

On the record of the sandbar shark *Carcharhinus plumbeus* Nardo, 1827 (Carcharhiniformes: Carcharhinidae) in the middle Adriatic Sea

Branko DRAGIČEVIĆ¹, Jakov DULČIĆ¹ and Lovrenc LIPEJ^{2*}

¹*Institute of Oceanography and Fisheries, P.O. Box 500, Split, Croatia*

²*Marine Biology Station, National Institute of Biology, Fornače 41, 6330 Piran, Slovenia*

**Corresponding author, e-mail: lipej@mbss.org*

*This paper deals with a new record of a neonatal specimen of *Carcharhinus plumbeus* Nardo, 1827 which was collected in the middle Adriatic. This specimen probably originates from the nursery area which is located in the northern Adriatic. Evaluating the status of such a sensitive species, especially in nursery areas, represents an essential basis for their successful protection.*

Key words: *Carcharhinus plumbeus*, Adriatic Sea, neonatal specimen, Chondrichthyes

INTRODUCTION

Nowadays, many shark species are facing the danger of extinction. The most important factors causing the decline of shark populations are by-catch and over-exploitation of marine fish resources, known to be preyed on by sharks. Some shark species which are fished commercially are severely over-exploited. They are vulnerable mostly because of their biological peculiarities such as long sexual maturation, low fecundity, long gestation and low rates of reproduction (LIPEJ *et al.*, 2004).

The sandbar shark *Carcharhinus plumbeus* (Nardo, 1827) is a medium-sized shark species known to occur in temperate and tropical waters of the Atlantic and Indo-pacific oceans. It is also native to the Mediterranean Sea throughout which it used to be distributed. However, nowadays this species seems to have disap-

peared from many areas such as the coast of France (CAPAPÉ *et al.*, 2000). Indeed, according to MUSICK *et al.* (2007), *Carcharhinus plumbeus* is considered endangered in the Mediterranean although, unlike Australian and US stocks, this species is not subject to management.

It is a bottom-dwelling fish rarely seen at the surface. It inhabits continental and insular shelves and can be found at depths from 0 to at least 315 m. The birth takes place in shallow waters where neonates continue their nursery period (LIPEJ *et al.*, 2004).

Although there are different opinions about the status of *C. plumbeus* in the Adriatic Sea, this species is probably less rare than previous records suggested (see LIPEJ *et al.*, 2000 for evidence from older records). This is especially true for the area of the northern Adriatic which yielded almost all recent records of this species. The presence of the sandbar shark in the Gulf

of Trieste has been previously reported by LIPEJ *et al.* (2000), COSTANTINI & AFFRONTI (2003) and LIPEJ *et al.* (2008). Their reports relate to the capture of nine neonate sandbar sharks in the northern Adriatic Sea that measure from 465 to 815 mm in total length. However, based on scarce data about this species in the northern Adriatic and Adriatic as a whole it is impossible to assess the real status of the sandbar shark in the area.

In this report we describe a new record of a neonatal specimen of the sandbar shark from the middle Adriatic Sea.

MATERIAL AND METHODS

A specimen of a neonatal sandbar shark was captured in waters off Zaostrog in the middle Adriatic on 23 November 2009 (Fig 1.). It was caught on a long line at a depth of 20-30 meters. The specimen was identified according to description given by COMPAGNO (1984).



Body measurements of the sandbar shark were taken with a hand meter and caliper to the nearest 0.5 cm and to the nearest millimeter, respectively. All measurements were taken according to the guidelines of COMPAGNO (1984). Afterwards, the specimen was weighed to the nearest gram. Morphometric measurements are presented in Table 1. After examination, the specimen was sent to a taxidermist and its skinmount is currently housed in a private collection.

RESULTS AND DISCUSSION

The specimen of sandbar shark was a female which measured 78.5 cm and weighed 3650 g (Fig 2.), which is similar in length to specimens from the northern Adriatic, especially to those from the Gulf of Piran. The weight and length fall well within the length-weight relationship interval given by LIPEJ *et al.* (2008) and morphometric measurements are similar to those provided by LIPEJ *et al.* (2000). According to COMPAGNO (1984), the size at birth ranges from 56-75 cm and we conclude that our specimen was probably neonatal since the umbilical scar was still visible. LIPEJ *et al.* (2008) stated that parturition time in the Adriatic takes place in late summer and autumn period which is in agreement with the present finding.

Although it was believed that this species is rare in the Adriatic in previous years, in the last ten years there has been quite a few reports on

Fig. 1. Locality of the record of the sandbar shark in the middle Adriatic Sea



Fig. 2. A female specimen of *Carcharhinus plumbeus* from the middle Adriatic (Photo: Neven Alač)

Table 1. Measurements of the sandbar shark *Carcharhinus plumbeus* (Nardo, 1827) caught off Zaostrug, Croatia (Middle Adriatic). All measurements are given in centimeters

	cm	% TL
Total length (TL)	78.5	100
Fork length	63.8	81.3
Precaudal length	57.4	73.1
Pre-second dorsal length	49.0	62.4
Pre-first dorsal length	23.5	29.9
Head length	19.4	24.7
Prebranchial length	15.7	20
Preorbital length	6.5	8.3
Interdorsal space	17.4	22.2
Dorsal-caudal space	5.3	6.75
Prepectoral length	18.5	23.6
Prepelvic length	39.5	50.3
Pectoral-pelvic space	16.5	21
Pelvic-anal space	6.5	8.3
Pelvic-caudal space	13.8	17.6
Preanal length	51.1	65.1
Prenarial length	3.4	4.3
Preoral length	6.4	8.2
Eye length	1.0	1.3
Eye height	1.1	1.4
Intergill length	4.3	5.5
Pectoral anterior margin	13.5	17.2
Pectoral posterior margin	11.4	14.5
Pectoral base	5.6	7.1
Pectoral inner margin	5.0	6.4
Pectoral length	11.1	14.1
Pectoral height	12.3	15.7
First dorsal anterior margin	10.5	13.4
First dorsal posterior margin	9	11.5
First dorsal base	9.9	12.6
First dorsal length	13.2	16.8
First dorsal height	8.0	10.2
Second dorsal anterior margin	3.3	4.2
Second dorsal posterior margin	4.1	5.2

	cm	% TL
Second dorsal base	3.3	4.2
Second dorsal length	6.3	8.0
Second dorsal height	2.4	3.1
Pelvic anterior margin	4.6	5.9
Pelvic posterior margin	5.2	6.6
Pelvic base	4.6	5.9
Pelvic inner margin length	2.7	3.4
Pelvic length	6.5	8.3
Pelvic height	3.6	4.6
Anal anterior margin	5.1	6.5
Anal posterior margin	3.4	4.3
Anal base	3.7	4.7
Anal length	6.3	8.0
Anal height	2.8	3.6
Dorsal caudal margin	20.5	26.1
Preventral caudal margin	7.9	10.1
Lower postventral caudal margin	3.8	4.8
Caudal fork length	6.3	8.0
Upper postventral caudal margin	12.3	15.7
Caudal fork width	6.3	8.0
Terminal caudal margin	4.8	6.1
Terminal caudal lobe	5.4	6.9
Internarial space	4.9	6.2
Mouth width	6.9	8.8
Head height	11	14.0
Trunk height	12.4	15.8
Abdomen height	12	15.3
Tail height	8.1	10.3
Caudal peduncle height	3.2	4.1
Interorbital space	8.5	10.8
Head width	10.7	13.6
Trunk width	10.3	13.1
Weight	3650 g	

occurrences of neonatal and juvenile specimens of sandbar sharks. Interestingly, all these reports related to specimens caught in the northern Adriatic which, as suggested by LIPEJ *et al.* (2008), is a nursery area for this species. This fact is also supported by the capture of a pregnant female carrying nine embryos in the northern Adriatic (COSTANTINI & AFFRONTE, 2003). The greater number of records over the past few years could be a consequence of greater interest in this spe-

cies and a greater number of ichthyological surveys in the area rather than a recent arrival of the species. However, the status of this species in the middle Adriatic is still doubtful. Although scientific literature reports that this species is rare in this part of the Adriatic, we were unable to locate any record of the Sandbar shark from this area. Additionally, KIRINČIĆ & LEPETIĆ (1955) report on the catch of a single specimen of this species in the southern Adriatic. The speci-

men was collected on 28 May 1952 at a location south of Dubrovnik at a depth of 100 meters. It was a 123 cm long female weighing 10.3 kg.

Our finding provides further evidence that neonatal specimens could also be found along the coast of the middle Adriatic. Although it is difficult to establish whether the specimen originated from the northern Adriatic or was born somewhere in the studied area in the middle Adriatic, the fact that it was caught in late autumn, while almost all specimens from the northern Adriatic were collected in earlier months, could be explained as a continuation of the nursery period along with southward movement which could have been triggered by water cooling in northern parts.

Lately, many shark species seem to disappear very rapidly worldwide. The same is also true for the Adriatic Sea, as shown recently by JARDAS *et al.* (2008) in the Red Book of Sea Fishes of Croatia. Therefore, evaluating the status of such a sensitive species, especially in nursery areas, represents an essential basis for their successful protection.

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O nalazu morskog psa tupana *Carcharhinus plumbeus* Nardo, 1827 (Carcharhiniformes: Carcharhinidae) u srednjem Jadranu

Branko DRAGIČEVIĆ¹, Jakov DULČIĆ¹ i Lovrenc LIPEJ^{2*}

¹*Institut za oceanografiju i ribarstvo, P.P. 500, Split, Hrvatska*

²*Morska biološka postaja, Nacionalni institut za biologiju, Piran, Slovenija*

**Kontakt adresa, e-mail: lipej@mbss.org*

SAŽETAK

U radu se opisuje nalaz mladunca morskog psa tupana, *Carcharhinus plumbeus* Nardo, 1827, ulovljenog u srednjem Jadranu. Primjerak vjerojatno potječe iz područja Sjevernog Jadrana koje je ujedno i rastilište ove vrste. Poznavanje statusa osjetljivih vrsta, poglavito u područjima koja su od važnosti za rane životne stadije, predstavlja temelj za njihovu uspješnu zaštitu.

Ključne riječi: *Carcharhinus plumbeus*, Jadransko more, mladunac, Chondrichthyes

