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## A Taxonomical Study on the Rotifer Fauna of Yedigöller (Bolu-Turkey)

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**Abstract:** The study was carried out at Yedigöller (Turkey) between January and November, 1997. Thirty-one species of rotifers were identified, all of which were new for Yedigöller. Three species (*Dicronophorus caudatus*, *Synchaeta lokowitziana*, *Trichocerca bidens*) were new records for the Turkish fauna.

**Key Words:** Yedigöller, Rotifera, taxonomy.

### Yedigöller'in (Bolu) Rotifera Faunası Üzerine Taksonomik Bir Çalışma

**Özet:** Ocak 1997 - Kasım 1997 tarihleri arasında yapılan bu çalışmada, Yedigöller rotifera faunasına ait 31 tür tesbit edilmiştir. Bu türlerin tamamı Yedigöller için ve bu türlerden 3 tür (*Dicronophorus caudatus*, *Synchaeta lokowitziana*, *Trichocerca bidens*) Türkiye için yeni kayıttır.

**Anahtar Sözcükler:** Yedigöller, Rotifera, taksonomi.

### Introduction

Phytoplankton and zooplankton comprise the first and second steps in the food chain of lake ecosystems. Invertebrates, fish and sometimes birds most often use zooplankton as food.

The main groups of zooplankton consist of Copepoda and Cladocera, with the subphylum Crustacea and the phylum Rotifera. Some studies on the phylum Rotifera show that certain species act as indicators of water quality, pollution and eutrophication (1-3).

Daday (4) was the first to publish research on Anatolian rotifers from lakes Apolyont and Iznik (Western Anatolia), followed by Vavra (5) and Zederbauer and Brehm (6), who carried out their studies at Sarıgöl in the Erciyas mountain range of Eastern Anatolia. Furthermore, Geldiay (7), Hauer (8) and Tokat (9) reported their availability in Eymir Lake, Çubuk dam (Ankara), Lake Van and Lake Hazar respectively. Nevertheless, Zederbauer and Brehm (6) found no any rotifer in the saline crater lake (Konya), and Dumont and De Ridder (10) reported availability of one species from the same lake.

A short list of Turkish rotifer fauna from various lakes is provided by Mann (11), Margaritora and Cottarelli (12) and Margaritora et al., (13). In addition, Dumont and De Ridder (14); Emir (15-19); Ustaoglu (20); Ustaoglu and Akyürek (21); Ustaoglu and Balık (22-25); Ustaoglu et al.

(26); Balık and Ustaoglu (27); Altındağ (28); Altındağ and Sözen (29); Balık and Özkurt (30); Demirhindi (31); have also reported about Turkish rotifer fauna.

Three new species of rotifers were, for the first time reported and added to the Turkish fauna as a result of present study.

### Study Area

The Yedigöller basin with an area of 1636 hectares lies in the state forest area at the 45th km on the Bolu-Zonguldak Road. They are created by natural obstruction of land masses restricting the flow of water, resulting in the formation of lakes. The highest point in the basin is Eğrikiriş peak (1488 m) which becomes deeper towards south. The lowest point is Kirazçalı (465 m). The basin, mainly composed of magmatic bedrock of limestone and serpentine. As far as climate is concerned, it has rather cool winters and springs, warm summers and moderate autumns (32). The total surface area of the lakes is 5 hectares, the smallest being 0.3 hectares and the largest being 2.7 hectares. The lakes, with an elevation of 800 m and a maximum depth of 25 m (Deringöl) are tectonic in origin, and are formed by karst movements. Lakes are fed by Karadere and their discharge water is rich in plankton. Trout is being regularly released into the lakes after being raised in nearby trout farms. Annual fish production is about 1000 kg (33). These lakes are also important tourist areas in Turkey.

## Materials and Methods

The samples were collected between January and November, 1997, on a monthly basis (except February and March) from two stations each in Deringöl, Büyükgöl and Nazlıgöl and one each in Seringöl, Sazlıgöl and Incegöl (Figure 1), with a plankton net 25 cm in diameter with a mesh size of 55  $\mu$ . The net was drawn horizontally and vertically to collect the samples. No study was carried out in Kurugöl because of its dryness. Formaldehyde solution (4%) was used to preserve the samples soon after collection. The samples were identified as per Kolisko (34); Koste (35); Edmondson (36) and Ward and Whipple (37). The photographs of some of these rotifers were taken by inverted microscopy and are shown in Figure 2 (A-Q).

## Result and Discussion

A total of 31 rotifer species were identified and are given below:

Phylum - Rotifera

Class - Monogononta

Order - Ploima

Family - Brachionidae

- *Kellicottia longispina* (KELLICOTT, 1879)

- *Keratella cochlearis* (GOSSE, 1851)

- *Keratella quadrata* (O. F. MÜLLER, 1786)

- *Brachionus angularis* (GOSSE, 1851)

- *Brachionus urceolaris* (O. F. MÜLLER, 1773)

- *Brachionus calyciflorus* (PALLAS, 1766)

- *Notholca acuminata* (EHRENBERG, 1832)

- *Anuraeopsis fissa* GOSSE, 1851

Family - Lecanidae

- *Lecane luna* (O.F. MÜLLER, 1776)

- *Lecane closterocerca* (SCHMARDA, 1859)

- *Lecane hamata* (STOKES, 1896)

Family - Colurellidae

- *Colurella adriatica* EHRENBERG, 1831

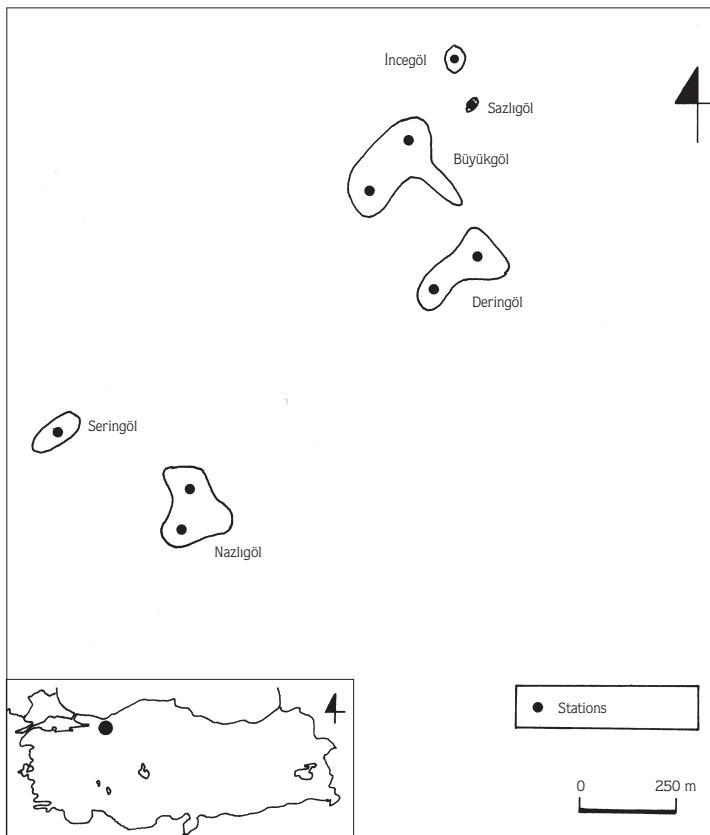


Figure 1. Locations of the lakes and sampling sites.

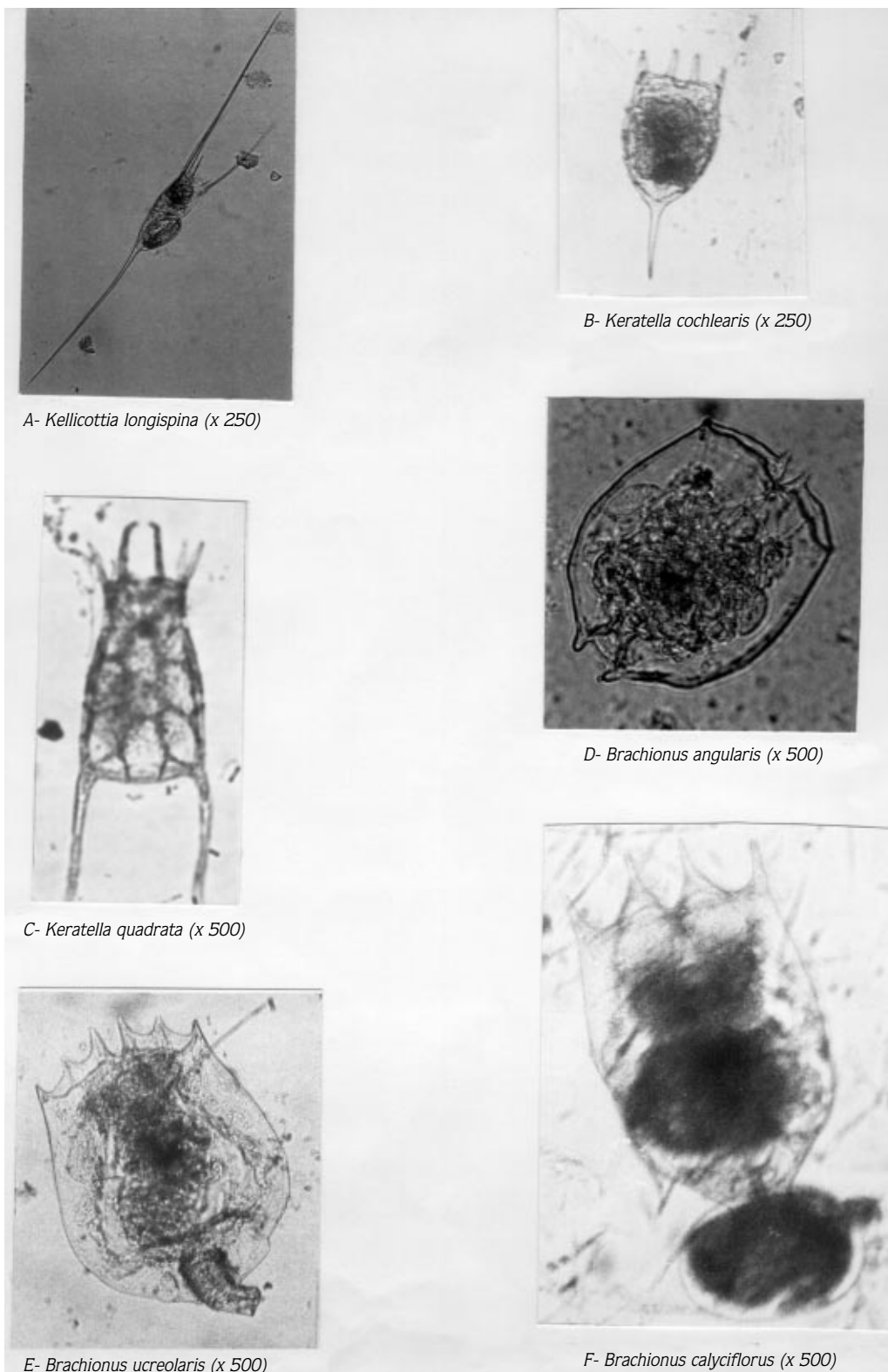


Figure 2. A- *Kellicottia longispina* (x 250), B- *Keratella cochlearis* (x 250), C- *Keratella quadrata* (x 500), D- *Brachionus angularis* (x 500), E- *Brachionus urceolaris* (x 500), F- *Brachionus calyciflorus* (x 500).

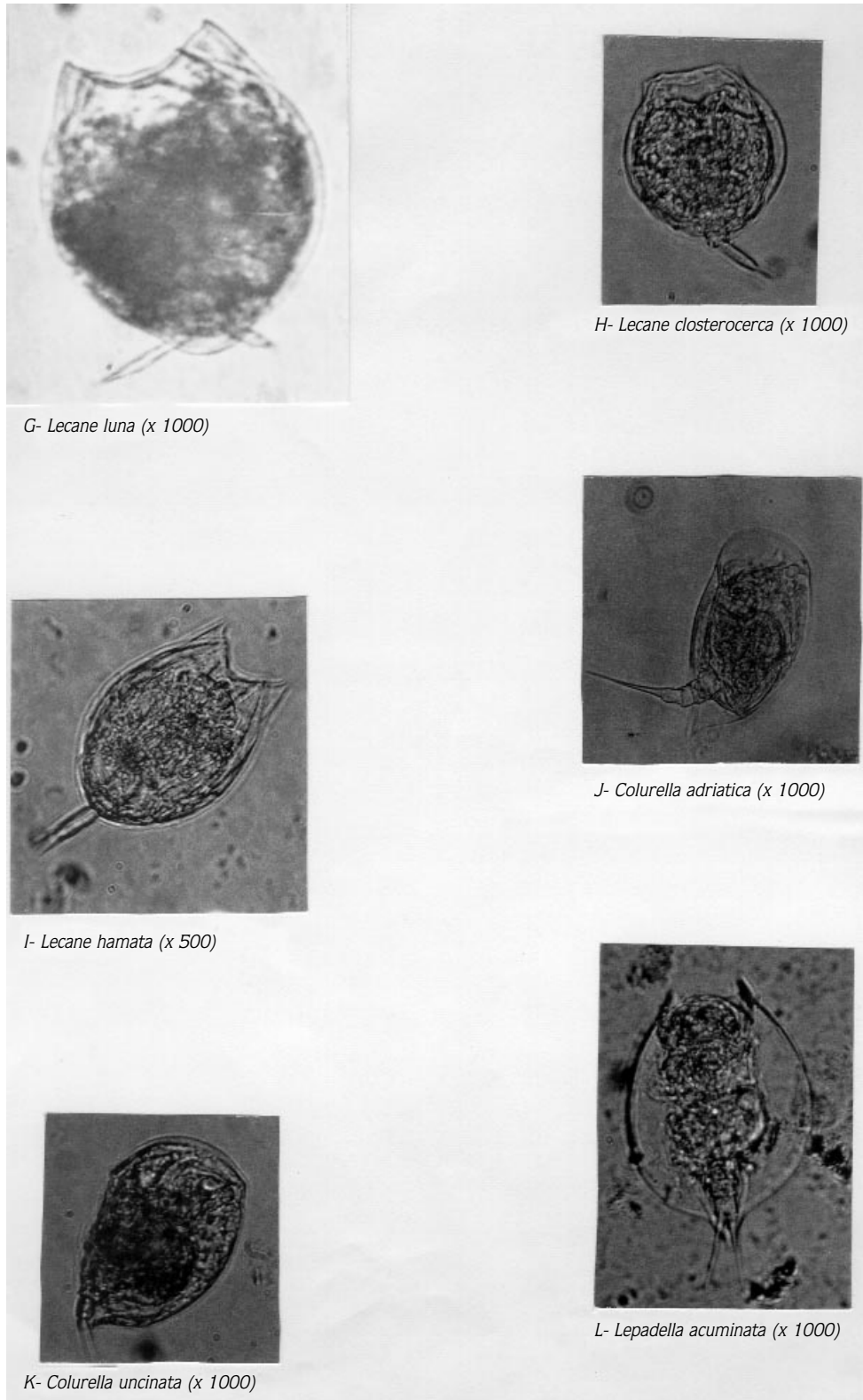
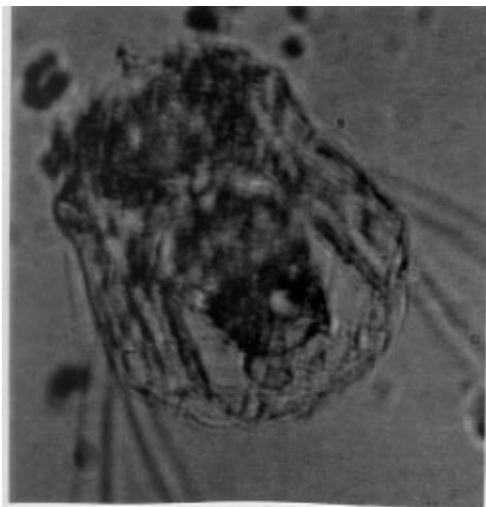


Figure 2. G- *Lecane luna* (x 1000), H- *Lecane clostocerca* (x 1000), I- *Lecane hamata* (x 500), J- *Colurella adriatica* (x 1000), K- *Colurella uncinata* (x 1000), L- *Lepadella acuminata* (x 1000).



M- *Polyarhra dolichoptera* (x 1000)



N- *Trichocerca relicta* (x 1000)



O- Trophi of *Asplanchna girodi*, 120  $\mu$



P- *Asplanchna priodonta* (x 250)



R- *Cephalodella catellina* (x 500)

Figure 2. M- *Polyarhra dolichoptera* (x 1000), N- *Trichocerca relicta* (x 1000), O- Trophi of *Asplanchna girodi*, 120  $\mu$ , P- *Asplanchna priodonta* (x 250), R- *Cephalodella catellina* (x 500).

- *Colurella uncinata* (O. F. MÜLLER, 1773)
- *Lepadella patella* (O. F. MÜLLER, 1786)
- *Lepadella acuminata* (EHRENBERG, 1834)
- Family - Synchaetidae
- *Polyarthra vulgaris* CARLIN, 1943
- *Polyarthra dolichoptera* IDELSON, 1925
- *Synchaeta litoralis* ROUSSELET, 1902
- *Synchaeta pectinata* EHRENBERG, 1832
- *Synchaeta lakowitziana* LUCKS, 1930
- Order: Flosculariacea
- Family - Filinidae
- *Filinia longiseta* (EHRENBERG, 1834)
- Family - Euchlanidae
- *Euchlanis dilatata* EHRENBERG, 1832
- Family - Trichocercidae

- *Trichocerca bidens* (LUCKS, 1912)
- *Trichocerca tenuior* (GOSSE, 1886)
- *Trichocerca tigris* (O. F. MÜLLER, 1786)
- *Trichocerca relictta* (DONNER, 1950)
- Family - Asplanchnidae
- *Asplanchna girodi* (DE GUERNE, 1888)
- *Asplanchna priodonta* GOSSE, 1850
- Family - Notommatidae
- *Cephalodella ventripes* DIXON - NUTTALL, 1901
- *Cephalodella catellina* (O. F. MÜLLER, 1768)
- Family - Dicranophoridae
- *Dicranophorus caudatus* (EHRENBERG, 1834)

The distribution of the identified rotifer species is given in Table 1, which shows them to belong to 10 families. A maximum of 17 species were found in Deringöl. None of the identified 31 species were

Table 1. The distribution of the identified species in Yedigöller.

Species	Büyükgöl	Deringöl	Nazlıgöl	İncegöl	Seringöl	Sazlıgöl
<i>Kellicottia longispina</i>	+	+	+			+
<i>Keratella cochlearis</i>	+	+	+	+	+	
<i>Keratella quadrata</i>			+			
<i>Brachionus angularis</i>	+	+	+	+		
<i>B. urceolaris</i>				+		
<i>B. calyciflorus</i>		+	+			
<i>Notholca acuminata</i>	+		+		+	+
<i>Anuraeopsis fissa</i>		+		+		
<i>Lecane luna</i>			+			
<i>L. closteroerca</i>				+		+
<i>L. hamata</i>		+		+		
<i>Colurella adriatica</i>		+			+	+
<i>C. uncinata</i>				+		
<i>Lepadella patella</i>		+	+	+		
<i>L. accuminata</i>		+		+		
<i>Polvarthra vulgaris</i>	+	+	+		+	
<i>P. dolichoptera</i>			+	+		
<i>Synchaeta litoralis</i>	+	+	+	+		+
<i>S. pectinata</i>	+			+	+	+
<i>S. lakowitziana</i>	+		+		+	+
<i>Filinia longiseta</i>	+				+	
<i>Euchlanis dilatata</i>		+	+	+		
<i>Trichocerca bidens</i>		+				+
<i>T. tenuior</i>		+		+	+	+
<i>T. tigris</i>		+	+			+
<i>T. relictta</i>				+		
<i>Asplanchna girodi</i>	+	+		+	+	
<i>Asplanchna priodonta</i>	+				+	
<i>Cephalodella ventripes</i>			+			+
<i>C. catellina</i>	+	+		+		+
<i>Dicranophorus caudatus</i>		+	+		+	

previously reported from these lakes. Three species (*Dicranophorus caudatus*, *Synchaeta lakowitziana*, *Trichocerca bidens*) are new records for the Turkish fauna. The ecological features of the identified species show that most of them are cosmopolitan and littoral, inhibiting aquatic macro-vegetation (34, 35)

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