

CONTRIBUTIONS TO THE ROTIFER FAUNA OF PANJAB STATE, INDIA. I. FAMILY BRACHIONIDAE

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Abstract

This communication deals with an account of 20 species (spread over four genera) belonging to the family Brachionidae, collected from various localities in Panjab State (N.W. India). A number of infraspecific categories (forms and varieties) are also recorded. The present study has added 8 taxa as new records to the list of previously recorded brachionid rotifers from N.W. India and one represents a new record from India.

Introduction

The present study gives an account of brachionid rotifers (Rotifera: Eurotatoria: Brachionidae) collected from various freshwater impoundments in the state of Panjab. As a result of this study, 20 species (including various infraspecific categories) belonging to four brachionid genera have been reported.

The only earlier contributions to the Brachionidae from this state are by Vasisht & Battish (1971a, '71b) and Sharma (1976). This study has added 8 new records to the rotifer fauna of N.W. India and one represents a new record from India. The various presently recorded taxa have been briefly commented.

Material and methods

The material for this study was collected from a number of freshwater tanks and ponds from Panjab State. The plankton samples were preserved in 5% formalin. Specimens mounted in Polyvinyl-lactophenol mixture were examined. The drawings were made using a camera lucida and measurements given in microns (μ). The classification followed is after Koste (1978).

List of localities

1. Bhatinda district ($30^{\circ}21/N$, $75^{\circ}00/E$)
 - i. Bhatinda BTI
 - ii. Deon village DN
 - iii. Behman Dewana village BD
 - iv. Buladewala village BW
 - v. Baluana village BA
 - vi. Giddar Baha GB
2. Patiala (Dist. Patiala) PTI
($30^{\circ}20/N$, $76^{\circ}25/E$)
3. Nabha (Dist. Patiala) NBH
($30^{\circ}25/N$, $76^{\circ}29/E$)
4. Ferozepur (Dist. Ferozepur) FZR
($30^{\circ}55/N$, $74^{\circ}40/E$)

Systematic account

- Class : Rotifera
Subclass : Eurotatoria Bartos, 1959
Superorder: Monogononta Wesenberg-Lund, 1889
Order : Ploimida Delage, 1887
Family : Brachionidae Hudson & Gosse, 1888

Anuraeopsis coelata (De Beaucamp, 1932) (Fig. 1).
? *A. navicula* Vasisht & Battish, 1971b, p. 33, Fig. 14.
Material: BTI, NBH, FZR.

The present specimens, with granulated lorica and with U-shaped sinus at the anterior end, are identical with the specimens reported from West Bengal (Sharma, 1979a).

Measurements: Lorica length 105; maximum width 48.

Distribution: India—Baroda, N.W. India, West Bengal. Elsewhere—Tropics and subtropics.

Anuraeopsis fissa (Gosse, 1851) (Fig. 2).
Material: BTI, BD.

Lorica finely stippled, more or less cylindrical and obtusely pointed posteriorly.

Measurements: Lorica length 78; maximum width 50.
 Distribution: India–N.W. India, Baroda, Rajasthan, Kerala, West Bengal. Elsewhere–Cosmopolitan.

Brachionus angularis Gosse, 1851 (Figs. 3 & 4).
 Material: BTI, DN, BD, BA, PTI, NBH, FZR.

Anterior occipital margin with two small median spines flanked by a U-shaped notch. Lorica stippled, with a pattern of cuticular plates on the dorsum. Common in the present material.

Measurements: Total length 74–88; maximum width 65–70; anterior width 45–52.

Distribution: India–N.W. India, Rajasthan, Kerala, Andhra Pradesh, West Bengal. Elsewhere–Cosmopolitan in alkaline waters.

Brachionus bidentata Anderson, 1889 (Fig. 5)
 Material: BTI, BW.

This brachionid presents a series of variants, with or without posterior spines and their place of origin may also differ in different specimens. However, the present forms are identical with those reported from West Bengal (Sharma, 1979a) and Orissa (Sharma, 1980).

Measurements: Total length 155; maximum width 108; anterior width 90.

Distribution: India–West Bengal, N.W. India, Kashmir, Andhra Pradesh.

(i) forma *adorna* Wulfert, 1966 (Fig. 6).
 Material: BTI.

A few specimens of this form, and identical with those reported from West Bengal (Sharma, 1979a), were examined.

Measurements: Total length 150; maximum width 124; anterior width 96.

Distribution: India (Baroda, West Bengal).

Brachionus budapestiensis Daday, 1885

Material: PTI.

Anterior occipital margin with four spines; medians longer than laterals and curving ventrally. Lorica tuberculate and with a pattern of cuticular plates on the dorsal and ventral side.

Measurements: Total length 128; maximum width 90; anterolateral spines 18; median occipital spines 30.

Distribution: India–Nagpur, West Bengal, N.W. India. Elsewhere–Subtropicopolitan.

Brachionus calyciflorus Pallas, 1776.

Material: BTI, PTI, NBH, FZR.

B. calyciflorus is cosmopolitan in alkaline waters. This species shows considerable variations in the size and length of the posterolateral spines.

The specimens of this species are common in the examined material. No infraspecific category of this species has been earlier reported from N.W. India. However, in this material, *B. calyciflorus* is represented by v. *dorcas* and formae *amphicercos*, *anuraeiformis* and *borgerti*.

Brachionus caudatus Borris & Daday, 1894 (Figs. 8 & 9).

Material: BTI, PTI, NBH, FZR.

It is yet another variable brachionid species. In the present material, it is represented by v. *personatus* (Fig. 8) and v. *aculeatus* (Fig. 9).

variety	Measurements		
	Total length	Max. width	anterior width
v. <i>personatus</i>	170	90	68
v. <i>aculeatus</i>	138	88	64

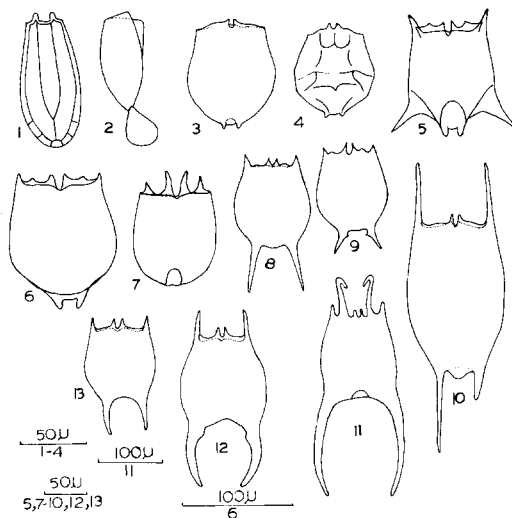


Fig. 1. *Anuraeopsis coelata* (De Beauchamp), Dorsal view; Fig. 2. *Anuraeopsis fissa* (Gosse), Lateral view; Figs. 3 & 4. *Brachionus angularis* Gosse, Dorsal views; Fig. 5. *Brachionus bidentata* Anderson, Ventral view; Fig. 6. *B. bidentata* f. *adorna* Wulfert, Ventral view; Fig. 7. *Brachionus budapestiensis* Daday, Ventral view; Fig. 8. *Brachionus caudatus* v. *personatus* Ahlstrom, Ventral view; Fig. 9. *Brachionus caudatus* v. *aculeatus* (Hauer), Ventral view; Fig. 10. *Brachionus diversicornis*, Dorsal view; Fig. 11. *Brachionus falcatus* Zacharias, Dorsal view; Fig. 12. *Brachionus forficula* Wierzejski, Dorsal view; Fig. 13. *B. forficula* f. *minor* (Voronkov), Dorsal view.

Brachionus diversicornis (Daday, 1893) (Fig. 10).

Material: BTI, DN, GB, BA, PTI.

With four occipital spines, laterals longer than medians. Posterior spines two, unequal and divergent; the right spine usually longer.

Measurements: Lorica length 202; maximum width 130; anterolateral spines 78; right posterior spine 90; left posterior spine 38.

Distribution: India-N.W. India, Andhra Pradesh, West Bengal. Elsewhere-Asia, Africa, Europe.

Brachionus falcatus Zacharias, 1898 (Fig. 11).

Material, BTI, DN, BA, NBH, PTI, FZR.

Occipital margin with six spines; intermediates much longer and curved ventrally; medians and laterals shorter and of almost equal length. Posterior spines long, incurved and with widely separated bases.

Measurements: Total length 340; maximum width 128; posterior spines 145.

Distribution: India - Widely distributed. Reported from Nagpur, Baroda, Kerala, N.W. India, Andhra Pradesh and West Bengal. Elsewhere-Cosmopolitan.

Brachionus forficula Wierzejski, 1891 (Fig. 12).

Material: BTI, BD, GB, NBH, PTI.

Characterised by stout, bent posterior spines with knee-like swellings on the inner sides of their bases. Four occipital spines; laterals of variable length but longer than the medians.

Measurements: Total length 220; maximum width 110.

Distribution: India-Baroda, N.W. India and West Bengal. Elsewhere-Subtropicopolitan.

(i) f. *minor* (Voronkov, 1913) (Fig. 13).

Material: BTI, GB.

Specimens small and identical with those reported from West Bengal (Sharma, 1979a). This form is a new record from N.W. India.

Measurements: Total length 142; maximum width 72; posterior spines 49.

Brachionus leydigi Cohn, 1862 (Fig. 14).

Material: BTI.

Present specimens smaller but identical with the material described from Sri Lanka (Chengalath *et al.*, 1973).

Measurements: Total length 220; maximum width 165.

Distribution: India-N.W. India (Panjab). Elsewhere-China and Sri Lanka.

Brachionus patulus O. F. Müller, 1786 (Fig. 15).

Material: BTI, DN, GB, PTI, FZR.

Identical with the description given by Ahlstrom (1940).

Measurements: Total length 220; maximum width 150.

Distribution: India-Widely distributed. Reported so far from Baroda, Kerala, Rajasthan, N.W. India, West Bengal and Nilgiri Hills (South India). Elsewhere-Cosmopolitan.

Brachionus plicatilis O. F. Muller, 1786 (Fig. 16).

Material: BTI, FZR.

Lorica with six broad-based, acutely pointed and saw-toothed occipital spines. Mental edge four lobed.

Measurements: Total length 170; maximum width 130.

Distribution: India-N.W. India (Panjab, Ladakh), Rajasthan, Andhra Pradesh. Elsewhere-Cosmopolitan in alkaline waters.

Brachionus quadridentatus Hermann, 1783 (Figs. 17-19).

Material: BTI, BR, GB, PTI, FZR.

It is variable species. Cosmopolitan in its distribution. In the present material, this species is represented by the typical form (Fig. 17), v. *rehenanus* (Fig. 18) and v. *cluniorbicularis* (Fig. 19). The mentioned varieties have not been reported from this region of the country. Of these, v. *rehenanus* is also a new record from India.

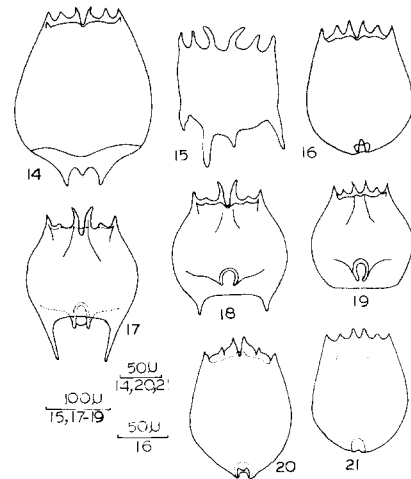


Fig. 14. *Brachionus leydigi* Cohn, Ventral view; Fig. 15. *Brachionus patulus* O. F. Muller, Dorsal View; Fig. 16. *Brachionus plicatilis* O. F. Muller, Ventral view; Fig. 17. *Brachionus quadridentatus* Hermann, Ventral view; Fig. 18. *B. quadridentatus* v. *rehenanus*, Ventral view; Fig. 19. *B. quadridentatus* v. *cluniorbicularis*, Ventral view; Fig. 20. *Brachionus rubens* Ehrenberg, Dorsal view; Fig. 21. *Brachionus urceolaris* O. F. Muller, Dorsal view.

Measurements

	Total length	Maximum width
Typical form	250	170
v. <i>reheanus</i>	210	180
v. <i>clunirbicularis</i>	170	156

Brachionus rubens Ehrenberg, 1838 (Fig. 20)

Material: BTI, DN, BW, BA, FZR.

The examined specimens are identical with those reported from West Bengal (Sharma, 1979a). Sharma (1979b) has commented on the epizoic nature of this brachionid. However, in the present material this species was found to be epizoic only on *Daphnia carinata*.

Measurements: Total length 180; maximum width 125.

Distribution: India–West Bengal, Rajasthan, N.W. India. Elsewhere–Cosmopolitan.

Brachionus urceolaris O. F. Müller, 1773 (Fig. 21).

Material: BTI, NBH.

Identical with the specimens reported by the author (Sharma, 1979a) from West Bengal.

Measurements: Total length 150; maximum width 120.

Distribution: India–West Bengal, N.W. India. Elsewhere–Cosmopolitan.

Keratella lenzi Hauer, 1938 (Fig. 22).

Material: BTI.

Very rare in the present material and represents a new record from N.W. India. The present specimens are slightly smaller than those reported from West Bengal (Sharma, 1979a).

Measurements: Total length 138; maximum width 56.

Distribution: India–West Bengal (Calcutta and its environs). Elsewhere–Tropics and subtropics.

Keratella procurva (Thorpe, 1891) (Fig. 23).

Material: DN, BW, NBH, FZR.

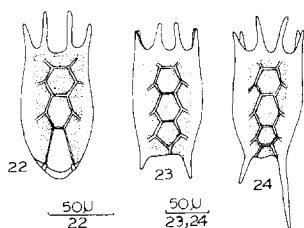


Fig. 22. *Keratella lenzi* Hauer, Dorsal view; Fig. 23. *Keratella procurva* (Thorpe), Dorsal view; Fig. 24. *Keratella tropica* (Apstein), Dorsal view.

The present specimens are identical with those reported by the author from West Bengal (Sharma, 1979a) and Orissa (Sharma; 1980).

Measurements: Lorica length 80; maximum width 52; right posterior spine 20; left posterior spine 12.

Distribution: India–N.W. India, Kerala, Rajasthan, West Bengal, Orissa. Elsewhere–Tropics and subtropics.

Keratella tropica (Apstein, 1907) (Fig. 24).

Material: BTI, DN, BD, BA, GB, PTI, FZR.

This species is well represented in the examined material. The present specimens agree with the description given by Berzins (1955).

Measurements: Lorica length 130; maximum width 84; right posterior spine 90; left posterior spine 32.

Distribution: India–Widespread. Reported earlier from N.W. India, West Bengal, Nagpur, Baroda, Kerala, Andhra Pradesh and Nilgiri Hills. Elsewhere–Tropics and subtropics.

Platytias quadricornis Ehrenberg, 1832.

Material: BTI, GB, PTI, NBH, FZR.

The examined specimens agree with the description given by Ahlstrom (1940).

Measurements: Total length 305, maximum width 178.

Distribution: India–West Bengal, N.W. India, Kerala, Orissa. Elsewhere–Cosmopolitan.

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