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ADDITIONAL HISTORICAL RECORDS OF THE GREAT WHITE SHARK, *CARCHARODON CARCHARIAS* (LAMNIFORMES: LAMNIDAE) IN THE EASTERN ADRIATIC: UPDATING REGIONAL OCCURRENCE OF A CRITICALLY ENDANGERED SHARK

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ABSTRACT

This paper presents additional historical records of Carcharodon carcharias *in the eastern Adriatic and provides an updated list of the species' occurrence in this area from 1868 onwards. Since the publication of the last list in 2002, 10 new records have been added based on newly available information. Out of these, 8 records date back to the 19th and 20th centuries, while the remaining 2 are from the 21st century.*

Key words: *Carcharodon carcharias*, great white shark, occurrence, Adriatic Sea

ULTERIORI SEGNALAZIONI STORICHE DEL GRANDE SQUALO BIANCO, *CARCHARODON CARCHARIAS* (LAMNIFORMES: LAMNIDAE) NELL'ADRIATICO ORIENTALE: AGGIORNAMENTO DELLA PRESENZA REGIONALE DI UNO SQUALO A RISCHIO CRITICO DI ESTINZIONE

SINTESI

Il presente lavoro fornisce ulteriori dati storici di Carcharodon carcharias *nell'Adriatico orientale e un elenco aggiornato della presenza della specie in quest'area dal 1868 in poi. Dalla pubblicazione dell'ultimo elenco nel 2002 sono state aggiunte 10 nuove segnalazioni basate su nuove informazioni disponibili. Di queste, 8 risalgono al XIX e XX secolo, mentre le restanti due sono del XXI secolo.*

Parole chiave: *Carcharodon carcharias*, grande squalo bianco, presenza, Adriatico

INTRODUCTION

The great white shark, *Carcharodon carcharias* (Linnaeus, 1758), is a cosmopolitan species that inhabits various marine environments, ranging from shallow coastal waters, including bays and estuaries, to far offshore areas, including remote oceanic islands. It is found at depths of up to 1,300 m (Compagno, 2001; Ebert & Dando, 2021). *C. carcharias* is one of the fish species with the widest habitat and geographic ranges, tolerating temperatures from 5 to 25°C and able to undertake long-distance seasonal migrations across oceans (Compagno, 2001; Ebert & Dando, 2021). It has a long historical track record in the Adriatic Sea, particularly in its eastern part. This is not surprising, considering that the white shark, as the world's largest carnivorous fish with a nearly global distribution and dramatic interactions with humans, has always appeared as a charismatic species, attracting significant public attention (Huveneers *et al*., 2018). But despite its high media presence, this apex predator is still considered elusive in the Mediterranean, and in the Adriatic, due to its low population density and absence of conventional aggregation sites. Such a situation is highly challenging for any comprehensive study. Although electronic tagging is commonly used in monitoring studies in other parts of the world, it has not been successful in the Mediterranean Sea, despite attempts being made (Soldo & Peirce, 2005). Most of the knowledge about the species is therefore derived from occurrence records published for the various regions of the Mediterranean Sea (e.g., Bradai & Saidi, 2004; Storai *et al*., 2005; Kabasakal *et al*., 2022). The problem with these records is that they provide limited information, which allows for various opinions on different patterns related to the biology and ecology of the species. Furthermore, the origin, and therefore credibility, of many records is questionable. Numerous regional records are opportunistic, being collected and reported without using a consistent field method, as well as without specific knowledge of the situation and various factors potentially impacting the validity of the data in a particular region. For example, Soldo & Jardas (2002a, 2002b) reported a total of 61 records of the white shark in the eastern Adriatic from 1868 to 2000, but did not include Fergusson's records (1996) related to several alleged sightings of a white shark in 1993 near Šibenik and the Lošinj area. In fact, Soldo & Jardas (2002a, 2002b) thoroughly investigated these records and, after tracing the original information, discovered that they were based on fake news. As a result, they excluded them from their list. However, since those records had already been published, some authors (De Maddalena & Heim, 2012; Boldrocchi *et al*., 2017; Moro *et al*., 2020) ignored Soldo & Jardas's findings (2002a, 2002b) and continued to cite Fergusson (1996), thus perpetuating the error and inevitably compromising the validity of their conclusions, as they were based on inaccurate data.

Soldo & Jardas (2002a, 2002b) were the first in the Mediterranean region to associate the presence of the great white shark in the coastal waters of the eastern Adriatic Sea with a high abundance of Atlantic bluefin tuna *Thunnus thynnus* (Linnaeus, 1758), which was suggested as the shark's major prey. With the introduction of intensive tuna fishing in the open waters of the Adriatic Sea, and especially during the 1970s, the tuna disappeared from the coastal waters of the eastern Adriatic and, as a result, the great white shark was no longer recorded in the last decades of the 20th century. Soldo & Jardas (2002a, 2002b) then predicted that future records of the great white shark in the Adriatic Sea would be linked to new migratory routes and areas with high tuna populations. This was later supported by a record of a 5.70 m long female shark caught in a tuna purse-seine 15 Nm southwest of the island of Jabuka (Soldo & Dulčić, 2005).

Great white sharks recorded in the Adriatic are considered to be part of the Mediterranean population, which is classified as critically endangered on the IUCN Red List of Threatened Species (Soldo *et al*., 2016). A recent assessment has found the species to be critically endangered in the Adriatic Sea as well, prompting the introduction of several protective regulations, the most important being the designation of the strictly protected species status in Croatia (Soldo & Lipej, 2022).

Taking into account the critically endangered status of the species, it is important to understand the changes in its abundance and distribution and prioritize the conservation efforts accordingly. Any information on the occurrence of this species in the Adriatic is valuable. This paper aims to present additional historical records of *C. carcharias* in the eastern Adriatic and thus update the list of its occurrences in this area since 1868.

MATERIAL AND METHODS

The new database of occurrences of the great white shark in the eastern Adriatic is based on the most comprehensive list published by Soldo & Jardas (2002a, 2002b), which includes records from 1868 until the end of the 20th century. Further investigation involved extensive bibliographic research of other currently available "grey literature", such as historical editions of various newspapers and personal reports written in different languages, e.g., Croatian, German (Austrian), Hungarian, Italian, and Albanian. For each observation, we followed Soldo & Jardas (2002a, 2002b) and recorded: date and location; total length; weight; sex; and type of record (capture, sighting, stomach content, fishing gear used).

The identification of the specimens was based on the most distinctive characteristics of the great white shark, which clearly set *C. carcharias* apart from other sharks and facilitate accurate species determination. One of the basic traits we focused on was the length

Tab. 1: The records of the great white shark, *Carcharodon carcharias*, ***in the Eastern Adriatic since 1868.***
Tab. 1: Zapisi o pojavljanju belega morskega volka *(Carcharodon carcharias)* ***v vzhodnem Jadranu od leta 1868.***

NO.	DATE	LOCATION	TL (cm)	WEIGHT (kg)	SEX	REMARKS
1	01.09.1868	Trieste	-	-	-	attack with fatal injury
2	14.09.1868	Jablanac	-	-	-	-
3	16.12.1868	Sv. Juraj	460	-	-	-
4	16.04.1872	Rijeka	490	-	-	man's head and leg and dolphin in stomach
5	19.04.1872	Trieste	300	-	-	-
6	12.05.1872	Opuzen	95	-	-	-
7	12.05.1872	Mljet	237	-	-	-
8	08.06.1872	Rijeka	131	-	-	-
9	16.06.1872	Dugi Otok	146	-	-	-
10	25.07.1872	Cavtat	260	-	-	-
11	08.08.1872	Rab	130	-	-	-
12	05.05.1877	Cres	460	-	-	-
13	08.05.1877	Cres	413	-	-	-
14	17.06.1878	Osor-Cres	371	-	-	-
15	09.08.1878	Poreč	-	-	-	-
16	21.05.1879	Osor	382	-	-	-
17	23.07.1879	Split	402	-	-	-
18	21.09.1879	Cres	530	-	-	-
19	05.10.1879	Gradac	250	-	-	-
20	22.04.1881	Rab	380	-	-	-
21	16.10.1881	Rab	405	-	-	-
22	13.04.1882	Cres	529	-	-	-
23	13.06.1883	Vrboska-Krk	300	-	-	-
24	26.09.1883	Rab	396	-	-	-
25	14.09.1885	Trieste	400	-	-	-
26	03.03.1886	Korčula	560	-	-	-
27	02.09.1887	Krk	470	-	-	-
28	July 1888	Sv. Juraj	470	-	-	woman's body and lamb in stomach
29	23.10. 1888	Sušak	500	3500	female	caught during tuna fishing, in stomach 7 unborn sharks and human remains
30	26.08. 1890	Senj	4,40 m	-	-	-
31	15.09.1890	Bakarac	3,84			
32	26.04.1891	Pag	-	-	-	preserved at Nat. Hist. Mus. Zagreb
33	September 1892	Bakarac	450	-	-	-
34	19.02.1893	Zlarin	165	-	male	-
35	29.08.1894	Bakar	-	-	-	preserved at Nat. Hist. Mus. Rijeka
36	15.07.1901	Dubrovnik	520	-	-	-
37	1901	Eastern Adriatic	500	-	-	-
38	1902	Trieste	375	-	male	-
39	30.09.1903	Povile	450	-	-	-
40	29.06.1906	Bakarac	522	-	female	-
41	June 1908	Trieste	-	1400	-	-
42	October 1909	Kraljevica	550	-	-	-
43	02.02.1920	Dugi Otok-Kornati	525	1300	-	dolphin in stomach
44	March 1926	Ugljan	500	700	-	noticed and the second shark
45	June 1926	Herceg Novi	300	-	-	woman's shoes, laundry in the stomach
46	August 1926	Lumbarda	400	500	-	human remains in the stomach
47	Summer 1926	Kraljevica	600	1000	-	several inedible objects in the stomach
48	October 1926	Lumbarda	600	1800	-	caught in gillnet
49	1931	Rogoznica	150	-	female	-
50	1934	Kraljevica	775	1100	-	caught in tuna gillnet
51	21.08.1934	Kraljevica	-	-	-	fatal attack
52	September 1934	Mošćenička Draga	600	1000	-	caught
53	20.07.1935	Lukovo	600	2500	-	caught in tuna gillnet
54	Summer of 1946	Bakarac	-	-	-	a pig of 10 kg in the stomach
55	May 1947	Eastern Adriatic	300	300	-	-
56	August 1950	Primošten	700-800	-	-	encounter during the eating of a dead calf
57	02.10.1954	Pag	550	1500	-	attack on boat
58	August 1955	Budva	-	-	-	fatal attack
59	1956	Krk	400	-	-	-
60	24.09. 1961	Opatija	-	-	-	fatal attack
61	22.10. 1963	Izola	600	1100	-	dolphin of 200 kg in the stomach
62	15.04.1964	Qeparo-Borsh, Himare,	445	>550	female	Caught in trammel net, the stomach empty
63	1968	Rava	-	-	-	-
64	1969	Central Adriatic	-	-	-	-
65	1971	Opatija	-	-	-	fatal attack
66	17.08.1972	Kornati	600	-	-	-
67	26.07.1973	Luka Šipanska	-	-	-	-
68	10.08.1974	Lokva Rogoznica	-	-	-	fatal attack
69	17.6.1976	Vrsi near Nin	-	-	-	killed by locals
70	25.06.2003	15 SI of island of Jabuka	570	2000-2500	female	caught during tuna purse seining
71	06.10.2008	Smokova Bay, island of Vis	cca. 450	-	-	non-fatal attack on speardiver

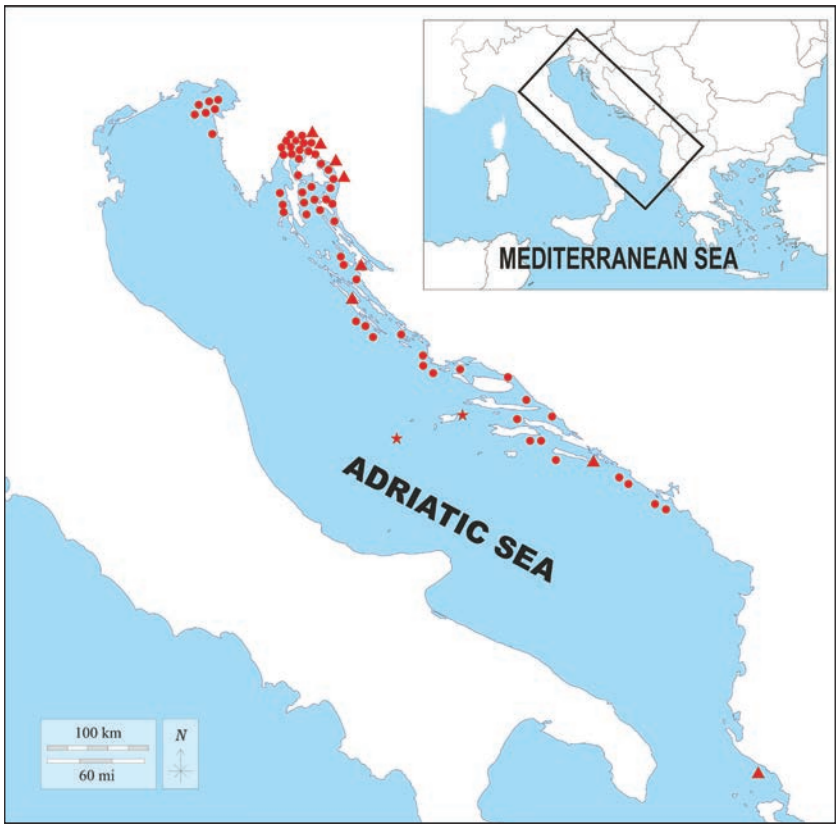

Fig. 1: Distribution of great white shark records in the eastern Adriatic. Red circles indicate previously published records, red triangles indicate new historical records dating from the 19th and 20th centuries, and red stars mark the locations of 21st century records.
Sl. 1: Razširjenost belega morskega volka na podlagi zapisov o pojavljanju v vzhodnem Jadranu. Rdeči krogci označujejo predhodno objavljene zapise o pojavljanju, rdeči trikotniki označujejo nove historične zapise o pojavljanju iz 19. in 20. stoletja, in rdeče zvezdice označujejo lokalitete, ki se nanašajo na zapise in 21. stoletja.

of the captured specimen, reported and/or visible from the available photo. Other indicative characteristics included the visible heavy spindle-shaped body and moderately long conical snout, as well as the broadly triangular and serrated teeth, an unmistakable feature of this species (Compagno, 2001; Ebert & Dando, 2021).

Only records in which these characteristics were reported and/or unquestionably visible were considered valid; reports in which the species of the specimen was not immediately determinable and could not be irrefutably verified were not listed, as the potential issues arising from reporting uncertain data were deemed more significant than any value gained from their inclusion.

RESULTS AND DISCUSSION

Since 1868, a total of 71 records of the great white shark have been reported for the eastern Adriatic (Tab. 1). The new list presented herein contains 10 additional records (Fig. 1) compared to the one previously published by Soldo & Jardas (2002a, 2002b), along with some newly available information that rectifies previous presumed data. This information, related to records no. 47 and 51 also cited by Soldo and Jardas (2002a, 200b), changes the previously reported date of catch from 1927 to 1926 in record no. 47, and further specifies the location of record no. 51, from 'nearby Sušak' to 'Kraljevica'. The correction to record no. 47 is based on an article published on 2 September 1926 in Austrian newspapers (Fig. 2), which described an event so similar to the one reported for 1927 that it was inferred to be the same, thereby suggesting that the catch likely occurred during the summer of 1926.

The first additional record (no. 29) is based on a newspaper article published on 23 October 1888, announcing the display of a 5-meter-long carcass weighing

Fig. 2: Photo of record no. 47.
Sl. 2: Fotografija v zvezi z zapisom št. 47.

3.5 tons, along with the price of the ticket. The article mentions that the shark was caught near Rijeka during tuna fishing and was killed by fishermen after getting entangled in a purse-seine. Further on, three rows of large triangular and serrated teeth are mentioned, along with other distinguishing and described characteristics (although the weight is probably overestimated). These point to the great white shark, one that was likely caught just a few days before the publishing date.

There are also 33 historical records dating to the last decades of the 19th and the beginning of the 20th century, more specifically to the period from 1872 to 1909, which have been reported by Klinger (2011). Some of these were previously cited by Soldo & Jardas (2002a, 2002b), and many are associated with tuna fishery, reporting sharks that were either caught during fishing or found entangled in tuna seines. It should be noted that Klinger himself (2011) questioned the homogeneity of the data and concluded that many of the records are likely unreliable, as a large number of them were essentially based on reports by Professor Giovanni (János) Matisz and not verified against any other source. Hence, the authors of this paper, reluctant to indiscriminately include all additional unsubstantiated records, decided to only include those which, along with the reported length, contained other information that could be attributed to the great white shark, such as the description of large triangular teeth (records no. 30, 31, and 39). Also, the records were reported for the larger area of Kvarner Bay, which has already been identified as a historical hotspot for the great white shark in the last decades of the 19th century and for the greater part of the 20th century. As explained, this was associated with intensive tuna fishing conducted in coastal areas at the time (Soldo & Jardas, 2002a, 2002b). There are several other available photos showing landed great white sharks, presumably from the wider area of Kvarner Bay and allegedly dating from the first half of the 20th century, but since they lack other corroborating information, these records were not included in the list either.

The record with most information is no. 62, which pertains to the great white shark caught on 15 April 1964, close to the coast of Qeparo-Borsh in Albania. It is based on morphological and biometric measurements performed by a researcher, Panajot Jorgji, who published that information in his personal report in the Albanian language. According to his data, the shark got entangled in a trammel net with a mesh size of 28 mm, at a depth of 5–6 m. At that time, this species of shark was highly uncommon on the Albanian coast and even more conspicuous for its dimensions. Panajot Jorgji measured its total length at 4.45 m and estimated a weight exceeding 550 kg. He also included a description of the shark, noting that its body was relatively slim along the main axes. The mouth was large, located on the underside of the head, 45 cm long and with a perimeter of 65 cm (bottom jaw). The snout length was 1.4 times larger than the mouth and 2.3 times larger than the mouth perimeter. The dorsal fin was triangular, measuring 0.5 m in height and 0.44 m in width at the base, which means that the base width was 1.1 times smaller than the height. Furthermore, Jorgji reported that the pectoral fins, located in the first third of the shark's body, were triangular in shape, with their base dimension 2.5 times smaller than the height of the triangle. The pelvic fins were located in the middle of the body, triangularly shaped and with the height 1.3 times larger than the triangle

Tab. 2: Measurement of the great white shark caught on 15th April 1964, close to the coast of Qeparo-Borsh near Himare on the Albanian coastline (translated from the Albanian language).
Tab. 2: Meritve belega morskega volka, ujetega 15. aprila 1964 blizu obale Qeparo-Borsh pri Himari na albanski obali (prevedeno iz albanskega jezika).

Total length	445 cm
Standard length	430 cm
Head length (Ceph.)	134 cm
Biggest height of the body (H)	50 cm
Smaller height of the body (h)	30 cm
Antedorsal (Antd)	180 cm
Anteventral (Antv)	265 cm
Anteanale (Anta)	330 cm
Snout length	28 cm
Base length of dorsal fin	44 cm
Height of the dorsal fin	50 cm
Base length of the pectoral fin	35 cm
Height of the pectoral fin	88 cm
Base length of the pelvic fin	43 cm
Height of the pelvic fin	58 cm
Base length of the anal fin	8 cm
Height of the anal fin	13 cm
Maximal width of the body (in the part where the pectoral fin begins)	85 cm
Minimal width of the body	12 cm

base. The triangular anal fins were relatively small, located close to the end part of the body, their height 2 times larger than the base. The caudal fin was composed of two parts, with the bottom part measuring about 2/3 of the upper part. The eye diameter equalled 1/7 of the snout length. Additional morphologic and biometric measurements were reported in Table 2.

The teeth of the upper jaw were described as being arranged in two rows attached to the base, with 14 teeth in each row. The teeth of the lower jaw were positioned in the same way and their number was also the same. The teeth were triangular in shape, with a 30 mm wide base and 38 mm long sides. Each tooth was serrated, resembling the edge of a saw. The distance between two teeth (at their highest points) in a row was 50 mm, while the distance between the rows measured up to 70 mm. The shark's body was dark on the dorsal and white on the ventral side. The skin was rough and thick. Underneath

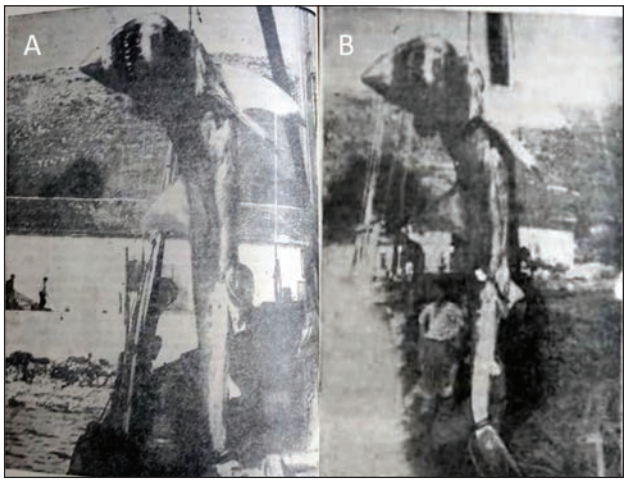

Fig. 3: Photos of record no. 62.
Sl. 3: Fotografija v zvezi z zapisom št. 62.

Fig. 4: Photo of record no. 63.
Sl. 4: Fotografija v zvezi z zapisom št. 63.

Fig. 5: Photo of record no. 67.
Sl. 5: Fotografija v zvezi z zapisom št. 67.

the skin, there was a stratum similar to a fatty layer, with a thickness of up to 2 cm.

The shark's stomach was empty, with no presence of any organisms observed inside. The specimen was identified as female. Based on the provided morphometric data, the researcher concluded that the shark belonged to the genus *Carcharhinus*. Indeed, although some of the characters were not measured or described according to contemporary standards, the description and the available photos (Fig. 3) undoubtedly correspond to those of the great white shark. It should be noted that this is the most recent documented record of the great white shark from the Albanian coast.

The additional record no. 63 is from 1968, but the exact date is not known. The available information refers to the catch of a great white shark on the NE coast of the island Rava (Fig. 4).

Another new record, no. 67, is related to the capture of a 4-meter-long great white shark near Luka Šipanska on the island of Šipan on 26 July 1973. Not many details are provided, apart from several photos and the information that many locals kept its large teeth as souvenirs (Fig. 5).

Record no. 69 refers to a male great white shark measuring 4.5 m in length, which was caught on 17 June 1976 in Vrsi near Nin. There are several accounts of this event, two differing in the date of the catch, one placing the record in 1978, the other one in 1975. Since the former was provided by persons involved in catching the shark themselves, it is considered more accurate. As all the accounts are similar, it can be presumed that they are all related to this single event. The great white shark entered a very shallow area where it was spotted by the locals. These eventually killed it and landed it on the

Fig. 6: Photo of record no. 69.
Sl. 6: Fotografija v zvezi z zapisom št. 69.

coast with the use of a tractor (Fig. 6). The shark's belly was cut open but, according to the available information, the stomach did not contain anything worth mentioning.

Subsequent to the latest list of records published by Soldo & Jardas (2002a, 2002b), two additional records were reported. The first (no. 70), reported and published by Soldo & Dulčić (2005), referred to a large female measuring 570 cm in length and weighing 2–2.5 tons, which was caught during tuna purse-seining on 24 June 2003. The second (no. 71) reported an attack by a great white shark on a spear diver that occurred on 6 October 2008 on the island of Vis. It seems that the great white shark was attracted to the fish caught by the spear diver, whom it then bit on the leg. Luckily, the spear diver was quickly transported to the hospital, where he recovered after a long treatment. Teeth particles extracted from the bitten leg were examined (Fig. 7) by one of the authors of this paper (A. Soldo), who confirmed that the attack was carried out by a great white shark.

Apart from these new verified records, others have been reported over the past two decades and all of them were again related to tunas, either of sharks seen feeding on tuna or following or swimming in the vicinity of a school of tunas. However, since these reports were not substantiated with additional evidence (reliable photo or video) or the available evidence was inconclusive (photos not allowing proper identification), they were

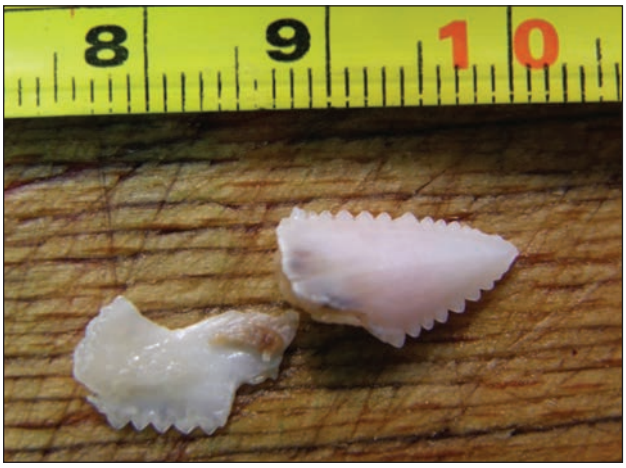

Fig. 7: Photo of teeth particles related to record no. 71.
Sl. 7: Fotografija zobnih partiklov, ki se nanašajo na zapis št. 71.

not included in the list. Interestingly, despite advancements in information technologies, the records reported in recent times are not always more accurate and validated, as would be expected. In fact, the same errors are frequently made, with plain misidentification being particularly common (Casey & Pratt, 1985). Typically, the mistake consists in confusing the great white shark with its close relatives, the shortfin mako *Isurus oxyrinchus*, Rafinesque, 1810, or the porbeagle *Lamna nasus* (Bonnaterre, 1788), and erroneously reporting them as juvenile great white sharks. Such misidentifications are not only suspected in historical records, which cannot be verified anymore without any additional data, but are even discovered in contemporary records. For example, in the recently reported case of a porbeagle caught near Šibenik on 14 September 2023. Porbeagles are rarely but typically caught in that area, and a careful examination of the available photos confirmed it was indeed another case of a porbeagle. However, in many media the specimen was reported as a juvenile great white shark, which would have been the first record of a juvenile in the Adriatic Sea ever. In the beginning of the 20th century, a sudden increase in the records of basking shark *Cetorhinus maximus* (Gunnerus, 1765) was observed in the northern Adriatic, and probably due to its size, the species was mistakenly reported as the great white shark at the time (Soldo *et al*., 2008). Nowadays, the general public is better educated about the basking shark, so mistakes in identification are much fewer. As for historical records, given the absence of any confirmable data, we will never know for sure how many reports of the great white shark were actually of the basking shark or some other species. Considering that even nowadays, numerous new records of different shark species are being published without verification, Soldo and Lipej (2024) encourage authors to refrain from making tentative identifications of species and publishing arbitrary observations in the absence of verified evidence. This would avoid adding to the confusion surrounding the status of sharks in the Mediterranean, which is particularly important for species such as the great white shark, where such records are usually the only source of data used to interpret their population patterns.

Soldo & Jardas (2002a, 2002b) assumed that as tuna fishing activities gradually declined near the Adriatic coast in the late 20th century and shifted more towards open sea areas, new discoveries of great white sharks would occur in the open sea, where tuna now mainly live, while previously known areas of high abundance of the great white shark, such as Kvarner Bay, would lose their importance. Reports in the 21st century, both verified and unverified, seem to confirm that assumption. Interestingly, since the beginning of the 21th century, the tuna farming industry has developed in the eastern Adriatic, but there have been no reports yet of white shark sightings around the tuna cages. The reason may be the fact that their location is near the coast; however, based on the same set of data, some authors suggest that this is rather the result of a significant decline in the great white shark population in the eastern Adriatic. They estimate a 3- to 20-fold decline (median estimate = 8) in population abundance from 1868 to 1970 and an 84% decrease over three generations (McPherson & Myers, 2009). However, McPherson & Myers (2009) also argue that interpretations of high declines do not take into account an important predator-prey interaction between the great white shark and tunas. This raises a new question: are the reported population declines real, or have they been influenced, fully or in part, by a relocation of the great white shark populations due to changes in tuna distribution? The answer to this question is obviously very important, not only for the Adriatic Sea, but for the Mediterranean as a whole. Therefore, further studies are needed to address this issue and find an accurate answer that would explain the true conservation status of this charismatic species in the Mediterranean.

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DODATNI HISTORIČNI ZAPISI O POJAVLJANJU BELEGA MORSKEGA VOLKA, *CARCHARODON CARCHARIAS* (LAMNIFORMES: LAMNIDAE) V VZHODNEM JADRANSKEM MORJU: AKTUALNO REGIONALNO POJAVLJANJE KRITIČNO OGROŽENE VRSTE

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POVZETEK

Avtorja predstavljata dodatne historične zapise o pojavljanju belega morskega volka v vzhodnem Jadranu in ponujata posodobljen seznam pojavljanja vrste na tem območju od leta 1868 naprej. Od objave zadnjega seznama iz leta 2002 je bilo na podlagi razpoložljivih podatkov dodanih 10 novih zapisov o pojavljanju. Od teh jih 8 sega v 19. in 20. stoletje, druga dva pa sta iz 21. stoletja.

Ključne besede: *Carcharodon carcharias*, beli morski volk, pojavljanje, Jadransko morje

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