Ichthyofauna of Darbandikhan Lake in Kurdistan Region, Iraq

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ABSTRACT

In the present study, random samples of fishes were taken by gill net from Darbandikhan Lake, southeast of Sulaimani City, Kurdistan Region, Iraq, to find out the fishes that are naturally found in lake Darbandikhan. The study was carried out during the period from March to the end of October 2012. A total of 255 freshwater fishes, belong to 17 species, namely: Arabibarbus grypus, Barbus barbulus, Capoeta trutta, Capoeta umbla, Carasobarbus luteus, Carassius auratus, Chondrostoma regium, Cyprinion macrostomum, Cyprinus carpio, Garra rufa, Hemiculter leuciscus, Hypophthalmichthys molitrix, Luciobarbus esocinus, Squalius lepidus (Family Cyprinidae), Mystus pelusius (Bagridae), Silarus triostegus (Siluridae) and Mastacembelus mastacembelus (Mastacembelidae), were collected from this lake. The study demonstrated that Capoeta trutta, Cyprinion macrostomum and H. leuciscus were the most abundant and wide spread in lake Darbandikhan, while M. pelusius and H. molitrix were scarce.

1. INTRODUCTION

Fishes have been ecological dominants in aquatic habitats they have occupied nearly all major aquatic habitats, from lakes and polar oceans that are ice-covered through much of the year, to tropical swamps, temporary ponds, intertidal pools, ocean depths, and all the more benign environments that lie within these various extremes (Gene et al., 2009).

Fishes are excellent sources of protein, containing all the ten essential amino acids in desirable concentrations for human beings and available at cheaper rates (Agrawal, 1999). The white meat of fish contains 16-29% of protein and has a food value of 300-1600 calories per pound (Shaukat, 2008).

Kurdistan Region is very rich in freshwater bodies as there are many lakes, rivers, stream, karees and springs e.g. Dokan Lake, Darbandikhan Lake, Duhok Lake, Bawashaswar Lake, Greater Zab River, Lesser Zab River and Sirwan River. These water bodies are a good habit for many aquatic organisms especially Ichthyofauna. Unfortunately the study of this fauna in theses water bodies were very limited (Abdullah et al., 2007).

In Darbandikhan Lake there are many species of fishes; some are native species and
others are exotic, some are large and others never grow to enough size for human consumption. The purpose of this paper is to identify the fish species in this lake and to know which species was more abundance in this lake.

2. MATERIALS AND METHODS

2.1. Description of Study Area

Darbandikhan Lake is 7500 hectare, located about 60 km southeast of Sulaimani city, north of Iraq. It is situated between 35° N and 45° E, with the altitude of 485 m above sea level. The surface area is about 121 km² and the lake capacity is 3,000,000,000 m³ with the maximum depth of 75 m, while the Mean depth is 14.8-24.9 m, the main structure is a 128 m high dam with a central clay core and rock fill shoulders. The crest length of the dam is 445 m. Darbandikhan lake was constructed in 1962 at Sirwan river for the purposes of irrigation, control of flood, generating electricity power, fish raising and tourism (Al-Saudi, 1976).

The lake is fed by two rivers, Tanjero River in the north and Sirwan River in the east. It is surrounded by mountains, from north of the lake toward the east are Baranan, Kolkarash, Gulan, Jardsna, while to the south are Zmnako, Zawale, Psht-Qala, Dilf and Shameran, and to the south east is Bashi perk (Al-Saudi, 1976).

Water levels decline in summer due to end of the raining season, and dam releases until raining season resumes in late autumn. The lake and surrounding area is a biological diverse area for wildlife (Bachmann et al., 2008).

2.2. Collection and Preservation of Fishes

A total of 255 fish specimens were collected from Darbandikhan Lake by local fishermen by using gill netting (2 x 100 m mesh sizes 1.5 x 1.5, 3 x 3, 4 x 4 and 6 x 6 cm), cast netting (2 x 50m mesh sizes 2 x 2 cm), electro fishing, and hook biweekly during the period from March to the end of October 2012.

The fishes were placed in containers with local lake water, transferred immediately to the laboratory and examined as soon as possible after their capture. The fishes were identified according to Beckman (1962) and Coad (2010) and the scientific names for fishes were according to Froese and Pauly (2016).

Specimens were preserved, without removal of the guts or gills so that no key characters are lost. Fishes were dropped into 1 part full-strength formalin to kill the fish quickly and then 9 parts of water were added to form a 10% preserving solution according to Coad (2010).

3. RESULTS AND DISCUSSION

A total of 255 different specimens of fishes were collected from Darbandikhan Lake during the period from March to the end of October 2012. Table (1) shows different species of fishes and their abundance in the lake of Darbandikhan. The fish fauna of Darbandikhan lake included 13 native species (plate 1) with the ratio of 76.47%; namely Arabibarbus gyporus, Barbus barbulus, Capoeta trutta, Capoeta umbla, Carasobarbus luteus, Chondrostoma regium, Cyprinion macrostomum, Garra rufa, Luciobarbus esocinus, Squalius lepidus (Family Cyprinidae), Mystus pelusius (Bagridae), Silurus triostegus (Siluridae) and Mastacembelus mastacembelus (Mastacembelidae). The exotic species (plate 2) included four species with a total ratio of
23.52%; namely *Carassius auratus*, *Cyprinus carpio*, *Hemiculter leucisculus* and *Hypophthalmichthys molitrix*. Coad (2010) mentioned that there are 13 species of exotic fishes in the Tigris-Euphrates Basins including the four recorded species in the present study.

The most abundant species recorded in this investigation belonged to family Cyprinidae (14 species with a ratio 82.35%), followed by families Bagridae, Siluridae and Mastacembelidae (one species for each family with a total ratio of 5.88%). It was obvious that *Capoeta trutta* was the most abundant and wide spread, followed by *Cyprinion macrostomum*, then in the third rank *H. leucisculus* while *Mystus pelusius* and *H. molitrix* were scarce. Abdullah (2005) indicated that *A. grypus* and *C. carpio* were the most abundant species in Darbandikhan Lake. Abdullah et al. (2007) also, showed that *Capoeta damascinus* was the most abundant species followed by *C. carpio* and *A. grypus* in Darbandikhan Lake.

It seems from the present study that the distribution of fish populations in the Darbandikhan lake is changing, due to the period, place, and way of fishing, besides the nature of the lake itself which is characterized by changing its water level from year to year and season to season, thus affecting fish distribution (Abdullah et al., 2007).

Moreover, the reason might belong to the introduction of some fish (*C. auratus*, *C. carpio* and *H. molitrix*) into this environment at the end of the seventies of the last century and culturing processes of some of such species are continuous which are leading to their quick spread that affects the density of the rest of species. The evidence supporting this idea is the increase of their fishing and marketing into the local markets nearby the lake. It is inevitable that the increase of these fishes is at the expense of the other species that are similar in their nutrition to the carp like *A. grypus* and *Luciobarbus xanhopterus* (Al-Saadi et al., 1986; Abdullah et al., 2007).

| Family and Scientific Names | Total length (cm) | Number |
|-----------------------------|-------------------|--------|
| **Cyprinidae**               |                   |        |
| *Arabibarbus grypus* (Heckel, 1843) | 33-88             | 10     |
| *Barbus barbus* (Heckel, 1847)  | 28-32.5           | 10     |
| *Capoeta trutta* (Heckel, 1843) | 19-35.5           | 69     |
| *Capoeta umbla* (Heckel, 1843)  | 25-40             | 12     |
| *Carassobarbus luteus* (Heckel, 1843) | 23-27.5         | 11     |
| *Carassius auratus* (Linnaeus, 1758) | 20-28            | 13     |
| *Chondrostoma regium* (Heckel, 1843) | 18-25.5          | 14     |
| *Cyprinion macrostomum* (Heckel, 1843) | 21.5-23          | 22     |
| *Cyprinus carpio* (Linnaeus, 1758) | 23.5-41          | 13     |
| *Garra rufa* (Heckel, 1843)  | 14-16             | 6      |
| *Hemiculter leucisculus* (Basilewsky, 1855) | 9.5-12.5 | 20     |
| *Hypophthalmichthys molitrix* (Valenciennes, 1844) | 40-67           | 4      |
| *Luciobarbus esocinus* (Heckel, 1843) | 24.5-51          | 11     |
| *Squalius lepidus* (Heckel, 1843) | 21.5-33          | 17     |
| **Bagridae**                 |                   |        |
| *Mystus pelusius* (Solander, 1794) | 20-25            | 2      |
| Family            | Species                        | Length Range | Count |
|-------------------|--------------------------------|--------------|-------|
| Siluridae         | *Silurus triostegus* Heckel, 1843 | 54.5-80      | 7     |
| Mastacembelidae   | *Mastacembelus mastacembelus* (Banks and Solander, 1794) | 49-64        | 14    |
| **Total**         |                                | **255**      |       |

Figure 1: Native fish species in Darbandikhan Lake.
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