Zooplankton of Çat Dam Lake (Malatya-Turkey) with a new record for Turkish rotifers

*Lecane intrasinuata* (Olofsson, 1917)

**Saler S.**¹; **Bulut H.**¹*; **Karakaya G.**²

Received: February 2015  Accepted: February 2017

¹-Fırat University, Fisheries Faculty, 23119 Elazığ-Turkey
²-Elazığ Fisheries Research Station, Elazığ-Turkey
*Corresponding author’s Email: hilahaykir@gmail.com

**Keywords**: Rotifera, *Lecane intrasinuata*, New record, Turkey, Çat Dam Lake

**Introduction**

There are many studies on the zooplankton of Turkish lakes, many of which are about seasonal fluctuations, distribution and hydrological changes. In recent years many scientists focused their attention on the zooplankton of Turkish inland waters (Dumont and De Ridder, 1987; Segers *et al.*, 1992).

The family Lecanidae consists of one genus, *Lecane* Nitzsch, 1827 with about 200 species. This genus is the most common rotifer species inhabiting in various aquatic environments (Segers 1994, 1995, 2008). They are from Monogonont rotifers and are diagnosed by the retractile head, the structure of the foot and toes and by the trophy in the female (Segers, 1995). Lecanids have got a loricate body and the body is compressed dorso-ventrally. The dorso-ventral plates are connected by a flexible membrane. The feet have got two primitive segments of which only the posterior is movable. Toes varied remarkably within individuals of the same species (Arora, 1965). Their bodies resemble each other which causes difficulties in identifying species (Segers *et al.*, 1992).

**Materials and methods**

Çat Dam Lake was established on Abdulvahap Stream for irrigation and is located 68 km south of Malatya. The Dam lake volume is 240 hm³ and lake area is 14 km². Sampling stations are shown in Fig. 1, and listed with sampling coordinates in Table 1.
Plankton samples were collected using a standard Hydro-bios plankton net (55 μm mesh size) from Çat Dam Lake on 02.20.2013 from six stations. Zooplankton samples were fixed in 4% formalin solution. Specimens were analysed under Leitz inverted microscope and identified under Nicon Eclipse 80i microscope and drawings were made using camera lucida.

**Results and discussion**

From Çat Dam Lake, 19 zooplankton species (15 species from Rotifera, 2 species from Cladocera and 2 species from Copepoda) were identified. The species *L. intrasinuata* was not reported in any study in Turkey until now (Ustaoğlu *et al.*, 2012; Ustaoğlu, 2015). Therefore, this species is a new record for the Turkish rotifer fauna.

List of zooplankton species recorded in Çat Dam Lake was given below.

**Plankton samples were collected using a standard Hydro-bios plankton net (55 μm mesh size) from Çat Dam Lake on 02.20.2013 from six stations. Zooplankton samples were fixed in 4% formalin solution. Specimens were analysed under Leitz inverted microscope and identified under Nicon Eclipse 80i microscope and drawings were made using camera lucida.**

**Results and discussion**

From Çat Dam Lake, 19 zooplankton species (15 species from Rotifera, 2 species from Cladocera and 2 species from Copepoda) were identified. The species *L. intrasinuata* was not reported in any study in Turkey until now (Ustaoğlu *et al.*, 2012; Ustaoğlu, 2015). Therefore, this species is a new record for the Turkish rotifer fauna.

List of zooplankton species recorded in Çat Dam Lake was given below.

**Phylum Rotifera Cuvier, 1817**

**Class Euroatoria De Ridder, 1957**

**Subclass Monogononta Plate, 1889**

**Superorder Pseudotocha Kutikova, 1970**

**Order Ploimia Hudson & Gosse, 1886**

**Family Brachionidae Ehrenberg, 1838**

**Genus Keratella Bory de St Vincent, 1822**

*Keratella cochlearis* (Gosse, 1851)  
*K. tecta* (Lauterborn, 1900)  
*K. quadrata* (Müller, 1786)

**Table 1: Sampling coordinates.**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Coordinates</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>38° 4′40.22˝N,  38° 18′38.11˝E</td>
</tr>
<tr>
<td>II</td>
<td>38° 4′12.73˝N,  38° 18′45.48˝E</td>
</tr>
<tr>
<td>III</td>
<td>38° 4′09.93˝N,  38° 18′21.27˝E</td>
</tr>
<tr>
<td>IV</td>
<td>38° 3′55.05˝N,  38° 17′46.73˝E</td>
</tr>
<tr>
<td>V</td>
<td>38° 3′30.98˝N,  38° 16′38.55˝E</td>
</tr>
<tr>
<td>VI</td>
<td>38° 2′40.49˝N,  38° 14′17.52˝E</td>
</tr>
</tbody>
</table>

**Figure 1:** Çat Dam Lake and the sampling stations.
Genus Notholca Gosse, 1886

*Notholca squamula* (Müller, 1786)

Genus Kellicottia Ahlstrom, 1938

*Kellicottia longispina* (Kellicott, 1879)

Family Euchlanidae Ehrenberg, 1838

Genus Euchlanis Ehrenberg, 1832

*Euchlanis dilatata* Ehrenberg, 1832

Family Lecanidae Remane, 1933

Genus Lecane Nitzsch, 1827

*L. lunaris* (Ehrenberg, 1832)

*L. intrasinuata* (Olofsson, 1917)

Family Trichocercidae Harring, 1913

Genus Trichocerca Lamark, 1801

*Trichocerca capucina* Wierzejski & Zacharias, 1893

*Trichocerca similis* (Wierzejski, 1893)

Family Synchaetidae Hudson & Gosse, 1886

*Polyarthra dolichoptera* (Idelson, 1925)

Family Asplanchnidae Eckstein, 1883

Genus Asplanchna Gosse, 1850

*Asplanchna priodonta* Gosse, 1850

Superorder Gnesiotrocha Kutikova, 1970

Order Flosculariacea Harring, 1913

Family Conochililidae Harring, 1913

Genus Conochilus Ehrenberg, 1834

*Conochilus dossuarius* (Hudson, 1885)

Family Filinidae Harring & Myers, 1926

Genus Filinia Bory de St. Vincent, 1824

*Filinia terminalis* (Plate, 1886)

Phylum Arthropoda Latreille, 1829

Subphylum: Crustacea Brünnich, 1772

Subclass Phyllopoda Preuss, 1951

Order Diplostraca Gerstaecker, 1866

Suborder Cladocera Latreille, 1829

Family Daphniidae Sars, 1930

Genus *Daphnia* Müller, 1785

*Daphnia longispina* Müller, 1875

Family Bosminidae Baird, 1845

Genus *Bosmina* Baird, 1845

*Bosmina longirostris* (Müller, 1785)

Class Maxillopoda Dahl, 1956

Subclass Copepoda H.Milne-Edwaeds, 1840

Infraclass Neocopepoda Huys & Boxshall, 1991

Superorder Gymnoplea Giebesbrecht, 1882

Order Calanoïda Sars, 1930

Family Diaptomidae Sars, 1903

Genus *Acanthodiaptomus* Kiefer, 1932

*Acanthodiaptomus denticornis* (Wierzejski, 1887)

Superorder Podoplea Giesbrecht, 1882

Order Cyclopoida Sars, 1918

Family Cyclopidae Kiefer, 1927

Genus *Cyclops* Müller, 1785

*Cyclops vicinus* Uljanin, 1875

Distribution of zooplankton species among 6 stations in Çat Dam Lake is given in Table 2.

<table>
<thead>
<tr>
<th>Species</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td><strong>Rotifera</strong></td>
<td></td>
</tr>
<tr>
<td><em>A. priodonta</em></td>
<td>+</td>
</tr>
<tr>
<td><em>C. dossuarius</em></td>
<td>+</td>
</tr>
<tr>
<td><em>E. dilatata</em></td>
<td></td>
</tr>
<tr>
<td><em>F. terminalis</em></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 continued:

<table>
<thead>
<tr>
<th>Species</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>K. longispina</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>K. cochlearis</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>K. quadrata</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>K. tecta</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. luna</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. lunaris</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*L. intrasinuata</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. squamula</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. dolichoptera</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. capucina</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. similis</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cladocera

<table>
<thead>
<tr>
<th>Species</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. longirostris</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>D. longispina</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Copepoda

<table>
<thead>
<tr>
<th>Species</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. denticornis</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. vicinus</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Family Brachionidae was found as the most dominant group (with 5 species, K. cochlearis, K. quadrata, K. tecta, K. longispina and N. squamula). In some dam lakes like Göksu (Bekleyen, 2003), Cip (Saler and Şen, 2000), Birecik (Bozkurt and Sagat, 2008), Beyhan (Bulut and Saler 2014), Kalecik (Bulut and Saler 2013) Dam Lakes species from Brachionidae represented most of the species.

In Çat Dam Lake K. cochlearis and K. quadrata were the most abundant species in this study followed by Lecane spp. Among zooplankton groups Rotifera was observed in high number of individuals and species diversity. This profile was in accordance with zooplankton distribution of dam lakes in Turkey (Bekleyen, 2003; Kaya and Altındağ, 2007; Özdemir Mis et al., 2009; Saler and İpek Aış, 2014; Saler et al., 2014). Bekleyen et al. (2011) identified 34 new Rotifer species. Ustaoğlu et al. (2012) recorded 341 rotifer taxa from Turkey. Ustaoğlu (2015), updated the rotifer species number as 417. Among these rotifer species L. intrasinuata has not been mentioned (Fig. 2).

Figure 2: General view of Lecane intrasinuata A. Ventral B. Dorsal.

Family Lecanidae Remane, 1933

Lecane intrasinuata (Olofsson, 1917)

Syn: L. ephestra Harring, 1921

Syn: L. mylacris Harring & Myers, 1926 (Segers, 2007).

The features of L. intrasinuata were given below.
Differential diagnosis

*L. intrasinuata* is confused with *L. stichaea*. *L. intrasinuata* has got a smooth lorica and the width of its lorica is greater than that of *L. stichaea*. Its ventral plate width is about two thirds of its length and the plate is slightly swollen. The foot is shorter than in *L. flexilis*, and the presence of pseudoclaws distinguishes the species from *L. haliclysta*, *L. stichoclysta* and *L. verecunda*.

Description

Lorica is stiff, dorsal plate is anteriorly narrower, and medially wider than the ventral plate. The plate is smooth. Head aperture margins are dorsally and ventrally slightly convex or straight, coincident, with small antero-lateral spines. Ventral plate is longer than its width. Lateral margins curved, irregularly undulate, with anterior notches. Toes are parallel-sided, bearing pseudoclaws.

Measurements

DPI. 52-135, DPw. 68-101, VPI. 56-125, VPw. 36-76, toe 15-26, claw 4-6.

Distribution

According to Segers (1995), it was found in the northern temperate zone only. He also reported a record from a pond near Alexandrowsk from Norway Fig. 2.

References


**Bozkurt, A. and Y. Sagat, 2008.** Vertical distribution of Birecik Dam Lake (Turkey), zooplankton, *Journal of FisheriesSciences*, 2, 332-342

**Bulut, H. and Saler, S., 2013.** Kalecik Baraj Gölü (Elazığ-Türkiye) zooplanktonu. *Fırat Universitesi Fen Bilimleri Dergisi*, 25(2), 99-103

**Bulut, H. and Saler, S., 2014.** Zooplankton of Beyhan Dam Lake (Elazığ-Turkey). *Turkish Journal of Science and Technology*, 9(1), 23-28


