

First Record of Topmouth Gudgeon *Pseudorasbora parva* (Temminck and Schlegel, 1846) in the Süreyyabey Dam Lake, Yeşilırmak Basin, Turkey

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ABSTRACT

The aim of this study is to determine certain morphometric characteristics of *Pseudorasbora* “ from Süreyyabey Dam Lake. Morphological analyses of thirty two morphometric characters were performed. These characteristics were standard length, fork length, total length, body weight, head length, preorbital distance, eye diameter, postorbital distance, head depth, predorsal distance, prepelvic distance, preanal distance, pectoral fin- pelvic fin distance, pelvic fin-anal fin distance, body depth, dorsal fin (anterior end) – anal fin distance, dorsal fin (posterior end) – anal fin distance, postdorsal distance, postanal distance, caudal peduncle length (dorsal), caudal peduncle length (ventral), caudal peduncle depth, dorsal fin base length, anal fin base fin length, pectoral fin length, pelvic fin length, caudal upper lobe length, caudal fork length, caudal lower lobe length, dorsal fin length, anal fin length and gape. The samples were measured regarding the weight to the nearest 0.01 g and total, fork and standard length to the nearest 0.01 mm. The Standard Length (SL) ranged from 35.0 mm to 55.0 mm and body weight ranged from 1.0 to 3.46 g.

Keywords: *Pseudorasbora parva*; Topmouth gudgeon; Morphometries properties; Süreyyabey Dam Lake

INTRODUCTION

Turkey is an extremely diverse region in terms of fauna and zoogeography [1]. Turkey is also rich in biodiversity of freshwater fish [2]. Topmouth gudgeon, *Pseudorasbora parva* (Temminck and Schlegel, 1842) is a small cyprinid and a greatly invasive species in Europe [3]. This species is known to have environmental tolerance to low oxygen, organic pollution, and even concentrations of pesticides that are fatal to other fish species [4]. The life story flexibility of successful invaders may also be related to their potential for huge morphological plasticity [5,6]. *P. parva* has a negative effect on the negative fish fauna through competition spawning area, food and other resources [7]. *P. parva*'s natural area is East Asia [8]. It has been found first time in Turkish Thrace region [9].

P. parva has large populations due to its high reproductive capacity [10]. The presence of the internal waters of Turkey has been reported by many researchers [9-16]. Fishermen who hunted for commercial purposes to hunt *Atherina boyeri* have also been found to hunt *Aphanius marassantensis* and *P. parva* species in the region surveyed. Several studies deal with the morphology *P. parva* [5,17-19].

There are many studies on various features of *P. parva* at national and international [5,15,19-21]. There have been no studies on Süreyyabey Dam Lake. Located in inland water resources in Turkey, the life cycle of fish species and determination of biological characteristics are important.

In this paper, the first occurrence of *Pseudorasbora parva* from Süreyyabey Dam Lake in Yeşilırmak Basin is reported. This paper describes the area where this fish was found and its morphometric data of the population was documented.

MATERIALS AND METHODS

Süreyyabey Dam Lake is located approximately 82 km northeast of Yozgat (35°28' N and 35°33' N latitudes and 39°55' E and 40°03' E longitudes) (Figure 1). Süreyyabey Dam, Yozgat province on the Çekerek Creek, was constructed for irrigation, energy and flood control. The area of lake is 4134 km² with a rock body fill type dam. The Çekerek River, one of the most important branches of Yeşilırmak, is located between the Deveci Mountains (1892 m) and Dagni Mountain (1755 m) [22].

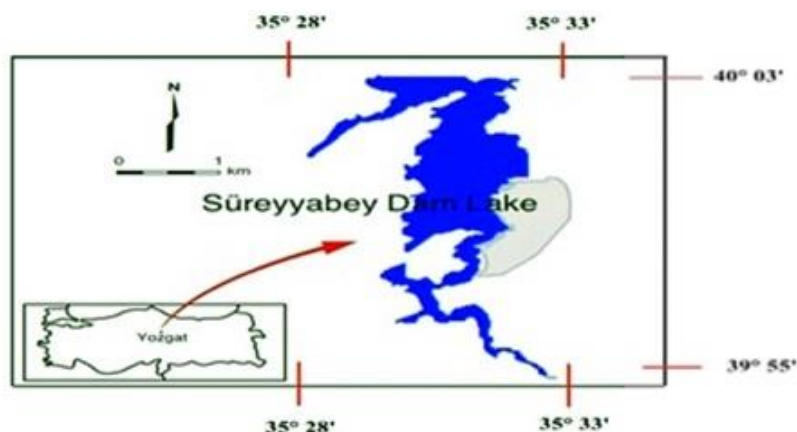


Figure 1: Map of Süreyyabey Dam Lake.

Fish specimens were captured by commercial fisherman from Süreyyabey Dam Lake in 2016 (**Figure 2**). Sex determination was based on external coloration of individuals. The samples were preserved in 4% formaldehyde solution and transported to the laboratory; weight was measured to the nearest 0.01 g and total and standard length to the nearest 0.01 mm. In total, thirty two morphometric characters of samples were measured. These characteristics were standard length, fork length, total length, body weight, head length, preorbital distance, eye diameter, postorbital distance, head depth, predorsal distance, prepelvic distance, preanal distance, pectoral fin-pelvic fin distance, pelvic fin-anal fin distance, body depth, dorsal fin (anterior end) – anal fin distance, dorsal fin (posterior end) – anal fin distance, postdorsal distance, postanal distance, caudal peduncle length (dorsal), caudal peduncle length (ventral), caudal peduncle depth, dorsal fin base length, anal fin base fin length, pectoral fin length, pelvic fin length, caudal upper lobe length, caudal fork length, caudal lower lobe length, dorsal fin length, anal fin length and gape. The SL of 47 individuals ranged from 35 to 55 mm. The TL of individuals was between 41 and 68 cm, and W ranged between 1.0 and 3.46 g. subsequently.



Figure 2: Photo of *P. parva*.

RESULTS

In this research, thirty two morphometric characters were examined and the minimum, maximum, mean, standard deviation values are given in Table 1. Measurements and counts of the 47 specimens are given in **Table 1**. Total lengths and weights of the examined specimens ranged 4.10 and 6.80 cm; 1.00 and 3.46 g respectively.

Table 1: Morphometric characteristics of *P. parva* specimens.

| PARAMETERS | | min | Max | Average | SD | CI | margin of error | upper bound | lower bound |
|------------|--|------|------|---------|-------|-------|-----------------|-------------|-------------|
| 1 | Standard Length | 3.50 | 5.50 | 4.388 | 0.470 | 0.134 | 0.009 | 4.523 | 4.254 |
| 2 | Fork Length | 3.80 | 6.10 | 4.794 | 0.527 | 0.151 | 0.012 | 4.944 | 4.643 |
| 3 | Total Length | 4.10 | 6.80 | 5.332 | 0.571 | 0.163 | 0.014 | 5.495 | 5.169 |
| 4 | Body Weight | 1.00 | 3.46 | 1.612 | 0.561 | 0.160 | 0.013 | 1.772 | 1.451 |
| 5 | Head length | 0.90 | 1.50 | 1.107 | 0.140 | 0.040 | 0.001 | 1.148 | 1.067 |
| 6 | Preorbital distance | 0.20 | 35.0 | 1.096 | 5.054 | 1.445 | 1.065 | 2.541 | -0.349 |
| 7 | Eye diameter | 0.20 | 0.40 | 0.304 | 0.043 | 0.012 | 0.000 | 0.316 | 0.292 |
| 8 | Postorbital distance | 0.30 | 0.70 | 0.481 | 0.095 | 0.027 | 0.000 | 0.508 | 0.454 |
| 9 | Head depth | 0.60 | 1.30 | 0.862 | 0.147 | 0.042 | 0.001 | 0.904 | 0.820 |
| 10 | Predorsal distance | 2.00 | 3.00 | 2.354 | 0.261 | 0.075 | 0.003 | 2.429 | 2.280 |
| 11 | Prepelvic distance | 1.30 | 3.70 | 2.328 | 0.374 | 0.107 | 0.006 | 2.435 | 2.221 |
| 12 | Preanal distance | 2.20 | 4.30 | 3.173 | 0.382 | 0.109 | 0.006 | 3.283 | 3.064 |
| 13 | Pectoral fin - pelvic fin distance | 0.70 | 1.50 | 1.112 | 0.186 | 0.053 | 0.001 | 1.165 | 1.058 |
| 14 | Pelvic fin - anal fin distance | 0.60 | 1.30 | 0.948 | 0.163 | 0.046 | 0.001 | 0.994 | 0.901 |
| 15 | Body depth | 0.90 | 1.90 | 1.145 | 0.199 | 0.057 | 0.002 | 1.201 | 1.088 |
| 16 | Dorsal fin (anterior end) – anal fin distance | 0.80 | 2.10 | 1.389 | 0.259 | 0.074 | 0.003 | 1.463 | 1.315 |
| 17 | Dorsal fin (posterior end) – anal fin distance | 0.70 | 1.70 | 1.026 | 0.230 | 0.066 | 0.002 | 1.091 | 0.960 |
| 18 | Postdorsal distance | 0.90 | 2.30 | 1.694 | 0.303 | 0.087 | 0.004 | 1.780 | 1.607 |
| 19 | Postanal distance | 0.70 | 1.30 | 1.023 | 0.152 | 0.043 | 0.001 | 1.067 | 0.980 |
| 20 | Caudal peduncle length (dorsal) | 0.70 | 2.20 | 1.557 | 0.318 | 0.091 | 0.004 | 1.648 | 1.467 |
| 21 | Caudal peduncle length (ventral) | 0.12 | 1.50 | 0.910 | 0.189 | 0.054 | 0.001 | 0.964 | 0.856 |
| 22 | Caudal peduncle depth, | 0.16 | 0.70 | 0.463 | 0.106 | 0.030 | 0.000 | 0.493 | 0.433 |
| 23 | Dorsal fin base length | 0.20 | 1.20 | 0.545 | 0.150 | 0.043 | 0.001 | 0.588 | 0.502 |
| 24 | Anal fin base fin length | 0.10 | 0.60 | 0.353 | 0.099 | 0.028 | 0.000 | 0.382 | 0.325 |
| 25 | Pectoral fin length | 0.30 | 1.00 | 0.671 | 0.159 | 0.046 | 0.001 | 0.717 | 0.626 |
| 26 | Pelvic fin length | 0.40 | 1.00 | 0.633 | 0.140 | 0.040 | 0.001 | 0.673 | 0.593 |
| 27 | Caudal upper lobe length | 0.60 | 1.40 | 1.022 | 0.186 | 0.053 | 0.001 | 1.076 | 0.969 |
| 28 | Caudal fork length | 0.40 | 1.10 | 0.586 | 0.136 | 0.039 | 0.001 | 0.625 | 0.547 |
| 29 | Caudal lower lobe length | 0.70 | 1.40 | 1.028 | 0.179 | 0.051 | 0.001 | 1.079 | 0.976 |
| 30 | Dorsal fin length | 0.50 | 1.10 | 0.937 | 0.132 | 0.038 | 0.001 | 0.975 | 0.899 |
| 31 | Anal fin length | 0.20 | 1.10 | 0.632 | 0.179 | 0.051 | 0.001 | 0.683 | 0.581 |
| 32 | Gape | 0.10 | 0.60 | 0.274 | 0.111 | 0.032 | 0.001 | 0.306 | 0.243 |

SD: Std Deviation; **CI:** Confidence Interval

In this study we found difference even between populations from the other water systems. The top mouth gudgeon is considered to be a species with great morphological variability [18, 21]. Standard Length (SL) of 47 individuals ranged from 3.50 to 5.50 cm. The SL of the whole top mouth gudgeon population ranged from 9.26 to 81.89 mm in Lichenskie Lake [21]. For the length – weight relationships, fork lengths between 2.4 and 11.8 cm [23]. The length of the specimens caught in Kuchki Pond varied from 27.8 to 58.1 mm, weight varied from 0.4 to 3.2 g [24].

The difference may be caused by differences in morphological features of the species and habitats. In general, top mouth gudgeon populations show considerable variation in external morphology, which is not only evident in European populations but also in its native range [25]. It would be expected that populations from different latitudes and/or habitats show significant morphological variability, but differences were also found between populations from the same region [5]. This variability can be expressed not only in the formation of different adult phenotypes but also in the manner with which the phenotypes are achieved. In general, the temperature regime has a considerable influence on life histories and extreme temperatures are known to affect various traits, from morphology [26].

P. parva individuals prefers wide, varied environments with abundant food sources, in shallow regions and regions with dense vegetation [27]. It was reported that *P. parva* transmits fatal disease to native fish fauna, limits the reproduction of the endangered native fish species, and influences the decline of native fish species [10].

In this paper, we report first occurrence from Süreyyabey Dam Lake in Yeşilırmak Basin. This paper describes the area where this fish were found and recorded morphometric data of the population. Findings obtained in this study are very important because the previous studies about the morphometric properties of *P. parva* have not been found. It is considered that the data obtained in this study will also contribute to future studies.

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