Turk J Zool
25 (2001) 251-255

A Taxonomical Study on the Rotifera Fauna of Devegeçidi Dam Lake (Diyarbakır-TURKEY)

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Received: 05.01.2000

Abstract: In this study, Rotifera fauna of Devegeçidi dam lake was taxonomically investigated between April 1995 and December 1996. Thirty-four species belonging to the phylum Rotifera were identified, all of which were new for this lake. Three species (*Brachionus caudatus*, *Lecane* (M.) *scutata* and *Testudinella truncata*) were new records for Turkish inland waters.

Key Words: Rotifera, Zooplankton, Taxonomy, Freshwater

Devegeçidi Baraj Gölünün (Diyarbakır-TÜRKİYE) Rotifera Faunası Üzerine Taksonomik Bir Çalışma

Özet: Bu çalışmada, Devegeçidi baraj gölünün Rotifera faunası, Nisan 1995-Aralık 1996 tarihleri arasında taksonomik açıdan incelenmiştir. Gölde, Rotifera filumuna ait 34 tür tespit edilmiştir. Bu türlerin tamamı Devegeçidi baraj gölü için, 3 tanesi de (*Brachionus caudatus, Lecane* (M.) *scutata* ve *Testudinella truncata*) Türkiye içsuları için yeni kayıttır.

Anahtar Sözcükler: Rotifera, Zooplankton, Taksonomi, Tatlısu

Introduction

Rotifers, which form the second step of the food chain, are important food sources for some invertebrate animals and fishes. Rotifera are one of the basic groups of the zooplankton community providing the energy flux of freshwater ecosystems and they inhabit virtually all aquatic habitats. Certain species and genera of rotifers are used as indicators of water quality, eutrophic status and productivity of a lake ecosystem (1-3).

The first study on the Rotifera fauna of Turkey was reported by Vavra (4) in 1903. After a long interval, Rotifera species were revealed in numerous publications by Geldiay (5), Hauer (6), Tokat (7), Dumont and Ridder (8), Ustaoğlu (9, 10), Ustaoğlu and Balık (11-13), Emir (14-16), Ustaoğlu and Akyürek (17), Bekleyen and Bilgin (18), Altındağ and Yiğit (19), Altındağ (20), but the Rotifera fauna of south-east Anatolia is poorly known.

The present study is a part of limnological studies conducted during 1995-1996, covering the composition and distribution of the zooplankton community and their relationship to the physical and chemical characteristics of Devegeçidi dam lake (21).

The purpose of this paper was particularly to determine the Rotifera fauna of Devegeçidi dam lake, and also the whole Rotifera fauna of south-east Anatolia.

Description of the Lake

Devegeçidi dam lake, which is used for irrigation, is located 20 km north-west of Diyarbakır city centre (37°55' N/40°12' E) in south-east Anatolia. The dam was built on Furtaşka Stream, connected to the River Dicle, in the 1970s by DSI. The lake, with an elevation of 670 m, is fed by Şarge, Çegenek, Çay, Hatun and Ayşe streams. The surface area and maximum depth of the dam lake are 11 km^2 and 30 m, respectively. The dam lake's maximum volume is 219 hm^3. The main rainfall area is 1578 km^2. Its catchment area is used for agriculture. Mean water levels of dry and rainy months in the lake differ by more than five metres. Devegeçidi dam lake contains economically important fish species, namely, *Barbus esocinus, B. plebejus lacerta, B. rajonorum,*

Chalchalburnus mossulensis, Capoeta trutta, C. capoeta umbla, Cyprinus carpio, Acantobrama marmid, and *Leuciscus cephalus orientalis* (22). Additionally, according to the physico-chemical variables, organic and inorganic pollution exists in the lake (Table 1) (21).

Materials and Methods

This study was carried out between April 1995 and December 1996. The samples were collected monthly at five different stations in Devegeçidi dam lake (Figure) with a 55-µ-pore-sized Hydro-Bios plankton net by horizontal hauls. In January and February, samples could not be collected due to unfavourable weather conditions. The collected samples were preserved in 4% formalin solution. The rotifer species were identified according to Edmondson (23), Kolisko (24) and Koste (25).

Results and Discussion

The Rotifera species living in Devegeçidi dam lake are as follows:

Class: Monogononta

Order: Ploima

Family: Brachionidae
1. *Brachionus urceolaris* (O.F.Müller, 1773)
2. *Brachionus falcatus* Zacharias, 1898
3. *Brachionus calyciflorus* Pallas, 1766
4. *Brachionus angularis* Gosse, 1851
5. *Brachionus caudatus* (BarroisandDaday,1894)
6. *Keratella quadrata* (O.F.Müller, 1786)
7. *Keratella tropica* (Apstein, 1907)
8. *Keratella valga* (Ehrenberg, 1834)
9. *Keratella cochlearis* (Gosse, 1851)
10. *Notholca squamula* (O.F.Müller, 1786)
11. *Kellicottia longispina* (Kellicott, 1879)
12. *Anuraeopsis coelata* (De Beauchamp, 1932)

Family: Euchlanidae
13. *Euchlanis dilatata* Ehrenberg, 1832

Family: Colurellidae
14. *Lepadella acuminata* (Ehrenberg, 1834)

Family: Lecanidae
15. *Lecane luna* (O.F.Müller, 1776)
16. *Lecane* (M.) *scutata* (H.&M., 1926)

Family: Notommatidae
17. *Cephalodella gibba* (Ehrenberg, 1838)

Family: Trichocercidae
18. *Trichocerca cylindrica* (Imhof, 1891)

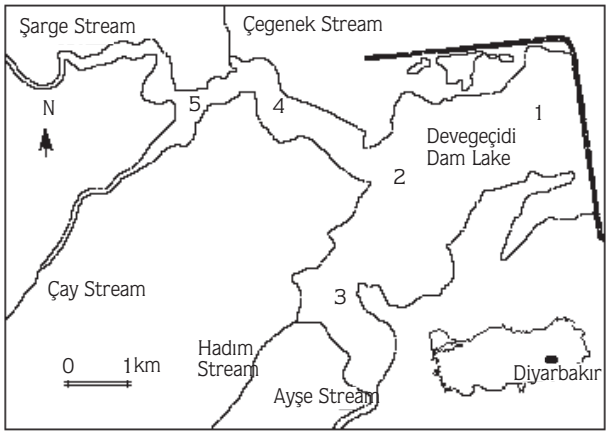

Figure Devegeçidi dam lake and sampling stations.

Table 1. Some physical and chemical parameters of Devegeçidi dam lake water.

Parameters	1995			1996		
	Min.	Max.	Mean	Min.	Max.	Mean
Temperature (°C)	3	28	20.2	7	27	18.3
Dissolved Oxygen (mg/l)	4.6	11.2	7.6	4.2	12.5	8.7
pH	7.8	8.6	8.3	7.6	8.5	8.1
Turbidity (NTU)	3	48	12.7	4	28	13.5
Ammonium (mg/l)	0.26	5.20	0.76	0.26	1.30	0.57
Nitnate (mg/l)	0.00	2.90	0.72	0.00	1.10	0.53
Nitrite (mg/l)	0.00	8	2.02	0.00	6	1.78
Ortho-Phosphate (mg/l)	0.70	1.10	0.83	0.40	2.60	1.19
Sulphate (mg/l)	29	33	30.4	20	33	25.1
Calcium (mg/l)	46	84	62.3	33	69	48.1
Magnesium (mg/l)	38	52	44.3	28	45	34.4
Total Hardness (mg/l $CaCO_3$)	116	209	154.8	84	172	121.2

19. *Trichocerca similis* (Wierzejski, 1893)
20. *Trichocerca pusilla* (Lauterborn,1898)

Family: Gastropodidae
21. *Ascomorpha ovalis* (Bergendahl, 1892)

Family: Synchaetidae
22. *Synchaeta oblonga* Ehrenberg, 1831
23. *Polyarthra vulgaris* Carlin, 1943
24. *Polyarthra dolichoptera* Idelson, 1925

Family: Asplanchnidae
25. *Asplanchna priodonta* Gosse, 1850
26. *Asplanchna sieboldi* (Leydig, 1854)

Family: Testudinellidae
27. *Testudinella truncata* (Gosse, 1886)
28. *Pompholyx complanata* Gosse, 1851

Family: Conochilidae
29. *Conochilus dossuarius* (Hudson, 1914)

Family: Hexarthridae
30. *Hexarthra intermedia* Wiszniewski, 1929

Family: Filiniidae
31. *Filinia longiseta* (Ehrenberg, 1834)
32. *Filinia terminalis* (Plate 1886)
33. *Filinia opoliensis* (Zacharias, 1898)

Family: Collethecidae
34. *Colletheca mutabilis* (Hudson, 1885)

Table 2. The distribution of the rotifer species at the stations in Devegeçidi dam lake.

Species	Stations				
	1	2	3	4	5
Brachionus urceolaris	+	+	+		
Brachionus falcatus	+	+	+	+	+
Brachionus calyciflorus	+	+	+	+	+
Brachionus angularis	+	+	+	+	+
Brachionus caudatus	+	+		+	+
Keratella quadrata	+	+	+	+	+
Keratella tropica	+	+	+	+	+
Keratella valga			+	+	+
Keratella cochlearis	+	+	+	+	+
Notholca squamula	+				
Kellicottia longispina	+	+	+	+	+
Anuraeopsis coelata	+		+	+	+
Euchlanis dilatata	+		+		
Lepadella acuminata	+				
Lecane luna	+			+	
Lecane (M.) scutata				+	
Cephalodella gibba	+		+		
Trichocerca cylindrica	+	+	+	+	+
Trichocerca similis				+	
Trichocerca pusilla	+				
Ascomorpha ovalis	+	+	+	+	+
Synchaeta oblonga	+		+	+	
Polyarthra vulgaris	+	+	+	+	+
Polyarthra dolichoptera	+	+	+	+	+
Asplanchna priodonta	+	+	+	+	+
Asplanchna sieboldi	+	+	+	+	+
Testudinella truncata	+	+	+	+	+
Pompholyx complanata	+		+	+	+
Conochilus dossuarius	+		+	+	+
Hexarthra intermedia	+	+	+	+	+
Filinia longiseta	+	+	+	+	+
Filinia terminalis	+	+	+	+	+
Filinia opoliensis	+	+	+	+	+
Colletheca mutabilis	+	+	+	+	+
Total of species	31	21	27	28	24

In Devegeçidi dam lake, 34 species of the phylum Rotifera were identified, three of which (*Brachionus caudatus, Lecane* (M.) *scutata* and *Testudinella truncata*) were new records for Turkey. All the identified species were recorded for the first time in the lake. The most numerous species were representatives (12 species) of the family Brachionidae, with 35.3% of the species listed, followed by species of the families Trichocercidae, Synchaetidae and Filiniidae with 8.8% during the sampling period. Most of the recorded species are cosmopolitans. In addition, some species belonging to the genera *Notholca, Lecane, Lepadella, Cephalodella* and *Colletheca* are littoral-periphytic forms.

At the sampling stations, the number of rotifer species was as follows: 31 at station 1, 21 at station 2, 27 at station 3, 28 at station 4 and 24 at station 5 (Table 2). The number of species at the first station was higher than at the other stations. While most of the species were found at all the stations throughout the year, *Notholca squamula, Lepadella acuminata*, and *Trichocerca pusilla* were only found at station 1 and *Lecane* (M.) *scutata* and Trichocerca similis only at station 4.

Table 3. Monthly distribution of the rotifer species in Devegeçidi dam lake.

Species MONTHS	1995									1996											
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Brachionus urceolaris	-	-	-	-	-	-	-	-	+	x	x	+	+	x	-	-	-	-	-	-	-
Brachionus falcatus	-	-	+	+	+	+	+	-	-	x	x	-	-	x	+	+	+	+	+	-	-
Brachionus calyciflorus	+	+	+	+	+	+	+	+	-	x	x	+	+	x	+	+	+	+	+	+	-
Brachionus angularis	-	-	+	+	-	+	-	+	+	x	x	+	+	x	+	+	+	+	+	+	-
*Brachionus caudatus**	+	-	-	-	-	+	+	-	-	x	x	+	-	x	+	-	-	+	-	+	-
Keratella quadrata	+	-	-	-	-	-	-	-	-	x	x	+	+	x	+	-	-	-	-	+	+
Keratella tropica	-	-	+	+	+	-	-	-	-	x	x	-	-	x	+	+	+	+	+	+	-
Keratella valga	-	-	-	+	-	-	-	-	-	x	x	-	-	x	+	-	-	+	-	-	-
Keratella cochlearis	+	+	+	+	+	+	+	+	+	x	x	+	+	x	+	+	+	+	+	+	+
Notholca squamula	+	-	-	-	-	-	-	-	-	x	x	-	+	x	-	-	-	-	-	-	-
Kellicottia longispina	+	+	+	+	-	-	-	-	-	x	x	-	+	x	+	+	-	-	-	+	-
Anuraeopsis coelata	-	-	-	+	+	-	-	-	+	x	x	-	-	x	-	+	+	+	-	-	-
Euchlanis dilatata	+	-	-	-	-	-	+	+	-	x	x	-	-	x	-	-	-	-	-	-	-
Lepadella acuminata	+	-	-	-	-	-	-	-	-	x	x	+	-	x	-	-	-	-	-	-	-
Lecane luna	-	-	-	+	-	-	-	-	-	x	x	-	-	x	-	-	-	-	-	-	-
Lecane (M.) *scutata**	-	-	-	-	-	-	-	+	-	x	x	-	-	x	-	-	+	-	-	-	-
Cephalodella gibba	-	-	-	-	-	-	+	-	-	x	x	-	-	x	-	+	-	-	-	-	+
Trichocerca cylindrica	+	+	+	+	+	+	+	+	-	x	x	-	-	x	+	+	+	+	+	+	+
Trichocerca similis	-	-	-	+	-	-	-	-	-	x	x	-	-	x	-	-	-	-	-	-	-
Trichocerca pusilla	-	-	-	+	-	-	+	-	-	x	x	-	-	x	-	-	-	+	-	-	-
Ascomorpha ovalis	+	-	-	-	-	-	-	+	+	x	x	+	+	x	+	+	-	-	-	+	+
Synchaeta oblonga	+	-	-	-	-	-	+	+	+	x	x	+	+	x	+	+	-	-	-	+	+
Polyarthra vulgaris	+	+	+	+	+	+	+	+	+	x	x	+	+	x	+	+	+	+	+	+	+
Polyarthra dolichoptera	+	+	+	+	+	+	+	+	+	x	x	+	+	x	+	+	+	+	+	+	+
Asplanchna priodonta	+	+	+	+	+	+	+	+	-	x	x	+	+	x	+	+	+	+	+	+	+
Asplanchna sieboldi	+	+	+	+	+	+	+	+	-	x	x	+	+	x	+	+	+	+	+	+	+
*Testudinella truncata**	-	+	+	+	+	+	+	+	-	x	x	-	-	x	+	+	+	+	-	+	+
Pompholyx complanata	+	+	+	+	+	+	+	+	+	x	x	+	+	x	+	+	+	+	+	+	+
Conochilus dossuarius	+	+	-	+	-	-	+	-	+	x	x	-	-	x	+	+	+	-	+	-	-
Hexarthra intermedia	-	+	-	-	-	+	+	-	-	x	x	-	+	x	+	-	-	-	-	+	-
Filinia longiseta	+	-	-	+	-	+	+	+	+	x	x	+	+	x	+	+	-	-	+	+	+
Filinia terminalis	-	-	-	-	-	-	-	-	-	x	x	+	+	x	-	-	-	-	-	-	-
Filinia opoliensis	-	-	-	+	+	+	+	-	-	x	x	-	+	x	-	+	+	+	+	+	-
Colletheca mutabilis	-	-	+	+	-	-	-	+	+	x	x	-	-	x	+	+	-	-	+	-	+

ANNOTATION. Species marked by asterisk were new records for Turkey and in months marked by x could not be collected.

Among the identified species, *Brachionus calyciflorus, Brachionus angularis, Keratella cochlearis, Trichocerca cylindrica, Polyarthra vulgaris, Polyarthra dolichoptera, Asplanchna priodonta, Asplanchna sieboldi* and *Pompholyx complanata* were recorded in the zooplankton virtually throughout the sampling period (Table 3). However, *Brachionus urceolaris, Keratella valga, Notholca squamula, Euchlanis dilatata, Lepadella acuminata, Lecane luna, Lecane* (M.) *scutata, Cephalodella gibba, Trichocerca similis, Trichocerca pusilla and Filinia terminalis* were rarely found in the lake. Additionally, one species (*Filinia terminalis*) in 1995 and three species (*Euchlanis dilatata, Lecane luna* and *Trichocerca similis*) in 1996 were absent in the collected material.

The present study contributes to the determination of the Rotifera fauna of south-east Anatolia and particularly of Devegeçidi dam lake.

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