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# Journal of Threatened Taxa

10.11609/jott.2026.18.3.28455-28606  
[www.threatenedtaxa.org](http://www.threatenedtaxa.org)

26 March 2026 (Online & Print)  
18(3): 28455-28606  
ISSN 0974-7907 (Online)  
ISSN 0974-7893 (Print)



Open Access





ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher  
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www.wild.zooreach.org

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Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatti, Coimbatore, Tamil Nadu 641035, India  
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India  
Ph: +91 9385339863 | [www.threatenedtaxa.org](http://www.threatenedtaxa.org)  
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Cover: Digital illustration of Smooth-coated Otter *Lutrogale perspicillata* by Dupati Poojitha. Reference from the picture taken by Rana & Sugandhi.



## New distribution records of five species of freshwater palaemonid prawns (Crustacea: Decapoda) in Nagaland, India

K. Valarmathi 

Crustacea Division, FPS Building, Zoological Survey of India, 27, JL Nehru Road, Kolkata, West Bengal 700016, India.  
valarkamacro@gmail.com

**Abstract:** Freshwater palaemonid prawns of Nagaland is studied based on the collections made during different surveys from 1998 to 2022 by various survey teams of Zoological Survey of India, Kolkata. Though 20 species of palaemonid prawns are reported from northeastern states of India, there are no previous reports from Nagaland. During the present study five species of palaemonid prawns—*Macrobrachium cacharensense* (Tiwari, 1952), *M. dayanum* (Henderson, 1893), *M. kempfi* (Tiwari, 1949), *M. lamarrei lamarrei* (H. Milne Edwards, 1837), and *M. platyrostris* (Tiwari, 1952)—are reported and forms first report from this underexplored state of India.

**Keywords:** Caridae, Crustacea, *Macrobrachium*, northeastern India, Palaemonidae.

Freshwater prawns are popular crustaceans belonging to the order Decapoda, family Palaemonidae. They play an important role in the ecosystem for nutrient recycling. Being a source of good protein for human consumption they have a great economic value. The family Palaemonidae is represented by 160 genera and the genus *Macrobrachium* with 291 species (DecaNet eds. 2025) with 58 species in India (Valarmathi 2025).

Nagaland is a mountainous state rich in biodiversity lying between the parallels 95–94° E and 25.2–27.0° N. Though in other northeastern states 20 species of palaemonid prawns have been reported (Valarmathi & Mitra 2021), Nagaland remains unexplored.

The present report is the outcome of the analysis of prawns collected during the surveys from 1998 to 2022 by

various teams of Zoological Survey of India.

### MATERIAL AND METHODS

Freshwater prawns were collected by using D-shaped scoop nets and local fishermen nets from hill streams, river banks, and small water drainages of Dimapur, Kiphire, Longleng and Peren districts of Nagaland. The collected prawns were anaesthetised by keeping them in an airtight container with a cotton ball immersed in clove oil, fixed in formaldehyde and preserved in 70% alcohol. Specimens were studied by using Leica, EZ4 microscope, Leica, Mc120D and Nikon DSLR camera were used for taking images. The species were identified using relevant literature (Jayachandran 2001; Henderson 1893; Tiwari 1949, 1952). The identified specimens were deposited with registration number in the National Zoological Collection of Crustacea Division, Zoological Survey of India (ZSI), Kolkata.

### RESULT

The present study reveals the occurrence of five species of *Macrobrachium* in Nagaland namely *Macrobrachium cacharensense* (Tiwari, 1952), *M. dayanum* (Henderson, 1893), *M. kempfi* (Tiwari, 1949), *M. lamarrei lamarrei* (H. Milne Edwards, 1837), and *M. platyrostris* (Tiwari, 1952), previously not recorded from the state.

**Editor:** V. Deepak Samuel, National Maritime Foundation, New Delhi, India.

**Date of publication:** 26 March 2026 (online & print)

**Citation:** Valarmathi K. (2026). New distribution records of five species of freshwater palaemonid prawns (Crustacea: Decapoda) in Nagaland, India. *Journal of Threatened Taxa* 18(3): 28590–28593. <https://doi.org/10.11609/jott.10355.18.3.28590-28593>

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**Funding:** Zoological Survey of India.

**Competing interests:** The author declares no competing interests.

**Acknowledgements:** The author thankfully acknowledges Dr. Dhriti Banerjee, director, Zoological Survey of India, Kolkata, for her continuous support and research facilities. The author expresses her sincere thanks to the scientists and party members who have undertaken the surveys, collected and shared the freshwater prawns for this study.



## Systematics

Subphylum Crustacea Brönnich, 1772  
 Class Malacostraca Latreille, 1802  
 Subclass Eumalacostraca Grobben, 1892  
 Superorder Eucarida Calman, 1904  
 Order Decapoda Latreille, 1802  
 Suborder Pleocyemata Burkenroad, 1963  
 Infraorder Caridea Dana, 1852  
 Superfamily Palaemonoidea Rafinesque, 1815  
 Family Palaemonidae Rafinesque, 1815  
 Genus *Macrobrachium* Spence Bate, 1868

### 1. *Macrobrachium cacharensis* (Tiwari, 1952)

(Image 1D)

1952. *Palaemon hendersoni cacharensis* Tiwari, *Ann. Mag. Nat. Hist.*, V (ser.12): 32

2001. *Macrobrachium hendersoni cacharensis* Jayachandran, *Prawns Biodiversity, Taxonomy, Biology and Management*. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta. 107.

Material examined: C9795/2 -1 male, 2 females, 23.viii.2022, Stream near Longleng River, Nagaland, coll. Thangavel Kubendran.

Diagnosis: Rostrum short, convex reaching to the tip of the antennular peduncle; dorsal margin with 8–9 teeth of which 2–3 are on the carapace, ventral margin with 2–3 teeth. Second pereopods larger, chela with characteristic grooves and pubescence restricted to 2/3<sup>rd</sup> of the proximal part of the fingers.

Distribution: India (Assam, Meghalaya, & Nagaland).

Remarks: This species was described as a sub species of *M. hendersoni* by Tiwari (1952) from Cachar District, Assam and it differs from typical *M. hendersoni* by the nature of the rostrum as well as the by lack of flute and pubescence in the distal 1/3<sup>rd</sup> of the chela of the 2<sup>nd</sup> pereopod, *M. cacharensis* is endemic to northeastern India.

### 2. *Macrobrachium dayanum* (Henderson, 1893)

(Image 1B)

1893. *Palaemon dayanum* Henderson, *Trans. Linn. Soc. London*, 5(2): 443; Plate 40, figs 7-13.

1950. *Macrobrachium dayanum* Holthuis, *Siboga Exped. Monogr.*, 39(9): 197.

Material examined: C7420/2 -1 male, 1 female, 26.iii.2017, Dhansiri River, Ntangi National Park, Peren, Nagaland, coll. Panakkool Thamban Aneesh; C8420/2, 1 male, 5.vi.1998 from Broader cam experimental fish farm, Dimapur, Nagaland, coll. Dr. A.K. Karmakar.

Diagnosis: Rostrum longer than antennular peduncle and reaching the end of the antennal scale or little beyond it; dorsal margin of the rostrum with 5–11 teeth of which 1–3 are behind the orbit. In mature adults second

pereopods are comparatively stronger, the grooves and pubescence are more prominent in the fingers of the chela whereas in sub adults it is feeble and the chela is distinctly longer than carpus.

Distribution: India (Assam, Arunachal Pradesh, Bihar, Jharkhand, Goa, Madhya Pradesh, Meghalaya, Nagaland, Odisha, Punjab, Tripura, Uttarakhand, Uttar Pradesh, & West Bengal); Pakistan; Myanmar (Cai & Ng 2002); and Germany (Klotz et al. 2013).

Remarks: This species is widely distributed in central, northern and northeastern India.

### 3. *Macrobrachium kempii* (Tiwari, 1949)

(Image 1C)

1949. *Palaemon kempii* Tiwari, *Rec. Indian Mus.*, 45(for 1947): 330

2001. *Macrobrachium kempii* Jayachandran, *Prawns Biodiversity, Taxonomy, Biology and Management*. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta. 126.

Material examined: C7421/2, 7 males, 10 females, 26.iii.2017 from Dhansiri River, Ntangi National Park, Peren District, Nagaland, coll. Panakkool Thamban Aneesh.

Diagnosis: Rostrum short reaching up to the middle or end of the 3<sup>rd</sup> antennular peduncle; dorsal margin with eight teeth of which two are behind the orbit, ventral margin with 2–3 teeth. The second pereopods are stronger, carpus is shorter than finger, palm and merus; fingers without grooves; inner palm with dense felt of hairs.

Distribution: India (Meghalaya); Bangladesh.

Remarks: This species was described by Tiwari (1949) based on the specimens collected from Chittagong, Bangladesh, and Ghosh et al. (1999) reported this species from Meghalaya, the species has been rarely reported.

### 4. *Macrobrachium lamarrei lamarrei* (H. Milne Edwards, 1837)

(Image 1E)

1837. *Palaemon lamarrei* H. Milne Edwards., *Hist. nat. Crustaces*, II: 397.

1950. *Macrobrachium lamarrei*: Holthuis, *Siboga Exped. Monogr.*, 39(9): 119.

2001. *Macrobrachium lamarrei lamarrei*: Jayachandran *Prawns Biodiversity, Taxonomy, Biology and Management*. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta. 128.

Material examined: C9180/2, 2 males, 9 females, 18.ix.2021, Kiusam water channel near Bem hills, Kiphire, Nagaland, coll. Santanu Mitra; C9181/2, 11 males, 13 females, Madziphima tributaries of Dhanusiri River, Dimapur, Nagaland, coll. Santanu Mitra.

Diagnosis: Rostrum extends to or longer than antennal

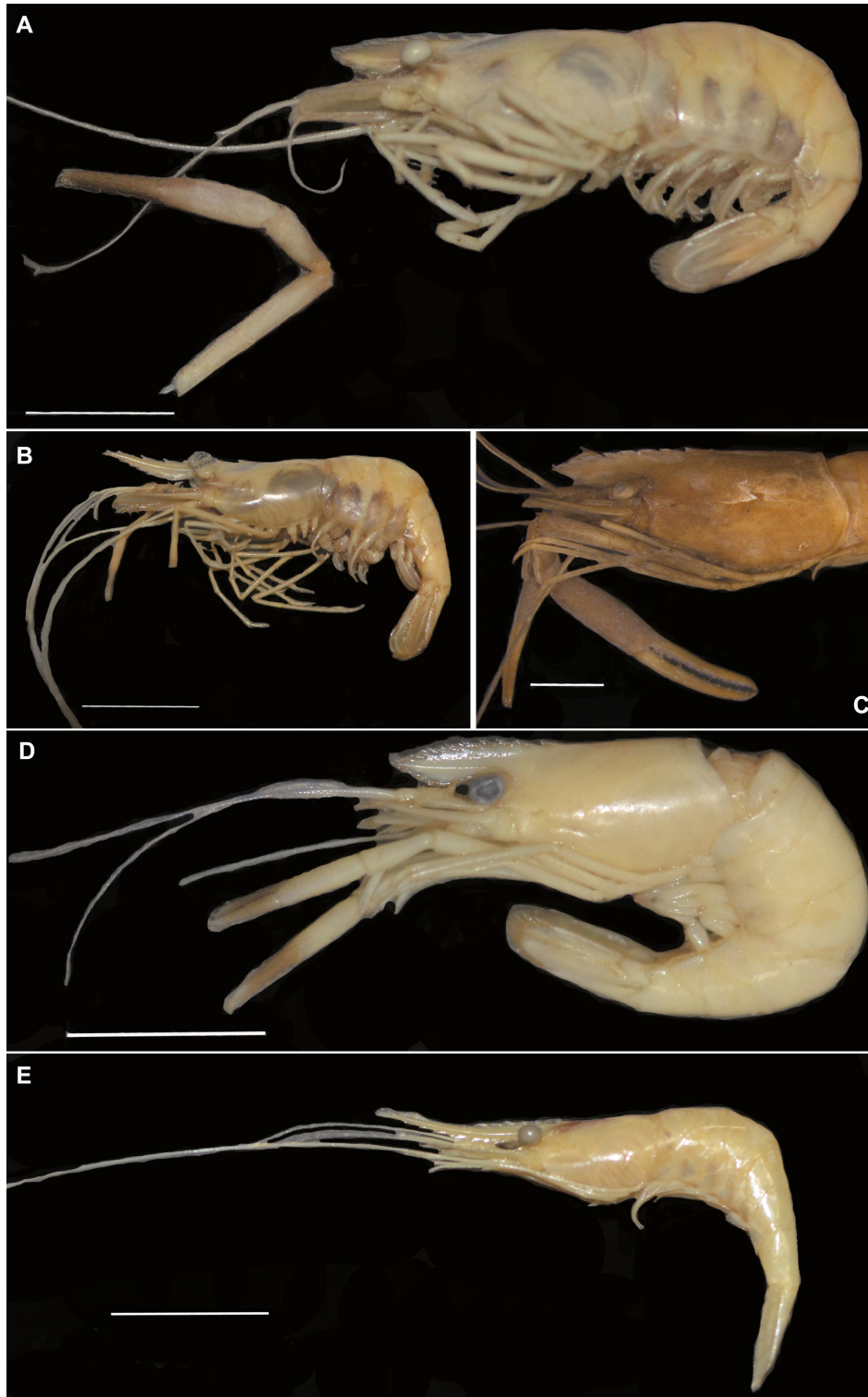


Image 1. A—*Macrobrachium platyrostris* (Tiwari, 1952) | B—*M. dayanum* (Henderson, 1893) | C—*M. kempfi* | D—*M. cacharensis* (Tiwari, 1952) | E—*M. lamarrei lamarrei* (H. Milne Edwards, 1837). Scale bars: 10 mm. © K. Valarmathi.

scale. Rostral formula 4-7+1-2 / 4-9 (1-2). Upper margin of the rostrum with proximal group of 4–7 teeth, widely separated from the distal 0-2 sub-terminal tooth. The second pereiopods are simple and similar in both the

sexes, finger is shorter than palm; chela nearly  $\frac{1}{2}$  of the carpus; merus longer than chela but shorter than carpus.

Distribution: India: This is a very common and widely distributed species in various states of the country (but

Key useful for species of *Macrobrachium* of Nagaland

1. Rostrum longer than or equal to antennal scale ..... 2
- Rostrum always shorter than antennal scale ..... 3
2. Second pereopods slender and carpus is 1.5 to 2 times longer than chela, no pubescence and grooves in the fingers, ventral margin of the rostrum with 5–9 teeth ..... *M. lamarrei lamarrei*
- Second pereopods comparatively strong, carpus shorter than chela, fingers with pubescence and mild grooves, ventral margin of the rostrum with 4–7 teeth ..... *M. dayanum*
3. Fingers in the male second chela with grooves and without hairs on inner palm ..... 4
- Fingers in the male second chela without grooves and with hairs on inner palm ..... *M. kempfi*
4. In adult male entire fingers of the second chela are with many grooves filled with hairs ..... *M. platyrostris*
- In adult male, the fingers of the second chela are with many grooves and only 2/3<sup>rd</sup> filled with hairs ..... *M. cacharensis*

this is the first report to Nagaland); Bangladesh; Myanmar; and Pakistan.

Remarks: This common species adapts to most of the aquatic habitats like freshwater, estuarine and even subterranean water (Holthuis 1950).

### 5. *Macrobrachium platyrostris* (Tiwari, 1952)

(Image 1A)

1952. *Palaemon hendersoni platyrostris* Tiwari, *Ann. Mag. Nat. Hist.*, V (ser.12): 32

2001. *Macrobrachium hendersoni platyrostris* Jayachandran Palaemonid Prawns Biodiversity, Taxonomy, Biology and Management. Oxford & IBH Publishing Co. Pvt. Ltd. Calcutta. 108.

Material examined: C9794/2, 1 male, 4 females, 23.viii.2022, Dikhu River, Near Tamlu, Longleng District, 96.695°N; 94.803°E, coll. Thangavel Kubendran.

Diagnosis: Rostrum short reaches up to the end of antennular peduncle, the dorsal margin of the rostrum is with 7–10 teeth of which 2–3 behind the orbit. Second pereopods larger, chela with characteristic grooves and pubescence in the entire fingers.

Distribution: India (Assam, Arunachal Pradesh, Himachal Pradesh, Jharkhand, Manipur, Meghalaya, Nagaland, Tripura, Uttarakhand, & West Bengal); Myanmar (Cai & Ng 2002); China.

Remarks: This species was described as a subspecies of *M. hendersoni* by Tiwari (1952) from Assam and it differs from typical *M. hendersoni* by the length and depth of the rostrum and number of rostral teeth.

### DISCUSSION

The prawns collected from rivers and streams, especially during rainy seasons in large quantity were consumed by people in most of the north-eastern states. They are also smoke dried and stored for future use or sold (INR 1,000 per kg). Konyak et al. (2023) while studying the aquatic biodiversity in Dzuna River, Jotsoma, Nagaland has reported the availability of palaemonid prawns in this river but they had mentioned it to be *Palaemon* sp. So all the five species of palaemonid prawns

encountered during this study forms the first report to this poorly explored state. Among these five species of *Macrobrachium*, *M. cacharensis*, and *M. kempfi* are very rare species. The present work recommends for intensive studies for freshwater species from Nagaland.

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**Journal of Threatened Taxa** is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64

Print copies of the Journal are available at cost. Write to:  
The Managing Editor, JoTT,  
c/o Wildlife Information Liaison Development Society,  
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,  
Tamil Nadu 641006, India  
ravi@threatenedtaxa.org & ravi@zooreach.org



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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

March 2026 | Vol. 18 | No. 3 | Pages: 28455–28606

Date of Publication: 26 March 2026 (Online & Print)

DOI: 10.11609/jott.2026.18.3.28455-28606

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