

received: 2020-06-17

DOI 10.19233/ASHN.2020.21

REPORT ON A GREAT WHITE SHARK *CARCHARODON CARCHARIAS* OBSERVED OFF LAMPEDUSA, ITALY

Francesco TIRALONGO

Department of Biological, Geological and Environmental Sciences, University of Catania, Catania, Italy
Ente Fauna Marina Mediterranea, Avola, Italy
e-mail: francesco.tiralongo@unict.it

Clara MONACO

Department of Agriculture, Food and Environment (Di3A), University of Catania, Italy
MareCamp Association, Aci Castello (CT), Italy
e-mail: clamonaco@unict.it

Alessandro DE MADDALENA

Shark Museum, 26 Forest Hill Road, Simon's Town, 7995 Cape Town, South Africa
e-mail: alessandrodemaddalena@gmail.com

ABSTRACT

A female great white shark (Carcharodon carcharias) estimated at 500 cm was observed on 23 May 2020 near Lampedusa, in the Pelagie Islands, Italy. This record is of special relevance given the importance of the Strait of Sicily as a parturition ground and nursery area for this species, which is classified as critically endangered in the Mediterranean Sea by the International Union for Conservation of Nature (IUCN).

Key words: great white shark, *Carcharodon carcharias*, Lampedusa, Italy, Mediterranean Sea

SEGNALAZIONE DI UNO SQUALO BIANCO *CARCHARODON CARCHARIAS* OSSERVATO AL LARGO DI LAMPEDUSA, ITALIA

SINTESI

Una femmina di squalo bianco (Carcharodon carcharias) di lunghezza stimata pari a 500 cm, è stata osservata il 23 maggio 2020 presso Lampedusa, nelle Isole Pelagie, Italia. Tale caso è di particolare interesse a causa dell'importanza del Canale di Sicilia quale area di parto e di nursery per la specie che è classificata come in pericolo critico di estinzione nel mar Mediterraneo dall'Unione Internazionale per la Conservazione della Natura (IUCN).

Parole chiave: squalo bianco, *Carcharodon carcharias*, Lampedusa, Italia, Mediterraneo

INTRODUCTION

Since 1996, the Italian Great White Shark Data Bank (Banca Dati Italiana Squalo Bianco) has collected a substantial amount of information regarding historical and recent records on the great white shark, *Carcharodon carcharias* (Linnaeus, 1758), from the Mediterranean Sea. This data include information on size, distribution, habitat, behaviour, reproduction, diet, fishery, and attacks on humans (De Maddalena, 2000a, 2000b, 2002, 2006; Celona et al., 2001, 2006; De Maddalena & Heim, 2012; De Maddalena & Zuffa, 2009; De Maddalena et al., 2001, 2003; Galaz & De Maddalena, 2004). An accurate recording of new observations of great white sharks in the Mediterranean area is a fundamental part of this ongoing research programme. Data on the presence of the species in the Mediterranean Sea have also been reported in recent years by Boldrocchi et al. (2017), Kabasakal (2014, 2016), Kabasakal & Gedikoğlu (2008), Kabasakal et al. (2018).

In the present article, we report the record of a large great white shark spotted in May 2020 by sport fishermen in the Pelagie Islands, in Italian Mediterranean waters.

MATERIAL AND METHODS

On the morning of 23 May 2020, three sport fishermen, Salvatore Sicurello and two friends, were aboard an 8 m long boat in the waters of Lampedusa Island, the Pelagie archipelago, Italy, in the Central Mediterranean Sea (Fig. 1). The anglers were fishing with *bolentino*, using strips of European flying squid, *Todarodes sagittatus* (Lamarck, 1798), as bait, without chum, and they caught some red porgies, *Pagrus pagrus* (Linnaeus, 1758). At 10:04 a.m., with a 5–6 kn wind and a calm sea, the dorsal fin of a shark was observed in 60–70 m deep blue waters, 10 nm south of the Lampedusa harbour. The shark was observed by the anglers for approximately 3 minutes. They were the only boat in the area at that moment. The shark showed no particular interest in the boat and, after swimming nearby, left the area. After the encounter, the three sport fishermen resumed fishing but moved to another site.

A short, 1:30 minute low-resolution video, filmed by Mr. Sicurello from the boat, was uploaded on a Facebook group, and brought public attention to this case. The video was later published by several Italian media (Stampa TV, 2020).

A higher resolution version of the video was provided by Mr. Sicurello to the authors, and was fundamental for identification purposes. A data collection form was sent by the authors to Mr. Sicurello, in order to collect detailed information on the observation.

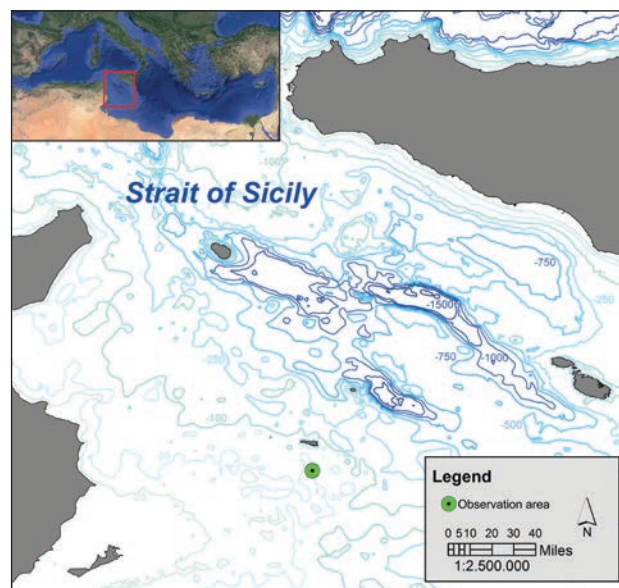


Fig. 1: Map showing the exact location where the female great white shark, *Carcharodon carcharias* (Linnaeus, 1758), estimated at 500 cm TL, was observed on 23 May 2020 (map created with ArcGis).

Sl. 1: Zemljevid obravnavanega območja (v ArcGis) z označbo lokalitete, kjer je bila 23. maja 2020 opažena približno 500 cm dolga samica belega morskega volka (*Carcharodon carcharias* (Linnaeus, 1758)).

RESULTS AND DISCUSSION

Some evident morphological features of the animal, including brownish grey coloration, markedly spindle-shaped body, massive trunk, wide head, pointed conical snout, large and pointed dorsal fin with irregular posterior margin, long and wide pectoral fins, wide caudal keels, long gill slits, lunate caudal fin, presence of black spot at the pectoral fin insertion, white marks on pectoral fin, free rear tip, pelvic fins and caudal fin lower lobe (Fig. 2), allowed the authors to make an immediate identification of the shark as a great white shark, *Carcharodon carcharias* (Linnaeus, 1758).

Other typical features of the species, such as the large triangular serrated teeth and the black apex of the pectoral fin's ventral surface, could not be observed due to the fact that the video was filmed from the surface, and the shark never exposed the ventral surfaces to the observer. However, based on the observable features listed above we identified the species as *C. carcharias*.

The higher resolution version allowed a close observation of the pelvic area, including a glimpse of the pelvic fin's free rear tip, which revealed the absence of claspers. We could therefore conclude that the observed shark was a female.



Fig. 2: The female great white shark, *Carcharodon carcharias* (Linnaeus, 1758), estimated at 500 cm TL, observed near Lampedusa, the Pelagie Islands, Italy, on 23 May 2020 (stills from a video by Salvatore Sicurello).

Sl. 2: Približno 500 cm dolga samica belega morskega volka (*Carcharodon carcharias* (Linnaeus, 1758)), opažena 23. maja 2020 blizu Lampeduse (Isole Pelagie, Italija) (slika dobljena iz videoposnetka, ki ga je posnel Salvatore Sicurello).

The size of the shark was estimated by Mr. Sicurello at 500 cm total length (TL), based on the size of the 8-metre boat.

The encounter took place in the Strait of Sicily, between Italy and Tunisia, a well-known parturition ground and nursery area for newborn and juvenile white sharks (Cigala-Fulgosi, 1990; De Maddalena & Heim, 2012). Since female white sharks attain sexual maturity between 400 and 500 cm TL, and both mating and parturition tend to occur in spring and summer (Compagno, 2001; Francis, 1996), we can assume that the female shark observed near Lampedusa was sexually mature, and speculate that perhaps its presence in the area may be related to mating or parturition. No mating scar is observable in the video, but this may be due to the relatively low resolution of the images, and should not eliminate the possibility of sexual maturity and potential sexual activity.

Great white sharks have long sexual maturation times, low fecundity, long gestation periods, and produce small numbers of young, which makes them highly vulnerable to over-exploitation (De Maddalena & Heim, 2012). Limited evidence indicates that great white sharks have few nursery areas, therefore even minimal fishing pressure in one of these pupping areas where pregnant females and newborns are concentrat-

ed, like the Strait of Sicily, can have devastating results. Great white sharks were, without a doubt, at one time much more abundant in the Mediterranean than they are presently, which could be the result of overfishing either the shark or its preys. A decrease of 45.88% in the number of great white shark records in the Mediterranean has been reported from the 1989-1998 decade to the 1999-2008 decade (De Maddalena & Heim, 2012). The observation of a potentially mature female in an important parturition ground presented herein is therefore a positive sign of the species' continuous vitality in the area. We also underline the importance of citizen science, public engagement, and social networks for the detection and observation of species of interest, including ecological observation of scientific relevance (Tiralongo *et al.*, 2019a, 2019b).

ACKNOWLEDGEMENTS

Very special thanks to Salvatore Sicurello, who was on board at the time of the observation reported in this article. The authors wish to thank Eric Glenn Haenni for taking the time to edit the manuscript. Alessandro De Maddalena thanks Alessandra, Antonio and Phoebe for their support and love.

ZAPIS O POJAVLJANJU BELEGA MORSKEGA VOLKA *CARCHARODON CARCHARIAS* PRI LAMPEDUSI, ITALIJA

Francesco TIRALONGO

Department of Biological, Geological and Environmental Sciences, University of Catania, Catania, Italy
 Ente Fauna Marina Mediterranea, Avola, Italy
 e-mail: francesco.tiralongo@unict.it

Clara MONACO

Department of Agriculture, Food and Environment (Di3A), University of Catania, Italy
 MareCamp Association, Aci Castello (CT), Italy
 e-mail: clamonaco@unict.it

Alessandro DE MADDALENA

Shark Museum, 26 Forest Hill Road, Simon's Town, 7995 Cape Town, South Africa
 e-mail: alessandrodemaddalena@gmail.com

POVZETEK

Triindvajsetega marca 2020 so avtorji opazovali približno pet metrov dolgo samico belega morskega volka (Carcharodon carcharias) blizu Lampeduse (Isole Pelagie, Italija). Ta zapis je še posebej pomemben, saj je Sicilski preliv razmnoževalno območje te vrste, ki je opredeljena kot kritično ogrožena v Sredozemskem morju po merilih Mednarodne zveze za ohranjanje narave (IUCN).

Ključne besede: beli morski volk, *Carcharodon carcharias*, Lampedusa, Italija, Sredozemsko morje

REFERENCES

- Boldrocchi, G., J. Kiszka, S. Purkis, T. Storai, L. Zingula & D. Burkholder (2017):** Distribution, ecology and status of the white shark, *Carcharodon carcharias*, in the Mediterranean Sea. Reviews in Fish Biology and Fisheries, 27(2), DOI: 10.1007/s1160-017-9470-S.
- Celona, A., A. De Maddalena & G. Comparetto (2006):** Evidence of a predatory attack on a bottlenose dolphin *Tursiops truncatus* by a great white shark *Carcharodon carcharias* in the Mediterranean Sea. Annales, Series Historia Naturalis, 16(2), 159-164.
- Celona, A., N. Donato & A. De Maddalena (2001):** In relation to the captures of a great white shark *Carcharodon carcharias* (Linnaeus, 1758) and a shortfin mako, *Isurus oxyrinchus* Rafinesque, 1809 in the Messina Strait. Annales, Series Historia Naturalis, 11(1), 13-16.
- Cigala Fulgosi, F. (1990):** Predation (or possible scavenging) by a great white shark on an extinct species of bottlenosed dolphin in the Italian Pliocene. Tertiary Research, 12(1), 17-36.
- Compagno, L.J.V. (2001):** Sharks of the World. Volume 2. FAO Species Catalogue for Fishery Purposes, 1(2), 1-269.
- De Maddalena, A. (2000a):** Sui reperti di 28 esemplari di squalo bianco, *Carcharodon carcharias* (Linnaeus, 1758), conservati in musei italiani. Annali del Museo Civico di Storia Naturale "G. Doria", Genova, 93, 565-605.
- De Maddalena, A. (2000b):** Historical and contemporary presence of the great white shark *Carcharodon carcharias* (Linnaeus, 1758), in the Northern and Central Adriatic Sea. Annales, Series Historia Naturalis, 10(1), 3-18.
- De Maddalena, A. (2002):** Lo squalo bianco nei mari d'Italia. Ireco, Formello, 144 pp.
- De Maddalena, A. (2006):** A catalogue of great white sharks *Carcharodon carcharias* (Linnaeus, 1758) preserved in European museums. Journal of the National Museum, Natural History Series, 175(3-4), 109-125.
- De Maddalena, A., O. Glaizot & G. Oliver (2003):** On the great white shark, *Carcharodon carcharias* (Linnaeus, 1758), preserved in the Museum of Zoology in Lausanne. Marine Life, 13(1/2), 53-59.
- De Maddalena, A. & W. Heim (2012):** Mediterranean Great White Sharks. A Comprehensive Study Including All Recorded Sightings. McFarland, Jefferson, 254 pp.

De Maddalena, A. & M. Zuffa (2009): Historical and contemporary presence of the great white shark, *Carcharodon carcharias* (Linnaeus, 1758), along the Mediterranean coast of France. Bollettino del Museo civico di Storia naturale di Venezia, 59, 81-94.

De Maddalena, A., M. Zuffa, L. Lipej & A. Celona (2001): An analysis of the photographic evidences of the largest great white sharks, *Carcharodon carcharias* (Linnaeus, 1758), captured in the Mediterranean Sea with considerations about the maximum size of the species. Annales, Series Historia Naturalis, 11(2), 193-206.

Francis, M.P. (1996): Observations on a pregnant white shark with a review of reproductive biology. In: Klimley, A.P. & D.G. Ainley (eds.): Great white sharks: The biology of *Carcharodon carcharias*. Academic Press, San Diego, pp. 157-172.

Galaz, T. & A. De Maddalena (2004): On a great white shark, *Carcharodon carcharias* (Linnaeus, 1758), trapped in a tuna cage off Libya, Mediterranean Sea. Annales, Series Historia Naturalis, 14(2), 159-164.

Kabasakal, H. (2014): The status of the great white shark (*Carcharodon carcharias*) in Turkey's waters. Marine Biodiversity Records, doi: 10.1017/S1755267214000980; Vol. 7; e109.

Kabasakal, H. (2016): Historical dispersal of the great white shark, *Carcharodon carcharias*, and bluefin tuna, *Thunnus thynnus*, in Turkish waters: Decline of a predator in response to the loss of its

prey. Annales, Series Historia Naturalis, 26, 213-220.

Kabasakal, H. & S.Ö. Gedikoğlu (2008): Two new-born great white sharks, *Carcharodon carcharias* (Linnaeus, 1758) (Lamniformes; Lamnidae) from Turkish waters of the northern Aegean Sea. Acta Adriatica, 49, 125-135.

Kabasakal, H., E. Bayrı & E. Ataç (2018): Recent records of the great white shark, *Carcharodon carcharias* (Linnaeus, 1758) (Chondrichthyes: Lamnidae), in Turkish waters (eastern Mediterranean). Annales, Series Historia Naturalis, 28, 93-98.

Stampa TV (2020): Avvistato uno squalo bianco nei pressi dell'isola di Lampedusa. La Stampa, Youtube Channel: <https://www.youtube.com/watch?v=76evLnMzWfl>

Tiralongo, F., A.O. Lillo, D. Tibullo, E. Tondo, C. Lo Martire, R. D'Agnese, A. Macali, E. Mancini, I. Giovos, S. Coco & E. Azzurro (2019a): Monitoring uncommon and non-indigenous fishes in Italian waters: One year of results for the AlienFish project. Regional Studies in Marine Science, 28. DOI: 10.1016/j.rsma.2019.100606.

Tiralongo, F., F. Russo & M. Colombo (2019b): From scuba diving to social networks: A curious association between two small fish species, *Lepidogaster candolii* Risso, 1810 and *Parablennius rouxi* (Cocco, 1833), and *Muraena helena* (Linnaeus, 1758) coming from citizen science. Regional Studies in Marine Science, 29. DOI: 10.1016/j.rsma.2019.100648.