

PHOTOGRAPHIC RECORD OF THE SPINNER SHARK, *CARCHARHINUS BREVIPINNA* (MÜLLER & HENLE, 1839), IN GÖKOVA BAY (SOUTH AEGEAN SEA, TURKEY)*Halit FİLİZ*

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## ABSTRACT

*In August 1998, a picture of a spinner shark, Carcharhinus brevipinna (Müller & Henle, 1839) was taken by an amateur group of divers at a depth of 3 m in Boncuk Bay (Gökova Bay, south Aegean Sea). Photographic evidence of this shark in Boncuk Bay contributes to our knowledge about the historical distribution of the species in Turkish waters. C. brevipinna is considered a very rare shark species in Turkish seas and needs immediate protection in Turkish territorial waters. The sighting of the spinner shark in the vicinity of a well-documented nursery ground of the sandbar shark, C. plumbeus, does not necessarily indicate a breeding ground for C. brevipinna in the studied area, as well; however, the possibility of a hypothetical nursery for the spinner shark in the Boncuk Bay area should be investigated in the future.*

**Key words:** spinner shark, *Carcharhinus brevipinna*, occurrence, distribution, Aegean Sea

AVVISTAMENTO FOTOGRAFICO DELLO SQUALO TISSITORE, *CARCHARHINUS BREVIPINNA* (MÜLLER & HENLE, 1839), NEL GOLFO DI GÖKOVA (MAR EGEO MERIDIONALE, TURCHIA)

## SINTESI

*Nell'agosto del 1998 uno squalo tissitore, Carcharhinus brevipinna (Müller & Henle, 1839), è stato ripreso da un gruppo amatoriale di subacquei ad una profondità di 3 metri nella baia di Boncuk (golfo di Gökova, mar Egeo meridionale). Le prove fotografiche della presenza di questo squalo nella baia di Boncuk contribuiscono alla conoscenza sulla distribuzione storica delle specie in acque turche. C. brevipinna è considerato quale specie molto rara di squali nei mari della Turchia e ha pertanto bisogno di una protezione immediata nelle acque territoriali turche. L'avvistamento dello squalo tissitore in prossimità di una ben documentata zona di crescita dello squalo grigio, C. plumbeus, non indica necessariamente una zona di riproduzione per C. brevipinna nell'area studiata. Tuttavia, la possibilità di un'ipotetica zona di crescita per lo squalo tissitore nella baia di Boncuk dovrebbe venir verificata in un prossimo futuro.*

**Parole chiave:** squalo tissitore, *Carcharhinus brevipinna*, avvistamento, distribuzione, mar Egeo

## INTRODUCTION

The spinner shark, *Carcharhinus brevipinna* (Müller & Henle, 1839), is a common coastal-pelagic, warm-temperate and tropical shark of the continental and insular shelves, commonly found in shallow waters less than 30 m deep, though it is occasionally reported from a depth of at least 75 m (Ebert & Stehmann, 2013). *C. brevipinna* is a rare-to-occasional species in the whole Mediterranean, where it is recorded as bycatch in deep-sea and pelagic longline fishing off the eastern Algerian and Tunisian coasts (Serena, 2005).

Although Akşıray (1987) and Mater & Meriç (1996) included spinner shark in their ichthyological inventories of the seas of Turkey, the occurrence and status of *C. brevipinna* in the mentioned region had been a point of debate until the 2000s. Kabasakal (2002) reported the presence of *C. brevipinna* in Turkish waters based on 3 specimens recorded off the Kuşadası and Marmaris coasts (Aegean Sea) and in İskenderun Bay (NE Mediterranean Sea).

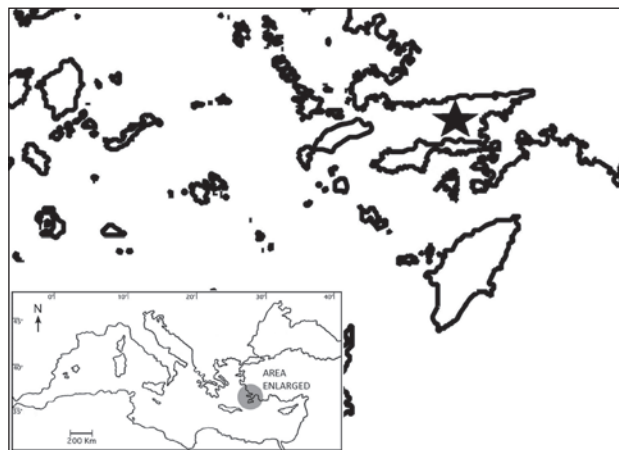
In the present article, authors report a specimen of *C. brevipinna* photographed in Gökova Bay (SE Aegean Sea) in the late 1990s. The present article could be a significant contribution to our current knowledge on the historical occurrence of the spinner shark in Aegean waters.

## MATERIAL AND METHODS

In August 1998, a carcharhinid shark was observed and photographed by an amateur group of divers in Boncuk Bay (approximate location 36° 58' 42.0" N, 28° 12' 52.5" E; Fig. 1) within the boundaries of the Gökova Special Environmental Protection Area (SEPA). The shark remained in close proximity to the divers for about 5 minutes at a depth of 3 m. Due to the absence of a nearby reference object during photographing it was not possible to estimate the size of the shark. The photograph was obtained from the archives of H. Lukas, F. Diestel and P. Rauhut by the first author in 2012. The shark was subsequently identified by the authors as *Carcharhinus brevipinna*. The identification of the species is based on Grace (2001), Serena (2005) and Bariche (2012). The photographs of the present specimen are held in the personal archives of the both authors.

## RESULTS AND DISCUSSION

The following description of the spinner shark is based on the specimen seen in Figure 2: a large, but slender shark with a long, sharply pointed snout, small eyes, long gill slits, and small pectoral fins. The body is robustly fusiform, with a wide caudal peduncle. The origin of the first dorsal fin is over the behind/ rear tip of the pectoral fin. Between the two dorsal fins there is no



**Fig. 1: Map showing approximate location (★) of sighting of present spinner shark, *C. brevipinna*, in Gökova Bay.**

**Sl. 1: Zemljevid z označeno lokaliteto (★), kjer so fotografirali kratkoplavutega morskega psa, *C. brevipinna*, v zalivu Gökova**

interdorsal ridge. The tips of the fins are dark. A white band is visible on flanks.

*Carcharhinus brevipinna*, like many of the large shark species, poses a particular dilemma, as it is yet unknown whether it is rare in the Mediterranean and adjacent waters, or just rarely caught and reported (Cavanagh & Gibson, 2007). For example, Branstetter (1984) reports *C. brevipinna* being present throughout the Mediterranean, even in the Adriatic; however, according to Lipej *et al.* (2004), there have been no confirmed records of spinner shark occurrence in the Adriatic Sea. In a recent comprehensive study on the occurrences of large sharks in the open waters of the SE Mediterranean Sea, Dimalas & Megalofonou (2012) recorded 249 specimens representing 10 species, captured by Greek and Cypriot longline fishing vessels between 1998 and 2005. Although the authors observed 4 carcharhinid taxa (*C. plumbeus*, *Carcharhinus* spp., *Prionace glauca* and *Rhizoprionodon acutus*) in the investigated area, their catch data did not include *C. brevipinna*. To date, 11 carcharhinid species have been reported from Mediterranean waters (Serena, 2005). However, *Carcharhinus* is one of the largest and most important genera of sharks, and the discrimination between the species in the field is sometimes rather difficult, due to a strong resemblance between the black-tipped *Carcharhinus* species (*brevipinna* and *limbatus*), which occur sympatrically in the Mediterranean Sea (Serena, 2005) and could possibly cause misidentifications. Indeed, the first record of the spinner shark in the Mediterranean was provided by Tortonese (1963) (as *Aprionodon brevipinna*), and was based on an earlier misidentification as *C. limbatus* by Tortonese (1938) (R. Fricke, *pers. comm.*).

Based on the information obtained from available literature, the occurrence of the spinner shark in the eastern Levant dates back to the mid-20<sup>th</sup> century, when a shark specimen (total length 55 cm) was hooked in Haifa Bay (Israeli coast of the E Mediterranean) on 23<sup>rd</sup> November 1958, and was later identified as *A. brevipinna* (Ben-Tuvia, 1966). According to Ben-Tuvia's report (Ben-Tuvia, 1966), the identification of the Haifa specimen was later confirmed by world-renowned shark experts J. Garrick and V. G. Springer. Following the first Haifa specimen, another spinner shark (total length 110 cm) was hooked in the same area on 27<sup>th</sup> May 1964. Later, Ben-Tuvia (1971) reported on the capture of a third spinner shark (length 29 cm) without giving detailed information about the specimen or the fishing locality. Before the observation of the present specimen in Boncuk Bay, Kabasakal (2002) reported on the capture of 3 spinner sharks off the coast of Turkey (2 in Aegean waters and 1 in the eastern Mediterranean). Since the field survey of Kabasakal's study was carried out between 1995 and 1999 (Kabasakal, 2002), the capture of these 3 spinner sharks does not necessarily confirm the contemporary occurrence of *C. brevipinna* in Turkish waters, nor does the present specimen observed in 1998.

Therefore, the current presence of *C. brevipinna* in the seas of Turkey requires clarification. On this same note, a record of *C. brevipinna* can indeed be found in the updated checklist of the marine fishes of Turkey (Bilecenoğlu *et al.*, 2014), however, it is based on the distributional data given by Branstetter (1984). Similarly, Hadjichristophorou (2006) includes *C. brevipinna* in the list of Cypriot sharks, but his record is based on the distributional information of spinner shark provided quite some time ago by Compagno (1984); whereas a recent list of sharks recorded off the Syrian coast (E Mediterranean; Saad *et al.*, 2006) does not include *C. brevipinna* at all. Although Ben-Tuvia (1966, 1971) and Golani (2006) conclude that *C. brevipinna* is a common or prevalent shark in the Mediterranean waters of Israel, Bariche (2012) suggests that it is a rare-to-occasional shark in the region. Supporting Bariche's suggestion (Bariche, 2012), Serena (2005) also considers *C. brevipinna* as a rare-to-occasional shark throughout the Mediterranean, contrasting with the alleged commonness of the spinner shark off the Israeli coast (Ben-Tuvia, 1966, 1971; Golani, 2006).

The origin of *C. brevipinna* in the eastern Mediterranean waters has been a constant point of debate since Ben-Tuvia's milestone study on the Red Sea fishes found in the Mediterranean (Ben-Tuvia, 1966). In one of his classical studies of Lessepsian fish in the Levantine Basin, based on the supposition that no records of *C. brevipinna* from the western Mediterranean existed at that time, Ben-Tuvia (1966) assumed a Red Sea origin for the spinner shark. In contrast to his assumption (Ben-Tuvia, 1966), there are now numerous records of *C. brevipinna* in western Mediterranean waters available (see Hemida



**Fig. 2: Spinner shark, *C. brevipinna*, sighted in Gökova Bay, in August 1998.**

**Sl. 2: Kratkoplavuti morski pes, *C. brevipinna*, posnet v zalivu Gökova v avgustu 1998**

*et al.*, 2002; Bradai *et al.*, 2006; Psoadakakis *et al.*, 2012; Sperone *et al.*, 2012).

Our current knowledge on the species of the *Carcharhinus* genera occurring in the seas of Turkey consists of rudimentary data (Başusta *et al.*, 1998; Kabasakal, 2015). Earlier accounts of the occurrence of spinner shark in Turkish waters were based on reports of general ichthyological inventory studies carried out in the mentioned region (e.g. Mater & Meric, 1996; Başusta *et al.*, 1998; Fricke *et al.*, 2007; Bilecenoğlu *et al.*, 2014), in which the occurrence data for *C. brevipinna* is based on Branstetter (1984), Akşiray (1987) and Fischer *et al.* (1987). Even Akşiray's record of *C. brevipinna* from Turkish waters fails to provide information on where the examined specimens had been caught or stored (Akşiray, 1987). Kabasakal (2002) provided the first reliable report on the presence of *C. brevipinna*, based on the three specimens he had collected from Kuşadası, Marmaris and İskenderun Bays, respectively.

This historical photographic evidence of the spinner shark is also the first record for Gökova Bay. Since Gökova Bay is a SEPA, the monitoring of the status and of the possible changes in biodiversity is therefore an important issue. So far, 15 studies have been carried out in Gökova SEPA in order to assess the fish fauna occurring in the area (e.g. Öğretmen *et al.*, 2005; Öziç & Yılmaz, 2006), but none of them included *C. brevipinna* in their inventories of the recorded fish species. Since Boncuk Bay, which is located on the eastern coast of Gökova SEPA, provides a nursery area for sandbar shark (*C. plumbeus*), annual monitoring studies have been conducted there since 2006, but the spinner shark has never been observed or otherwise recorded in these studies (Bilecenoğlu, 2008; Akça, 2010; Filiz *et al.*, 2012).

Today, the conservation status of *C. brevipinna* in the Mediterranean Sea is estimated as data deficient – DD

(Cavanagh & Gibson, 2007), and endangered (EN) in Turkish seas (Fricke *et al.*, 2007). In the Northwest Atlantic, *C. brevipinna* is considered a vulnerable shark by IUCN (Serena, 2005). The scarcity of records about *C. brevipinna* in the studied area could be explained as a consequence of a rapid decline of this shark (Ferretti *et al.*, 2008). Occurrence of the spinner shark in the vicinity of a well-documented nursery ground of the sandbar shark does not necessarily indicate a possible breeding ground for *C. brevipinna* in the studied area, though this possibility should be in the future investigated in the Boncuk Bay area.

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## FOTOGRAFSKI ZAPIS O KRATKOPLAVUTEM MORSKEM PSU, *CARCHARHINUS BREVIPINNA* (MÜLLER & HENLE, 1839), V ZALIVU GÖKOVA BAY (JUŽNO EGEJSKO MORJE, TURČIJA)

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#### POVZETEK

*Avgusta 1998 so amaterski potapljači posneli kratkoplavutega morskega psa, Carcharhinus brevipinna (Müller & Henle, 1839), na globini 3 m v zalivu Boncuk (zaliv Gökova, južno Egejsko morje). Fotografija te vrste, posneta v zalivu Boncuk, je nov doprinos k poznavanju zgodovinske razširjenosti kratkoplavutega morskega psa v turških morjih. Vrsta C. brevipinna je opredeljena kot zelo redka vrsta v turških morjih in kot taka potrebna takojšnjega varovanja na območju turških ozemeljskih voda. Opažanje kratkoplavutega morskega psa v bližini znanega razmnoževalnega območja sivega morskega psa, C. plumbeus, še ne pomeni, da se tudi ta vrsta v tem okolju razmnožuje, vsekakor pa bi bilo to smiselno preveriti na območju zaliva Boncuk v bližnji prihodnosti.*

**Ključne besede:** kratkoplavuti morski pes, *Carcharhinus brevipinna*, pojavljanje, razširjenost, Egejsko morje

## REFERENCES

- Akça, N. (2010):** Underwater observations on the bioecology of *Carcharhinus plumbeus* (Nardo, 1827) inhabiting Boncuk Bay (Gökova Gulf). M. Sc. Thesis. Adnan Menderes University, Aydın, 45 p. (In Turkish)
- Akşiray, F. (1987):** Türkiye Deniz Balıkları Ve Tayin Anahtarı, 2<sup>nd</sup> Edition. Publications of İstanbul University, İstanbul, no. 3490, 811 p.
- Bariche, M. (2012):** Field identification guide to the living marine resources of eastern and southern Mediterranean. FAO Species Identification Guide for Fishery Purposes. FAO, Rome, 610 p.
- Başusta, N., Ü. Erdem & C. Çevik (1998):** An investigation on chondrichthyes in İskenderun Bay. Celal Bayar University, Journal of the Science and Arts Faculty, Ser. Nat. Sci., 1, 63-69.
- Ben-Tuvia, A. (1966):** Red Sea fishes recently found in the Mediterranean. Copeia, 1966, 254-275.
- Ben-Tuvia, A. (1971):** Revised list of the Mediterranean fishes of Israel. Isr. J. Zool., 20, 1-39.
- Bilecenoğlu, M. (2008):** Project of Conservation and Monitoring of Sandbar Shark (*Carcharhinus plumbeus*) in Boncuk Bay in Gökova Special Environmental Protection Area. Project Report. Environmental Protection Agency for Special Areas, Ministry of Environment and Forestry, Ankara, 32 p. (In Turkish)
- Bilecenoğlu, M., M. Kaya, B. Cihangir & E. Çiçek (2014):** An updated checklist of the marine fishes of Turkey. Turk. J. Zool., 38, 901-929.
- Brađai, M. N., B. Saidi, S. Enajjar & A. Bouain (2006):** The Gulf of Gabès: A spot for the Mediterranean elasmobranchs. In: Başusta, N., Ç. Keskin, F. Serena & B. Seret (eds.): The Proceedings of the International Workshop on Mediterranean Cartilaginous Fish with Emphasis on Southern and Eastern Mediterranean. 14-16 October 2005, İstanbul, Turkey. Turkish Marine Research Foundation, pp. 107-117.
- Branstetter, S. (1984):** Carcharhinidae. In: Whitehead, P. J. P., M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese (eds.): Fishes of the North-eastern Atlantic and the Mediterranean. Vol. I. UNESCO, Paris, pp. 102-114.
- Cavanagh, R. D. & C. Gibson (2007):** Overview of the conservation status of cartilaginous fishes (Chondrichthyans) in the Mediterranean Sea. IUCN, Gland, Switzerland and Malaga, Spain, 42 p.
- 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 Fish. Synop., (125) Vol. 4, 655 p.
- Damalas, D. & P. Megalofonou (2012):** Occurrences of large sharks in the open waters of the southeastern Mediterranean Sea. J. Nat. Hist., 46, 43-44.
- Ebert, D. A. & M. F. W. Stehmann (2013):** Sharks, batoids and chimaeras of the North Atlantic. FAO Species Catalogue for Fishery Purposes, No. 7. FAO, Rome, 523 p.
- Ferretti, F., R. A. Myers, F. Serena & H. K. Lotze (2008):** Loss of large predator sharks from the Mediterranean Sea. Conserv. Biol., 22, 952-964.
- Filiz, H., A. Gülşahin, H. Cerim & G. Bilge (2012):** The pursuit of the sandbar shark [*Carcharhinus plumbeus* (Nardo, 1827)]. Harmonization of Biodiversity and Marine Industries, Turkey-Japan Marine Forum. November 5-12, 2012, İzmir, Turkey. Abstract Book, pp. 16.
- Fischer, W., M. L. Bauchot & M. Schneider (1987):** Fiches FAO d'identification des espèces pour les besoins de la pêche. Méditerranée et mer Noire. Zone de pêche 37. FAO, Rome, 760 p.
- Fricke, R., M. Bilecenoğlu & H. M. Sarı (2007):** Annotated checklist of fish and lamprey species (Gnathostomata and Petromyzontomorphi) of Turkey, including a Red List of threatened and declining species. Stuttg. Beitr. Natkd. A. Biol., 706, 169 p.
- Golani, D. (2006):** Cartilaginous fishes of the Mediterranean coast of Israel. In: Başusta, N., Ç. Keskin, F. Serena & B. Seret (eds.): The Proceedings of the International Workshop on Mediterranean Cartilaginous Fish with Emphasis on Southern and Eastern Mediterranean. 14-16 October 2005, İstanbul, Turkey. Turkish Marine Research Foundation, pp. 95-100.
- Grace, M. A. (2001):** Field guide to requiem sharks (Elasmobranchiomorphi: Carcharhinidae) of the Western North Atlantic. U.S. Dep. Commer., NOAA Tech. Rep. NMFS153, 32p.
- Hadjichristophorou, M. (2006):** Chondrichthyes in Cyprus. In: Başusta, N., Ç. Keskin, F. Serena & B. Seret (eds.): The Proceedings of the International Workshop on Mediterranean Cartilaginous Fish with Emphasis on Southern and Eastern Mediterranean. 14-16 October 2005, İstanbul, Turkey. Turkish Marine Research Foundation, pp. 162-168.
- Hemida, F., R. Seridji, N. Labidi, J. Bensaci & C. Capapé (2002):** Records of *Carcharhinus* spp. (Chondrichthyes: Carcharhinidae) from off the Algerian coast (southern Mediterranean). Acta Adriat., 43, 83-92.
- Kabasakal, H. (2002):** Elasmobranch species of the seas of Turkey. Annales, Ser. Hist. Nat., 12 (1), 15-22.
- Kabasakal, H. (2015):** Historical occurrence of *Carcharhinus* spp. in the Sea of Marmara during the 1950s. Marine Biodiversity Records, 8, e48.
- Lipej, L., A. De Maddalena & A. Soldo (2004):** Sharks of the Adriatic Sea. Knjižnica Annales Majora, Koper, 253 p.
- Mater, S. & N. Meriç (1996):** Deniz Balıkları. In: Kence, A. & C. C. Bilgin (eds.): Türkiye Omurgalılar Tür Listesi. TÜBİTAK, Ankara, pp. 129-172.
- Öğretmen, F., F. Yılmaz & H. Torcu Koç (2005):** An investigation on fishes of Gökova Bay (Southern Aegean Sea). BAÜ Fen. Bil. Enst. Dergisi, 7, 19-36.
- Öziç, F. & F. Yılmaz (2006):** Gökova Körfezi demersal balıkları üzerine bir araştırma. Ekoloji, 58, 16-20.
- Psomadakis, P. N., S. Giustino & M. Vacchi. (2012):** Mediterranean fish biodiversity: an updated inventory

with focus on the Ligurian and Tyrrhenian seas. *Zootaxa*, 3263, 1–46

**Saad, A., M. Ali & B. Seret (2006):** Shark exploitation and conservation in Syria. In: Başusta, N., Ç. Keskin, F. Serena & B. Seret (eds.): The Proceedings of the International Workshop on Mediterranean Cartilaginous Fish with Emphasis on Southern and Eastern Mediterranean. 14–16 October 2005, Istanbul, Turkey. Turkish Marine Research Foundation, pp. 202–208.

**Serena, F. (2005):** Field identification guide to the sharks and rays of the Mediterranean and Black Sea. FAO Species Identification Guide for Fishery Purposes, FAO, Rome, 97 p.

**Sperone, E., G. Parise, A. Leone, C. Milazzo, V. Circosta, G. Santoro, G. Paolillo, P. Micarelli & S. Tripepi (2012):** Spatiotemporal patterns of distribution of large predatory sharks in Calabria (central Mediterranean, southern Italy). *Acta Adriat.*, 53, 13–24.

**Tortonese, E. (1938):** Uno squalo nuovo per il Mediterraneo. *Natura*, 29, 157–160.

**Tortonese, E. (1963):** Elenco riveduto dei Leptocardi, Ciclostomi, pesci cartilaginei e ossei del mare Mediterraneo. *Ann. Mus. Civ. Stor. Nat. Giacomo Doria*, 74, 156–185.