

OCCURRENCE OF THE ANGULAR ROUGH SHARK, *OXYNOTUS CENTRINA* (CHONDRICHTHYES: OXYNOTIDAE) IN THE EASTERN MEDITERRANEAN

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ABSTRACT

Based on field surveys and available literature, 88 specimens of *Oxynotus centrina* (Linnaeus, 1758), were recorded from Marmara, Aegean and Mediterranean seas, between the late 1800's and October 2012. Sixty-four specimens (72 %) were recorded in the Aegean Sea, followed by 19 records (21.5 %) from the Sea of Marmara and 5 records (5.6 %) from the Mediterranean Sea. Total length of the recorded specimens (sexes combined) ranged from 22.5 cm to 79 cm. Bottom-trawling was the main fishing gear ($n = 64$, 72 %), by which most angular rough sharks have been caught, followed by beam-trawl ($n = 3$, 3.3 %), gill-net ($n = 3$, 3.3 %) and long-line ($n = 1$, 1.1 %). Seven specimens (7.8 %) were recorded by means of visual sampling (underwater imaging), all of which were carried out in the Sea of Marmara. *O. centrina* is a rare and threatened deep-sea shark in the eastern Mediterranean and adjacent seas. Capture of pregnant females creates a significant threat to the survival of the species, thus, before the implementation of evidence-based measures for the conservation, and even a ban on the fishing of *O. centrina*, promoting fishermen to release live specimens, appears to be an urgent, feasible first step in the protection of this rare species.

Key words: Elasmobranchii, *Oxynotus centrina*, mortality, survival, protection, Mediterranean Sea

PRESENZA DI PESCE PORCO, *OXYNOTUS CENTRINA* (CHONDRICHTHYES: OXYNOTIDAE), IN MEDITERRANEO ORIENTALE

SINTESI

In base alla letteratura disponibile ed ai rilevamenti effettuati in mare, la presenza di 88 esemplari di *Oxynotus centrina* (Linnaeus, 1758) è stata confermata nel Mar di Marmara, nell'Egeo e nel Mediterraneo, tra la fine del 1800 e l'ottobre 2012. Sessantaquattro campioni (il 72 % del totale) provengono dall'Egeo, 19 campioni (ossia il 21,5 %) dal Mar di Marmara e solo 5 campioni (il 5,6 %) dalla restanti aree del Mediterraneo. La lunghezza totale degli individui campionati (di entrambi i sessi) è compresa tra i 22,5 cm e i 79 cm. L'attrezzo da pesca principale con il quale sono stati catturati gli esemplari di pesce porco è risultata la rete a strascico con divergenti ($n = 64$, pari al 72 %), seguita dai rapidi o ramponi ($n = 3$, pari al 3,3 %), dalla rete ad imbrocco ($n = 3$, pari al 3.3 %) e dal palangaro ($n = 1$, pari all'1,1 %). La presenza di sette individui (il 7,8 %) è stata confermata mediante campionatura visiva (immagini subacquee) effettuata nel Mar di Marmara. Il pesce porco è uno squalo di acque profonde raro e minacciato nella parte orientale del Mediterraneo e nei mari adiacenti. La cattura di femmine gravide è una minaccia significativa per la sopravvivenza della specie. Come primo passo nella protezione di questa specie rara risulta urgente e fattibile educare i pescatori a rilasciare gli esemplari vivi, ancor prima di mettere in atto linee guida per la conservazione o il divieto di pesca della specie in questione.

Parole chiave: Elasmobranchi, *Oxynotus centrina*, mortalità, sopravvivenza, protezione, mare Mediterraneo

INTRODUCTION

The angular rough shark, *Oxynotus centrina* (Linnaeus, 1758), is a rare to uncommon deep sea shark throughout its range (Ebert & Stehmann, 2013). In the eastern Atlantic, its distribution range extends from Norway to Portugal, and extending southward to the South African coast (Ebert & Stehmann, 2013). *O. centrina* occurs in the entire Mediterranean Sea, from the Straits of Gibraltar to Israel (Serena, 2005), and extending northward to the Sea of Marmara (Kabasakal, 2010). It is a sluggish and harmless shark found over the continental shelf and upper slope from depths of 60 to 660 m, where it is an uncommon bycatch in Mediterranean deep demersal fisheries (Serena, 2005). A recent DESEAS survey in the western Ionian Sea demonstrated that, the lower limit of its depth distribution could extend to 800 m (Sion *et al.*, 2004).

Historical and contemporary occurrence of *O. centrina* in the Mediterranean Sea dates back to the 16th century, recorded both in general ichthyological (e.g., Bellon, 1553; Risso, 1810; Carus, 1889-1893; Ninni, 1912; Quéro, 1984; Akşiray, 1987; Papaconstantinou, 1988; Serena, 2005) and shark specific studies (e.g., Tortonese, 1956; Quignard & Capapé, 1971; Capapé, 1977; Barrull *et al.*, 1999; Kabasakal, 2002; Cugini & De Maddalena, 2003; Kabasakal & Kabasakal, 2004; Lipej *et al.*, 2004; Storai, 2004). Although, several studies have been carried out to reveal the life history parameters of the an-

gular rough shark (Calderwood, 1892; Geldiay & Mater, 1968; Capapé *et al.*, 1999; Barrull & Mate, 2001; Megalofonou & Damalas, 2004; Capapé, 2008; Dragičević *et al.* 2009; Kabasakal, 2009), there are still many gaps present in our understanding of the life history of *O. centrina*. Furthermore, the fragmentary nature of the eastern Mediterranean records of the species is a complicating factor in providing a complete picture of its distribution in the mentioned region.

Oldest known records on the eastern Mediterranean occurrence of *O. centrina* were reported by Carus (1889-1893) and Hoffman & Jordan (1892), from Greek waters, and the most recent records of the species from the mentioned region have been reported by Kousteni & Megalofonou (2012). The occurrence of *O. centrina* from the eastern Mediterranean and adjacent seas have also been reported by the following authors: Erazi (1942), Akyüz (1957), Geldiay & Mater (1968), Papaconstantinou & Tortonese (1980), Papaconstantinou & Tsimenidis (1985), Baştusta *et al.* (1998), Karakulak *et al.* (2000), Eryilmaz (2003), Kabasakal (2003, 2010), Kabasakal & Kabasakal (2004), Megalofonou & Damalas (2004), Eryilmaz & Meriç (2005), Golani (2006), Hadjichristophoru (2006), Öziç & Yilmaz (2006), Bayhan *et al.* (2006), Saad *et al.* (2006), Damalas & Vassilopoulou (2009), Keskin & Eryilmaz (2010) and Moftah *et al.* (2011). The aim of this article is to provide new data on the occurrence of *O. centrina* in the eastern Mediterranean, as well as in the adjacent Aegean and Marmaric

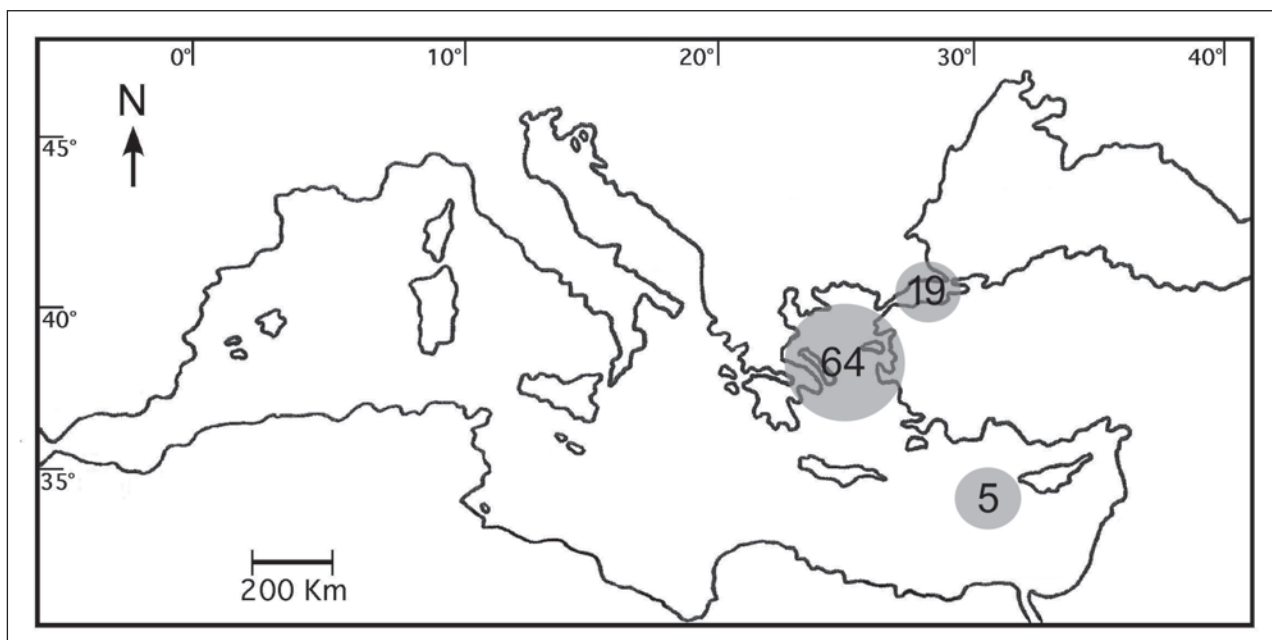


Fig. 1: Map showing the study area, where specimens of *Oxynotus centrina* recorded in eastern Mediterranean and adjacent waters. Numbers in shaded circles indicate the number of confirmed records in Marmara, Aegean and Mediterranean waters.

Sl. 1: Zemljevid obravnavanega območja, kjer so bili ugotovljeni primerki morskih prašičev (*Oxynotus centrina*). Številke v osenčenih krožcih kažejo število potrjenih zapisov v Marmarskem, Egejskem in Sredozemskem morju.

waters, with a brief review of historical and contemporary records, as well as the rarity of the species in the mentioned region.

MATERIAL AND METHODS

This study is part of an extensive research to provide up-to-date information on the status of shark species occurring in the seas of Turkey, which has been ongoing since 2000, as an initiative of the Ichthyological Research Society (IRS). A previous report of *Oxynotus centrina* substudy, which summarised the historical and contemporary records of the angular rough shark from Turkish waters, was recently published by Kabasakal (2010). Eastern Mediterranean, Aegean and Marmaric records of *O. centrina* were obtained from the following sources: (a) available ichthyological literature; (b) printed or electronic versions of popular media such as daily newspapers, fishing and/or diving magazines, with reliable photographic evidence; (c) field surveys; (d) specimens stored in museums; and (e) underwater photographs and/or video footage with information on locality of sight, date, depth, etc.

The following data were recorded, if conditions allowed for such measurements and observations: total length (TL), weight (w), sex, depth and date of sight or caught, and type of sampling. Total length data of specimens was extracted from the literature or measured on board. Since the underwater cameras of recreational scuba divers lack twin laser pointers, which can be used to create inwater lased reference points on specimens and utilized as a scale bar for further length measurements, TL data of the visually sampled angular rough sharks could not be recorded in most occasions. Total length is the horizontal line between the tip of the snout and the tip of the upper lobe of caudal fin, where the caudal fin depressed to body axis (Serena, 2005). Regarding the records based on popular media, the author visited the fishing ports indicated in the press releases to interview the fishermen and validate the shark species as *O. centrina*. Description of the species and taxonomic nomenclature follow Serena (2005). Raw data sheets and specimen photographs and/or video footage are stored in the archives of IRS and available for inspection on request.

REVIEW

General remarks on catch data and specimens

Based on field surveys and available literature, of which references are quoted in Table 1, 88 specimens of *Oxynotus centrina* were recorded from Marmara, Aegean and Mediterranean seas between the late 1800's and October 2012. Sixty-four specimens (72 %) were recorded in the Aegean Sea, followed by 19 records (21.5 %) from the Sea of Marmara and 5 records (5.6 %) from the Mediterranean Sea (Fig. 1). Total length of

the recorded specimens (sexes combined) ranged from 22.5 cm to 79 cm. Bottom-trawling was the main fishing gear (n = 64, 72 %), by which most angular rough sharks have been caught, followed by beam-trawl (n = 3, 3.3 %), gill-net (n = 3, 3.3 %) and long-line (n = 1, 1.1 %) (Fig. 2). Seven specimens (7.8 %) were recorded by means of visual sampling (underwater imaging), all of which were carried out in the Sea of Marmara. No data was obtained on the type of sampling of 10 specimens (Fig. 2). Individual remarks of records and the relevant references are summarised in Table 1.

The following description of *O. centrina* is based on examined specimens: the body is robust with a short, blunt snout and large nostrils; high, sail-like dorsal fins with strong spines (Fig. 3d); no anal fin, first dorsal fin spine inclined forwards, high and thick. Cross-section of the body is triangular with strong dermal ridges extending from the base of the ventral fin to the front corner of the ventral fin base (Fig. 3d). Spiracles are large and vertically elongated, crescent or oval in shape (Fig. 3b). Teeth on upper and lower jaws dissimilar; upper teeth are lanceolate and lower teeth are bladeliike. Colour is grey to greyish brown above and below, with darker blotches on head and sides; light horizontal lines separate the dark areas on head (Figs. 3a, b).

Notes on occurrence and rarity

As it can be seen in Table 1, the oldest known records of *O. centrina* from eastern Mediterranean and adjacent seas date back to the late 1800's (e.g., Carus, 1889-1893; Hoffman & Jordan, 1892). In one of the pioneering studies on the fauna and flora of the Mediterranean Sea, Carus (1889-1893) recorded *O. centrina* off Pire in Greek waters of the Aegean Sea. Furthermore, Hoffman & Jordan (1892) reported on an angular rough shark, which they observed in the Athens market, with brief remarks.

Although eastern Mediterranean records of *O. centrina* date back to the late 1800's the species was not mentioned in the pioneering ichthyological studies of Turkey's waters by Ninni (1923), Deveciyan (1926) and Ayaşlı (1937). The oldest confirmed record of the species from Turkey's waters is based on a mid 20th century ichthyological inventory of Marmaric and Bosphoric waters by Erazi (1942).

Based on available literature and field surveys the most recent confirmed specimen of *O. centrina*, a discarded bycaught female, from the mentioned region was recorded on 21 October 2012 in the prebosphoric region of the Sea of Marmara (Tab. 1). The occurrence of only 88 confirmed records of *O. centrina* from the eastern Mediterranean and adjacent seas (Tab. 1) from the oldest confirmed records (Carus, 1889-1893; Hoffman & Jordan, 1892) to the most recent record on 21 October 2012 is proving the rarity of the species in the mentioned area.

Tab. 1: Historical and contemporary records of angular rough shark, *Oxynotus centrina*, in eastern Mediterranean and adjacent seas between 1800's and 2012. AE – Aegean Sea, BT – bottom trawling, BET – beam trawling, GN – gill netting, LL – longline, ME – Mediterranean Sea, SM – Sea of Marmara, VS – visual sampling

Tab. 1: Starejši in recentni podatki o pojavljanju morskega prašiča *Oxynotus centrina* v vzhodnem Sredozemlju med koncem 19. stoletja in letom 2012. AE – Egejsko morje, BT – pridnena koča, BET – vlečna mrežo z gredjo, GN – zabodna mreža, LL – parangal, ME – Sredozemsko morje, SM – Marmarsko morje, VS – opazovalni popis

No	Date	Locality	Region	TL (cm)	Sex	Depth (m)	References & Remarks
1	late 1800's	Pire, Greece	AE	?	?	?	Carus (1889-1893). One of the earliest records of <i>O. centrina</i> from eastern Mediterranean.
2	late 1800's	Athens, Greece	AE	?	?	?	Hoffman & Jordan (1892). One of the earliest records of <i>O. centrina</i> from eastern Mediterranean based on a specimen observed in the market at Athens by the authors.
3	1942	Sea of Marmara	SM	?	?	?	Erazi (1942)
4	1957	İskenderun Bay	ME	?	?	?	Akyüz (1957)
5	1966	İzmir Bay	AE	?	♀	35	Geldiay & Mater (1968), BT
6	1980	Thermaikos Gulf, Greece	AE	24.8	?	?	Papaconstantinou & Tortonese (1980)
7	1985	Pagassitikos Gulf, Greece	AE	?	?	?	Papaconstantinou & Tsimenidis (1985)
8	Nov. 1994	Yassiada	SM	40	♀	90	Kabasakal (2003), BT
9	Feb. 1996	Ekinlik Island	SM	35	♂	60	Kabasakal (2003), GN
10	Feb. 1996	Ekinlik Island	SM	41	♂	60	Kabasakal (2003), GN
11	Nov. 1998	Gökçeada	AE	65	♀	?	Kabasakal & Kabasakal (2004), BT
12	1994-1996	İskenderun Bay	ME	53.2	?	70-80	Başusta <i>et al.</i> (1998), BT
13	Feb. 1999	Kea Island	AE	69	♀	100-200	Megalofonou & Damalas (2004), BT. Gravid female with 15 embryos.
14	2003-2004	Gökova Bay	AE	?	?	80	Öziç & Yilmaz (2006), BT
15	2000	Yassiada	SM	ca. 50	♀	ca. 35	Kabasakal (2010), VS
16	2000	Turkey's Mediterranean coast	ME			?	Unpubl. data. Preserved in fishery collections at Samatya Fishing Harbour (Fig. 2d).
17	Aug. 2000	Sea of Marmara	SM	?	?	35-100	Karakulak <i>et al.</i> (2000), BT
18	Sept. 2000	Bozcaada	AE	22.5	?	60	Eryilmaz (2003), BT
19	Dec. 2000	SW Sea of Marmara	SM	36	?	42-86	Bayhan <i>et al.</i> (2006), BET
20	Mar. 2001	SW Sea of Marmara	SM	50	?	42-86	Bayhan <i>et al.</i> (2006), BET
21	June 2001	SW Sea of Marmara	SM	52	?	42-86	Bayhan <i>et al.</i> (2006), BET
22	19 June 2001	Turkey's Mediterranean coast	ME			?	Unpubl. data. Preserved in fishery collections at Samatya Fishing Harbour.
23	2004	Balıkçı Adası	SM	?	?	54	Unpubl. data, VS. Recorded by Cem Yıldırım.
24	2005	Sea of Marmara	SM	?	?	?	Eryilmaz & Meriç (2005)
25	2005	Sedef Island	SM	?	?	43	Unpubl. data, VS. Recorded by Serço Ekşiyen.
26	2006	Balıkçı Island	SM	?	?	56	Unpubl. data, VS. Recorded by Cem Yıldırım (Fig. 2b).
27	Oct. 2006	SW Sea of Marmara	SM	?	?	52-74	Keskin & Eryilmaz (2010), BT
28-78	1995-2006	Central Aegean Sea	AE	?	?	?	Damalas & Vassilopoulou (2009). A total of 51 specimens were caught in the BT haulings over 11 year period, which were 100 % discarded. Authors did not give individual details of the specimens.
79	Mar. 2007	SW Sea of Marmara	SM	?	?	38-45	Keskin & Eryilmaz (2010), BT
80	Oct. 2007	Psara, Greece	AE	53.3	?	130	Kousteni & Megalofonou (2012), BT
81	Oct. 2007	Psara, Greece	AE	56.5	?	130	Kousteni & Megalofonou (2012), BT
82	7 Mar. 2008	Sea of Marmara	SM	?	?	?	Unpubl. data, GN
83	25 May 2008	Yassiada	SM	?	♀	35	Unpubl. data, VS. Recorded by Polat İnce.
84	between May. and Nov. 2008	Off Alexandria, Egypt	ME	?	?	?	Moftah <i>et al.</i> (2011). Sampled in the fish market.
85	27 Sept. 2009	Balıkçı Island	SM	ca. 60	♀	35	Kabasakal (2010), VS (Fig. 2a).
86	June 2010	Korinthiakos Gulf, Greece	AE	79	?	180	Kousteni & Megalofonou (2012), LL
87	May 2011	Evia - Greece	AE	67.4	?	366-458	Kousteni & Megalofonou (2012), BT
88	21 Oct. 2012	Ahırkapı	SM	57	♀	7	Unpubl. data, VS. Discarded by fishermen off the coast (Fig. 2c).

The rarity of *O. centrina* in the entire Mediterranean Sea is a generally well-accepted fact, both in the historical and contemporary reports (Tortonese, 1956; Capapé, 1977; Papaconstantinou & Tortonese, 1980; Cugini & De Maddalena, 2003; Kabasakal & Kabasakal, 2004; Storai, 2004; Hadjichristophoru, 2006; Kabasakal, 2010; Moftah *et al.*, 2011; Kousteni & Megalofonou, 2012). According to Cugini & De Maddalena (2003), the population of *O. centrina* in Italian waters declined constantly during 20th century. Kabasakal & Kabasakal (2004) recorded only one specimen of *O. centrina* during an extensive survey of sharks in the northern Aegean Sea between 1995 and 2004. During this survey, Kabasakal & Kabasakal (2004) recorded 1068 shark specimens representing 20 species and *O. centrina* represented 0.09 % of the total catch. Capapé *et al.* (1999) and Capapé (2008) carried out the most detailed investigations on the reproductive biology and diet of *O. centrina*, respectively, in the western and central Mediterranean Sea; in both studies total numbers of the examined specimens over the 20 year research period were 80 and 102, respectively. During a survey on bycatch sharks caught by commercial bottom-trawlers in the central Aegean Sea between 1995 and 2006 Damalas & Vassilopoulou (2009) recorded 51 specimens of *O. centrina* and stated that the angular rough shark is > 95 % discarded shark. Based on the results of a survey on the abundance of sharks in the central Mediterranean Sea, Ragonese *et al.* (2013) considered *O. centrina* as a rare shark. Results of the present study have confirmed the rarity of *O. centrina* in the eastern Mediterranean. According to Serena & Relini (2006), *O. centrina* is more common in the western Mediterranean.

Contrary to above statements, which suggest the rarity of *O. centrina* in the eastern Mediterranean, Golani (2006) postulated that the angular rough shark is a prevalent species off Israel's coast. Furthermore, Eryilmaz & Meriç (2005) also postulated that *O. centrina* is also prevalent in the Sea of Marmara. The low number of records of *O. centrina* from the eastern Mediterranean and adjacent seas (n = 88) contradicts with the suggestions of Eryilmaz & Meriç (2005) and Golani (2006), and provides solid evidence supporting the well-accepted rare status of *O. centrina* in the mentioned region. In a recent work on the distribution of demersal fishes in the eastern Levant basin, Keskin *et al.* (2011) did not record any specimens of *O. centrina* in the bottom-trawl haulings between the depths of 43 and 121 m. Regarding the depth distribution of the angular rough shark (60–660 m, and in one occasion 800 m) (Sion *et al.*, 2004; Serena, 2005) it is obvious that further research should be carried out in deeper waters in order to obtain more information on the occurrence of *O. centrina* on the bathyal grounds of the Levant Sea. Furthermore, in a recent update of Syrian sharks no comment was made on the abundance of *O. centrina* in the mentioned region (Saad *et al.*, 2006).

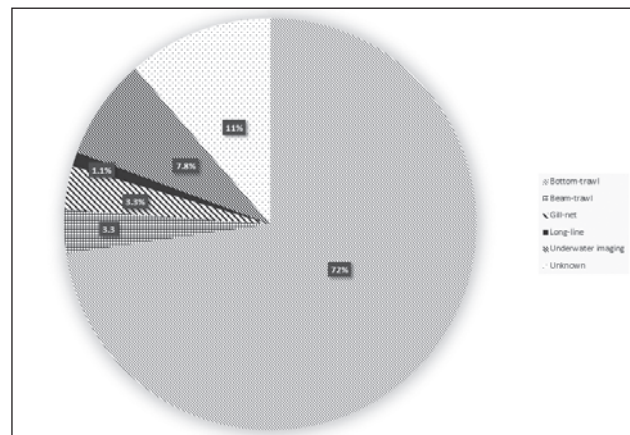


Fig. 2: Main fishing gears of *O. centrina* and proportion of visual sampling in overall records.

Sl. 2: Glavna ribolovna orodja, s katerimi so bili ujeti primerki morskih prašičev, in delež opaženih primerkov v opazovalnih popisih glede na celotno število zapisov

The angular rough shark is a bycatch of demersal fisheries, which is a well-recognized fact of *O. centrina* (Serena, 2005) and results of the present study have confirmed this fact. The majority of the present specimens (n = 71, 80 %) were caught by demersal fishing gears (Tab. 1, Fig. 2). Since the angular rough shark is not a commercially valuable species, it is generally discarded (e.g., > 95 % discarded in central Aegean Sea; Damalas & Vassilopoulou, 2009). However, in several occasions this harmless shark can be killed onboard before discarding (Fig. 3c). Not surprisingly, *O. centrina* is another shark species, stigmatized with superstitions; for instance, it is immediately returned to the sea by fisheries from Mazara, Sicily (Italian waters) because they think the angular rough shark brings bad luck (Ragonese *et al.*, 2013). Thus, attempts to change this attitude of fishermen, who kill *O. centrina* before discarding, would increase the chance of survival of this rare deep-sea shark.

The Sea of Marmara, a small land-locked sea, appears to provide a shelter for the angular rough shark throughout its distribution range in the eastern Mediterranean. Recent research demonstrated that several rare or vulnerable deep-sea shark species (e.g., *Hexanchus griseus*, *Dalatias licha*, *Echinorhinus brucus*, *Centrophorus granulosus*, *Squalus blainvillei* and *O. centrina*) are the inhabitants of the deeper zones of Marmaric waters (Kabasakal, 2003, 2010, 2013; Kabasakal & Bilecenoglu, 2014; Kabasakal & Kabasakal, 2014). A recent survey on the biology of *O. centrina* showed that the angular rough shark regularly occurs in the coastal waters off the Princes' Islands, northeastern Sea of Marmara (Kabasakal, 2009). Coastal occurrence of *O. centrina* in the mentioned region was visually documented by recreational divers (visual sampling in Table 1). Thus,

this area offers remarkable opportunities for *O. centrina* research to collect data on behaviour and spatiotemporal distribution of the species on a 24h basis. Results of such research can provide vital information for the implementation of protective measures to minimize the fishing pressure on this threatened shark.

CONCLUSIONS

Oxynotus centrina is a rare deep-sea shark in the eastern Mediterranean and adjacent seas. According to Serena (2005), it is a threatened shark in the entire Mediterranean Sea. Based on the FAO classifications for the status of exploited species, *O. centrina* is placed in

B1, which means, while it is an exploited species, its exploitation, vulnerability or decline status is not clear due to lack of data and therefore, it should be urgently investigated as recommended by IUCN (Serena, 2005). Because the fishing grounds of deep demersal fisheries overlap with the habitat of the angular rough shark, Ebert & Stehmann (2013) consider *O. centrina* as a vulnerable species. According to Ebert & Stehmann (2013), the most notable population decline of *O. centrina* may be inferred in the Mediterranean Sea. Given the low reproductive potential of *O. centrina* with up to 15 young per litter (Megalofonou & Damalas, 2004), capture of pregnant females create a significant threat to the survival of the species. Thus, before the implementation

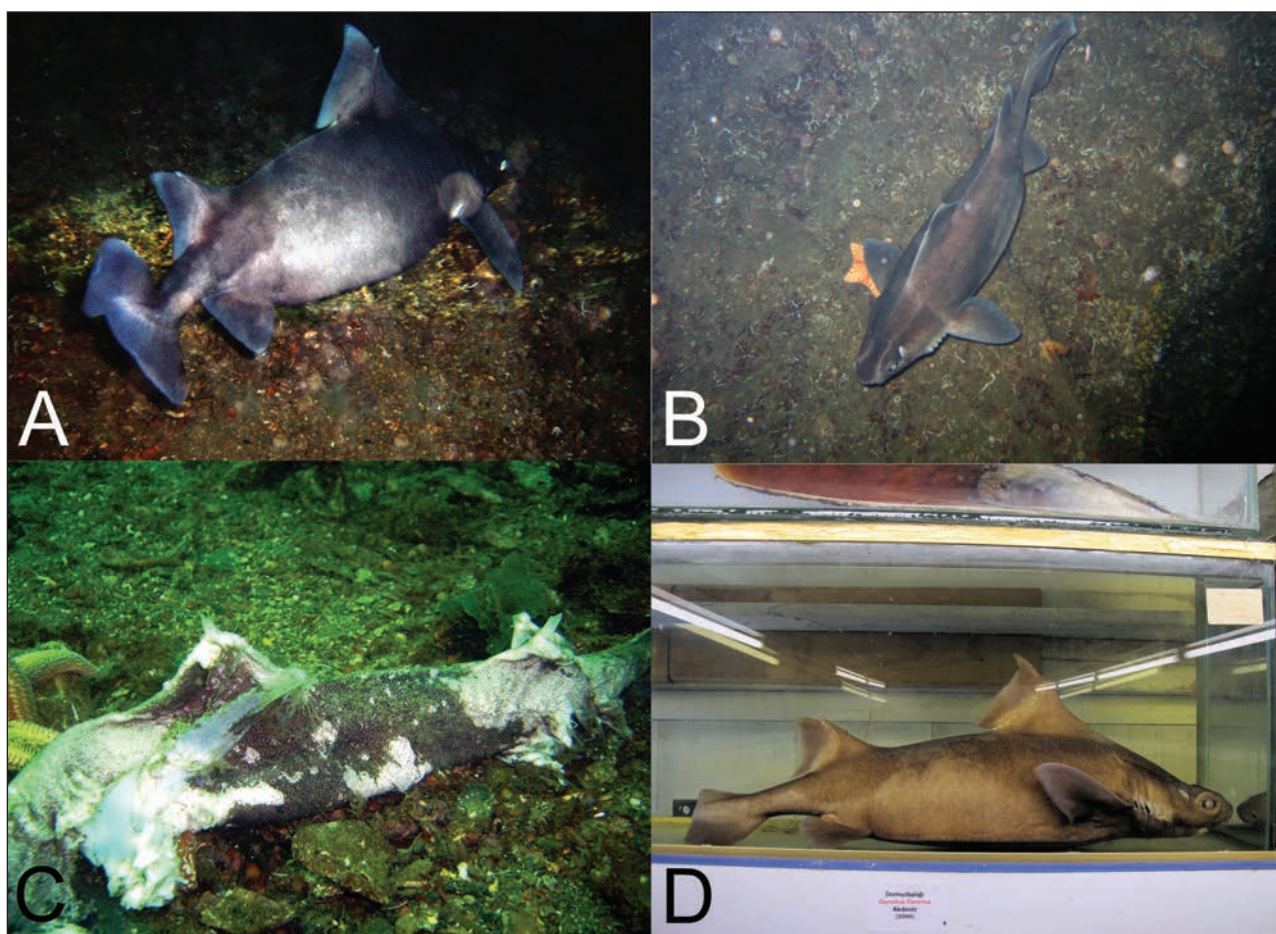


Fig. 3: Several specimens of *O. centrina* recorded in the seas of Turkey. (a) Specimen observed off Balıkcı Island (Sea of Marmara) on 27 September 2009 (sp No. 85, Tab. 1; photo: H. Kabasakal); (b) specimen observed off Balıkcı Island (Sea of Marmara) in 2006 (sp No. 26, Tab. 1; photo: C. Yıldırım); (c) specimen observed off Ahırkapı (Sea of Marmara) on 21 October 2012 (sp No. 88, Tab. 1; photo: H. Kabasakal); (d) specimen caught in Mediterranean off Turkey's coast in 2000 and stored in museum at Samatya Fishing Port (sp No. 16, Tab. 1; photo: H. Kabasakal).
Sl. 3: Številni primerki morskega prašiča iz turških morij: (a) primerek, opažen 27. 9. 2009 pri otoku Balıkcı (Marmarsko morje) (primerek št. 85, Tab. 1; foto: H. Kabasakal), (b) primerek, opažen v letu 2006 pri otoku Balıkcı (Marmarsko morje) (primerek št. 23, Tab. 1; foto: C. Yıldırım), (c) primerek, opažen 21. 10. 2012 blizu lokalitete Ahırkapı (Marmarsko morje) (primerek št. 88, Tab. 1; foto: H. Kabasakal), (d) primerek, ujet na sredozemski turški obali leta 2000 in shranjen v muzeju Samatya Fishing Port (primerek št. 16, Tab. 1; foto: H. Kabasakal).

of evidence-based measures for the conservation, and even a ban on the fishing of *O. centrina*, promoting fishermen to release live specimens appears to be an urgent, feasible first step for the protection of this rare species.

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POJAVLJANJE MORSKEGA PRAŠIČA, *OXYNOTUS CENTRINA* (CHONDRICHTHYES: OXYNOTIDAE) V VZHODNEM SREDOZEMSKEM MORJU*Hakan KABASAKAL*Ichthyological Research Society, Tantavi Mahallesi, Montesoglu Caddesi, Idil Apt., No: 30, D: 4, Umraniye, TR-34764 Istanbul, Turkey
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POVZETEK

Na temelju terenskih pregledov in razpoložljivih pisnih virov med koncem 19. stoletja in oktobrom 2012 je avtor pridobil podatke o pojavljanju 88 primerkov vrste *Oxynotus centrina* (Linnaeus, 1758) iz Marmarskega, Egejskega in Sredozemskega morja. Štiriinšestdeset primerkov (72 %) izvira iz Egejskega morja, 19 (21,5 %) iz Marmarskega morja in 5 (5,6 %) iz Sredozemskega morja. Obravnavani primerki (obeh spolov) so merili od 22,5 do 79 cm telesne dolžine. Največkrat so se morski prašiči ujeli v pridneno kočo ($n = 64, 72\%$), nekajkrat v vlečno mrežo z gredjo ($n = 3, 3,3\%$) in zabodno mrežo ($n = 3, 3,3\%$) ter v enem primeru na parangal (1,1 %). Sedem primerkov so opazili pri opazovalnih cenzusih (podvodni popisi) v Marmarskem morju. Morski prašič je redka in ogrožena pridnena vrsta v vzhodnem Sredozemskem morju. Ulov oplojenih samic predstavlja znaten problem za preživetje te vrste. Pred implementacijo naravovarstvenih smernic ali celo prepovedjo lova na morske prašiče, bi bil še toliko bolj smiseln prvi korak k varovanju vrste; to je prepričevanje ribičev, da ujeta primerke takoj po ulovu izpustijo.

Ključne besede: Elasmobranchii, *Oxynotus centrina*, smrtnost, preživetje, varovanje, Sredozemsko morje

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