SPECIES

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First documentation of the Camptandriine crab *Baruna socialis* Stebbing, 1904 in the Arabian Sea from the mangroves of Kerala

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ABSTRACT

Crabs belonging to the *Baruna* genus, as classified by Stebbing in 1904 and part of the Camptandriidae family described by Stimpson in 1858, are commonly observed in various habitats within the Indo-West Pacific region. These habitats include mangroves, estuaries, mudflats, and open mudflats. Among the four known *Baruna* species found in the northern Indian Ocean, only one species, *Baruna socialis* Stebbing, 1904, has been documented in India, specifically in locations such as Chilka, Andhra Pradesh, and Tamil Nadu. This report presents the initial confirmed sighting of *Baruna socialis* Stebbing, 1904, in the Arabian Sea, specifically within the mangroves of Northern Kerala - Payyannur and Kunhimangalam.

Keywords: Brachyura, Crab, Crustacean diversity, Mangrove, New record.

1. INTRODUCTION

Crustaceans are the most diverse cryptic fauna, scattered in multiple habitats within the ecosystem. A total of 910 marine brachyuran crabs belonging to 361 genera are reported from Indian waters (Trivedi et al., 2018). Brachyuran crab species belonging to the Camptandriidae family, as described by Stimpson in 1858, are frequently encountered in the Indo-West Pacific region, inhabiting areas such as mangroves, estuaries, mudflats, and open mudflat environments. The Camptandriidae family is comprised of approximately 40 species distributed across 22 genera globally, as indicated by (Patel et al., 2021). Five species from the same family have been reported from India and extended their distribution range in the northern Indian Ocean. Four species, that belong to the genus *Baruna* Stebbing, 1904, are documented from the north-eastern Indian Ocean (Harminto and Peter, 1991). *Baruna socialis* Stebbing, 1904 have been reported from Chilka Lake, Andra Pradesh, and Tamil Nadu along the east coast of India (Trivedi et al., 2017; Dev-Roy, 2008). This note reports the first occurrence of *Baruna socialis* Stebbing, 1904 from the west coast of India.

2. MATERIAL AND METHODS

As part of the regular faunal surveys of the Zoological Survey of India, a survey was conducted at the mangroves of Payyannur at Kunhimangalam in northern Kerala in August 2023 (Figure 1). Two crab specimens were collected from the mangrove habitat at Thekkumbad region of Kunhimangalam (12.051°N, 75.229°E) near Payyannur, Kerala. The specimens were hand-picked at low tide from the crevices and decayed mangrove wood and bark. To represent the original color, live specimens were photographed in field. For DNA analysis, one specimen was afterward preserved in ethanol, while the remaining sample was initially fixed in 10% formalin and later transferred to 70% ethanol for long-term preservation. All morphometric data was recorded accurately up to 0.1 millimeters using digital vernier calipers. The species is identified following (Harminto and Peter, 1991). All the identified specimens were registered and deposited in the National Zoological Collection of the Zoological Survey of India, Western Ghat Regional Centre.

Figure 1 Map showing the collection locality at Kunhimangalam, Payyannur, Kerala

3. RESULT

The collected specimen is identified as *Baruna socialis* Stebbing, 1904. Details of the species are given below.

Systematic position:

Order: Decapoda Latreille, 1803

Infraorder: Brachyura Linnaeus, 1758

Family: Camptandriidae Stimpson, 1858

Genus: *Baruna* Stebbing, 1904

***Baruna socialis* Stebbing, 1904**

Synonym

Leipocten sordidulum Kemp, 1915

Material examined

ZSI/WGRC/IR-INV 24756, 2exs., female, Kunhimangalam, Kannur, Kerala, (12.051°N, 75.229°E), 20.08.2023;

Coll

Sreelakshmi Surendran (Figure 2).

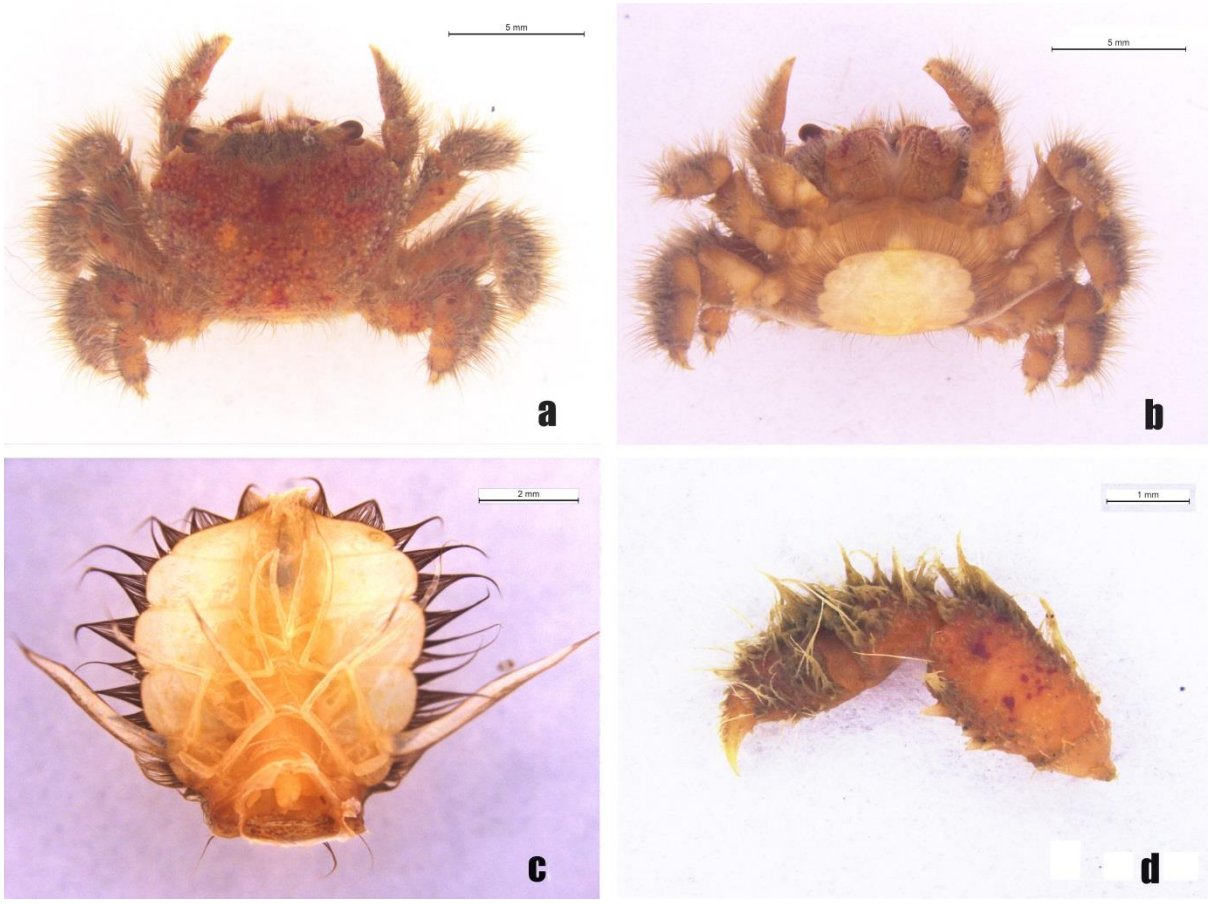

Figure 2 *Baruna socialis* Stebbing, 1904. (a) Dorsal view, (b) Ventral view, (c) Female abdomen (d) second ambulatory leg.

Diagnostic characters

Colour in live dirty brown. Carapace broader than long; sub quadrilateral; evenly low, longitudinally and transversely convex shaped. The upper surface of the carapace is punctate and granulose with scarcely areolated regions, and the carapace with the tract of short bristles and long woolly hairs posteriorly. Visible but weak epigastric cristae present. Short anterolateral margin compared to posterolateral margin; divided into three lobes, in which largest one near to the orbit with six to seven small marginal granules, second one with three to four marginal granules; last produced into a blunt tooth, with or without distinct marginal granules.

Posterolateral margins converge with strong granules in females and soft granules in males. Female with a group of larger, laterally flattened granules just before meeting posterior margin. The posterior margin is straight, and gently granulose, with a parallel ridge of small granules before the margin. Frontal margin about one-third of the width of carapace; slightly depressed, pubescent, smooth, or granulose. Supraorbital and infraorbital margins obscurely crenulate, granulose, meeting the frontal margin gradually. Antennae as long as front. Orbits large, eyestalks stout. The buccal cavern is huge, broader than long, and somewhat transversely oval.

Male chelae equal to subequal, swollen large; outer surface with small granules on the upper surface, without hairs or bristles; dactylus with prominent stout tooth near the proximal end; inner distal margin of carpus serrated, with submarginal row of granules, cutting edge of fingers with numerous denticles. Female chela equal to the subequal, not swollen, outer surface with numerous bristles, hairs, and cone-shaped granules, the dorsal margin of dactylus with many sharp granules and tubercles, cutting edge of fingers without teeth or denticles.

Ambulatory legs short, stout, hairy; with several well-developed granules on ventral margin of ischio- basis, last pair shortest; merus with short, and stout ventral spines, tubercles, and granules attached in a U- U-shaped structure, dorsal margin unevenly serrated, outer surface distinctly granulose; upper margin of carpus uneven; lower distal margin of propodus with one to three

small teeth and one to two strong spines on the edge of dorsal margin. G1 tip lobiform, with several spines on one subapical edge and a long, gradually tapering subapical process on the other, the tip of which is pointed.

Habitat

Found in mangrove environments, these crabs can be observed dwelling within crevices and decaying mangrove bark. They can be encountered in various water types, from freshwater to saltwater, and are often located within the hollow spaces of marine laterite blocks and amidst shells within mangrove oyster beds (Kemp, 1915).

Distribution

Indo-Pacific region- (India) Orissa, Andra Pradesh, Tamil Nadu, Andaman & Nicobar Islands, East coast of India; Sri Lanka; Peninsular Malaysia (Dev-Roy, 2008). Kerala (New Record).

Remarks

Since the collected samples were sexually immature females, spines on the subapical edge of G1 tip were not developed up to sight.

4. DISCUSSION

The genus *Baruna* was established by Stebbing in 1904 when he discovered a new species, *B. socialis*, in Sri Lanka. Initially, Stebbing classified *Baruna* under Grapsidae based on the characteristics of its third maxilliped, and it was perceived to be close to *Varuna* and *Pseudograpsus* (Harminto and Peter, 1991). In 1915, Kemp established the genus *Leipocten* for a new species, *L. sordidulum,* from India. Crabs attributed to *L. sordidulum* have been widely reported across various areas in the Indo-West Pacific region (Manning and Holthuis, 1981). The primary distinguishing feature of the family Camptandriinae Stimpson, (1858) is the strongly recurved male first pleopod. Neither Stebbing nor Kemp provided descriptions of the male first gonopod of *B. socialis* and *L. sordidulum*, respectively. The male first pleopod of *L. sordidulum* was illustrated by (Tweedie, 1937). Manning and Holthuis, (1981) subsequently furnished a key to the genera, including *Leipocten*, which they recognized in the Camptandriinae family. Serene, (1974) found *B. socialis* identical to *L. sordidulum*.

Furthermore, Manning and Holthuis, (1981) suggested that Baruna and Leipocten might be considered as synonymous. However, after a careful examination of the original descriptions, distinctions in carapace shape and male abdominal structure became apparent. *Baruna* was described as having seven distinct free male abdominal segments, whereas Leipocten's second and third male abdominal segments are fused. Consequently, both genera are now confirmed to be synonymous, with Baruna taking precedence, as documented by (Harminto and Peter, 1991). The species' habitat is concealed and cryptic, typically within crevices and decaying mangrove logs, making it easily missed due to its small size. Given that this species has a broader distribution in the northeastern Indian Ocean and along the east coast of India, it is possible that it could also be found along the west coast. Further comprehensive investigations in Indian waters can uncover numerous other species from this understudied group of crabs.

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Authors' contribution

Author SCR, confirmed the identification and prepared the manuscript. Authors, SS collected the specimens. Author SS, HTD, HN assisted in the identification and draft manuscript preparation. Author VPL, coordinated the project and finalized the manuscript.

Specimens' deposition

The specimens used for the study are deposited in the National Zoological Collection of Zoological Survey of India, Western Ghats Regional Centre, Kozhikode 673006, India. (Reg Nos: ZSI/WGRC/IR-INV- 24756).

Ethical approval

The Animal ethical guidelines are followed in the study for species observation & identification.

Conflicts of interests

The authors declare that there are no conflicts of interest.

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The study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

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