



# Rotifer Biodiversity of North-East India: A Review

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**Abstract:** A study of the rotifer communities in North East India, a "hot-spot" for biodiversity worldwide, reveals 188 species, accounting for 53.2% of the Indian Rotifera, and reflects the highest species, generic, and family richness ever discovered in any area of this nation. The Indian Rotifera now includes nine additional species. One Australasian species, three Oriental species, and seven Palaeotropical species are among the biogeographically noteworthy components. Cosmotropical > Pantropical species are substantially represented, but cosmopolitan species (69.2%) exhibit higher richness. The Lecanidae, Lepadellidae, Trichocercidae, and Brachionidae are particularly abundant in the rotifer fauna, which also exhibits a general "tropical character," the presence of various acidophilic species, and a dearth of Brachionus species. The Rotifera have a higher species diversity, lesser dominance, and higher evenness, making up a significant quantitative portion of zooplankton (45.8 8.1%). Richness and density are positively connected with dissolved oxygen and negatively correlated with water, temperature, rainfall, hardness, nitrate, chloride, and total dissolved solids. Furthermore, pH and richness are inversely associated.

**Keywords:** North-East India (NEI), Rotifera, metazoans, richness, dominance, evenness, biodiversity, taxocoenosis, biogeographical

## INTRODUCTION

North-East India (NEI) is recognised by a variety of aquatic habitats that are found under various ecological conditions throughout its eight constituent states. It is a part of the Himalayan and Indo-Myanmar biodiversity "hot-spots." The NEI is characterised as a significant area with a large biodiversity of Rotifera.

The study conducted by B. K. Sharma & Sumita Sharma examines the diversity of Rotifera in seven floodplain lakes of the Brahmaputra basin in Assam (NEI), paying particular attention to the general nature and composition of the taxocoenosis, biogeography, and ecology as well as the species richness and community similarity among the lakes.

Rotifera have been documented from a wide range of inland aquatic biotopes of

India for more than a century. Deepor beel (Sharma & Sharma 2005, 2008), one of the largest floodplain wetlands in the Brahmaputra basin of lower Assam (NEI), is the only "Ramsar site" in this country where studies on their diversity in wetlands of international significance for conservation under the Ramsar convention have been conducted. The rotifer populations of Loktak Lake, one of the largest naturally occurring freshwater lakes in eastern India, a Ramsar site, and a significant floodplain wetland of South Asia. In 2009, B.K. Sharma investigated the biodiversity of Rotifera in Loktak Lake, paying particular attention to their nature, composition, and biogeographically intriguing components. At the selected sampling site, observations were conducted on temporal fluctuations

in species richness and abundance of the rotifers.

B.K. Sharma and Sharma 2019 expanded their research to include the floodplains of the Barak River in light of the noteworthy features of Assam. The Barak valley river basin in south Assam is essentially unknown in terms of rotifer fauna (Sharma & Sharma 2014a). Despite numerous limnological studies from the Barak valley this lacuna is more prominent because of incomplete species lists, missed identifications of small taxa, insufficient sampling, and a lack of taxonomic knowledge. Therefore, this work offers the first thorough evaluation of the rotifer biodiversity from the floodplain wetlands of the Barak River basin. To justify validations that are frequently lacking for the rotifer taxa reported from India, an inventory of the observed species is offered along with numerous new records and interesting species. The findings provide a valuable contribution to the biodiversity of Rotifera in India, as well as that of sub-tropical floodplains and wetlands.

Mizoram, one of the hill states in North-East India (NEI), did not receive much attention for its aquatic metazoan and Rotifera richness. Therefore, based on the most recent sample surveys, the current study aims to provide a more thorough overview of the Rotifera species of Mizoram. Comments are made on the composition and richness of the observed

diversity, as well as on a number of intriguing components and the distribution of distinct species (Bhushan Kumar Sharma 2015).

Another project is a thorough sampling-based attempt to research Nagaland Rotifera with a focus on small water bodies that are an essential component of the aquatic resources. The little lentic waters are significant because they are a natural component of the worldwide network of metabolically active locations and are essential to maintaining biodiversity. The reported rotifer diversity of Nagaland is discussed in relation to the nature and the structure of the taxon, new records, interesting species, the distribution of different species, and other striking traits (B.K. Sharma 2017).

The study assumes special biodiversity and ecological interest in Rotifera, the most diverse species of zooplankton, found in the floodplain lakes or "pats" of Manipur. The species richness, community similarity, and overall character and composition of the taxocoenosis of the rotifer communities in fifteen lakes in this state are examined. On biogeographically intriguing components and the distribution of diverse species, remarks are given. Additionally, changes in species diversity, dominance, evenness, and ecology of Rotifera are noted, along with variations in richness and abundance. (B.K. Sharma 2009)

**Table 1. Rotifer species richness of North-East India's freshwater sources.**

<b>Sr. No.</b>	<b>Author</b>	<b>Locality</b>	<b>Species Richness</b>
<b>1.</b>	<b>B. K. Sharma (2000)</b>	<b>Assam (Floodplain Lakes)</b>	<b>64</b>
<b>2.</b>	<b>B. K. Sharma (2001)</b>	<b>Assam (Brahmaputra river basin)</b>	<b>116</b>
<b>3.</b>	<b>B. K. Sharma</b>	<b>Assam (Deepor Beel - A Ramsar)</b>	<b>110</b>

	(2005)	Site)	
4.	B. K. Sharma (2009)	Assam	170
		Meghalaya	116
		Tripura	112
5.	B. K. Sharma (2009)	Manipur (Loktak Lake)	124
6.	B. K. Sharma (2009)	Manipur (Floodplain Lakes)	151
7.	B. K. Sharma (2015)	Mizoram	162
8.	B. K. Sharma (2017)	Nagaland	150
9.	B. K. Sharma (2018)	Jammu and Kashmir (Floodplain Lakes)	140
10.	B. K. Sharma (2019)	Assam (Barak valley)	170

#### Conclusion:

The littoral periphytic taxa of the Lecanidae, Lepadellidae, Trichocercidae, and Testudinellidae dominate the rich and diverse Rotifera taxocoenosis in India's north-eastern region. Notable features include the presence of numerous biogeographically intriguing elements, acidophilic species, and a dearth of Brachionus species. The limnetic surroundings of the fish ponds that were analysed contained higher levels of diversity for the Brachionus and Keratella species. In regional flood plain lakes, rotifers exhibit more species variety, higher evenness, and lower dominance, making them an important qualitative and quantitative component of zooplankton. Future research should pay particular attention to the rotifer relationships with the various aquatic macrophytes found in the Ramsar region. Investigations are needed in this special and interesting wetland to determine the effects of invertebrate and vertebrate predation on the nature and composition, community

structure, abundance, and role of the rotifers in aquatic productivity. Even though the large area of NEI have been covered for the biodiversity study still it was not possible to cover all the wetlands and hence the results that are drawn are little biased.

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North east Region of india exhibits rich and diversified Rotifera taxocoenosis dominated by littoral periphytic taxa of Lecanidae, Lepadellidae, Trichocercidae and Testudinellidae. The occurrence of various biogeographically interesting elements, acidophilic species and paucity of Brachionus spp. are noteworthy. Species of Brachionus and Keratella recorded more richness in limnetic environs of fish ponds which were studied. The rotifers form an important qualitative and quantitative component of zooplankton and, are characterized by higher species diversity, higher evenness and lower dominance than in other regional flood plain lakes. Studies on the rotifer associations with diverse aquatic macrophytes present in this Ramsar site merit special future interest. The impact of invertebrate and vertebrate predation on the nature and composition, community structure and abundance of the rotifers as well as their role in aquatic productivity requires investigations in this unique and interesting wetland.