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NOTES ON NEW RECORDS OF MONOGONONT ROTIFERS (ROTIFERA : EUROTATORIA) FROM FLOODPLAIN LAKES OF ASSAM

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INTRODUCTION

Although systematic studies on the Indian Rotifera began more than one century ago, the related investigations from North-Eastern India, one of the global biodiversity 'hot-spots', were initiated in the later half of 20th century. The status of faunal diversity of Rotifera of N.E. region is reviewed by Sharma and Sharma (2005a). In addition, several new records of interesting taxa from this region have been reported by Sharma (2004, 2005, 2007).

The present study, a part of comprehensive survey of the Rotifera biodiversity in N.E. India, deals with ten species of rare and interesting monogonont rotifers collected from the floodplain lakes (beels) of the Brahmaputra river basin of Assam. The documented species include four new records from India, four new reports from Northeastern region and two new records from Assam. All the examined species are briefly diagnosed and illustrated and remarks are made their distribution.

MATERIALS AND METHODS

The present observations are based on plankton samples collected during January-December, 2007 from various floodplain lakes (beels) of the Brahmaputra river basin of Assam by towing a nylobolt plankton net (No. 25) and preserved in 5% formalin. The samples are screened, the rotifer taxa are isolated and mounted individually in Polyvinyl alcohol-lectophenol mixture.

The different species are identified following the works of Kutikova (1970), Koste (1978), Koste and Shiel (1989), Segers (1995) and Sharma (1998, 2007). The drawings are made with a Leitz-Dialux phase contrast stereoscopic microscope using a drawing tube attachment and measurements are indicated in micrometers (μm). Segers (2002) is followed for the recent system of nomenclature of Rotifera and remarks on the distribution are made *vide* Segers (2007). The reference materials are deposited in the holdings of the senior author (BKS) at, Department of Zoology, North-Eastern Hill University, Shillong.

LIST OF THE EXAMINED SPECIES

Phylum	ROTIFERA
Class	EUROTATORIA
Subclass	MONOGONONTA
Order	PLOIMA
Family	EUCHLANIDAE

Tripleuchlanis plicata (Levander, 1894)**

Family LEPADELLIDAE

Colurella colurus (Ehrenberg, 1830)*

Lepadella bicornis Vasisht & Battish, 1971***

L. elongata Koste, 1992*

L. latusinus (Hilgendorf, 1889)*

L. rhomboidula (Bryce, 1890)**

L. triptera alata (Myers, 1934)*

Family LECANIDAE

Lecane aspasia Myers, 1947**

L. elegans Haring, 1914***

L. elongata Haring & Myers, 1926**

TAXONOMIC NOTES

Tripleuchlanis plicata (Levander, 1894)

(Figs. 1-3)

Material examined : 6 examples, R/BKS/Assam/211-216, Deepor beel, Dharapur (Kamrup district), 26.08.2006, coll. B.K. Sharma.

Characters : Lorica rigid and ovoid, with double cuticular folds between dorsal and ventral plates. Foot robust, three-segmented and often projecting beyond lorica. Toes short, parallel-sided and with pointed tips.

Distribution : N.E. India : New record India : West Bengal, Andhra Pradesh and Tamil Nadu. Elsewhere : Cosmopolitan.

Colurella colurus (Ehrenberg, 1830)

(Figs. 4-5)

Material examined : 3 examples, R/BKS/Assam/231-233, Padmakhua beel (Morigaon district), 20.03.2007, coll. B.K. Sharma.

Characters : Lorica oblong in outline, with maximum width slightly before its middle and rounded posterior end; anterior lorica margin rounded. Foot three-segmented; toes long, slender and pointed.

Distribution : India : new record. Elsewhere : Cosmopolitan.

Lepadella bicornis Vasisht & Battish, 1971

(Figs. 6-7)

Material examined : 3 examples, R/BKS/Assam/241-243, Amuri beel, (Morigaon district), 18.09.2007, coll. B.K. Sharma.

Characters : Lorica broadly ovate, moderately compressed dorso-ventrally; with prominent acutely pointed broad-based corners laterally. Anterior dorsal margin concave and anterior ventral sinus v-shaped. Foot-groove shallow. Foot 4-segmented, distal foot-segment longest; toes equal and pointed.

Distribution : N.E. India : New record. India : Chandigarh (U.T.). Elsewhere : Brazil.

Lepadella elongata Koste, 1992

(Figs. 8-9)

Material examined : 4 examples, R/BKS/Assam/247-250, Muijan beel, (Dibrugarh district), 26.08.2006, coll. B.K. Sharma.

Characters : Lorica oblong in outline, with maximum width in its middle region; posterior end of lorica narrower and slightly truncate. Anterior opening deep, nearly U-shaped dorsally and V-shaped ventrally. Foot-opening elongated, nearly parallel-sided; toes long and pointed.

Distribution : India : new record. Elsewhere : Neotropical, Oriental and Pacific regions.

Lepadella latusinus (Hilgendorf, 1889)

(Figs. 10-12)

Material examined : 4 examples, R/BKS/Assam/252-255, Maghuri beel, Guujan (Tinsukia district), 12.05.2008, coll. B.K. Sharma.

Characters : Lorica elongated-oval, broadest in middle and then tapering slightly to each end; vaulted hemispherical in cross-section. Occipital margin cowl-like and ventrally protruding; head aperture small, with slightly convex dorsal margin and a deep U-shaped ventral sinus. Foot-opening wide and with outwardly curved corners; last foot-segment < 1/2 toe length. Toes elongated, pointed and ventrally directed.

Distribution : India : new record. Elsewhere : Cosmopolitan.

Lepadella rhomboidula (Bryce, 1890)

(Figs. 13-15)

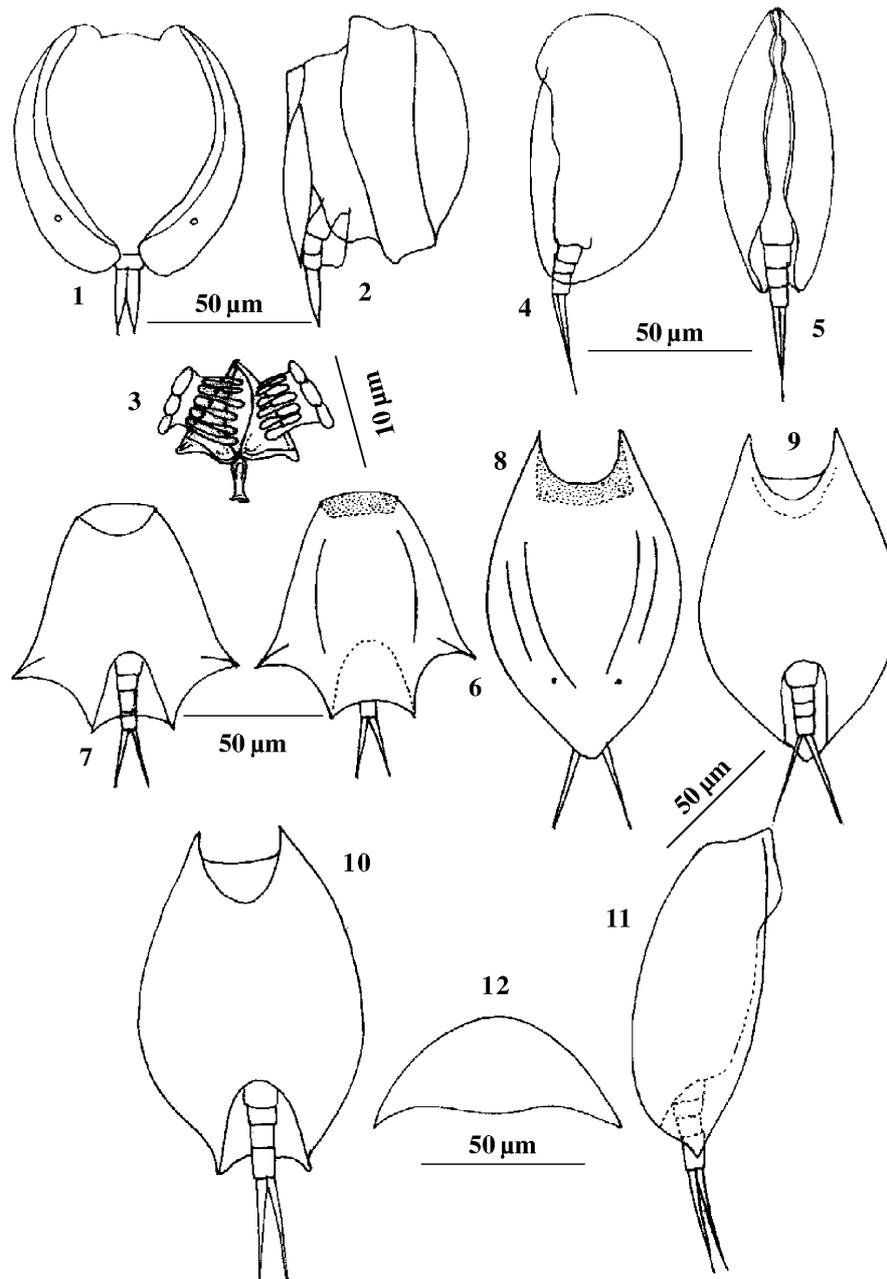
Material examined : 3 examples, R/BKS/Assam/259-261, Deepor beel, Dharapur (Kamrup district), 26.08.2006, coll. B.K. Sharma.

Characters : Lorica rhomboidal in outline, with moderately high dorsal keel and maximum width in its middle region. Dorsal sinus lacking. Ventral sinus shallow and semicircular. Foot-groove inverted U-shaped; toes short and pointed.

* New record from India

** New Record from N.E. India

*** New record from Assam



Tripleuchlanis plicata (Levander, 1894) : Fig. 1. dorsal view; Fig. 2. lateral view, Fig. 3. trophi; *Colurella colurus* (Ehrenberg, 1830) : Fig. 4. lateral view, Fig. 5. ventral view; *Lepadella bicornis* Vasisht & Battish, 1971; Fig. 6. dorsal view, Fig. 7. ventral view; *Lepadella elongata* Koste, 1992; Fig. 8. dorsal view, Fig. 9. ventral view; *Lepadella latusinus* (Hilgendorf, 1889); Fig. 10. ventral view, Fig. 11. lateral view, Fig. 12. cross-section.

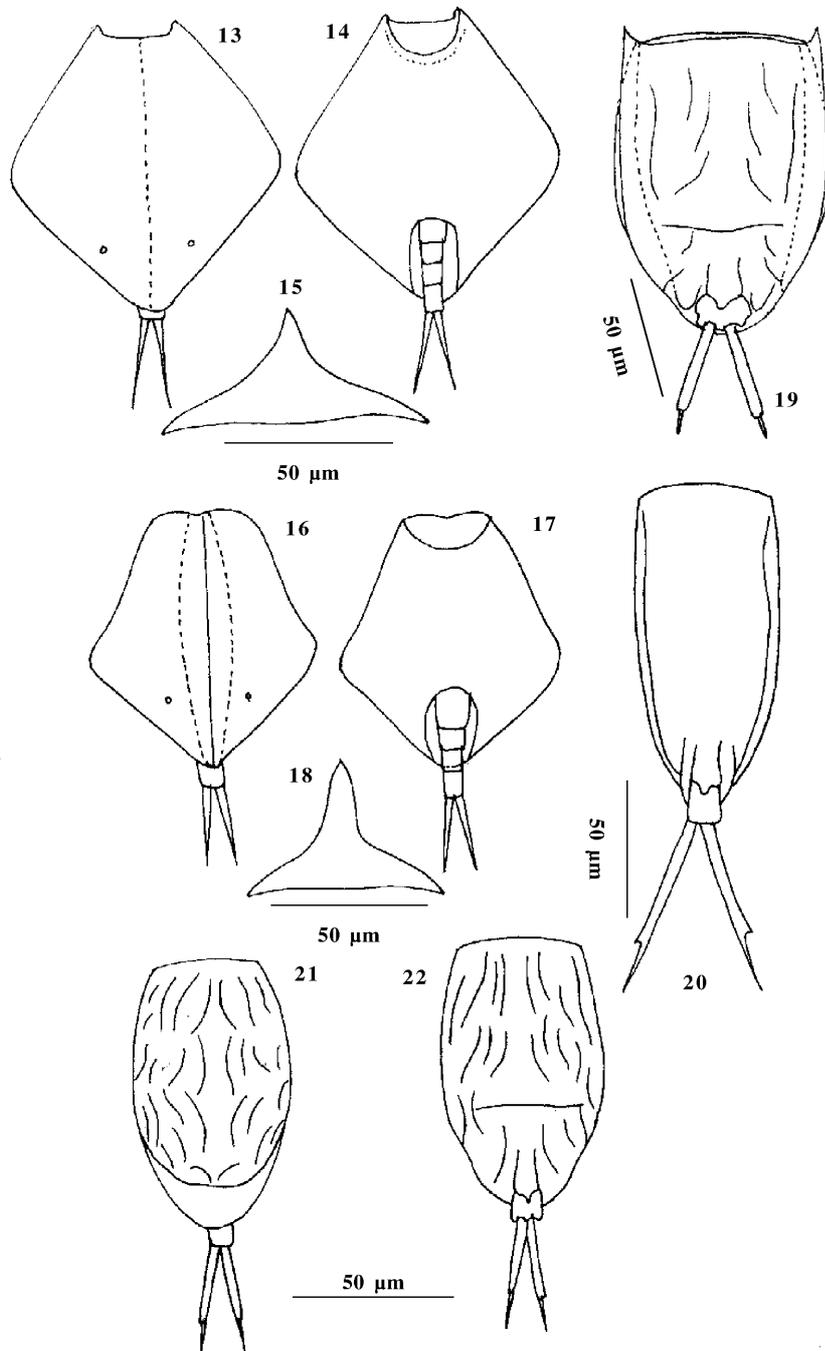
Distribution : N.E. India : New record. India : West Bengal. Elsewhere : African, Australian, Oriental and Palaearctic regions.

Lepadella triptera alata (Myers, 1934)
(Figs. 16-18)

Material examined : 4 examples, R/BKS/Assam/265-268, Deepor beel, Dharapur (Kamrup district), 26.08.2006, coll. B.K. Sharma.

Characters : Lorica small, rhombic in outline, broadest in its middle region. Dorsal surface of lorica vaulted, with high median keel and slightly produced posterior end. Head aperture small, with a slight median notch dorsally and shallow U-shaped sinus ventrally. Foot-opening small and oval. Toes short and pointed.

Distribution : N.E. India : New record. India : new record. Elsewhere : Cosmopolitan.



Lepadella rhomboidula (Bryce, 1890); **Fig. 13.** dorsal view; **Fig. 14.** ventral view; **Fig. 16.** cross-section; *Lepadella triptera alata* (Myers, 1934); **Fig. 16.** dorsal view; **Fig. 17.** ventral view, **Fig. 18.** cross-section; *Lecane aspasia* Myers, 1947; **Fig. 19.** ventral view; *Lecane elegans* Harring, 1914; **Fig. 20.** ventral view; *Lecane elongata* Harring & Myers, 1926; **Fig. 21.** dorsal view, **Fig. 22.** ventral view.

***Lecane aspasia* Myers, 1947**
(Figs. 19)

Material examined : 3 examples, R/BKS/Assam/280-282, Itakhuli beel, (Dibrugarh district), 12.05.2008, coll. B.K. Sharma.

Characters : Lorica elongated, lateral sulci shallow; anterior margins nearly straight and coincident and

ventral occipital margin with small antero-lateral spines. Dorsal plate narrow anteriorly, nearly as wide as ventral plate and ornamented. Ventral plate longer than wide, with incomplete transverse fold and few longitudinal folds. Posterior segment rounded. Foot pseudo segment wider than long and slightly projecting. Toes parallel-sided, with sharp completely separated claws.

Distribution : N.E. India : New record. India : Delhi.
Elsewhere : Cosmopolitan.

Lecane elegans Harring, 1914

(Fig. 20)

Material examined : 2 examples, R/BKS/Assam/289-290, Memdubi beel, Guijan (Tinsukia district), 15.05.2008, coll. B.K. Sharma.

Characters : Lorica smooth, elongated and slender, anterior occipital margins nearly straight and coincident. Lateral sluci indistinct. Ventral plate with few longitudinal folds. Foot plate large. Second foot-segment elongated and projects beyond lorica. Toes long, parallel-sided and slightly curved distally. Pseudo-claws long, curved and with distinct denticles and pointed tips.

Distribution : N.E. India : New record from Assam. India : Manipur. Elsewhere : Pantropical.

Lecane elongata Harring & Myers, 1926

(Figs. 21-22)

Material examined : 3 examples, R/BKS/Assam/294-296, Butikor beel, Dhemaji (Dhemaji district), 26.08.2006, coll. B.K. Sharma.

Characters : Lorica elongate, lateral sluci shallow; anterior margins coincident, anterior-lateral corners angulated. Dorsal plate ornamented, medially wider than ventral plate. Ventral plate elongate, with longitudinal and transverse folds. Posterior segment rounded. Foot plate narrow, coxal plates rounded. Foot pseudo-segment elongate and projecting. Toes parallel-sided and with long completely separated claws.

Distribution : N.E. India : New record. India : Delhi. Elsewhere : Holarctic region.

REMARKS

Ten interesting species of monogonont rotifers belonging to three eurotatorien families and four genera are recorded from the floodplain lakes of the Brahmaputra river basin. Amongst these, *Colurella colurus*, *Lepadella elongata*, *L. latusinus* and *L. triptera alata* are new records from India. In addition, four species namely *Tripleuchlanis plicata*, *Lepadella rhomboidula*, *Lecane aspasia* and *L. elongata* are new records from Northeastern India while *Lepadella bicornis* and *Lecane elegans* are new records from the

state of Assam. The recorded taxa are rare elements in the examined material and these include six Cosmopolitan, one Holarctic, one Palaeotropical and one Pantropical elements while one species is so far known from the Neotropical, Oriental and Palaearctic regions.

Among the members of the Lepadellidae, *Lepadella elongata* merits distributional interest with earlier reports from Brazil, Ecuador and Nigeria and, its only report from the Oriental region dealt with occurrence in Thailand (Sanoamuang and Savatentalinton, 1999). The present second report of this species from the Oriental region now extends its distributional range to the Indian subcontinent. *L. latusinus* is another interesting addition to the Rotifera fauna of this subcontinent though it is known to exhibit wider global distribution (Segers, 2007). *L. triptera alata*, yet another new record of the Lepadellidae from India, differs from the typical *L. triptera* (Ehrenberg) in the characteristic shape of lorica and restricted occurrence in spite of its apparently cosmopolitan nature.

Lepadella bicornis was originally described by Vasisht and Battish (1971) from a fish pond at Chandigarh (North India) and was not known from the Indian subcontinent since its description. Segers *et al.* (1993) provided the only confirmed report of this species from the Rio Abobral and Rio Paraguai (Pantal region, Brazil). On the other hand, it was erroneously identified as *L. ehrenbergi* from Rio Tapajos (Koste, 1974) and as *L. pterygoida* from Rio Nhamunda (Brandorff *et al.*, 1982) from the Amazon region, Brazil. The recent report (Sharma, 2007) of this interesting palaeotropical species from Loktak lake (a Ramsar site) represents the second Indian record since its description. The present report of this species from Assam adds further to extension of its distributional range within N.E. India. In addition, *L. rhomboidula* is so far known from India only from West Bengal (Sharma, 1978); the present second report of this rare species from this country, extends its distributional range to N.E. Region.

The cosmopolitan *Colurella colurus*, a new report from India, is another interesting member of the Lepadellidae. It is often confused with *C. adriatica* but can be differentiated by the rounded or blunt-spined posterior lorica.

The Lecanidae includes three species with regional biogeographical importance in the Indian fauna. Among these, the Holarctic *L. elongata* is so far recorded from the back waters of the river Yamuna at Delhi (Arora and Mehra, 2003). Its present disjunct report from the floodplains of the Brahmaputra river basin, therefore, extends its distribution to Northeastern India. The cosmopolitan *L. aspasia* is so far known from this country from Delhi (Segers *et al.*, 1994). The occurrence of this lecanid in a floodplain lake of Assam is yet another example of extension of its distributional range to N.E. region. The pantropical *L. elegans*, third member of the Lecanidae, is recorded recently from India from Loktak lake, Manipur (Sharma, 2007) and is now examined from the state of Assam.

The genus *Tripleuchlanis* (Family : Euchlanidae) is represented by only one species i.e., *T. plicata* from the Indian inland waters. This euchlanid was first reported from India from West Bengal (Sharma, 1979) and is so far recorded from Andhra Pradesh and Tamil Nadu. The present report, therefore, extends its distributional range to Northeastern region. Interestingly, this species is currently examined from Deepor beel (a Ramsar site) but was not observed so far in our earlier collections from this wetland since the last one decade.

The present report raises the Rotifera richness known so far from Northeastern India (Sharma and Sharma, 2005a) to 210 species belonging to 44 genera and 21 families. The occurrence of the stated new records highlights our earlier comments (Sharma, 2005, Sharma and Sharma, loc cit.) on the global importance of the floodplain lakes of the Brahmaputra basin as 'hotspots' for the Rotifer biodiversity and also lays emphasis on analysis of more extensive collections from

these ecotones. Interesting, three taxa are new additions to the rotifer fauna of Deepor beel studied earlier by Sharma and Sharma (2005b), thereby, raising total richness from this Ramsar site to 113 species-the second highest qualitative diversity of Phylum Rotifera so far reported from any floodplain lakes of the Indian subcontinent.

SUMMARY

Plankton samples examined from the floodplain lakes of the Brahmaputra river basin revealed 10 species of interesting monogonont Rotifera belonging to three families and four genera. Among these, *Colurella colurus*, *Lepadella elongata*, *L. latusinus* and *L. triptera alata* are new records from India; *Tripleuchlanis plicata*, *Lepadella rhomboidula*, *Lecane aspasia* and *L. elongata* are new records from Northeastern India and, *Lepadella bicornis* and *Lecane elegans* are new records from the state of Assam. The recorded taxa are rare elements in the examined material and these include six Cosmopolitan, one Holarctic, one Palaeotropical and one Pantropical elements while one species is so far known from Neotropical, Oriental and Palaearctic regions.

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