

VOL.68 NO.01 JANUARY-JUNE 2026 • PRINT ISSN 0025-3146 • ONLINE ISSN 2321-7898

# JMBAI

**JOURNAL OF THE MARINE  
BIOLOGICAL ASSOCIATION OF INDIA**



**MBAI**  
Marine Biological Association of India





# First record of the mole crab, *Emerita emeritus* (Linnaeus, 1767), from the Gujarat coast, India

Piyush Vadher<sup>1</sup>, Hitesh Kardani<sup>1\*</sup>, Imtiyaz Beleem<sup>2,3</sup>, Rajkumar Dabhi<sup>1</sup>, Ajay Ram<sup>1</sup>, Pinak Bamaniya<sup>1</sup> and Sunil Shekh<sup>1</sup>

<sup>1</sup>Fisheries Research Station, Kamdhenu University, Sikka -361140, Gujarat, India.

<sup>2</sup>Estonian Marine Institute, University of Tartu, Mäealuse 14, Tallinn-12618, Estonia.

<sup>3</sup>Office of Chief Conservator of Forest, Marine National Park, Jamnagar - 361001, Gujarat, India.

\*Correspondence e-mail: [hiteshkardani@gmail.com](mailto:hiteshkardani@gmail.com)

ORCID: <https://orcid.org/0000-0002-8112-5061>

Received: 24 October 2025 Revised: 18 February 2026

Accepted: 25 February 2026 Published: 26 May 2026

## Short Communication

### Abstract

*Emerita emeritus* (Linnaeus, 1767) collected from Navi Bandar in Gujarat represents the first record of this species, genus, and family from the coastal waters of Gujarat. Five males and nine females were found buried in the sandy substrate of the beach. Two species of *Emerita* within the family of Hippidae have been reported from various coastal regions of India. This report provides a detailed morphological description of *E. emeritus*, along with notes on its habitat and distribution.

**Keywords:** Hippidae, mole crab, new record, taxonomy, Gujarat

### Introduction

The family Hippidae Latreille, 1825, commonly known as mole crabs, consists of a small group of sand-burrowing crustaceans typically found in subtidal zones across the globe. Much like nature's beach miners, these crabs tunnel through sand in search of food and protection. The family currently includes three genera and 30 species globally. These organisms are predominantly distributed along sandy beaches in temperate, tropical, and subtropical regions (Osawa *et al.*, 2010; Mantelatto *et al.*, 2023; WoRMS, 2025). Six species belonging to three genera within the family Hippidae have been reported from various coastal regions of India (Patel *et al.*, 2022). The genus *Emerita* Scopoli, 1777 is distinguished from the other two genera within the family by the antennal flagellum, which is at least as long as the carapace and densely covered ventrally with long plumose setae. Additionally, the dactylus of the first pereopod is lamellate and broad (Osawa

*et al.*, 2010). The genus comprises approximately 13 species distributed globally, typically inhabiting intertidal and upper subtidal sandy marine environments. Of these, two species of *Emerita*, namely, *Emerita emeritus* (Linnaeus, 1767) and *Emerita holthuisi* (Sankolli, 1965), have been reported from Indian waters (Pillai and Thirumilu, 2005; Sharma *et al.*, 2016; Patel *et al.*, 2022; Mantelatto *et al.*, 2023; WoRMS, 2025). *Emerita emeritus* typically inhabits sandy beaches, with a preference for areas dominated by coarse sand fractions (Mahapatro *et al.*, 2018; Rahmatuloh *et al.*, 2020). This species is distributed across various regions of the Indo-Pacific Ocean, including India, Indonesia, Malaysia, Sri Lanka, Thailand, and Vietnam (Efford, 1976). A review of the literature on Anomuran crabs of India reveals that the family Hippidae has not previously been reported from the waters of Gujarat (Patel *et al.*, 2022). Therefore, this study reports a new record of the family Hippidae, genus *Emerita*, and species *Emerita emeritus* from Gujarat coastal waters.

### Material and methods

The Navi Bandar is a small coastal village situated at the mouth of the Bhadar River, approximately 35 km east of Porbandar, India. The river features a wide estuarine region that historically served as a safe harbour; however, the regular formation of sand bars at its mouth now restricts navigation to small fishing boats only. The coastline of Navi Bandar is characterised by sandy and rocky substrates. A total of fourteen specimens of *E. emeritus*, comprising nine females (including two ovigerous individuals) and five males, were collected from the sandy intertidal zone at Navi Bandar (21° 26' 59.8" N; 69° 47' 03.0" E), Gujarat, India (Fig. 1). Specimens were found buried in the sandy upper intertidal zone along the

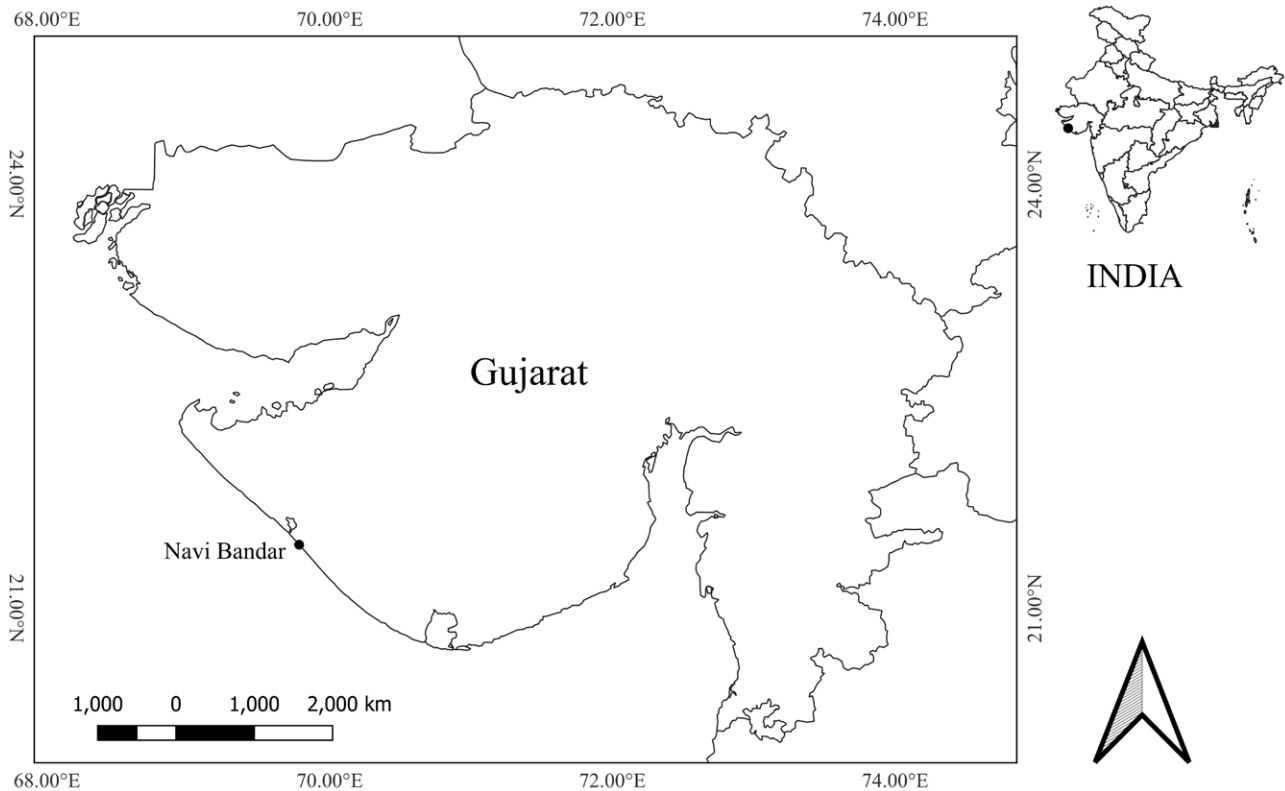


Fig. 1. Map of the study area

Navi Bandar, Gujarat. The collected specimens were transferred to the laboratory of the Fisheries Research Station, Kamdhenu University, Sikka. The specimens were cleaned, photographed, and subjected to a detailed examination of their morphological characters. Taxonomic identification was performed using standard references (Sankolli, 1965; Mahapatro *et al.*, 2018; Farajallah *et al.*, 2025). Specimens were preserved in 70 % ethanol and deposited under accession number FRSACDA-07 in the Museum of the Fisheries Research Station, Kamdhenu University, Sikka. The size of the specimens is given as carapace length (CL), measured from the tip of the rostrum (frontal lobe) to the posterior edge of the carapace (excluding the abdomen/telson), and total length (TL), measured from the tip of the rostrum (frontal lobe) to the distal end of the telson (Fig. 2B). The body weight of each crab was recorded using a weighing balance and expressed in grams.

## Results and discussion

### Systematics

Order : Decapoda Latreille, 1802  
 Infraorder : Anomura MacLeay, 1838  
 Superfamily : Hippoidea Latreille, 1825  
 Family : Hippidae Latreille, 1825  
 Genus : *Emerita* Scopoli, 1777  
*Emerita emeritus* (Linnaeus, 1767) (Fig. 2)

### Materials examined

14 specimens, FRSACDA-07, five males (1) cl = 12 mm, tl = 14 mm, weight = 0.53 gm, (2) cl = 12 mm, tl = 14 mm, weight = 0.66 gm, (3) cl = 12 mm, tl = 14 mm, weight = 0.50 gm, (4) cl = 13 mm, tl = 15 mm, weight = 0.78 gm, (5) cl = 13 mm, tl = 15 mm, weight = 0.89 gm, seven females (1) cl = 13 mm, tl = 15 mm, weight = 0.72 gm, (2) cl = 13 mm, tl = 15 mm, weight = 0.90 gm, (3) cl = 13 mm, tl = 15 mm, weight = 0.96 gm, (4) cl = 14 mm, tl = 16 mm, weight = 1.03 gm, (5) cl = 14 mm, tl = 16 mm, weight = 0.99 gm, (6) cl = 14 mm, tl = 16 mm, weight = 0.98 gm, (7) cl = 14 mm, tl = 16 mm, weight = 1.05 gm, two ovigerous females (1) cl = 14 mm, tl = 16 mm, weight = 1.12 gm, (2) cl = 14 mm, tl = 16 mm, weight = 1.02 gm, (21°26'59.8"N 69°47'03.0"E) of Navi Bandar, Gujarat, coll. by Hitesh Kardani and Piyush Vadher, 03 May, 2025.

### Diagnosis

Body almost cylindrical. Carapace frontal margin tridentate; 3 lobes slender, elongate with distinct horny tips (Fig. 2A). Median lobe triangular, acute, distinctly separated from lateral lobes, gap exceeds basal width of median lobe. Anterolateral margin smooth. Dorsal transverse rugae are crowded, rarely interrupted. Postfrontal and postgastric furrows are well defined. Hepatic region strongly grooved. Posterolateral margin rounded. Ocular peduncles are slender, elongated, and extend well beyond the

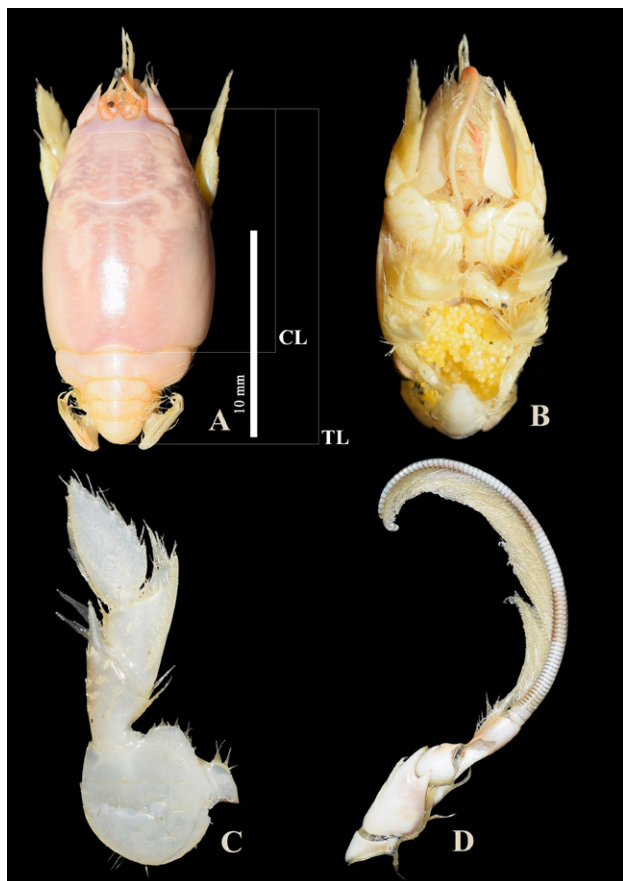


Fig. 2. *Emerita emeritus* (Linnaeus, 1767) (A) Dorsal view; (B) Ventral view; (C) First pereiopod; (D) Antennules flagellum. Scale bars: 10 mm

spines of antennal segment II. Antennules densely hairy (Fig. 2D); flagellum with 25-85 articles. Antenna of segment II bears 3 distal spines with horny tips; the median spine is longest. Two distinct oblique ridges with fine movable spinules are present, aligned with the ventral tooth. First ridge arises mid-segment, follows ventral spine; second ridge lies just below. The dorsal side between the median and dorsal teeth has several short oblique rugae. Merus of the third maxilliped rectangular; 1.5 times longer than wide. Outer anterolateral angle produced, tooth-like, often with a horny tip (may be broken); antero-internal lobe low, triangular, but prominent. Dactylus of first pereiopod broadly ovate (Fig. 2C), length 1.8-2.0 greatest width; terminates in single spine. Distal third of lower margin bears 4-5 horny, movable spines. Upper margin near tip with 1-3 spines (usually 2), often short with shallow bases, inner margin typically with 4 spines in distal one-third of lower margin. Entire animal pink in color; appendages pale yellowish; eyes reddish; overall semi-translucent with visible internal segmentation, egg mass bright yellow.

### Distribution

Asian sea (Milne Edwards, 1837); Indian Ocean (Linnaeus, 1767); Indonesia (Efford, 1976; Rahmatuloh *et al.*, 2020;

Farajallah *et al.*, 2025); Malaysia (Efford, 1976); Sri Lanka (Efford, 1976); Thailand (Efford, 1976); Vietnam (Efford, 1976).

India: Gujarat (Present study); Goa (Efford, 1976); Karnataka (Patil, 1951); Kerala (Efford, 1976); Lakshadweep Islands (Nagabhushanam and Rao, 1972); Tamil Nadu (Sankolli, 1965; Efford, 1976); Andhra Pradesh (Efford, 1976); Odisha (Efford, 1976; Mahapatro *et al.*, 2018).

### Remarks

The detailed morphological characteristics of the present specimen are in strong agreement with the descriptions (Sankolli, 1965; Mahapatro *et al.*, 2018; Farajallah *et al.*, 2025). *Emerita emeritus* similar to *E. holthuisi* Sankolli, 1965, but differs in having a broadly ovate dactylus of the first pereiopod with spines on both margins, while *E. holthuisi* has a more slender dactylus bearing spines only on the lower margin. The frontal lobes of *E. emeritus* are long and slender, whereas in *E. holthuisi*, they are shorter and broader. Additionally, *E. emeritus* exhibits more densely crowded dorsal rugae, while those in *E. holthuisi* are more spaced and interrupted. The outer anterolateral angle of the third maxilliped is tooth-like and produced in *E. emeritus*, but is rectangular and not produced in *E. holthuisi* (Sankolli, 1965).

*Emerita emeritus* resembles *E. pangandaran* Farajallah, Hanim, Putri and Wardiatno, 2025 but differs from *E. pangandaran* in several key characters. While both species share general features such as a flattened, ovate dactylus with a terminal spine and acutely pointed frontal lobes, *E. emeritus* typically has a smooth anterolateral carapace margin and distinct spines on the outer margin of the dactylus, which are absent in *E. pangandaran*. The outer angle of the third maxilliped merus is tooth-like and produced in *E. emeritus*, but rectangular and unproduced in the *E. pangandaran*. Additionally, *E. emeritus* exhibits a different configuration in the armature of the anterior carapace margin, which contrasts with the more reduced or altered pattern observed in *E. pangandaran* (Farajallah *et al.*, 2025).

### Conclusion

The present study reports the first occurrence of *Emerita emeritus* (Linnaeus, 1767) from Gujarat, extends the known distribution range of *E. emeritus* to the northwestern coast of India, and highlights the underexplored diversity of intertidal crustaceans in Gujarat waters. Detailed morphological analysis confirms the identity of the species and distinguishes it from closely related taxa, such as *E. holthuisi* and *E. pangandaran*. This baseline record underscores the need for continued taxonomic and ecological surveys along India's western coastline to better understand and conserve its marine biodiversity.

## Acknowledgements

The authors are thankful to Kamdhenu University, Gandhinagar, for providing the necessary facilities and encouragement. The authors want to thank Marine National Park & Sanctuary officials for supporting and encouragement. Authors are also grateful to Dr Christopher B Boyko (Division of Invertebrate Zoology, American Museum of Natural History, New York) for valuable suggestions in the identification of mole crab species.

## Author contributions

Conceptualisation: PV, HK, IB; Methodology: PV, HK, IB; Data Collection: PV, HK; Data Analysis: PV, HK, IB, RD, AR, PB, SS; Writing Original Draft: PV, HK, RD, AR, PB, SS; Writing Review and Editing: HK, IB; Supervision: HK.

## Data availability

The data are available and can be requested from the corresponding author.

## Conflicts of interest

The authors declare that they have no conflict of financial or non-financial interests that could have influenced the outcome or interpretation of the results.

## Ethical statement

No ethical approval is required as the study does not include activities that require ethical approval or involve protected organisms/ human subjects/ collection of samples/ protected environments.

## Funding

No funds, grants, or other financial support were received for this study.

## Publisher's note

The views and claims presented in this article are solely those of the authors and do not necessarily reflect the positions of the publisher, editors, or

reviewers. The publisher does not endorse or guarantee any claims made by the authors or those citing this article.

## References

- Efford, I. E. 1976. Distribution of the sand crabs in the genus *Emerita* (Decapoda, Hippidae). *Crustaceana*, 30 (2): 169-183.
- Farajallah, A., N. Hanim, V. W. Putri and Y. Wardiatno. 2025. Two mole crab species of *Emerita* Scopoli, 1777 (Decapoda: Anomura: Hippidae) from Java Island, Indonesia, with description of a new species. *Zootaxa*, 5631 (3): 509-520.
- Linnaeus, C. 1767. *Systema naturae*. Vol. 1, Part 2. 12<sup>th</sup> Edition Revision. Laurentii Salvii, Holmiae, 1327 pp.
- Mahapatro, D., S. K. Karna, S. K. Mohanty, B. Mohanty, P. R. Muduli, A. K. Pattnaik and S. Nanda. 2018. First record of a burrowing mole crab *Emerita emeritus* (Decapoda: Anomura: Hippidae) from Chilika Lake, East coast of India. *Indian J. Geo-Mar. Sci.*, 47 (1): 109-113.
- Mantelatto, F. L., J. M. Paixão, R. Robles, J. N. Teles and F. C. Balbino. 2023. Evidence using morphology, molecules, and biogeography clarifies the taxonomic status of mole crabs of the genus *Emerita* Scopoli, 1777 (Anomura, Hippidae) and reveals a new species from the western Atlantic. *ZooKeys*, 1161: 169-202.
- Milne Edwards, H. 1837. *Histoire Naturelle des Crustacés, Comprenant l'Anatomie, la Physiologie et la Classification de ces Animaux*. Vol. 2. Encyclopédique Roret, Paris, 532 pp.
- Nagabhushanam, A. K. and G. C. Rao. 1972. An ecological survey of the marine fauna of Minicoy Atoll (Laccadive Archipelago, Arabian Sea). *Mitt. Zool. Mus. Berlin*, 48 (2): 265-324.
- Osawa, M., C. B. Boyko and T.-Y. Chan. 2010. Hippoidea (Mole crabs) Part I. In: T.-Y. Chan (Eds.) *Crustacean Fauna of Taiwan: Crab-Like Anomurans (Hippoidea, Lithodoidea, and Porcellanidae)*, National Taiwan Ocean University, Keelung, p. 1-41.
- Patel, K., V. Padate, M. Osawa, S. Tiwari, K. Vachhrajani and J. Trivedi. 2022. An annotated checklist of anomuran species (Crustacea: Decapoda) of India. *Zootaxa*, 5157 (1): 1-100.
- Patil, A. M. 1951. Study of the marine fauna of the Karwar coast and neighbouring islands. Part I. Protozoa to Arthropoda. *J. Bombay Nat. Hist. Soc.*, 50 (1): 128-139.
- Pillai, S. L. and P. Thirumilu. 2005. Exploitation of sand crabs (*Emerita asiatica* and *Alubunea symnista*) as a source of income during the post-tsunami period along the Chennai coast, Tamil Nadu. *Mar. Fish. Infor. Serv., T&E Ser.*, 186: 5-7.
- Rahmatuloh, I. H. S., A. Hartoko and B. Sulardiono. 2020. Biological aspect of *Emerita emeritus* (Linnaeus 1767) at the beach of Glagah, Parangtritis, and Parangkusumo. *J. Coast. Mar. Resour. Manage.*, 4 (1): 42-51.
- Sankolli, K. N. 1965. On a new species of *Emerita* (Decapoda, Anomura) from India, with a note on *Emerita emeritus* (L.). *Crustaceana*, 8 (1): 48-54.
- Sharma, S. D., L. Nayak, S. Samantaray and M. P. Pati. 2016. Temporal variation of mole crab species *Emerita asiatica* in relation to water quality along Gopalpur coast, east coast of India. *J. Env. Sci. Pollut. Res.*, 2 (4): 117-120.
- WoRMS. 2025. Hippidae Latreille, 1825. World Register of Marine Species Web. <https://www.marinespecies.org/aphia.php?p=taxdetails&id=158390> Accessed 19 May 2025.