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OCCURRENCE OF THE BASKING SHARK, *CETORHINUS MAXIMUS* (GÜNNERUS, 1765), IN THE WATERS OFF PIRAN (GULF OF TRIESTE, NORTHERN ADRIATIC)

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ABSTRACT

Two juvenile basking sharks (Cetorhinus maximus) were accidentally caught in the waters off Piran, Slovenia, in the summer of 2000. One specimen was entrapped in special nets for small sharks (Mustelus), while the other was caught in a flatfish net. Some information about the data on this shark species is dealt with in this article.

Key words: *Cetorhinus maximus*, basking shark, occurrence, Gulf of Trieste, Northern Adriatic

RITROVAMENTO DELLO SQUALO ELEFANTE, *CETORHINUS MAXIMUS* (GÜNNERUS, 1765) AL LARGO DI PIRANO (GOLFO DI TRIESTE, NORD ADRIATICO)

SINTESI

Due giovani esemplari di squalo elefante (Cetorhinus maximus) sono stati accidentalmente catturati al largo di Pirano, Slovenia, nell'estate del 2000. Il primo esemplare è rimasto intrappolato in speciali reti per piccoli squali (Mustelus), mentre il secondo è stato catturato con la rete per sogliole e passere. Nell'articolo vengono presentati alcuni dati inerenti questa specie di squalo.

Parole chiave: *Cetorhinus maximus*, squalo elefante, ritrovamento, Slovenia, Nord Adriatico

INTRODUCTION

The basking shark *Cetorhinus maximus* (Günnerus, 1765) is the biggest Mediterranean shark (Fig. 1), for it can reach more than 9 m in length, according to some authors even more than 15 m (Quéro, 1984). It is a typical planktivorous shark, actively foraging to locate productive zooplankton patches (Sims & Merrett, 1997). In the Adriatic Sea, the basking shark is considered to be a relatively rare and occasional species (Jardas, 1996). According to some of the available reports from the 19th century (Naccari, Nardo, Mertens, Perugia, Ninni, Trois, Doderlein, Faber, Brusina, Stossich, Valle), this species was considered to be quite accidental in the Adriatic at that time as well (Brusina, 1888; Barrul & Mate, 1999).

At least 30 records on the occurrence of the basking shark have been published to date in the scientific literature as caught or sighted in the eastern part of the Adriatic, but the bulk of them have been made during the 20th century (Soldo & Jardas, 2000). Compagno (1984) considered this shark to be more vulnerable to overfishing than other shark species. According to the UK Basking shark Proposal of the Department of the Environment, Transport and the Regions (www.wildlife-countryside.detr.gov.uk/gwd/shark), the basking shark has been subjected to unsustainable fisheries, which resulted in population collapse in the last decades. Basking shark is included in the list of animal species in the Slovenian *Decree on Protection of Threatened Animal Species* (1993). This shark also appears in the *List of endangered or threatened species in the Mediterranean* according to Annex II in the new SPA protocol (UNEP(OCA)/MED WG.149/3)).

The present article is our contribution to the Slovenian ichthyological bibliography, which happens to be extremely scarce as far as shark data are concerned.

METHODS

Basking sharks were measured and photographed immediately after the fishing boat docked in the Piran harbour. Body measurements were taken with hand meter to the closest cm according to the guidelines by Compagno (1984) (Fig. 2). Unfortunately, both specimens were sold at the fish market in Piran. The collection of photographs of both juveniles is kept at the Marine Biological Station in Piran.

RESULTS AND DISCUSSION

On May 22nd 2000, a juvenile male basking shark was caught in a special "cagnolara" net for small sharks (mainly species from the genus *Mustelus*) in the waters some 7 nm NW off Piran (Fig. 3). It was 299 cm long and weighing approximately 120 kg. After some minutes of exposure, the fish was cut by fisherman into pieces and sold at the Piran fish market.

On July 19th 2000, another male basking shark was caught with a special "passalera" flatfish net in the waters 6.4 nm off the town of Piran (Fig. 4). The shark was accidentally entangled in the net and successively transported to the Piran harbour, where it was sold at the fish market. This shark was 249 cm long and weighed approximately 70 kg. The data on morphometric measurements of both specimens are presented in table 1.

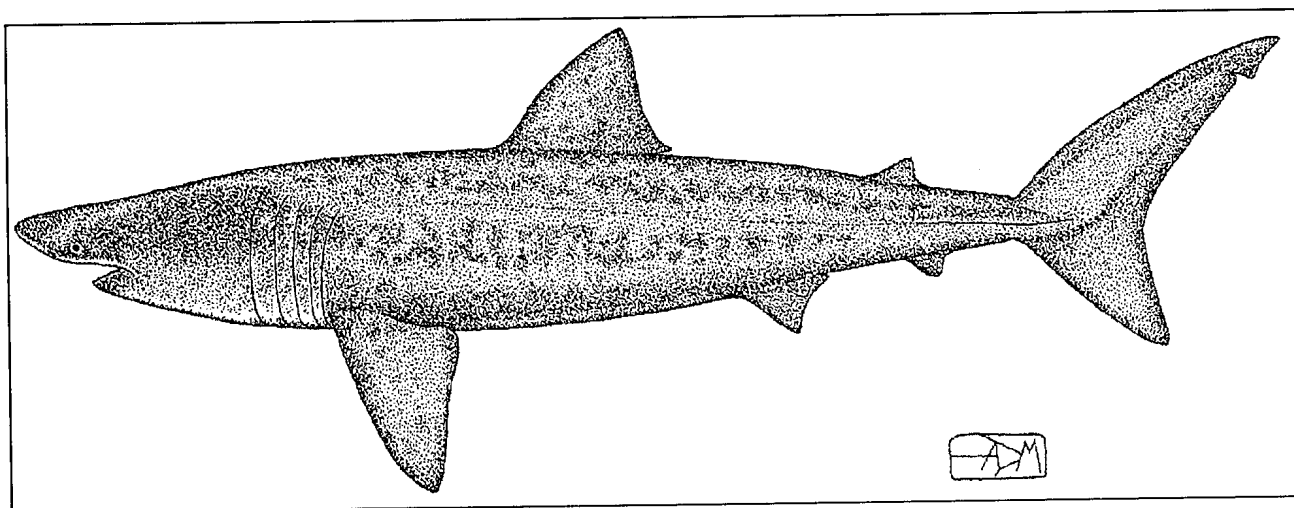


Fig. 1: Basking shark *Cetorhinus maximus* (Drawing by A. De Maddalena).
Sl. 1: Morski pes orjak (*Cetorhinus maximus*) (Risba: A. De Maddalena).

Tab. 1: Biometric measurements (in cm) of two juvenile basking sharks caught in the Gulf of Trieste in May (1) and July 2000 (2).

Tab. 1: Biometrične meritve (v cm) dveh ujetih mladičev morskega psa orjaka v Tržaškem zalivu maja (1) in julija 2000 (2).

Morphometric characteristics (cm)	1	2
1. Total length	299	249
2. Fork length	254	-
3. Precaudal length	236	195
4. First dorsal length	29	25
6. First dorsal anterior margin	32,5	26
5. First dorsal height	26	21
7. Second dorsal length	9	9
8. Second dorsal anterior margin	11	10
9. Second dorsal height	10	7
10. Dorsal caudal margin	63	55
11. Pectoral anterior margin	43	38
12. Pectoral posterior margin	28	21
13. Pelvic anterior margin	-	16
14. Pelvic length	23	20
15. Pelvic height	23	14
16. Anal anterior margin	-	9
17. Anal length	-	5,5
18. Anal height	-	6

The size of the newborn basking sharks is unknown and the smallest recovered specimen measured 165 cm (Compagno, 1984). By comparing our data with the data of Izawa & Shibata (1993), the smaller specimen in our study could be estimated as approximately 6 months old. Juveniles below 3 m were reported to be extremely rare in the scientific literature (*sensu* Compagno, 1984). At least six other juveniles (250, 265, 310, 320, 350 and 392 cm) have been previously reported according to the up-to-date records of basking sharks in the Adriatic Sea (Soldo & Jardas, 2000). One of these juveniles, the 3.92 m specimen, was also caught in the small "passalera" net used for flatfish about 400 metres off the coast of Trieste (Bussani, 1974). Sims *et al.* (1997) reported that basking sharks smaller than 3 m in size occurred in the summer. Bigger specimens were more frequent in springtime in the waters off Plymouth, directly after the increase of zooplankton density in May.

According to Bussani's report (1986) on the *Ichthyofauna of the marine sanctuary Miramare near Trieste*, these sharks are quite often caught in flatfish nets. It is interesting that the gut dissection of a 6m long shark caught in the sanctuary and referred to in his report (unfortunately no data regarding the year of the capture and others details of the shark were mentioned) proved that the basking shark feeds on small clupeids (*Sprattus sprattus*). In May 1991, Roberto Odorico (*pers. comm.*) observed, at the very same locality off Miramare, a 6 m long basking shark feeding on a huge school of *Atherina* spp.

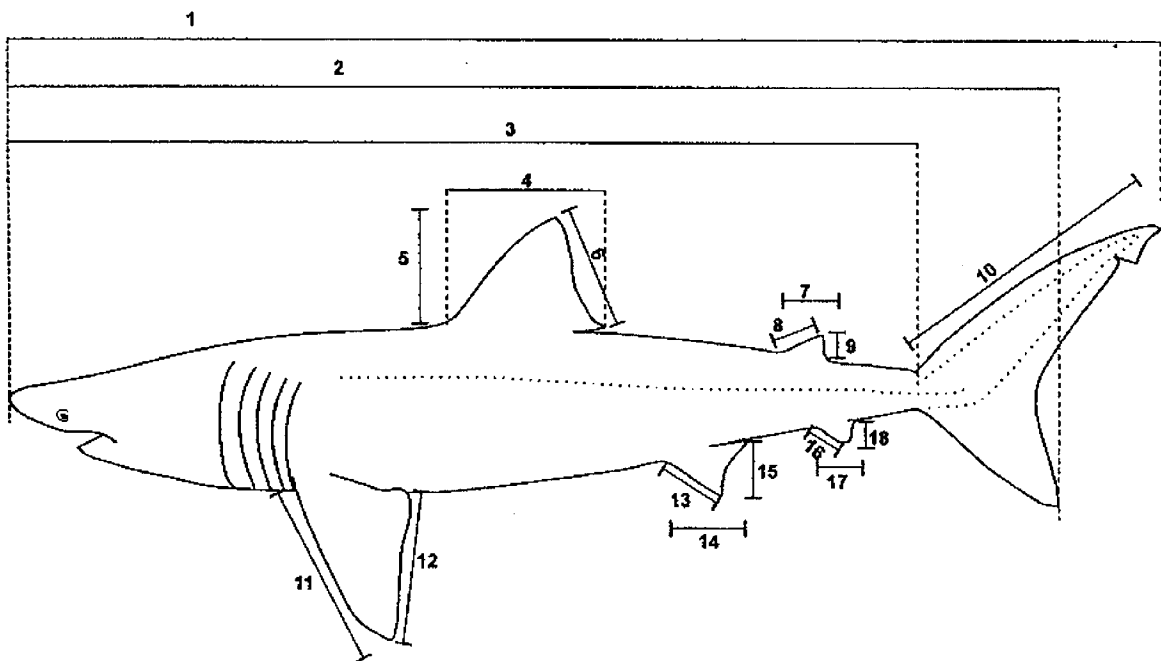


Fig. 2: Morphometric measurements (sensu Compagno, 1984).

Sl. 2: Morfometrične meritve (privzete po Compagno, 1984).

Tab. 2: Some recent records of the basking shark in the Adriatic (Legend: GT - Gulf of Trieste, NA - Northern Adriatic, MA - Middle Adriatic, SA - Southern Adriatic).

Tab. 2: Novejši podatki o pojavljanju morskega psa orjaka v Jadranskem morju (Legenda: GT - Tržaški zaliv, NA - severni Jadran, MA - srednji Jadran, SA - južni Jadran).

Year	Locus	Area	Length (cm)	Source
1968	Ston	SA	250	Soldo & Jardas (2000)
1974	Trieste	GT	392	Bussani (1974)
1980	Molat	MA	550	Miličić (1994)
1981	Ičići	NA	265	Soldo & Jardas (2000)
1985	Opatija	NA	647	Miličić (1994)
1991	Ičići	NA	app.600	Kovačić (1993)
1991	Miramare near Trieste	GT	app. 600	Perco (1993)
1994	Mola di Bari	SA	430	Bello (1999)
1995	Island of Ugljan	MA	700	Dulčić (1997)
1997	Bitonto (Apulia)	SA	juvenile	Bello (1999)
1999	Osobljava (Pelješac)	SA	722	Soldo <i>et al.</i> (1999)
2000	Pula	NA	770	Dulčić (<i>pers. comm.</i>)
2000	Blitvenica	MA	850	Dulčić (<i>pers. comm.</i>)
2000	Piran	GT	299	This report
2000	Piran	GT	249	This report



Fig. 3: Juvenile basking shark caught on 22nd May 2000 in the waters off Piran (Photo: T. Makovec).

Sl. 3: Mladič morskega psa orjaka, ujet 22. maja 2000 v vodah nedaleč od Pirana (Foto: T. Makovec).



Fig. 4: Juvenile basking shark caught on 19th July 2000 in the waters off Piran (Photo: T. Makovec).

Sl. 4: Mladič morskega psa orjaka, ujet 19. julija 2000 v vodah nedaleč od Pirana (Foto: T. Makovec).

To our opinion, the number of records would be much higher if the information regarding sightings and captures of basking sharks reached ichthyologists. Bello (1999) reported about a butchered juvenile Basking shark caught off the Apulian coast in the Southern Adriatic (Tab. 2).

In a comprehensive survey, Barrull & Mate (1999) collected data on 165 basking sharks from documented records in the scientific literature covering the entire Mediterranean. Analysing the collected data, the authors reached the conclusion that basking sharks were more frequently caught in May and June. The two smallest specimens, both caught off the western Italian coasts, measured 150 cm, whereas the larger Mediterranean shark caught measured 1300 cm (Barrull & Mate, 1999). In order to establish the ratio of specimens lower than 3 m in size, we complemented these data with those of Soldo & Jardas (2000) and our records. From 149 records of the measured basking sharks (*e.g.* where data

on size exist) recorded from the Mediterranean in the 1795-2000 period, almost half of them (44.3%) are smaller than 400 cm (Fig. 5) and almost a fifth of them (18.8%) smaller than 300 cm. On the basis of the high number of juveniles lower than 300 cm recorded in their study, Barrull & Mate (1999) believe that there is a possibility that the basking shark gives birth in the Mediterranean.

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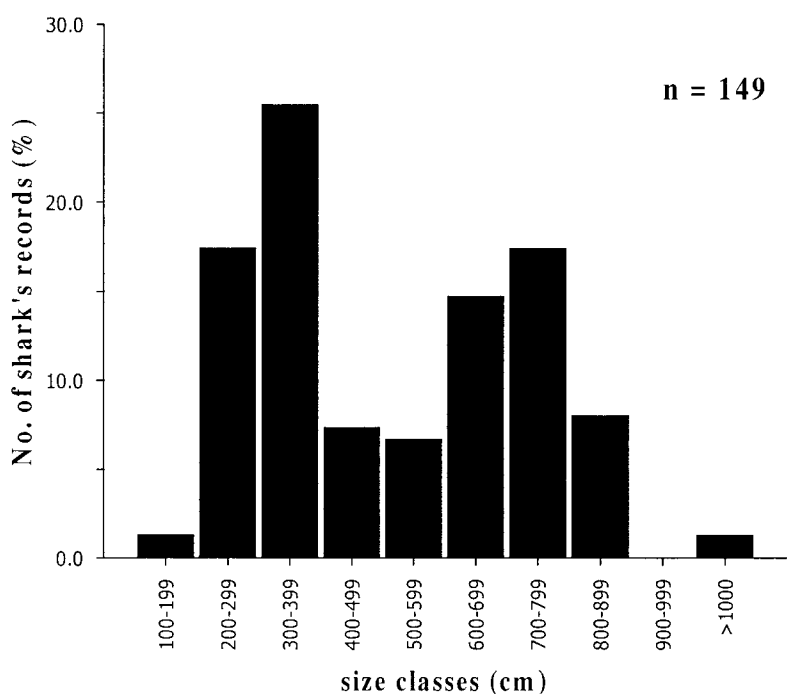


Fig. 5: Size distribution of basking sharks recorded ($n=149$) in the Mediterranean from 1795 to 2000. The bulk of the data was obtained from Barrull & Mate (1999), while data missing in their work were complemented with those according to Soldo & Jardas (2000) and our data.

Sl. 5: Velikostna porazdelitev v obdobju 1795-2000 dokumentiranih osebkov morskega psa orjaka ($n = 149$), ujetih ali opaženih v Sredozemskem morju. Večina podatkov izvira iz prispevka Barrull & Mate (1999), v tamkajšnjem delu manjkajoče podatke pa smo povzeli po Soldo & Jardas (2000) ter vključili še naše podatke.

POJAVLJANJE MORSKEGA PSA ORJAKA *CETORHINUS MAXIMUS* (GÜNNERUS, 1765)
V VODAH NEDALEČ OD PIRANA (TRŽAŠKI ZALIV, SEVERNI JADRAN)

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POVZETEK

Morski pes orjak (*Cetorhinus maximus*) je druga največja vrsta morskega psa, ki lahko zraste tudi do 15 m. V letu 2000 sta se v vodah nedaleč od Pirana v ribiške mreže piranskih ribičev ujela dva mladiča morskega psa orjaka. Prvi je bil ulovljen 22. maja 2000 v posebno ribiško mrežo, prirejeno za lov majhnih morskih psov iz rodu *Mustelus*. Meril je 299 cm in tehtal okoli 120 kg. Drugi, ki so ga ujeli 19. julija 2000 v mrežo za bokoplavutarice, pa je meril 249 cm in tehtal okoli 70 kg. Podatki o tej vrsti morskega psa so v Jadranskem morju redki, saj je bilo doslej zabeleženih le kakih 30 primerov pojavljanja, za slovenski del Jadrana pa je to sploh prvi zapis o pojavljanju te vrste.

V Sredozemskem morju je bilo doslej evidentiranih 188 podatkov o morskem psu orjaku, od katerih je kar 44,3% manjših od 4 metrov, torej mladičev. Velika večina teh psov je bila ujetih v maju in juniju.

Glede na to, da gre za vrsto, ki je v slovenskem in tudi sredozemskem merilu zavarovana, je dejstvo, da sta oba primerka končala v ribarnici, vredno vsega obžalovanja.

Ključne besede: *Cetorhinus maximus*, morski pes orjak, pojavljanje, severni Jadran

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