

"Research Note"

ROTIFERS OF KEPEKTAS DAM LAKE (ELAZIG-TURKEY)*

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Abstract – With the aim of identifying the Rotifera fauna of Kepektas Dam Lake, samples were collected monthly between January-December 2005. In total 11 rotifer species were identified. As a species-wise percentage, *Kellicottia longispina* had the highest level with 57%. When the annual abundance of species was taken into consideration *Polyarthra vulgaris*, *Colurella uncinata*, *Asplanchna priodonta* and *Keratella cochlearis* were determined as dominant species. These species were observed in most months of the year and were well observed in their annual abundance. *Notholca squamula* was classified as cold steno-thermal species, as this species was recorded only in February and March. Increases in Rotifer individual numbers were observed in spring and summer months.

Keywords – Rotifera, rotifer abundance, rotifer distribution, rotifer seasonal variation, Kepektas Dam Lake, Turkey

1. INTRODUCTION

Zooplankton constitute the food source of organisms at higher trophic levels and some are of high economic value in lake ecosystems. They are the major food source of fish and other aquatic animals, and play an important role in aquaculture, including an indicator species that determine water quality, pollution and the state of eutrophication. Some species of rotifers, which are very important for the food chain, are indicative of quality and eutrophication states of the water that they live in.

Several studies in Turkey on rotifer fauna have been conducted in Lake Karagol [1], Lake Kus [2], Lake Marmara [3], Lake Akgol [4], Gumuldur Stream [5], Kunduzlar and Çatören Dam Lakes [6], the Cip Dam Lake [7], the Euphrates River [8], Tadım Pond [9], the Hazar Lake [10], the Keban Dam Lake [11, 12], the Zıkkım Stream [13], the Devegeçidi Dam Lake [14], and Goksu Dam Lake [15]. However, no previous study on the Rotifera fauna of the Kepektas Dam Lake has been reported. The present study was conducted to determine the abundance and distribution of the rotifer species in the Kepektas Dam Lake.

2. METHODS AND MATERIALS

Kepektas Dam Lake is located 25 km west of Elazığ. The dam was built on the Gorgusan Stream and has been used for irrigation since 2004. Its total volume is 3.60hm³ and the total area 238 hec. The Kepektas Dam Lake was stocked with 20 000 carp in 2002 [16].

Zooplankton was sampled between January-December 2005. Samples were collected with a 55 pore sized Hydro-Bios plankton net by horizontal hauls and specimens were preserved in 4 % formaldehyde solution. After making the plankton samples in the laboratory homogenous, a 1 ml quantity was taken and put in the counting container and all of the samples were counted under a microscope. This process was

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repeated 10 times in total and the average number of individual 1ml was determined. Quantative analysis and evaluation were estimated according to Edmondson [17] and Telesh [18]. The taxonomical investigations of the samples were performed according to the key given by Edmondson [17], Ruttner-Kolisko [19] and Koste [20].

3. RESULTS

A total of 11 rotifer species were identified. Ten of the identified species belong to the order Monogononta and one of the order Bdelloidea, and the seven different families found were as follows:

Order Monogononta

Family Brachionidae

Brachionus urceolaris (O. F. M., 1773)

Keratella cochlearis (Gosse, 1851)

Keratella quadrata (O. F. M., 1786)

Notholca squamula (O. F. M., 1786)

Kellicottia longispina (Kellicott, 1879)

Family Colurellidae

Colurella uncinata (O. F. M., 1773)

Family Lecanidae

Lecane lunaris (Ehrenberg, 1832)

Family Synchaetidae

Polyathra vulgaris Carlin, 1943

Family Asplanchnidae

Asplanchna priodonta Gosse, 1850

Family Filinidae

Filinia terminalis (Plate, 1886)

Order Bdelloidea

Family Philodinidae

Philodina roseola Bryce, 1940

All the identified species were recorded for the first time in the lake. The individual number of all rotifer species in the lake was found to be 1414503 ind. m³ (Table 1).

In a quantative evaluation of the samples, on average 370436 ind.m³. rotifers of the Kepektas Lake were determined (Table 1). Species-wise percentages were as follows:

B. urceolaris 3.9 %, *K. cochlearis* 16.2 %, *K. quadrata* 14 %, *Notholca squamula* 0.2 %, *K. longispina* 57 %, *C. uncinata* 1.8 %, *L. lunaris* 0.9 %, *P. vulgaris* 1.6 %, *A. priodonta* 1 % ,

F. terminalis 3 % and *P. roseola* 0.4%. The number of rotifers in the lake was in its summit in May, and fell to its lowest level in November and December (Table 1)

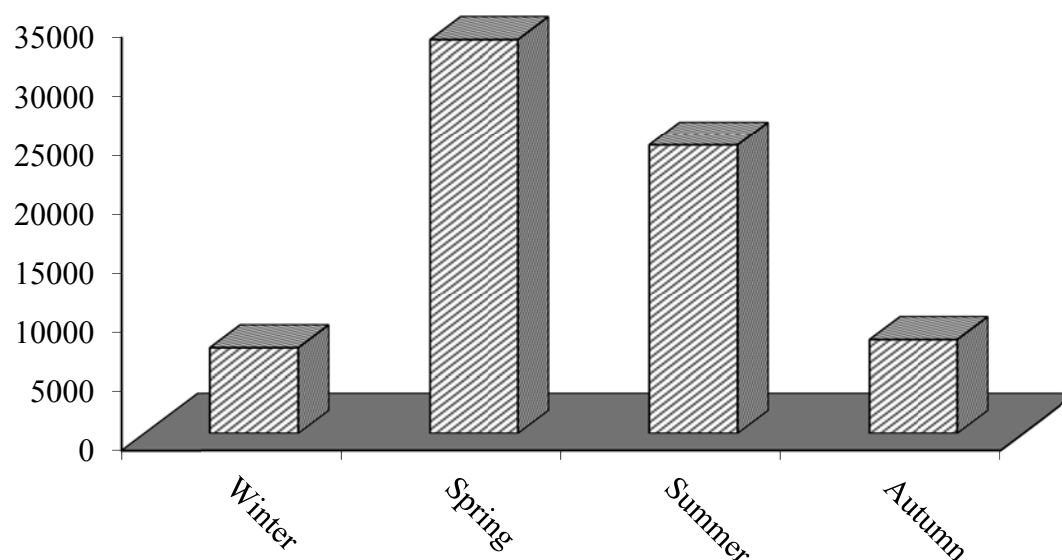
While examining the monthly distributions of samples collected from Kepektas Lake, the highest numbers of rotifers were noted in May (9 taxa) and the least were found in December (1 taxa). According to the average number of individuals, *K. longispina*, which was found only in 2 months, took the first place with 57 %, *K. cochlearis* follows it with 16.2 %, and *N. squamula* was found to have the lowest level with 0.2 % (Table 1).

The highest number of rotifer species was recorded in May with 362541 ind m³ and the lowest in November with 10798 ind m³ (Table 1).

Table 1. The monthly distribution of Rotifera in Kepektas Dam Lake (ind. m³)

Months	<i>B. urceolaris</i>	<i>K. cochlearis</i>	<i>K. quadrata</i>	<i>N. squamula</i>	<i>K. longispina</i>	<i>C. uncinata</i>	<i>L. lunaris</i>	<i>P. vulgaris</i>	<i>A. priodonta</i>	<i>F. terminalis</i>	<i>P. roseola</i>	Gen Total
Jan	14695	-	-	-	-	318	-	-	-	3519	-	18532
Feb	12679	5374	1592	1214	-	636	-	159	943	14135	-	36732
Mar	26500	107484	1592	849	-	-	-	318	3185	14949	1592	156469
Apr	17856	214968	95541	-	-	943	1592	1636	1588	-	1433	335557
May	4382	63696	103503	-	175159	1800	3343	5731	3176	-	1751	362541
June	-	79617	-	-	246815	4692	5254	1432	4796	-	-	342606
July	-	-	-	-	-	3184	4286	7164	-	-	-	14634
Aug	-	1592	-	-	-	9869	3291	11463	3296	-	-	29511
Sep	-	-	-	-	-	27865	-	22926	4764	13189	-	68744
Oct	-	1905	-	-	-	12441	-	3275	9867	-	-	27488
Nov	-	5573	-	-	-	-	-	5225	-	-	-	10798
Dec	10891	-	-	-	-	-	-	-	-	-	-	10891
												1414503
Aver	14500	60025	50557	1031	210987	6860	3553	5932	3951	11448	1592	370436
%	3.9	16.2	14.0	0.2	57.0	1.8	0.9	1.6	1.0	3.0	0.4	

P. vulgaris, the most abundant species, was observed for 10 months during the study period and showed its peak in September with 22926 ind m³, while the lowest was recorded in February with 159 ind m³. The second most dominant species was *C. uncinata*, which occurred in 9 months. The highest number of this species was recorded in September with 27865 ind m³, and the lowest in January with 318 ind. m³. In seasonal distribution, Rotifera was observed at the maximum level with 60.4 % in spring and a minimum level in winter with 4.6%. Spring also had the highest number of species diversity (Fig. 1).

Fig. 1. The seasonal distributions of Rotifera in Kepektas Dam Lake (ind m³)

The temperature of the lake varied from 7 to 25° C, pH 7.9 to 8.5 and dissolved oxygen 5.7 to 11.2 mg L⁻¹ (Fig. 2).

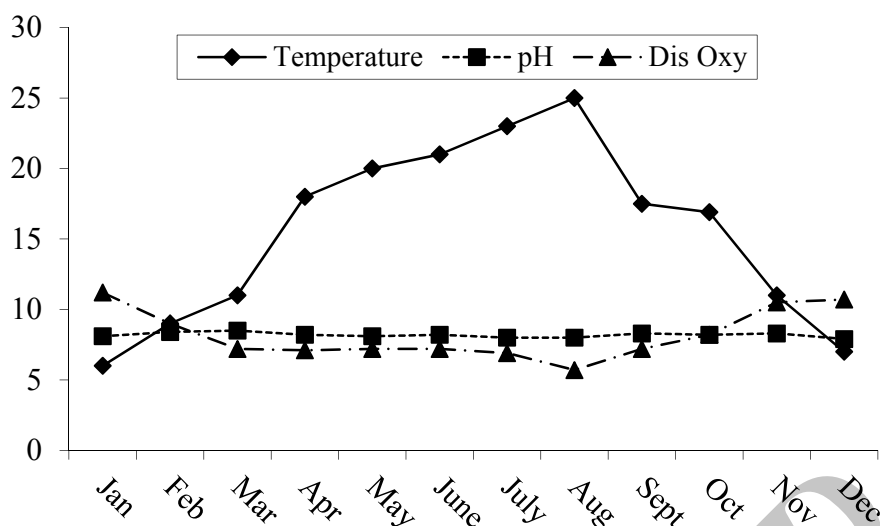


Fig. 2. Physical and chemical parameters measured in Kepektas Dam Lake

4. DISCUSSION

In oligotrophic lakes representatives of genus *P. vulgaris*, *K. cochlearis*, *K. longispina*, *A. priodonta* and *F. terminalis* are predominant [19]. In Kepektas Dam Lake, *P. vulgaris*, *K. cochlearis* and *A. priodonta* are recorded as the dominant groups. *K. longispina* had the highest relative density with 57%. It was also indicated that *Brachionus* spp. are the most common group in shallow waters and that *K. cochlearis*, *P. vulgaris* are also found as dominant groups [19]. Lair (1980) reported that *Brachionus* is a cosmopolitan genus living in fresh, salty and brakish waters and also has a world-wide distribution [21]. In the present study, five genus belonging to Brachionidae were observed and *K. cochlearis* was found to be the third most dominant rotifer species of all identified species in Kepektas Lake (Table 1).

Salser (2001), reported seasonal population peaks in rotifer density in Keban Dam Lake, located in the same region with the Kepektas Dam Lake [11]. She also reported that rotifer individual numbers had shown peaks in spring [11]. The same peaks were observed in individual numbers of Rotifera in the research area in spring. In Keban Dam Lake [11], *P. vulgaris* was recorded as the most abundant species as in this study.

Vasconcelos (1990) stated that *Polyarthra* sp., *A. priodonta* and *K. cochlearis* were the dominant rotifer species during most of the year except the winter months [22]. These findings are consistent with Kepektas Dam Lake's rotifer profile.

Laxhuber (1987) noted that *P. vulgaris* and *K. cochlearis* were the most dominant species throughout the year [23]. Berzins and Pejler (1989) stated that *P. vulgaris*, *A. priodonta*, and *K. cochlearis* were the most common rotifer species during the year [24]. These species were also the most abundant species in Kepektas Dam Lake.

According to Berzins and Pejler (1989), *N. squamula* is a cold-stenothermal species, but *L. lunaris* is a hot-stenothermal species [24]. These findings are consistent with this study. In the lake *N. squamula* was observed in February and March, whereas *L. lunaris* was recorded in spring and summer months. Berzins and Pejler (1989) also reported that *P. vulgaris* and *K. cochlearis* were characterized in a wide range of oxygen concentrations [24]. The oxygen concentration of the Kepektas Dam Lake ranged from 5.7 to 11.2 mg L⁻¹ and the occurrence of *P. vulgaris* and *K. cochlearis* throughout the year could be connected with a range of oxygen concentrations in this dam lake.

Mengestou et al (1991) stated that most rotifer species tend to peak during July to December when the lake is mixing. *C. uncinata*, *P. vulgaris* and *A. priodonta* were also found in large numbers during the same period [25]. They reported that the rotifer community showed a similar seasonal pattern during the observation period, with the highest numbers occurring during July to December, and the lowest numbers during April to June [25]. In the Kepektas Dam Lake the highest numbers of rotifers were recorded from April to June and the lowest from November to December.

F. terminalis is known to occur at low temperatures, and in Kolisko's (1974) experience, not over 15° C [19]. In the Kepektas Dam Lake *F. terminalis* was observed in the cold period, between January and March.

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