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RESEARCH ARTICLE

New Record of the Zebra Goby, *Zebrus zebrus* (Risso, 1827), in the Bosphorus Strait (Turkey)

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Abstract
One specimen of zebra goby, *Zebrus zebrus* (Risso, 1827) was collected in the Bosphorus Strait. The present record of Z. *zebrus* from the Bosphorus Strait extended the geographical distribution of this species. The present finding is an evidence that Z. *zebrus* is more of a common species in Turkish waters than it is previously believed..
Keywords: Gobiidae, *Zebrus zebrus*, Bosphorus Strait, Turkish Strait System

Introduction

Gobiidae is the most species-rich family in the Turkish marine fish fauna, comprising 98 species (Bilecenoğlu *et al.,* 2014; Engin *et al.,* 2018,). They are an important component of coastal habitats as well as the local biodiversity due to their high level of endemism. *Zebrus zebrus* (Risso, 1827) is a small cryptobenthic species having a continuous distribution along the Mediterranean coasts (Kovačić *et al*., 2005). According to Fricke *et al*. (2007), *Z. zebrus* was classified as a vulnerable species mostly due to habitat destruction. However, there is a lack of knowledge about their biology, distribution and ecology, primarily due to their cryptic life-style. The aim of this paper is to present the first record of zebra goby, *Z. zebrus,* from the Bosphorus Strait.

Material and Methods

One specimen (Figure 1) was collected from the İstinye-Bosphorus Strait (41º 06′ 67″- 29º 03′ 77″), Turkey, on 02 February 2016, at the depth of 36.4 m. The specimen was found during macro invertebrate surveys off the coasts of the Bosphorus Strait. The sample is stored in the Istanbul University Science Faculty, Hydrobiology Museum, (IUSHM 2018-1404). Meristic characters, morphometric measurements and terminology of lateral-line system were obtained under a binocular microscope (to the nearest 0.01 mm) following Miller (1986).

Results

Diagnosis

The following minimum combination of characters positively identify the specimen as *Zebrus zebrus* (Risso 1827) among the species of the Gobiidae family in the Clofnam area according to Miller (1986) respectively: (1) suborbital papillae without longitudinal row *a*; (2) predorsal area naked; (3) oculoscopular row x^{-1} ends behind pore β; (4) all three head canals present; (5) chin with transverse ridges; (6) row 5i present; (7) LL = 38.

The present specimen differs from the species description of Miller (1986) in the higher number of anal

Figure 1. A specimen of *Zebrus zebrus*, collected from the Bosphorus Strait, Turkey. (TL: 34 mm)

Table 1. The previous records of Zebrus zebrus in the Turkish coasts.

	Region	Locality	Sampling Method	Depth
Kovačić and Engin, 2009	Black Sea	Ordu	SCUBA	5 m
Bogorodsky et al., 2010	South Aegean Sea	Bodrum Peninsula	SCUBA	1 m
Bilecenoğlu et al., 2014	Levant Sea	Fethiye Bay	SCUBA	12 m
Engin et al., 2018	North Aegean Sea	Saros ve Çandarlı Körfezi	SCUBA	2-13 m

fins. Anterior nostril short, tubular, with tentacle from inner part of rim.

Description

Anterior nostril short, tubular, with tentacle from inner part of rim. Branchiostegal membrane attached to entire side of isthmus. First dorsal fin rays VI; second dorsal fin rays I+10; anal fin rays I+11; caudal fin rays 14-15 and pectoral fin rays 16 rays. Body with ctenoid scales; scales in lateral series 38, scales in transverse series 11. Total length 34 mm; standard length 28 mm; head length 8 mm; snout length 2 mm; eye diameter 3 mm; body depth 5 mm; pedoncule depth 3 mm; predorsal distance 10 mm; preanal distance 12 mm. Head, predorsal area and breast naked.

Colour preserved: body greyish brown, six vertical dark bars recognizable along lateral sides. Head predorsal area, and operculum pigmented. Breast also pigmented. First dorsal fin with two longitudinal bands. Second dorsal fin with three to four longitudinal bands. Caudal fin transparent, with vertical dark strip along origin. Pectoral fin with vertical dark strip along origin of rays, the rest of fin colourless. Ventral fin colourless.

Head with anterior and posterior oculoscapular and preopercular canals with pores; σ, λ, κ, ω, α, β, ρ, ρ*1*, ρ*2*, and γ, δ, ε respectively. Rows and number of sensory papillae in the suborbital areas as follows: 1 (7), 2 (4), 3 (5), 4 (6), 5s (4), 5i (3), 6s (4), 6i (4).

Discussion

Previous records of the zebra goby, *Z. zebrus,* were known from the northern part of the Mediterranean, the Adriatic, the Aegean Sea and the Levantine Basin (Kovačić *et al.,* 2005). It was also reported in the Turkish coasts of the Levantine Sea, the Aegean Sea and the Black Sea (Table 1). The present record of *Z. zebrus* from the Bosphorus Strait extended the geographical distribution of this species. Showing both the Black Sea and the Sea of Marmara characteristics, the Bosphorus Strait should be considered a substantial study area. Hence, there is a need for comprehensive fish fauna studies in order to improve our understanding of the area.

The increasing number of records year by year can lead us to the conclusion that *Z. zebrus* is a more common species in the Turkish waters than it is thought to be and its' distribution is probably much greater than that determined to date. We believe that the knowledge of Turkish ichthyofauna is improved with this new record.

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