FIRST RECORD OF LITTLE SLEEPER SHARK, SOMNIOSUS ROSTRATUS (ELASMOBRANCHII: SQUALIFORMES: SOMNIOSIDAE), FROM THE TUNISIAN COAST, CENTRAL MEDITERRANEAN SEA

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Abstract. The first record of the little sleeper shark, Somniosus rostratus (Risso, 1827), from the Tunisian coast, is presented in this note. It was an adult female measuring 990 mm total length and weighing 4500 g. The capture occurred off Ras Jebel located in north-eastern Tunisia at a depth of 120 m. The specimen is herein described including morphological measurements, color, and dental formula. Due to a lack of records, the real status of the species in the Mediterranean Sea remains questionable. Somniosus rostratus is rarely caught in this sea because it lives in deep bottoms poorly exploited by commercial vessels. However, recent captures of specimens and occurrence of nursery grounds suggest that a viable population of S. rostratus is probably established in this sea.

Keywords: description, morphometric measurements, dental formula, deep bottoms, fragmented distribution, nursery grounds

INTRODUCTION

Little sleeper shark, Somniosus rostratus (Risso, 1827), is known in the eastern Atlantic from the Bay of Biscay, reported as its junior synonym S. bauchotae by Quéro (1976), from the northern coast of Spain (Bañon et al. 2010) and the coast of Portugal (Mc Eachran and Branstetter 1984, Carneiro et al. 2019). South of the Strait of Gibraltar, the species is known off Morocco (Lloris and Rucabado 1998), but not recorded southward off the western coast of Africa, from Mauritania (Maigret and Ly 1986) and Senegal (Capapé et al. 1994, Diatta et al. 2019). Conversely, S. rostratus is reported in the waters surrounding the Azores (Barcelos et al. 2019), Madeira (Biscoito et al. 2018), and the Canaries (Brito et al. 2002). The species is possibly caught from the western Atlantic, off Cuba (Ebert and Stehmann 2013), but Pacific records were probably based on a misidentification (Yano et al. 2004).

Somniosus rostratus occurs in the Mediterranean, especially in the western Basin where it was recorded for the first time, off Nice, southern France (Risso 1826, Moreau 1881). The species was found in the Gulf of Genoa, in the waters surrounding Sicily Island (Tortonese 1956), off the Ligurian coast (Cigala-Fulgosi and Gandolfi 1983), and in the north-western Ionian Sea (Capezzuto et al. 2010). Westwards, S. rostratus was reported from the Catalan Sea (Barrul and Mate 2001, Barría et al. 2015), the Gulf of Lions (Barría et al. 2015), and between the Balearic Islands and the Spanish coast (De Loyola Fernández et al. 2017).

Somniosus rostratus was previously reported as rare from the Algerian coast (Dieuzeide et al. 1953), but investigations conducted off Algiers, in the central region, allowed to collect 19 specimens (Kheddam et al. 2016). Conversely, S. rostratus remains unknown to date from the eastern Algerian coast (Refes et al. 2010). The
species was recorded from the Central Mediterranean Sea, in the waters surrounding Malta (Vella et al. 2013), and the presently reported specimen from the Tunisian coast. Additionally, *S. rostratus* was recorded in the Aegean Sea (Economidis 1973), the Levant Basin, off Haifa (Golani 1986), and from the coast of Syria (Ali and Saad 2003). The Tunisian specimen of *Somniosus rostratus* is described in this paper with comments on its distribution in the area and the wide Mediterranean Sea.

**MATERIAL AND METHODS**

Information on the capture on *Somniosus rostratus* was provided by an experienced fisherman. The help of local communities was considered by researchers to enlarge and improve attention in fisheries research, referred to as local ecological knowledge (sensu Anadón et al. 2009). The description of the specimen in the present paper follows Bello et al. (2014) for first records.

On 16 May 2019, a specimen of *Somniosus rostratus* was caught by commercial trawler off Ras Jebel (37°31′28″N, 10°17′10″E) (see Fig. 1). It was collected at a depth of 120 m, on rocky bottoms, together with shoals of smooth hound, *Mustelus mustelus* (Linnaeus 1758). All morphometric measurements were carried out using digital caliper to the nearest 1 mm following Compagno (1984), the weight was determined to the nearest 0.1 g, included in Table 1, together with the dental formula. The specimen was fixed in 10% buffered formalin, preserved in 75% ethanol, and deposited in the Ichthyological Collection of the Institut Supérieur d’Aquaculture et de Pêche of Bizerte (Tunisia), receiving the catalog number ISPAB-Som-rost-01.

**RESULTS AND DISCUSSION**

The presently reported specimen was identified as *Somniosus rostratus* based on a combination of the following characters (Fig. 2A): head short; snout short and broadly rounded; no fin spines on both dorsal fins; no anal fin; insertion of first dorsal fin closer to pectoral bases than pelvic bases; interdorsal space greater than distance from snout to second gill slits; second dorsal origin above end of pelvic base; short lateral keel present on base of caudal fin; caudal peduncle short; eyes small, round; nostrils large; mouth slightly curved with distinct deep fold in corner; upper teeth smooth-edged sharply pointed directed and curved laterally; lower teeth larger finely serrated with oblique cusp and overlapping bases, roots broadly flattened imbricate with a notch in the middle below (Fig. 2B); scales with horizontal cusp giving skin a smooth texture, fixed to the skin by a short and strong peduncle, broad in front ending in a sharp long point, at the end three undulations, the middle one more elevated than the two other ones (Fig. 2C); color uniformly blackish without transverse dark bands, small light spots, and blotches.

The morphology, measurements, counts, and color are in total agreement with previous descriptions of *Somniosus rostratus* provided by Maul (1955), Tortonese (1956), Compagno (1984), Mc Eachran and Branstetter (1984), and Ebert and Stehmann (2013). This capture of *S. rostratus* constitutes the first record of the species from the Tunisian coast and should be included at present in the local ichthyofauna (see Bradai et al. 2004). The presently reported specimen measured 990 mm TL and its total body weight reached 4500 g. It was an adult female in a resting phase, males mature at 710 mm TL and females at 800 TL, respectively (Barrull and Mate 2001, Guillart et al. 2013). Additionally, the species hardly exceeds 1000 mm TL in the Mediterranean Sea (Séret et al. 2009).

*Somniosus rostratus* is actually restricted to the northeastern Atlantic and the Mediterranean Sea where the species is rather considered as rare, or at least rarely caught (Garibaldi et al. 2012, 2013). Such a pattern could

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**Fig. 1.** Records of *Somniosus rostratus* reported in the Mediterranean Sea by chronological order (1) Off Nice (Risso 1826); (2) Off Nice (Moreau 1881); (3) From the Algerian coast (Dieuzeide et al. 1953); (4) In the Gulf of Genoa (Tortonese 1956); (5) From Sicily (Tortonese 1956); (6) From the Aegean Sea (Economidis 1973); (7) From the Ligurian coast (Cigala-Fulgosi and Gandolfi 1983); (8) Off Haifa, in the Levant Basin (Golani 1986); (9) From the Catalan Sea (Barrull and Mate 2001); (10) From the coast of Syria (Ali and Saad 2003); (11) From the northwestern Ionian Sea (Capezzuto et al. 2010); (12) From waters surrounding Malta Islands (Vella et al. 2013); (13) Ibiza Channel (Guillart et al. 2013); (14) Catalan Sea (Barria et al. 2015); (15) Gulf of Lions (Barria et al. 2015); (16) Marine area between the Balearic Islands and Spanish coast (De Loyola Fernández 2017); (17) Off Ras Jebel, northeastern Tunisian coast (this study); black circles indicate the occurrence of nursery grounds.
First record of *Somniosus rostratus* from Tunisian coast

be due to fact that the species lives on the outer continental shelf and upper slope at depths of 120–2220 m, and the majority of the records occurred from less than 1000 m, poorly exploited by commercial vessels reducing fishing pressure (Barrul and Mate 2001). The species has not a high commercial value and is probably discarded at sea by fishermen, or included among the shark species belonging to the genus *Centrophorus* Müller et Henle, 1837, no separate fishery statistics were provided for this species (Ebert and Stehmann 2013). Barrul and Mate (2001) noted that the species fed on fishes and benthic species, however, the occurrence of cephalopods in stomach contents suggests that *S. rostratus* forages in the water column (Golani 1986, Guallart et al. 2013) that is probably the case for the present specimen caught at a depth of only 120 m. Additionally, a reproductive strategy cannot be totally ruled out, generally, adult females approach shallow coastal waters to find favorable nursery grounds to lay and protect their brood from predation by larger specimens. Such behavior is well known in elasmobranch oviparous and viviparous species since Muñoz-Chápuli (1984) and Castro (1993), and frequently reported to date (Heithaus 2007).

Additionally, records of pregnant females were reported since Moreau (1881) who observed a female caught off Nice, during March 1874 carrying 12 embryos. Southward, from the Gulf of Genoa, Tortonese (1956) reported the capture of a female carrying 17 embryos, and from the Ligurian Sea, Cigala-Fulgosi and Gandolfi (1983) observed a female with 5 embryos in the left uterus and 4 in the right one. Such reports suggest that nursery grounds occur in these latter areas. Similar patterns were reported from the Spanish coast, in the Catalan Sea where Barrull and Mate (2001) observed a female carrying 8 developing embryos. Southward, in the Balearic Sea, Guallart et al. (2013) reported the capture of eight pregnant females and noted that litter size ranged between 5 and 17 ova/embryos. These data show that *S. rostratus* is not very prolific as other elasmobranch species (Mellinger 1989), but indicate the presence of nursery grounds allowing to state that a viable population is successfully established for several decades in the Mediterranean Sea, at least in western areas. The captures of the present specimen and the records of Vella et al. (2013) in the central Mediterranean allowed such opinion. Golani (1986) and Ali and Saad (2003) reported the occurrence of *S. rostratus* from the eastern Levant Basin, but conversely, the species is not recorded in close areas such as Lebanon (Bariche and Fricke 2019) and the Mediterranean coast of Egypt (El Sayed et al. 2017). It appears that the species is sporadically caught in the eastern Mediterranean where the establishment of a viable population remains questionable until records of other specimens will be reported.
Absolute and relative values of selected morphometric measurements, dental formula, and total body weight of a female specimen of *Somniosus rostratus* collected off Ras Jebel, northeastern Tunisian coast (ref. ISPAB-Som-rost-01)

| Character                         | Absolute [mm] | Relative [%TL] |
|----------------------------------|---------------|----------------|
| Total length (TL)                | 990           | 100.0          |
| Fork length                      | 890           | 89.90          |
| Precaudal length                 | 800           | 80.81          |
| Pre-first dorsal length          | 380           | 38.38          |
| Pre-second dorsal length         | 690           | 69.70          |
| Head length                      | 210           | 21.21          |
| Mouth length                     | 20            | 2.02           |
| Eye length                       | 13            | 1.31           |
| Prebranchial length              | 160           | 16.16          |
| Prespiracular length             | 150           | 15.15          |
| Preorbital length                | 70            | 7.07           |
| Prepectoral length               | 210           | 21.21          |
| Preanal length                   | 595           | 60.10          |
| Snout-vent length                | 640           | 64.65          |
| Interdorsal space                | 260           | 26.26          |
| Dorsal–caudal space              | 70            | 7.07           |
| Pectoral–pelvic space            | 340           | 34.34          |
| Anal–caudal space                | 115           | 11.62          |
| Pelvic–caudal space              | 53            | 5.55           |
| Vent–caudal length               | 120           | 12.12          |
| Preoral length                   | 70            | 7.07           |
| First gill slit height           | 20            | 2.02           |
| Fift gill slit height            | 25            | 2.53           |
| Pectoral base                    | 60            | 6.06           |
| Pectoral anterior margin         | 120           | 12.12          |
| Pectoral inner margin            | 40            | 4.04           |
| Pectoral posterior margin        | 70            | 7.07           |
| Pectoral height                  | 110           | 11.11          |
| First dorsal base                | 70            | 7.07           |
| First dorsal anterior margin     | 90            | 9.09           |
| First dorsal inner margin        | 45            | 4.55           |
| First dorsal posterior margin    | 70            | 7.07           |
| Second dorsal base               | 50            | 5.05           |
| Second dorsal anterior margin    | 40            | 4.04           |
| Second dorsal inner margin       | 65            | 6.57           |
| Second dorsal posterior margin   | 80            | 8.08           |
| Anal base                        | 50            | 5.05           |
| Anal anterior margin             | 70            | 7.07           |
| Anal inner margin                | 40            | 4.04           |
| Anal posterior margin            | 70            | 7.07           |
| Caudal base                      | 40            | 4.04           |
| Dorsal caudal margin             | 180           | 18.18          |
| Terminal caudal lobe             | 120           | 12.12          |
| Lower postventral caudal margin  | 75            | 7.58           |
| Preventral caudal margin         | 130           | 13.13          |
| Dental formula                   | 63/16-1-16    |                |
| Total body weight [g]            | 4500          |                |

Table 1

However, it appears an evident area discontinuity between captures from the western and eastern Mediterranean areas. Similarly, Ben Amor et al. (2019) reported also an area discontinuity of captures for the roundfisht stingray, *Taeniourus grabata* (Geoffroy Saint-Hilaire, 1817). The species is known in the eastern Mediterranean Basin, but totally unknown in the western Basin, including the Maghreb shore. Following Lucrezi and Schlacher (2014), Capapé et al. (2020) noted that such area discontinuity is probably due to the fact that the Mediterranean Sea was invaded during a warm interglacial period in the Quaternary, and some species disappeared from the western Basin due to the intra-glacial cold climatic conditions. Ramirez-Amaro et al (2017) and Geraci et al. (2019) reported similar patterns for the Norwegian skate, *Dipturus nidarosiensis* (Storm, 1881), a species recently found in the Mediterranean Sea. Additionally, global warming of sea waters throughout the world and especially in the entire Mediterranean Sea (Francour et al. 1994) could enhance the emergence of species previously unknown. This hypothesis is suitable but needs further records to be confirmed, even if it cannot be totally ruled out. A lack of sampling in the western Basin is more probably the cause of this discontinuity. Séret et al. (2009) noted that the European regional assessment considered *S. rostratus* as “Data Deficient” (DD). Due to its K-selected reproductive traits as other elasmobranch species, the use of bottom trawlers increase the risk of the drastic decline of the species, most of the sampled specimens were caught at less than 1000 m (Séret et al. 2009). Following Séret et al. (2009) to avoid such risk, a monitoring plan is needed to preserve the occurrence of *Somniosus rostratus* in the Mediterranean regions where the species appears to be substantially established.

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*Somniosus rostratus*
First record of *Somniosus rostratus* from Tunisian coast

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