

**FIRST RECORD OF THE WEST AFRICAN GOATFISH, *PSEUDUPENEUS PRAYENSIS*  
(ACTINOPTERYGII: PERCIFORMES: MULLIDAE), OFF THE TUNISIAN COAST  
(CENTRAL MEDITERRANEAN)**

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**Abstract.** Two specimens of the west African goatfish, *Pseudupeneus prayensis* (Cuvier, 1829), were found for the first time off the Tunisian coast, in northern area. They constituted the third Mediterranean record of this fish. Both specimens were studied and described, and some biological observations were reported. Same taxonomic characters were concomitantly determined on two west African goatfish caught off the coast of Senegal, for comparison. The occurrence of *Pseudupeneus prayensis* in the area and the Mediterranean Sea is discussed and commented.

**Keywords:** Mullidae, *Pseudupeneus prayensis*, first record, Tunisian coast, Mediterranean

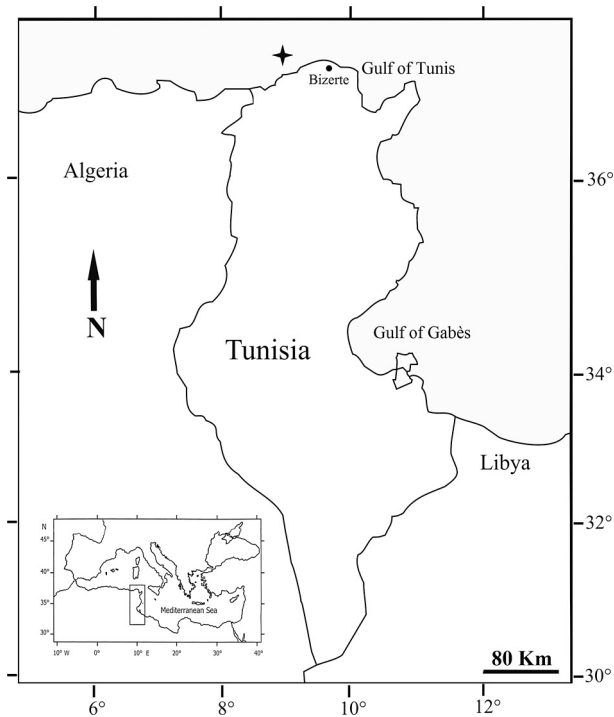
The west African goatfish, *Pseudupeneus prayensis* (Cuvier, 1829), is known from the eastern Atlantic. The northernmost record was from the southern part of the Strait of Gibraltar (Ben-Tuvia (1981)). The species was reported off Morocco (Lloris and Rucabado 1998), but captures are rather abundant off Mauritania (Maigret and Ly 1986), Senegal (Séret and Opic 1990), and Guinea-Bissau (Sanches 1991). Southwards, *P. prayensis* is known to occur from the Gulf of Guinea (Blache et al. 1970) to Angola (Hureau 1986, Ben-Tuvia 1990).

*Pseudupeneus prayensis* was first recorded in the Mediterranean Sea off Málaga, in the Alboran Sea, southern Spain, (Reina-Hervás 1987), and five years later, a second record was reported northward in the Catalan Sea, northern Spain (Mercader 2002). The species is considered as a recent Atlantic immigrant in the Mediterranean (Golani et al. 2002). Investigations conducted in northern Tunisian waters allowed us to collect two specimens of *P. prayensis*, which are described in the present note concomitantly with two other specimens from Senegal.

On 27 May 2010, two specimens of the west African goatfish were captured at the depth of 20–25 m by demersal gill nets (20 × 24 mm mesh size), on rocky swallows named Brothers Bank, 20 km east to Jalta Island

(lat 37°29.33' N, long 9°25.40' E) off the northern coast of Tunisia (Fig. 1). The fresh specimens were identified based on Ben-Tuvia (1981), Hureau (1986), Sanches (1991), Golani et al. (2002), then photographed, measured to the nearest millimetre and weighed to the nearest decigram (Fig. 2). Morphometric measurements with percent of standard length and meristic counts are given in Table 1. The stomach content was removed, sorted, and identified to the lowest possible taxonomic level and weighed. Same measurements, counts and percent of total length were concomitantly carried out on two west African goatfish caught off the coast of Senegal, on 20 June 2010, at the depth of 40 m by demersal gill nets, on rocky bottom, for comparison. The four studied *P. prayensis* were preserved in 5% buffered formalin, the two Tunisian specimens were deposited in the Ichthyological Collection at the Laboratoire d'Hydrobiologie Littorale et Limnique of the Faculté des Sciences of Bizerte, Tunisia, receiving the catalogue number FSB-Pseu-pra 01 (Fig. 2), and FSB-Pseu-pra 02, while those from Senegal were deposited in the Ichthyological Collection of the Institut Fondamental d'Afrique noire Cheikh Anta Diop de Dakar, Senegal, receiving the catalogue numbers IFAN-Pseu-pra 01 and IFAN-Pseu-pra 02.

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**Fig. 1.** Map of the Mediterranean showing Tunisia and map of the coast of Tunisia pointing out the capture site of the two Tunisian specimens of west African goatfish, *Pseudupeneus prayensis* (black star)

Both specimens of *Pseudupeneus prayensis* caught off the northern Tunisian coast were described as follows: body elongated and moderately compressed towards tail; profile of head convex. One spine on posterior margin of operculum (Fig. 2). Mouth subterminal and slightly protruding, conical teeth on both jaws, some of outer teeth in upper jaw pointed backwards and clearly visible in closed mouth, no teeth on vomer and palatin. Pair of stout barbels under chin. Scales large and slightly ctenoid. First spine of dorsal fin very short. Colour rosy with red lines on body.

Biological observations carried out on both specimens showed exhibited a genital duct not sufficiently differentiated. No data has been available on the reproductive biology of *P. prayensis*, however, Hureau (1986) and Golani et al. (2002) estimated that the total length at first sexual maturity was probably around 250 mm. The two observed specimens, 239 mm and 203 mm, respectively were both juveniles. The specimen FSB-Pseu-pra 01 contained remains of food in the gut, among them four peanut worms, *Sipunculus nudus* Linnaeus, 1766, while the specimen FSB-Pseu-pra 01 contained entirely digested food. These observations confirm that *P. prayensis* feeds on benthic invertebrates detected by chemoreceptor barbels on the chin (Hureau 1986, Golani et al. 2002).

Morphology, morphometric measurements, percents of total length, meristic counts, and colour are in agreement with previous descriptions of the species (Ben-Tuvia 1981, Hureau 1986, Maigret and Ly 1986, Sanches 1991,



**Fig. 2.** Specimen of west African goatfish, *Pseudupeneus prayensis* (FSB-Pseu-pra 01) collected off the northern Tunisian coast; scale bar = 50 mm; inset shows the opercular spine (black arrow)

Golani et al. 2002). Additionally, the parameters were very similar to those recorded in two specimens caught off the Senegalese coast (see Table 1). All these features allow us to confirm the occurrence of *Pseudupeneus prayensis* in Tunisian waters, and these two findings constitute the first records of the species in the area, but also the third Mediterranean record to date. *P. prayensis* could be included in the Tunisian ichthyofauna which comprises at present, three other mullid species: two are autochthonous, both regularly and abundantly captured in Tunisian marine waters, the red mullet, *Mullus barbatus* L., and the surmullet (striped red mullet), *M. surmuletus* L. (see Bradai et al. 2004), while the third one the Por's goatfish, *Upeneus pori* Ben-Tuvia et Golani, 1989, a Lessepsian migrant was recorded in the southern Gulf of Gabès (Ben Souissi et al. 2005) and more recently off the northern coast (Azzouz et al. 2010), suggesting that a sustainable population is probably establishing in its new region as in other Mediterranean areas (Golani et al. 2002), however this hypothesis needs to be confirmed by further records.

**Table 1**

Morphometric measurements (in mm and as % TL), meristic counts and masses recorded in west African goatfish, *Pseudupeneus prayensis* from northern Tunisian coast (two specimens: FSB-Pseu-pra 01 and FSB-Pseu-pra 02) and from the Senegalese coast (two specimens: IFAN-Pseu-pra 01 and IFAN-Pseu-pra 02)

References	FSB-Pseu-pra 01		FSB-Pseu-pra 02		IFAN-Pseu-pra 01		IFAN-Pseu-pra 02	
Total mass [g]	194		127		139		93	
Measurements	mm	%SL	mm	%SL	mm	%SL	mm	%SL
Total length	239	116.01	230	116.75	215	126.47	194	125.16
Fork length	213	103.39	207	105.07	185	108.82	164	105.8
Standard length	206	100	197	100	170	100	155	100
Head length	63.04	30.60	60.47	30.69	57.03	33.54	48.02	30.98
Snout length	30.92	15.00	30.00	15.22	29.01	17.06	23.01	14.84
Interorbital width	19.77	9.59	16.47	8.36	14.10	8.29	11.04	7.12
Eye diameter	12.75	6.18	13.01	6.60	12.01	7.06	10.08	6.50
Barbels length	49.91	24.22	43.34	22	44.03	25.9	35.06	22.61
Caudal fin height	62.83	30.5	43.94	22.30	52.06	30.62	47.07	30.36
Caudal peduncle length	19.37	9.40	17.84	9.05	34.01	18.24	30.07	19.36
Caudal peduncle depth	8.94	4.12	7.33	3.72	17.04	10.02	15.01	9.68
Predorsal length	66.82	32.43	67.86	34.44	68.10	40.05	59.08	38.11
Space between snout and vent	119.95	58.22	117.65	59.72	108.07	63.57	97.04	62.60
Pectoral fin length	44.18	21.44	42.78	21.71	43.01	25.3	34.00	21.93
Pectoral fin base	12.10	5.87	14.00	7.10	11.08	6.51	8.01	5.16
First dorsal fin height	33.54	16.28	32.68	16.58	31.05	18.26	23.09	14.89
First dorsal fin base	41.46	20.12	34.32	17.42	34.00	20	23.08	14.89
Second dorsal fin height	22.06	10.70	20.92	10.61	21.04	12.37	17.06	11.00
Second dorsal fin base	31.43	15.25	27.47	13.94	29.09	17.11	23.01	14.84
Pelvic fin length	39.97	19.40	35.81	18.17	36.07	21.21	27.03	17.43
Pelvic fin base	8.99	4.36	8.25	4.18	8.03	4.72	7.01	4.52
Anal fin height	19.80	9.61	18.52	9.40	20.09	11.81	17.04	10.99
Anal fin base	23.35	11.33	22.15	11.24	22.00	12.94	18.02	11.62
Counts	FSB-Pseu-pra-01		FSB-Pseu-pra 02		IFAN-Pseu- pra 01		IFAN-Pseu-pra 02	
Dorsal rays	VIII +I, 8		VIII+ I, 8		VIII +I, 8		VIII + I, 8	
Pelvic rays	I, 5		I, 5		I, 5		I, 5	
Pectoral rays	15		18		15		14	
Anal rays	I, 6		I, 6		I, 6		I, 6	
Scales between two dorsal fins	3		3		3		3	
Scales below lateral line	6		6		6		6	
Lateral line scales	32		31		32		31	
Caudal fin	16		16		17		17	

*P. prayensis* can be distinguished from its co-familial species in the Mediterranean by the presence of spine on opercular margin, but also by teeth visible when mouth is closed. The lack of stripes on fins could also be a main character allowing to distinguish it from the species belonging to the genus *Upeneus* Cuvier, 1829.

This new report of *P. prayensis* in the central Mediterranean shows the species has extended its distribution by approximately 1000 km eastward, in a period of 8 years, pointing out a significant distribution extension of the species in the Mediterranean. However, these records are not sufficient to state that a sustainable population is at present established in the Mediterranean, such as an other Atlantic migrant, the bluespotted seabass, *Cephalopholis taeniops* (Valenciennes, 1828), according to Salameh et al. (2009). However, similar patterns were observed for the (Atlantic) blunthead puffer, *Sphoeroides pachygaster* (Müller et Troschel, 1848) substantially established in Tunisian marine waters (Chérif et al. 2010)

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