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FIRST RECORD OF *CARCHARHINUS BRACHYURUS* (GUNTHER, 1870) (CHONDRICHTHYES; CARCHARHINIDAE) FROM SARDINIAN WATERS (CENTRAL MEDITERRANEAN)

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ABSTRACT

The authors report on the first record of Carcharhinus brachyurus *(Gunther, 1870) (Chondrichthyes; Carcharhinidae) from Sardinian waters registered in the Sardinian Large Elasmobranch Database (S.L.E.D.). A female carcharhinid shark, measuring 253 cm total length, was caught in June 2005 in a tuna net off San Pietro Island (south-western Sardinia, Italy, Mediterranean Sea), and was later identified as* C. brachyurus *from photographs based on its dentition and some morphological features.*

Key words: *Carcharhinus brachyurus,* distribution, Sardinian Large Elasmobranch Database (S.L.E.D.), Mediterranean Sea

PRIMA SEGNALAZIONE DI *CARCHARHINUS BRACHYURUS* (GUNTHER, 1870) (CHONDRICHTHYES; CARCHARHINIDAE) PER LE ACQUE DELLA SARDEGNA (MEDITERRANEO CENTRALE)

SINTESI

Viene presentata la prima segnalazione di Carcharhinus brachyurus *(Gunther, 1870) (Chondrichthyes; Carcharhinidae) per le acque della Sardegna, registrata nel Sardinian Large Elasmobranch Database (S.L.E.D.). La segnalazione è relativa ad un esemplare femmina di carcarinide di cm. 253 di lunghezza totale, catturato nel giugno del 2005 nelle reti della tonnara dell'Isola di San Pietro (Sardegna sud-occidentale, Italia, mediterraneo) e identificato successivamente come* C. brachyurus *sulla base di fotografie evidenzianti la dentatura ed alcuni parametri morfometrici.*

Parole chiave: *Carcharhinus brachyurus,* distribuzione, Sardinian Large Elasmobranch Database (S.L.E.D.), Mediterraneo

INTRODUCTION

The Copper Shark or Bronze Whaler, *Carcharhinus brachyurus* (Gunther, 1870), is both an epipelagic and insular shark species, occurring predominately in warm temperate and subtropical waters of all oceans (Garrick, 1982; Compagno, 1984b; Compagno *et al.*, 2005), including the Mediterranean Sea (Serena, 2005). The presence of this species in the Mediterranean basin was confirmed in 1981 (Cigala Fulgosi, 1983), while its presence in the Mediterranean had been suspected since the 19th century (Garrick, 1982; Orsi Relini, 1998).

Recently, the distribution of *C. brachyurus* in the Mediterranean basin has been defined with more precision, thanks to records in the scientific literature. Besides the historical records concerning some specimens coming from the northwestern Mediterranean Sea (Nice, France), and one from the northern Adriatic Sea (Garrick, 1982), there are more recent records from Palma de Mallorca in the Balearic Islands (Morey & Massuti, 2003), the Ligurian Sea (Vacchi *et al.*, 1996), the southern Tyrrhenian Sea (Zava *et al.*, 2006), the Sicilian Channel (Cigala Fulgosi, 1983), the Algerian coast (Hemida *et al.*, 2002), and from the Dodecanese Islands (Fergusson, 1994).

This note is the thirty-seventh record of *C. brachyurus* from the Mediterranean Sea (Zava *et al.*, 2006), but the very first from Sardinian waters recorded in the Sardinian Large Elasmobranch Database (S.L.E.D.), furthering our knowledge on the distribution of this species in the Mediterranean Sea. The prime objective of this project, which is carried out by the "DNAquA – Laboratorio di ricerche e studi sulla vita marina" and other independent researchers is to collect historical and recent data on elasmobranch species occurring in Sardinian waters.

MATERIALS AND METHODS

In the afternoon of June19th, 2005, a female *Carcharhinus brachyurus* (Fig. 1) was found trapped in a commercial tuna net in the "Tacche Bianche" locality in the channel between San Pietro Island and Sardinia, less than 500m from the northern coast of San Pietro Island (approx. 39°14′N, 8°31′E). The shark had probably been entangled for some days before being retrieved, as it already began to decompose.

The shark was initially identified by local fishermen as a "grigione" (big grey), a generic name usually adopted for carcharhinid sharks, particularly *Carcharhinus plumbeus* (Nardo, 1827), the most common carcharhinid in Sardinian waters (Storai *et al.*, 2006).

The identification of this specimen as *C. brachyurus* is based on several morphological features, observed from the photographs taken of the shark. These features match the diagnostic keys (Garrick, 1982; Compagno, 1984b), which allow definitely discriminate among the most two similar carcharhinid species *Carcharhinus obscurus* and *C. plumbeus* (Tab. 1). The specimen was recorded in the S.L.E.D. with the record code #2005 CB046.4. Conventionally, S.L.E.D. records are identified by a code of eleven alphanumeric characters, including: year of the signalling, first letter of the genus name and species name of the specimen, progressive number of the record, and a separate number (from 1 to 4) referring to one of the four areas into which Sardinian waters have been divided (Storai *et al.*, 2006). All records have been inserted in a multiple keywords database that will be available on the web site http: //www.dnaqua.it through restricted access granted by the webmaster. The stored data, periodically updated, will be thus available for both scientific and popular publications.

Fig. 1: Adult female** Carcharhinus brachyurus**, 253 cm TOT, caught in tuna net off San Pietro Island (south-western Sardinia, Italy, Mediterranean Sea) on June 19th, 2005 (S.L.E.D. record #2005CB046.4).
Sl. 1: Odrasla samica vrste** Carcharhinus brachyurus**, 253 cm TOT, ujeta v mrežo za lovljenje tunov 19. junija 2005 v bližini otoka San Pietro (jugozahodna Sardinija, Sredozemsko morje) (S.L.E.D. #2005CB 046.4).

Tab. 1: Matches of the specimen #2005CB046.4 with the main discrimination diagnostic features among *C. brachyurus, C. obscurus* ***and*** *C. plumbeus* ***(Compagno, 1984b).***
Tab. 1: Primerjave primerka #2005CB046.4 z glavnimi diagnostičnimi značilnostmi vrst *C. brachyurus, C. obscurus* ***in*** *C. plumbeus* ***(Compagno, 1984b).***

	#2005CB046.4	*C. brachyurus*	*C. obscurus*	*C. plumbeus*
upper dentition	narrow, mesial edge curved, distinct notch on distal edge	narrow, bent-cusped, serrated without cuspslets; crown feet with slightly coarser serrations but no cuspslets	erect, broad, triangular semioblique cusped, serrated without cuspslets; low erect to slightly oblique cups that smoothly merge into the crown feet	semierect, broad, triangular high cusped, serrated without cuspslets; semi-erect to slightly oblique cups that smoothly merge into the crown feet
snout shape	rounded, narrowly pointed	moderately long, rounded or narrowly pointed	short or moderately long, broadly rounded	short, broadly rounded or parabolic
interdorsal ridge	no interdorsal ridge relievable	no interdorsal ridge	low interdorsal ridge	narrow interdorsal ridge
first dorsal fin	small, falcate; origin slightly anterior to pectoral rear tip	small, falcate with short rear tip, no conspicuous markings; pointed or narrowly rounded apex; origin over or slightly anterior to pectoral rear tip	moderate-sized, semifalcate with short rear tip, no conspicuous markings; pointed or narrowly rounded apex; origin over or slightly anterior to pectoral rear tip	very large, semifalcate, no conspicuous markings; pointed or narrowly rounded apex; origin over or slightly anterior to pectoral fin insertion

RESULTS AND DISCUSSION

The specimen was 253 cm of total length and weighed more than 200 kg, and was distinguished from the two most similar carcharhinid species in the area, namely *Carcharhinus obscurus* (Lesueur, 1818) and *Carcharhinus plumbeus*. The upper dentition in our specimen is relatively narrow (Fig. 2), and not as broad as in *C. obscurus* or *C. plumbeus*. The mesial edges of the upper teeth in our specimen are pronouncedly curved, whereas the mesial edges of the upper teeth in both *C. obscurus* and *C. plumbeus* are straight, or nearly so, and a distinct notch is observed on the distal edges of the teeth in our specimen, whereas this notch is indistinct, or absent, in the distal edges of the upper teeth of *C. obscurus* and *C. plumbeus*.

The shape of the snout in our specimen is long and narrowly pointed (Fig. 3), as in *Carcharhinus brachyurus*, whereas the snouts of *C. obscurus* and *C. plumbeus* are shorter and more broadly rounded. The shape and size of the first dorsal fins of *C. brachyurus* and *C. obscurus* are similar; however, *C. plumbeus* has a characteristically high, triangular first dorsal fin, which is not the case in our specimen (Fig. 4). The shark specimen that we are reporting on has dentition, snout, and fin morphology that matches that of *C. brachyurus*. The dentition and shape of the snout of our specimen does not conform to the descriptions of *C. obscurus* or *C. plumbeus*, and the first dorsal fin shape of our specimen is different to the one observed in *C. plumbeus* (Bass *et al.*, 1973; Garrick, 1982; Compagno, 1984b, 1988).

Fig. 2: Detail of the upper jaw teeth of the specimen identified as *C. brachyurus***.**
Sl. 2: Detajl zob v zgornji čeljusti primerka, identificiranega kot *C. brachyurus***.**

Fig. 3: Detail of the head of the specimen identified as** C. brachyurus**, showing its mouth and snout.
Sl. 3: Detajl glave (čeljusti in gobca) primerka, identificiranega kot** C. brachyurus**.

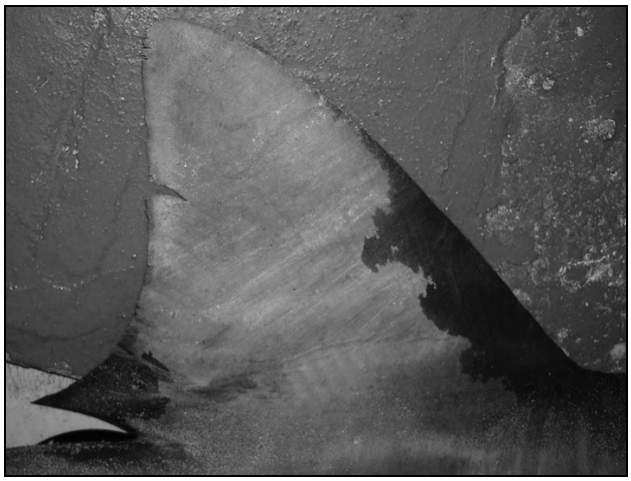

Fig. 4: Detail of the first dorsal fin of the specimen identified as** C. brachyurus**.
Sl. 4: Detajl prve hrbtne plavuti primerka, identificiranega kot** C. brachyurus**.

The following morphometric measurements (Tab.2) were collected as per Compagno (1984a) by the fishermen catching the shark: 253 cm Total Length (TOT), 182 cm (71.9% TOT) Precaudal Length (PRC), 131 cm (51.8% TOT) Snout-Vent Length (SVL), 33 cm (13.0% TOT) Preorbital Length (POB), and 29 cm (11.5% TOT) First Dorsal Height (D1H). Due to the logistic difficulties, it was not possible to make observations on the stomach contents, nor the reproductive tract, and no biopsy samples were taken.

Tab. 2: Synthesis of the available measurements of the specimen #2005CB046.4 caught off San Pietro Island (southwestern Sardinia, Italy, Mediterranean Sea) in June 2005.
Legend: TOT – total length; PRC – precaudal length; SVL – snout-vent length; POB – preorbital length; D1H – first dorsal height.
Tab. 2: Sinteza razpoložljivih dimenzij primerka #2005CB046.4, ujetega junija 2005 v bližini otoka San Pietro (jugozahodna Sardinija, Italija, Sredozemsko morje).
Legenda: TOT – celotna iztegnjena dolžina; PRC – predrepna dolžina; SVL – dolžina od konice gobca do trebušne plavuti; POB – dolžina od konice gobca do oči; D1H – višina prve hrbtne plavuti.

	TOT	PRC	SVL	POB	D1H
cm	253	182	131	33	29
% TOT	100	71.9	51.0	13.0	11.5

According to the literature available for *C. brachyurus* (Garrick, 1982; Vacchi *et al.*, 1996; Morey & Massuti, 2003; Zava *et al.*, 2006), the specimen was probably sexually mature, as sexual maturity for this species is usually reached at approximately 200–220 cm TOT (Compagno *et al.*, 2005; Serena 2005), although a recent record from the southern Tyrrhenian Sea (Zava *et al.*, 2006) reports on a mature male specimen at only 164 cm TOT.

This record of *C. brachyurus* from Sardinia confirms a geographical continuum in the distribution of *C. brachyurus* throughout the western Mediterranean Sea. *C. brachyurus* ranges from the Balearic Islands to the Algerian coast in the Mediterranean Sea. In our opinion, a reproductively viable population of *C. brachyurus* exists in the Mediterranean Sea.

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PRVI PODATEK O POJAVLJANJU VRSTE *CARCHARHINUS BRACHYURUS* (GUNTHER, 1870) (CHONDRICHTHYES; CARCHARHINIDAE) V VODAH SARDINIJE (SREDNJE SREDOZEMLJE)

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POVZETEK

Avtorji pričujočega članka poročajo o prvem pojavljanju vrste Carcharhinus brachyurus *(Gunther, 1870) (Chondrichthyes; Carcharhinidae) v vodah Sardinije, in sicer na osnovi zapisa v Sardinski bazi podatkov za velike morske pse in skate (S.L.E.D.). Junija 2005 se je v mrežo za lovljenje tunov, postavljeno v bližini otoka San Pietro (jugozahodna Sardinija, Sredozemsko morje), ujela samica pravega morskega psa, ki je bila na osnovi fotografij njenega zobovja in nekaterih morfoloških značilnosti pozneje identificirana kot* C. brachyurus.

Ključne besede: *Carcharhinus brachyurus,* razširjenost, Sardinska baza podatkov za velike morske pse in skate (S.L.E.D.), Sredozemsko morje

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