

**FIRST RECORD OF THE BLACKBAR HOGFISH, *BODIANUS SPECIOSUS*  
(ACTINOPTERYGII: PERCIFORMES: LABRIDAE), IN THE MEDITERRANEAN SEA**

Halit FİLİZ<sup>1</sup>, Nail SEVİNGEL<sup>2</sup>, Hasan CERİM<sup>1\*</sup>, and Gökçen BİLGE<sup>1</sup>

<sup>1</sup>*Department of Fisheries Science, Faculty of Fisheries, Muğla Sıtkı Koçman University, Muğla, Turkey*

<sup>2</sup>*232/2 Kızılcın Str., Karsiyaka, İzmir, Turkey*

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**Abstract.** In this report, a very intriguing (although isolated) occurrence record of blackbar hogfish, *Bodianus speciosus* (Bowdich, 1825), is being made, at a significant distance from its known range. This record could be a useful addition to our understanding of alien species and their appearance in new areas, especially considering its relatively large size. The specimen was captured by spearfishing on a rocky bottom at the depth of 11 m in Horozgediği Bay (Aegean Sea, Turkey, Aliğa, 38°44'57.5"N, 26°53'47.3"E). Standard length (SL), fork length (FL), total length (TL), total net weight (W), age, and stomach content were analysed. The specimen was a 4-year-old female and, measuring 267 mm TL and weighing 354.95 g. Examination of the stomach content indicated that the specimen was feeding on Mollusca and Crustacea. Based on our knowledge on the biology and distribution of the species, the best explanation for its presence in the eastern Mediterranean is translocation, presumably as an aquarium release, which is known, important introduction vector to the Mediterranean Sea.

**Keywords:** alien species, Mediterranean, Atlantic origin fish, Aliğa

## INTRODUCTION

Fishes of the genus *Bodianus* (family Labridae) can be found in all warm oceans, with the greatest diversity in the Indo–West Pacific (Gomon 2006, Nelson 2006). The blackbar hogfish, *Bodianus speciosus* (Bowdich, 1825), is distributed along the tropical west coast of Africa from Cameroon to Guinea and in the offshore Cape Verde Islands (Froese and Pauly 2019) and from there to São Tomé Island (Wirtz et al. 2007). The species appears to be common at depths of 20–40 m and juveniles occur, at least occasionally, in rocky areas at depths of 10–12 m (Gomon 2006). The maximum length reported for *B. speciosus* was 50.0 cm SL (Gomon and Forsyth 1990), however, specimens of approximately 40.0 cm TL are commonly observed (Schneider 1990).

*Bodianus speciosus* has not been previously recorded in the Mediterranean (Froese and Pauly 2019). In this study, we reported the first record of *B. speciosus* in the Mediterranean Sea.

## MATERIALS AND METHODS

On 9 June 2018, a single specimen of the blackbar hogfish, *Bodianus speciosus* (Fig. 1), was captured by spearfishing on a rocky bottom at the depth of 11 m in Horozgediği Bay (Aegean Sea, Turkey, Aliğa, 38°44'57.5"N, 26°53'47.3"E). The water temperature

was 21°C. The specimen was moved to the laboratory on ice. Procedures described by Gomon (2006) were followed for the identification of the specimen. Following identification, standard length (SL), fork length (FL), and total length (TL) were measured to the nearest mm and wet body weight (to the nearest 0.01 g) was determined. Sex was assessed by visual examination of the gonads. Age was determined from five scales taken between the lateral line and the dorsal fin from the fresh specimen and cleared with NaOH solution and distilled water, respectively. Subsequently, scales were placed on a microscope slide and photographed under the Nikon SMZ-U stereo zoom microscope with the reflected light at 10× magnification by a digital microscope camera. Digital image of the scales was processed using Toupview Digital image analysing software. Three independent readers performed the age readings. The stomach was removed from the oesophageal region and preserved in 4% buffered formalin for 24 h, stored in 70% ethanol in marked containers, and analysed. Species was screened with the Aquatic Species Invasiveness Screening Kit (AS–ISK) for their potential invasiveness in the Mediterranean Sea—the Risk Assessment (RA) area (see Bilge et al. 2019). The specimen was deposited in the Museum of the Faculty of Fisheries, Muğla Sıtkı Koçman University (catalogue number MUSUF/PIS–2018–1).

\* Correspondence: Dr Hasan CERİM, Muğla Sıtkı Koçman Üniversitesi, Su Ürünleri Fakültesi, Muğla, Türkiye/Turkey, (+90) 252 211 5083, e-mail: (HC) [hasancerim@gmail.com](mailto:hasancerim@gmail.com), (HF) [halit.filiz@mu.edu.tr](mailto:halit.filiz@mu.edu.tr), (NS) [blackmarlin1@gmail.com](mailto:blackmarlin1@gmail.com), (GB) [gbilge@gmail.com](mailto:gbilge@gmail.com).

\*\* <https://www.cefas.co.uk/nns/tools>.

## RESULTS

In reference to Gomon (2006), the specimen of the blackbar hogfish, *Bodianus speciosus* caught in Horozgediği Bay had all typical characteristics of the species. This fish is relatively easy to identify and differing from its congeners in having a dark band below the last few dorsal-fin spines (Fig. 1). The specimen of this protogynous hermaphrodite fish was at an “initial-phase adult” female and had a total length of 267 mm (214 mm SL and 257 mm FL) and the weight of 354.95 g. It was estimated to be 4 years old (Fig. 2). Basic Risk Assessment (BRA) and BRA + Climate Change Assessment (CCA) scores were calculated as 13.0 and 21.0, respectively. The stomach was full and the content was substantially digested (preys highly fragmented), a fact that decreased the possibility of identifying items found in the stomach to low taxonomic levels. The examined prey items indicated that *B. speciosus* might be a carnivore, with the diet consisting of Mollusca (unidentified Bivalvia, *Venus verrucosa*, unidentified Gastropoda, *Hexaplex trunculus*) and Crustacea (decapods, juvenile *Pagurus* sp.)

## DISCUSSION

The lack records of *Bodianus speciosus* in different parts of the Mediterranean Sea indicate that it is not a natural migrant but its presently reported record might have been an outcome of an “anthropogenic intervention” (Zenetos et al. 2016).

Looking from the Mediterranean perspective, Katsanevakis et al. (2014) indicated that shipping activity is one of the main vectors of introducing alien marine species. Our record was in a location very close to harbours with intensive trade, ship dismantling, and petrochemical facilities. Moreover, despite the fact that the family Labridae is the second most numerous marine families of fishes (Nelson 2006), its members have never been recorded in ballast waters (Wonham et al. 2000). Therefore, we doubt that the suggested translocation may be attributed to shipping, especially in terms of great distances. This is also contradicted by the relatively large size (267 mm TL) of the presently reported specimen.

Based on our knowledge, however, of the biology and distribution of blackbar hogfish, the best plausible



**Fig. 1.** General (A) and ventral (B) view of the first *Bodianus speciosus* specimen recorded from the Mediterranean within the Aegean Sea, having a total length of 267 mm

explanation for its presence in the eastern Mediterranean may be translocation via aquarium releasing. *Bodianus speciosus* is one of the preferred species in the aquarium industry worldwide (Froese and Pauly 2019). It has a tremendous potential to be an interesting species, particularly during its juvenile stage. As a juvenile, this fish acts as a cleaner of other fish species (Vasco-Rodrigues et al. 2017), reducing stress in their “clients” (Bshary et al. 2007), which is a desirable characteristic in the aquarium trade. It also exhibits an interesting colour pattern (for this industry) during this stage. When it reaches approximately 10 cm TL, though, it changes its behaviour by losing the “cleaning” habits and also its colours, becoming less desirable for this market. On top of that, it reaches a length of more than 50 cm TL considered too large for the typical hobbyist’s home aquarium. Many times, this leads to animals being released back into the wild, often in habitats and/or latitudes very far away from their natural home, leading to the involuntary introduction of alien species (Rhyne et al. 2012). In the Mediterranean Sea, at least 19 marine fishes have been introduced by aquarium trade (Zenetos et al. 2016). It is an important first step to analyse the potential invasiveness risk analysis of every organism who entered the Mediterranean Sea. Bilge et al.



**Fig. 2.** A scale of the *Bodianus speciosus* specimen recorded from the Aegean Sea, estimated to be four years old; scale bar, 1 mm

(2019) calculated the BRA and BRA + CCA thresholds for medium risk species with scores within the interval [1, 18.5] and [1, 29.5], respectively. Our BRA (13.0) and BRA + CCA (21.0) scores indicated a medium risk for *B. speciosus*.

We captured only a single individual and, despite the same area was revisited three times, we were not able to observe any other individuals. Consequently, we believe that *B. speciosus* has not established a population. Nevertheless, its capture confirms an “isolated record” rather than a “geographical expansion” of Atlantic origin species in the Mediterranean Sea. Although the aquarium release may seem the most likely vector, the reasons behind the presence of this individual in such distant areas from its native region, still remain unclear.

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