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UNUSUAL AND SUBSTANTIATED RECORDS OF *HEPTRANCHIAS PERLO* (CHONDRICHTHYES: HEXANCHIDAE) IN THE N-E TUNISIAN WATERS (CENTRAL MEDITERRANEAN SEA)

SUMMARY

The present paper report unusual and additional records of sharpnose seven-gill shark *Hepttranchias perlo* (BONNATERRE, 1788) from the northeastern Tunisian waters. Four specimens were collected in the Gulf of Tunis and two specimens off Bizerte. The specimens were measured for total length and weighed. The specimens from Bizerte were described in the present paper including morphometric measurements and tooth counts. These captures were carried out at lower depth that it was usually the case and showed that the specimens migrated southward, where a viable population is probably established.

INTRODUCTION

Sharpnose seven-gill shark *Hepttranchias perlo* (BONNATERRE, 1788) is a semi cosmopolitan species, occurring in temperate and warm temperate waters and well known throughout the Mediterranean Sea (CAPAPÉ, 1980; BOESEMAN, 1984; SERENA 2005), but also in the Adriatic Sea (LIPEJ and DULCIC, 2010) and in the eastern Levant Basin (GOLANI, 2005). DE MADDALENA *et al.* (2002) recorded *H. perlo* in Sicilian waters (central Mediterranean), based on the

capture of 7 specimens. SCHEMBRI *et al.* (2003) reported the species as rather frequent in Maltese waters. Additionally, MALIET (pers. com.) informed us that some specimens were regularly caught by local fishermen around Corsica Island. Although the species was considered as rare in Turkish waters, it occurs in both northern and southern Aegean coast (FILIZ and MATER, 2002; ÖZİÇ and YILMAZ, 2006; KABASAKAL and INCE, 2008).

In Tunisian waters, captures of *H. perlo* appeared to be rather restricted in northern areas, such as the Eskerkis Bank, off Tabarka, city close to the Algerian border, and around Jalta Island (CAPAPÉ, 1980). EL KAMEL-MOUTALIBI *et al.* (2014) reported the capture of 4 sharpnose sharks between 2007 and 2014 in waters surrounding the Eskerkis Bank, and noted that a local occurrence of a viable population remains a suitable hypothesis which needs to be supported by further records.

Additionally, on 25 September 2014, RAFRAFI-NOUIRA *et al.* (2015b) reported that a female *Hepranchias perlo* was captured by trawl in waters surrounding Cani Rocks, at a depth of 56 m, on rocky bottom, between 37°21'22.04» N and 10°10'56.14» E, following information provided by fishermen. This capture occurred at lower depth, rather unusual for this species. Investigations were continuously conducted throughout the Gulf of Tunis, in the context of a national project concerning the elasmobranch species of the northern Tunisian areas. Other specimens of *H. perlo* are discussed in the present paper, including comment on the species distribution.

MATERIAL AND METHODS

In the wake of a collaboration with experienced fishermen aware of fishing grounds we were informed that specimens of sharpnose seven-gill shark were captured in the Gulf of Tunis. A first capture occurred on 24 November 2015, in the waters surrounding the Island of Zembra in the NE Gulf of Tunis, where four specimens were captured during shrimp trawling at a depth of 150 m approximately on coralligenous bottoms, by 37° 23' 88" N and 10° 85' 79" E (Fig. 1).

A second capture occurred on 02 August 2018 off Ras Jebel city located in the NW Gulf of Tunis; it concerned two specimens captured by longlines at depths between 130 and 140 m on sandy-rocky bottoms, by 37°27'29" N and 10°05'40" E (Fig. 1), together with sparid species and swordfish *Xiphias gladius* Linnaeus, 1758.

All specimens were measured (total length, TL to the nearest mm, and total weight to the nearest g). The four specimens collected during the first capture were immediately sold, conversely, both specimens from the second capture were delivered at the laboratory and morphometric measurements could be carried out following RAFRAFI-NOUIRA *et al.* (2015b) and presented in

Table 1. The heads of both specimens were fixed in 10% buffered formaline and conserved in 75% ethanol, and deposited in the ichthyological collection of the Faculté des Sciences of Bizerte (Tunisia), receiving the catalogue numbers, FSB Hep-per. 03 and FSB Hep-per. 04, respectively.

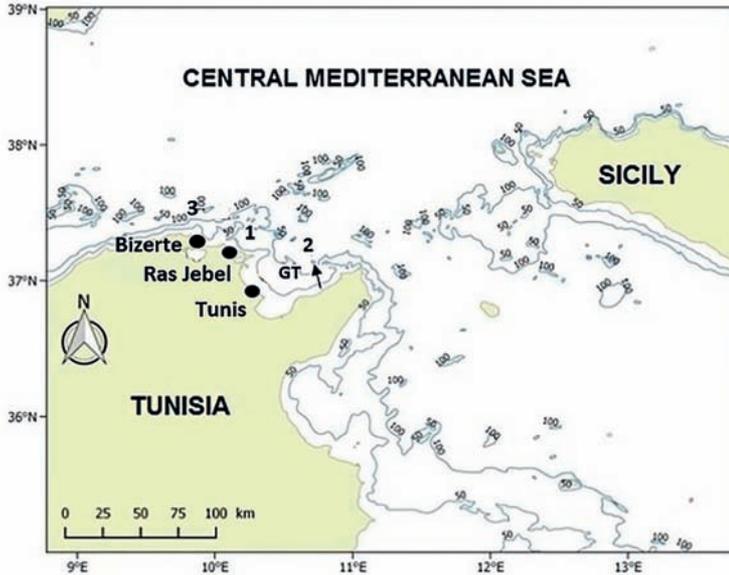


Fig. 1. Map of the northeastern coast of Tunisia indicating the capture sites of *Heptranchias perlo* in the Tunisian waters. 1: Cani Rocks (RAFRABI-NOUIRA *et al.*, 2015b). 2: Gulf of Tunis, in the waters surrounding the Island of Zembra indicated by arrow (this study). 3: Off Bizerte (this study).

RESULTS AND DISCUSSION

All specimens were identified following the combination of main characters as follows: body slender, with seven gill-slits broadly separated, eyes very large, minute nostrils, a single dorsal fin with base before that of anal fin, caudal fin with moderate lower lobe, pectoral fins rather short and triangular, pelvic fins displaying a sexual dimorphism : short and triangular in females, those of males exhibit an expansion which entirely surround the clasper as a sheath (Fig 2). Teeth are different in shape on each jaw. Teeth of upper jaw, from the median region present a single cusp rather strong and oblique, while in the lateral region, teeth exhibited minute cusplets on both sides of the cusp. Teeth of lower jaws are large, comblike, with a large anterior cusp preceded by a few smaller ones, and followed by 7 or 8 distal cusplets (Fig. 3). Colour brown-grey, with small lighter spots, belly beige to whitish.



Fig. 2. *Heptanchias perlo* collected off Bizerte, with scale bar = 100 mm.



Fig. 3. Head of *Heptanchias perlo*, mouth opened to point out shape of teeth from upper and lower jaws, with scale bar = 30 mm.

Morphology, morphometric measurements and colour are in total agreement with descriptions of *Heptanchias perlo* given by CAPAPÉ (1980), BOESEMAN (1984), EL KAMEL-MOUTALIBI et al. (2014) and RAFRAFI-NOUIRA et al. (2015b). The first record of *H. perlo* in the Gulf of Tunis was reported by RAFRAFI-NOUIRA et al. (2015b), and the recent captures of the species seem to confirm its presence in the area.

Of the 4 specimens caught in the waters surrounding the Island of Zembra, 2 were males and 2 females. The males measured 740 mm TL and 840

mm TL, respectively, and weighed 1300 g and 1735 g, respectively. The females measured 720 mm TL and 1120 mm TL, respectively, and weighed 1150 g and 2255 g, respectively. One male and one female were captured off Bizerte, they measured 720 mm TL and 700 mm TL, respectively, and weighed 1130 g and 1092 g, respectively.

Generally, *Heptranchias perlo* inhabits deep-sea waters, between 100 and 600 m, and occasionally to 800 m (BOESEMAN, 1984). These captures occurred at lower depth, rather unusual for this species. In Tunisian waters, captures of *H. perlo* appear to be rather restricted in N areas, such as the Eskerkis Bank, off Tabarka, city close to the Algerian border, and around Jalta Island (EL KAMEL-MOUTALIBI *et al.*, 2014). Additionally, on 04 February 1999, BRADAÏ *et al.* (2002) reported from the Gulf of Gabès the capture of a free-swimming specimen of 390 mm TL and weight of 138 g, then between 2001 and 2003, 9 other captures were reported ranging in size between 695 and 1000 mm TL. A migration towards the Tunisian S areas cannot be totally ruled out, although recent studies indicated that fish species preferentially migrated towards N due to the general waters warming in the Mediterranean Sea (RAFRAFI-NOUIRA *et al.*, 2015a, 2015b). Such opposite phenomenon could be the consequence of changes in fishing methods, for instance some species having low values as *H. perlo* were formerly discarded at sea. To date the drastic decline of fishery productions induces the fishermen to reconsider the value of some species due to economical reasons, *H. perlo* as other shark species reach at present relative high values in Tunisian fish-markets which could explain locally its recent abundance

References	FSB Hep-per.03		FSB Hep-per.04	
Sex	Male		Female	
Morphometric measurements	mm	% TL	mm	% TL
Total length (TL)	720	100.00	700	100
Precaudal length	495	68.75	490	70
Fork length	555	77.08	550	78.57
Pre-dorsal length	356	49.44	350	50.00
Prepectoral length	149	20.69	145	20.71
Head length	145	20.14	142	20.29
Prebranchial space	36	5.00	35	5.00
Preoral length	35	4.86	35	5.00
Pelvic fin length	65	9.03	62	8.86
Prepelvic length	294	40.83	290	41.43
Preanal length	384	53.33	380	54.29

Pelvic-anal length	44	6.11	40	5.71
Pelvic-caudal length	158	21.94	150	21.43
Anal-caudal length	66	9.17	65	9.29
Snout-vent length	258	35.83	255	36.43
Vent-caudal length	147	20.42	145	20.71
Prenasal length	20	2.78	20	2.86
Intergill length	21	2.92	20	2.86
Eye width	31	4.31	30	4.29
Eye height	18	2.50	18	2.57
Internasal length	22	3.06	22	3.14
Mouth width	78	10.83	77	11
Dorsal base	42	5.83	40	5.71
Dorsal inner margin	17	2.36	16	2.29
Dorsal anterior margin	54	7.50	50	7.14
Dorsal posterior margin	31	4.31	30	4.29
Pectoral base	47	6.53	45	6.43
Pectoral inner margin	36	5.00	35	5
Pectoral anterior margin	82	11.39	80	11.43
Pectoral posterior margin	35	4.86	35	5
Pelvic base	65	9.03	65	9.29
Pelvic inner margin	11	1.53	10	1.43
Pelvic anterior margin	31	4.31	30	4.29
Pelvic posterior margin	52	7.22	50	7.14
Anal base	43	5.97	42	6
Anal inner margin	12	1.67	12	1.71
Anal anterior margin	28	3.89	27	3.86
Anal posterior margin	35	4.86	35	5
Dorsal caudal margin	218	30.28	215	30.71
Upper postventral caudal margin	116	16.11	115	16.43
Subterminal caudal margin	30	4.17	30	4.29
Lower postventral caudal margin	31	4.31	30	4.29

Reference	FSB Hep-per.03		FSB Hep-per.04	
	mm	% LT	mm	% LT
Morphometric measurements				
Preventral caudal margin	62	8.61	60	8.57
Terminal caudal margin	32	4.44	32	4.57
Caudal peduncle height	31	4.31	30	4.29
First gill slit length	51	7.08	50	7.14
Fifth gill slit length	32	4.44	30	4.29
Counts				
Teeth rows upper jaw	9+9		9+9	
Teeth rows lower jaw	5+1+5		5+1+5	
Weight				
Total body mass. g	1130		1092	

Table 1. Morphometric measurements (mm) with percentages of total length (%TL), tooth counts on each jaw, and total body weight (g) recorded in *Heptranchias perlo* collected off Bizerte.

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