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Capture of a Rare Smoothback Angelshark *Squatina oculata* (Squatinidae) in Turkish Waters, with Updated Records from the eastern Mediterranean Sea

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Abstract

The authors report on the capture of a specimen of smoothback angelshark *Squatina oculata* Bonaparte, 1840 from Turkish marine waters. The specimen measured 720 mm in total length and was caught by means of a commercial purse-seiner at a depth of 60 m. The species appeared to be sporadically caught in the area and the eastern Mediterranean Sea, however, the size diversity of recorded specimens shows the species still occurred in the region. Although the smoothback angel shark is listed as a protected species according to Turkish Marine Fisheries Act, a management plan should be integrated with local fisheries to preserve the species from extirpation throughout its distribution range in Turkish seas.

Keywords:

Squatinidae, fishing pressure, management, threatened species, eastern Mediterranean Sea

Article history:

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Introduction

Smoothback angelshark *Squatina oculata* Bonaparte, 1840 is known in the eastern Atlantic from Morocco to Angola, and it is one of the three Mediterranean species belonging to the genus Squatina Duméril, 1806 (Roux, 1984). *S. oculata* occurs in the western Mediterranean Basin, but the species was unknown off the Mediterranean coast of France (Capapé et al., 2000). Tortonese (1956) noted its occurrence in Italian waters, and Zava et al. (2016) collected 4 juvenile specimens from the Strait of Sicily. Zava et al. (2022) also documented 34 specimens of *S. oculata*, of which

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32 from the central Mediterranean Sea (21 from Malta, 6 from Tunisia, 5 from Sicily and 2 from Egypt) were incidentally captured or observed between 2005 and 2021.

Squatina oculata is also reported in the eastern Mediterranean where it was first confirmed in the Levant Basin (Golani, 1996), and furtherly from the Syrian coast (Ali, 2018) and the Lebanese coast (Bariche & Fricke, 2020) and recently, from the Egypt (Zava et al., 2022). Ergüden et al. (2019) listed findings of *S. oculata* in the entire Turkish waters where the species is sporadically caught and considered as rather rare in the region. In a recent study, Özgür Özbek & Kabasakal (2022), provided notes on the biology of *S. oculata*, based on observations of 15 specimens captured by commercial bottom-trawlers operated in the Gulf of Antalya.

The main goal of the present paper is to report the capture of a specimen of *S. oculata* together with an extensive literature review that included previous checklists, and individual species accounts from the eastern Mediterranean Sea. This information will allow us to assess in the region, the real status of *S. oculata* classified as "Critically Endangered" in the Global List by the International Union of Conservation of Nature (IUCN, 208), as the two other Mediterranean congeneric species, sawback angelshark *S. aculeata* Cuvier, 1829 and common angelshark *S. squatina* (Linnaeus, 1758).

Materials and Methods

On 1st September 2022, a specimen of *Squatina oculata* was captured by means of a commercial purse-seiner at a depth of 60 m, off Marmaris, Mugla, 36°44' N - 28°20' E (Figure 1), following information provided by fishermen. The specimen was landed at the fish market, where it was carefully observed, identified and photographed. Unfortunately, it was rapidly cut into slices and sold to local consumers. Therefore, no morphometric measurements could be taken.

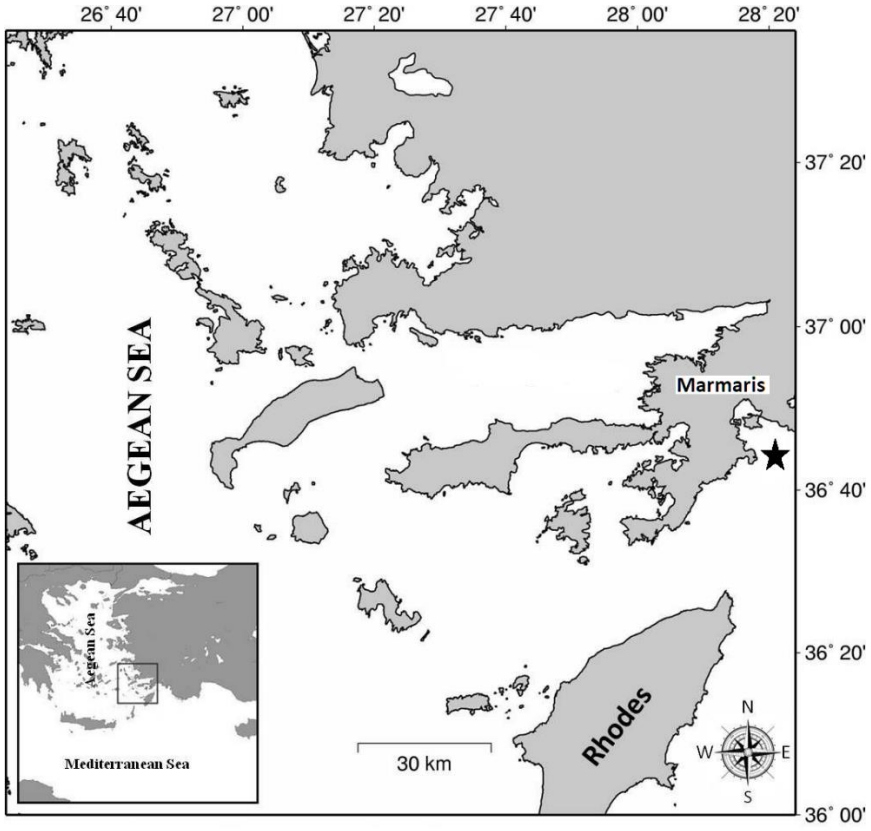

Figure 1. Map indicating the capture site (black star) of *Squatina oculata*, off Marmaris, in the Aegean Sea

Results and Discussion

The examined specimen was a female measuring 720 mm in total length (Figure 2). It was identified as *Squatina oculata* via based on the combination of main morphological characteristics: trunk very broad, eye diameter equal to or larger than spiracle length; external nasal flap with two barbels bordering a fringed median lobe (Figure 3A, 1); dermal folds on sides of head slightly undulate (Figure 3A, 2); pectoral fins very high and broad with broadly rounded rear tips; hind tips of pelvic fins not reaching the level of first dorsal fin origin, dorsal surface rough but no median line of spines, lower surface with small denticles only on the front margin of pectoral and pelvic fins and down the centre of tail; teeth pointed, slightly curved at the distal end and with a triangular base, dispersed in 20/20 in upper and lower jaws (Figure 3 B, 3), colour greyish-brown with some white spots, and belly beige. The description and colour of the present specimen are coincided with the descriptive charactristics provided in Roux (1986), Capapé & Roux (1980), Compagno (1984), Kabasakal & Kabasakal (2004), Ergüden et al. (2019) and Rafrafi-Nouira et al. (2022).

Figure 2. *Squatina oculata*, captured off Marmaris, SE Aegean Sea, scale bar = 50 mm (Photo: H.B. Toprak)

Figure 3. *Squatina oculata*, captured off Marmaris, SE Aegean Sea. A) Front of the head showing, (1) barbels bordering a fringed median lobe, (2) dermal folds on sides of head slightly undulate, scale bar = 50 mm. B) Opening of the mouth showing teeth (3), scale bar = 100 mm (Photo: H.B. Toprak)

Recent captures of *S. oculata* in the eastern Mediterranean Sea, where the species appeared to be sporadically caught mostly as solitary specimens, are listed in Table 1. The nature of the solitary occurrence of *S. oculata*, which was suggested by the previous observation of Kabasakal & Kabasakal (2004) and Ergüden et al. (2019) was also confirmed with present specimen. *S. oculata* has a high economic value and is threatened by fishing pressure due to its K-selected characteristics (Capapé et al., 1990). Furthermore, smoothback angel shark is considered under the threat of multimodal fisheries in Turkish waters (Ergüden et al., 2019; Kabasakal, 2021), The specimens included in Table 1 show the occurrence of specimens displaying different sizes, showing that the species has not totally disappeared in the region. However, they do not constitute sufficient records allowing to suggest that a viable population is really established.

Table 1. Contemporary records of *Squatina oculata* from the eastern Mediterranean

Location	Depth (m)	Gear*	Record date	Number collected	Size, TL (mm)	References
Haifa, Israel E Mediterranean	30-100	BT	11 Mar.1990	1	612	Golani (1996)
Erdek Bay, the Sea of Marmara	31	BT	17 Apr.1992	1	294	Meriç (1994)
Off Karataş, NE Mediterranean	50-60	BT	1994-1996	1	756	Başusta & Erdem (2000)
Gökçeada, NE Aegean Sea	?	BT	July 1997	1	300	Kabasakal & Kabasakal (2004)
Gökçeada, NE Aegean Sea	?	BT	Sept.1999	1	950	Kabasakal & Kabasakal (2004)
NW Rhodes, Greek Aegean Sea	60-80	BT	23 Dec.2004	1	795	Corsini & Zava (2007)
Gulf of Antalya, NE Med.	50-100	BT	2009-2010	10	240-880	Özgür Özbek & Kabasakal (2022)
Gulf of Antalya, NE Med.	10-200	BT	2009-2011	13	482-804	Mutlu et al. (2022)
Coast of Egypt	?	?	?	?	?	El Sayed et al. (2017)
Aydıncık, NE Mediterranean	65	BT	4 Nov.2017	1	726	Ergüden et al. (2019)
Coast of Syria	?	?	?	?	?	Ali (2018)
Gökçeada, NE Aegean Sea	110	BT	22 Mar.2018	1	875	Yığın et al. (2019)
Tyre, Lebanon, E Mediterranean	?	?	10 Apr.2019	1	?	Bariche & Fricke (2020)
Off El-Hamam, Egypt	55-70	BT	28 Mar.2021	2	492-700	Zava et al. (2022)
Off Marmaris, SE Aegean Sea	60	PS	01 Sept. 2022	1	720	This study

*BT: Bottom trawl; PS: Purse seine

Similar patterns were observed for squatinid species from the Tunisian coast, which have an important commercial interest for local fisheries (Capapé et al., 1990; 2002). In total accordance with Ergüden et al. (2019) and Kabasakal (2021), a management plan should be integrated with the local fisheries together with the contribution of local fishermen. It should be essential to preserve the squatinid species from their extirpation throughout the areas where they habitually aggregated.

Author Contributions

OA; Writing - original draft, visualization, writing – review & editing. TÇ; Investigation, interview, HBT; Data collection, interview and take photographs. CC; Conceptualization, methodology, writing - original draft, writing - review & editing.

Conflict of Interest

The authors declare that there are no conflicts of interest.

Data Availability Statement

The data supporting this study's findings are available on request from the corresponding author OA.

Compliance with Ethical Standards

Local Ethics Committee Approval was not obtained because experimental animals were not used in this study.

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