



ICHTHYOFAUNA OF ZARIVAR LAKE (IRAN) WITH THE FIRST RECORDS OF *HEMICULTER LEUCISCULUS* AND *ALBURNUS HOHENACKERI* IN THE TIGRIS DRAINAGE

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Abstract: The fish fauna of Zarivar lake, Iran is reviewed. Fourteen fish species are reported, five of them native and nine alien to the Euphrates and Tigris drainages. During a survey of the lake in 2009, nine fish species could be recorded, that all of them non native. No native species could be found at all. Furthermore, we report here the first occurrence of the East Asian cyprinid *Hemiculter leucisculus* and the Caspian cyprinid *Alburnus hohenackeri* from Tigris drainage both most likely having been introduced from the Caspian Sea basin.

Key words: Alien species, ichthyofauna, Cyprinidae, Zarivar, Iran

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Introduction

Zarivar (Zeribar) lake (Figure 1) is situated within the Tigris drainage at 1,285 meters above the sea level and is one of the biggest freshwater lakes of the Kurdistan Province in Iran. It is an important wetland with about 750 ha, an average water depth of 4.5 meters and a water volume of 22 to 47 million cubic meters; its water originates mostly from springs at the lake bottom (Jalali and Barzegar 2006). While the introduction of freshwater fish species to Iran dates back to the 1920s (see recent reviews by Coad 2010 and Esmaeili et al. 2010), introduction of fishes to the lake Zarivar have been started in 1982 by the local Fisheries Company with the aim of improving commercial fisheries (Jalali and Barzegar 2006). Our knowledge concerning the ichthyofauna of this lake is limited to fish parasitic studies carried out by Jalali et al. (2001; 2002;

2005; 2008), Jalali and Barzegar (2006) and Shamsi et al. (2009) also recording some fish species from the lake.

Visiting the lake in 2009, we aim to update the knowledge on the fishes of Zarivar Lake and report our findings.

Materials and Methods

The present study is based on previous records and new collections made by the authors applying gillnet, hand net and hook and line fishing at Zarivar Lake (35°32'N, 46°08'E) during three days field work in June 2009. We also surveyed the catches of local fishermen and also the fish market in the Marivan City. Voucher specimens were preserved in 10% formalin in the field and deposited in the Collection of Biology Department, Shiraz University (ZM-CBSU). Fishes were identified based on morphological and meristic characters.



Figure 1. Zarivar lake close to Marivan City (Tigris drainage).

Results

The ichthyofauna of Zarivar lake based on previous reports and our recent visit is listed in Table 1. Five native and nine alien species have been recorded. In June 2009, *Alburnus hohenackeri* was the most abundant species recorded by us. *Hemiculter leucisculus* (Figure 2) and *Alburnus hohenackeri* (Figure 3) are recorded for the first time from Tigris drainage.

Discussion

To date 14 fish species have been recorded from Zarivar lake (Table 1). The majority of these (9 species) species are not native to the lake or to the Tigris drainage.

Native species recoded before as *Capoeta barroisi*, *Barbus lacerta*, *Mastacembelus mastacembelus* and *Squalius lepidus* have not been found during our study at Zarivar lake. These species might be extirpated from the lake or they are actually very, very rare.

Some of the previously reported fishes are very likely to have been the victim of misidentifications. Records of *Carassius carassius* and *Gambusia affinis* by Jalali and Barzegar (2006) most likely report to *C. gibelio* and *G. holbrooki*. All reports of *C. carassius* in Iran by Armantrout (1980) and Abdi (1999) need confirmation and it is very likely that this species has to be excluded from



Figure 2. *Hemiculter leucisculus*, Zarivar lake.



Figure 3. *Alburnus hohenackeri*, Zarivar lake.

Table 1. Previous and present (x) recorded native and exotic fish species from Zarivar Lake

Scientific name	Record 2009	Native
Family: Cyprinidae		
<i>Alburnus hohenackeri</i>	x	No
<i>Barbus lacerta</i>		Yes
<i>Capoeta barroisi</i>		Yes
<i>Capoeta damascina</i>		Yes
<i>Carassius gibelio</i>	x	No
<i>Ctenopharyngodon idella</i>	x	No
<i>Cyprinus carpio</i>	x	No
<i>Hemiculter leucisculus</i>	x	No
<i>Hypophthalmichthys molitrix</i>	x	No
<i>Hypophthalmichthys nobilis</i>	x	No
<i>Pseudorasbora parva</i>	x	No
<i>Squalius lepidus</i>		Yes
Family Mastacembelidae		
<i>Mastacembelus mastacembelus</i>		Yes
Family: Poeciliidae		
<i>Gambusia holbrooki</i>	x	No

the fauna of Iran and all records are misidentified *C. gibelio* or *C. auratus* (Coad 2010). Jalali and Barzegar (2006) recorded *Barbus cyclolepis* from the lakes outflow. *Barbus cyclolepis* is endemic to the European Aegean Sea and Black Sea basins (Greece, Bulgaria, Turkey) (Kottelat and Freyhof 2007). In Tigris drainage, only one *Barbus* species is known, *B. lacerta*, which is superficially similar to *B. cyclolepis* and was most likely misidentified as this species.

Fishes identified as *Chalcalburnus* sp. by Jalali and Barzegar (2006) are most likely the bleaks which we identified here as *Alburnus hohenackeri*. This species is widely identified as *A. alburnus* in Iranian literature (Kiabi et al. 1999; Abdoli and Naderi 2009; Coad 2010). Bogutskaya and Naseka (2004), Kottelat and Freyhof (2007) and Naseka and Bogutskaya (2009) recognize *A. hohenackeri* as a distinct species. *Alburnus alburnus* is absent from Iran and has to be deleted from the fauna of this country. *Alburnus hohenackeri* is very abundant in the lake and a dominant species of the fish community. Coad (2010) presented a map of the occurrence of *A. alburnus* in Iran indicating a wide distribution of this species in the Tigris drainage. Obviously, a bleak similar or identical to *A. hohenackeri* exist also in other parts of the Tigris drainage. Some care should be taken by identifying such fishes as the picture shown by Coad (2010) as *A. alburnus* most likely represent *A. caerulaeus*, another bleak being widespread and very abundant at least in upper Tigris drainage in Turkey and expected to occur in Iran also. Both species are immediately distinguished by a plain silvery lateral body coloration in *A. hohenackeri* (vs. dusty grey with dark gray individual or patches of scales in *A. caerulaeus*).

The East Asian cyprinid *H. leucisculus* has been recorded from several localities in the southern Caspian Sea basin (Abbasi et al. 1999; Kiabi et al. 1999; Abdoli 2000; Gasmir and Mirzaei 2004; Patimar et al. 2002a, 2002b, 2008; Patimar 2008). It also occur in the Tedzhen River in Turkmenistan and therefore might also be found in the Tedzhen (= Hari) River drainage of Iran (Coad 2010). This is the first record of this species in the Tigris drainage and we speculate that this might be the starting point of an invasion of the whole drainage system by this species. Actually, *H. leucisculus* seems to be still very rare in the lake and only one individual could be recorded. *Hemiculter leucisculus* and *A. hohenackeri* both occur in the Iranian Caspian Seabasin and are very likely to have been imported from this area to Zarivar lake together with commercial fish species as *Cyprinus carpio*, *Hypophthalmichthys molitrix*, *H. nobilis* and *Ctenopharyngodon idella*. It should also be noted, that the Chinese carps *C. idella*, *H. molitrix* and *H. nobilis* are only found in the lake due to permanent stocking activities as these species do not find appropriate spawning possibilities in the lake. Young fishes for this permanent stocking do not originate from local artificial breeding facilities but fingerlings are imported from Caspian Sea basin. This practice is a permanent open gate for all unwanted alien species to reach into Zarivar Lake.

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