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Range Extension of *Priacanthus sagittarius* Starnes, 1988 Southeastern Mediterranean Coast of Turkey

Mevlüt Gürlek, Deniz Ergüden*, Cemal Turan

*İskenderun Technical University, Faculty of Marine Sciences and Technology, 31220, İskenderun, Hatay, Turkey
Correspondent: deniz.erguden@iste.edu.tr
Received: 02.11.2021 *Accepted: 16.11.2021*
Mevlüt Gürlek: Orcid 0000-0003-1949-7670
Deniz Ergüden: Orcid 0000-0002-2597-2151
Cemal Turan: Orcid 0000-0001-9584-0261

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Abstract: A single specimen of *Priacanthus sagittarius* Starnes, 1988 has been captured in the Iskenderun Bay (Konacık, Turkey), at a depth of 80 m in February 2021. This species represents the second record from Turkish waters and the first record from southeastern Mediterranean coast of Turkey. Besides, this species is the fifth successive record from the. The presence of *P. sagittarius* in the Mediterranean coast of Turkey is evidently due to migration from the Red Sea through the Suez Canal. On the other hand, available records show that this species is gradually expanding its distribution in the Mediterranean.

Key words: Red Sea Species, Expansion, Suez Canal, Pricanthidae, Eastern Mediterranean

Priacanthus sagittarius Starnes 1988'un Türkiye'nin Güneydoğu Akdeniz Kıyısına Menzil Genişlemesi

Özet: *Priacanthus sagittarius* Starnes, 1988'in bir örneği Şubat 2021'de İskenderun Körfezi'nde (Konacık, Türkiye), 80 m derinlikten yakalanmıştır. Araştırmamız, Türkiye sularından balığın ikinci ve Türkiye'nin Güneydoğu Akdeniz kıyılarından da ilk kaydını ortaya koymaktadır. Aynı zamanda yaptığımız kayıt türün Akdeniz deniz sularından beşinci kaydını oluşturmaktadır. *P. sagittarus* Türkiye'nin Akdeniz kıyısındaki varlığı, bu balığın da Süveyş Kanalı yoluyla Kızıldeniz'den Akdeniz'e geçtiğinin işaretleridir. Diğer yandan mevcut kayıtlar, bu türün Akdeniz'de dağılımını giderek genişlettiğini göstermektedir.

Anahtar kelimeler: Kızıldeniz Türü, Yayılma, Suveyş Kanalı, Pricanthidae, Akdeniz Suları

Introduction

The opening of Suez Canal in 1869, has provided an important corridor for the bio-invasion of many fish species from the Red Sea penetrating into the Mediterranean Sea. In this way, many new alien species began to invade the Mediterranean (Golani, 1998).

To date, four Priacanthid species were reported from the Mediterranean; Atlantic bigeye, *Priacanthus arenatus* Cuvier, 1829. Moontail bullseye, *P. hamrur* (Forsskål, 1775), Elongate bulleye, *P. prolixus* Starnes, 1988 and Arrow bulleye, *P. sagittarius* Starnes, 1988. Although *P. blotchi* Bleeker 1853, a fifth species, is known to live in the Red Sea (Golani, Sonin, & Edelist, 2011), it has not been reported from the Mediterranean waters until now.

Priacanthus sagittarius is distributed from the Red Sea to Japan, including Australia and Samoa (Starnes 1988). This species is a solitary fish which is found in sheltered reefs, usually in caves or under coral plates (Kuitar & Tonozuka, 2001) may also be found in rocky habitats (Froese & Pauly, 2021).

The first Mediterranean record of the arrow bulleye *P. sagittarius* was reported by Goren et al. (2010) from Israel coast (Ashdod) followed by a second record from Haifa, Israel by Golani et al. (2011). Later, *P. sagittarus* was recorded from the Egyptian Mediterranean waters by Farrag et al. (2016). The first report of *P. sagittarius* from the Turkish seas was from Taşucu (Mersin Bay), in 2017 by Gökoğlu & Teker (2018)..

In the present paper, we report the second occurence of *P. sagittarus* from the Mediterranean waters of Turkey. The current specimen represents the fifth record from the Mediterranean Sea and the first record from Iskenderun Bay (southeastern Mediterranean Sea, Turkey).

Material and Methods

One specimen of *P. sagittarius* Starnes, 1988 was caught by a commercial trawler at a depth of 80 m on February 24th, 2021 from Konacık (Iskenderun coast; Figure 1). Identification of the collected specimen was in accordance with the original species description by Starnes (1988). The specimen was deposited in the Department of the Marine Sciences, Faculty of Marine Sciences and Technology, University of Iskenderun Technical (Figure 2) (MSM-PIS/2021-1).

Ethical Approval: The formal consent is not required for this study.

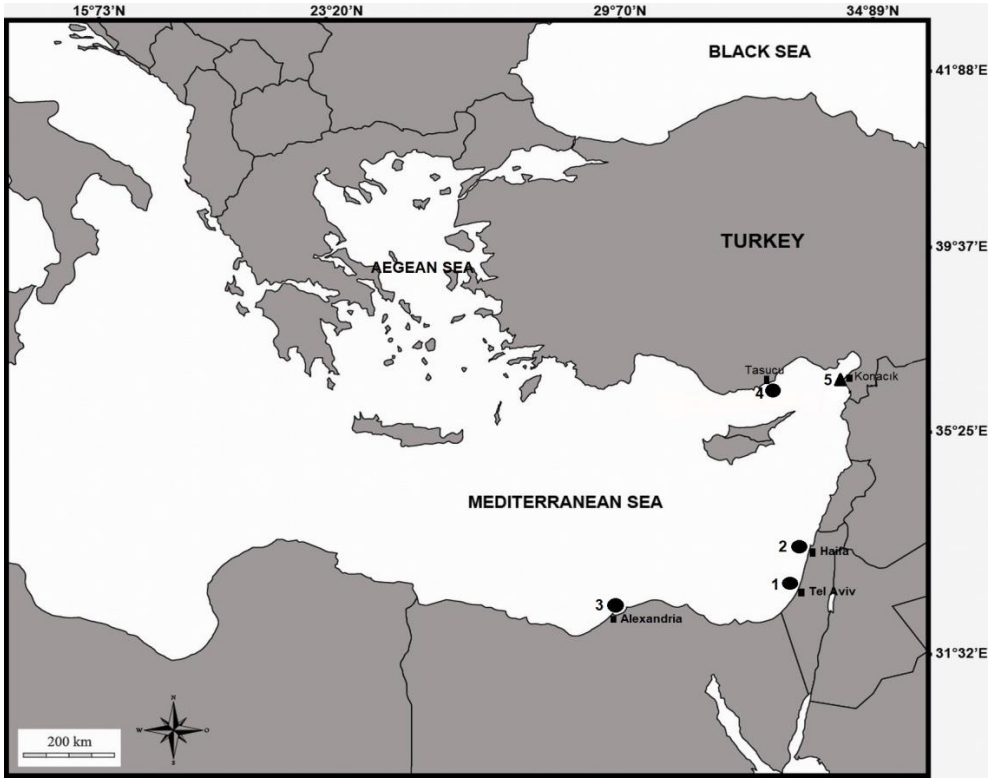

Figure 1. Map showing the capture sites of *Priacanthus sagittarus* in Mediterranean Sea, ●, Previous record; ▲, Konacık (Present study); 1, Tel Aviv, Israel; 2, Haifa Bay, Israel; 3, Alexandria, Egypt; 4, Tasucu (Mersin Bay), Turkey; 5, Konacık (Iskenderun Bay), Turkey

Results

The collected specimen of *P. sagittarus* was 13.3 cm in total length (TL), 10.6 in standard length (SL) and weighed 46.14 g. The specimen had the following features: Dorsal fin rays; X +13 anal fin rays; III +14, pectoral fin rays; 16, gill rakers; 16 on lower limb and and 3 upper limb of first arch, below lateral line 33, above lateral line 17. Head length is 34.23% of standard length; body depth is 39.64% of standard length; eye diameter is 34.21% of head length; interorbital width is 21.05% of head length; Distance from upper lip to orbit was 15.78% of head length; distance from upper lip to origin of dorsal fin was 29.73% of standard length; distance between upper lip to origin of anal fin was 53.15% of standard length; longest pectoral ray was 16.21% of standard length; longest pelvic ray was 29.73% of standard length; first dorsal spine was 8.11% of standard length; second dorsal spine was 10.81% of standard length and 63.15% of tenth spine; tenth spine was 17.12% of standard length; first anal spine 11.6% of standard length; second anal spine was 13.1% of standard length; body depth at sixth dorsal-fin spine was 39.7% of the standart length.

The color of the specimen was mostly light pink-reddish; the body was rectangular and had large eyes. The soft part of the dorsal fin was higher than the spiny part. The upper edge of the dorsal fin was spotted with black. There were black spots on the anterior pelvic fin base. Lower margin of the anal fin and the posterior part of caudal fin were blackish. The previous reports of *P. sagittarus* from the Mediterranean Sea are given in Table 1 together with the findings of the present study.

Figure 2. The presently reported specimen of arrow bulleye *Priacanthus sagittarus*, captured (10.6 cm, SL) from the Iskenderun Bay, Turkey

Table 1. Records of *P. sagittarus* from the Mediterranean Sea during the period 2009-2021

References	Record Date	Number of Samples	Location	Sampling Gear	Depth (m)	SL (cm)
Goren et al. (2010)	28 November 2009	1	Ashdod, Israel	Trawl-net	40	11.4
Golani et al. (2011)	22 October 2010	1	Haifa Bay, Israel	Trawl-net	50	18.1
Farrag et al. (2016)	19 May 2015	1	Egyptian coast, Alexandria, Egypt	Trawl-net	35	10.8
Gökoğlu and Teker (2018)	27 November 2017	1	Mersin Bay (Taşucu), Turkey	Bottom Trawl	100	20.0
Present study	24 February 2021	1	Konacık Iskenderun Bay, Turkey	Trawl-net	80	10.6

Discussion

Priacanthus sagittarius is a nocturnal species occurring in its natural distribution range between 0 to 400 m (Golani, Sonin, & Edelist, 2011). Similarly, Starnes (1988) reported that the species lives at depths ranging from the surface down to 440 m. It feeds commonly on zooplanktoon, cephalopods, crustaceans and small fishes (Allen & Erdmann, 2012).

Although *Priacanthus* species are similar to each other, *P. sagittarus* is different from *P. arenatus, P. blochii P. hamrur* and *P. prolixus* by having the first two spinous dorsal-fin membranes covered with black blotches and the length of the second dorsal spine was half of that of the tenth spine (Starnes, 1988). Besides, there fewer gill rakers in *P. sagittarius* (19–22) than those of other *Pricanthid* species, (*P. arenatus* 28–31; *P. hamrur* 24–26; and *P. prolixus* 29–31; Starnes, 1988).

Previously, a specimen of *P. sagittarius* reported from the Iskenderun Bay by Yapıcı & Hasbek (2018) was misidentified. Later, Ergüden et al. (2018) reported that the misidentified species was *P. hamrur*. Thus, there has been no record of this species from the southeastern coast of thr Mediterranean waters of Turkey.

P. sagittarius can reach a maximum SL up to 35 cm (Kuiter & Tonozuka, 2001). Goren et al. (2010) and Golani et al. (2011) reported the SL of *P. sagittarus* from the Israel coast for Mediterranean waters as 11.4 cm and 18.1 cm, respectively. Later, Farrag et al (2016) recorded that the standard length was 10.8 cm in the Egyptian coast of the Mediterranean Sea. Recently Gökoğlu & Teker (2018) stated that TL and SL of *P. sagittarus* from the Mediterranean coast of Turkey were 25.5 cm and 20.0 cm, respectively. .

In the present study, our specimen was 10.6 cm in SL which was close to the previous record from the Egyptian Mediterranean waters but was smaller than the other three specimens recorded by (Goren, Stern, Galil, & Diamant, 2010) (11.4 cm, SL), (Golani, Sonin, & Edelist, 2011) (18.1 cm, SL) and Gökoğlu and Teker (2018) (20.0 cm, SL), from Ashdod and Haifa (Israel) and Tasucu coast (Turkey).

The occurrence of *P. sagittarus* in the Mediterranean Sea is most evidently due to migration from the Red Sea via the Suez Canal (Goren, Stern, Galil, & Diamant, 2010; Golani, Sonin, & Edelist, 2011). While a single specimen does not necessarily indicate the existence of an established population in Iskenderun Bay, the past and present records of two Pricanthid species (Gürlek, Ergüden, & Turan, 2017; Ergüden, Gurlek, & Turan, 2018) indicate the eastward migration of the species in the Mediterranean waters of Turkey.

In the present study, we report the presence of *P. sagittarius* from the southeastern Mediterranean, (Iskenderun Bay, Turkey). The presence of this alien fish species on the Mediterranean coast of Turkey is probably be due to penetration from the Red Sea through the Suez Canal. As a result of climate change and the tropicalization of the Mediterranean Sea, the introduction of alien fish species into Turkish waters (Turan, Erguden, & Gürlek, 2016) is accelerated and thus contribute to the ichthyofaunal diversity of Turkey.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

Author Contributions

All authors contributed equally to the paper.

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