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CAPTURES OF THE RARE SMOOTHBACK ANGEL SHARK *SQUATINA OCULATA* (SQUATINIDAE) FROM THE TUNISIAN COAST (CENTRAL MEDITERRANEAN SEA)

SUMMARY

The authors report the captures of 3 specimens of common angel shark *Squatina oculata* Bonaparte, 1840 from the northern coast of Tunisia in the central Mediterranean Sea. They were 3 adult males which measured 905, 1350 and 1400 mm, respectively, and their eviscerated weight was 4.3, 8.5 and 10.8 kg respectively. Combined with other captures made in the Tunisian waters and throughout the central Mediterranean Sea. The establishment of a viable population of the species in the capture area remains a suitable hypothesis which cannot be totally ruled out. However, further reords are needed. Together with other squatinid species present in the same region, a management plan should be integrated in Tunisian fisheries. This management should be conducted with the contribution of local fishermen to preserve the species of a possible and definitive exctinction.

INTRODUCTION

The smoothbach angelshark *Squatina oculata* Bonaparte, 1840 is known in the eastern Atlantic south the Straits of Gibraltar from Morocco (Lloris & Rucabado, 1998) to the Gulf of Guinea (Blache *et al.*, 1970) and probably elsewhere until Angola (Roux, 1984). The species is abundant from the coast of Senegal where it formed the object of a study concerning its reproductive

biology (Capapé *et al*., 2002). It is used in this area for finning, flesh and oil extracted from liver for therapeutic interests (Gueye-Ndiaye *et al*., 1996).

Squatina oculata is one of three Mediterranean species belonging to the genus *Squatina* Duméril, 1806 together with sawback angelshark *S. aculeata* Cuvier, 1829 and common angelshark *S. squatina* (Linnaeus, 1758). Roux (1984) noted that *S. oculata* is only present 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.

On the other hand, *Squatina oculata* is reported in the eastern Mediterranean where its occurrence was firstly confirmed in the Levant Basin (Golani, 1996), and furtherly reported from the Syian coast (Ali, 2018) and the Lebanese coast (Bariche & Fricke, 2020). Ergüden *et al*. (2019) and Özgür Özbek & Kabasakal (2022) listed the findings of *S. oculata* in the entire Turkish waters where the species is sporadically caught and considered as rather rare in the region.

S. oculata was previously known as relatively abundant off the Tunisian coast, especially in northern areas where captured specimens were used to provide information about its reproductive biology (Capapé *et al*., 1990). However, Bradaï *et al*. (2002) reported captures of specimens southward in the Gulf of Gabès. Later, 4 adult specimens, 2 males and 2 females were caught in the study area, their average total length was 1020 mm (Mnasri, 2008). On 26 December 2018, a female was captured from the same study area, having 1300 mm in TL, and weighing 5 kg (Rafrafi-Nouira *et al*., 2018). However, a routine monitoring conducted in the northern Tunisian waters, allowed us to observe three specimens of *S. oculata*. These captures are described and commented in the present paper to assess about the real status of the species in the study area, but also in the Mediterranean Sea.

MATERIAL AND METHODS

Three specimens of *Squatina oculata* were caugth on 28 February 2022, by commercial trawl in a region located off the city of Bizerte, at a depth of 100-150 m approximately, on sandy-muddy bottom, by 37°32′ N and 10° 08′ E (Fig. 1). The specimens were eviscerated on board and delivered at the fish market of Bizerte (Fig. 2). They were measured for total length (TL) to the nearest centimetre, and weighed for eviscerated weight (EW) to the nearest kilogram. All specimens were examined and identified, unfortunately rapidly cut into slices by fishermen to be sold. However, some morphometric measurements were carried out only in a single specimen (Tab. 1), the specimens being immediately cut into slices and sold in the fish market.

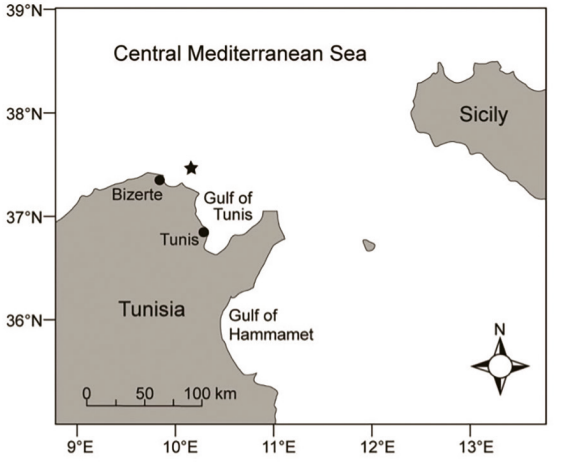

Fig. 1 - Map of the northern Tunisian coast, included in the central Mediterranean Sea: the black star indicates the capture site of *Squatina oculata*.

Fig. 2 - Specimens of *Squatina oculata*, captured off the northern Tunisian coast. scale bar = 150 mm.

Tab. 1 - Morphometric measurements, in mm and as % of total length (TL), and eviscerated body weight (in kilogram) recorded in a specimen of *Squatina oculata*, captured off the northern Tunisian coast.

Morphometric measurements	Millimetre	% TL
Total length	1400	100
Standard length	1250	89.3
Head length	212	15.1
Eye diameter	28	2.0
Mouth width	208	14.8
Interspiracular space	105	7.5
Pre-orbital length	35	2..5
Pre-oral length	36	2.6
Snout to mouth	50	3.6
Snout to first gill-slit	88	6.3
Mouth width	169	12.1
Pre-anal length	644	46.0
Pre-first dorsal length	910	65.0
Pre-second dorsal length	1054	75.2
Space between dorsal bases	220	15.7
Eviscerated weight (in kg)	5	

RESULTS AND DISCUSSION

The 3 specimens were identified as *Squatina oculata* following the combination of main morphological characteristics;

- eye equal or larger than spiracle;
- frontal cephalic membranes slightly ondulate;
- nasal flap with two barbels bordering a fringed median lobe;
- hind tips of pelvic fins not reaching level of first dorsal fin origin;
- lack of median line of spines;
- colour greyish with dark and white spots on dorsal surface and brown bars on tail;
- belly beige.

Morphological measurements, and colour are in total agreement of the previous descriptions of the species (Capapé & Roux, 1980; Roux, 1984; Compagno, 1984; Çigdem Yigin *et al*., 2019; Ergüden *et al*., 2019), and confirm on the presence of the species in the Tunisian waters. The specimens measured

905, 1350 and 1400 mm, respectively and their eviscerated weight reached 4.3, 8.5 and 10.8 kg respectively, the two latter specimens were the largest *S. oculata* recorded to date in Tunisia. All were dult mals displaying well-developed, rigid ad calcified claspers, confirming previous observations for specimens from the Tunisian coast, where they mature at 710 mm TL (Capapé *et al*., 1990) and the Senegalese coast, at 820 mm TL (Capapé *et al*., 2002).

Squatina oculata is classified as «Critically Endangered» together with the two other Mediterranean squatinid species (IUCN, 2018). A drastic decrease of captures was observed in the entire Mediterranean Sea (Ergüden *et al*., 2019), where specimens are sporadically caught. Since 1990, no specimens were captured from the Tunisian waters to our knowledge. However, the captures of small specimens reported by Zava *et al*. (2016), and large sized specimens recorded from the northern Tunisian coast (Mnasri, 2008; Rafrafi-Nouira *et al*., 2019; this study), and southward in the Gulf of Gabès (Bradaï *et al*., 2002) suggest that the species is not totally exctinted in the central Mediterranean. Conversely, the occurrence of a viable population of *S. oculata* in the same area remains speculative and further captures are needed for confirmation. Additionally, due to its *k*-selected characteristics, *S. oculata* is negatively facing to the fishing pressure and remains a species locally considered as threatened.

Squatina oculata displays an important commercial interest for Tunisian fisheries together with the two other squatinid species occuring in the Tunisian waters. In total accordance with Ergüden (2019), Kabasakal (2021) and Özgür Özbek & Kabasakal (2022) a management plan should be integrated in local fisheries together with the contribution of local fishermen. These latter need to be informed of the important role they could play to preserve the squatinid species about an exctinction in areas where they habitually aggregated.

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