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ADDITIONAL RECORDS OF THE BLUNTHEAD PUFFER, *SPHOEROIDES PACHYGASTER* (OSTEICHTHYES: TETRAODONTIDAE) OFF THE TUNISIAN COAST (CENTRAL MEDITERRANEAN)

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ABSTRACT

*The record of two juvenile blunthead puffers, *Sphoeroides pachygaster* (Müller & Troschel, 1848) confirms the occurrence of the species in Tunisian waters. The specimens were captured in the Gulf of Hammamet, north-eastern Tunisia that constitutes the northernmost extension range of the species in the area where the specimen is substantially established, probably due to higher temperatures of waters.*

Key words: Osteichthyes, Tetraodontidae, *Sphoeroides pachygaster*, distribution, Tunisia, Mediterranean Sea

NUOVE SEGNALAZIONI DI PESCE PALLA LISCIO, *SPHOEROIDES PACHYGASTER* (OSTEICHTHYES: TETRAODONTIDAE) AL LARGO DELLA COSTA TUNISINA (MEDITERRANEO CENTRALE)

SINTESI

*L'avvistamento di due esemplari giovani di pesce palla liscio, *Sphoeroides pachygaster* (Müller & Troschel, 1848), conferma la presenza della specie in acque tunisine. Gli esemplari sono stati catturati nel Golfo di Hammamet, nella Tunisia nord-orientale, che rappresenta il limite di estensione più settentrionale della specie nell'area, e dove la specie si è effettivamente stabilizzata, probabilmente a causa dell'innalzamento della temperatura dell'acqua.*

Parole chiave: Osteichthyes, Tetraodontidae, *Sphoeroides pachygaster*, distribuzione, Tunisia, mare Mediterraneo

INTRODUCTION

The blunthead puffer *Sphoeroides pachygaster* (Müller & Troschel, 1848) is widely distributed in tropical and temperate waters on both sides of the Atlantic Ocean (Shipp, 1990; Sampaio *et al.*, 2001). The species is frequently captured off the eastern tropical Atlantic, especially off Senegal (Séret & Opic, 1991) and in the Gulf of Guinea (Blache *et al.*, 1970; Shipp, 1990).

Sphoeroides pachygaster is known in the Mediterranean where at least 30 records were reported (Peristeraki *et al.*, 2006; Psomadakis *et al.*, 2006; Ligas *et al.*, 2006, 2007), the latest being from Hemida *et al.* (2009) off the Algerian coast; the northernmost extension range of the species in the Mediterranean being the Adriatic Sea (Dulčić, 2002). The species was first recorded in Tunisian marine waters by Bradaï (2000), who observed 5 specimens caught in the Gulf of Gabès between 1992 and 1996; since then, no specimen was recorded in the area, although it was formerly considered to be the 'core' of the Mediterranean population (Golani *et al.*, 2002).

During research, recently conducted off the eastern Tunisian coast, 2 specimens were captured; they are described in the present paper, including detailed morphometric characters, meristic counts and some biological observations. Additionally, we comment on the distribution of *S. pachygaster* in Tunisian marine waters and in the Mediterranean, while the aim of the paper is to point out that the species is substantially established in the area.

MATERIAL AND METHODS

Two blunthead puffers were caught on 03 October 2009, in the Gulf of Hammamet, north-eastern Tunisia, by trawl net shrimp boat, at 50.4 m depth, located between 36°10'23" N, 11°16'13" E and 36°16'26" N, 11°15'48" E (Fig. 1), concomitantly with 12 teleost species, among them the red mullet *Mullus barbatus* (Linnaeus, 1758) and the Atlantic horse mackerel *Trachurus trachurus* (Linnaeus, 1758), which were the most abundant, and 5 cephalopod species, mostly the common cuttlefish *Sepia officinalis* (Linnaeus, 1758). Total weight of landed teleost species reached 75.7 kg, while this of cephalopod species was 7.3 kg.

Morphometric measurements, meristic counts following Ragonese *et al.* (1997), and weights were recorded on fresh specimens. All data is summarized in Table 1. Measurements were carried out to the nearest millimetre while weights to the nearest gram. Both specimens are preserved in the ichthyological collection of Institut National des Sciences et Technologies de la Mer of Salammbô, city located 12 km north of Tunis, Tunisia, with catalogue numbers, INSTM-SPH-Pachy-01 and INSTM-SPH-Pachy-02 (Fig. 2)

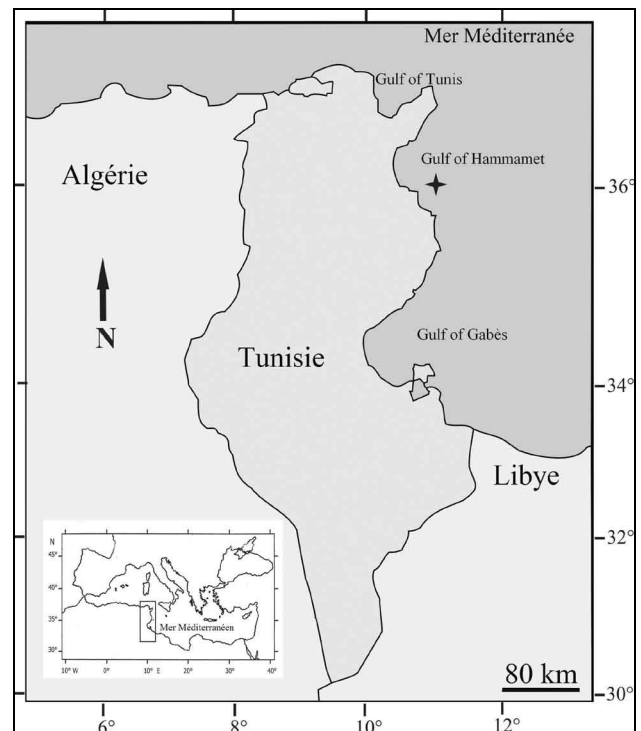


Fig. 1: Map of the Mediterranean showing the Tunisian coast and capture site of the two specimens of *Sphoeroides pachygaster* in the Gulf of Hammamet (black star).

Sl. 1: Zemljevid Sredozemlja s tunizijsko obalo in točko v zalivu Hammamet, kjer sta bila ujeta dva primerka *Sphoeroides pachygaster* (črna zvezda).

RESULTS AND DISCUSSION

Identification was made on the basis of completely smooth skin, on lateral line on each side convoluted, body inflatable, large head and snout rounded, beak-like jaws with two large teeth on each jaw forming a dental plate with entire cutting edge, eye big and oval, pelvic fin absent and caudal fin truncated or slightly concave; colour greyish on dorsal surface with dark spots, belly greyish, caudal fin base dark. The specimen referenced as INSTM-SPH-Pachy-01 was a juvenile female, the second one, INSTM-SPH-Pachy-02, a juvenile male. Additionally, no food or remains of food were found in the guts of specimens.

Morphology, colour, morphometric measurements and counts are in agreement with previous descriptions of specimens from the Mediterranean Sea (Ragonese *et al.*, 1997; Golani *et al.*, 2002; Psomadakis *et al.*, 2006), especially the Algerian specimen (see Hemida *et al.*, 2009). However, slight variations were recorded with special regard to specimens caught off south-western Atlantic coast (see Sampaio *et al.*, 2001).

Tab. 1: Morphometric measurements (in mm and as % TL), meristic counts and weights in grammes, carried out in two *Sphoeroides pachygaster* caught in Tunisian waters. Comparison with the specimen caught off the Algerian coast (Hemida *et al.*, 2009).

Tab. 1: Morfometrične meritve (v mm in kot % TL), meristično štetje in teža v gramih dveh primerkov *Sphoeroides pachygaster*, ujetih v tunizijskih vodah. Primerjava s primerkom, ujetim ob alžirski obali (Hemida *et al.*, 2009).

Reference	INSTM-SPH-Pachy-01		INSTM-SPH-Pachy-02		Hemida <i>et al.</i> (2009)	
	mm	% TL	mm	% TL	mm	% TL
Morphometric measurements						
Total length (TL)	101.0	100	95.0	100	330	100
Standard length	90.0	89.1	82	86.3	295	89.4
Head length	32.1	31.8	33.4	35.2	100	30.3
Head width	21.5	21.3	20.1	21.2	70	21.2
Head height	25.3	25.0	29.4	30.9	60	18.2
Eye horizontal diameter	8.1	8.0	7.5	7.9	21	6.4
Eye vertical diameter	4.1	4.1	6.5	6.8	21	6.4
Interorbital space	17.9	17.7	17.5	18.4	30	9.1
Snout length	11.4	11.3	8.4	8.8	40	12.1
Postorbital length	10.7	10.6	12.4	13.1	35	10.6
Width of pedunculum	12.1	12.0	11.6	12.2	35	10.6
Width of gill opening	8.2	8.1	6.9	7.3	25	7.6
Predorsal length	61.5	60.9	65.1	68.5	215	65.2
Preanal length	65.7	65.0	66.5	70.0	225	68.2
Dorsal fin length	9.5	9.4	12.4	13.1	25	7.6
Dorsal fin base	6.1	6.0	4.9	5.2	11	3.3
Anal fin length	10.2	10.1	11.6	12.2	30	9.1
Anal fin base length	3.5	3.5	3.2	3.4	11	3.3
Pectoral fin length	13.4	13.3	14.1	14.8	30	9.1
Caudal fin length	15.6	15.4	16.3	17.2	38	11.5
Body thickness	28.9	28.6	29.1	30.6	90	27.3
Body height	33.9	33.6	37.9	39.9	90	27.3
Nostrill greatest diameter	3.7	3.7	4.1	4.3	6	1.8
Nostrill lesser diameter	2.6	2.6	2.2	2.3	4	1.2
Internarial space	13.6	13.5	12.4	13.1	30	9.1
Meristic counts						
Dorsal fin soft rays	8		8		8	
Anal fin soft rays	8		8		8	
Pectoral fin soft rays	15		15		15	
Caudal fin soft rays	12		12		10	
Weights (g)						
Total weight	47.91		41.86			
Eviscerated weight	40.48		32.44			
Liver mass weight	2.59		2.32			
Gonad weight	0.16		0.13			

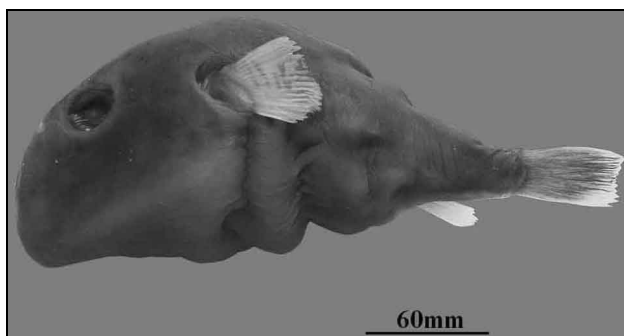


Fig. 2: *S. pachygaster* (INSTM-SPH-Pachy-02) captured in the Gulf of Hammamet (scale bar = 60 mm).

Sl. 2: *S. pachygaster* (INSTM-SPH-Pachy-02), ujet v zalivu Hammamet (merilo = 60 mm).

This new finding of *S. pachygaster* in Tunisian marine waters constituted the northernmost extension range of the species in the area, where the species could at

present be considered as substantially established, several specimens being previously found in the southern Gulf of Gabès by Bradaï (2000). A migration towards northern Tunisian areas remains a suitable hypothesis, as it was the case with other species such as the filfish *Stephanolepis diaspros* (Fraser-Brünnner, 1940) according to Ben Amor & Capapé (2008), probably due to the fact that Tunisian marine waters as other Mediterranean areas are becoming warmer (Francour *et al.*, 1994), showing both regular and permanent processes of tropicalisation (Quignard & Tomasini, 2000). Additionally, a migration southward from the Algerian coast (see Hemida *et al.*, 2009) cannot be totally excluded. However, further confirmation by genetic methods is needed in the case of a single population from off the Maghreb coast.

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NOVI PODATKI O ŠTIRIZOBKI, *SPHOEROIDES PACHYGASTER* (OSTEICHTHYES: TETRAODONTIDAE) IZ OBREŽNIH TUNIZIJSKIH VODA (OSREDNJE SREDOZEMLJE)

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POVZETEK

Podatki o dveh mladostnih štirizobkah *Sphoeroides pachygaster* (Müller & Troschel, 1848) potrjujejo prisotnost vrste v tunizijskih vodah. Primerka sta bila ujeta v zalivu Hammamet, v severovzhodni Tuniziji, kar predstavlja najsevernejši del območja razširjenosti vrste, ki je tu v veliki meri prisotna, po vsej verjetnosti zaradi višjih temperatur vode.

Ključne besede: Osteichthyes, Tetraodontidae, *Sphoeroides pachygaster*, distribucija, Tunizija, Sredozemsko morje

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