A First Record of the Bitterling *Rhodeus amarus* (Bloch, 1782) (Cypriniformes, Cyprinidae) in the Iranian Part of Tigris-Euphrates Basin

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**ABSTRACT:** The Bitterling (*Rhodeus amarus*) is reported for the first time from the Iranian part of Tigris-Euphrates basin. Previously, this species is reported in Caspian Sea Basin. In this report, a total of 7 Specimens from a tributary of upper Tigris-Euphrates Basin, Ghare-sou River (Kermanshah province, Iran) were caught by an Electro-fishing. Morphological characteristics were examined and then compared with those reported in previous studies.

**Keywords:** Cyprinidae, Bitterling, Upper Tigris-Euphrates Basin, Ghare-sou River

**Introduction**

The Bitterling (*Rhodeus amarus*) is found in small lakes, marshes and lentic parts of river systems (Coop, 1989; Schiemer and Waidbacher, 1992). This small cyprinid spawns in unionid mussels and because of this behavior being an example of a unique mode of reproduction (Breder and Rosen, 1966) and valuable model species in behavioral and evolutionary ecology (Mills and Reynolds, 2003).

The Bitterling is recorded in Iran from the Astara to the Gorgan River including the Anzali lagoon (Coad, 2012). There is not any previously distributional report of this species in other basins of Iran (Coad, 2012). Kiabi et al. (1999) consider this species to be of least concern in the south Caspian Sea basin according to IUCN criteria. Criteria include medium in numbers, widespread distributional range (75% of water bodies), absence in other water bodies in Iran, and presence outside the Caspian Sea basin (Pipoyan, 1996; Coad, 2012).

**Materials and methods**

Seven Bitterling specimens were caught at the Ghare-sou river (E: 46°54'4.8", N: 34°27'48.52"), one of tributary of the Saimare river that discharge to the Karkheh river (Kermanshah province, near Gravand village) in 2 May 2003 by electro-fishing (220 VAC transformed to 220 VDC) (Figs. 1 and 2). Sampling station locates about 200 meters downstream output of two vegetated ponds that are watered by springs in their bottom. Northern and Southern ponds are called respectively Sarab-e-Yavari and Saranb-e-Niloufari. Table 1 shows the List of captured species in sampling station and two nearby ponds. Fish samples were fixed in 10 % buffered formalin and transferred to the laboratory for further processing. The taxonomic key given by Abdoli (2000), Abdoli and Naderi (2010) and Coad (2012) were used to identify of samples. Meristic characteristics of the specimens were counted using a stereomicroscope. Morphometric features were measured by using a caliper at 0.1 mm.

**Results**

Two of the Bitterling specimens were stored in the Iranian Natural History Museum (MMTT-X1754 and MMTT-X1755).
Table 1: List of captured species in sampling station and two nearby ponds (present + and absent -).

<table>
<thead>
<tr>
<th>Species</th>
<th>Ghare sou River</th>
<th>Niloufari</th>
<th>Yavari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprinus kais</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Garra rufa</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Rasbora pseudoparva</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Mastacembelus mastacembulus</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alburnus bipunctatus</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chondrostoma regium</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gambusia holbrooki</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Carassius auratus</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Rudeus sericus</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alburnus mossulensis</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Description: General body shape of the Bitterling is displayed in Figure 2. The body covered with large scales and its lateral line is incomplete, with pores distinguishable only in the first five scales behind its head.

Meristic characteristics: Dorsal fin: II-(10-11), anal fin: II-(6-8), pored lateral line scales: (5).

Morphometric characteristics: Predorsal length is 0.51 to 0.53 of standard length. Head length is 0.21 to 0.22 of standard length. Body depth is 0.29 to 0.33 of standard length. Caudal peduncle is 0.21 to 0.32 of standard length. Caudal peduncle depth is 0.33 to 0.55 of own length. Snout is 0.27 to 0.35 of head length. Eye diameter is 0.41 to 0.44 of head length. Interorbital distance is 0.46 to 0.65 of head length.

Discussion

Iranian population of the Bitterling were long considered as Rhodeus sericeus amarus, Bloch, 1782 (Coad, 2012), but based on Bohlen et al (2006) it was regarded as Rhodeus amarus. Also, the Caspian Bitterling have been refered as yet undescribed (Van Damme et al., 2007). Its name rateined as an indication that this group geographically isolated (Coad, 2012). Merestic and morphometric characteristics of the specimen collected were in the range of those one reported by Coad (2012) and Abdoli (2000).

This species probably introduced to adjacent ponds of sampling station along with farmed fishes like Chinese carps by Fish farmers, Jahad-e Keshavarzi Organization or other ways like an exotic fish, mosquitofish (Gambusia holbrooki) which has been released as a control agent for Anopheles controling (malaria) (Tabibzadeh et al., 1970a, 1970b; Emadi, 1996). The successful occurrence of this species also implies presence of a freshwater mussel species which needs for its reproduction.

Figure 1. General body shape of Bitterling.
References