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Short Communication

First record of the symbiotic crab *Harrovia elegans* De Man, 1887 from west coast of India

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Abstract
The present study documents the first record of the crinoid-associated brachyuran crab *Harrovia elegans* De Man, 1887 from dense beds of the feather star *Tropiometra carinata* (Lamarck, 1816) in tide pools within the intertidal zone of the Simbor Coast, Gujarat, India. Previously, *H. elegans* has been reported with different crinoid species from limited localities in Indian waters, including Tamil Nadu and the Andaman and Nicobar Islands, typically at depths ranging from 5 to 200 meters. This report provides detailed morphological descriptions of *H. elegans*, along with information on its habitat preferences and regional distribution.

Keywords: crinoid association; distribution; Gujarat; new record; Pilumnidae; taxonomy

1 | INTRODUCTION

Brachyuran crabs represent one of the most diverse groups of crustaceans, comprising 6,793 species across 1,271 genera and 93 families worldwide, and they occupy a broad spectrum of habitats ranging from marine and freshwater systems to terrestrial environments (Ng *et al*. 2008; De Grave *et al*. 2009). In India, 944 species of brachyuran crabs, belonging to 393 genera and 65 families, have been recorded (Trivedi *et al*. 2018; Valarmathi 2024). Decapod crustaceans (shrimps, crabs, and others) were found in symbiotic associations, both external and internal, with various echinoderms (Kemp 1922; Barnard 1950; Al-Kandari *et al*. 2020; Prakash and Marimuthu 2020). The genus *Harrovia* Adams & White, 1849, belonging to the family Pilumnidae and subfamily Eumedoninae, comprises brachyuran crabs that are obligate symbionts of crinoids (Jones and Sankarankutty 1960). Many species within this genus exhibit high host specificity, often forming associations with various marine benthic invertebrates, particularly crinoids (Castro 1989). At present, genus *Harrovia* comprises seven valid species distributed throughout the Indo-Pacific region (Chia and Ng 1998). In India, the genus is represented by two species, namely *Harrovia albolineata* Adams & White, 1849 and *Harrovia elegans* De Man, 1887 (Dev Roy and Nandi 2012; Jose and Kutty 2020). Members of this genus are obligate symbionts of crinoids, relying on their host for shelter and protection (Chia and Ng 1998). These crabs are distinguished by their minute size and cryptic coloration, which aid in camouflage with the specific host (Castro 1989). Key diagnostic features include two prominent tooth-like anterolateral spines and distinct dark bands across the carapace (Chia and Ng 1998).

The brachyuran crab *H. elegans* has previously been reported in symbiotic association with the crinoid *Comanthus wahlbergii* (Müller, 1843) in the Gulf of Mannar,

Tamil Nadu (Jose and Kutty 2020). In the present study, *H. elegans* is recorded in association with a different crinoid host, *Tropiometra carinata* (Lamarck, 1816), from tide pools in the intertidal zone of Simbor, Gujarat, representing a new host and locality record for this species. To date, 190 species of marine brachyuran crabs, representing 107 genera and 32 families, have been recorded from the coastal waters of Gujarat (Beleem *et al*. 2019; Vadher *et al*. 2025). However, no species belonging to the genus *Harrovia* has been reported from this region until now. The aim of the present study is to report a crinoid-associated crab with its taxonomic note, habitat, and distribution status for the first time from the West coast of India.

2 | METHODOLOGY

2.1 Study area

The Simbor is situated at the mouth of the Sahil River in the Bay of Simbor (20°45′00.0″N 71°09′00.0″E), approximately 25 km east of Diu, India. The region is characterized by its distinct coastal features, including a sandy substrate and rich biotic diversity. The coastal stretch forms an 'L' shape and the intertidal zone is distinctly divided into two main habitats: a sandy beach and rocky outcrops. Although vertical zonation is not clearly defined, much of the intertidal zone remains submerged, becoming exposed only during low tide (Barolia and Kundu 2021). A notable landmark in the area is Fort St. Anthony of Simbor located on Pânikota Island, situated at the mouth of the Sahil River within the bay.

2.2 Sample collection

A single male specimen of *H. elegans* De Man, 1887 (Figure 1) was carefully collected from the feather star habitat in the intertidal zone of Simbor, Gujarat (20°45′00.0″N 71°09′00.0″E). The specimen was transferred to the Department of Zoology, Dr. Subhash University, Junagadh, for further analysis. Upon arrival, the specimen was cleaned, photographed, and examined in detail for its morphological characteristics.

2.3 Identification and morphological characters examined

Taxonomic identification was carried out using standard references (Chia and Ng 1998; Jose and Kutty 2020) and further verified through expert consultation. The specimen was preserved in 70 % ethanol and deposited in the Museum of the Department of Zoology, Dr. Subhash University, Junagadh, under the accession number DZD-SUACBD-01. Morphometric measurements, including maximum carapace width (CW) and maximum carapace length (CL), were recorded in millimetres (mm). The following abbreviations are used throughout the study: CL = Carapace Length, CW = Carapace width, P1 – P5 = First to fifth pereiopods, G1 = First gonopod.

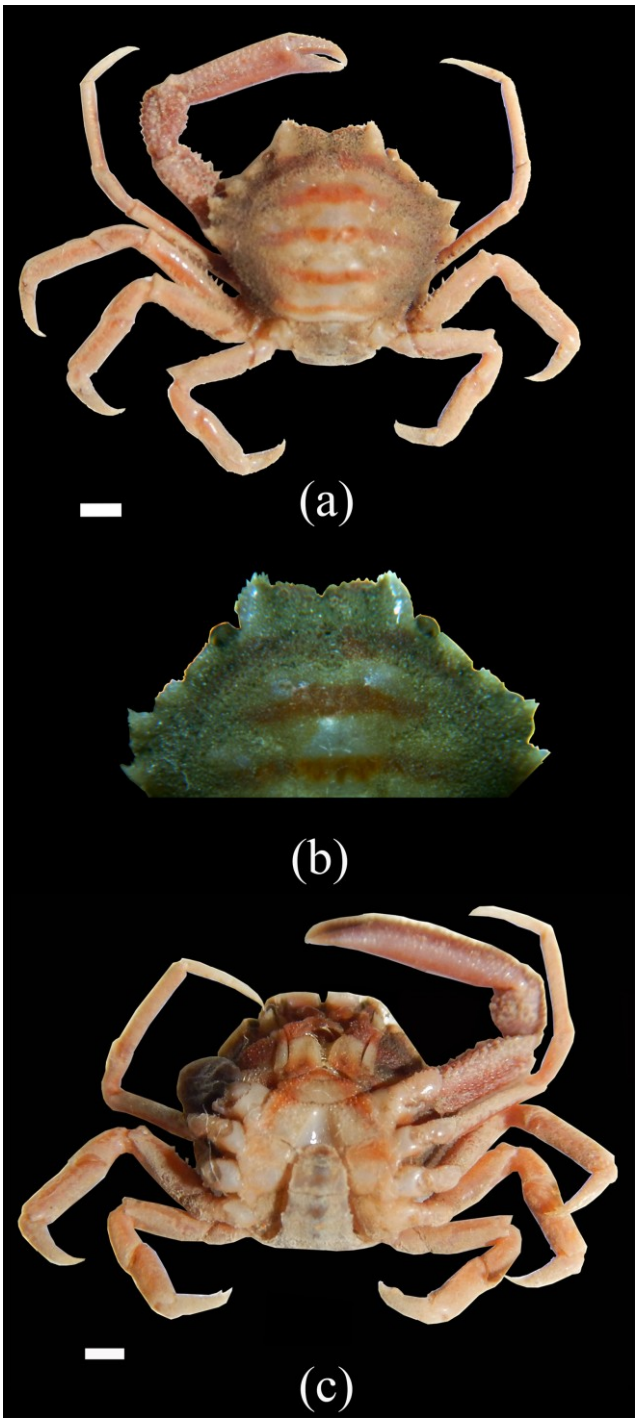

FIGURE 1 *Harrovia elegans* De Man, 1887, male: (a) dorsal view; (b) enlarged dorsal view and (c) ventral view. scale bars: 1 mm.

3 | RESULT AND DISCUSSION

3.1 Systematic accounts

Order: Decapoda Latreille, 1802
Infraorder: Brachyura Latreille, 1802
Family: Pilumnidae Samouelle, 1819
Genus: *Harrovia* Adams & White, 1849
Species: *Harrovia elegans* De Man, 1887

3.2 Material examined

One male (DZDSUACBD-01). CL, 8.90 mm; CW, 9.10 mm, lower intertidal zone (20°45′00.0″N 71°09′00.0″E), Simbor, Gujarat: Coll: Pradip Kachhiya on 1 February 2025.

3.3 Diagnosis

Carapace hexagonal in shape, regions ill defined; carapace surface thickly pubescent. Anterolateral margins separated into four lobes; the first and second generally lobiform, very low, subtruncate, the margins usually straight, separated by wide cleft, not fused; lobe two elongate and appears dentiform; third and four lobes noticeably dentiform, directed obliquely outwards. Frontal margin with small median fissure, slightly deflexed, appearing straight from dorsal view, shallow median cleft. Infraorbital and subhepatic teeth not as strong. Merus of third maxilliped tuberculated. Surfaces of sternum tuberculated. Chelipeds cylindrical, dorsal and ventral surfaces highly tuberculated, carpus unarmed on distal inner margin, entirely tuberculated, merus longer than broad, spiny tuberculated entirely. Ambulatory legs (P2 – P5) short and stout, second pereiopod (P2) longer and P3, P4 and P5 decreasing gradually in length, anterior margin of the ambulatory of each meri lined with strong spinules; carpi each unarmed; propodi each with one spine at postero-distal end; dactyli each spine tipped. G1 bends distally approximately 45°.

3.4 Colouration

The entire body of crab is a light reddish-brown coloration with a pale, glossy carapace. The carapace is marked by three distinct, dark reddish transverse bands. The chelipeds (claws) are similarly light reddish in colour. The walking legs (P2–P5) exhibit a uniform reddish hue, slightly lighter than the chelipeds.

3.5 Habitat

Previously, *H. elegans* has been reported in association with the feather star *C. wahlbergii* in the subtidal zones at depths ranging from 5 to 200 meters in regions such as Tamil Nadu and the Andaman and Nicobar Islands (Dev Roy and Nandi 2012; Jose and Kutty 2020). In the present study, *H. elegans* was collected from a tide pool within a dense aggregation of feather stars (*T. carinata*) located in the intertidal zone of Simbor, Gujarat.

3.6 Distribution in India

Gujarat (Present study); Tamil Nadu (Jose and Kutty 2020); Andaman and Nicobar Islands (Dev Roy and Nandi 2012).

3.7 Distribution in world

Indonesia (De Man 1902; Chia and Ng 1998); Marshall Islands (Garth 1964; Castro 1989); Myanmar (De Man 1887); Pakistan (Tirmizi and Kazmi 1982; Tirmizi and Kazmi 1988); Philippines (Serène and Vadon 1981; Chia and Ng 1998); Somalia (Castro 1989; Chia and Ng 1998); South China Sea (Chia and Ng 1998); Sri Lanka (Chia and Ng 1998); Thailand (Castro 1989; Chia and Ng 1998); Vietnam (Serène *et al*. 1958).

3.8 Remarks

Taxonomic characters of the present specimen examined agree well with the detailed description given by Chia and Ng (1998). *H. elegans* and *H. albolineata* show some similarities and are usually misidentified. However, *H. elegans* is recognised by the presence of two prominent teeth-like anterolateral spines in its carapace and the occurrence of dark bands on the white background of the carapace (Castro 1989; Serène *et al*. 1958). *H. elegans* has been shown to occur from the Indian Ocean to Indonesia and parts of the western Pacific (Chia and Ng 1998). *H. elegans* is closely related to *H. japonica* Balss, 1921, with the primary distinction lying in the morphology of their anterolateral teeth. While both species are undoubtedly similar, consistent differences are evident in the structure of their anterolateral lobes. In *H. japonica*, the margins of the first and second anterolateral lobes are distinctly concave, with their edges being strongly spiniform and appearing fused due to their opposing orientation. Additionally, the third and fourth lobes are sharply spiniform, acutely pointed, and curve forward prominently, traits that are observable even in smaller specimens. In contrast, *H. elegans* exhibits first and second anterolateral teeth with straight or subtruncate margins, lacking spiniform edges, and separated by a noticeable gap. Its third and fourth teeth are weaklier developed, less acute, and oriented obliquely outward. Further distinguishing features include the more robust infraorbital and subhepatic teeth and pronounced spinules on the anterior margins of the ambulatory meri in *H. japonica*. Meanwhile, *H. elegans* shows a more tuberculate texture on the third maxillipeds and thoracic sternum. Size also differentiates the two, with adult *H. japonica* typically exceeding 10 mm in carapace width, whereas *H. elegans* generally remains below this size (Chia and Ng 1998).

4 | CONCLUSIONS

The present study reports the first record of the crinoid-associated brachyuran crab *H. elegans* De Man, 1887 from the Simbor coast, Gujarat, located on the west coast of India. This finding represents a significant extension of the known distribution range of *H. elegans*, previously documented only from select localities along the eastern Indian coastline, including Tamil Nadu and the Andaman and Nicobar Islands. The specimen was observed in symbiotic association with the feather star *T. carinata* in the lower intertidal tide pools, a novel host and habitat record for this species in the region. The discovery not only contributes to the biodiversity inventory of Gujarat,

where no species of *Harrovia* had been reported previously, but also provides valuable insight into the ecological associations and biogeography of this rare and cryptic crab species. Further surveys and ecological studies are encouraged to better understand the distribution, host specificity, and conservation status of *H. elegans* in Indian waters.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

AUTHORS' CONTRIBUTION

PV and IB Conceptualization; PK and IB Methodology; PK and IB Data Collection; PV and IB Data Analysis; PK, PV and IB Writing Original Draft; PV and IB Writing Review and Editing; IB Supervision.

DATA AVAILABILITY STATEMENT

The specimen recorded in this study has been deposited in the Department of Zoology, Dr. Subhash University, Junagadh, Gujarat, India [Accession number DLSUACDB-01] which can be freely accessible.

REFERENCES

Al-Kandari M, Anker A, Hussain S, Al-Yassen S, Sattari Z, De Grave S (2020) New records of decapod crustaceans from Kuwait (Malacostraca: Decapoda). Zootaxa 4803(2): 251–280.

Barnard KH (1950) Descriptive catalogue of South African decapod Crustacea. Annals of the South African Museum 38: 1–837.

Barolia H, Kundu R (2021) Intertidal aggregation of feather stars (Echinodermata: Crinoidea) on the South Saurashtra coastline of Gujarat state, India. International Journal of Ecology and Environmental Sciences 47(4): 339–344.

Beleem I, Poriya P, Gohil B (2019) An annotated checklist of marine brachyuran crabs of Gujarat waters, India. Iranian Journal of Animal Biosystematics 15(1): 9–46.

Castro P (1989) Range extensions and new host records of eumedonid crabs of the genus *Harrovia* Adams & White, 1848 (Decapoda, Brachyura, Eumedonidae). Crustaceana 57(1): 97–100.

Chia DGB, Ng PKL (1998) A revision of *Ceratocarcinus* White, 1847, and *Harrovia* Adams & White, 1849 (Crustacea: Decapoda: Brachyura: Eumedonidae), two genera of crabs symbiotic with crinoids. Raffles Bulletin of Zoology 46(2): 493–563.

De Grave S, Pentcheff ND, Ahyong ST, Chan T-Y, Crandall KA, … Wetzer R (2009) A classification of recent and fossil genera of decapod crustaceans. Raffles Bulletin of Zoology, Supplement 21: 1–109.

De Man JG (1887) Report on the podophthalmous crustacea of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson F.R.S., Superintendent of the Museum. Journal of the Linnean Society, London (Zoology) 22 (136): 1–128.

De Man JG (1902) Die von Herrn Professor Kükenthal im Indischen Archipel gesammelten Dekapoden und Stomatopoden. In: Kükenthal W (ed) Ergebnisse einer zoologishen Forschungreise in den Molukken und Borneo. Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft.

Dev Roy MK, Nandi NC (2012) Brachyuran crabs (Crustacea). Fauna of Andaman and Nicobar Islands, State Fauna Series 19(1): 185–236.

Garth JS (1964) The Crustacea Decapoda (Brachyura and Anomura) of Eniwetok Atoll, Marshall Islands, with special reference to the obligate commensals of branching corals. Micronesica 1(1-2): 137–144.

Jones S, Sankarankutty C (1960) Notes on animal associations. 3. A parthenopid crab, *Harrovia albolineata* adams & white on a mariametrid crinoid, *Lamprometra sp*. Marine Biological Association of India 2 (2): 194–195.

Jose S, Kutty R (2020) A new record of symbiotic crab (*Harrovia elegans* de Man, 1887) from the Gulf of Mannar, India. Thalassas 36: 585–588.

Kemp S (1922) Notes on Crustacea Decapoda in the Indian Museum, XV. Pontoniinae. Records of the Indian Museum 24(2): 113–288.

Ng PKL, Guinot D, Davie PJF (2008) Systema Brachyurorum: Part I. An annotated checklist of extant Brachyuran crabs of the World. Raffles Bulletin of Zoology 17: 1–286.

Prakash S, Marimuthu N (2020) Notes on some crinoid associated decapod crustaceans (Crustacea: Decapoda) of Lakshadweep Archipelago, Central Indian Ocean. Zootaxa 4766(1): 86–100.

Serène R, Duc TV, Luom NV (1958) Eumedoninae du Vietnam (Crustacea) (avec une bibliographie de la Sous-famille). Treubia 24(2): 135–242.

Serène R, Vadon C (1981) Crustaces Decapodes: Brachyoures. Liste preliminaire, descriptions de formes nouvelles et remarques taxonomiques, Resultats des Campagnes MUSORSTOM, I - Philippines (18–28 mars 1976), Tome 1. Collection Memoires ORSTOM 91: 117–140.

Tirmizi NM, Kazmi QB (1982) Range extension of *Harrovia*

elegans De Man, 1887, with a note on the male of *Dentoxanthus iranicus* Stephensen, 1945, from the northern Arabian sea (Decapoda, Brachyura, Eumedoninae). Crustaceana 43(3): 308–313.

Tirmizi NM, Kazmi QB (1988) Marine fauna of Pakistan: 4. Crustacea: Brachyura (Dromiacea, Archaeobrachyura, Oxystomata, Oxyrhyncha). BCCI Foundation Chair, Institute of Marine Sciences, University of Karachi, Karachi.

Trivedi JN, Trivedi DJ, Vachhrajani KD, Ng PKL (2018) An annotated checklist of the marine brachyuran crabs (Crustacea: Decapoda: Brachyura) of India. Zootaxa 4502(1): 001–083.

Vadher P, Kardani H, Radosta O, Dabhi R, Beleem I. (2025) Marine brachyuran crabs of Gujarat waters, India: An updated checklist with fifteen new records. Thalassas: An International Journal of Marine Sciences 41, 181.

Valarmathi K (2024) Fauna of India checklist: Arthropoda: Crustacea: Decapoda: Brachyura (Marine Crabs). Zoological Survey India 72: 1–39.

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