

CAPTURE OF A BIGEYE THRESHER SHARK *ALOPIAS SUPERCILIOSUS* (ALOPIIDAE) IN TURKISH WATERS (EASTERN MEDITERRANEAN SEA)

Okan AKYOL & Tevfik CEYHAN

Ege University, Faculty of Fisheries, 35440, Urla, Izmir, Turkey

Christian CAPAPÉ

Laboratoire d'Ichtyologie, Université de Montpellier, case 104, 34095 Montpellier cedex 5, France
e-mail: capape@univ-montp2.fr

ABSTRACT

*The present paper reports a new capture of bigeye thresher shark, *Alopias superciliosus* (Lowe, 1839). To date, 9 specimens have been recorded in the area, suggesting that a viable population of this type of shark might be successfully establishing in the area, but other records are needed to confirm this hypothesis. The paper comments on the distribution of the species in the Mediterranean Sea, suggesting that it does not originate from this sea, but is probably a migrant species from the eastern tropical Atlantic or from the Indian Ocean.*

Key words: Chondrichthyes, Alopiidae, distribution, population, migration

CATTURA DI SQUALO VOLPE OCCHIONE *ALOPIAS SUPERCILIOSUS* (ALOPIIDAE) IN ACQUE DELLA TURCHIA (MEDITERRANEO ORIENTALE)

SINTESI

*Il presente documento riporta una nuova cattura di squalo volpe occhione, *Alopias superciliosus* (Lowe, 1839). Ad oggi, nove esemplari sono stati registrati nell'area, suggerendo che una popolazione vitale di questa specie si stia stabilendo con successo nell'area. Saranno comunque necessarie altre segnalazioni per confermare questa ipotesi. L'articolo commenta la distribuzione delle specie nel Mediterraneo, suggerendo che lo squalo volpe occhione non sia originario di questo mare, ma sia probabilmente una specie migratrice arrivata all'Atlantico orientale o dall'Oceano Indiano.*

Parole chiave: Chondrichthyes, Alopiidae, distribuzione, popolazione, migrazione

INTRODUCTION

The bigeye thresher shark, *Alopias superciliosus* (Lowe, 1840), is a cosmopolitan species widely distributed in warm temperate waters of the the Atlantic, Pacific and Indian Oceans (Compagno, 1984). Off the eastern Atlantic coast, *A. superciliosus* is abundantly collected off the eastern side of the Atlantic Ocean from Portugal and Madeira to Morocco between 15° and 40° N (Quéro, 1984); Moreno & Morón (1992) and Fernandez-Carvalho *et al.* (2011) provided data about some traits of its reproductive biology from these areas.

A. superciliosus probably entered the Mediterranean Sea through the Strait of Gibraltar; in the Mediterranean, it was first recorded in the Ionian Sea following Gruber & Compagno (1981). An overview of Mediterranean records reported in literature shows that at least 40 specimens have been captured since, most of them in the eastern Basin, and especially in Turkish waters (Lanteri *et al.*, 2017). Investigations regularly conducted in the latter area, focusing on elasmobranch species and supported by local fishermen actively helping the researchers, have enabled the collection of the specimen of *A. superciliosus* presented in this paper, which also provides comments about the species' origin and distribution in the same area and in the wider Mediterranean Sea.

MATERIAL AND METHODS

On 23 September 2012, a specimen of *A. superciliosus* was captured by a pelagic longline at a depth of 1100 m off Fethiye, a city by the Aegean Sea, located at 36° 23' N and 29° 00' E (Fig. 1). The specimen was a female measuring 150 cm in total length (TL), and weighing 30.2 kg (Fig. 2). It was caught together with a Mediterranean moray eel *Muraena helena* Linnaeus, 1758, an oilfish *Ruvettus pretiosus* Cocco, 1829 and a swordfish *Xiphias gladius*, Linnaeus 1758.

RESULTS AND DISCUSSION

The specimen was identified as *A. superciliosus* based on the combination of the following main morphological characters: species-typical elongated upper lobe; snout rather long, bulbous; eyes very large, with orbits reaching the dorsal surface of the head; horizontal groove present on either side of head above the gills; labial furrows absent; first dorsal fin closer to pelvic fins than to pectoral fins; dorsal surface dark blue, belly cream to greyish.

These morphological characters are in total agreement with Compagno (1984), Quéro (1984) and Ebert & Stehmann (2013), and allow to include the present specimen among the nine *A. superciliosus* recorded to date in Turkish waters (Tab. 1). Ebert

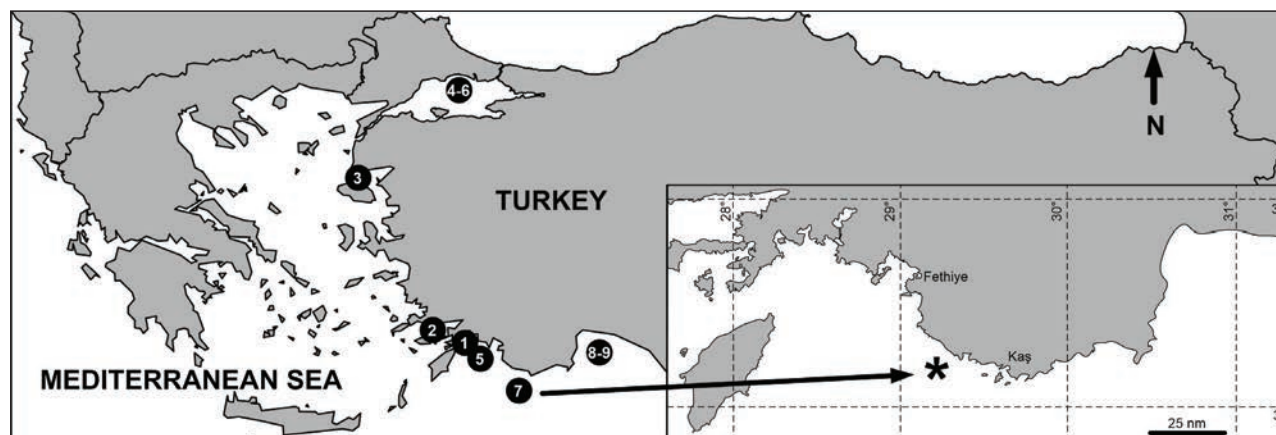


Fig. 1: Records of *Alopias superciliosus* captured in Turkish waters by chronological order. 1: Marmaris, Aegean Sea (Clo *et al.*, 2009). 2: Gökova Bay, Aegean Sea (Kabasakal, unpubl. data). 3: Sivrice, Aegean Sea (Kabasakal *et al.*, 2011). 4: Silivri, Sea of Marmara (Kabasakal & Karhan, 2007). 5: Fethiye, Aegean Sea (Kabasakal *et al.*, 2011). 6: Silivri, Sea of Marmara (Kabasakal *et al.*, 2011). 7: Fethiye, Aegean Sea (This study). 8-9: Antalya, NE Mediterranean (Soldo *et al.*, 2014). Insert: asterisk indicates the capture site of the present specimen.

Sl. 1: Zapisi o pojavljanju velikooke morske lisice v turških vodah po kronološkem redosledu. 1: Marmaris, Egejsko morje (Clo *in sod.*, 2009). 2: Gökova Bay, Egejsko morje (Kabasakal, neobjavl. podatki). 3: Sivrice, Egejsko morje (Kabasakal *in sod.*, 2011). 4: Silivri, Marmarsko morje (Kabasakal & Karhan, 2007). 5: Fethiye, Egejsko morje (Kabasakal *in sod.*, 2011). 6: Silivri, Marmarsko morje (Kabasakal *in sod.*, 2011). 7: Fethiye, Egejsko morje (pričujoča raziskava). 8-9: Antalya, SV Sredozemsko morje (Soldo *in sod.*, 2014). Manjša slika - zvezdica označuje mesto ulova obravnavanega primerka.



Fig. 2: A - specimen of *Alopias superciliosus* captured off Fethiye (Aegean Sea), scale bar = 75 mm. B - head of the same specimen, scale bar = 75 mm.

Sl. 2: A - primerek velikooke morske lisice, ujet v vodah pred Fethiye (Egejsko morje), merilo = 75 mm. B - glava primerka, merilo = 75 mm.

& Stehmann (2013) noted that size at birth ranged between 100 and 140 cm TL, with the largest adult *A. superciliosus* ever captured reaching 484 cm TL. Since female specimens mature between 332 and 356 mm TL (Ebert & Stehmann, 2013), the present *A. superciliosus* could be considered at least as a juvenile female.

Serena (2005) noted that *A. superciliosus* was an occasional or rather rare species in the Mediterranean Sea. Conversely Clo *et al.* (2008) and Corsini-Foka & Sioulas (2009) considered the species abundant in some areas. De Maddalena & Baensch (2005) noted that the recent findings of *A. superci-*

liosus indicate that the shark occurs in the Mediterranean and is rather abundant in the eastern Basin, where a viable population appears to be progressively establishing (Kabasakal *et al.*, 2011). However, no nursery grounds for *A. superciliosus* were clearly observed anywhere in the Mediterranean Sea, and some traits of its reproductive biology are locally still unknown.

The status of the species in some Mediterranean areas remains questionable, due to fact that it is also noted as endangered (Walls & Soldo, 2016). Additionally, it is facing interspecific competition pressure from its closely sympatric species, thresh-

Tab. 1: Detailed records of specimens of *Alopias superciliosus* caught in Turkish waters.

Tab. 1: Podrobni zapisi o primerkih velikooke morske lisice, ujetih v turških vodah.

Record	Date	Area	Depth (m)	TL (cm)	Fishing gear	References
1	? /04/2005	Marmaris, Aegean Sea	?	?	?	Clo <i>et al.</i> (2009)
2	23/ 05/2005	Gökova Bay, Aegean Sea	?	350	?	Kabasakal (unpub. data)
3	21/05/2006	Sivrice, Aegean Sea	100	400	gill net	Kabasakal <i>et al.</i> (2011)
4	23/02/2007	Silivri, Sea of Marmara	?	450	purse-seine	Kabasakal & Karhan (2007)
5	28/02/2011	Fethiye, Aegean Sea	110	450	trammel net	Kabasakal <i>et al.</i> (2011)
6	02/07/2011	Silivri, Sea of Marmara	?	250	purse-seine	Kabasakal <i>et al.</i> (2011)
7	23/09/2012	Fethiye, Aegean Sea	1100	150	longline	This study
8	15/04/2015	Antalya, NE Mediterranean	500	?	?	Soldo <i>et al.</i> (2014)
9	05/05/2015	Antalya, NE Mediterranean	500	?	trawl	Soldo <i>et al.</i> (2014)

er shark *Alopias vulpinus* (Bonnaterre, 1788), which is locally somewhat more abundant. The best example of such competition is probably the Maghreb shore, where *A. superciliosus* does not occur and *A. vulpinus* is commonly caught (Hemida, 2005; Hemida 2019; pers. comm., Rafrafi-Nouira et al., 2019).

The first Mediterranean records of *A. superciliosus* occurred during 1952-1954 according to Corsini-Forkas & Sioulas (2009), with 40 other records reported since (Lanterni et al., 2017). The first reports on the species came from the western Basin, suggesting a migration of *A. superciliosus* from the eastern tropical Atlantic to the Mediterranean Sea through the Strait of Gibraltar. It appears that most of the subsequent records of *A. superciliosus* reported by Lanterni et al. (2017) occurred in the eastern areas, therefore a migration of the species toward these areas remains a valid hypothesis.

A. superciliosus is known throughout the Indian Ocean, where viable populations are successfully established (Bass et al., 1975; Das et al., 2016). Although it is not recorded in the Red Sea (Golani & Fricke, 2005), a migration of the species into the Mediterranean Sea through the Suez Canal cannot be totally ruled out. It is evident that *A. superciliosus* does not originate from the Mediterranean Sea; rather, it is a vagrant species – a Herculean migrant (*sensu* Quignard & Tomasini, 2001) or a Lessepsian migrant (*sensu* Por, 1978), or having perhaps both origins. Similar patterns were also reported for the milk shark *Rhizoprionodon acutus* (Rüppell, 19837) by Ben Amor et al. (2016). Consequently, the origin of *A. superciliosus* in the Mediterranean could and should be determined using molecular tools. Still, whatever the origin of *A. superciliosus*, the latter should be defined as an alien species among the fish species known to date in this sea (see Golani et al., 2017).

ULOV VELIKOOKE MORSKE LISICE *ALOPIAS SUPERCILIOSUS* (ALOPIIDAE) V TURŠKIH VODAH (VZHODNO SREDOZEMSKO MORJE)

Okan AKYOL & Tevfik CEYHAN
Ege University, Faculty of Fisheries, 35440, Urla, Izmir, Turkey

Christian CAPAPÉ
Laboratoire d'Ichtyologie, Université de Montpellier, case 104, 34095 Montpellier cedex 5, France
e-mail: capape@univ-montp2.fr

POVZETEK

Avtorji poročajo o novem primeru pojavljanja velikooke morske lisice, *Alopias superciliosus* (Lowe, 1839). Do danes je bilo v turških vodah potrjenih 9 zapisov o pojavljanju te vrste, na podlagi katerih bi lahko sklepali, da se je viabilna populacija te vrste uspela ustaliti v obravnavanem območju, čeprav bi to hipotezo zanesljivo potrdili novi podatki. Avtorji razpravljajo o razširjenosti vrste v Sredozemskem morju, na podlagi katerih menijo, da vrsta ne domuje v njem, ampak je vanj najverjetneje zašla kot selivka iz vzhodnega tropskega Atlantika ali iz Indijskega oceana.

Ključne vrste: Chondrichthyes, Alopiidae, razširjenost, populacija, selitev

REFERENCES

- Bass, A.J., J.D. D'Aubrey & N. Kistnasamy (1975):** Sharks of the east coast of southern Africa. IV. The families Odontaspidae, Scaphanorhynchidae, Isuridae, Cetorhinidae, Alopiidae, Orectolobidae and Rhinodontidae. Oceanogr. Res. Inst. (Durban) Invest. Rep. No. 39, 102 pp.
- Ben Amor, M.M., Y. Diatta, M. Diop, M. Ben Salem & C. Capapé (2016):** Confirmed occurrence in the Mediterranean Sea of milk shark *Rhizoprionodon acutus* (Chondrichthyes: Carcharhinidae) and first record off the Tunisian coast. Cah. Biol. Mar., 57(2), 145-149.
- Cigala Fulgosi, F. (1983):** First record of *Alopias superciliosus* (Lowe, 1839) in the Mediterranean, with some notes on some fossil species of the genus *Alopias*. Ann. Mus. Civ. Stor. Nat. Genova, 84, 211-229.
- Clo, S., R. Bonfil & E. De Sabata (2008):** Additional records of the bigeye thresher shark, *Alopias superciliosus* (Lowe, 1839), from the central and eastern Mediterranean Sea. JMBA2. Biodiv. Rec., 6168. <http://www.mba.ac.uk/jmba/jmba2biodiversityrecords.php>
- Compagno, L.J.V. (1984):** FAO Species Catalogue, vol. 4, Sharks of the World. An Annotated and Illustrated Catalogue of Shark Species known to Date. FAO Fisheries Synopsis, 125, vol. 4, part 1 (non carcharhinoids), viii+1–250 pp.
- Corsini-Foka, M. & A. Sioulas (2009):** On two old specimens of *Alopias superciliosus* (Chondrichthyes : Alopiidae) from the Aegean waters. Mar. Biodiv. Rec., 2, e72.
- Das, P., M.K. Sinha, A.K. Baregama, P. Singh, K. C. Sahu & K. S. Mali (2016):** A report on the recruitments of *Alopias pelagicus* and *Alopias superciliosus* in the Ardaman Sea. J. Aquac. Mar. Biol., 4(6). DOI: 10.15406/jamb.2016.04.00099
- De Maddalena, A. & H. Baensch (2005):** Haie im Mittelmeer. Frackh-Kosmos Verlags-GmbH & Co., Stuttgart, 240 pp.
- Ebert, D. A. & M.F.W. Stehmann (2013):** Sharks batoids and Chimaeras of the North Atlantic. FAO species Catalogue for Fisheries Purposes, n° 7, Rome, FAO, 523 pp.
- Fernandez-Carvalho, J., R. Coelho, K. Erzini & M. Nevs Santos (2011):** Age and growth of the bigeye thresher shark, *Alopias superciliosus*, from the pelagic longline fisheries in the tropical northeastern Atlantic Ocean, determined by vertebral band counts. Aquat. Liv. Res., 24(4), 359–368.
- Golani, D. & R. Fricke (2005):** Check-list of the Red Sea fishes with delineation of the Gulf of Suez, Gulf of Aqaba, endemism and lessepsian migrants. Zootaxa, 4509, 1-215.
- Golani, D., L. Orsi-Relini., E. Massuti, J.-P. Quignard, J. Dulcic & E. Azzurro (2017):** CIESM Atlas of Exotic Fishes in the Mediterranean Sea : alien fishes, invasive fishes. World Wide Web electronic publication. <http://www.ciesm.org/atlas/appendix1.html>, version 01/2017.
- Gruber, S.H. & L.V.J. Compagno (1981):** Taxonomic status and biology of the bigeye thresher shark *Alopias superciliosus* (Lowe, 1839). Fishery Bulletin, National Marine Fisheries Service, 79, 617-640.

- Hemida, F. (2005):** Les Sélaciens de la côte algérienne: biosystématique des requins et des raies; écologie, reproduction et exploitation de quelques espèces capturées. PhD Thesis, Université des Sciences et de la Technologie, Houari Boumediène, Algiers, Algeria, 390 pp.
- Kabasakal, H. & S.Ü. Karhan (2007):** On the occurrence of the bigeye thresher shark *Alopias superciliosus* (Lowe, 1839) in Turkish waters. JMBA2, Biodiv. Rec., 5745, <http://www.mba.ac.uk:jmba2biodiversityrecords.php>
- Kabasakal, H., C. Dalyan & A. Yurtsever (2011):** Additional records of the bigeye thresher shark *Alopias superciliosus* (Lowe, 1839) (Chondrichthyes: Lamniformes: Alopiidae) from Turkish waters. Annales, Ser. Hist. Nat., 21(2), 143-148.
- Lanteri, L., L. Castellano & F. Garibaldi (2017):** New records of *Alopias superciliosus* (Lowe, 1841) in the north-western Mediterranean and annotated review of the Mediterranean records. Acta Adriat., 58(2), 313-324.
- Moreno, J.A. & J. Morón (1992):** Reproductive biology of the bigeye thresher shark, *Alopias superciliosus* (Lowe, 1939). Austral. J. Mar. Freshwater Res., 43(1), 77–86.
- Por, F.D. (1978):** Lessepsian migration. Ecological studies 23. Springer-Verlag, Berlin, New-York, 228 pp.
- Quéro, J.C. (1984):** Alopiidae. In: P.J.P. Whitehead, M.L. Bauchot, J.C. Hureau., J. Nielsen J.& Tortonese. E. (Editors), pp. 91-92. Fishes of the North-western Atlantic and the Mediterranean, Vol I, UNESCO, Paris.
- Quignard, J.-P. & J.A. Tomasini (2000):** Mediterranean fish biodiversity. Biol. Mar. Medit, 7, 1-66.
- Rafrafi-Nouira, S., Y. Diatta, A. Diaby A. & C. Capapé (2019):** Additional records of rare sharks from northern Tunisia (central Mediterranean Sea). Annales, Ser. Hist. Nat., 29(1), 25-34.
- Serena, F. (2005):** Field identification guide to the sharks and rays of the Mediterranean and the Black Sea. FAO Species Identification Guide for Fishery Purposes, FAO, Rome, 87 pp.
- Soldo, A., F. Briand & K. Rassoulzadegan (2014):** CIESM Forum – In search of rare shark species. <http://ciesm.org/forums/Sharks.html> Electronic version accessed on 03 April 2020.
- Walls, R.H.L. & A. Soldo (2016.):** *Alopias superciliosus*. The IUCN Red List of Threatened Species 2016: e.T161696A16527729. Downloaded on 10 April 2020.