



Easternmost occurrence of Andromeda goby, *Didogobius schlieweni* Miller, 1993, in the Mediterranean Sea

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Abstract

A single individual of andromeda goby, *Didogobius schlieweni* Miller, 1993, was observed and photographed at Sığacık Bay (Aegean Sea, İzmir), representing a first record for the Turkish marine fish fauna. The finding also considerably expands the known distribution range of the species in the eastern Mediterranean Sea.

Keywords: Ichthyofauna, Gobiidae, Turkey, Scuba observation.

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Introduction

Knowledge on the distribution of Gobiidae species inhabiting the Mediterranean Sea has considerably flourished during the last decade. The number of goby species reported from this basin (excluding the Black Sea) has raised from 59 (Kovačić and Patzner 2011) to 73 (including 11 alien taxa and 26 endemics) (Kovačić 2020), primarily as a result of the significant increase in scientific efforts, comprising not only the specialized sampling methods using certain anesthetics but also less conventional methods such as scuba observations and underwater photography.

The genus *Didogobius* (Miller, 1966) is represented by three species endemic to the Mediterranean Sea. *Didogobius bentuvii* is known only by its unique holotype from the eastern coast of the Mediterranean Sea (Miller, 1966), but not been recorded yet elsewhere probably due to its specialized burrowing mode of life. The other two congeneric species were described almost during the same era, from Cres Island, Croatia as *D. schlieweni* (Miller, 1993) and Balearic Island Ibiza, Spain as *D. splechnai* (Ahnelt and Patzner 1995), and both considered to be rare. Nevertheless, *in situ* observations carried out by scuba diving have revealed that these distinctively colored cryptobenthic gobies are indeed widely distributed throughout the Mediterranean Sea (Patzner 2007; Francour 2008; Colombo and Langeneck 2013; Kampouris et al. 2019). The disparity of Mediterranean gobiid distribution is thus irrelevant to the numerical rarity of the species, which most likely relates to the unequal sampling efforts exerted (Kovačić et al. 2012).

In Turkey, only one member of the genus (*D. splechnai*) was previously reported from Gökova Bay, southern Aegean Sea (Francour et al. 2007), whose status elsewhere is totally unknown. We are here reporting the occurrence of *D. schlieweni*, based on its underwater observations in Sığacık Bay, eastern Aegean Sea. The present finding is not only new addition to the Turkish ichthyofauna but also represents the easternmost occurrence of the species in the Mediterranean Sea.

Material and Methods

The Sığacık Bay (eastern Aegean Sea, İzmir) is one of the most impressive diving localities in the eastern Aegean Sea coast, characterized by dense algal coverage at shallow depths (i.e., *Cystoseira* spp.), widespread *Posidonia oceanica* beds, various reefs and caves associated with coralligenous habitats that lead to a unique

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ecosystem especially for cryptobenthic species.

The single *D. schlieveni* individual (Fig. 1) was observed on 07 July 2015 at a depth of 6 m during a scuba dive carried out at dusk (19:00) and photographed using a Canon Powershot G12 camera. Only two photo frames could be taken; the better one used herein. The individual stayed quiet for a while over the rocky substrate covered by filamentous algae, which then rapidly escaped to the nearest rock cavity upon approach by the diver. Although a special effort was not spent for measuring length of the observed fish, it was a remarkably large sized individual with almost 10 cm of total length. Species identification was made according to the coloration characteristics following Miller (1993).



Figure 1. Underwater photograph of the *Didogobius schlieveni* individual observed at Sığacık Bay, Turkey (Photograph: Türkay Çelik).

Results and Discussion

Gobiids' identification is mainly based on the examination of head canal pores and papillae rows of the lateral line system (Kovačić 2008), but accurate identification of several taxa is also possible based on their unique color patterns (Francour et al. 2007; Colombo and Langeneck 2013; Bilecenoglu and Yokeş 2016). By its dark brown body with whitish dots on head and neck, four typical white spots along the flanks (below D1/D2), and broadly edged white dorsal and caudal fins, *D. schlieveni* has an unmistakable body coloration that can easily be identified during scuba diving. The color of the Turkish sample is perfectly in accordance with descriptions of Miller (1993) and Ballesta et al. (1998).

Andromeda goby inhabits shallow waters of up to 15 m, where it displays a nocturnal behavior (Patzner 2019). According to the habitat observations carried out in various localities of the Mediterranean Sea, the species was mostly encountered over pebbles and gravel, while only a few records were given from *P. oceanica* meadows or the vicinity of *Caulerpa cylindracea* beds (Patzner 2007; Francour 2008; Kampouris et al. 2019). The present finding from Sığacık Bay was over a rocky substrate covered by filamentous algae, which possibly indicates that the species may prefer a wide range of habitats throughout its distribution range.

It appears that *D. schlieveni* is a widespread, but also a very rare cryptobenthic goby. Since its description from the Adriatic Sea (Miller 1993), the species was recorded only from 11 localities (Fig. 2) concentrated mainly at the western and central Mediterranean Sea. The absence of observations from the southern coasts of the Mediterranean is probably because of lack of studies. Recent records from the western Aegean Sea (Kampouris et al. 2019) and Turkey may be considered as an indication for a wider distribution range, for example towards the eastern Levant basin where the species is currently unknown. Considering that the traditional sampling methods are certainly useless in sampling such cryptobenthic gobies, the most plausible approach would be to use unmatched opportunities presented by scuba diving, which will be of great help in

obtaining important bioecological data.

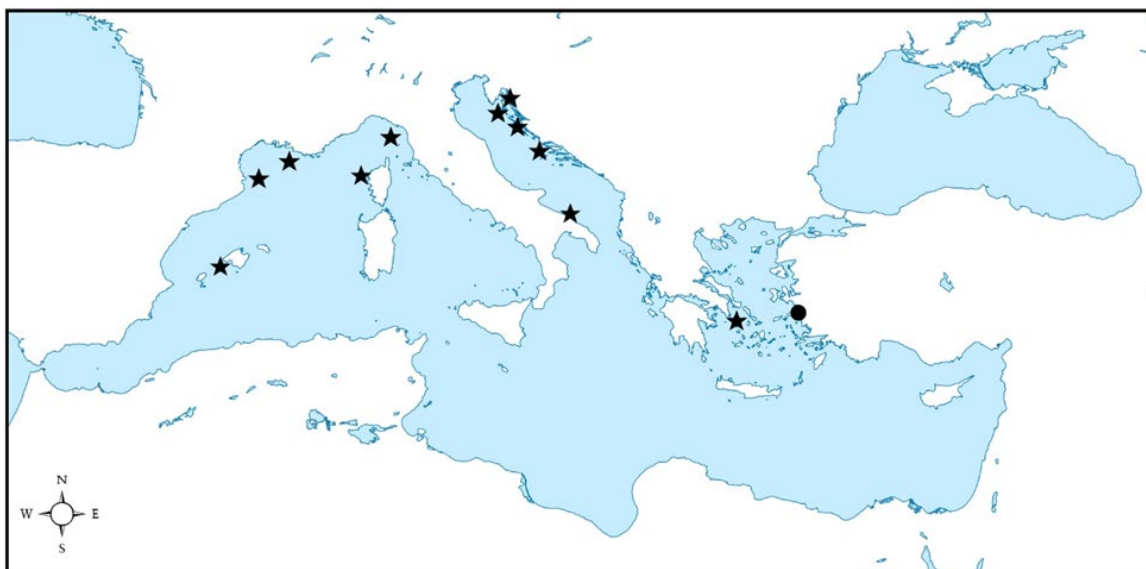


Figure 2. Current distribution of *Didogobius schlieveni* in the Mediterranean Sea. Previous records are indicated by a star, while the newly recorded locality is shown by a full dot. Former occurrence data compiled from Patzner (2007, 2019) and Kampouris et al. (2019).

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