

First confirmed record of the sesarmid crab, *Parasesarma bengalense* (Davie, 2003) (Decapoda: Brachyura) in Indian waters

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ABSTRACT

The mangrove crab, *Parasesarma bengalense* (Davie, 2003), was previously reported in an ecological study from the Coringa Wildlife Sanctuary of Andhra Pradesh on the east coast of India. No specimen, however, is readily available to confirm the identity of *P. bengalense* from the Coringa Wildlife Sanctuary. The present study confirms the presence of *P. bengalense* in Indian waters for the first time based on the collections from Kerala and Maharashtra in the west coast of India (Arabian Sea). The distributional range of *P. bengalense* is now extended to the Arabian Sea because the species was previously known only from the Bay of Bengal and the Andaman Sea. India now has 918 species of marine brachyuran crabs and six species of *Parasesarma* De Man, 1895, including the present new record. The west coast of India is home to 465 brachyuran species whereas Kerala and Maharashtra coasts now contain 180 and 131 marine crab species, respectively. *Parasesarma bengalense* can be distinguished among the Indian species of *Parasesarma* except for *P. bidens* (De Haan, 1835) mainly by the presence of a prominent epibranchial tooth with a distinct notch. *Parasesarma bengalense* is distinct from *P. bidens* mainly by its male cheliped, which has a greater number of dactylar tubercles and a lesser number of teeth on the transverse crests of the palm.

KEYWORDS

Crustacea, Sesarmidae, New record, Arabian Sea, India.

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The sesarmid genus, *Parasesarma* De Man, 1895, is currently represented by 68 species (Cannicci et al., 2017; Shahdadi and Schubart, 2017; Li et al., 2018; Shahdadi et al., 2018; 2019; Fratini et al., 2019). *Parasesarma* was certainly known from five species in India (Shahdadi and Schubart, 2017; Trivedi and Vachhrajani, 2017; Trivedi et al., 2018): *P. asperum* (Heller, 1865) [East Coast (Tamil Nadu); Andaman and Nicobar islands], *P. bidens* (De Haan, 1835) [West Coast except for Gujarat; East Coast; Andaman and Nicobar islands], *P. persicum* Naderloo and Schubart, 2010 [West Coast (Gujarat)], *P. pictum* (De Haan, 1835) [West Coast (Kerala); East Coast (Tamil Nadu and West Bengal); Andaman and Nicobar islands], and *P. plicatum* (Latreille, 1803) [West Coast; East Coast; Andaman and Nicobar islands].

We have examined some material from the Zoological Survey of India, Western Regional Centre, Pune, India (ZSI-WRC), which was collected from the mangroves of the west coast of India in the Arabian Sea (Fig. 1). These specimens are assigned herein to *Parasesarma bengalense* (Davie, 2003),

a species that was rarely reported in Indian waters. *Parasesarma bengalense* appeared in India only in an ecological study of Bouillon et al. (2004). Their specimens from the Coringa Wildlife Sanctuary of Andhra Pradesh in the east coast, however, are not readily available for a re-examination. We, therefore, took this opportunity to confirm the presence of *P. bengalense* in Indian waters for the first time based on the present material. Previous reliable records of *P. bengalense* were only from Sri Lanka (Bay of Bengal) and Thailand (Andaman Sea) (Davie, 2003) (Fig. 1). The distributional range of *P. bengalense* is now extended to the Arabian Sea coast of India. All the present and past records of *P. bengalense* indicate that these crabs are very likely to occur widely along both the coasts of the Indian mainland and in the Andaman and Nicobar Islands.

Parasesarma bengalense was originally described under *Perisesarma* De Man, 1895 by Davie (2003). The recent phylogenetic study of Shahdadi and Schubart (2017), however, revealed that *Perisesarma* is restricted to a lone species, i.e., *Perisesarma dusumieri* (H. Milne

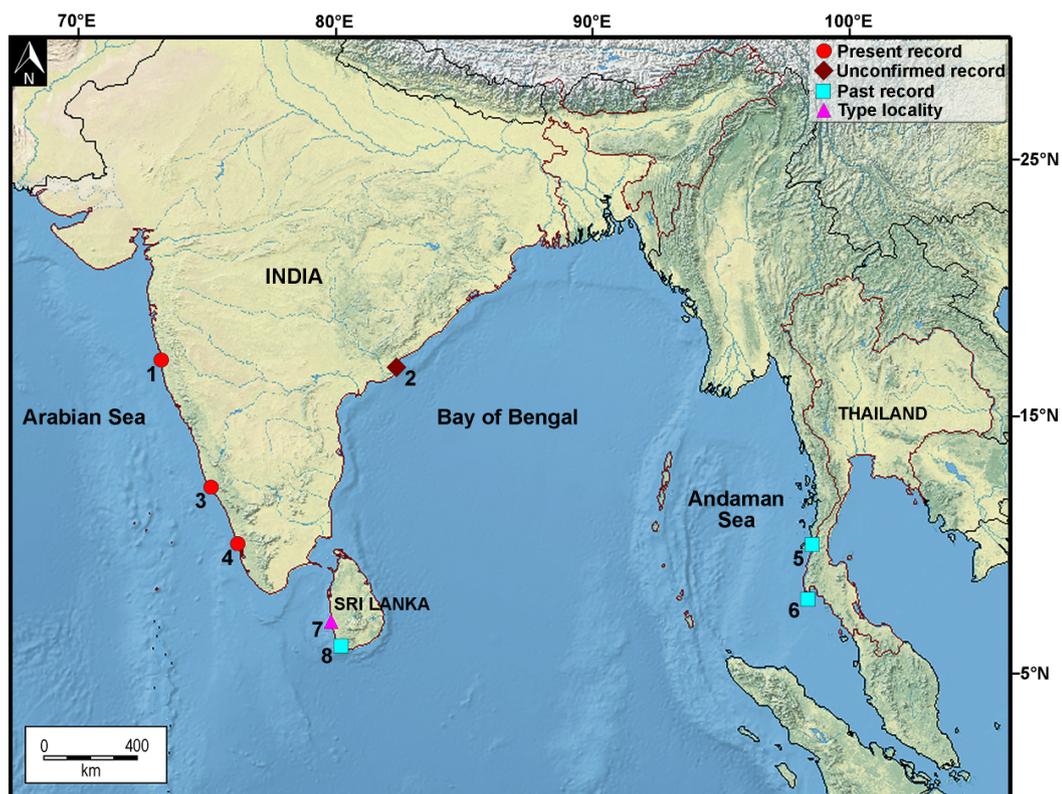


Figure 1. Map showing distribution of *Parasesarma bengalense* (Davie, 2003). 1, Malgund (Maharashtra, India); 2, Coringa (Andhra Pradesh, India); 3, Palayi Kadavu (Kerala, India); 4, Valiyavattom (Kerala, India); 5, Ranong (Thailand); 6, Phuket (Thailand); 7, Colombo (Sri Lanka); 8, Galle (Sri Lanka). Circle, present records; diamond, unconfirmed record; square, past records; triangle, type locality.

Edwards, 1853). They have questioned the usefulness of the epibranchial tooth for generic placement and transferred most of the species of *Perisesarma* to *Parasesarma*, including *Perisesarma bengalense*.

The present confirmed record of *P. bengalense* raises the number of Indian species of *Parasesarma* to six. India is now known to have 918 marine crab species, including 465 species from the west coast (Padate et al., 2018, 2019; Trivedi et al., 2018; Ng et al., 2019; Suvarna Devi et al., 2019). Kerala and Maharashtra coasts now contain 180 and 131 species of marine brachyurans, respectively (Trivedi et al., 2018).

The terminology follows Davie et al. (2015). The diagnosis is after Davie (2003). Measurements (in millimeters) were taken for the maximum carapace width (between external orbital tooth) and mid carapace length. The following abbreviations are used: cw, maximum carapace width; cl, mid carapace length; coll. collected by; G1, male first gonopod.

Superfamily Grapsoidea MacLeay, 1838

Family Sesarmidae Dana, 1851

Genus *Parasesarma* De Man, 1895

Parasesarma bengalense (Davie, 2003)

(Fig. 2)

Perisesarma bengalense Davie, 2003: 388.

Perisesarma bengalensis — Bouillon et al., 2004: 83 (list).

Perisesarma bengalense — Ng et al., 2008: 222 (list); Davie, 2010: 197 (list).

Parasesarma bengalense — Shahdadi and Schubart, 2017: 534 (list and new combination).

Material examined. INDIA: MAHARASHTRA — male (12.20 × 9.94 mm) and female (13.67 × 11.04 mm), Malgund, approximately 2 km north of Ganapatipule, Ratnagiri district (17.164°N, 73.259°E), 9 April 1991, coll. S.V. Mulay (ZSI-WRC C.1286). KERALA — 2 males (16.10 × 12.94 mm; 11.87 × 9.86 mm) and female (12.52 × 10.52 mm), Thejaswini River, near Palayi Kadavu, Kasaragod district (12.261°N, 75.165°E), 21 October 2018, coll. P.S. Sujila and P.S. Lakshmi (ZSI-WRC C.1910); 2 males (17.13 × 13.99 mm; 11.59 × 9.52 mm), Valiyavattom Island,

near Narakkal, Cochin Estuary, Ernakulam district (10.044°N, 76.234°E), 9 March 2019, coll. V. Rani (ZSI-WRC C.1914).

Diagnosis. Carapace subrectangular, slightly broader than long (cw/cl 1.2–1.5); regions well defined; postfrontal region with 4 prominent, rounded lobes; medial lobes slightly broader than lateral lobes; lateral lobes not separated from inner orbital rim; front deflexed downwards, margin sinuous; anterolateral margin with large, acutely triangular external orbital tooth and smaller, acutely triangular epibranchial tooth, separated from each other by distinct notch; lateral margins subparallel, slightly concave, with numerous short setae; cornea slightly extending beyond tip of external orbital tooth (Fig. 2A). Male cheliped with 2 transverse pectinate crests on upper surface of palm; primary pectinate crest with 14–18 tall, broad corneous teeth; secondary pectinate crest shorter than primary pectinate crest, with 13–15 relatively shorter corneous teeth; fingers serrated along cutting margins; fixed finger with strong subdistal tooth along cutting margin; dactylus with strong subdistal tooth and prominent medial tooth along cutting margin, and 16–18 almost symmetrical, distinct tubercles on upper surface; proximal 1–10 dactylar tubercles closely spaced, transversely broadened; distal dactylar tubercles relatively widely spaced, rounded; outer surfaces of palm and proximal portion of dactylus relatively more coarsely granular (Fig. 2B–E). Ambulatory legs moderately long, stout (Fig. 2A). Male pleon moderately broad; sixth pleonal somite approximately 2.1 times broader than long (Fig. 2F). G1 moderately stout, gently curved; apical process corneous, relatively shorter and stouter, bent at angle of about 60° from longitudinal axis (Fig. 2G).

Remarks. *Parasesarma bengalense* mostly resembles *P. darwinense* (Campbell, 1967), an endemic species of northwestern Australia, in terms of morphological characters (see Davie, 2003). *Parasesarma bengalense* is nevertheless distinguished from *P. darwinense* by the characters of the male cheliped, male sixth pleonal somite, and G1 (Davie, 2003; 2010).

On the other hand, the molecular data of Shahdadi and Schubart (2017) showed that *P. bengalense* forms a distinct clade along with *P. bidens*, *P. cricotum* (Rahayu

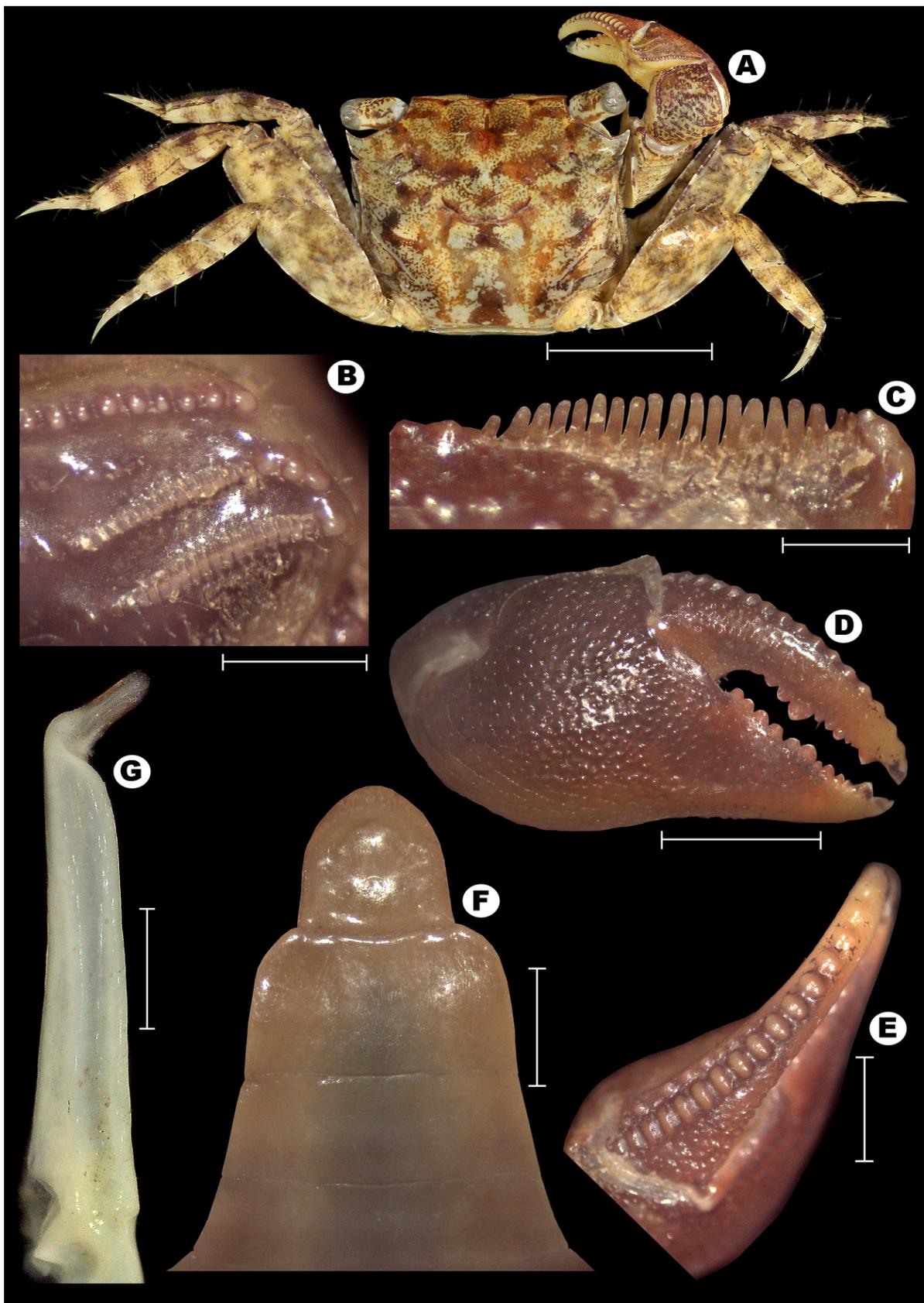


Figure 2. *Parasesarma bengalense* (Davie, 2003), male (16.10 × 12.94 mm) (ZSI-WRC C.1910). **A**, overall dorsal view; **B**, upper view of transverse crests on palm of right chela; **C**, frontal view of primary transverse crest on palm of right chela; **D**, outer view of right cheliped; **E**, dorsal view of dactylar tubercles on right cheliped; **F**, male pleonal somites 4–6 and telson; **G**, left G1 denuded of setae. Scale bars = 10 mm (A), 4 mm (D), 2 mm (E, F), 1 mm (B, G), 0.5 mm (C).

and Davie, 2002), and the more closely related *P. guttatum* (A. Milne-Edwards, 1869). Among these, only *P. bidens* is known to occur in Indian waters with a wider distribution (see Trivedi et al., 2018). The juvenile crabs of *P. bengalense* are likely to be confused with *P. bidens* due to similarities in some carapace morphology. For instance, both the species have a prominent epibranchial tooth (Fig. 2A; see De Haan, 1837: pl. 16, fig. 4), and the male sixth pleonal somite of *P. bengalense* is almost equally broad as that of *P. bidens* (Fig. 2F; see Davie, 2010; De Haan, 1837: pl. 16, fig. 4). The male cheliped of both the species, in particular, has long transverse pectinate crests on the upper surface of the palm and distinct tubercles on the upper surface of the dactylus (Fig. 2A, B, E; see Davie, 2010; De Haan, 1837: pl. 16, fig. 4). The dactylar tubercles on the male cheliped, however, are greater in number (16–18), and transversely broadened proximally and rounded distally in *P. bengalense* (Fig. 2E) whereas these tubercles are lesser in number (12 or 13) and oval in *P. bidens* (cf. Davie, 2010). In addition, both the primary and secondary transverse crests on the palm of the male cheliped are relatively shorter (14–18 and 13–15 teeth, respectively) in *P. bengalense* (Fig. 2B) than in *P. bidens* (19–22 and 15–20 teeth, respectively) (Davie, 2010).

Parasesarma bengalense is easily distinguished from the other Indian species of *Parasesarma* (*P. asperum*, *P. persicum*, *P. pictum*, and *P. plicatum*) mainly by its prominent epibranchial tooth with a distinct notch (Fig. 2A) (*vs.* indistinct epibranchial tooth with an indistinct notch or mostly with a small prominence; see De Haan, 1837: pl. 16, fig. 6; Heller, 1865: pl. 6, fig. 1; Naderloo and Schubart, 2010: fig. 2A; Rahayu and Ng, 2010: fig. 1A; Shahdadi and Schubart, 2017: figs. 1A, C, 2A, C).

Geographical distribution. *Parasesarma bengalense* is currently known from India (Maharashtra, Kerala and possibly Andhra Pradesh states) (present study; Bouillon et al., 2004), Sri Lanka (Southern and Western provinces) (Davie, 2003), and Thailand (Ranong and Phuket provinces) (Davie, 2003; Shahdadi and Schubart, 2017) (Fig. 1).

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