

First record of the exotic species *Hemiculter leucisculus* (Pisces: Cyprinidae) in southern Iran

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ABSTRACT

First record of the exotic *Hemiculter leucisculus* (Pisces, Cyprinidae) in southern Iran

The occurrence of the sawbelly, *Hemiculter leucisculus*, is reported for the first time from the Halil River in the Hamun-e-Jazmourian basin, Kerman Province, southern Iran. The sawbelly is an exotic species in Iran. This species may have adverse effects on native fishes, as the sawbelly is an aggressive and territorial species that is well-known for its ability to rapidly colonize a body of water. This new data regarding its range demonstrates an extension of this species' known range further to the southern area of Iran.

Key words: Sawbelly, Halil river, Kerman Province, Exotic species.

RESUMEN

Primer registro del pez exótico "Sawbelly" *Hemiculter leucisculus* (Pisces, Cyprinidae) en el sur de Irán

La presencia de *Hemiculter leucisculus* se reporta por primera vez en el río Halil en la cuenca Hamun-e-Jazmourian, provincia de Kerman al sur de Irán. Esta especie es exótica en Irán. La presencia de *Hemiculter leucisculus* tiene efectos negativos en las especies nativas, ya que es una especie agresiva y territorial y es bien conocida por su facilidad para colonizar rápidamente un nuevo hábitat. Esta nueva información demuestra una extensión en su rango de distribución hacia el sur de Irán.

Palabras clave: "Sawbelly", río Halil, provincia de Kerman, especies exóticas.

INTRODUCTION

The sawbelly, *Hemiculter leucisculus*, is a freshwater and brackish water fish belonging to the Cultrinae subfamily (Cyprinidae) (Abdoli, 2000). This is a widespread species, occurring in heavily-modified water bodies (Coad, 2014). *Hemiculter leucisculus* is usually found in shallow water over a sandy bottom of large and medium-sized rivers (Coad, 2014); however, occasionally they are found in pools along the

beds of mountain streams (Patimar *et al.*, 2008) and in ponds, lakes and the backwaters of rivers (Coad, 2014). This species is highly tolerant of water pollution (Coad, 2014). It is native to the rivers of China, Korea and Vietnam and to the Amur River basin (Holčík & Razavi, 1992). *Hemiculter leucisculus* was reported from different Iranian inland water resources, including Zarivar Lake (Esmaeili *et al.*, 2011), the Sefidrud and Aras Rivers, and the Anzali, Alma-Gol, Adji-Gol and Ala-Gol wetlands (Mousavi-Sabet

et al., 2013). It also occurs in the Hari River in Turkmenistan and therefore may be found in the Hari River basin of Iran (Coad, 2014; Esmaeili *et al.*, 2011). This species has now been found in the Halil River in the Hamun-e-Jazmourian basin, demonstrating an extension of its known range to the southern area of Iran.

MATERIALS AND METHODS

Eighteen sawbelly specimens were caught in the Halil River near Jiroft city, Kerman Province (E: 57°41'33"; N: 28°41'8.8"), southern Iran (Fig. 1), on 5 August 2014 using a backpack electrofishing equipment (SAMUS-725M; Poland). Fish samples were fixed in 10% buffered formaldehyde. A total of 20 morphometric characters were measured using a digital caliper to the nearest 0.1 mm (Table 1). Methods for taking counts and measurements follow Hubbs & Lagler (1958).

RESULTS

The eighteen collected specimens of *H. leucisculus* from the Halil River range from 96 to 121 mm in standard length (Fig. 1). The general body shape of the collected *H. leucisculus* is displayed

Table 1. Morphometric characteristics (Mean \pm SD) of *Hemiculter leucisculus* collected from the Halil River (SD = standard deviation; Min = minimum; Max = maximum; number of specimens = 18). *Características morfológicas (Media \pm SD) de Hemiculter leucisculus en el río Halil (SD = desviación estandar; Min = mínimo; Max = máximo; número de especímenes = 18).*

Characters	Mean \pm SD	Min-Max
Total length (mm)	125.39 \pm 10.04	111-140
Standard length (mm)	106.89 \pm 8.18	95-121
Standard length %		
Total length	117.30 \pm 2.75	112.61-123.01
Body depth	23.34 \pm 1.25	21.70-26.32
Predorsal length	52.82 \pm 1.67	50.50-56.64
Prepelvic length	49.23 \pm 2.00	46.88-54.87
Preal anal length	71.91 \pm 1.76	69.57-76.99
Dorsal-fin height	14.84 \pm 1.57	11.57-17.65
Dorsal-fin base length	11.09 \pm 0.79	9.92-12.62
Anal-fin height	10.24 \pm 1.32	8.26-13.21
Anal-fin base length	12.43 \pm 1.08	10.62-14.58
Ventral-fin length	12.53 \pm 1.33	9.92-14.71
Pectoral-fin length	16.91 \pm 2.24	12.87-20.00
pectoral – pelvic fins distance	28.19 \pm 1.31	25.47-30.69
Caudal peduncle L	17.25 \pm 1.08	15.69-19.81
Caudal peduncle D	9.59 \pm 0.73	8.40-10.78
Head width	17.31 \pm 0.98	15.52-19.47
Head length	19.99 \pm 2.48	16.83-26.55
Head length %		
Snout length	19.73 \pm 3.75	10.53-26.67
Postorbital length	53.36 \pm 3.72	47.83-60.00
Eye diameter	23.52 \pm 3.04	17.65-29.41



Figure 1. Map of the sampling site in the Halil River, in the Hamun-e-Jazmourian basin, southern Iran. *Mapa del lugar de estudio en el río Halil en la cuenca Hamun-e-Jazmourian, en el sur de Irán.*

in Fig. 2. The meristic counts of the preserved specimens are as follows: Dorsal fin: II 7, anal fin: II 12, and 44-59 lateral line scales. The percentage ratios of morphometric characters in relation to standard lengths and head lengths were analyzed and are presented in Table 1.

Two other exotic fish species, *Pseudorasbora parva* and *Carassius auratus*, were collected from this river during sampling. Additionally, *Macrobrachium nipponense* (Oriental River Prawn) was another invasive species collected.

DISCUSSION

Fish are one of the aquatic taxa that have been widely introduced and translocated. The introduction of a non-native species to an ecosystem likely presents an ecological risk if the species is able to integrate itself successfully into the ecosystem (Gozlan & Newton, 2009), resulting in possible detrimental interactions with native species or even with the function of the ecosystem (Gozlan *et al.*, 2010). Introduced fish species can play a role in the spread of disease or parasites to other animals. As many parasites have been reported to originate from invasive and native fish species in Iran (Coad, 2014), it seems that the wide distribution of exotic species may have a significant role in the spread of parasites (Esmaeili *et al.*, 2014).

Exotic species were primarily introduced into ecosystems in Iran through human activity, either intentionally or unintentionally (Esmaeili *et al.*,

2007; 2010). The sawbelly, an exotic species in Iran, is native to Maritime Russia south through China to Korea and Vietnam (Coad, 2014). This species was first reported in the Anzali Wetland by Holčík & Razavi (1992) and apparently is a common species in that region (Coad, 2014). This species has been introduced to Iran, most likely accidentally along with commercial shipments of Chinese major carp from Central Asia in the former U.S.S.R. and/or Romania in 1967 (Coad, 2014). The Chinese major carp in Central Asia came from the Amur River basin in the Far East, and sawbellies were accidentally transferred with them in 1950-1960 (Holčík & Razavi, 1992; Coad, 1996). In this study, the sawbelly is reported for the first time in the Halil River in the Hamun-e-Jazmourian basin, Kerman Province, southern Iran. This species was most likely introduced to this river by fish farmers along with other farmed fish, such as Chinese carp.

The sawbelly is able to easily switch from one food to another as conditions change (Holčík & Razavi, 1992; Coad, 2014) and then is probably compete with native species for food. The preferred habitat of this species are lakes, ponds, and backwaters of rivers; the lower reaches of slow flowing large and medium-sized rivers, shallow water over sandy bottom rivers (Zareian *et al.*, 2015), which makes the Halil River system ideal. This species is known to show more rapid growth rate and a higher fecundity in its preferred habitats than under native conditions (Esmaeili *et al.*, 2010; Zareian *et al.*,



Figure 2. Picture of *Hemiculter leucisculus* collected from the Halil River, in the Hamun-e-Jazmourian basin, southern Iran. *Fotografía de Hemiculter leucisculus muestreado en el río Halil en la cuenca Hamun-e-Jazmourian, en el sur de Irán.*

2015). Contreras & Escalante (1984) regarded this species as a pest when introduced (Coad, 1996; Coad, 2014). Adaptability to variable environmental conditions allows the sawbelly to breed and become established in areas outside their native range (Martin *et al.*, 2010). These factors may further contribute to the successful reproduction and establishment of this exotic fish in the Hamun-e-Jazmourian basin in the near future. In this study, meristic and morphometric characteristics of the collected specimens were in the range of those reported by Coad (2014) and Abdoli (2000). Monitoring of this newly introduced fish by scientists, conservationists, and environmentalists is highly recommended.

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