Interesting rotifers (Rotifera: Eurotatoria) from a subtropical wetland of Meghalaya, Northeast India: new records

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Abstract: The plankton and semiplankton samples examined from a subtropical wetland of Shillong, Meghalaya, Northeast India (NEI), revealed seven new records of rotifers belonging to six genera and six families. These include five species new to the Indian Rotifera and two species new to the rotifer fauna of NEI, thus meriting interest in terms of biodiversity and distribution. All the species are illustrated to warrant validation. While a detailed account of the rich rotifer diversity of the wetland is continuing, this interim report raises the total tally of Rotifera known from Meghalaya to 141 species belonging to 41 genera and 20 families.

Key words: Biodiversity, distribution, interesting taxa, urban wetland

The phylum Rotifera is an important component of freshwater microinvertebrate communities and an integral link of aquatic food webs. The faunal diversity of the phylum from the hill state of Meghalaya, Northeast India (NEI), was documented by Sharma and Sharma (1999) and that was followed by certain additions subsequently by Sharma (2006, 2008, 2010) and Sharma and Sharma (2011). This interim report on seven new records, part of a more detailed analysis of the rich rotifer diversity of a subtropical wetland of Meghalaya, is an attempt to update the biodiversity status of the taxa from this state. All recorded species are illustrated for validation and comments are made on their taxonomy and distribution.

This report is a part of limnological reconnaissance of a subtropical wetland (25°36′32.8″N to 25°36′36.3″N, 91°53′46.9″E to 91°54′01.5″E; alt. 1400 m a.s.l.) located at the campus of North-Eastern Hill University, Shillong, the capital city of the Meghalaya state of NEI (Figure 1). Sampling was done monthly between August 2014 and July 2015. Water samples were collected for basic abiotic parameters. Water temperature, specific conductivity, and pH were recorded by field probes; dissolved oxygen was estimated by Winkler's method and free carbon dioxide, alkalinity, hardness, calcium, and chloride were analyzed following APHA protocols (1992).

The qualitative plankton and littoral periphytonic samples were collected by towing a Nylobolt plankton net (#50 µm) and preserved in 5% formalin. All collections were screened with a Wild stereoscopic binocular microscope; the rotifers were isolated and mounted in polyvinyl alcohol-lactophenol and were observed with a Leica DM 1000 stereoscopic phase-contrast microscope fitted with an image analyzer. Various taxa were identified following Koste (1978), Koste and Shiel (1989), Segers (1995), and Trinh Dang et al. (2015).

The variations (ranges, mean ± SD) of the recorded abiotic parameters of the sampled wetland are indicated in the Table.

Seven new records of Rotifera belonging to six genera and six families are reported. These include five species new to the Indian Rotifera, namely Colurella tesselata (Figure 2), Lecane stichaea (Figure 3), Gastropus minor (Figure 4), Stephanoceros fimbriatus (Figure 5), and Dissotrocha aculeata (Figure 6), while Lecane dorysimilis (Figure 7) and Cupelopagis vorax (Figures 8 and 9) are new additions to the rotifer fauna of NEI.

Systematic list of the recorded Rotifera taxa

Phylum: Rotifera
Class: Eurotatoria
Subclass: Monogononta
Order: Ploima
Family: Lepadellidae
1. Colurella tesselata (Glascott, 1893)
2. Lecane stichaea Harring, 1913
3. Lecane dorysimilis Trinh Dang, Segers & Sanoamuang, 2015

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Family: Gastropodidae
4. Gastropus minor (Rousselet, 1892)

Order: Flosculariaceae
Family: Floscularidae
5. Stephanoceros fimbriatus (Goldfusz, 1820)

Order: Collothecaceae
Family: Atrochidae
6. Cupelopagis vorax (Leidy, 1857)

Subclass: Bdelloidea
Family: Philodinidae
7. Dissotrocha aculeata (Ehrenberg, 1832)

The wetland is characterized by its subtropical, slightly acidic-circumneutral, soft, well-oxygenated, and calcium-poor waters with low free carbon dioxide and low ionic concentrations; the last salient feature warranted inclusion of the water body in the ‘Class I’ category of trophic classification according to Talling and Talling (1965). The chloride content indicated certain influence of human impact in this seepage and rainwater-fed ecosystem.

The present study revealed seven new records of rotifers belonging to six genera and six families. Of these, Colurella tesselata, Lecane stichaea, Gastropus minor, Stephanoceros fimbriatus, and Dissotrocha aculeata are new to the Indian Rotifera while Lecane dorysimilis and Cupelopagis vorax are new additions to the fauna of NEI. This report merits interest in terms of biodiversity and distribution interest and has raised the total tally of Rotifera known from Meghalaya to 141 species belonging to 41 genera and 20 families. Furthermore, the majority of these taxa, except Dissotrocha aculeata, are rare in the studied collections.

### Table. Variations in some basic abiotic parameters.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Range</th>
<th>Mean ± SD</th>
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<tbody>
<tr>
<td>Water temperature (°C)</td>
<td>12.0–22.5</td>
<td>17.4 ± 3.2</td>
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<tr>
<td>pH</td>
<td>6.02–6.99</td>
<td>6.59 ± 0.19</td>
</tr>
<tr>
<td>Specific conductivity (µs/cm)</td>
<td>31.0–51.0</td>
<td>37.4 ± 5.4</td>
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<tr>
<td>Dissolved oxygen (mg/L)</td>
<td>5.6–7.6</td>
<td>6.7 ± 0.5</td>
</tr>
<tr>
<td>Free carbon dioxide (mg/L)</td>
<td>6.0–22.0</td>
<td>11.3 ± 4.3</td>
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<tr>
<td>Total alkalinity (mg/L)</td>
<td>18.0–30.0</td>
<td>24.0 ± 3.5</td>
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<tr>
<td>Total hardness (mg/L)</td>
<td>20.0–32.0</td>
<td>26.3 ± 3.4</td>
</tr>
<tr>
<td>Calcium (mg/L)</td>
<td>8.4–23.1</td>
<td>14.4 ± 4.6</td>
</tr>
<tr>
<td>Chloride (mg/L)</td>
<td>25.0–38.0</td>
<td>32.5 ± 4.1</td>
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Figure 1. A) Map of India showing Meghalaya state; B) District map of Meghalaya showing Shillong (East Khasi hills district).
Colurella tesselata, a new record from India, is characterized by its dorsal keel and facet-like pattern of ribs on the lorica (Koste and Shiel, 1989). This species is known from African, Australian, Nearctic, Palearctic, Neotropical, and Oriental regions (Segers, 2007). It is reported from the Oriental region from Thailand (Sa-Ardrit et al., 2013).
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References


