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Case Report

A CONCISE REPORT ON TAXONOMY, PERCENTAGE COMPOSITION, DENSITY AND SEASONAL VARIATIONS OF ROTIFERS OF THE GENUS *BRACHIONUS* IN A POND ECOSYSTEM OF TRIPURA, INDIA

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ABSTRACT

The observation recorded the presence of 9 species of rotifers of the genus *Brachionus viz., Brachionus falcatus*, *Brachionus forficula*, *Brachionus angularis*, *Brachionus quadridentatus*, *Brachionus bidentata*, *Brachionus calyciflorus*, *Brachionus rubens*, *Brachionus urceolaris* and *Brachionus caudatus*. The detailed taxonomical features were studied of the different *Brachionus*. The density (mean) of different rotifer species of the Genus *Brachionus* in the studied pond ecosystem was recorded. The percentage composition of different species under the genus *Brachionus* was also observed. Seasonal variation of the different species showed highest density in the winter season and lowest density in the summer season. The study infers that different species of *Brachionus* although prefer different environmental requirements, co-exist successfully in the same pond and dynamic nature of the lentic ecosystem as well as the impact of competitive interactions may be expected to influence the seasonal variation of *Brachionus* population.

INTRODUCTION

The Rotifers also called wheel animalcules due to the presence of a wheel like organ belong to the phylum Rotifera which form an integral part of the freshwater zooplankton (Sharma and Michael, 1980**)**. Rotifers are ubiquitous occurring in an endless variety of aquatic and semi-aquatic biotopes including the littoral, limnetic and deepest regions of largest lakes and smallest puddles (Patra, 2022). *Brachionus* is the most ancient genus amongst monogonont rotifers (Sharma and Sharma, 2005**).** The different species of this genus exhibit great morphological variability in terms of size, shape and ornamentation of the lorica, in the relative size and shape of the occipital spines, presence or absence of posterior spines, corona, its shape, structure, ciliation, foot, shape, structure, type of trophi etc are useful for identification of genus *Brachionus* (Dhanapathi, 2000; Segers, 2007). Proper taxonomic identification of rotifer species is difficult because of their microscopic size and the morphological traits are difficult to examine, especially in species that contract when preserved (Segers, *et al*., 2012; Michaloudi *et al*., 2017). Brachionidae family shows high adaptive radiation capacity to grow well in various environments and as such they usually dominate among the other rotifer families (Sharma, 1987). Rotifers especially the genus *Brachionus* are used as a model organism to study the aquatic toxicology due to their small size, high sensitivity to toxins and easier to growth in the laboratory (Preston *et al*., 2000). As the species composition of *Brachionus* is sensitive to environmental fluctuations, their ecological characteristics often used as a basis for water quality evaluation in lentic ecosystem (Fontaneto and Smet, 2015**).** Dominance of the planktonic rotifers of the genus *Brachionus* is an indication of eutrophic state and their abundance is due to the presence of high concentration of organic matter in the lentic ecosystem (Dirican *et al*, (2009). Rotifers serve as live food biota for fishes which in turn significantly contribute in aquaculture (Wallace *et al*. 2006). Rotifers have higher population density amongst zooplanktons especially in lake ecosystem where density often exceed 1000 ind/lit.(Sharma *et al*., 2013; Kar and Kar, 2016) Seasonal variation of rotifer populations in the lentic ecosystem has been attributed to both abiotic (physico-chemical) factors (such as temperature, pH, dissolved oxygen etc.) and biotic factors (such as food resources, competition, and predation(Nandini *et al*., 2005; Sulehria *et al*. 2009; Xin-Li *et al*., 2011; Ekhande *et al*., 2013; Sugumaran and Amsath, 2015).

MATERIALS AND METHODS

Study area

The present observation was carried out in a freshwater pond locate at Mailakhala area, Agartala, Tripura, India during a period from March 2020 to February, 2022. The studied pond lies geographically at the Latitude 23° 50' 9.78" N and Longitude 91° 16' 45.80" E. It is perennial and rectangular

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shaped. The surface area of the pond is about 1.6 ha. The mean depth of the water column of the pond fluctuates from 0.8 m during summer to 2.0 m in the monsoon. It is noteworthy to mention that the studied pond is located about half kilometre away from the municipal garbage dumping point.

Estimation and Identification of rotifers

Rotifer samples were collected using plankton net made of bolting silk cloth no.25 (mesh size 55 microns) from the littoral zones of the studied pond at weekly intervals. The collected samples were immediately transferred unaltered to the laboratory for further examination. Identification of loricate rotifers was carried out by observing the lorica morphology of contracted rotifer specimens using the collected sample fixed and preserved in 4 per cent formaldehyde. Enumeration is being done quantitatively in the laboratory through Sedgewick Rafter Plankton Counting Cell (Biocraft, model - BSW 15) and results were expressed as ind/lit. Identification up to species level of the genus *Brachionus* was done following keys of Pennak(1978), Battish (1992) and Edmondson(1992).Camera lucida drawings have been done in order to get a clear concept of body structure of different species of *Brachionus.* The image capture of live and preserved rotifer samples were done using Trinocular compound microscope (Model-MLX TR) having an inbuilt 5.0 megapixel camera.

RESULTS AND DISCUSSIONS

In the present observations, 9 species of rotifers of the genus *Brachionus* have been recorded in the pond ecosystem of Tripura, India. The species recorded were *Brachionus falcatus*, *Brachionus forficula*, *Brachionus angularis*, *Brachionus quadridentatus*, *Brachionus bidentata*, *Brachionus calyciflorus*, *Brachionus rubens*, *Brachionus urceolaris* and *Brachionus caudatus*.

Brachionus falcatus Zacharias, 1898

Lorica dorsosoventrally compressed; six unequal spines on the anterodorsal margin of lorica; long posterior spines widely separated at the basal part; unflanked foot opening between bases of posterior spines; median spines almost equal to lateral spines (Fig.1a, 2a).

Measurements: Total length 338µ; maximum width 132µ; intermediate spine 78µ; posterior spine 148µ.

Brachionus forficula Wierzejski, 1891

Lorica moderately compressed dorsoventrally; four occipital spines; anterolateral spines comparatively longer than the anteromedian spines; lorica terminating into two long, stout, subsquare spines widely separated basally and tapering to blunt points (Fig.1b, 2b).

Measurements: Total length 118µ; maximum width 73µ.

Brachionus angularis Gosse, 1851

Dorso-ventrally flattened lorica; one pair of median small spines present at the anterior end of the lorica with a U-shaped notch in between; lateral and intermediate spines obliterated; paired finger-like blunt process on either side of the foot opening (Fig. 1c, 2c).

Measurements: Total length 92µ; Maximum width 70µ; anterior width 60µ.

Brachionus quadridentatus Hermann, 1783

Six occipital spines; median spines longest, curved outwards; lateral spines comparatively longer than the intermediate spines; retractile foot, foot opening tube shaped; posterolateral spines present, variable in length(Fig. 1d, 2d).

Measurements: Total length 248 µ; Maximum width 168µ; anterior width 130µ; posterolateral spine 88µ; posteromedian spine 20µ; anterolateral spine 28µ; anteromedian spine 68µ.

Brachionus bidentata Anderson, 1889

Definite pattern of plaques on lorica; lorica divided into dorsal, ventral and basal plate; dorsal and ventral plates soldered together for three-fifths length of the lorica and thereafter these plates diverge and then united to form a third basal plate; posterior spines variable in length and may be sometimes absent(Fig. 1e, 2e).

Measurements: Total length 178µ; maximum width 138µ; anterior width 98µ; anterior spine(lateral and median) 18µ; anterior spine(intermediate) 10µ; posterior spine 23 µ.

Brachionus calyciflorus Pallas, 1766

Two pairs of broad base pointed occipital spines; anteromedian spines comparatively longer than the anterolateral spines; posterior spines either present or absent; lorica flexible, oval shaped (Fig. 1f, 2f).

Measurements: Total length 268µ; maximum width 140µ; posterolateral spine 68µ; posteromedian spine 37µ; anterolateral spine 38µ; anteromedian spine 30µ.

Brachionus rubens Ehrenberg, 1838

Asymmetrical spine at the anterior part of the lorica; anterodorsal magin with six spines; median spines longest, intermediate spines comparatively longer than lateral spines; foot opening sub square shaped; lorica transparent, oval shaped and dorsoventrally compressed(Fig. 1g, 2g).

Measurements: Total length 278µ; maximum width 240µ; anterior width 138µ.

Brachionus urceolaris Muller, 1773

Lorica pitcher shaped, elongated; six occipital spines; posterior spine absent; small lateral projections on foot opening; anteromedian spines longest, straight (Fig. 1h, 2h).

Measurements: Total length 198µ; maximum width 162µ; anteromedian spine 34µ.

Brachionus caudatus Barrois and Daday, 1894

Two median spines with v-shaped notch on the anterodorsal margin of lorica; well developed posterolateral spines; intermediate spines either reduced or wanting; lateral spines comparatively longer than the median spines (Fig. 1i, 2i).

Measurements: Total length 296µ; maximum width 142µ; posterior spine 84µ.

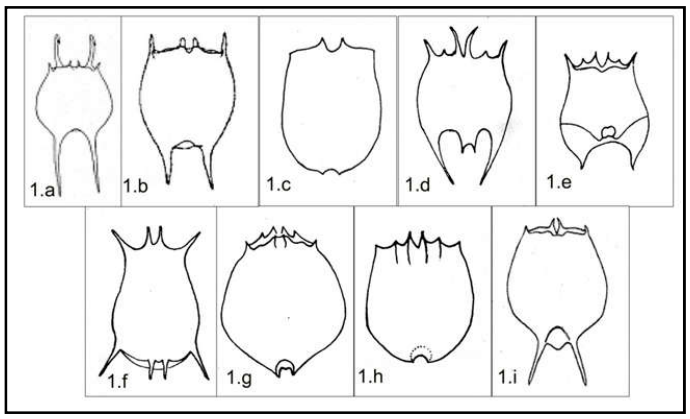

Fig 1 Camera Lucida drawings of different *Brachionus species* in the studied pond of Tripura.
1a. *Brachionus falcatus*; 1b *Brachionus forficula*; 1c. *Brachionus angularis*; 1d. *Brachionus quadridentatus*; 1e. *Brachionus bidentata*; 1f. *Brachionus calyciflorus*; 1g. *Brachionus rubens*; 1h. *Brachionus urceolaris*; 1i. *Brachionus caudatus*

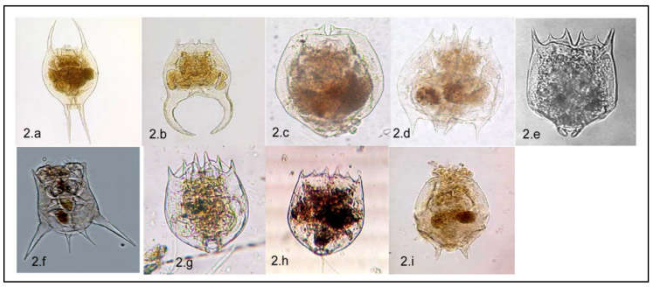

Fig 2 Photomicrographs of different *Brachionus species* in the studied pond of Tripura.

2a. *Brachionus falcatus*; 2b *Brachionus forficula*; 2c. *Brachionus angularis*; 2d. *Brachionus quadridentatus*; 2e. *Brachionus bidentata*; 2f. *Brachionus calyciflorus*; 2g. *Brachionus rubens*; 2h. *Brachionus urceolaris*; 2i. *Brachionus caudatus*

Amongst rotifers of the genus *Brachionus* under the family Brachionidae the percentage composition of the *Brachionus falcatus*, *Brachionus forficula*, *Brachionus angularis, Brachionus quadridentatus, Brachonus bidentata, Brachonus calyciflorus, Brachonus rubens, Brachonus urceolaris and Brachionus caudatus* were 15%, 4%, 23%, 8%, 21% , 3% , 9%, 6% and 11% respectively(Fig.3).

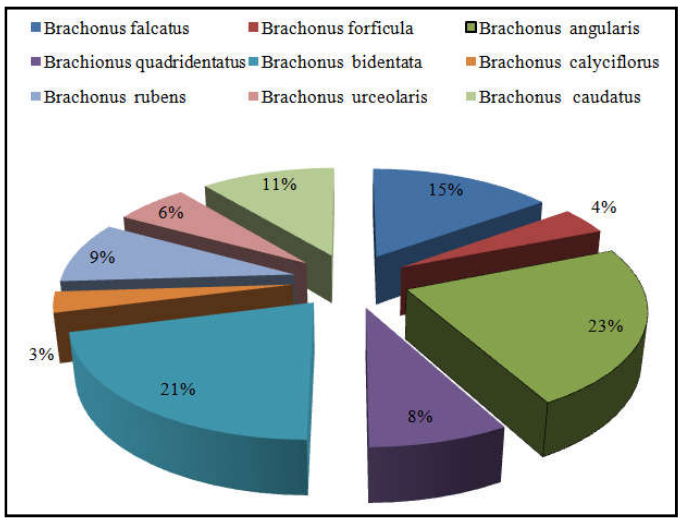

Fig 3 Percentage composition of different *species* of the Genus *Brachionus* in the studied pond ecosystem, Tripura

As regards to seasonal variations of rotifers of the genus Brachionus in the studied pond, the seasonal variations in the density (mean density) of rotifers exhibited a definite rhythm of seasonal succession showing highest density in the winter (November to February) and lowest density in the summer (March to May) during a period from March 2020 to February 2022(Fig.4). *Brachonus falcatus* showed its highest density (241ind/lit) in the winter season and lowest density in the summer season (33ind/lit). *Brachonus forficula* exhibited highest density (91ind/lit) in the winter season and lowest density in the summer season(17ind/lit). *Brachonus angularis* showed its highest density (372ind/lit) in the winter season and lowest density in the summer season (73ind/lit). *Brachionus quadridentatus* showed its maximum density (129ind/lit) in the winter season and minimum density in the summer season (27ind/lit). *Brachonus bidentata* exhibited highest density (317ind/lit) in the winter season and lowest density in the summer season (38ind/lit). *Brachonus calyciflorus* showed its highest density (841ind/lit) in the winter season and lowest density in the summer season (14ind/lit). *Brachonus rubens* showed its highest density (163ind/lit) in the winter season and lowest density in the summer season (43ind/lit). *Brachonus urceolaris* exhibited highest density (117ind/lit) in the winter season and lowest density in the summer season (13ind/lit). *Brachonus caudatus* showed its maximum density (231ind/lit) in the winter season and minimum density in the summer season (33ind/lit).

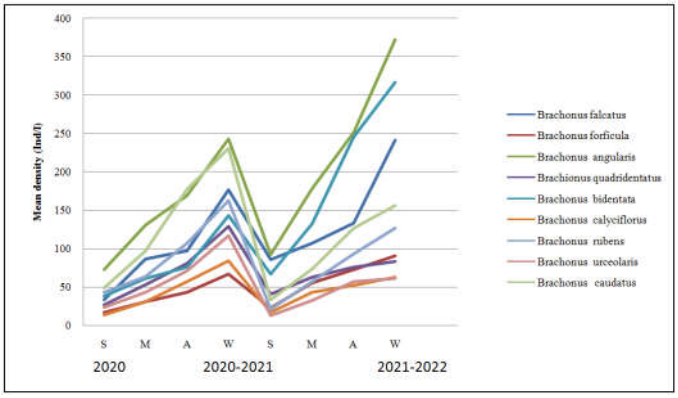

Fig 4 Seasonal variations in the density (mean) of different rotifer *species* of the Genus *Brachionus* in the studied pond ecosystem, Tripura

Lowest density of planktonic rotifers of the genus *Brachionus* during summer season may be due to low availability of live food biota as well as lower concentration of dissolved organic matter during summer season (Mikschi, 1989, Banik, 1995; Mahar *et al*., 2000; Castro *et al*., 2005; Paulose and Maheshwari, 2008; Chakrabarti, 2021). Planktonic rotifers exhibited highest density in winter season may be due to favourable conditions like food in addition to optimal levels of some physico-chemical parameters like temperature, P^H, dissolved oxygen etc. as reported by several noteworthy researchers (Hofmann, 1977; Stewart and George, 1987; Nasar, 1997, Patra & Datta, 2004, Sivakami *et al*., 2013 Khanam *et al*., 2014). Gophen (2005) reported that rotifer to be more numerically abundant during winter season and less abundant during summer season. Khan and Siddique (1974) also found that the abundance of rotifer was highest in November month.

Brachionus regarded *as* the dominant genus among the planktonic rotifers throughout the study period. These species are found extensively in eutrophic waters Stemberger (1990) and Sampaio *et al*.(2002) reported that *Brachionus* species are found abundantly in eutrophic water bodies. Sladecek (1983)

opined that *Brachionus* species were very common in temperate and tropical waters, having alkaline pH. Higher numerical abundance of *Brachionus* rotifer species in the studied pond may be due the alkaline nature of water. The similar observations were reported by Pourriot and Meybeck (1995) and Malathi *et al*. (1998). Bhat *et al*., (2014) and Murkute and Chavan (2016**)** reported that the presence of more than five species of *Brachionus* reflected eutrophied nature of water bodies. Planktonic rotifers of the genus *Brachionus* is specifically renowned to tolerate polluted waters (Matveeva, 1991; Dulic *et al*., 2006; Sousa *et al*., 2008). Paturej (2008) observed that the density of rotifers increased significantly with the increasing trophic state in the lentic ecosystem.

CONCLUSION

In conclusion, it is quite judicious to mention that the density of rotifer species of the genus *Brachionus i*s highly variable from species to species in the studied pond ecosystem and seasons have strongly affected the density and species composition in terms of percentage. The study also infers that the different species of *Brachionus* co-exist successfully in the same water body (pond), although they prefer different environmental requirements. It is noteworthy to mention that the dynamic nature of the lentic ecosystem as well as the impact of competitive interactions may be expected to influence the seasonal variation of *Brachionus* population in the studied pond ecosystem. As the studied pond is located about half kilometre away from the municipal garbage dumping point and the presence of five pollutant tolerant species in the studied pond, it is presumed that the studied pond is stressed or in a state of eutrophic water body.

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References

Banik S. 1995. Zooplankton abundance in a fresh water fish farming pond in west Bengal in relation to some environmental factors. Bangladesh Journal of Zoology. 23 (1):109-110.

Battish, S. K. 1992. Freshwater Zooplankton of India. Oxford & IBH Publishing Co., New Delhi. 233pp.

Bhat, Najeeb Ahmad., Raina, Rajni and Wanganeo, Ashwani. 2014. Occurrence and Spatial Distribution of Brachionus Species: A Bioindicator of Eutrophication in Bhoj Wetland, Bhopal**.** Ecologia Balkanica. 6 (2): 43-50.

Castro B., Antunes, S.C., Pereira, R., Sores, A.M. and Goncalves, F. 2005. Rotifer community structure in three shallow lakes: Seasonal fluctuations and explanatory factors. Hydrobiologia 543, 221-232. Chakrabarti, Saumen. 2021. Observations on density, percentage composition and seasonal variations of zooplankton in a perennial pond of Tripura, India in relation to physic-chemical factors. Uttar Pradesh Journal of Zoology. 42(23): 38-47.

Dhanapathi, M.V.S.S.S.2000. Taxonomic notes on the rotifers from India, IAAB, Publication no. 10.

Dirican S., Haldun M, Suleyman, C. 2009. Some physic-chemical characteristics and Rotifers of Camligoze Dam lake, Susehri, Sivas, Turkey. Journal of Animal and Veterinary Advances. 8(4):715-719.

Dulic, Z., Mitrovic-Tutundzic, V., Markovic, Z. and Zivic, I. 2006..Monitoring water quality using zooplankton organisms as bioindicators at the Dubica fish farm, Serbia. - Archive of Biological Science 58: 245-248.

Edmondson, W. T. 1992. Rotifera. In Freshwater Biology (Edmondson, W.T. Ed) 2nd Ed., John Wiley and Sons, New York, 1248pp.

Ekhande, A., Patil, J., R. Patil and Padate, G. 2013. Water quality monitoring–study of seasonal variation of rotifers and their correlation with physicochemical parameters of Yashwant Lake, Toranmal (MS) India. Arch. Appl. Sci. Res. 5: 177-181.

Fontaneto, D and Smet, W.H. De. 2015. Rotifera. In: SchmidtRhaesa A, editor. Handbook of Zoology: Gastrotricha, Cycloneuralia and Gnathifera. Volume 3: Gastrotricha and Gnathifera. Berlin, Germany: Walter de Gruyter. p 217–300

Gophen, M. 2005. Seasonal rotifer dynamics in the long term (1969-2002) record from lake Kinneret (Israel). Hydrobiologia, 546:443-450.

Hofmann, W. 1977. The influence of abiotic factors on the population dynamics in planktonic rotifers. Arch. Hydrobiol. Beih. Ergebn. Limol. 8: 77-83.

Kar, S. and Kar, D. 2016. Zooplankton diversity of a freshwater wetland of Assam. Int. J. Adv. Biotechnol. Res. 7: 614-620.

Khan, A.A. and Siddiqui, Q. 1974**.** Seasonal changes in the limnology of a perennial fish pond at Aligarh. Indian Journal of Fish, 21(2):463-478.

Khanam, M.R.M., Naser, M.N., and Ali, S. 2014. Population dynamics of planktonic rotifers in the southern coastal area of Bangladesh. International Journal of Natural and Social Sciences, 1(2): 53-60.

Mahar, M.A., Baloch, W.A. and Jafri, S.I.H. 2000. Diversity and seasonal occurrence of planktonic rotifers in Manchhar lake, Sindh Pakistan. Pakistan J. Fish. 1(1), 25-32.

Malathi, Chandrasekhar, S.V.A., and Kodarkar, M.S. 1998. Studies on Brachionus from lake Hussain Sagar, Hyde rabad, India. J. Aqua Bio. Vol. 13(1and2): 7-12.

Matveeva, L.K. 1991. Planktonic rotifers as indicators of trophic state. Bulletin of the Moscow Naturalist's Society, Biology Section. 96 (1): 54–62.

Michaloudi, E., Mills, S., Papakostas, S., Stelzer, C.P., Triantafyllidis, A., Kappas, I.,Vasileiadou, K. Proios, K., Abatzopoulos, T.J. 2017. Morphological and taxonomic demarcation of *Brachionus asplanchnoidis* Charin within the *Brachionus plicatilis* cryptic species complex (Rotifera, Monogononta). Hydrobiologia 796, 19–37.

Mikschi, E. 1989. Rotifer distribution in relation to temperature and oxygen content. Hydrobiol. 186/187, 209-214.

Murkute, V.B. and Chavan, A.W. 2016. Report on rotifer diversity with reference to their role in Eutrophication from lentic ecosystems at Bramhapuri, Dist: Chandrapur (M.S.) India. International Journal of Researches in Biosciences, Agriculture and Technology. Special Issue: 8-12.

Nandini, S., Ramirez Garcia, P. and Sarma, S. S. S. 2005. Seasonal Variations in the Species Diversity of Planktonic Rotifers in Lake Xochimilco, Mexico, Journal of Freshwater Ecology, 20(2): 287-294.

Nasar, S.A.K. 1997. Investigations on the seasonal productivity of zooplankton in the freshwater pond in Bhagalpur, India. Acta. Hydrochem. Hydrobiol. 5: 577-584.

Patra, S. B. 2022. Abundance of Genus *Brachionus* (Rotifer) of a Freshwater Wetland of District Howrah, West Bengal, India. Int J Adv Life Sci Res. 5(2): 6-12.

Paturej, E. 2008. Assessment of the trophic state of a restored urban lake based on community structure and zooplankton-related indices. Pol. J. Natur. Sci. 23(2): 440-449.

Paulose, P.V. and Maheshwari, K. 2008. Seasonal variation on zooplankton community structure of Ramgarh lake, Jaipur, Rajasthan.12th World Lake Conference, 82-87

Pennak, R.W. 1978. Freshwater Invertebrates of the United States. 2nd Ed. John Wiley & Sons., New York, 803pp.

Pourriot, R. and Meybeck, M. 1995. Zonation physique, chimique et écologique dans leslacs. - In: R. Pourriot & M. Meybeck (eds.), *Limnologie générale* .Masson. Collection d'Ecologie. pp.404–410.

Preston, B. L., Snell, T. W., Robertson, T. L. and Dingmann, B. J. 2000. Use of freshwater rotifer *Brachionus calyciflorus* in screening assay for potential endocrine disruptors. Environmental Toxicology and Chemistry: An International Journal, 19: 2923-2928.

Sampaio, E., Rocha, O., Matsumura, T. J. and Tundisi, J. 2002. Composition and abundance of zooplankton in the limnetic zone of seven reservoirs of the Paranapanema River, Brazil. – Brazilian Journal of Biology. 62: 525-545.

Segers, H. 2007. Annotated checklist of the rotifers (Phylum Rotifera), with notes on nomenclature, taxonomy and distribution. Zootaxa. 1564: 1-104.

Segers, H., De Smet, W.H. Fischer, C., Fontaneto, D., Michaloudi, E., Wallace, R.L..and Jersabek, C.D. 2012. Towards a list of available names in zoology, partim Phylum Rotifera. Zootaxa. 3179: 61–68.

Sharma, B. K. 1987. Indian brachionidae (Eurotatoria: Monogononta) and their distribution. Hydrobiologia. 144: 269-275.

Sharma, B.K. and Michael, R.G.1980. Synopsis of taxonomic studies on Indian Rotatoria. Hydrobiologia. 73: 229–236.

Sharma, B. K. and Sharma, S. 2005. Faunal diversity of rotifers (Rotifera: Eurotatoria) of Deepor Beel, Assam (Northeast India) - A Ramsar site. J. Bombay Nat. Hist. Soc. 102(2):169-175.

Sharma. B.K. and Sharma, S. 2021. Biodiversity of Indian Rotifers (Rotifera) with remarks on biogeography and richness in diverse ecosystems**.** Opusc. Zool. Budapest. 52(1): 69–97.

Sharma, K.K., Sharma, R., S. Langer, Chandrakiran (2013). Diversity and Density Variations in the Community Structure of Rotifera Fauna of Behlol Nullah, Jammu (J&K), India. Asian Academic Research J. Multidisciplinary. 1(14): 129-144.

Sivakami, R., Sugumar, R., Sumithra, P. and Amina, S. 2013. Rotifer diversity and its seasonal variation of two perennial temple ponds of Tiruchirapalli, Tamil Nadu. Asia Pacific Journal of Research. 2(8): 157-162.

Sladecek, V. 1983. Rotifers as indicators of water quality, Hydrobiologia, 100: 169–201.

Sousa, W., Attayde, J.L., Rocha, E.S. and Anna, E.M.E. 2008. The response of zooplankton assemblages to variations in the water quality of four manmade lakes in semi-arid northeastern Brazil. J. Plankton Res. 30: 699-708.

Stemberger, R.S. 1990. Food limitation, spination, and reproduction in *Brachionus calyciflorus*. Limnol. Oceanogr. 35(l): 33-44.

Sugumaran, J. and Amsath, A. 2015. Seasonal Diversity of Rotifers from Agniyar Estuary, Thanjavur District, Tamil Nadu, India. Int. J. Pure Appl. Zool. 3: 287-292.

Sulehria, A. Q. K., Qamar,M. F., Anjum, R., Ejaz, M. and Hussain, A. 2009. Seasonal fluctuations of Rotifers in a fish pond at District Bahawalnagar, Pakistan. Biologia (Pakistan). 55: 21-28.

Wallace, R. L., Snell, T.W., Ricci, C. and Thomas, N. 2006. Rotifera. 1, Biology, Ecology and Systematics. Backhuys Publishers.

Xin-Li Wen, Yi-Long, Xi. Yu-Feng, Yang, Xing-An, Zhang and Zhang, Gen.2011. Temperature is the key factor controlling population dynamics of *Brachionus angularis* in Lake Jinghu during Summer and Autumn, Journal of Freshwater Ecology. 26(2): 277-286.

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