

Research Article

On the Occurrence of the Blunthead Puffer, *Sphoeroides pachygaster* (Osteichthyes: Tetraodontidae), in the Strait of Messina (Central Mediterranean)

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The record of *Sphoeroides pachygaster* reveals the presence of the species in the Strait of Messina (Central Mediterranean Sea). The adult species was captured on 15 March 2012. It measured 280 mm of total length and weighed 461.5 g. Morphometric measurements (mm) and meristic counts were reported in this paper.

1. Introduction

The blunthead puffer *Sphoeroides pachygaster* (Müller & Troschel, 1848) is widely distributed in tropical and temperate waters on both sides of the Atlantic Ocean [1, 2]. The species was reported from New England to Southern Brazil [3], off the Eastern Atlantic in Irish Waters [4], in the Bay of Biscay [5, 6] and off Portugal [7]. *S. pachygaster* was frequently reported in the south of the Strait of Gibraltar, from Morocco, Senegal [8], to the Gulf of Guinea [1, 9].

The species is known in the Mediterranean [10–12] where the northernmost extension range of the species was the Adriatic Sea [13]. In the Tunisian marine waters, the species was observed by Bradaï [14] and recently by Chérif et al. [15], where a substantial population seems to be at present definitively established. In the Italian Seas *S. pachygaster* was found in the Southern Tyrrhenian Sea [16], Sicilian Channel [17], Ionian Sea [18], Adriatic Sea, and Northern Tyrrhenian Sea [13, 19].

Information available strongly supports the general opinion which considers *S. pachygaster* a recent immigrant, probably undergoing a fast diffusion eastwards [16, 17] even though Relini and Orsi Relini [20] speculated on the possibility of a previous presence of the species within the

Mediterranean on the basis of old ichthyological illustrations.

The aim of this paper is to point out that the species is present in the area. With the present note, the blunthead puffer can now be added to the Strait of Messina fish checklist.

2. Material and Methods

On 15 March 2012 in the Strait of Messina (Sicily), one specimen of *Sphoeroides pachygaster* was caught by a fisherman (Figure 1). The specimen was weighted to the nearest gram and measured to the nearest millimetre. The morphometric measurement and meristic counts were performed according to Ragonese et al. [17].

The specimen was photographed and preserved in the ichthyological collection of the Institute for Marine Coastal Environmental (IAMC) of the National Council of Research (CNR) in Messina (Italy).

3. Results and Discussion

The first finding of *Sphoeroides pachygaster* in the Strait of Messina was an adult male that weighted 461.5 g (Figure 2).



FIGURE 1: Area of discovery: Strait of Messina.



FIGURE 2: *S. pachygaster* captured in the Strait of Messina (Central Mediterranean Sea).

TABLE 1: Morphometric measurements (in mm and F% of TL) and meristic counts of *S. pachygaster* caught in the Strait of Messina.

(a)		
Morphometric measurements	mm	% of TL
Total length (TL)	280	100,0
Standard length	245	87,5
Head length	65	23,2
Head width	45	16,1
Head height	54	19,3
Eye horizontal diameter	19	6,8
Eye vertical diameter	18	6,4
Interorbital space	28	10,0
Snout length	35	12,5
Postorbital length	30	10,7
Width of pedunculum	32	11,4
Width of gill opening	24	8,6
Predorsal length	20	7,1
Preanal length	21	7,5
Dorsal fin length	23	8,2
Dorsal fin base length	10	3,6
Anal fin length	24	8,6
Anal fin base length	10	3,6
Pectoral fin length	29	10,4
Caudal fin length	36	12,9
Body thickness	70	25,0
Body height	67	23,9
Nostril greatest diameter	6	2,1
Nostril lesser diameter	4	1,4
Internal space	28	10,0
(b)		
Meristic counts		
Dorsal fin rays		8
Anal fin rays		8
Pectoral fin rays		14
Caudal fin rays		10



FIGURE 3: Particular of teeth of *S. pachygaster*.

on each side convoluted; body inflatable, with large head and snout rounded; with beak-like jaws with two large teeth on each jaw forming a dental plate with entire cutting edge (Figure 3); eyes big and oval with a flat interorbital space; dorsal fin single placed in front of the similar-shaped anal fin, pelvic fin absent and caudal fin truncated or slightly concave; colour greyish on dorsal surface with brownish spots; belly whitish pale grey; caudal fin base dark.

Morphology, colour, morphometric measurements, and meristic counts of this blunthead puffer agree with previous descriptions [3, 11, 12, 17, 21]. The number of alien fish species increased recently in the Black Sea-Mediterranean Basin because of the opening of the Suez Canal, climate change, and international shipping activities [22]. Introduction of Alien species to new ecosystem is considered to be a major threat to its biodiversity, structure, and function [23, 24]. More than 790 alien species have been introduced to the Mediterranean Sea, most of which are benthos and fish species [25]. Movements of species in relation with global warming may increase spatial overlapping between exotic and endemic species, which is a critical issue for the conservation of biodiversity. Marine biological invasions are becoming a reality with sometimes devastating effects [26]. At the same time, it is important to study the genotypic changes of new populations driven by natural selection through the interactions with indigenous populations and in response to the new abiotic environment. Records of the Indo-Pacific and Atlantic fish species from the Mediterranean areas increase continuously [27]. In particular in the Ionian Sea *S. pachygaster*, after its first occurrence in 1991,

The morphometric measurement with percents of total length (% of TL) and meristic counts are shown in Table 1.

Identification was made by skin completely smooth with total lack of scales, spines, and body plates; one lateral line

showed a significant increase with time and there is now a steady population [28].

This note provides information about a new discovery of *Sphoeroides pachygaster*. In this Mediterranean area all records and stranding due to upwelling phenomena (typical of the Straits of Messina) should be reported.

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References

- [1] R. L. Shipp, "Tetraodontidae," in *Check-List of the Fishes of the Eastern Tropical Atlantic*, J. C. Quéro, J. C. H. Ureau, C. Karrer, A. Post, and L. Saldanha, Eds., UNESCO, Paris, France, 1990.
- [2] C. L. S. Sampaio, P. R. D. Lopes, and G. Olavo, "Registros de *Lagocephalus lagocephalus* (Linnaeus, 1758) e *Sphoeroides testudineus* (Muller & Troschel, 1848) (Actinopterygii: Tetraodontidae) para o litoral de Bahia, Nordeste do Brasil," *Interiencia*, vol. 26, no. 4, pp. 157–160, 2001.
- [3] D. Golani, L. Orsi-Relini, E. Massuti, and J. P. Quignard, *CIESM Atlas of Exotic Species in the Mediterranean. Vol. 1 Fishes. (F. Briand editor)*, CIESM Publications, Monte Carlo, Monaco, 2002.
- [4] A. Wheeler and M. J. P. Van Oijen, "The occurrence of *Sphoeroides pachygaster* (Osteichthyes-Tetraodontiformes) off North-West Ireland," *Zoologische Mededelingen*, vol. 59, no. 11, pp. 101–107, 1985.
- [5] J. C. Quéro, M. H. Du Buit, and J. J. Vayne, "Les observations de poissons tropicaux et le réchauffement des eaux dans l'Atlantique européen," *Oceanologica Acta*, vol. 21, no. 2, pp. 345–361, 1998.
- [6] J. C. Quéro, P. Porché, and J. J. Vayne, *Guide des Poissons de l'Atlantique Européen. Les Guides du Naturaliste*, Delachaux & Niestlé, Paris, France, 2003.
- [7] M. R. Albuquerque, "Peixes de Portugal," *Portugaliae Acta Biologica*, vol. 5, pp. 1–1164, 1954–1956.
- [8] B. Séret and P. Opic, *Poissons de Mer de l'Ouest Africain Tropical*, Office de la Recherche Scientifique et Technique d'Outre-Mer (ORSTOM), Paris, France, 1981.
- [9] J. Blache, J. Cadenat, and A. Stauch, *Clés de détermination des poissons de mer signalés dans l'Atlantique oriental entre le 20 parallèle nord et le 15 parallèle sud. Faune Tropicale XVIII*, Office de la Recherche Scientifique et Technique d'Outre-Mer (ORSTOM), Paris, France, 1970.
- [10] P. Peristeraki, G. Lazarakis, M. Skarvelis, M. Georgiadis, and G. Tserpes, "Additional records on the occurrence of alien fish species in the eastern Mediterranean Sea," *Mediterranean Marine Science*, vol. 7, no. 2, pp. 61–66, 2006.
- [11] P. N. Psomadakis, P. Ceddia, and M. Vacchi, "Additional records of *Sphoeroides pachygaster* (Pisces, Tetraodontidae) in the Tyrrhenian sea and notes on the distributions of the species in the Mediterranean," *JMBA2 Biodiversity Records*, vol. 1, Article ID e18, 2008.
- [12] F. Hemida, M. M. Ben Amor, and C. Capapé, "First confirmed record of the blunthead puffer, *Sphoeroides pachygaster* (Osteichthyes: Tetraodontidae) off the Algerian coast (south-western Mediterranean)," *Pan-American Journal of Aquatic Sciences*, vol. 4, no. 2, pp. 188–192, 2009.
- [13] J. Dulčić, "Northernmost occurrence of *Sphoeroides pachygaster* (Tetraodontidae) in the Adriatic Sea," *Bulletin of Marine Science*, vol. 70, no. 1, pp. 133–139, 2002.
- [14] M. N. Bradai, *Diversité du peuplement ichtyque et contribution à la connaissance des sparidès du Golfe de Gabes [Ph.D. thesis]*, University of Sfax, Sfax, Tunisia, 2000.
- [15] M. Chérif, M. M. Ben Amor, M. Bdioui, S. Ben Salem, H. Mis-saoui, and C. Canapé, "Additional records of the Blunthead puffer, *Sphoeroides pachygaster* (Osteichthyes: Tetraodontidae) off the Tunisian Coast (Central Mediterranean)," *Annales Historia Naturalis*, vol. 20, no. 1, pp. 33–36, 2010.
- [16] M. Arculeo, S. Riggio, and G. D'Anna, "First record of *Sphoeroides pachygaster* (Tetraodontidae) in the south Tyrrhenian (N/W Sicily)," *Cybium*, vol. 18, no. 2, pp. 209–210, 1994.
- [17] S. Ragonese, P. Jereb, and U. Morara, "Morphometric relationships of *Sphoeroides pachygaster* (Pisces-Tetraodontidae) of the strait of sicily (Mediterranean Sea)," *Cahiers de Biologie Marine*, vol. 38, no. 4, pp. 283–289, 1997.
- [18] A. Tursi, G. D'Onghia, and A. Matarrese, "First finding of *Sphoeroides pachygaster* (Müller & Troschel, 1848) (Tetraodontidae) in the Ionian Sea (middle eastern Mediterranean)," *Cybium*, vol. 16, no. 2, pp. 171–172, 1992.
- [19] A. Ligas, R. Sirna, and R. Sartor, "Prima segnalazione di *Sphoeroides pachygaster* (Müller & Troschel, 1848) (Pisces, Tetraodontidae) nel Mar Tirreno Settentrionale," *Biologia Marina Mediterranea*, vol. 13, pp. 274–275, 2006.
- [20] M. Relini and L. Orsi Relini, "Pesci palla in Mediterraneo, presenza antiche e recenti," *Biologia Marina Mediterranea*, vol. 2, no. 2, pp. 509–511, 1995.
- [21] E. Tortonese, "Tetraodontidae," in *Fishes of the North-Eastern Atlantic and the Mediterranean*, P. J. P. Whitehead, J. C. Hureau, J. Nielsen, and E. Tortonese, Eds., pp. 1984–1986, UNESCO, Paris, France, 1986.
- [22] J. M. Drake and D. M. Lodge, "Global hot spots of biological invasions: evaluating options for ballast-water management," *Proceedings of the Royal Society B*, vol. 271, no. 1539, pp. 575–580, 2004.
- [23] F. Courchamp, R. Woodroffe, and G. Roemer, "Removing Protected Populations to Save Endangered Species," *Science*, vol. 302, no. 5650, p. 1532, 2003.
- [24] C. F. Boudouresque, S. Ruitton, and M. Verlaque, "Large-scale disturbances, regime shift and recovery in littoral systems subject to biological invasions," in *Unesco Roste/BAS Workshop on Regime Shifts*, V. Velikova and N. Chipev, Eds., pp. 85–101, UNESCO, Varna, Bulgaria, 2005.
- [25] A. Zenetos, V. Vassilopoulou, M. Salomidi, and E. Poursanidis, "Additions to the marine alien fauna to Greek waters," *Marine Biodiversity Records*, vol. 1, p. e91, 2007.
- [26] M. De Poorter, C. Darby, and J. MacKay, *Marine Menace. Alien invasive species in the marine environment*, IUCN, <http://www.iucn.org/>, 2010.
- [27] M. Oral, "Alien fish species in the Mediterranean-Black Sea Basin," *Journal of the Black Sea/Mediterranean Environment*, vol. 16, no. 1, pp. 87–132, 2010.
- [28] P. Maiorano, L. Sion, R. Carlucci et al., "The demersal faunal assemblage of the north-western Ionian Sea (central Mediterranean): current knowledge and perspectives," *Chemistry and Ecology*, vol. 26, no. 1, pp. 219–240, 2010.



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