

Distribution of Indian clam shrimps (Branchiopoda: Crustacea)

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Thirty-five species of clam shrimps known from India are listed. These include one species of *Cyclestheria*, five species of *Lynceus*, nine species of *Eulimnadia*, two species of *Leptestheria*, two species of *Leptestheriella*, one species of *Sewellestheria*, one species of *Caenestheria*, six species of *Caenestheriella*, and eight species of *Eocycticus*. All these species except *Lynceus brachyura*, *Cyclestheria hislopi* and *Sewellestheria sambarensis* are distributed only in temporary waters. The distributional aspects of all the Indian clam shrimp species are discussed.

Keywords: Clam shrimps, distribution, occurrence, type locality.

Introduction

THIS article presents an overview on the occurrence and distribution of the clam shrimps in India. The collection, cataloguing and preservation of biological specimens, including the large branchiopods have not been undertaken in the country, as accomplished in many developed countries, which are characterized by relative simplicity in biodiversity. The vastness of India (3.6 million km²) and its enormously complex and diverse geo-climatic zones, and the consequent richness of biological diversity have prevented us from completing the documentation of all available large branchiopods. However, of the 200 species of clam shrimps known all over the world¹, 41 are known from India. However, the records for the claimed 41 species suffer from the following: (1) Many descriptions of clam shrimps are based on sporadic collections. (2) Incomplete descriptions, without considering characters varying with age and life stage, have unduly led to the erection of new species. (3) Similarly, for several species, no type material has been deposited in any recognized museum or institution. (4) The type localities of many species are also not described. Hence this presentation has selected only 35 species of clam shrimps, for which fairly adequate information is recorded.

Distribution of Indian clam shrimps

There are about 200 species of clam shrimps known all over the world¹. They occur in rainwater ditches, rocky pools, seasonal ponds and less frequently in bigger water bodies like lakes and rivers². As a group they have a wide geographical distribution, but many species are local³. In India, 35 species have been recognized so far⁴. The distribution of Indian clam shrimps is summarized in Table 1. Among these species, *Cyclestheria hislopi* is distributed in the warmer parts of the world⁵. It is an eurytopic species distributed in different parts of India found frequently amongst aquatic macrophytes with finely divided leaves and on the delicate stems of *Hydrilla* sp., *Najas* sp., *Marsilea* sp. and to a lesser extent, *Potamogeton* spp. *C. hislopi*⁶ lives predominantly among plants with a minimal underwater surface. It rarely occurs in open waters. This habitat preference for weed-persistent waters is unusual among clam shrimps⁷. The genus *Lynceus* is cosmopolitan, but rarely distributed in the plains of South India. This genus is recorded at higher altitudes (Kodaikanal)⁸ and in ponds infested with vegetation in Kerala^{9,10}. In North India, *Lynceus vasishti* is reported from Punjab¹¹. Nine species of the genus *Eulimnadia* are recorded from temporary puddles and rocky pools in different parts of India, and they usually occur in association with grass temporarily submerged under water. They exhibit extreme endemism and six species in India are so far known only from their respective localities. This sort of localized distribution is also known in the North American species of *Eulimnadia*³. The genera *Leptestheriella*, *Leptestheria* and *Eocycticus* are known to occur in rocky and muddy water pools and puddles during monsoon season in different parts of India. They are mostly confined to the tropical parts of the world. Both *Leptestheriella nobilis* and *Leptestheriella sarsi* are known from different parts of South India. *Sewellestheria sambarensis* is so far known only from the Sambar Lake of Rajasthan¹². Among the eight *Eocycticus* species known from India, six are confined to their type localities, whereas one species, namely *E. bouveri* is known from Himachal Pradesh and Uttarakhand, and the other species, *E. orientalis* is known from China and India (Indo-Malayan region). *Caenestheriella* and *Caenestheria* are distributed in rocky pools and littoral regions of seasonal ponds infested with higher

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Table 1. Distribution of clam shrimps in India

Species	Locality	Type of distribution
<i>Cyclestheria hislopi</i> ¹⁶	Nagapur, Kolkata, Allahabad, Berhampur, Chennai, Thiruvananthapuram, Irrinjalakuda, Guntur, East Godavari	Cosmotropical
<i>Lynceus brachyura</i> ¹⁷	Shandur Lake, Chitral, Irrinjalakuda,	Cosmopolitan
<i>Lynceus denticulatus</i> ⁸	Kodaikanal, Tamil Nadu	Known from its type locality
<i>Lynceus serratus</i> ¹⁸	Madurai, Tamil Nadu	Known from the region
<i>Lynceus vasishti</i> ¹¹	Rakhra, Punjab	Known from its type locality
<i>Lynceus alleppensis</i> ¹⁰	Alleppey, Kerala	Known from its type locality
<i>Eulimnadia compressa</i> ¹⁶	Nagpur, Maharashtra	Known from its type locality
<i>Eulimnadia gibba</i> ¹⁹	Jamla Hill Fort, South Canara, Karnataka	Known from South India
<i>Eulimnadia similis</i> ¹⁹	Shevaroy Hills, Tamil Nadu	Known from its type locality
<i>Eulimnadia margaretae</i> ²⁰	Punjab	Known from its type locality
<i>Eulimnadia michaeli</i> ²¹	Madurai, Tamil Nadu; Trichur;	Known from South India
<i>Eulimnadia gunturensis</i> ²²	Guntur, Racharla, Andhra Pradesh	Known from Andhra Pradesh
<i>Eulimnadia ovata inversa</i> ¹¹	Ludhiana, Punjab	Known from its type locality
<i>Eulimnadia ovata</i> ⁹	Khetri Fort, Rajasthan	Known from its type locality
<i>Eulimnadia indocylindrova</i> ²³	Racharla, Andhra Pradesh	Known from Racharla, Andhra Pradesh
<i>Leptestheria jaisalmarensis</i> ¹²	Rajasthan	Known from its type locality
<i>Leptestheria longispinosa</i> ⁹	Pilani, Rajasthan	Known from its type locality
<i>Leptestheriella nobilis</i> ¹⁹	Sholingur, Gingi, Kadur, Panchagani, Narasingampatti, Madurai, Guntur, Nalgonda, Racharla	Known from South India
<i>Leptestheriella sarsi</i> ²⁴	Sholingur, Gingi	Known from South India
<i>Sewellestheria sambarensis</i> ¹²	Sambar Lake, Rajasthan	Known from its type locality
<i>Caenestheria misrai</i> ²⁵	Rajasthan	Known from its type locality
<i>Caenestheriella boysi</i> ²⁶	India (type locality not known)	Known from its source
<i>Caenestheriella similis</i> ²⁶	India (type locality not known)	Known from its source
<i>Caenestheriella indica</i> ¹⁶	Mandapam, Pambam passage, Madurai, Kalka, Sil Hills, Tanjore, Guntur, Racharla, Vijayawada	Known from South India
<i>Caenestheriella anandalei</i> ¹³	Kalka, Sil Hills, Tanjore, Tamil Nadu	Known from Tamil Nadu
<i>Caenestheriella roonwali</i> ²⁵	Rajasthan	Known from its type locality
<i>Caenestheriella ludhianata</i> ¹¹	Rakra, Punjab	Known from its type locality
<i>Eocycticus hutchinsoni</i> ²⁰	Punjab	Known from its type locality
<i>Eocycticus deterrana</i> ²⁰	Rawalpindi, Sohawa, Punjab	Known from its type locality
<i>Eocycticus pellucidus</i> ²¹	Rajasthan	Known from its type locality
<i>Eocycticus plumosus</i> ¹⁸	Tuticorin, Tamil Nadu	Known from its type locality
<i>Eocycticus bouveri</i> ¹³	Simla Hills, Kumaon	Known from Himachal Pradesh and Uttarakhand
<i>Eocycticus dhilloni</i> ¹¹	Patiala, Punjab	Known from its type locality
<i>Eocycticus acuta</i> ⁹	Pilani, Rajasthan	Known from its type locality
<i>Eocycticus orientalis</i> ²⁷	China, India	Known from Indo-Malayan region

*Five species, *Leptestheria* (1), *Eocycticus* (1), *Eulimnadia* (1) and *Estheria* (2) are unconfirmed and not included in this list.

aquatic vegetation. *C. indica* has been recorded in abundant numbers during the monsoon season in fish ponds of Andhra Pradesh, whereas *C. misrai* is known from its type locality in Rajasthan. *Caenestheriella* is known from South India. The type localities of *Caenestheriella similis* and *C. boysi* described from India are not known¹³.

Many of the clam shrimp species recorded from India are from neglected waters such as puddles, roadside ditches and quarry pools, which may disappear in a short span of time. Hence, they often skip the attention of the collectors. Also, many clam shrimp species exhibit extreme endemism and are confined to their regions or type localities. Among the 35 of clam shrimps recorded from India, 32 species are known only from India and among them, four *Lynceus* species, six *Eulimnadia* species, two *Leptestheria* species, one *Caenestheria* species, two *Caenestheriella* species and seven *Eocycticus* species are

known only from their type localities (Table 1). Even in localities where the occurrence of widely spread species could be expected a priori, viz. temporary waters, there is increasing evidence that selection has been for local adaptation leading to restricted geographical distribution¹⁴. Similar type of distributional trend was also recorded in other large branchiopod species^{14,15}. If properly worked out, some clam shrimp species can be used as geographical indicators.

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