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HISTORICAL AND CONTEMPORARY PRESENCE
OF THE GREAT WHITE SHARK, *CARCHARODON CARCHARIAS*
(LINNAEUS, 1758), ALONG THE MEDITERRANEAN COAST OF FRANCE

Riassunto. *Presenza storica e attuale dello squalo bianco, Carcharodon carcharias (Linnaeus, 1758), lungo la costa francese del Mediterraneo.*

Sino ad oggi, sono state raccolte 489 segnalazioni di squalo bianco *Carcharodon carcharias* nel Mare Mediterraneo. Di queste, 43 (8.79%) sono localizzate lungo la costa francese del Mediterraneo: 34 (79.07%) nel Golfo del Leone, 7 (16.28%) lungo la Costa Azzurra, e 2 (4.65%) in acque corse. In aggiunta, sono stati reperiti altri 17 esemplari di provenienza ignota ma almeno in parte verosimilmente mediterranei. La maggior parte dei casi è stata registrata in estate ed autunno, con la massima frequenza in Ottobre. Vi sono alcuni interessanti casi di squali bianchi di enormi dimensioni registrati nell'area: un esemplare di 800 cm catturato presso il Grau-du-Roi attorno al 1940; un esemplare stimato tra 630 e 680 cm avvistato il 6 Ottobre 2001 al largo di Marsiglia; un esemplare di 670 cm catturato nel Medio-Evo nei dintorni di Aix-en-Provence; un esemplare di 600 cm catturato il 15 Ottobre 1925 al largo dell'Estaque, Marsiglia; una femmina di 600 cm presa il 9 Gennaio 1991 al largo di Sète; una femmina di 589 cm catturata il 13 Ottobre 1956 al largo di Sète. Nessuna femmina gravida è stata registrata nell'area e l'esemplare giovane più piccolo misurava 242 cm; ne concludiamo che *C. carcharias* non si riproduce nel Mediterraneo francese. Un piccolo di foca monaca *Monachus monachus*, trovato nello stomaco di uno squalo bianco catturato al largo di Marsiglia nel 1956 rappresenta il primo caso riportato in letteratura di un pinnipede mangiato da *C. carcharias* nell'intero Mare Mediterraneo e nei mari europei. Altri contenuti stomacali includevano delfini, focene comuni *Phocoena phocoena*, tonni, pesci spada *Xiphias gladius*, e resti umani. Sono stati inoltre registrati 5 attacchi ad esseri umani.

Parole chiave: squalo bianco, *Carcharodon carcharias*, Francia, Mare Mediterraneo, foca monaca, *Monachus monachus*.

Summary. To date, records of 489 great white sharks *Carcharodon carcharias*, throughout the Mediterranean Sea have been catalogued. Of these records, 43 (8.79%) are from the French coast of the Mediterranean coastline: 34 (79.07%) are from the Golfe du Lion, 7 (16.28%) are from the Côte d'Azur, and 2 (4.65%) are from Corsica. A further 17 specimens from unknown locations were located, at least in some cases thought to originate from the French Mediterranean. Most of the events took place over the summer months and in the Fall, number of records peaked in October. There are some interesting cases of large white sharks reported from the area: an 800 cm specimen captured near Grau-du-Roi around in the 1940's; an estimated 630-680 cm specimen sighted on October 6, 2001, off Marseille; a 670 cm specimen caught in the Middle Ages, near Aix-en-Provence; a 600 cm specimen, caught on October 15, 1925, off Estaque, Marseille; a 600 cm female caught on January 9, 1991, off Sète; and a 589 cm female caught on October 13, 1956, off Sète. Not a single pregnant female was reported from the area, and the smallest young recorded is a 242 cm specimen. We conclude that *C. carcharias* does not reproduce in French Mediterranean waters. A Mediterranean monk seal pup *Monachus monachus*, found in the stomach of a white shark caught off Marseille in 1956 represents the first case reported in literature of a pinniped being preyed or scavenged by *C. carcharias* in the entire Mediterranean Sea and also in all European seas. Other stomach contents included dolphins, harbour porpoises *Phocoena phocoena*, tuna, swordfish *Xiphias gladius*, and human remains. Information on 5 white shark attacks on humans have been recorded.

Keywords: great white shark, *Carcharodon carcharias*, France, Mediterranean Sea, Mediterranean monk seal, *Monachus monachus*.

INTRODUCTION

Although the great white shark, *Carcharodon carcharias* (Linnaeus, 1758), has never been the subject of long-term specific studies along the Mediterranean coast of France, its presence in these waters has been known for a long time, and it has been recorded on many occasions by several authors.

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 of the great white shark from the Mediterranean Sea. This data includes information on size, distribution, habitat, behaviour, reproduction, diet, fisheries and attacks on humans (DE MADDALENA, 1998, 2000a, 2000b, 2002, 2005, 2006, 2007; CELONA et al., 2001, 2006; DE MADDALENA et al., 2001, 2003; GALAZ & DE MADDALENA, 2004). In total, records of 489 white sharks from the Mediterranean area have been collected so far.

A synthesis and an analysis of the data concerning the presence of *C. carcharias* along the french Mediterranean coast is reported here.

MATERIALS AND METHODS

The search for data on great white sharks from French Mediterranean waters was conducted by bibliographical research (examining carefully both scientific and popular literature), location and study of materials preserved in natural history museums, and collaborations with other researchers, coast guards, divers, sport-fishermen, commercial fishermen and other seamen.

For every case, where possible, a wide range of data concerning geographical and environmental variables, the physical and behavioural nature of the specimen as well as background information on the circumstances of the eyewitness, the event and the record was collected. Geographical and environmental data included the time and date, geographical location, distance from land, weather conditions and sea depth. Various data were recorded for each specimen; total length in cm (measurements varied by case from: TOT = total length with caudal fin in depressed position, TL_n = total length with the caudal fin in a natural position and TL = total length without indication of the way it was measured), mass (kg), sex, stomach contents and behaviour during the encounter, information about specimens preserved in museums, catalogue number (cat. no.) in the collections, and photographs.

RESULTS

The authors have collected a total of 43 records of great white shark from the French area of the Mediterranean sea (fig. 1). An overview of the records and primary data is presented in table 1. In addition to these records, a further 17 specimens from unknown locations were located, preserved in various natural history museums throughout France (fig. 2). These are very old specimens for which the catalogues have been lost or, when still

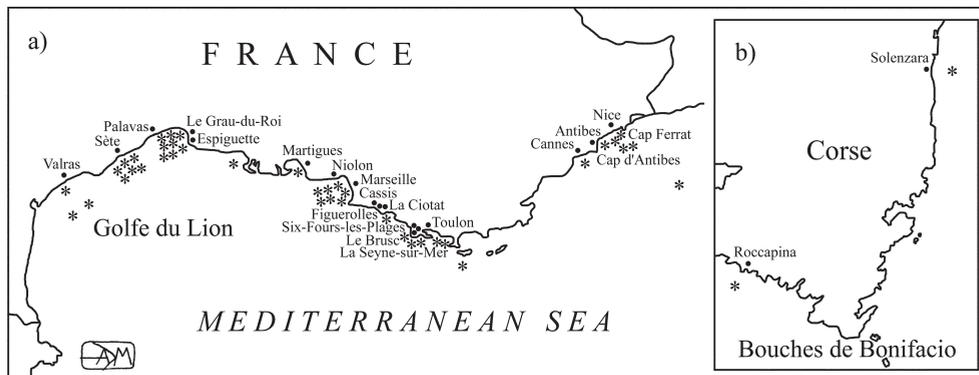


Fig. 1. The Mediterranean coast of France, showing the locations of great white shark records presented in this work: a) Mediterranean continental coast of France, b) southern coast of Corsica. Drawing by Alessandro De Maddalena.

present, lack basic data. Despite the limited information available it may be assumed that, at least in some cases, the specimens originated from the French regions of the Mediterranean. For this reason, these samples were included in this study and are reported in table 2.

DISCUSSION

To date, records of 489 great white sharks throughout the Mediterranean Sea have been catalogued by the Italian Great White Shark Data Bank. Of these records, 43 (8.79%) are from the French coast of the Mediterranean coastline. Of these 43 French Mediterranean records, 34 (79.07%) are from the Golfe du Lion, 7 (16.28%) are from the Côte d'Azur, and 2 (4.65%) are from Corsica. The records are most abundant in the area from Sète to pointe de l'Espiguette and from Marseille to Toulon. On the basis of the data collected, we must conclude that the great white shark is a rare species along the entire French Mediterranean coast, in concurrence with the findings of other authors (CAPAPÉ, 1977; SÉRET, 1996).

That the great white is less abundant along the French coast than the Italian or Croatian coastlines, can seemingly be attributed to the differences in habitat. These predators favor continental islands (such as Sicily, Egadi, Elba, Cres), straits (such as Messina Strait, Channel of Sicily, Channel of Piombino, Kvarner) and shoals (such as Secca del Quadro), as these geographical features play home to large congregations of prey species. Therefore the French coast seems to be a less congenial habitat to this species, because of its much greater uniformity, when compared to the Tyrrhenian Sea, the Channel of Sicily and the Northeastern Adriatic Sea.

The great white shark favors the offshore waters of the continental and insular shelves, but can occasionally come close inshore; more often in zones where the bottom drops off very rapidly, especially when pursuing schools of their prey, such as tuna. The cases listed in table 1 that fall into this category are the white shark encountered on June 20, 2002, 20

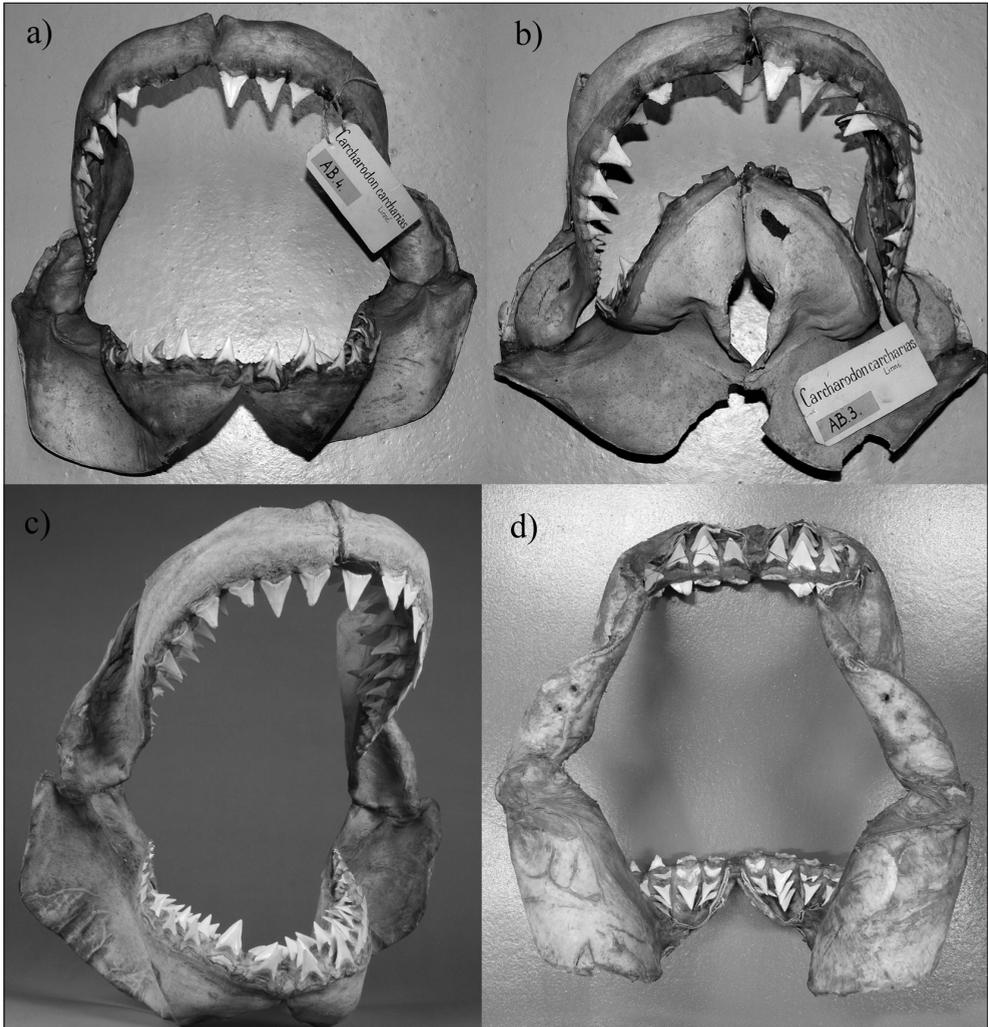


Fig. 2. Four great white shark jaws preserved in french museums: a) jaws preserved in the Muséum National d'Histoire Naturelle de Paris (cat. no. MNHN ab-0004), b) jaws preserved in the Muséum National d'Histoire Naturelle de Paris (cat. no. MNHN ab-0003), c) jaws preserved in the Musée d'Histoire Naturelle du Mans (cat. no. MHN LM 2005.7.1), d) jaws preserved in the Centre de Conservation et d'Etude des Collection, Musée des Confluences de Lyon. Photos by Bernard Séret / Muséum National d'Histoire Naturelle de Paris (a, b), Musées du Mans (c), Musée des Confluences de Lyon (d).

meters from shore at Caussiniere, near Cap Ferrat (C. Gelpi, pers. com.); the specimen caught only 200 m from Marseille in 1956 (DAMONTE, 1993; PEROSINO, 1963); and the white shark that entered the harbour of Marseille before 1965 (HEMINGWAY & DEVLIN, 1965).

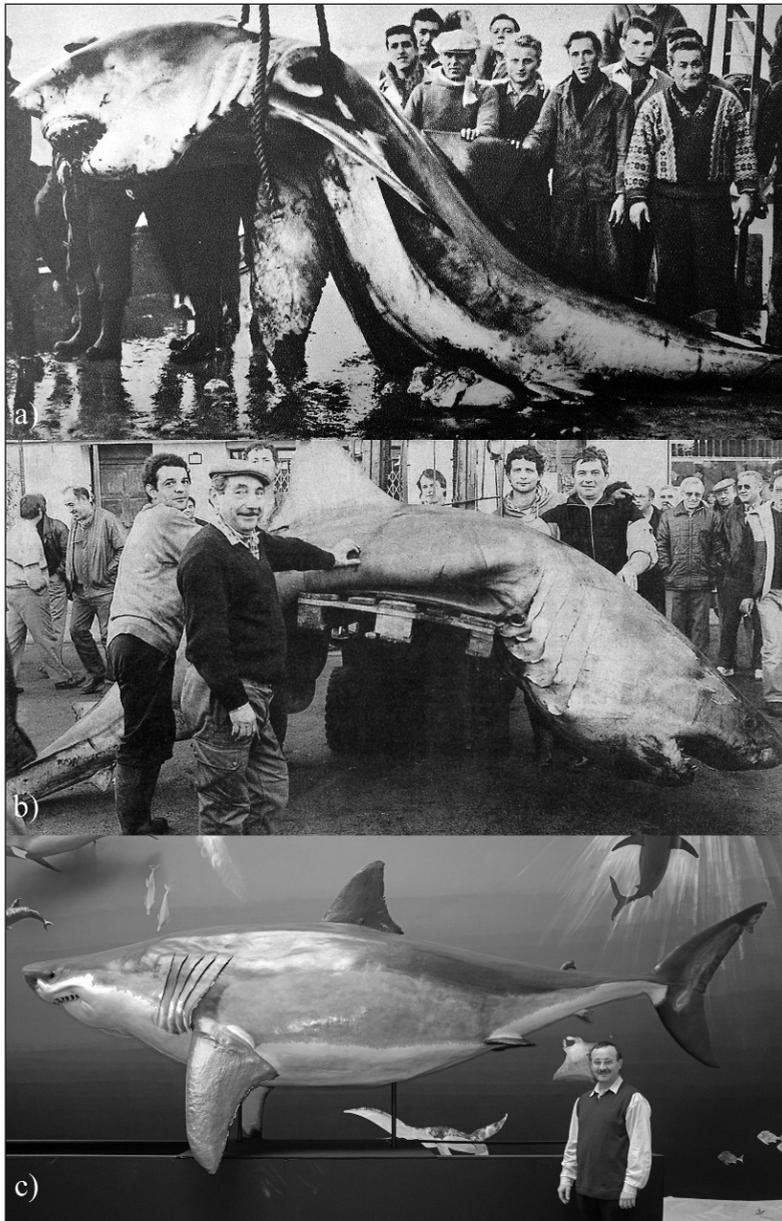


Fig. 3. Three of the largest white sharks recorded from the area: a) a 1800 kg white shark caught in 1956 off Marseille, b) a 600 cm female white shark (estimated at 591 cm TOT) caught on January 9, 1991 off Sète, c) a cast of a 589 cm female white shark caught on October 13, 1956 off Sète, preserved in the Musée cantonal de Zoologie de Lausanne, Switzerland. Photos by Agence Intercontinentale (a), Raymond de Neuville / "Midi-Libre" (b), Michel Krafft / Musée Cantonal de Zoologie de Lausanne (c).

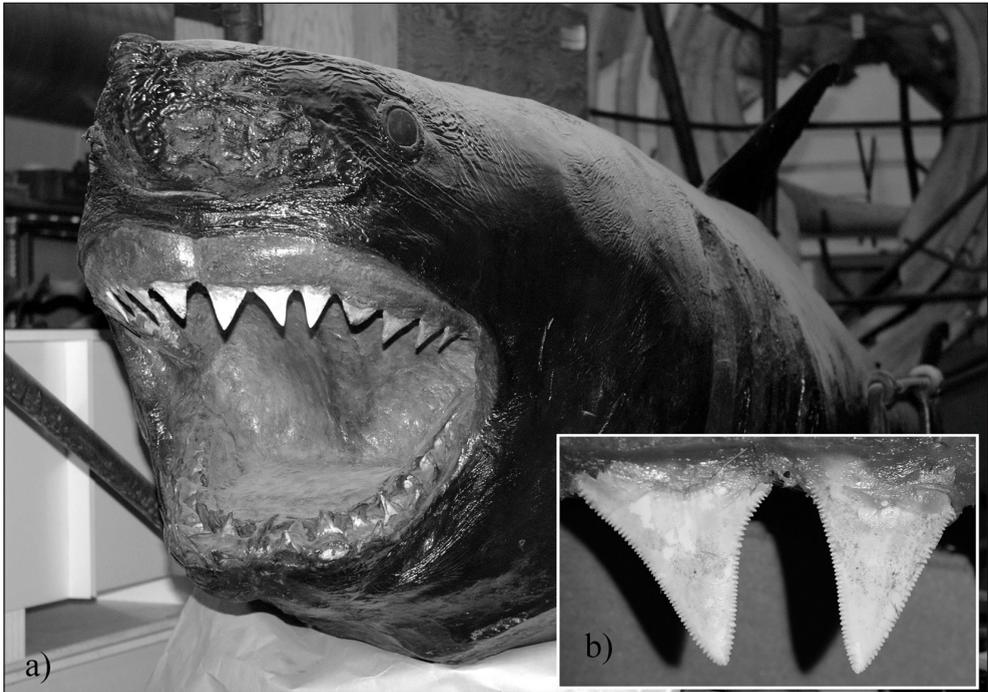


Fig. 4. a) A 500 cm taxidermied great white shark preserved in the Muséum National d'Historie Naturelle de Paris (cat. no. MNHNa-4669), b) a close-up of two of its largest upper teeth. Photos by Bernard Séret / Muséum National d'Historie Naturelle de Paris.

In 15 cases (34.88% of all records), the month or at least season of an encounter or capture is indicated. Most of the events and sightings took place over the summer months (5 specimens, or 33.33% of the records with month/season indicated) and in the Fall (7 specimens, or 46.67% of the records with month/season indicated) number of records peaked in October (6 specimens, or 40.00% of the records with month/season). Our findings are in agreement with PERRIER (1938), who stated: “In summer and fall they come along our coasts in pursuit of tuna and migratory fish.” Obviously, it must be taken into account that during the summer months, due to increasing numbers of people frequenting coastal waters, there are more possibilities of encounters between people and sharks, and a greater likelihood that their presence is recorded.

On the matter of size, there are some interesting cases of very large great white sharks reported from the area (figs. 3-4). They are: an 800 cm specimen captured near Grau-du-Roi around in the 1940's (GRANIER, 1964); an estimated 630-680 cm specimen sighted on October 6, 2001, off Marseille (DE MADDALENA & HERBER, 2002); a 670 cm specimen caught in the Middle Ages, probably near Aix-en-Provence (GIANTURCO, 1978; SMITH, 1833); a 600 cm specimen, caught on October 15, 1925, off Estaque, Marseille (P. Summonti, pers. com.); a 600 cm female (also estimated at 591 cm TOT from a

photograph), caught on January 9, 1991, off Sète (DE MADDALENA et al., 2001; V. Maliet, pers. com.); and a 589 cm TOT female caught on October 13, 1956, off Sète (DE MADDALENA et al., 2003). The cast of the 589 cm female white shark preserved in the Musée Cantonal de Zoologie de Lausanne, Switzerland, is the largest world-wide that has been reconstructed directly from a whole specimen. This is also one of the largest specimens ever measured accurately (DE MADDALENA et al., 2003).

No information about the reproduction of the species has emerged from this research. The low number of specimens for which the sex was recorded is insufficient to draw any conclusion about the presence or absence of sexual segregation in the area. Also, not a single pregnant female was reported from the area. The two smallest specimens recorded are a 242 cm specimen caught in 1876 off Sète (MOREAU, 1881) and a 250.5 cm male caught in 1888 off Grau-du-Roi and preserved taxidermied in the Muséum d'Histoire Naturelle de Nîmes (cat. no. BAC 132) (DE MADDALENA, 2006, 2007). White shark size at birth is between 120 and 151 cm (FRANCIS, 1996; UCHIDA et al., 1996), therefore no newborn specimen was reported from the area and we can conclude that *C. carcharias* does not reproduce in French Mediterranean waters. We can assume the only area of reproduction identified so far in the entire Mediterranean is the Sicilian Channel, where there are recorded captures of pregnant females and juveniles (CIGALA FULGOSI, 1990; DE MADDALENA, 2002; FERGUSSON, 1996; SAÏDI et al., 2005).

Stomach contents were reported for 12 of the specimens included in this study. The most interesting case concerns a Mediterranean monk seal pup, *Monachus monachus* (Hermann, 1779), found in the stomach of a 1800 kg great white shark caught off Marseille, in the inlets of Niolon and Figuerolles, in 1956 (DAMONTE, 1993; PEROSINO, 1963). This case represents the first episode reported in literature of a pinniped being preyed or scavenged by a great white shark in the entire Mediterranean Sea and also in all European seas. Since the 1950's the Mediterranean monk seal has almost totally disappeared from the French coast of the Mediterranean, with the exception of irregular sightings of individuals along the coast of Alpes Maritimes and Var regions between 1987 and 1990 and a single specimen sighted in 2007 along the coast of Corsica (L. Dupuis, pers. com.). Today, the rarity of *M. monachus* makes it only a possible exceptional prey for *C. carcharias* in the Mediterranean Sea. The same thing can be said about the harbour porpoise, *Phocoena phocoena* (Linnaeus, 1758).

This data suggests that in the area *C. carcharias* feeds mainly on large vertebrates: small marine mammals, in particular dolphins, and large fishes, in particular tuna and swordfish, *Xiphias gladius* Linnaeus, 1758. In many locations of the world, such as California, South Africa and South Australia, elasmobranchs and pinnipeds are the major components in the diet of great white sharks. In the Mediterranean Sea, where there are virtually no pinnipeds and sharks are not abundant, great white sharks feed mainly on cetaceans, large pelagic bony fishes and, where they are more common, marine turtles (DE MADDALENA, 2008). At least some of the human remains and a whole horse found in the stomach of a few specimens captured in the area may be the result of scavenging.

There are 5 reliable records of human remains found in the stomach contents of white sharks caught in the French Mediterranean (excluding one very doubtful case), but it is impossible to determine whether the stomach contents were taken through active predation

rather than postmortem scavenging. Therefore, excluding these 5 cases, information on 5 white shark attacks on humans have been recorded: a seaman who had a leg severed by a bite off Antibes in the XVIII Century (CAZEILS, 1998); a child that was fatally attacked and consumed off Nice in the XVIII Century (CAZEILS, 1998); fishermen who had their feet severed off Toulon in the 1950's (TOURET, 1992); a workman that fell into Marseille harbour waters before 1965 (HEMINGWAY & DEVLIN, 1965); and a scuba diver, who suffered no injuries but damage to his air tanks, off Cap d'Antibes in 1998 (P. Brocchi, pers. com.). The records are very limited for each of these 5 cases, lacking fundamental information that is important to understand at which point the source is reliable, and to confirm the species identification lacking even a vague estimate of the shark size or any element of its morphology. Regardless, the limited information available once again confirms that the fearsome reputation of *C. carcharias* is greatly exaggerated.

CONCLUSIONS

It is very important to continue collecting new and historical data on the occurrence of great white sharks along the French Mediterranean coast. This will, in time, permit enhance our knowledge of this species in general, and in the Mediterranean in particular.

Everyone who wishes to inform the author of records of great white sharks which are not represented in this work, can contact him at the address listed below. Whenever possible, please report the following: date, time, location of the encounter, depth of the sea, distance from the coast, weather, activity of observer at the time of the encounter, total length (in a straight line from the tip of the snout to the tip of the upper lobe of caudal fin), mass, sex, stomach contents and behavior of the specimen, presence of other species in the immediate area, comments, photographs, names of all eyewitnesses, your name and contact address, sources. It is very important, if at all possible, to retain teeth, vertebrae, samples of skin, and any embryos. Please also specify whether or not you authorize the publication of your data and pictures.

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Table 1. Summary of reports of the great white shark from the French area of the Mediterranean Sea.

| Date | Location | TL | Weight | Sex | Comments | Sources |
|---------------|------------------------------------|---------|--------|-----|---|---------------------------------|
| Middle-Age | Aix-en-Provence | 670 | | | Capture. Stomach contents included a human in a suit of armour. Specimen may be the same animal reported as captured in Marseille, below (GESSNER, 1560; RONDELET, 1554). | GIANTURCO (1978), SMITH (1833) |
| Before 1554 | Nice | | | | Capture. Stomach contents included a human in a suit of armour. | RONDELET (1554) |
| Before 1554 | Marseille | | | | Capture. Stomach contents included a human in a suit of armour. | GESSNER (1560), RONDELET (1554) |
| XVIII Century | Between Cassis and La Ciotat | | | | Capture. Stomach contents included the whole carcass of a human and two tuna. | CAZEILS (1998) |
| XVIII Century | Antibes | | | | Attack on human. Severed the leg of victim swimming to shore. | CAZEILS (1998) |
| XVIII Century | Nice | | | | Fatal attack (and consumptive attack) on human child. | CAZEILS (1998) |
| XVIII Century | Cannes, near île Sainte-Marguerite | | | | Capture of a large specimen. Stomach contents included an entire horse. | CAZEILS (1998) |
| Before 1860 | Sète | | | | Generic report on the presence of the species. | DOUMET (1860) |
| May 1861 | Sète | | | | Capture. Row of teeth preserved in the Muséum National d'Histoire Naturelle de Paris (cat. no. MNHN ab-0195). | DE MADDALENA (2006, 2007) |
| August 1875 | Sète | Ca. 400 | 600 | | Capture. | MOREAU (1881) |
| 1876 | Sète | 242 | | | Capture. | MOREAU (1881) |
| 1888 | Grau-du-Roi | 250.5 | | M | Capture. Preserved taxidermied in the Muséum d'Histoire Naturelle de Nîmes (cat. no. BAC 132). | DE MADDALENA (2006, 2007) |
| 1889 | La Seyne-sur-Mer | | | | Capture. 4 teeth preserved in the Muséum National d'Histoire Naturelle de Paris (cat. no. MNHN ab-0185). It may be the specimen caught in the same year in the city of Le Brusac, as below. | DE MADDALENA (2006, 2007) |
| October 1889 | Le Brusac | 400 | | | Capture. It had a harbour porpoise, <i>Phocoena phocoena</i> , the pelvis and the legs of a man in its stomach. | DUJARDIN (1890), MOREAU (1892) |
| Before 1893 | Toulon | | | | Capture? | CARUS (1893), FERGUSSON (1996) |
| Before 1893 | Nice | | | | Capture of some specimens. | MOREAU (1881), CARUS (1893) |

| Date | Location | TL | Weight | Sex | Comments | Sources |
|------------------|---|-----|----------|-----|---|---|
| Before 1898 | Var | 550 | Ca. 2000 | | Capture. Stomach contents included a harbour porpoise, <i>Phocoena phocoena</i> , three tuna and various unidentified fishes. | BONOMI (1898) |
| 1909 | Camargue | | | | Capture. Set of jaws preserved in the Musée Océanographique de Monaco (cat. no. MOM-P0I-4254). | BRUNI & WÜRTZ (2002), DE MADDALENA (2006, 2007) |
| Before 1909 | Martigues | | | | Capture. Set of jaws preserved in the Musée Océanographique de Monaco (cat. no. MOM-P0I-4253). | BRUNI & WÜRTZ (2002), DE MADDALENA (2006, 2007), ROULE (1912) |
| October 11, 1910 | Grau-du-Roi | | | | Capture. 3 teeth preserved in the Muséum d'Histoire Naturelle de Nîmes (cat. no. 6). | DE MADDALENA (2006, 2007) |
| 1912 | Six-Four-les Plages | | | | Capture of a large specimen. | G. Altman (pers. com.) |
| October 15, 1925 | Estaque, Marseille | 600 | 1500 | | Capture. | P. Summonti (pers. com.) |
| Summer 1935 | Espiguette | 500 | 1600 | | Capture, offshore. Stomach contents included 3 whole tuna. Cleaned weight recorded as 1600 kg. | PERRIER (1938) |
| Summer 1935 | Languedoc | | | | Capture. | PERRIER (1938) |
| Summer 1935 | Languedoc | | | | Multiple sightings recorded. | PERRIER (1938) |
| Ca. 1940 | Grau-du-Roi | 800 | | | Capture, offshore. Taxidermied and exhibited to the public across the Provence. | GRANIER (1964) |
| 1943 | Between Palavas and Grau-du-Roi | | | | Capture. | GRANIER (1964) |
| 1946 | Between Palavas and Grau-du-Roi | | | | Capture. | GRANIER (1964) |
| Ca. 1950 | Toulon | | | | Attack on humans. It bit the feet of fishermen. | TOURET (1992) |
| 1956 | Inlets of Niolon and Figuerolles, Marseille | | 1800 | | Capture, 200 m offshore. Stomach contents included a Mediterranean monk seal, <i>Monachus monachus</i> , pup, and the partial remains of several dolphins and tuna. | DAMONTE (1993), PEROSINO (1963) |

| Date | Location | TL | Weight | Sex | Comments | Sources |
|--------------------|--|-------------------|----------|-----|--|---|
| October 13, 1956 | Maguelone, Sète | 589 (TOT) | 2000 | F | Capture, 3 miles offshore. A cast is preserved in the Musée Cantonal de Zoologie de Lausanne. Stomach contents included the remains of two approx. 1.8 m dolphins. | DE BEAUMONT (1957), DE MADDALENA et al. (2003) |
| 1956 | Between Palavas and Grau-du-Roi | | | | Capture. | GRANIER (1964) |
| Before 1965 | Marseille | | | | Attack on victim fallen into the harbour. | HEMINGWAY & DEVLIN (1965) |
| September 14, 1984 | îlot des Moines, Roccapina, Corsica | 527 | Ca. 1500 | | Capture, on the shoal of Moines, 6 miles from Roccapina. Stomach contents included 60 kg dolphin. | ANONYMOUS (1984), MINICONI (1987, 1994), R. Miniconi (pers. com.) |
| December 4, 1986 | Îlot Tiboulon, Îles du Friol | 500-600 | | | Sighting. Individual encountered underwater by two divers (firemen of the Battalion of Marseille). | A. Alziari (pers. com.), ANONYMOUS (1986) |
| 1989 | Marseille | >400 | | | Sighting. Photographed while pursuing a school of tuna. | FERGUSSON (1996), TOURET (1992) |
| October 7, 1989 | Near Solenzara Estuary, Corsica | | | | Unverified sighting, 1800 m offshore. | F. Serena (pers. com.) |
| Ca. 1990 | Aude Estuary, Valras | | | | Sighting. Spy-hopping by fishing vessel. | G. Oliver (pers. com.) |
| January 9, 1991 | Sète | Ca. 600 (591 TOT) | Ca. 2000 | F | Capture, 45 miles offshore. Stomach contents included remains of four dolphins between 80-100 cm in length and two swordfish, <i>Xiphias gladius</i> . | ANONYMOUS (1991), DE MADDALENA et al. (2001), QUIGNARD & RAIBAUT (1993) |
| Ca. 1993 | Between Nice and Corsica | | | | Sighting from sport fishing vessel 40 m offshore. | G. Altman (pers. com.) |
| 1998 | Cap d'Antibes | | | | Non-fatal attack on scuba diver resulting in minor damage to the divers air tanks. | P. Brocchi (pers. com.) |
| October 6, 2001 | Between Cap Croisette and Cap Caveaux, Marseille | Ca. 630-680 | | | Sighting. Encountered by nine divers, accompanied by dive instructor Claude Wagner on the wreckage of Miquelon. | DE MADDALENA & HERBER (2002) |
| June 20, 2002 | Caussiniere, Cap Ferrat | Ca. 400 | | | Sighting. Encountered by Christian Gelpi and two other divers. | C. Gelpi (pers. com.) |

Table 2. Summary of specimens preserved in French natural history museums from unknown locations, at least in some cases thought to originate from the French Mediterranean.

| Museum | Material | Cat. no. | Source |
|---|--|------------------|-------------------------|
| Muséum Requier d'Avignon | Head | MR 1996-204 | E. Crégut (pers. com.) |
| Muséum Requier d'Avignon | Set of jaws. Specimen lost, only record remains. | Unknown | E. Crégut (pers. com.) |
| Muséum d'Histoire Naturelle de Grenoble | Set of jaws | MHNGr.OS.47 | DE MADDALENA (2006) |
| Muséum d'Histoire Naturelle du Havre | Some specimens (destroyed in 1944 by the WWII bombings). | Unknown | T. Vincent (pers. com.) |
| Centre de Conservation et d'Etude des Collection, Musée des Confluences de Lyon | Set of jaws | Without cat. no. | D. Berthet (pers. com.) |
| Musée Vert, Musée d'Histoire Naturelle du Mans | Set of jaws | MHN LM 2005.7.1 | N. Morel (pers. com.) |
| Muséum d'Histoire Naturelle de Nice | Lower jaw | OSTEO-130 | O. Gerriet (pers. com.) |
| Muséum d'Histoire Naturelle de Nice | Set of jaws | OSTEO-220 | O. Gerriet (pers. com.) |
| Muséum d'Histoire Naturelle de Nîmes | Set of jaws | 20 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | A 500 cm taxidermied specimen. | MNHNa-4669 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | Set of jaws | MNHN ab-0002 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | Set of jaws | MNHN ab-0003 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | Set of jaws | MNHN ab-0004 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | Set of jaws | MNHN ab-0143 | DE MADDALENA (2006) |
| Muséum National d'Histoire Naturelle de Paris | Preserved specimen measuring 383 cm. Specimen lost, only record remains. | Unknown | DUMERIL (1865) |
| Muséum d'Histoire Naturelle de Valence | Set of jaws | 2006.00.713 | P. Soleil (pers. com.) |