Rec. zool. Surv. India : **106**(Part–3) : 79-96, 2006

ROTIFER DIVERSITY (ROTIFERA : EUROTATORIA) OF FLOODPLAIN LAKES OF POBITORA WILD LIFE SANCTUARY, ASSAM

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INTRODUCTION

Floodplain wetlands, an integral component of tropical riverine systems of the world, are known to be the richest habitats for the rotifer diversity (Segers *et al.*, 1993; Sanoamuang, 1998; Sharma and Sharma, 2001; Sharma, 2005). Various wild life sanctuaries of North-Eastern India and that of the state of Assam are characterized by myriads of floodplain lakes (locally known as "beels") providing habitat par excellence for several wild animals as well as a wide array of vertebrates and invertebrates. However, no attention has so far been focused on the micro-faunal diversity of beels of sanctuaries of N. E. region in general and that of Rotifera in particular. The members of the later Phylum invariably comprise a dominant group of micro-invertebrate communities of these interesting ecotones and contribute significantly to their productivity.

The present study assumes special importance in view of the stated lacunae and deals with qualitative and quantitative diversity of summer rotifer communities of twelve perennial and seasonal floodplain lakes (beels) of the Pobitora Wild life Sanctuary, Assam. Various interesting species are briefly diagnosed and illustrated. Remarks are made on nature and composition of the examined fauna, distribution of interesting species and on richness, similarity, abundance, diversity, dominance and evenness of the rotifer communities.

MATERIALS AND METHODS

Water and plankton samples were collected, during summer season (April 4–6, 2005), from nine perennial (Solmari, Haduk, Sitalmari, Goranga, Kandhi, Dhuptoli, Dholi, Gorkhonjan, Jagdal) and three seasonal (Tamuli dova, Pagla dova, Lamba dova) floodplain lakes ("beels") of the Pobitora Wild life Sanctuary (Lat : 26°12'–26°15' N; Long : 90°02'–90°05' E; area : 15.9 sq. km).

Water samples, collected from the selected beels, were examined for water temperature, specific conductivity and pH with field probes while dissolved oxygen and other chemical parameters are analyzed following A.P.H.A. (1992). Plankton samples were collected with a nylobolt plankton net (No. 25, mesh size : 55 µm) and were preserved in 5% formalin. The rotifer species present in all the samples were identified and their densities measured. Various rotifer taxa were identified following Koste (1978), Segers (1995) and Sharma & Sharma (1987, 1997, 1999, 2000). The drawings were made with a Leitz-Dialux phase contrast stereoscopic microscope and measurements were indicated in micrometers (µm). Percentage similarities (Sorensen index), diversity (Shannon index), dominance (Berger-Parker index) and evenness (El index) were calculated following Ludwig & Reynolds (1988) and Magurran (1988). Ecological correlations were examined using correlation coefficients and canonical analysis.

SYSTEMATIC LIST OF THE EXAMINED ROTIFER TAXA

Phylum ROTIFERA

Class EUROTATORIA

Subclass MONOGONONTA

Order PLOIMIDA

Family : BRACHIONIDAE		Family : MYTILINIDAE	
Anuraeopsis fissa (Gosse, 1851)	C	*Mytilina bisulcata* (Lucks, 1912)	Pt
Brachionus angularis (Gosse, 1851)	C	*M. ventralis* (Ehrenberg, 1832)	C
B. bidentatus Anderson, 1889	Pt	Family : TRICHOTRIIDAE	
B. donneri Brehm, 1951	Pt	*Macrochaetus longipes* (Myers, 1934)	C
B. falcatus Zacharias, 1898	Pt	*M. sericus* (Thorpe, 1893)	Pt
B. forficula Wierzejski, 1891	Pt	*Trichotria tetractis* (Ehrenberg, 1830)	C
B. mirabilis Daday, 1897	T	Family : LEPADELLIDAE	
B. quadridentatus (Hermann, 1783)	C	*Colurella uncinata* (O.F. Müller, 1773)	C
Keratella lenzi Hauer, 1953	Pt	*Lepadella acuminata* (Ehrenberg, 1834)	C
K. tropica (Apstein, 1907)	C	*L. ehrenhergi* (Perty, 1850)	C
Platyias quadricornis (Ehrenberg, 1832)	C	*L. cristata* (Rousselet, 1893)	C
Platinous patulus (O.F. Müller, 1786)	C	*L. heterostyla* (Murray, 1913)	C
P. patulus macracanthus (Daday, 1905)	N	*L. ovalis* (O.F. Müller, 1786)	C
Family : EPIPHANIDAE		*L. patella* (O.F. Müller, 1773)	C
Epiphanes brachionus (Ehrenberg, 1837)*	C	*L. rhomboides* (Gosse, 1886)	C
Family : EUCHLANIDAE		*L. triptera* Ehrenberg, 1830	C
Euchlanis dilatata Ehrenberg, 1832	C		
Dipleuchlanis propatula (Gosse, 1886)	C		

Family : LECANIDAE		Family : SCARIDIIDAE	
Lecane aculeata (Jakubski, 1912)	T	*Scaridium longicaudum* (O.F. Müller, 1786)	C
L. bifurca (Bryce, 1892)*	C	Family : TRICHOCERCIDAE	
L. bulla (Gosse, 1851)	C	*Trichocerca bicristata* (Gosse, 1887)	C
L. crepida Harring, 1914	T	*T. cylindrica* (Imhof, 1891)	Pa
L. closterocerca (Schmarda, 1898)	C	*T. kostei* Segers, 1993*	Pa
L. curvicornis (Murray, 1913)	T	*T. similis* (Wierzejski, 1893)	C
L. furcata (Murray, 1913)	C	Family : ASPLANCHNIDAE	
L. hastata (Murray, 1913)	T	*Asplanchna priodonta* Gosse, 1850	C
L. hamata (Stokes, 1896)	C	Family : SYNCHAETIDAE	
L. inermis (Bryce, 1892)	C	*Polyarthra vulgaris* Carlin, 1943	C
L. leontina (Turner, 1892)	T	Order : GNESIOTROCHA	
L. ludwigii (Eckstein, 1883)	C	Family : FILINIIDAE	
L luna (O. F. Müller, 1776)	C	*Filnia camasecla* Myers, 1938	Pt
L. lunaris (Ehrenberg, 1832)	C	*Filinia longiseta* (Ehrenberg, 1834)	C
L. monostyla (Daday, 1897)	T	Family : TESTUDINELLIDAE	
L. papuana (Murray, 1913)	T	*Testudinella emarginula* (Stenroos, 1898)	C
L. quadridentata (Ehrenberg, 1832)	C	*T. parva* (Ternetz, 1892)	C
L. signifera (Jennings, 1896)	T	*T. patina* (Hermann, 1783)	C
L. sola Hauer, 1936	Pt	Subclass : BDELLOIDEA	
L. unguitata (Fadeev, 1925)	Pt	Family : PHILODINIDAE	
L. ungulata (Gosse, 1887)	C	*Rotaria rotatoria* (Pallas, 1766)	C
Family : NOTOMMATIDAE			
Monommata longiseta (O.F. Müller, 1786)	C		

*New record from N.E. India, Pa–Palaeotropical, Pt–Pantropical, T–Tropicopolitan, N–Neotropical, C–Cosmopolitan

TAXONOMIC NOTES ON INTERESTING SPECIES

Brachionus donneri Brehm, 1951

(Fig. 1)

Characters : Lorica oval and strongly compressed dorso-ventrally. Anterior occipital margin with six blunt spines and ventral margin with four short blunt spines. Lateral antennae located on conical lateral protuberances. Foot-opening deep and flanked with distinct club-shaped projections.

Distribution : INDIA : Assam, Meghalaya, Tripura, West Bengal and Tamil Nadu.

Elsewhere : Tropics and subtropics.

Brachionus forficula Wierzejski, 1891
(Fig. 2)

Characters : Lorica rigid, moderately compressed dorso-ventrally and finely stippled. Anterior margin with four occipital spines, laterals longer than medians. Posterior spines stout, inwardly directed and widely separated at their bases; each with a knee-like swelling on inner side near the base.

Distribution : INDIA : Assam, Meghalaya, Tripura, West Bengal, Orissa, Bihar, Andhra Pradesh, Gujarat and Punjab.

Elsewhere : Tropics and subtropics.

Brachionus mirabilis Daday, 1897
(Fig. 3)

Diagnosis : Ventral plate of lorica produced into two characteristic posterior spines extending backwards at an angle of 45°. Foot-opening situated between the bases of ventral spines and surrounded by a sheath,

Distribution : INDIA : Assam, Meghalaya, Tripura and West Bengal.

Elsewhere : Tropics and subtropics.

Macrochaetus longipes (Myers, 1934)
(Fig. 4)

Diagnosis : Lorica serrated, compressed dorso-ventrally and characterized by 12 long spines.

Distribution : INDIA : Assam and Meghalaya.

Elsewhere : Cosmopolitan.

Mytilina bisulcata (Lucks, 1912)
(Fig. 5)

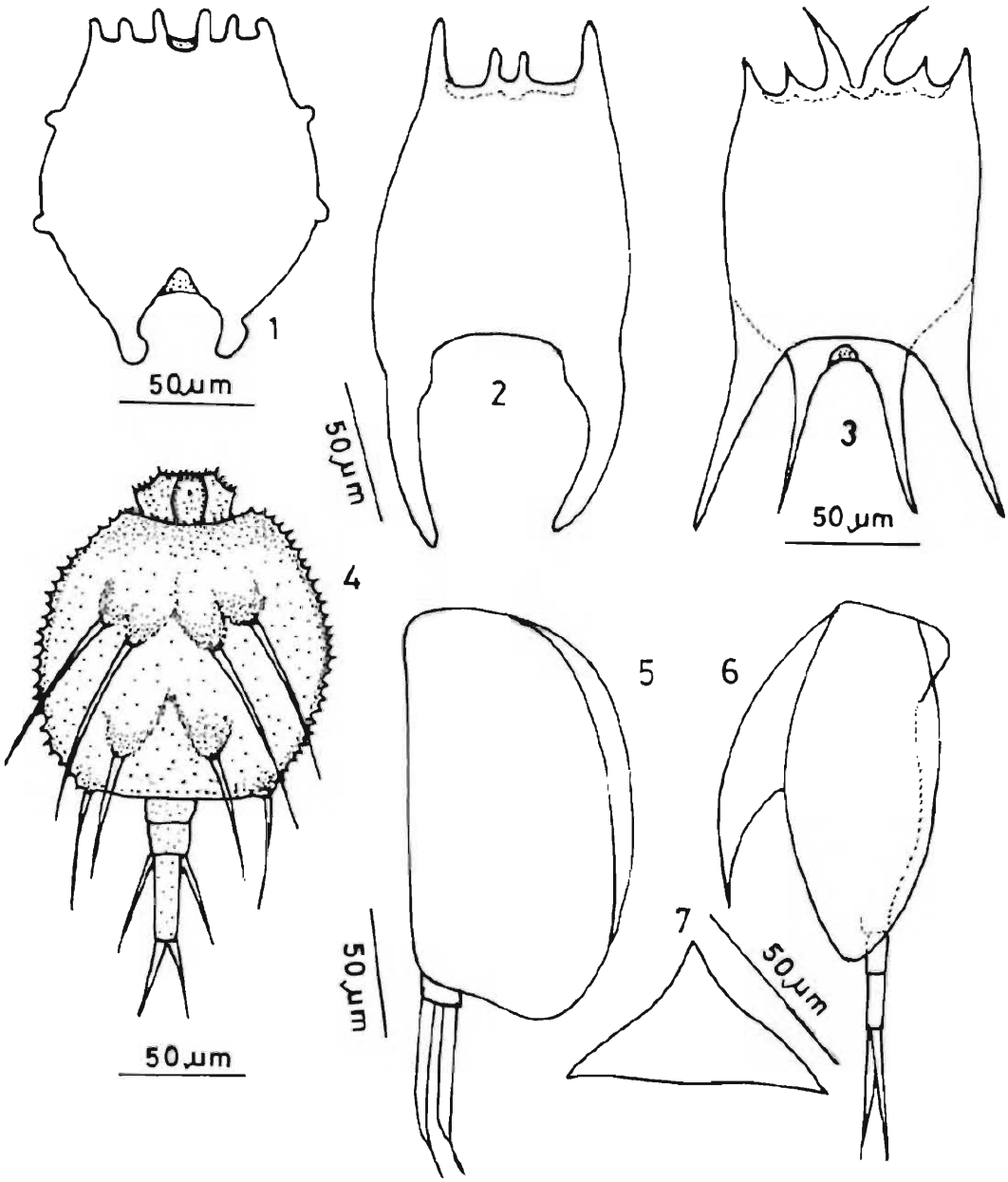
Characters : Lorica thin, and its anterior end with two folds; almost rounded in cross section and dorsal keel with three stumps. Toes long, slender and terminating into distinct slender spines.

Distribution : INDIA : Assam, Meghalaya, Tripura, West Bengal and Orissa.

Elsewhere : Tropics and subtropics.

Lepadella cristata (Rousselet, 1893)
(Figs. 6 & 7)

Characters : Lorica oval, with a dorsal median keel and a distinct dorsal crest. Anterior dorsal margin nearly straight; anterior ventral margin with a V- shaped sinus. Last foot-joint projecting beyond lorica. Toes long and pointed.



Figs. 1-7. : 1. *Brachionus donneri* Brehm, dorsal view; 2. *B. forficula* Wierzejski, dorsal view; 3. *B. mirabilis* Daday, dorsal view; 4. *Macrochaetus longipes* (Myers), dorsal view; 5. *Mytilina bisulcata* (Myers), lateral view; 6 & 7. *Lepadella cristata* (Rousselet), lateral view and cross-section.

Distribution : INDIA : Assam, Meghalaya, Tripura and West Bengal.

Elsewhere : Cosmopolitan.

Epiphanes brachionus (Ehrenberg, 1837)
(Fig. 8)

Characters : Body sacciform, semi-loricate; integument soft. Foot distinct, with three pseudo-segments, toes short. Pseudo-lorica with short lateral spines (var. *spinosus* Rousselet, 1901) in some specimens.

Distribution : INDIA : Kashmir and Delhi.

Elsewhere : Cosmopolitan.

Lecane bifurca (Bryce, 1892)
(Fig. 9)

Diagnosis : Lorica small, oval compressed and without any markings. Ventral plate slightly narrower than dorsal plate and with small posterior projections. Toe small, claws divergent.

Distribution : INDIA : Delhi and Orissa.

Elsewhere : Cosmopolitan.

Lecane hastata (Murray, 1913)
(Fig. 10)

Characters : Lorica oval, anterior margins coincident and anterior external angles of ventral plate with two small anteriorly directed spines. Dorsal plate smaller than ventral plate. Toes parallel-sided, slightly swollen at their free ends; claws distinct, with swollen bases.

Distribution : INDIA : Assam, Tripura and West Bengal.

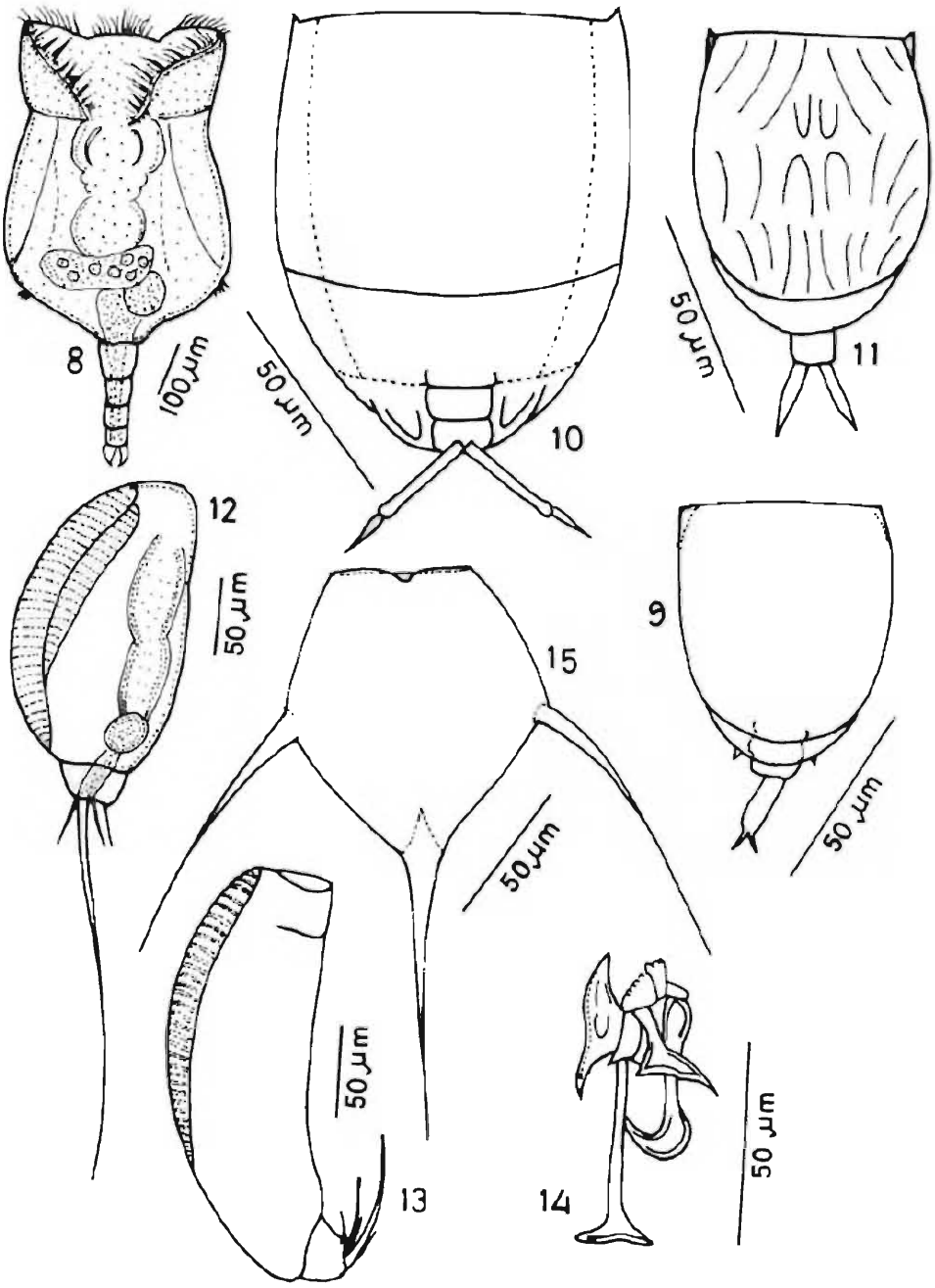
Elsewhere : Tropicopolitan.

Lecane sola Hauer, 1936
(Fig. 11)

Characters : Lorica small, oval, with straight and coincident anterior margins. Dorsal plate with distinct pattern. Ventral plate smaller than dorsal plate and with small spines at its external angles. Second foot-segment elongated, projecting beyond posterior end of lorica. Toes parallel-sided for about half of their length and then tapering to pointed tips.

Distribution : INDIA : Assam, Tripura and Tamil Nadu.

Elsewhere : Tropics and subtropics.



Figs. 8-15. : 8. *Epiphanes brachionus* (Ehrenberg), dorsal view; 9. *Lecane bifurca* (Bryce), dorsal view; 10. *L. hastata* (Murray), ventral view; 11. *L. sola* Hauer, dorsal view; 12. *Trichocerca bicristata* (Gosse), lateral view; 13 & 14. *T. kostei* Segers, lateral view and trophi; 15. *Filinia camasecla* Myers, dorsal view.

Trichocerca bicristata (Gosse, 1887)
(Fig. 12)

Diagnosis. Lorica with two characteristic distinct keels extending upto 2/3 the length of dorsum. Left toe longer than body, right toe reduced; substyles present.

Distribution : INDIA : Bihar, Orissa and Assam.

Elsewhere : Cosmopolitan.

Trichocerca kostei Segers, 1993
(Figs. 13 & 14)

Characters : Body (lorica) elongated, slightly curved; dorsal keel extending to more than half the body length. Right toe about half the length of left toe; each toe with 2–3 basal spines. Trophi characteristic and strongly asymmetrical.

Distribution : INDIA : Kerala.

Elsewhere : Palaeotropical.

Filinia camasecla Myers, 1938
(Fig. 15)

Characters : Body vase-shaped, with maximum width nearly in the middle region. Anterior dorsal margin straight, anterior ventral margin slightly elevated and with a shallow median sinus. Body with two lateral and one caudal stout and broad-based setae (spines); lateral setae nearly double the length of body.

Distribution : INDIA : Assam and Tripura.

Elsewhere : Tropics arid subtropics.

RESULTS AND DISCUSSION

All the sampled floodplain lakes (Table 1) are characterized by low ionic concentrations (mean conductivity : 138.9 ± 35.7 µS/cm). Water temperature (29.5–31.5°C) affirms a tropical range concurrent with geographical location of these ecosystems. Dissolved oxygen (4.8–7.9 mg/l) indicates oxygenated nature of all the beels which also record occurrence of free CO_2 (4.0–12.0 mg/l). pH indicates slightly acidic character (6.75–6.82) of two beels, three show nearly neutral nature (7.02–7.07) while seven exhibit alkaline waters (7.10–7.56). Nine beels exhibit soft or nearly soft-waters and the rest indicate marginally hard-waters. The recorded salient features confirm with earlier observations of Sharma (2000a, 2000b, 2005) and Sharma & Sharma, 2001) in several floodplain lakes of upper and lower Assam. In addition, the studied beels are “Calcium-poor”

water bodies with lower concentrations of micronutrients, sulphate, chloride and dissolved organic matter.

Sixty-four species recorded presently indicate fairly rich α-diversity of summer rotifer communities of the floodplain lakes of the Pobitora Wild-life sanctuary. The documented species form a notable fraction of North-Eastern Indian Rotifera (33.9%) and that of the fauna of Assam (37.5%). Total richness compares with the report of an identical number of species from five beels of upper Assam (Sharma, 2000a) while it is certainly higher than the reports of 29 species from four beels {Goswami, 1997), 48 species from 33 beels (Sarma, 2000), and 9 species from one beel (Goswami & Goswami, 2001) of Assam state, respectively. The observed richness is also higher than the report of 37 species from two Ox-bow lakes (Khan, 2002) and 38 species from 9 floodplain lakes (Khan, 2003) of South-eastern West Bengal.

Trichocerca kostei. Epiphanes brachionus and *Lecane bifurca* are new records from N.R. India. Among these rare elements, the palaeotropical *T. kostei* is so far known from India only from Kerala, *E. brachionus* is recorded from Kashmir and Delhi while the last lecanid is reported from Delhi and Orissa. Besides, *Macrochaetus longipes, Lecane monostyla* and *Filinia camasecla* deserve special mention because their occurrence is so far restricted to N. E. India. In addition, the examined material indicates several species of regional distributional/local importance namely *Brachionus donneri, B. mirabilis, Keratella lenzi, Lecane hastata, L. sola, Trichocerca bicristata* and *Testudinella parva*.

Nearly 67% of the recorded species are cosmopolitan. Pantropical (9 species) = cosmotropical/ tropicopolitan (9 species) elements, together, are well represented (28.2%). The examined collections also indicate three Palaeotropical species. Fourteen species (21.9%) are considered rare and these include *Brachionus donneri, B. forficula, Keratella lenzi, Epiphanes brachionus, Mytilina bisulcata, Lepadella cristata, Lecane bifurca, L. furcata, L. hastata, L. monostyla, L. signifera, L. sola, Trichocerca kostei* and *Filinia camascela.* On the other hand, twelve species (18.7%) exhibit common occurrence in various beels; they include *Brachionus falcatus, B. quadridentatus, Keratella tropica, Plationus patulus, Mytilina ventralis, Trichotria tetractis, Lecane bulla, L. leontina, L. lunaris, L. quadridentata, Asplanchna priodonta, Polyarthra vulgaris* and *Testudinella patina.*

The sampled beels depict qualitative and quantitative predominance of rotifers over other groups of zooplankton. This characteristic feature concurs with the findings of Sarma (2000), Sharma (2000a, 2000b, 2005), Sharma & Sharma (2001) and Khan (2002), The rotifer communities of different beels show 59.1–90.7% similarity (Table 2). A majority of instances in the matrix record higher similarity *i.e.*, about 88% instances show similarity > 60.0–80.0% while 66.7% instances register similarity between 70.0–80.0%. Higher similarity results from common occurrence of 12 species in all beels and occurrence of another 7 species in 10–11 beels. Peak and minimum similarities are noted between Tamuli dova *vs*. Dholi and Gorkhonjan *vs*. Lamba dova respectively.

In general, the similarity range noted presently is higher than 42.9–80.4% (Sharma & Sharma, 2001) and 37.3–68.8% (Sharma, 2000b) reported earlier from the beels of the upper Assam. Further, the rotifer taxocoenosis of the perennial beels shows 74.2 % similarity with species recorded from the seasonal beels.

Lecanidae (21 species) > Brachionidae (12 species) > Lepadellidae (9 species) constitute a dominant fraction (65.6%) of overall rotifer richness and that of the communities of individual beels. This feature also agrees with general composition of the Indian Rotifera (Sharma, 1998) and that of N.E. India (Sharma & Sharma, 2005). In addition, Trichocercidae > Testudinellidae are other qualitatively notable families (10.9%).

'Tropic-centered' genus *Lecane* is a significant component (32.8%) of total rotifer richness and that of the faunas of individual beels and, hence, compares well with floodplain rotifer communities studied by Segers *et al*. (1993, 1998), Sanoamuang (1998), Jose de Paggi (2001), Sharrna & Sharma (2001) and Sharma (2005). This salient feature assigns a general "tropical character" to the examined taxocoenosis and also concurs with the composition of 'tropical rotifer faunas' from different parts of the globe (Green, 1972; Pejler, 1977; Fernando, 1980; Dumont, 1983; Dussart *el al*. 1984; Segers, 1996,2001; Sharma, 1998). This generlization is also supported by distinct paucity of 'temperate-centered' *Keratella* (2 species). In addition, *Lepadella* (8 species) and 'tropic-centered' *Brachionus* (7 species) deserve mention for their qualitative contributions (23.4%).

The rotifer richness (31–51, 37 ± 5 species) in different beels (Table 3) is a little lower than 42–68 species noticed in summer communities of certain other floodplain lakes of Assam (Sharma, 2005) while it is certainly higher than 11–20 species observed during the corresponding season in five floodplain lakes of upper Assam (Sharma, 2000b). Peak richness in Sitalmari (51 species) is followed by occurrence of 44 species in Solmari while 31–39 species are recorded in rest of the beels. The rotifer richness registers significant direct correlations with density ($r = 0.625$, $p = 0.05$), specific conductivity ($r = 0.626$, $p = 0.05$), alkalinity ($r = 0.801$, $p = 0.01$) and hardness ($r = 0.642$, $p = 0.05$) while it shows an inverse relationship with water temperature ($r = -0.574$, $p = 0.05$).

The rotifers comprise between 49.4–64.7% of zooplankton densities of the sampled beels and show variations (Table 3) in their abundance (101–257, 166 ± 57 n/l). The recorded range concurs with the earlier reports of Sharma (2000a, 2005). Peak density in Haduk is followed by Sitalmari > Solmari > Goranga while the density is relatively lower (101–170 n/1) in rest of the beels, Brachionidae (33–138, 61 ± 41 n/1) > Lecanidae (29–74, 49 ± 16 n/1) > Lepadellidae (6–20, 12 ± 4 n/1 contribute mainly to rotifer abundance in various beels. Of the individual species only *K. tropica* (24 ± 26 n/1) shows quantitative importance. Besides, *Plationus patulus* > *Lecane bulla Polyarthra vulgaris* > *Brachionus falcatus* > *Lecane leontina*, all with mean density less than 10 n/1 each, represent subdominant species. The rotifer density shows significant direct

relationships with alkalinity (r = 0.571, p = 0.05), hardness (r = 0.692, p > 0.05) and chloride (r = 0.618, p > 0.05) and an inverse correlation with water temperature (r = 0.552). Canonical analysis indicates nearly 63% (R^2 = 0.6289) cumulative influence of seven abiotic factors namely water temperature, pH, conductivity, dissolved oxygen, free CO_2, alkalinity and hardness while nine abiotic factors (water temperature, pH, conductivity, dissolved oxygen, free CO_2, alkalinity, hardness, chloride, dissolved organic matter) result in still higher cumulative influence (R^2 = 0.7889).

The rotifer communities of different beels are characterized (Table 3) by higher diversity (2.666–3.393, 3.193 ± 0.207); the recorded values are even higher than the findings of Sharma (2005) and distinctly higher than the results of Sharma (2000a). The diversity records no significant relationship with richness, density and various abiotic factors. The present observations register low dominance (0.080–0.447; 0.159 ± 0.096) which, in turn, affirms quantitative influence of fewer species and, hence, endorses the quantitative results The dominance shows significant direct correlations with alkalinity (r = 0.696, p = 0.02), hardness (r = 0.856, p > 0.01) and chloride (r = 0.767, p > 0.01) and an inverse relationship with water temperature r = –0.619, p = 0.05). This study reflects a higher evenness (0.704–0.962; 0.881 ± 0.061) and affirms an equitable abundance of a majority of species. The evenness exhibits significant inverse correlations with dominance (r = –0.847, p = 0.01), conductivity (r = –0.614, p = 0.05), alkalinity (r = –0.857, p = 0.01), hardness (r = –0.845, p = 0.01) and chloride (r = –0.681, p = 0.02) while it records direct correlation with water temperature (r = 0.565, 0.05).

The present study, though limited to collections during summer season, provides valuable information on qualitative and quantitative diversity of the rotifer communities of beels of the Brahmaputra river basin, lower Assam. Besides, it presents a pioneering account of the rotifer diversity of Rotifera of wetlands of any wild-life sanctuary of N.E. India

SUMMARY

The summer rotifer communities of twelve perennial and ephemeral floodplain lakes of the Pobitora wild-life sanctuary reveal 64 species, belonging to 20 genera and 15 families. *Trichocerca kostei*, *Epiphanes brachionus* and *Lecane bifurca* are new records from N.E India. *Macrochaetus longipes*, *Lecane monostyla* and *Filinia camasecla* are so far known only N.E. India. *Brachionus donneri*, *B. mirabilis*, *Keratella lenzi*, *Lecane hastata*, *L. sola*, *Trichocerca bicristata* and *Testudinella parva* are examples of regional distributional/local importance. Cosmopolitan species predominate (67.2%) the recorded species while Pantropical = cosmotropical elements are well represented (28.2%). Fourteen species exhibit rare occurrence and twelve species exhibit common occurrence in various beels. The zooplankton communities of all the beels show qualitative predominance of rotifers, and register 59.1–90.7% similarity. Lecanidae > Brachionidae > Lepadellidae constitute a dominant fraction (65.6%) of alpha-diversity while Trichocercidae > Testudinellidae are other

notable families (10.9%). 'Tropic-centered' genus *Lecane* comprises a significant component (32.8%) of the recorded richness while *Lepadella* (8 species) and *Brachionus* (7 species) also deserve mention for their qualitative contributions (23.4%).

The richness (31–51, 37 ± 5 species) in different beels registers significant direct correlations with density, specific conductivity, alkalinity and hardness and shows an inverse relationship with water temperature. The rotifer abundance (101–257, 166 ± 57 n/1) records variations in different beels; it shows significant direct relationships with alkalinity, hardness and chloride and an inverse correlation with water temperature. Seven abiotic factors namely water temperature, pH, conductivity, dissolved oxygen, free CO_2, alkalinity and hardness indicate a cumulative influence of nearly 63% (R^2 = 0.6289) while nine abiotic factors (water temperature, pH, conductivity, dissolved oxygen, free CO_2, alkalinity, hardness, chloride, dissolved organic matter) result in still higher cumulative influence (R^2 = 0.7889). Brachionidae > Lecanidae > Lepadellidae contribute mainly to rotifer abundance. Of the individual species only *K. tropica* shows quantitative importance. The rotifer diversity (2.666–3.393, 3.193 ± 0.207) records insignificant relationships with richness, density and abiotic factors. The rotifer communities are characterized by low dominance and higher evenness. The dominance shows significant direct correlations with alkalinity, hardness and chloride and an inverse relationship with water temperature. The evenness records significant inverse correlations with dominance, alkalinity, hardness and chloride while it shows a direct correlation with water temperature.

ACKNOWLEDGMENTS

The author is grateful to the Director, Zoological Survey of India, Kolkata and the Officer-in-charge, Eastern regional Station, Zoological Survey of India, Shillong for kind permission and facilities for the project on "Zooplankton Diversity of Floodplain lakes of Assam" during which the present study is undertaken. Sincerest thanks are due to the Chief Conservator of Forests, Assam and Sh. T. K. Das, Planning Officer for kind permission for the visit. The help extended by Sh. R. N. Das, Range Officer, Pobitora Wild Life Sanctuary and his forest staff is gratefully acknowledged. The author is also thankful to Messers K. K. Deb and J. Japang for help in field collections.

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Table 1. : Abiotic parameters of floodplain lakes of Pobitora Wildlife Sanctuary.

Parameters/Localities	Range	Mean ± SD
Water temperature (°C)	29.5 – 31.5	30.5 ± 0.7
pH	6.75 – 7.56	7.14 ± 0.20
Specific Conductivity (μS/cm)	68.6 – 190.6	138.9 ± 35.7
Dissolved oxygen (mg/l)	4.8 – 7.9	6.2 ± 0.8
Free Carbon dioxide (mg/l)	4.0 – 12.0	7.7 ± 2.4
Alkalinity (mg/l)	30.0 – 68.0	44.6 ± 10.1
Hardness (mg/l)	26.0 – 72.0	39.8 ± 12.7
Calcium (mg/l)	16.2 – 31.5	21.6 ± 10.5
Magnesium (mg/l)	0.437 – 1.067	0.639 ± 0.222
Chloride (mg/l)	4.9 – 18.9	10.1 ± 4.6
Phosphate (mg/l)	0.027 – 0.340	0.120 ± 0.103
Nitrate (mg/l)	0.043 – 0.439	0.165 ± 0.128
Sulphate (mg/l)	2.253 – 16.495	7.633 ± 3.792
Dissolved organic matter (mg/l)	1.200 – 3.825	2.531 ± 0.917

Table 2. : Percentage similarity (Sorenson's index) between rotifer communities of floodplain lakes of Pobitora Wildlife Sanctuary.

Localities	1	2	3	4	5	6	7	8	9	10	11	12
1	–	68.3	75.8	71.6	66.7	79.5	76.9	74.3	82.5	74.1	74.3	73.7
2		–	78.6	77.3	69.6	75.3	72.3	80.5	78.4	69.3	77.8	71.4
3			–	75.0	65.8	84.4	77.6	75.3	78.2	77.3	75.3	72.3
4				–	67.6	73.4	72.3	78.9	82.2	81.8	70.4	66.7
5					–	71.4	73.8	70.8	65.7	70.6	64.6	73.0
6						–	77.8	68.5	90.7	68.4	76.7	73.2
7							–	70.6	77.1	73.2	70.6	66.7
8								–	77.1	76.1	70.6	78.8
9									–	71.2	80.0	79.4
10										–	59.1	69.6
11											–	66.7
12												–

1–Solmari, 2–Haduk, 3–Sitalmari, 4–Goranga, 5–Kandhi, 6–Tamuli dova, 7–Pagla dova, 8–Dhuptoli, 9–Dholi, 10–Gorkhonjan, 11–Lamba dova, 12–Jagdal.

Table 3. : Abundance of Rotifera (n/l) in floodplain lakes of Pobitora Wildlife Sanctuary.

Rotifer taxa / localities	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Family : BRACHIONIDAE												
Anuraeopsis fissa (Gosse)	1	–	5	–	–	–	2	–	–	–	2	–
Brachionus angularis (Gosse)	5	10	20	–	–	–	5	3	–	2	–	2
B. bidentatus Anderson	4	–	–	–	–	–	–	–	–	–	–	–
B. donneri Brehm	2	2	–	–	–	–	–	–	–	–	–	–
B. falcatus Zacharias	6	10	20	15	–	5	5	5	7	5	6	–
B. forficula Wierzejski	–	58	10	–	–	–	–	–	–	–	2	–
B. mirabilis Daday	1	–	1	–	2	–	–	1	–	1	–	1
B. quadridentatus (Hermann)	5	5	5	1	–	1	1	–	2	1	–	1
Keratella lenzi Hauer	–	–	–	–	–	–	–	–	–	–	–	1
K. tropica (Apstein)	102	45	32	30	8	12	–	8	12	10	18	12
Platyias quadricornis (Ehrenberg)	2	5	5	1	–	1	1	–	2	1	–	1
Platinous patulus (O.F. Müller)	5	3	10	8	10	5	32	10	8	6	8	6
P. patulus macracanthus (Daday)	4	–	5	–	–	–	4	–	–	–	2	–
Family : EPIPHANIDAE												
Epiphanes brachionus (Ehrb.)	–	–	–	–	–	–	12	–	–	–	–	–
Family : EUCHLANIDAE												
Euchlanis dilatata Ehrenberg	5	2	5	3	5	3	2	2	3	2	–	2
Dipleuchlanis propatula (Gosse)	–	2	1	2	–	–	–	1	1	–	2	1
Family : MYTILINIDAE												
Mytilina bisulcata (Lucks)	–	1	2	–	–	–	–	–	–	–	–	–
M. ventralis (Ehrenberg)	2	2	5	2	4	3	2	1	1	1	–	1
Family : TRICHOTRIIDAE												
Macrochaetus longipes (Myers)	2	–	3	5	4	–	2	–	–	–	–	–
M. sericus (Thorpe)	3	5	2	–	2	3	–	–	1	–	3	1
Trichotria tetractis (Ehrenberg)	3	7	4	5	3	4	2	3	2	4	3	2
Family : LEPADELLIDAE												
Colurella uncinata (O.F. Müller)	2	1	4	8	–	1	2	1	2	–	4	–
Lepadella acuminata (Ehrb.)	2	–	2	3	–	–	–	1	–	1	–	1
L. ehrenhergi (Perty)	–	–	–	–	–	–	–	2	–	–	–	–
L. cristata (Rousselet)	–	–	–	1	–	–	–	–	–	–	–	–
L. heterostyla (Murray)	–	2	–	2	2	–	–	1	–	2	–	–
L. ovalis (O.F. Müller)	2	3	2	1	3	4	3	2	3	2	3	2
L. patella (O.F. Müller)	3	2	5	3	4	2	4	3	3	1	3	3
L. rhomboides (Gosse)	–	2	3	–	5	3	3	–	–	–	2	–
L. triptera Ehrenberg	1	–	1	2	–	1	–	1	1	–	1	1

Table 3. : (*Cont'd.*)

Rotifer taxa / localities	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Family : LECANIDAE												
Lecane aculeata (Jakubski)	1	–	2	–	–	2	1	–	1	–	1	1
L. bifurca (Bryce)	1	–	–	–	–	–	–	–	–	–	–	–
L. bulla (Gosse)	8	12	15	20	16	12	5	4	6	5	4	6
L. crepida Harring	1	–	2	–	–	1	2	–	1	–	–	–
L. closterocerca (Schmarda)	6	10	8	2	–	6	8	5	8	4	3	–
L. curvicornis (Murray)	3	2	10	8	4	5	2	1	2	3	2	5
L. furcata (Murray)	–	–	–	2	–	–	–	–	–	–	–	–
L. hastata (Murray)	1	–	1	–	1	–	–	–	–	1	–	–
L. hamata (Stokes)	–	2	3	5	1	2	–	–	2	4	2	–
L. inermis (Bryce)	–	–	1	–	2	1	1	–	1	1	–	–
L. leontina (Turner)	6	10	7	12	8	8	5	6	4	5	6	8
L. ludwigii (Eckstein)	–	2	1	–	–	1	–	1	–	–	1	–
L luna (O.F. Müller)	2	4	2	–	2	5	–	1	3	–	3	2
L. lunaris (Ehrenberg)	4	6	2	10	6	8	4	3	5	2	–	6
L. monostyla (Daday)	–	–	1	–	–	–	–	–	–	1	–	–
L. papuana (Murray)	1	3	5	6	–	4	2	2	4	2	4	5
L. quadridentata (Ehrenberg)	1	5	3	5	22	6	5	3	5	4	3	2
L. signifera (Jennings)	–	–	–	–	–	–	–	–	–	1	–	–
L. sola Hauer	–	–	1	–	–	–	–	–	–	–	–	–
L. unguitata (Fadeev)	1	3	2	1	1	2	2	1	2	–	2	1
L. ungulata (Gosse)	3	5	2	3	–	4	–	2	1	3	3	2
Family : NOTOMMATIDAE												
Monommata longiseta (Müller)	2	–	2	–	–	1	–	–	–	1	–	–
Family : SCARIDIIDAE												
Scaridium longicaudum (Müller)	1	–	2	1	–	2	–	–	1	–	–	–
Family : TRICHOCERCIDAE												
Trichocerca bicristata (Gosse)	–	6	–	4	6	–	2	–	–	1	–	–
T. cylindrica (Imhof)	1	–	3	2	–	3	2	–	2	2	2	–
T. kostei Segers	1	–	–	–	–	–	–	–	1	–	1	–
T. similis (Wierzejski)	4	5	2	5	4	6	3	2	4	1	4	5
Family : ASPLANCHNIDAE												
Asplanchna priodonta Gosse	2	8	2	10	8	4	5	5	6	3	5	6

Table 3. : (*Cont'd.*)

Rotifer taxa / localities	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Family : SYNCHAETIDAE												
Polyarthra vulgaris Carlin	8	12	2	12	15	10	6	8	10	8	8	5
Family : FILINIIDAE												
Filnia camasecla Myers	–	–	1	2	–	–	–	–	–	1	–	–
Filinia longiseta (Ehrenberg)	4	6	1	8	4	–	1	3	–	6	4	–
Family : TESTUDINELLIDAE												
Testudinella parva (Ternetz)	–	2	1	–	–	1	–	–	–	–	–	1
T. emarginula (Stenroos)	2	–	3	–	2	1	2	1	2	3	–	1
T. patina (Hermann)	3	5	2	4	3	2	3	2	3	5	2	2
Family : PHILODINIDAE												
Rotaria rotatoria (Pallas)	1	–	–	–	1	1	–	–	–	–	1	–
Total density	228	275	241	214	170	150	150	101	126	110	123	101
Species richness	44	38	51	37	31	39	34	34	36	37	34	32
Species diversity	2.666	3.182	3.333	3.183	2.987	2.391	3.045	3.393	3.056	3.233	3.259	3.159
Dominance	0.447	0.210	0.133	0.140	0.129	0.080	0.213	0.099	0.095	0.091	0.146	0.119
Evenness	0.704	0.875	0.887	0.881	0.970	0.925	0.863	0.962	0.853	0.895	0.935	0.911

1–Solmari, 2–Haduk, 3–Sitalmari, 4–Goranga, 5–Kandhi, 6–Tamuli dova, 7–Pagla dova, 8–Dhuptoli, 9–Dholi, 10–Gorkhonjan, 11–Lamba dova, 12–Jagdal