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INCIDENTAL CAPTURES OF THRESHER SHARKS (LAMNIFORMES: ALOPIIDAE) FROM TURKISH COASTAL WATERS

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ABSTRACT

*Twenty-one alopiid sharks, 2 bigeye thresher (*Alopias superciliosus*) and 19 common thresher sharks (*Alopias vulpinus*), were incidentally captured in the coastal waters of Turkey. General information on the captured specimens is reported and the current status of conservation of alopiids is discussed.*

Key words: Alopiidae, *Alopias superciliosus, Alopias vulpinus*, small-scale fishery, conservation, Turkish waters

CATTURE ACCIDENTALI DI SQUALI ALOPIDI (LAMNIFORMES: ALOPIIDAE) IN ACQUE COSTIERE TURCHE

SINTESI

*Ventuno esemplari di squali alopidi, due di Squalo Volpe Occhione (*Alopias superciliosus*) e 19 di Squalo Volpe Comune (*Alopias vulpinus*), sono stati catturati accidentalmente nelle acque costiere della Turchia. Nell'articolo vengono fornite le informazioni generali degli esemplari catturati e viene discusso lo stato di conservazione attuale degli alopidi.*

Parole chiave: Alopiidae, *Alopias superciliosus, Alopias vulpinus*, pesca su piccola scala, conservazione, acque della Turchia

INTRODUCTION

Thresher sharks (Lamniformes: Alopiidae) are large, active, strong-swimming sharks, ranging in habitat from coastal to epipelagic and deepwater epibenthic, and distributed worldwide in tropical, subtropical and cold-temperate waters (Compagno, 1984). Until now, two species, *Alopias superciliosus* (Lowe, 1839) and *Alopias vulpinus* (Bonnaterre, 1788), have been recorded in the Mediterranean and adjacent waters (De Maddalena & Baensch, 2005; Serena, 2005). The first record of *A. superciliosus* in the Mediterranean Sea was reported by Cigala Fulgosi (1983), based on four specimens captured by the fishermen of Mazara del Vallo (Trapani) in the Sicilian Channel. According to Serena (2005), the bigeyed thresher shark is an occasional/rarely captured species in Mediterranean waters. Let us add that De Maddalena & Baensch (2005) reported *A. superciliosus* as being relatively common in the Mediterranean Sea, and that both Barrull & Mate (2002) and De Maddalena & Baensch (2005) described its presence in the Mediterranean as stable, and not occasional. On the other hand, *A. vulpinus* is fairly common in the Mediterranean Sea (De Maddalena & Baensch, 2005; Serena, 2005); many recordings of thresher shark have been made both by general ichthyological or faunistic works (*e.g.* Riedl, 1983; Quéro, 1984), and regional ichthyological or shark-specific works (*e.g.* Tortonese, 1956, Italian waters; Capapé, 1977, Toulon waters; Barrull *et. al.*, 1999, from Catalan littoral; Cugini & De Maddalena, 2003, off Pescara, Italy; Lipej *et al.*, 2004, Adriatic Sea; Serena, 2005, the entire Mediterranean basin).

The first records of *A. vulpinus* from Turkish waters date back to the early 20th century (Ninni, 1923, Devedjian, 1926, as *Alopias vulpes* in both references). Thresher shark is quite common in Turkish Mediterranean, Aegean and Marmaric waters (Akşıray, 1987; Kabasakal, 2002, 2003; Kabasakal & Kabasakal, 2004), and occasional records have been reported from the prebosphoric waters in the Black Sea (Kabasakal, 1998).

In the present study, incidental captures of alopiid sharks by coastal nets in Turkish waters are reported, and the current status of conservation of alopiids is discussed.

MATERIAL AND METHODS

The present study is part of an extensive research on sharks from Turkish waters, which has been carried out by Ichthyological Research Society (IRS) since 2000. Data on thresher sharks have been collected from the following sources: (a) scientific literature; (b) daily newspapers, fishing magazines and other popular media, and, as far as popular sources are concerned, the validity of the recordings has been confirmed by means of direct contact with the fishermen reported in the source; (c) visiting the fishing ports. For each examined thresher shark, the following data were recorded: total length (TL), weight (W), sex, date and locality, fishing gear, depth and time of the day. Photographs of the specimens, teeth samples (sp. no. 3, Tab. 1), set of upper and lower jaws of *Alopias superciliosus* (sp. no. 2, Tab. 1) and other relevant pieces of evidence about the catch are kept in the archives of IRS.

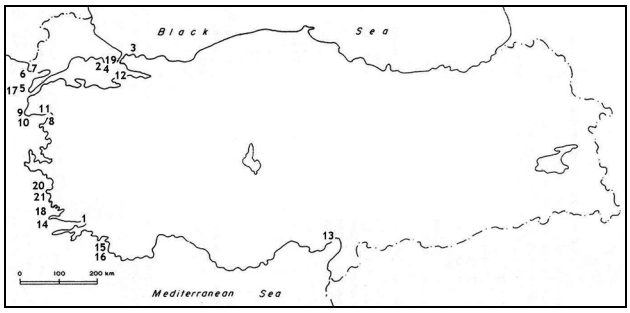

Fig. 1: Capture localities of alopiid sharks along Turkish coast. Numbers are same as in Table 1.
Sl. 1: Lokalitete vzdolž turške obale, na katerih so bile ujete obravnavane morske lisice. Številke so iste kot v Tabeli 1.

RESULTS

Thresher sharks captured in Turkish waters are listed in Table 1, with fishing localities shown in figure 1. One of the two specimens of *Alopias superciliosus* was captured in the south-eastern Aegean Sea, the other off the northern coast of the Sea of Marmara (Fig. 1). Eleven specimens of *Alopias vulpinus* were captured along Aegean coast of Turkey, 3 specimens in Marmaric waters and Mediterranean, and 1 in prebosphoric waters in the Western Black Sea (Fig. 1). Among 19 thresher sharks, 7 specimens were captured, in order of importance, by trammel-netters, 7 other thresher sharks by gill-netters, 3 of them by purse-seiners, and the remaining 2 by drift-netters for swordfish (Tab. 1). Stationary nets were the most important fishing gear, as far as incidental captures of *A. vulpinus* in Turkish coastal waters are concerned. Gökova Bay specimen of *A. superciliosus* was entangled in a shrimp net, a kind of dredging gear over the bottom, while Silivri specimen of the bigeye thresher shark was captured by means of a purse-seiner, operated only a few kilometres off the coast line. Five (23.8%) alopiid sharks (specimens 1, 4, 6, 20 & 21 in Tab. 1) were captured in early morning before dawn.

Tab. 1: Alopiid sharks recorded in the present study. Specimen numbers are same as on the map in figure 1.
Tab. 1: Morske lisice, opisane v pričujoči študiji. Številke primerkov so iste kot na zemljevidu na sliki 1.

No	TL (cm)	W (kg)	Sex	Date	Locality	Fishing gear	Remarks
Alopias superciliosus (Lowe, 1839)							
1	350	150	?	23.5.2005	Gökova	Shrimp-net	Captured in coastal waters at 12 m depth, early in the morning.
2	450	?	?	23.2.2007	Silivri	Purse-seine	Captured a few kilometers off the coast line (Fig. 2)
Alopias vulpinus (Bonnaterre, 1788)							
3	453	?	♀	8.11.1996	Şile	Purse-seine	The shark was captured in a purse-seine full of blue fish (Pomatomus saltator). Recorded by Kabasakal (1998).
4	190	?	♂	12.4.1997	Silivri	Gill-net	According to fisherman, it was captured early in the morning before dawn. Recorded by Kabasakal (2003).
5	400	150	?	17.2.1999	Çanakkale	Gill-net	Captured in coastal waters.
6	450	?	♂	18.4.2001	Enez	Gill-net	Captured in coastal waters, only 100 meters from the shoreline,early in the morning.
7	450	120	♀	04.03.2003	Bay of Saroz	Trammel-net	Captured in coastal waters.
8	600	>500	?	25.12.2003	Akçay	Gill-net	Captured in coastal waters.
9	400	120	♀	20.01.2004	Ezine	Gill-net	Captured in coastal waters.
10	250	?	♂	03.04.2004	Babakale	Gill-net	Captured in coastal waters.
11	500	300	♀	15.05.2004	Edremit	Gill-net	Captured in coastal waters.
12	350	200	?	01.10.2004	Yalova	Purse-seine	Captured in near shore waters between Prince Islands and Anatolian coast.
13	500	320	♀	11.03.2006	Karataş	Trammel-net	Captured in coastal waters.
14	300	100	♀	27.03.2006	Bodrum	Trammel-net	Captured in coastal waters.
15	600	500	♀	01.07.2006	Fethiye	Drift-net	Captured in near shore waters, in a drift-net for swordfish.
16	500	400	?	09.07.2006	Fethiye	Drift-net	Captured in near shore waters, in a drift-net for swordfish.
17	320	320	♂	03.11.2006	Bozcaada	Trammel-net	Captured between the eastern coast of the island and Gallipoli Peninsula.
18	400	120	♀	26.12.2006	Bodrum	Trammel-net	Captured in coastal waters.
19	300	85	♀	20.01.2007	Silivri	Trammel-net	Captured in coastal waters (Fig. 3).
20	400	?	?	05.02.2007	Didim	Gill-net	Captured in coastal waters, early in the morning before dawn.
21	400	500	♀	13.02.2007	Didim	Gill-net	Captured in coastal waters, early in the morning around 4 o'clock.

DISCUSSION AND CONCLUSIONS

The specimen of *Alopias superciliosus*, captured in Gökova Bay on 23 May 2005, was the first record of the bigeye thresher shark in Turkish waters. The second specimen of this species (Fig. 2) was captured on 23 February 2007, off the coast of Silivri, northern Sea of Marmara (Kabasakal & Karhan, *in press).* According to Compagno (1984), *A. superciliosus* is found in coastal waters over the continental shelves, sometimes close inshore in shallow waters. Nakano *et al.* (2003) reported that the bigeye thresher shark is a deep-water species, found in both coastal waters and the high seas, from the surface to near the bottom at depths greater than 500 m. In the eastern Pacific Ocean, the observed maximum recorded depth of 723 m is the deepest ever recorded for *A. superciliosus* (Nakano *et al.*, 2003). Gökova Bay specimen of bigeye thresher shark has been captured only a few hundred meters off the shoreline and at a depth of about 12 m. Identification of the Gökova Bay specimen is based on the photographs and as genital organs were not visible on the studied pictures, the author was not able to determine its' sex. On the other hand, the Silivri specimen was eviscerated and cut in parts, and identification was based on the morphology of the head. The genital organs of the second bigeye thresher

Fig. 2: Head of** Alopias superciliosus **(Lowe, 1839), captured off Silivri coast (sp. no. 2).
Sl. 2: Glava vrste** Alopias superciliosus **(Lowe, 1839), ujete v bližini Silivrija v Turčiji (vrsta št. 2).

shark were not visible either. However, regarding the total lengths of both bigeye thresher sharks, 350 cm and 450 cm TL, respectively, and the size of the adult males and females (270 to 400 cm TL for males, and 355 to 430 cm TL for females) reported by Compagno (1984), it seems that the Gökova Bay specimen was probably an adult male or a subadult female, whereas the Silivri specimen was an adult male or female. The data given by Compagno (1984) is global rather than regional, and because of this reason, a specific investigation is needed for a better understanding of the reproductive characteristics of *A. superciliosus* in Levantine basin waters.

Alopias vulpinus (Fig. 3) is one of the most common incidentally captured sharks in sword-fish fishery, operated in Turkish waters (Kabasakal, 1998). But the paucity of research on the biology of *A. vulpinus* in Turkish waters is clear. For the moment, there is no regulation set for the conservation of thresher sharks in the current fishery act. Thresher shark is considered an open water predator in most of the ichthyological works of Turkish waters; however, one of the remarkable contributions of the present study is the finding that *A. vulpinus* occurs in Turkish coastal waters and may be incidentally captured by the coastal artisanal fishing gear as well.

Many authors reported on the occurrence of *A. vulpinus* coastal insular or shelf waters (Compagno, 1984; Quignard & Capapé, 1971; Hattour & Nakamura, 2004; Lipej *et al.*, 2004). Young thresher sharks often close inshore and in shallow bays (Compagno, 1984; Lipej *et al.*, 2004). Hattour & Nakamura (2004) reported on the occurrence of six juveniles of *A. vulpinus*, ranging 136 to 143 cm TL, which were incidentally captured by trammel-netters from the Gulf of Tunis. Regarding the sizes of adult males and females (319 to 420 cm TL, for males, and 376 to 549 cm TL for females) reported by Compagno (1984), specimens 4 and 10 (Tab. 1) were juveniles, and their coastal occurrence coincided with the data reported by Compagno (1984). Based on the above data, the two males (sp nos. 6 and 17, Tab. 1) were adults. Ten thresher sharks (53.1%, Tab. 1) were females, and again based on the above reproductive data of Compagno (1984) and recorded total lengths in

Fig. 3: Thresher shark,** Alopias vulpinus **(Bonnaterre, 1788), captured off Silivri coast, on display at a fish store in Istanbul (sp. no. 19).
Sl. 3: Morska lisica** Alopias vulpinus **(Bonnaterre, 1788), ujeta v bližini Silivrija in razstavljena v neki istanbulski ribarnici (vrsta št. 19).

the present study, 8 of the 9 females (specimens 3, 7, 9, 11, 13, 15, 18 & 21) appeared to be adults. For the moment, the current data is not yet clear, whether those females penetrated coastal waters for reproduction or feeding; however, the fishing pressure caused by coastal fishing gear on the adult stock of *A. vulpinus* is obvious. A similar situation regarding the fishing pressure caused by the small-scale fishery on thresher sharks has been reported from Tunisian waters. According to Hattour & Nakamura (2004), the abundance of thresher shark in Tunisian waters apparently decreased dangerously. Authors reported that small-scale fishery seems targeting currently the vulnerable neonate of *A. vulpinus*.

Regarding the seasonality of captures, it was observed that thresher sharks have been captured in coastal waters almost throughout the year (Tab. 1). In order to regulate the coastal fishing activities and to provide rules of management for the conservation of thresher sharks, it is necessary to understand the nature and seasonality of this coastal occurrence.

According to Vas (1995), the success of sharks as a group, in evolutionary terms, is directly attributable to their adopted life history. In ecological terms, sharks are *k*-selected species, which means that they are maturing in very late ages and the litter size is small, a critical point making sharks vulnerable to overfishing.

According to FAO classification for the conservation and exploitation of fish resources, the conservation status of *A. superciliosus* and *A. vulpinus* is defined as, B3 (vulnerable to overfishing) and B4 (locally declined or extinct), respectively (Serena, 2005). Moreover, in the Mediterranean Sea, *A. vulpinus* is listed in the IUCN/SSG Red List (Soldo, 2003). Thresher sharks are known to be incidentally captured by long-lining and drift-netting for tuna, swordfish and other pelagic bony fishes (Soldo, 2003; Serena, 2005). Pressure of coastal fishery on large sharks is generally neglected; however, incidental captures of large sharks by coastal nets have been recorded from different regions (Brewster-Geisz & Miller, 2000; Lipej *et al.*, 2000; Kabasakal, 2004). Therefore, the effects of coastal fishery on large sharks should be estimated carefully, to achieve a clearer picture of incidental captures of sharks, as a whole. Although thresher sharks are regularly captured by both pelagic and coastal fishermen, there have been no attempts made in order to set regulatory measures for their conservation. This was because of the paucity of biological data on thresher sharks, as well as the passion of commercial fishermen to capture and land large sharks for display. Therefore, it is necessary to encourage fishermen to release incidentally captured thresher sharks, and other large sharks as well.

MORSKE LISICE (LAMNIFORMES: ALOPIIDAE), NAKLJUČNO UJETE V TURŠKIH OBREŽNIH VODAH

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POVZETEK

Po naključju je bilo v obrežnih vodah Turčije ujetih 21 morskih lisic (Alopiidae): 2 osebka vrste Alopias superciliosus *in 19 osebkov vrste* Alopias vulpinus*. Avtor podaja splošne informacije o ujetih lisicah in razpravlja o njihovem trenutnem ohranitvenem statusu.*

Ključne besede: Alopiidae, *Alopias superciliosus, Alopias vulpinus*, omejeno ribištvo, varstvo, turške obrežne vode

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