

Mediterranean Marine Science

Vol 7, No 2 (2006)



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doi: [10.12681/mms.172](https://doi.org/10.12681/mms.172)

To cite this article:

CORSINI-FOKA, M., MARGIES, P., KONDILATOS, G., & ECONOMIDIS, P. (2006). Torquigener flavimaculosus Hardy and Randall, 1983 (Pisces: Tetraodontidae) off Rhodes island marine area: a new alien fish in the Hellenic waters. *Mediterranean Marine Science*, 7(2), 73–76. <https://doi.org/10.12681/mms.172>

Mediterranean Marine Science
Volume 7/2, 2006, 73-76

***Torquigener flavimaculosus* Hardy and Randall, 1983 (Pisces: Tetraodontidae) off Rhodes island marine area: a new alien fish in the Hellenic waters**

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Abstract

The presence of the pufferfish Torquigener flavimaculosus was recorded during the winter 2006-2007 off Rhodes Island (SE Aegean Sea). The species, known from the western Indian Ocean, has established populations from the Levantine basin to Fethiye, Turkey. This finding expands the known range of the species in the Mediterranean to the south-eastern Aegean Sea.

Keywords: Aegean Sea; Lessepsian migration; Mediterranean; Tetraodontidae; *Torquigener flavimaculosus*.

The pufferfish *Torquigener flavimaculosus* Hardy and Randall, 1983 is a Lessepsian species immigrant to the eastern Mediterranean via the Suez Canal (GOLANI *et al.*, 2006). It is a reef-associated tropical fish dwelling at depths of 3 to 57 m in the western Indian Ocean, from east Africa to the Seychelles islands, in the Red Sea and the Persian Gulf (FROESE & PAULI, 2007). In the Mediterranean it was first collected at Haifa Bay in Israel in 1987 (GOLANI, 1987) and after a relatively long period of unrecorded spread the species reached the area off the Fethiye shore, along the Turkish Mediterranean coast, a border region between the Levantine and the Aegean seas, where a few specimens were observed in the field in 2002 and 2004 (GOLANI *et al.*, 2006; BILECE-NOGLU, 2003, 2005).

Three specimens of *Torquigener flavimaculosus* Hardy and Randall, 1983 were

collected by trawlers at Yalissos, Trianda Bay, NW coast of Rhodes (36° 26' N, 28° 11' E), at depth between 30 and 50m, over a sandy-muddy bottom covered with *Posidonia* beds. The first specimen, of a standard length of 110.8 mm and a weight of 55.9 g, was captured on 14th December 2006 (Figure 1), the second (94.4 mm standard length, 40.6 g in weight) on 27th December 2006 and the third (43.1 mm standard length, 3.3 g in weight) on 5th January 2007. These specimens were identified following HARDY & RANDALL (1983), GOLANI (1987) and GOLANI *et al.* (2006) after the following features: dorsal rays 9; anal rays 7; pectoral rays 14 (in specimens 1 and 2), 14/15 (in specimen 3, with the first ray very short on the right side); caudal rays 10. The above counts, along with the measurements of their morphometric characters, appear in Table 1. The lower margin of the eye was above the

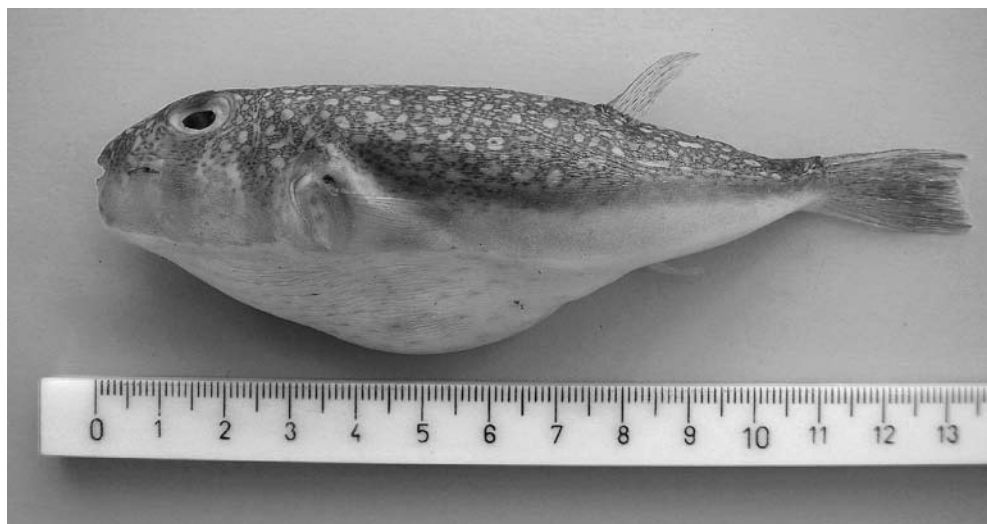


Fig.1: *Torquigener flavimaculosus* specimen, after defrosting.

level of the mouth corner and above the top of the fin base. The mouth terminal was at level of upper end of pectoral fin. The chin was distinct. Dorsal and anal fins were elongated and pointed. The skin had numerous longitudinal pleats. Small spinules were present on the belly, on the head, on the sides and the back in a patch which did not reach the dorsal fin. The number of spines across the belly on a line between pectoral bases was 16. The lower edge of the gill opening formed a cartilaginous spur. Small spines irregularly distributed were present on the margin of the gill opening (Table 1). Colour after defrosting (Fig. 1): dorsal surface brown with irregular grey-whitish spots; a mid-lateral line of well-distinguished yellow-orange spots, followed by a pale yellow zone, separating the dorsal coloured surface from the white ventral surface; vertical yellow-brown bands on the cheek, separated by irregular white bands. Caudal fin with brown spots, dorsal lightly spotted with white, anal and pectorals fins transparent.

Torquigener flavimaculosus Hardy and Randall, 1983 is very similar to *Torquigener hypselogeneion* Bleeker, 1852 (HARDY, 1983; HARDY & RANDALL, 1983; SMITH & HEEMSTRA, 1986; GOLANI,

1987). In our case the description of the three specimens followed closely those provided by HARDY & RANDALL (1983) and GOLANI (1987) for *T. flavimaculosus* except for the density of ventral spination and the number of pectoral rays which were similar to descriptions for *T. hypselogeneion* (HARDY, 1983; SMITH & HEEMSTRA, 1986). The differences observed could be included in the range of variation of the *Torquigener flavimaculosus* population.

Until 1994, the Tetraodontidae family were known in the area by three species, the autochthonous *Lagocephalus lagocephalus*, the Erythrean *Lagocephalus spadiceus* and the Atlantic *Sphoeroides pachygaster*. However, in recent years four more Indo-Pacific tetraodontids have been recorded: *Tylerius spinosissimus*, *Lagocephalus suezensis* (CORSINI *et al.*, 2005), *Lagocephalus sceleratus* (CORSINI *et al.*, 2006) and finally *T. flavimaculosus*. The last three species show a similar colonization pattern and spreading success, as observed along the Turkish coasts (BILECENOGLU *et al.*, 2002, 2006; BILECENOGLU, 2005; GOLANI *et al.*, 2006).

The first collection of *T. flavimaculosus* off the NW coasts of Rhodes island documents a range expansion of the species from

Table 1
Measurements (in mm) and counts for the *Torquigener flavimaculosus* specimens caught in Trianda Bay, Rhodes (Greece) during winter 2006-07.

	1	2	3
Total length	134.6	122.1	55.0
Standard length	110.8	94.4	43.1
Head length	38.4	34.4	17.1
Snout	16.6	14	7.2
Snout to origin of dorsal fin	76.7	64.8	29.1
Snout to origin of anal fin	79	68.4	31.5
Snout to origin of pectoral fin	40.9	36.7	18.7
Depth at posterior of dorsal fin	16.8	14.4	6.2
Caudal peduncle length	27.4	24.8	10.0
Caudal peduncle least depth	8.3	7.9	3.0
Mouth width	9.1	8.9	3.8
Eye horizontal diameter	9.6	9	4.3
Interorbital distance	15.6	12.2	6.5
Least fleshly interorbital distance	5.8	4.7	1.9
Posterior of eye to dorsal corner of gill opening	15.0	12.7	6.4
First dorsal ray length	8.9	5.1	2.7
Longest dorsal ray length	16.3	15.2	7.2
Base of dorsal fin	6.0	6.0	2.5
First anal ray length	5.9	5.0	2.4
Longest anal ray length	13.5	13.3	6.1
Base of anal fin	4.1	3.7	2.3
Maximum pectoral fin length	17.6	15.9	6.3
Maximum caudal fin length	24.6	23.8	12.0
Dorsal ray count	9	9	9
Anal ray count	7	7	7
Pectoral ray count	14/14	14/14	14/15
Caudal ray count	10	10	10
Spines count on the anterior margin of branchial opening	4-6	4-5	2-3

the Levantine into the SE Aegean, while the presence of different sized specimens, belonging to both juvenile and adult stages, indicates the existence of an established population in the region.

Acknowledgements

From the small Rhodes Biological Station which lacks an extensive fish collection or library and possesses only limited experience in studying Indo-Pacific fish fauna, the generous help offered by distinguished specialists is gratefully acknowledged: we thank

Dr. D. Golani, Dr. A. Suzumoto and Dr. J. E. Randall for their support and advice, as well as the fisherman, N. Tsoukalis, for providing the three specimens of *T. flavimaculosus*.

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Accepted in July 2007