

A Checklist of Cladocera in The Kufa River, Iraq

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ABSTRACT: Cladocera samples were collected from three sites on the Kufa River. The Kufa River is located in the Najaf governorate of Iraq. km long, with a length of (75.25 km). A net with a diameter of 50 cm and a mesh size of 55 µm was secondhand. to collect the Cladocera samples. A total of thirty-one taxa of 14 genera were identified. These genera: Alona, Bosmina, Campocercus, Chydorus, Ceriodaphnia, Daphnia, Diaphanosoma, Graptoleberis, Hyocryptus, Latonopsis, Leydigia, Macrothrix, Pleuroxus, Simocephalus belong to six families. Chydoridae was the prevailing family in this study, while Hyocryptidae included only one taxon. Bosmina longirostris, Chydorus sphaericus, Ceriodaphnia sp., and Simocephalus expinosus were recorded in all identified sites. This study aimed to identify the Cladocera species in the Kufa River.

Keywords: Bosmina, Daphnia, cladocera taxa, Kufa



1. INTRODUCTION

The Cladocera taxa, which comprise a large proportion of zooplankton, are useful for describing crustaceans of similar appearance. They are in motion most of the time, swimming by stroking the antennae, which are used as their chief form of propulsion. It is referred to as a water fleas because most cladocerans move in a series of hops in the same manner as fleas [1]. The size of Cladocera ranges between (0.2–18 mm). They are divided into four suborders: 11 families and 80 genera [2]. About 620 species are currently identified, but it is estimated that the actual number of species is four times higher [3]. Cladocerans are found in almost all types of aquatic habitats like rivers, ponds, lakes, streams, and other bodies of water [1], There are scarce studies of Cladocera in Iraq, as a review identified twenty-two Genera at Basrah regions as marshes of Basrah, subsidiary Rivers of the Shatt Al-Arab, marine waters and ponds [4]. So, this study aims to give an idea about the quality of major families of cladoceran and to achieve a checklist of cladoceran taxa in the Kufa River, because there are modicum studies about this River.

2. MATERIALS AND METHODS

a) The River of Euphrates extends 150 km south of Ramadi Province. Hilla and Hindiah branches are separated from the Euphrates, from Al-Hindia Dam at 180 km, even the Kfel district, and then subdivided after nearly 1 km from Abasya and the Kufa Rivers. The Kufa River in Najaf has a span of around 75.2 Km, and the landfill is monitored by the Kufa Dam. Three sites were chosen from Kufa Rivers to achieve the main aim of this study [5] (figure 1):-

Site 1: It is located at north of Al-Emam Ali Bridge: 32.084378, 44.387120

Site 2: It is located near the Kufa Bridge: 32.026274, 44.415745

Site 3: It is located about 1.5 km away from site two 31.933147, 44.486276

b) Methods: Samples were taken from each site from April to July 1919. For cladoceran studies, a net of 50 cm diameter was utilized to collect faunal samples. The samples were fixed immediately, then brought to the lab. The samples were transported to the laboratory for isolating, counting, and identification. As much as possible, identification was made up to species level or genus level using dissecting and compound microscopes with the aid of many references [6-9].



FIGURE 1. - A map depicts the sites. Source: directorate of water resources in Najaf

3. RESULTS AND DISCUSSION

A total of 31 taxa were recognized in the collected samples, belonging to six families: Chydoridae, 13 taxa; and Daphniidae, 11 taxa. Bosminidae and Macrothricidae included three taxa and Sididae and Hyocryptidae included two and one taxa respectively, Table 1 shows the taxonomic list of cladocerans. During the study period, the number of taxa recorded was not the same as that in a variety of Iraqi studies. For example, [10] recorded 52 taxa in the Tharthar-Euphrates Canal; [101] recorded 12 taxa in the Euphrates River in the middle of Iraq; [12] recorded 16 species near the hospital of Sader and the Isle of Sindbad.; [13] reported 124 taxa in three drainage canals within Abu-Gareeb, Al-Rhedwania, and Al-Yosfiaa; [14] recognized 51 species belonging to 20 Genera [15] recorded eight taxa in Khour Al-Zubair Stations; [16] recorded 38 taxa in Euphrates River. [17] recorded 14 taxa in the River Diyala and two of its branches, and [18] recorded five taxa in Madinat Al-Alaab.

Differences in taxon counts due to differences in environmental conditions or the nature of the studied ecosystems and dissimilarities in taxonomic aspects, related to the inability to diagnose certain taxonomic levels of genera and species or the size of the net., as pointed out in [19]. The make-up of the community in shallow water systems is affected by water cover., water chemistry, and predation. The formation of various ecological communities is largely due to these major factors [20, 21, 22].

Table 1. - Taxonomic list of cladoceran group in this study

- Phylum: Arthropoda**
- Class: Crustacea**
- Order: Copepoda**
- Suborder: Cladocera**
- Family: Bosminidae**
- Bosmina coregoni*
- Bosmina longirostris*
- Bosmina sp.*
- Family: Chydoridae**
- Alona costata*
- Alona guttata*
- Alona monocanthar*
- Alona rectangular*
- Alona sp.*
- Camptocercus rectirostris*

- Camptocercus sp.*
Chydorus sphaericus
Graptoleberis testudinaria
Leydigia acanthocercoides
Pleuroxus sp.
Family:Daphniidae
Ceriodaphnia sp.
Ceriodaphnia reticulata
Daphnia sp.
Daphnia laevis
Daphnia longiremis
Daphnia longispina
Daphnia pulex
Daphnia similis
Simocephalus sp.
Simocephalus expinosus
Simocephalus vetulus
Family: Hyocryptidae
Hyocryptus sordidus
Family: Macrothricidae
Macrothrix hirsuticomis
Macrothrix laticomis
Macrothrix rosea
Family: Sididae
Diaphanosoma brachyurum
Latonopsis occidentalis

Table 2 shows the distribution of the Cladocera taxa at the river sites during the study period. *Bosmina longirostris*, *Chydorus sphaericus*, *Ceriodaphnia sp.* , and *Simocephalus expinosus* were recorded in all identified sites. A stable degree was reached by these genera that were recorded at high frequencies in the Iraqi aquatic environment [23, 24], This is due to the control of small species on the severity of predation via predators, the removal of crustaceans of a large size is the outcome and substitute it with minor shellfish., particularly *Bosmina longirostris* [25]. *Simocephalus expinosus* is one of the most resistant. Contaminated environments are suitable for Cladocera species to live in.. *Chydorus sphaericus* commonly can adapt to some variable factors [26, 27]. In the present study, obvious changes in the composition of the cladocerans species, among sites, because of different factors such as the drainage of materials coming from plants and food materials that drift along watercourses. in addition to the variations in the density of phytoplankton in addition to the fluctuations of environmental factors, this surely affects the composition of cladocerans species [28, 29].

Table 2. - The list of parasite taxa that have been identified is either present or absent

Taxa	St.1	St.2	St.3
<i>Bosmina coregoni</i>	+	+	-
<i>Bosmina longirostris</i>	+	+	+
<i>Bosmina sp.</i>	-	-	+
<i>Alona costata</i>	+	-	+
<i>Alona guttata</i>	+	+	-
<i>Alona monocanthar</i>	+	-	-

<i>Alona rectangular</i>	+	-	+
<i>Alona sp.</i>	+	+	-
<i>Camptocercus rectirostris</i>	+	-	+
<i>Camptocercus sp.</i>	-	+	-
<i>Chydorus sphaericus</i>	+	+	+
<i>Graptoleberis testudinaria</i>	-	-	+
<i>Leydigia acanthocercoides</i>	-	-	+
<i>Pleuroxus sp.</i>	+	-	+
<i>Ceriodaphnia sp.</i>	+	+	+
<i>Ceriodaphnia reticulata</i>	+	+	-
<i>Daphnia sp.</i>	-	+	-
<i>Daphnia laevis</i>	+	-	-
<i>Daphnia longiremis</i>	-	-	+
<i>Daphnia longispina</i>	+	-	-
<i>Daphnia pulex</i>	+	+	-
<i>Daphnia similis</i>	-	+	-
<i>Simocephalus sp.</i>	+	-	-
<i>Simocephalus expinosus</i>	+	+	+
<i>Simocephalus vetulus</i>	+	+	-
<i>Hyocryptus sordidus</i>	+	+	-
<i>Macrothrix hirsuticomis</i>	-	-	+
<i>Macrothrix laticomis</i>	+	+	-
<i>Macrothrix rosea</i>	+	-	-
<i>Diaphanosoma brachyurum</i>	+	+	-
<i>Latonopsis occidentalis</i>	-	+	+

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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