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Aquatic Invasions Records

First record of the Lessepsian migrant species *Lagocephalus sceleratus* (Gmelin, 1789) (Actinopterygii: Tetraodontidae) in the Central Mediterranean

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Abstract

The Lessepsian migrant fish *Lagocephalus sceleratus* is being recorded for the first time from the gulf of Gabès (Central Mediterranean, Tunisia). The record is based on a single specimen collected in December 2010. Previous records of the species were confined to the Levantine and Aegean Seas. Recent research reveals that this species is extending its distribution area to the western Mediterranean. The species is toxic, containing tetrodotoxin (TTX) that paralyses the nervous and respiratory systems. Actions of awareness were taken in Tunisia to alert consumers and fishermen on the potential danger of this species.

Key words: *Lagocephalus sceleratus,* Tetraodontidae, Lessepsian species, Gulf of Gabès, Central Mediterranean, tetrodotoxin

Introduction

The silverstripe blaasop *Lagocephalus sceleratus* (Gmelin, 1789) is an Indo-Pacific migrant, but has been recorded in the Mediterranean Sea since 2003. It has also been recorded in Turkey (the Aegean Sea) (Filiz and Er 2004; Akyol et al. 2005; Bilecenoglu et al. 2006), in Greece (the Aegean Sea) (Corsini et al. 2006; Minos et al. 2010), in the Cretan Sea (Greece) (Kasapidis et al. 2007), in the Levantine (Golani and Levy 2005; Bilecenoglu et al. 2006) and in the Lebanon (Carpentieri et al. 2009). This report records the first occurrence of *L. sceleratus*, in the southern gulf of Gabes, Central Mediterranean.

Methods

A single specimen of *Lagocephalus sceleratus* was caught by a bottom trawler on 8 December 2010, at the southern end of the Gulf of Gabès (33°50′N; 11°52′E). It is currently located in a collection at the Sfax Centre of the National Institute of Sea Sciences and Technologies, catalogue no. TETRA003.

Results and discussion

The obtained specimen of *Lagocephalus sceleratus* had a total length of 60 cm, and weighed 2687 g (Figure 1). The body is elongated and cylindrical, slightly compressed laterally and ventrally with a tapering caudal peduncle. Small spinules are present on the dorsal area, extending from behind the upper lip to the dorsal fin, but the spinules do not reach the cloacae ventrally. No scales are present on the rest of the body surface. There is no pelvic fin. The dorsal and anal fins are opposite each other with a posterior position and the caudal fin is lunate. The colour of the dorsal area is brownish-grey with regularly distributed black dots. The abdominal side is white and rough. Wide silver bands are present laterally, from the mouth to the caudal fin. The pectoral fin base has a black color. A silver blotch was present in front and below the eye.

All measurements and meristic features are reported in Table 1.

The family Tetraodontidae is represented by nine species in the Mediterranean Sea (Golani et al. 2002; Akyol et al. 2005; Corsini et al. 2005; Golani et al. 2006). Five species have been

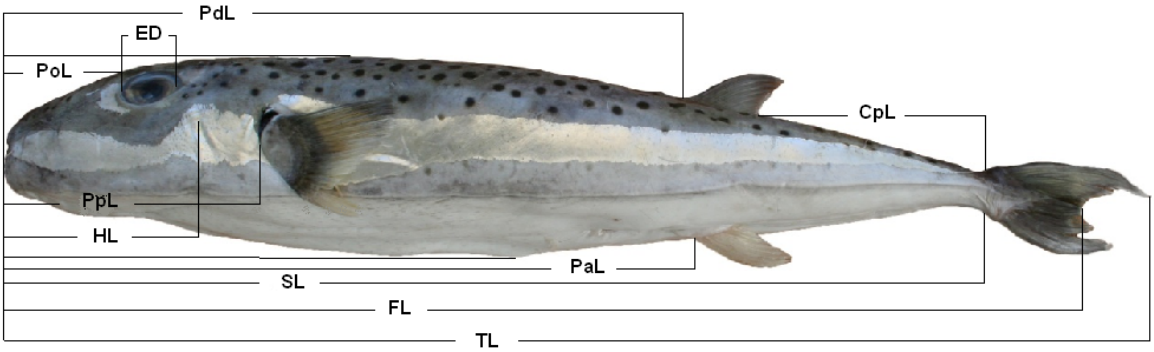

Figure 1. *Lagocephalus sceleratus* specimen caught off Central Mediterranean waters. Photograph by M. N. Bradai.

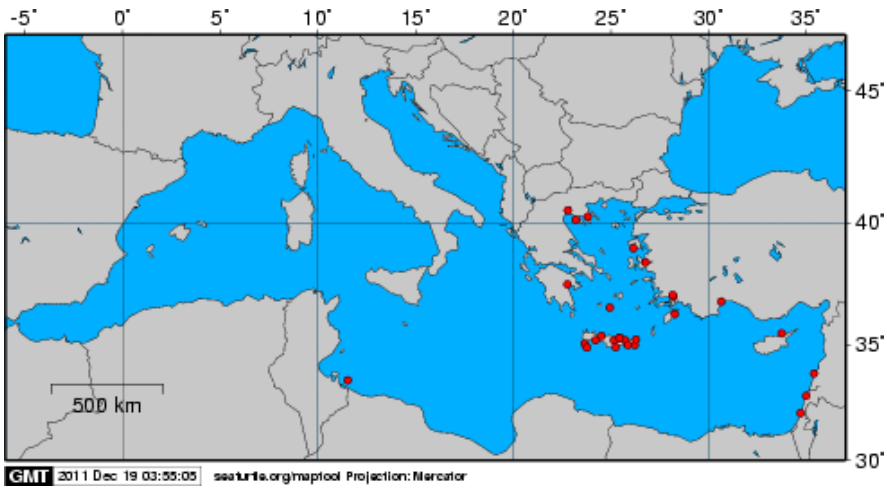

Figure 2. Map showing the locations where the silverstripe blaasop *Lagocephalus sceleratus* has been captured (see Appendix 1 for details).

Table 1. Measurements and counts for the *Lagocephalus sceleratus* specimen caught in the gulf of Gabes (Central Mediterranean), December 2010.

Measurements	Mm	Proportion
Total Length (TL)	600	
Fork Length (FL)	563	
Standard Length (SL)	510	
Body depth (BD)	122	23.9 SL
Head length (HL)	130	25.5 SL
Eye diameter (ED)	30/15	23.1/11.5 HL
Caudal peduncle length (CpL)	145	28.4SL
Preorbital length (PoL)	85	65.4HL
Prepectoral Length (PpL)	155	30.4SL
Predorsal length (PdL)	348	68.2SL
Preanal length (PaL)	350	68.6SL
Dorsal finrays	12	
Anal finrays	11	
Pectoral finrays	20	
Caudal finrays	35	

recorded in Tunisia namely: *Lagocephalus sceleratus* (Gmelin, 1789), the subject of this paper; a single specimen of *Ephippion guttiferum* (Bennett, 1831) recorded in the gulf of Tunis on 5 October 1980 (Hachaichi 1981); *Lagocephalus lagocephalus* (Linnaeus, 1758), common in the gulf of Gabes (Bradai et al. 2004); *Lagocephalus spadiceus* (Richardson, 1844), a Lessepsian immigrant recorded in the north of the gulf of Tunis and the tropical Atlantic, and *Sphoeroides pachygaster* (Muller and Troschel, 1848), that was first observed in the gulf of Gabès (Bradai et al. 1993) and later became common along Tunisian coasts (Bradai 2010).

L. sceleratus is a potential risk to humans, since it contains tetrodotoxin (TTX) that may be a source for food poisoning (Kasapidis et al. 2007; Bentur et al. 2008; Eisenman et al. 2008; Katikou et al. 2009). It is considered as a delicious sea food in Suez City, Egypt, where it

is illegally sold in spite of several fatal poisonings being reported there (Zaki 2004). Pufferfish is considered a delicacy in Japan, where it is known as fugu; the poisonous organs are removed by specialist cooks, the day the fish is caught.

L. sceleratus should not be consumed in Tunisia, since the skin and internal organs contain a neurotoxin that can paralyse both the nervous and respiratory systems. The toxin is not affected by heat or cooking (Arakawa et al. 2010).

Awareness of this highly toxic fish is urgently required for both fishermen and consumers. It is important to (i) notify local authorities about the presence of newly captured fish and (ii) avoid its consumption. Distribution of a brochure with photographic images and information pertaining to the fish are in press.

Lagocephalus sceleratus has shown a rapid expansion throughout the eastern Mediterranean Sea since its first appearance, reaching to the northern most parts of the Aegean Sea. This new occurrence south of the gulf of Gabes (Central Mediterranean) obviously suggests a successful adaptation of the species and a westerly movement into the Mediterranean Sea (Figure 2; Appendix 1).

Perhaps the gradual warming of the sea in the context of global warming (Brauch 2010), also facilitates the immigration of this Indo-pacific alien species. This concept leads to a more complex vision of the overall colonization process in the entire Mediterranean, especially since we are aware that *L. sceleratus* is in the list of the 100 “Worst Invasives” in the Mediterranean (Streftaris and Zenetos 2006).

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Appendix 1. Records of *Lagocephalus sceleratus* in the Mediterranean.

Map reference	Location/country	Number of individuals	Record coordinates		Date of record	Reference
			Latitude, N	Longitude, E		
1	Southern Aegean Sea Turkey	1	37° 02' N	28° 19' E	August 2003	Filiz and Er 2004
2	Gökova bay Aegean Sea (Turkey)	1	37° 09' N	28° 16' E	February 2003	Akyol et al. 2005
3*	Jaffa	1	32° 09' N	34° 70' E	November 2004	Golani and Levy 2005
4*	Kemer Antalya bay (Turkey)	1	36° 82' N	30° 64' E	September 2004	Bilecenoglu et al. 2006
5*	Haifa	1	32° 84' N	35° 00' E	February 2005	Golani and Levy 2005
6	Heraklion bay Cretan Sea (Greece)	1	35° 20' N	25° 15' E	July 2005	Kasapidis et al. 2007
7*	Ladiko Aegean Sea(Greece)	1	36° 31' N	28° 27' E	September 2005	Corsini et al. 2006
8	Georgioupolis/ Cretan Sea (Greece)	1	35° 21' N	24° 21' E	December 2005	Kasapidis et al. 2007
9*	South of Beirut Lebanon	?	33° 81' N	35° 42' E	2005-2006	Carpentieri et al. 2009
10*	Izmir Bay Aegean Sea (Turkey)	1	38° 42' N	26° 76' E	April 2006	Bilecenoglu et al. 2006
11*	Aegean, Cretan and Libyan seas	1	35° 20' N	25° 72' E	December 2006	Peristeraki 2006 (Paper accepted in May 2007)
12*	Aegean, Cretan and Libyan seas	1	35° 31' N	25° 45' E	February 2007	Peristeraki 2006 (Paper accepted in May 2007)
13*		1	38° 99' N	26° 15' E	February 2007	
14*		4	35° 00' N	26° 21' E	March 2007	
15*		1	35° 30' N	25° 44' E	March 2007	
16*		1	35° 38' N	24° 52' E	March 2007	
17*		1	35° 00' N	25° 87' E	March 2007	
18*		1	37° 53' N	22° 77' E	March 2007	
19*		21	35° 07' N	24° 64' E	March 2007	
20*		1	34° 89' N	24° 77' E	March 2007	
21*		3	34° 92' N	25° 24' E	March 2007	
22*		1	36° 57' N	24° 94' E	April 2007	
23*		1	35° 24' N	26° 29' E	April 2007	
24*	North Aegean Sea	1	40° 49' N	22° 79' E	October 2008	Minos et al. 2010
25*		1	40° 23' N	23° 81' E	Mars 2009	
26*		1	40° 12' N	23° 20' E	December 2009	
27*	Cyprus	?	35° 49' N	33° 74' E	2009	Katsanevakis et al. 2009
28	South of the gulf of Gabès (Central Mediterranean)	1	33° 50' N	11° 52' E	December 2010	Present study

*Coordinates are approximately determined from data in the text: not reported as such by the authors.