.1 mm).

Diagnosis

Carapace pyriform in shape, convex dorsally, and with small hooked setae. Five spines are present on the middle line of the dorsal surface of the carapace; a gastric region with two acute spines, single acute spine on the cardiac region, and two acute spines on the intestinal region. Two long, acute spines are present on the branchial region, which is directed to outside and backside. Rostrum significantly divergent, hairy and outwardly curved; antennae almost as long as a rostrum. Pre-orbital and antorbital spines present where pre-orbital spine is slightly longer than the antorbital spine and directed outwardly. Intercalated spine short. Strong lobe present on the hepatic region and hepatic margin with a small tubercle. Chelipeds are slender, smooth, and not much long; fingers with small blunt teeth; carpus small and curl; merus is two times longer than carpus. Ambulatory legs are slender, longer than chela except for last two pair of legs and covered with hooked setae; carpus with single spine on the distal end of upper border only on the first pair; margin of merus with acute curve spine on distal end, but the last two pairs are reduced in size; dactylus with an acute, curved spine.

Color

The dorsal surface of the carapace is blackish; ventral surface and appendages are whitish.

Habitat

The species usually inhabits sponges, corals, and algae which helps to decorate themselves, camouflage, defense, shelter, or food; also found under pebbles (Jaingam et al. 2008; Wisespongpan et al. 2012).



Figure 4. Photographs of *Prismatopus aculeatus* (C1903SM-10, CL: 26.8 mm, excluding rostrum; CW: 20.1 mm): A. dorsal view, B. ventral view.

Remarks and distribution

Prismatopus aculeatus is commonly known as spider crab or decorator crab as it can attach materials from an environment with the help of their hooked setae present on their carapace (Gary 2004). It can be distinguished from its closely related species by its different shape and number of spines present on the carapace (Wongissarakul and Jantrarotai 2014). It is widely distributed in the Indo-West Pacific; India (Tamil Nadu, Gulf of Kutch, Maharashtra, Kerala, Karnataka, Lakshadweep); Sri Lanka, Indonesia, Philippines, China, Japan, Mergui Archipelago, Gulf of Martaban, Malacca Strait, Singapore, Gulf of Thailand, Sulu Archipelago, Torres Strait, Australia (Queensland), Cape Jaubert and Thursday Island (Roy 2008; Roy 2013; Wongissarakul and Jantrarotai 2014; Beleem et al. 2019; Devi et al. 2019; GBIF.org 2021). The nearest distribution of this species is Tamil Nadu, the South-Western part of the Bay of Bengal, India (Roy 2008). The present study confirms the occurrence of *Prismatopus aculeatus* species in the northern Bay of Bengal, Bangladesh.

In conclusion, the current study successfully identified seven marine crab species under seven families from Bangladesh for the first time. Most of the species are naturally present in the Indo-west Pacific region. All species had previously been recorded from the east coast of India (Western part of the Bay of Bengal), which clarifies that the marine crab inventory of Bangladesh is incomplete. Results of this study exhibit the remarkable addition of new records to the country's crab checklist and uplift the total number of known marine species in Bangladesh. At the same time, it also shows the need for systematic, comprehensive, and extensive sampling to better understand the diversity and distribution of marine crab species in the northern Bay of Bengal.

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