

NOTE ON THE DECLINING STATUS OF THE SANDTIGER SHARK *CARCHARIAS TAURUS* IN THE MEDITERRANEAN SEA

by

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ABSTRACT. - The sandtiger shark *Carcharias taurus* was first described from Sicily in 1810 by Rafinesque, but has never been abundant in the Mediterranean. During the 19th century and perhaps early 20th century, it had a wide but diffuse coastal distribution, as evidenced by various published faunal accounts that distinguish it from the smalltooth sandtiger shark *Odontaspis ferox*. However, no contemporary records have come to light post-1980, indicating either the increasing scarcity or disappearance altogether of this species in the Mediterranean. These sharks may be acutely vulnerable to the effects of habitat degradation throughout much of the littoral Mediterranean and having always had a population of very low density, may be close to regional extinction.

RÉSUMÉ. - Note sur le déclin du requin-taureau, *Carcharias taurus*, en Méditerranée.

Le requin-taureau, *Carcharias taurus*, fut décrit de Sicile en 1810 par Rafinesque, mais il n'a jamais été abondant en Méditerranée. Au cours du 19^{ème} siècle, il avait une grande, mais erratique, distribution comme en témoignent diverses publications de faunistique qui le distinguent du requin féroce *Odontaspis ferox*. Cependant, aucun signalement contemporain n'a été fait après 1980, indiquant soit une augmentation de leur rareté, soit une disparition de ces deux espèces en Méditerranée. Ces requins sont probablement très sensibles aux effets de la dégradation des habitats dans la plupart des zones côtières méditerranéennes, et la densité de leurs populations ayant toujours été faible, ces espèces pourraient être proches de l'extinction en Méditerranée.

Key words. - Elasmobranch - *Carcharias taurus* - Disappearance - Mediterranean Sea.

The sandtiger or grey nurse shark *Carcharias taurus* is widely distributed in warm temperate and subtropical neritic regions of the Atlantic, Indian and Pacific Oceans. An essentially harmless but spectacular-looking large shark (females attain 318 cm TL, Compagno, 1984), it is a familiar sight in large public aquaria and often encountered by SCUBA divers in various regions of the world. Sizeable seasonal aggregations of this species are routinely observed by divers on the Protea Banks off South Africa's eastern Cape Province, and in some coastal areas of New South Wales, Australia.

The World Conservation Union (IUCN) presently considers this species as 'vulnerable' globally and 'endangered' in the southwest Atlantic Ocean and eastern Australian waters (Pollard and Smith, in press). Once easily hunted in large numbers by spearfishers and 'bang stick'-wielding SCUBA and free-divers, most notably so in eastern Australia, the species is

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now increasingly considered as amongst the keystone ichthyofauna of certain regions which support burgeoning ecotourism diving industries, such as South Africa. In recognition of its vulnerability to directed hunting, the Australian government has deemed sandtigers as a Federal Endangered Species throughout its waters since 1997, with state legislation also earlier enforced in New South Wales since 1984 (Pollard *et al.*, 1996). Targeted recreational and commercial fishing for *C. taurus* is also outlawed through national legislation (1997 Federal Fisheries Management Plan) along the entire eastern U.S. seaboard and Gulf of Mexico.

In the Mediterranean Sea, the species is not included among the chondrichthyes considered as endangered fauna within Annex II (as emended, 1995) of the 'Barcelona Convention' (Convention for the Protection of the Marine and Coastal Environment of the Mediterranean, 1978), nor is it afforded any unilateral protected status by any of the Mediterranean nations. This note describes the past and present status of this species, highlighting its apparent disappearance throughout the region post-1980.

DISCUSSION

Occurrence in the Mediterranean Sea

Historical literature

Rafinesque (1810) first described *Carcharias taurus* based upon a holotype from an unspecified type locality somewhere in Sicilian waters. The species is unambiguously cited in various faunal lists of the late 19th century for select Mediterranean regions, e.g., from the coasts of Algeria (Guichenot, 1850), Sicily, (Doderlein, 1881), the eastern Adriatic (Marchesetti, 1884) and Côte d'Azur (Moreau, 1881), but it is clear from these accounts that it was always rare. In fact, detailed records of captures are virtually non-existent in the regional literature, with the notable exception of Carruccio's (1910) account of a specimen taken in the Gulf of Cagliari, southern Sardinia.

Most literature citations from the first 60 years of the 20th century appear to rely upon repetition of previous accounts, with little reference to any new material having been examined in the intervening years (e.g., Lozano y Rey, 1928; Du Buen, 1935, Tortonese, 1956). This is a further indication of the rarity and infrequency of capture of *C. taurus*.

Recent records

Based on post-1975 records detailing captures of regionally-rare elasmobranchs in the Sicilian Channel, Ionian Sea and Tyrrhenian Seas, it is clear that *C. taurus* is considerably scarcer than three other uncommon, sympatric lamnoids which are nominally recorded each year: *Odontaspis ferox*, *Cetorhinus maximus* and *Carcharodon carcharias* respectively (authors's data and Franco Cigala-Fulgosi, pers. comm.). Indeed, no records whatsoever of this species have emerged during the official long-term monitoring by Italy's ICRAM (Central Institute of Applied Marine Research) of large elasmobranchs reported from the Tyrrhenian Sea and contiguous areas (Marino Vacchi, pers. comm.).

The paucity of reports is equally striking when considering the type locality (Sicily) and its environs, the Sicilian Channel, where commercial fisheries typically afford a good sampling source for various rare species of sharks (Cigala-Fulgosi, 1984). Since historical citations by the likes of Rafinesque (1810) and Doderlein (1881), published and unpublished capture records of *C. taurus* in the southern-central Mediterranean have become notably scant. Quignard and Capapé (1972) described a 228 cm TL female caught by gillnet off Ras Fartas, in the Gulf of Tunis, on 8 December 1971. Capapé *et al.* (1976) mention a further female, ca.

250 cm TL, taken near Sidi Daoud, Cape Bon, but noted that the species was extremely rare in Tunisian waters. The author has located no records of capture from the Maltese Islands post-1970, whereas *Odontaspis ferox* has been caught there fairly regularly (e.g., three specimens were caught off Gozo during 1998) and is often confused by fishermen with the better-publicised (and popularised) *C. taurus*. Franco Cigala-Fulgosi (pers. comm.) observed only one 'small' specimen in 1977, identifiable by a discarded head, during repeated annual summer monitoring of incidentally-landed sharks at the port of Mazara del Vallo, Sicily. Thus, combined evidence indicates a complete absence of recorded specimens from the Sicilian Channel since Cigala-Fulgosi's observation in 1977.

In the eastern Mediterranean, a handful of rather imprecise records have come from Greek waters (see Papakonstantinou, 1988, for literature summary) and nominally from Israel at Haifa Bay (Ben-Tuvia, 1971). A few discarded teeth from this species, found on reef flats off northwest Beirut, Lebanon, indicate its sporadic presence there in the past although all SCUBA observations and photography of sharks at the locality post-1980 have involved *Odontaspis ferox* (author, Leonard Compagno, Ken Graham, Fadi Fakhoury and Walid Noshie, unpublished data). Again therefore, available evidence indicates that if indeed it continues to occur in the Eastern Mediterranean, *C. taurus* is exceptionally rare.

Possible disappearance from the Mediterranean Sea

The contemporary paucity of Mediterranean records, especially when considering the continued reporting of other rare coastal shark species since 1980, might well indicate the complete disappearance of *C. taurus* from most or all of the region since Cigala-Fulgosi's (apparently last) observation of 1977 vintage. With an apparently low density Mediterranean population and habitually close affiliation with continental and insular littoral waters (Compagno, 1984), this species might be accurately considered as especially vulnerable to habitat degradation and anthropogenic pressures, such as coastal construction and interference created by the tourist industry. It is unclear if the Mediterranean records of this species constitute an effectively closed population, or one sharing recruitment from the eastern North Atlantic, where it occurs off West Africa (Cadenat, 1956; Cadenat and Blache, 1981), or if such specimens merely represent transient outliers from that region. If the first possibility is indeed the case, i.e., an effectively isolated Mediterranean population, then the risk of its regional extirpation may be acute and perhaps already well-advanced.

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