

original scientific article
received: 2005-01-24

UDC 591.9:597.3 (262.53)

PHOTOGRAPHIC EVIDENCE OF THE OCCURRENCE OF BRAMBLE SHARK, *ECHINORHINUS BRUCUS* (BONNATERRE, 1788) (SQUALIFORMES: ECHINORHINIDAE) FROM THE SEA OF MARMARA

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ABSTRACT

On October 2002, a bramble shark Echinorhinus brucus (Bonnaterre, 1788) was imaged by means of a ROV camera at a depth of 1214 m in the northern Sea of Marmara. This single recording of the bramble shark shows that E. brucus, once thought extinct in Turkish seas, still occurs in this area. E. brucus is a very rare shark species in the Mediterranean and needs immediate protection in the entire area.

Key words: *Echinorhinus brucus*, Echinorhinidae, bramble shark, Sea of Marmara, distribution

EVIDENZA FOTOGRAFICA DELLA PRESENZA DI RONCO SPINOSO *ECHINORHINUS BRUCUS* (BONNATERRE, 1788) (SQUALIFORMES: ECHINORHINIDAE) NEL MAR DI MARMARA

SINTESI

Nell'ottobre del 2002 un esemplare di ronco spinoso Echinorhinus brucus (Bonnaterre, 1788) è stato filmato nel Mar di Marmara settentrionale con l'ausilio di una telecamera per ROV, ad una profondità di 1214 metri. Quest'unica testimonianza della presenza di ronco spinoso, creduto estinto in acque turche, conferma che la specie è ancora presente nell'area. E. brucus è una specie di squalo rara in Mediterraneo e ha bisogno di venir protetta immediatamente nell'intera area.

Parole chiave: *Echinorhinus brucus*, Echinorhinidae, ronco spinoso, Mar di Marmara, distribuzione

INTRODUCTION

According to Compagno (1984), the bramble shark *Echinorhinus brucus* (Bonnaterre, 1788) (Fig. 1) is a large, sluggish bottom-dwelling shark, sometimes occurring in shallow waters but primarily a deepwater species on the continental and insular shelves and upper slopes at depths from 18 to 900 m. It is an ovoviviparous species and the number of young per litter varies from 15 to 24, with a maximum total length to about 310 cm (Compagno, 1984). Although it is captured by bottom trawls and line gear in the eastern Atlantic, especially from the North Sea to Portugal, it is relatively unimportant as a fisheries species (Compagno, 1984).

E. brucus is fairly common in the western to eastern Atlantic and in western Indian oceans (Compagno, 1984; Silas & Selveraj, 1972). Its distribution in the Mediterranean Sea includes both western and central parts of the basin (Risso, 1810; Moreau, 1881; Carus, 1889–1893; Ninni, 1912; Tortonese, 1956; Bini, 1967; McEachran & Branstetter, 1984; Bauchot, 1987; Barrull *et al.*, 1999; Hemida & Capapé, 2002; De Maddalena & Zuffa, 2003). In a recent study, De Maddalena & Zuffa (2003) summarised capture information on 24 bramble sharks, mainly in the central Mediterranean Sea, between 1798 and 2000. Although McEachran & Branstetter (1984) stated that the Mediterranean distribution of *E. brucus* includes the entire basin, Hemida & Capapé (2002) reported in their recent study that the bramble shark had been recorded only in the western Mediterranean basin and not in its eastern part.

Occurrence of the bramble shark in Turkish seas has been reported by Akşiray (1987); however, the author did not give information on the captured or examined specimens. Due to the lack of this shark species in the capture records of the last 15 years, Kabasakal (2002) concluded that *E. brucus* had probably disappeared from Turkish waters.

A single bramble shark has been recorded in the Sea of Marmara by Ninni (1923). Similarly, due to the lack of this shark in the recent ichthyological records from the Sea of Marmara (Erazi, 1942; Kocataş *et al.*, 1993), it

has been suggested that *E. brucus* had also disappeared from Marmaric waters (Kabasakal, 2003).

In the present paper, a single recent recording of *E. brucus* in the Sea of Marmara is presented and its distribution in the Mediterranean Sea discussed.

MATERIAL AND METHODS

The video image of bramble shark was recorded by means of a Remotely Operated Vehicle (ROV) camera, operated at a depth of 1214 m in Tekirdağ trench, submarine part of the northern Anatolian fault (northern Sea of Marmara, Fig. 2). During its imaging, it was not possible to estimate the size of the specimen.

The video clip and the photographs of the bramble shark are kept in the archive of the first author at the Ichthyological Research Society (IRS). As the photographs are extracted from the video clip, their quality is very poor; however, the main diagnostic characters of *E. brucus* are clearly visible both on the film and in figures 3 and 4. Identification follows Compagno (1984), while the taxonomic nomenclature follows Bilecenoğlu *et al.* (2002).

RESULTS AND DISCUSSION

On October 2002, a bramble shark *Echinorhinus brucus* was imaged by means of a ROV camera at a depth of 1214 m in the northern Sea of Marmara (Fig. 2). The following description of the observed bramble shark is based on the specimen seen in figures 3 and 4. Body is robustly fusiform with a wide caudal peduncle. Two small dorsal fins are located far back on the body, close to caudal fin; the beginning of the first dorsal fin is almost over the posterior portion of the pelvic fin base; the beginning of the second dorsal fin is almost over the pelvic fin tips. Pelvic fins are relatively long based and remarkably large. Pectoral fins are short. No anal fin. There is neither sub-terminal notch nor posterior notch on caudal fin, and the lower lobe is not well differentiated (Fig. 4). Body is brownish grey with lighter areas on pectoral and pelvic fins.

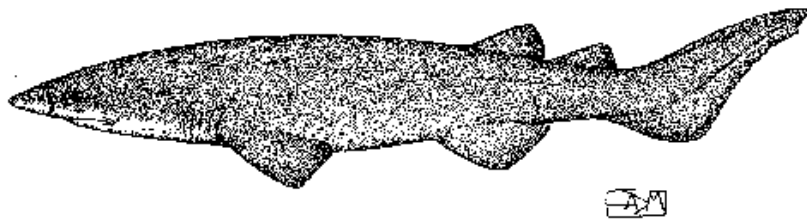


Fig. 1/Sl. 1: *Echinorhinus brucus* (Bonnaterre, 1788).
(Drawing/Risba: A. De Maddalena)

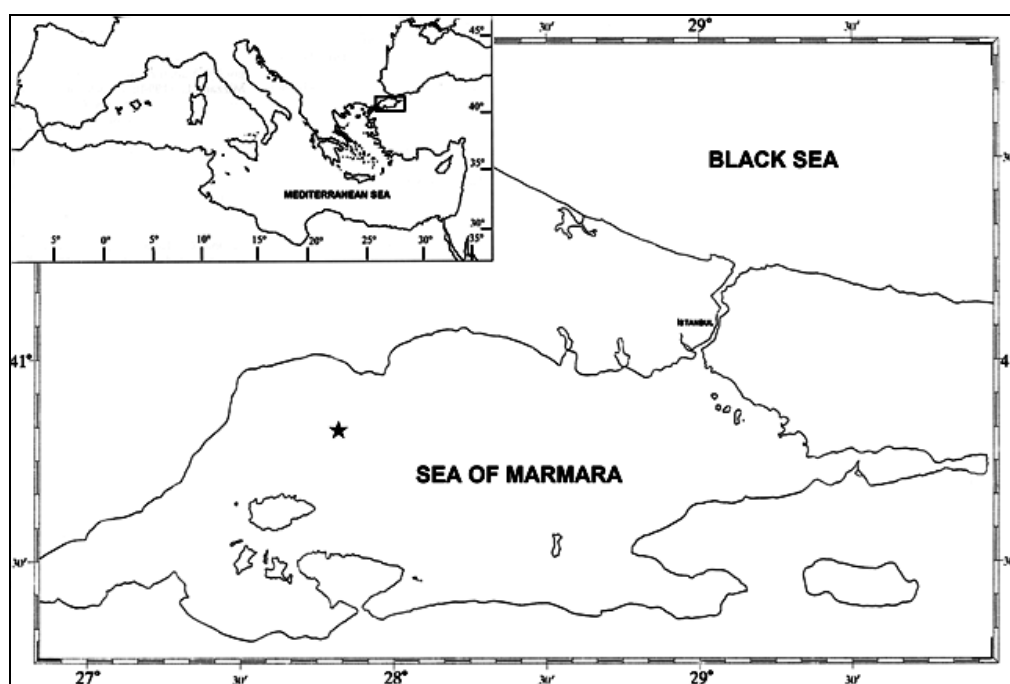


Fig. 2: Approximate location of the observation site, where the video image of the Marmaric specimen of *E. brucus* was recorded. The rectangle on the small map indicates the area of investigation. (Drawing: H. Kabasakal)

Sl. 2: Približna lokacija, na kateri je bil posnet marmarski primerek bodičastega morskoga psa *E. brucus*. Pravokotnik na malem zemljevidu ponazarja raziskovano območje. (Risba: H. Kabasakal)

Among the Mediterranean sharks, *E. brucus* is a species that can be easily identified by means of its characteristic buckler-like dermal denticles and the position of dorsal fins (Moreau, 1881; Tortonese, 1956; Bini, 1967; McEachran & Branstetter, 1984; Bauchot, 1987; Hemida & Capapé, 2002). Due to the image quality, no buckler-like dermal denticles were observed on the specimen; however, owing primarily to the position of the dorsal fins, as well as to some other diagnostic characters, we were able to identify the observed specimen as *E. brucus*.

In the Mediterranean Sea, *E. brucus* was recorded for the first time by Risso (1810), based on a specimen captured off Nice in 1798. Since then, a few bramble sharks have been recorded mostly in the western Mediterranean and adjacent waters. According to Ninni (1912), *E. brucus* is an accidentally captured shark in the Adriatic Sea. Ninni (1912) reported on two bramble sharks captured in Adriatic waters; one on 5 May 1877 (reported by E. F. Trois), and one in February 1904 off Porto di Chioggia. The bramble shark reported by Trois (1876, in Tortonese, 1956) was the first record of *E. brucus* from the Adriatic Sea. For the time being, a total of 24 captures of *E. brucus* are available among historical and contemporary records, all of which come from the western and central Mediterranean Sea (De Maddalena & Zuffa, 2003). According to Hemida & Capapé (2002) *E. brucus* had probably disappeared from the



Fig. 3: Side view of the bramble shark approaching the ROV at a depth of 1214 m. The transparent core sampling tube was used as a reference for estimating the total length of the shark. (Photo: IRS archive)

Sl. 3: Pogled od strani na bodičastega morskoga psa, ki se na globini 1214 m približuje kameri v daljinsko vodenem plovilu. Pri ocenjevanju celotne iztegnjene dolžine preučevanega morskoga psa je bila kot primerjava uporabljena prozorna vzorčna cev plovila. (Foto: Arhiv IRS)

Mediterranean Sea. However, the capture of a bramble shark, 254 cm TOT, captured off Annaba, indicates that it still occurs off the coast of Algeria (Hemida & Capapé, 2002).

According to Bauchot (1987), *E. brucus* is distributed along the entire Aegean coast of Turkey, but is apparently absent from the Turkish Mediterranean Sea and from the Sea of Marmara. McEachran & Branstetter (1984) stated that Mediterranean distribution of *E. brucus* extends to the Anatolian coast of both the Aegean and the Mediterranean Seas, with seasonal or occasional occurrence. Due to the absence of *E. brucus* in the fishing records of the last 15 years, Kabasakal (2002, 2003) concluded that the bramble shark had probably disappeared from Turkish seas. The capture of the Marmaric bramble shark in October 2002 indicated that *E. brucus* still occurs in Turkish waters.

In the greater part of the scientific literature, the reported depth range of the bramble shark is 400 to 900 m (Tortonese, 1956; Bini, 1967; McEachran & Branstetter, 1984; Bauchot, 1987; Hemida & Capapé, 2002), while Compagno (1984) reported its depth range as 18 to 900 m. The Marmaric bramble shark has been observed at a depth of 1214 m, which exceeds the previous maximum depth record of *E. brucus*.

According to Compagno (1984), *E. brucus* can reach up to 310 cm TOT. A 258 cm long male caught before 1879 off Nice, France, on display in the Pavia Museum of Zoology, is the largest Mediterranean bramble shark known to date (De Maddalena & Zuffa, 2003). Silas & Selveraj (1972) reported on two adult males of 162 and 174 cm TOT, captured over the continental slope from 200 to 400 meters off the west coast of India (Indian Ocean). Compagno (1984) reported that females between 213 and 230 cm TOT, and males between 150 and 174 cm TOT were adults. Total length of a gravid female bramble shark, captured off the Elba Island (western Mediterranean Sea) around 1985, was estimated at 250 cm (De Maddalena & Zuffa, 2003). Recent capture of an adult female of 254 cm TOT, off Annaba (eastern coast of Algeria), was reported by Hemida & Capapé (2002). On the photographs of a Marmaric bramble shark, the pelvic region of the specimen is not clear; this is the reason why the authors could not determine its sex. As we could not estimate the size of the shark, it was not possible to make any statement whether the specimen was sexually mature.



Fig. 4: Pelvic region and the lower caudal lobe of the bramble shark. (Photo: IRS archive)

Sl. 4: Medenica in spodnja repna krpica bodičastega morskega psa. (Foto: IRS archive)

CONCLUSIONS

"In the early days of marine biology...", as originally written by Barnes & Hughes (1988), "many people predicted that the abyssal depths would be found to be lifeless..." However, owing to the invention of deep-diving submersibles or unmanned vehicles, such as ROVs, we have now the opportunity to reveal the mysteries of deep seas. The video images recorded by the ROV camera during the seismic survey of Marmaric trenches in October 2002 clearly indicated that *Echinorhinus brucus* still occurs in the Sea of Marmara, a subregion of the eastern Mediterranean. The scarcity of bramble shark captures is due to the fact that the species inhabits deep bottoms between 500 and 900 m (or 1214 m in our case), where it is not subjected to commercial fishing pressures. *E. brucus*, as reported by De Maddalena & Zuffa (2003), is very rare in the Mediterranean and needs immediate protection in the entire area.

ACKNOWLEDGMENTS

The authors wish to thank to Alessandro De Maddalena, Italian Great White Shark Data Bank, Milan, Italy, for the illustration of *Echinorhinus brucus*.

FOTOGRAFSKI DOKAZI O POJAVLJANJU BODIČASTEGA MORSKEGA PSA
ECHINORHINUS BRUCUS (BONNATERRE, 1788) (SQUALIFORMES: ECHINORHINIDAE)
 V MARMARSKEM MORJU

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POVZETEK

Oktobra leta 2002 je bil v Marmarskem morju na globini 1214 m s kamero ROV – kamera v daljinsko vodenem plovilu – posnet bodičasti morski pes *Echinorhinus brucus* (Bonnaterre, 1788). Ta edini posnetek te vrste dokazuje, da se *E. brucus*, o katerem je veljalo prepričanje, da je izginil iz turških morij, še vedno pojavlja v teh vodah. *E. brucus* je zelo redka vrsta morskega psa v Sredozemskem morju in ga je treba nemudoma zaščititi v celotnem območju.

Ključne besede: *Echinorhinus brucus*, Echinorhinidae, bodičasti morski pes, Marmarsko morje, razširjenost

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