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UNDERWATER OBSERVATIONS OF THE RARE ANGULAR ROUGHSHARK *OXYNOTUS CENTRINA* (CHONDRICHTHYES: SQUALIDAE) IN THE WATERS OF SANTA TECLA (SICILY, ITALY)

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ABSTRACT

Three encounters with the uncommon and elusive angular roughshark, Oxynotus centrina*, are reported from the waters off Santa Tecla, Catania, Italy, in the Western Ionian Sea. The three observations occurred on 11 June 2019, 26 February 2020 and 26 January 2022, between 74 and 84 m depth. The sharks encountered were three different female individuals. Photographs of the sharks were taken on all the encounters.*

Key words: angular roughshark, *Oxynotus centrina*, Sicily, Ionian Sea, Mediterranean Sea

OSSERVAZIONI SUBACQUEE DEL RARO PESCE PORCO *OXYNOTUS CENTRINA* (CHONDRICHTHYES: SQUALIDAE) NELLE ACQUE DI SANTA TECLA (SICILIA, ITALIA)

SINTESI

Vengono riportati tre incontri con il poco comune ed elusivo pesce porco, Oxynotus centrina*, nelle acque di Santa Tecla, a Catania, in Italia, nel Mar Ionio Occidentale. Le tre osservazioni hanno avuto luogo l'11 giugno 2019, il 26 febbraio 2020 e il 26 gennaio 2022, tra i 74 e gli 84 m di profondità. Gli squali incontrati erano tre diversi individui, di lunghezza stimata di 75, 60 e 50 cm rispettivamente, tutti di sesso femminile. La documentazione fotografica è stata raccolta durante tutti gli incontri.*

Parole chiave: pesce porco, *Oxynotus centrina*, Sicilia, Mar Ionio, Mare Mediterraneo

INTRODUCTION

The angular roughshark, *Oxynotus centrina* (Linnaeus, 1758), belongs to the Order Squaliformes and the family Oxynotidae. The morphology of this species includes: no anal fin, broad dorsal fins with first dorsal fin origin over pectoral fin origin, fin spines on both dorsal fins, short pectoral fins, moderately long caudal fin upper lobe and short lower lobe, no caudal fin posterior notch, stout body, ventral ridges, large dermal denticles, short snout, small mouth with enlarged labial parts, large nostrils, large eyes, large spiracles, and five pairs of short gill slits. The coloration of the dorsal surfaces is grey-brown or blackish with a lighter pattern on the lateral part of the head, sides, caudal peduncle and caudal fin; the ventral surfaces are partially lighter. Its size at birth is 21-24 cm and the maximum size is 150 cm. The embryonic development of this species is aplacental viviparous, with unknown gestation and litter size of 7-23 young. It is a benthic species that lives on continental shelves and upper slope, at depths ranging from 50 m to at least 725 m, with nocturnal habits, feeding on bony fishes, small-spotted catshark eggs, crustaceans, and polychaetes (Bigelow & Schroeder, 1948; Bass *et al.*, 1976; Compagno, 1984; De Maddalena *et al.*, 2015).

It is found in the Eastern Atlantic Ocean and its presence throughout the Mediterranean Sea is well documented, despite being an uncommon species in the entire area, and very rare in most sites (Tortonese, 1956; Capapé, 1977; Cadenat & Blache, 1981; Bauchot, 1987; Vanni, 1992; Moreno, 1995; Mizzan, 1994; Barrull *et al.*, 1999; Barrull & Mate, 2001; Barrull & Mate, 2002; Dulvy *et al.*, 2003; Lipej *et al.*, 2004; Kabasakal, 2010; De Maddalena *et al.*, 2015; Kousteni & Megalofonou, 2016; Koehler, 2018; Capapé *et al.*, 2021; Gajić *et al.*, 2021).

Keeping in mind the paucity of observation of live individuals of this species (Kabasakal, 2009), it was considered important to report on recent underwater observations that occurred in the waters of the Western Ionian Sea, off the Eastern Sicilian coast.

Fig. 1: The estimated 75 cm TL angular roughshark, *Oxynotus centrina*, ***observed off Santa Tecla, Catania, on the Eastern Coast of Sicily, Italy, on 11 June 2019 at 10:16, at 74 m depth (photo: A. Pagano).***
Sl. 1: Približno 75 cm dolga samica morskega prašiča, *Oxynotus centrina*, ***opažena 11. junija 2019 ob 10:16, na globini 74 m ob Santa Tecli, Catania, na vzhodni obali Sicilije v Italiji (foto: A. Pagano).***

Tab. 1: Main details of the three encounters with angular roughsharks, *Oxynotus centrina*, ***reported in this article.***
Tab. 1: Glavne podrobnosti o treh srečanjih z morskimi prašiči, *Oxynotus centrina*, ***o katerih avtorja poročata v prispevku.***

Date	Location	Depth (m)	Sex	Estimated TL
11 June 2019	Santa Tecla, Catania, Italy	74	F	75 cm
26 February 2020	Santa Tecla, Catania, Italy	84	F	60 cm
26 January 2022	Santa Tecla, Catania, Italy	84	F	50 cm

MATERIAL AND METHODS

The first author experienced three encounters with angular roughsharks while scuba diving with another diver, Eugenio Longo, by Closed Circuit Rebreather in the waters of the Western Ionian Sea, off Santa Tecla, Catania, on the Eastern Coast of Sicily, Italy (latitude: 37.639682105936735 N, longitude: 15.183723565445055 E). The weather conditions were good, with calm sea. The dive site is located 150 m from the shore, where the bottom depth is between 80 and 110 m. The site is a rocky landslide that ends on a sandy bottom. The average temperature of the water was 14°C on all three encounters. The first author dives about 50 times per year on the observation site, with an average of one dive per week.

Sharks were photographed using a Nikon D800 reflex camera with a Tokina 10-17 mm lens for subse-

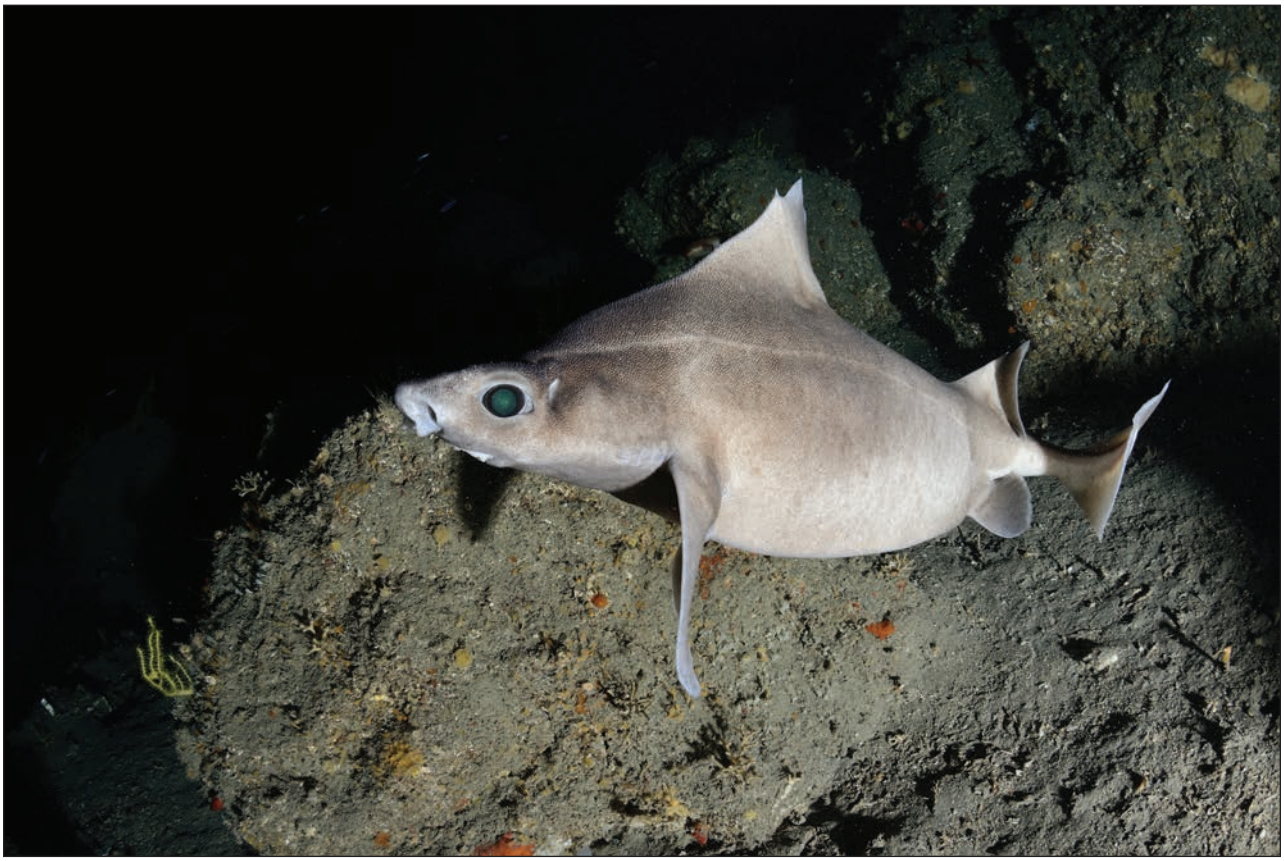

Fig. 2: The estimated 60 cm TL angular roughshark observed on the same site on 26 February 2020 at 10:26, at 84 m depth (photo: A. Pagano).
Sl. 2: Približno 60 cm dolga samica morskega prašiča, *Oxynotus centrina*, ***opažena na isti lokaliteti 26. februarja 2020 ob 10:26, na globini 84 m (foto: A. Pagano).***

quent analyses of their morphology and photoidentification of the individuals occurring in the area.

RESULTS AND DISCUSSION

On each encounter an individual female angular roughshark was observed (Tab. 1). The first encounter occurred on the morning of 11 June 2019, at 10:16, when the divers were at 74 m depth and the angular roughsark observed was estimated at 75 cm total length (TL). The second encounter occurred on the morning of 26 February 2020, at 10:26, when the divers were at 84 m depth, only 30 m from the site of the first encounter. This second shark was estimated at 60 cm total length. The third encounter occurred in the morning of 26 January 2022, at 11:26, once again when the divers were at 84 m depth, exactly in the same site of the second encounter. This third individual was estimated at 50 cm total length. Each encounter lasted 10 to 20 minutes.

Other species observed on the three encounters included the swallowtail seaperch, *Anthias anthias* (Linnaeus, 1758), the serpent eel, *Ophisurus serpens* (Linnaeus, 1758), the yellow gorgonian, *Eunicella cavolinii* (Koch, 1887), the small polyped gorgonian, *Paramuricea clavata* (Risso, 1826), and the red coral, *Corallium rubrum* (Linnaeus, 1758).

Based on the shape of the dorsal fins, the colour pattern and the size, it is evident that the angular roughsharks encountered were three different individuals. The total length of the sharks was estimated by comparison with the size of the underwater housing of the camera. The sharks initally kept a distance from the divers, apparently disturbed by the light, but then let the divers approach them at very close range and to take close-up pictures of the subjects. Therefore, photographic documentation of the shark was taken on all three encounters.

Eco-tourism, including the activities of shark diving are crucial to draw public attention to the importance of protecting sharks (De Maddalena & Galli, 2017). Currently the Mediterranean Sea offers very few spots where it is possible to have the chance to dive with some species of sharks. Among those documented spots are

Fig. 3: The estimated 50 cm TL angular roughshark observed on the same site on 26 January 2022, at 11:26, at 84 m depth (photo: A. Pagano).
Sl. 3: Približno 50 cm dolga samica morskega prašiča, *Oxynotus centrina*, ***opažena na isti lokaliteti 26. januarja 2022 ob 11:26, na globini 84 m (foto: A. Pagano).***

the Messina Strait, Italy, for the bluntnose sixgill shark, *Hexanchus griseus* (Bonnaterre, 1788) (Celona *et al.*, 2005), the offshore waters of Beirut, Lebanon, for the smalltooth sand tiger, *Odontaspis ferox* (Risso, 1810) (Barrull & Mate, 2002; De Maddalena *et al.*, 2015), Boncuk Bay, Turkey, Lampione, Italy, Hadera and Ashkelon, Israel, for the sandbar shark, *Carcharhinus plumbeus* (Nardo, 1827), and Hadera and Ashkelon, Israel, for the dusky shark, *Carcharhinus obscurus* (Le Sueur, 1818) (Barash *et al.*, 2018; Zemah Shamir *et al.*, 2019; Kabasakal, 2020; Cattano *et al.*, 2021). The fact that there are so few spots where it is possible to shark dive in the Mediterranean area, makes the site where the three observations of angular roughsark are described in this article even more important. The fact that the species is so uncommon in the entire Mediterranean makes the observation site unique and its preservation critical.

Since female angular roughsharks attain sexual maturity between 66 and 75 cm TL (De Maddalena *et al.*, 2015), we can assume that the female sharks observed off Santa Tecla were sexually mature or subadults, and speculate that perhaps their presence in the area may be related to mating or parturition. Unfortunately, the observation area, despite being also a site for the reproduction of catsharks, *Scyliorhinus* sp., (as clearly shown by egg cases observed by the first author), is not protected in any way. Fishing with gillnets, longlines and pots is still common practice and unregulated. The species is endangered according to the assessment of the IUCN red list (IUCN, 2022) and it's apparently extinct from some locations including the Adriatic Sea and the Gulf of Lion. We strongly recommend the angular roughshark be listed as a protected species, and the site be properly preserved and closely monitored to ensure viable habitat remains.

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PODVODNA OPAZOVANJA REDKEGA MORSKEGA PRAŠIČA, *OXYNOTUS CENTRINA* (CHONDRICHTHYES: SQUALIDAE) V VODAH SANTE TECLE (SICILIJA, ITALIJA)

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POVZETEK

Avtorja poročata o treh srečanjih z nenavadnim in izmuzljivim morskim prašičem, Oxynotus centrina*, v bližini Sante Tecle (Catania, Italija), v zahodnem Jonskem morju. Morskega prašiča so opazovali 11. junija 2019, 26. februarja 2020 in 26. januarja 2022, med 74 in 84 m globine. Bile so tri različne samice, vse tudi fotografirane.*

Ključne besede: morski prašič, *Oxynotus centrina*, Sicilija, Jonsko morje, Sredozemsko morje

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