

First Confirmed Record for the *Lepomis gibbosus* (L., 1758) in The Lower Sakarya River Basin (Turkey)

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ABSTRACT

This paper is the first reference of pumpkinseed (*Lepomis gibbosus*) in the lower Sakarya River basin (Turkey). The data were obtained from samplings carried out between April 2017 and July 2017. *L. gibbosus* is currently found in only two regions of Turkey, its introduced range is expanding rapidly, and for this reason it is important to monitor the impacts of this introduced species on natural ecosystems.

Keywords: Pumpkinseed, non-native species, Sakarya River.

ARTICLE INFO

SHORT COMMUNICATION

Geliş : 12.03.2018
Düzeltilme : 12.07.2018
Kabul : 16.07.2018
Yayım : 27.12.2018



DOI:10.17216/LimnoFish.404510

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Aşağı Sakarya Nehri Havzası'nda (Türkiye) *Lepomis gibbosus* (L., 1758) İçin İlk Kayıt

Öz: Bu çalışma, aşağı Sakarya Nehri havzasında (Türkiye) yakalanan güneş levreğinin (*Lepomis gibbosus*) ilk referansıdır. Veriler, Nisan 2017 ve Temmuz 2017 tarihleri arasında yapılan örneklemlerden elde edilmiştir. *L. gibbosus*, Türkiye'nin sadece iki bölgesinde bulunmakta olup, hızla yayılım göstermektedir ve bu nedenle, bu türün doğal ekosistemler üzerindeki etkilerini izlemek önemlidir.

Anahtar kelimeler: Güneş levreği, egzotik tür, Sakarya Nehri.

Alıntılama

Reis İ, Cerim H, Ateş C. 2018. First Confirmed Record for the *Lepomis gibbosus* (L., 1758) in The Lower Sakarya River Basin (Turkey). LimnoFish. 4(3): 189-191. doi: 10.17216/LimnoFish.404510

Introduction

Lepomis gibbosus has a high and laterally compressed body shape. The maximum size is up to 40 cm of total length (TL) in its native area (Page and Burr 1991), but is smaller in European water bodies (Copp et al. 2004). Unique colouration helps *L. gibbosus* stand out from other members of the sunfish family. The breast and underside of pumpkinseeds are orange to red-orange, while the back and sides are brown to olive. On some individuals, speckles of orange, yellow, blue and emerald may be found on the sides, back, anal and caudal fins. *L. gibbosus* have seven to eight irregular vertical bands on their sides. Radiating back from the snout and over the opercula are several wavy stripes (Jordan et al. 2009).

The native range of *L. gibbosus* is restricted to North America. The species was originally found

from New Brunswick down the Atlantic seaboard as far as northeastern Georgia. The species also occurred west of the Appalachian Mountains from southern Quebec to southern Ohio, west to northern Missouri, and north through eastern South Dakota to eastern Manitoba, including western Ontario (Scott and Crossman 1973).

L. gibbosus was first seen in Ipsala canal in Turkey (Erk'akan 1983). Afterwards, in Gala Lake (Baran and Ongan 1988). The species were also found in two water courses (Saricay, Milas Muğla and Dipsiz-Cine, Aydın) of the Aegean region presumably moved there by humans (Barlas et al. 2001) and subsequently in Dipsiz- Cine Stream Muğla-Aydın (Barlas and Dirican 2004; Dirican and Barlas 2005), Topcam Reservoir Cine-Aydın (Sasi and Balik 2003), Geyik Reservoir Muğla (Yılmaz et

al. 2006), Kemer Reservoir and Akçay Stream (Ozcan 2007) and Uşak province reservoirs (Yeğen et al. 2013).

Material and Methods

The Sakarya River Basin is Turkey's third largest river basin, with a total area of 58.160 km². It is 824 km long and its drainage basin covers 7.5% of Turkey's acreage. Its average flow rate is about 190 m³ per second. The water temperature changes between 7 to 24 °C throughout the year. The river basin is divided into three regions named Lower, Mid and Upper Basin (Sengorur and Isa 2001).

This study was conducted in three separate regions of Lower Sakarya Basin (Figure 1). Pamukova (latitude 40° 29' 40'' N and longitude 30° 13' 16'' E), Adapazari (latitude 40° 46' 55'' N and longitude 30° 26' 21'' E) and Karasu (latitude 41° 03' 59'' N and longitude 30° 36' 12'' E).

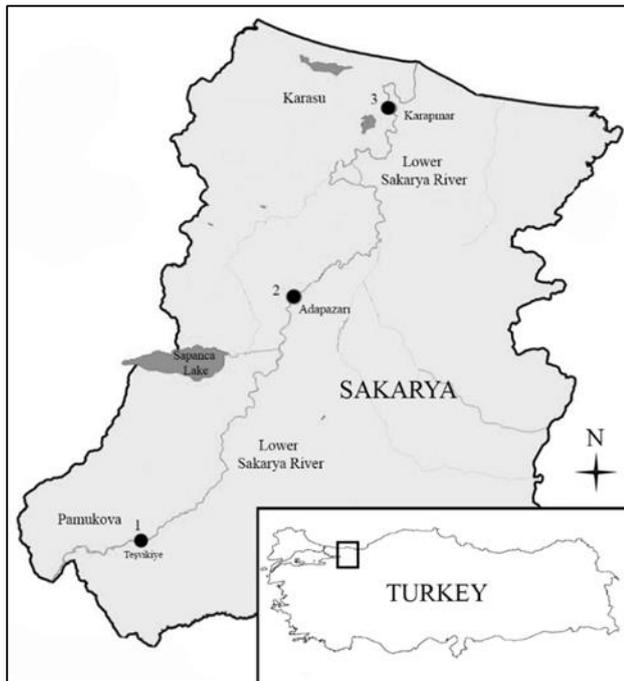


Figure 1. Study area (Scale: 1/500000).

Samples of *L. gibbosus* (Figure 2) were collected with gill-nets (22-36 mm mesh size) and electroshock (SAMUS1000) in Lower Sakarya River between April 2017 and July 2017.

Overall, 26 samples from *L. gibbosus* was examined in the lower Sakarya River

in Turkey. Samples brought to laboratory and were measured by boards. Total length (TL) was recorded to the nearest centimetre (0.1 cm), and bodyweight (W) was recorded to the nearest gram (0.01 g).



Figure 2. *L. gibbosus* (Linnaeus, 1758), Sakarya river, (Turkey). Lateral view (photo by Ismail Reis).

Result and Discussion

In this study, total length and weights were found that 8.7 (min) - 14.7 (max) cm and 13.53 (min) - 75.74 (max) g respectively for *L. gibbosus* (Table 1).

According to local fisherman, this fish started to be seen in the Sakarya river since 2016. *L. gibbosus* has been reported mainly for Mediterranean countries, where their diet has included endemic mollusc subspecies (García-Berthou and Moreno-Amich 2000) and fish eggs (García de Jalón et al. 1993). Although *L. gibbosus* is currently found in only two geographic regions of Turkey (Ozcan 2007), its introduced range is expanding rapidly. The severe ecological and economic damage by *L. gibbosus* in the Sakarya river must alert the authorities to monitor the effects of this introduced species on natural ecosystems. Contact and communication with local stakeholders (citizen scientists, fisherman, local authorities) may provide an effective mechanism for the early detection of invasive species in a new area. Efforts should also be made to build coherent databases to track progress in the region.

Acknowledgements

This project was supported by Mugla Sitki Kocman University (Project no: 17/073).

Table 1. Minimum-maximum and mean length and weight of the *L. gibbosus* collected in Sakarya River, Turkey.

Species	Sexuality	n	Total Length (cm)			Weight (g)		
			Min	Max	Mean±SD	Min	Max	Mean±SD
<i>L. gibbosus</i>	Male	12	8.7	14	12.12±2.15	13.53	61.20	44.40±20.26
	Female	14	8.9	14.7	12.06±2.39	14.87	75.74	44.99±24.78
	Total	26	8.7	14.7	12.08±2.24	13.53	75.74	44.72±22.36

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