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UNUSUAL RECORDS OF TRIPLETAIL *LOBOTES SURINAMENSIS* (OSTEICHTHYES: LOBOTIDAE) FROM THE TUNIS SOUTHERN LAGOON (NORTH-EASTERN TUNISIA, CENTRAL MEDITERRANEAN SEA)

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ABSTRACT

The present paper reports on the captures of two female specimens of tripletail Lobotes surinamensis (Bloch, 1790) in a peri-Mediterranean lagoon, the Tunis Southern Lagoon, located in north-eastern Tunisia. Both specimens are herein described and their intrusion in such brackish area is explained. It appears that in the past decade, captures of L. surinamensis in the Mediterranean have been increasing. Such a phenomenon suggests that a sustainable population is successfully established in this sea. However, migrations from the eastern Tropical Atlantic and the Red Sea cannot be ruled out completely.

Key words: *Lobotes surinamensis*, brackish area, migrations, morphometric measurements, meristic counts.

SEGNALAZIONI INSOLITE DEL PESCE FOGLIA *LOBOTES SURINAMENSIS* (OSTEICHTHYES: LOBOTIDAE) NELLA LAGUNA MERIDIONALE DI TUNISI (TUNISIA NORD-ORIENTALE, MEDITERRANEO CENTRALE)

SINTESI

Nel presente lavoro gli autori riportano le catture di due femmine di pesce foglia, Lobotes surinamensis (Bloch, 1790), in una laguna peri-mediterranea, la laguna meridionale di Tunisi, situata nel nord-est della Tunisia. Entrambi gli esemplari vengono descritti e viene spiegata la ragione della loro intrusione in tale area. Le catture di L. surinamensis risultano in aumento nell'ultimo decennio nel Mediterraneo. Tale fenomeno suggerisce che si sia stabilita una popolazione sostenibile in questo mare. Tuttavia, le migrazioni dall'Atlantico tropico-orientale e dal mar Rosso non possono venir del tutto escluse.

Parole chiave: *Lobotes surinamensis*, zona salmastra, migrazioni, misurazioni morfometriche, conte meristiche.

INTRODUCTION

Tripletail *Lobotes surinamensis* (Bloch, 1790) is a cosmopolitan species widely distributed in warm temperate and warm seas of the Pacific (Kharin *et al.*, 2009) and Indian Oceans and on either side of the Atlantic (Carpenter & Robertson, 2015). In the western Atlantic, the habitat of *L. surinamensis* extends from Massachusetts, the Gulf of Mexico and the Caribbean Sea (Franks *et al.*, 2003) southward to Argentina (Sazima *et al.*, 2009). In the eastern Atlantic, it is reported in the area spanning from southern Portugal to Angola, including the Canary and Cape Verde Islands (Fischer *et al.*, 1981; Roux, 1986; Carpenter & Robertson, 2015).

Lobotes surinamensis is reported from warm Mediterranean areas (Carpenter & Robertson, 2015) and could be considered as a Herculean migrant (*sensu* Quignard & Tomasini, 2000), despite the fact that its first record came from Sicilian waters (Doderlein, 1875). The occurrence of the species has been noted off the Italian coast (Bini, 1968; Zava *et al.*, 2007), Spain (Palom, 1991) and eastward, in the Aegean Sea, where several records have been summarized by Minos & Economidis (2015). *L. surinamensis* has also been recorded in the Adriatic Sea (Dulčić & Dragičević, 2011; Dulčić *et al.*, 2014a), where the northernmost record in the Mediterranean was reported by Dulčić *et al.* (2014b).

Lobotes surinamensis is reported from southern Mediterranean areas such as the Gulf of Gabès (Bradai, 2000), the Algerian coast (Hemida *et al.*, 2003) and the Maltese islands (Deidun *et al.*, 2010). Investigations regularly conducted in the Tunis Southern Lagoon allowed us to collect two specimens of *L. surinamensis* which are the object of the present paper. Both specimens are herein described and the species distribution in the area and the entire Mediterranean Sea is commented and discussed.

MATERIAL AND METHODS

For several years, surveys have regularly been conducted in the Tunis Southern Lagoon to assess the impact and results of the ecological restoration of this brackish area and to compile an inventory of autochthonous and allochthonous species recently found in the area, mainly crustaceans and fishes (Mejri *et al.*, 2004; Ben Souissi *et al.*, 2005; Ounifi-Ben Amor *et al.*, *in press*, a, b).

The Tunis Southern Lagoon is a peri-Mediterranean lagoon (*sensu* Quignard & Zaouali, 1980) adjoining the city of Tunis, located in the southwestern region of the Gulf of Tunis (36°47' N and 10°17' E). The Tunis Lagoon is divided into two areas separated by a navigation channel: the Tunis Northern Lagoon and the Tunis Southern Lagoon (see Fig. 1B). The latter area extends over 720 ha, has a regular depth of about 2.1 m and a maximum depth of 4 m. Its shores have been excavated and protected by large rocky stones.

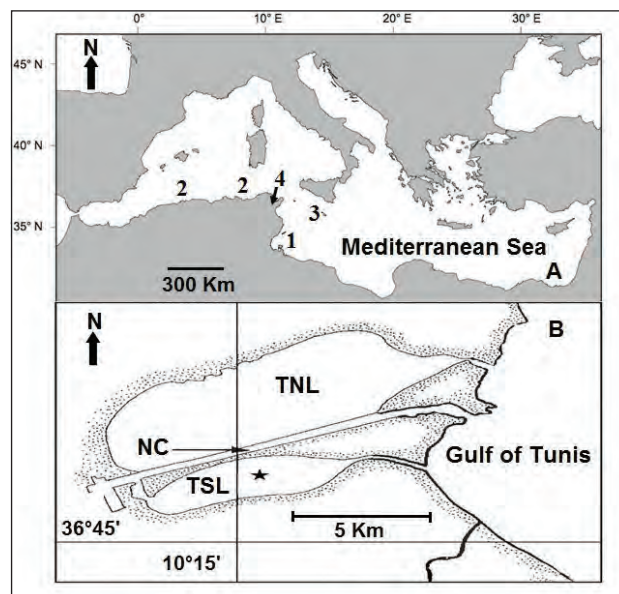


Fig. 1: A – Map of the Mediterranean Sea showing the captures site of *Lobotes surinamensis* (Bloch, 1790) in southern regions. Legend: 1. Gulf of Gabès (Bradai, 2000). 2. Coast of Algeria (Hemida *et al.*, 2003). 3. Maltese waters (Deidun *et al.*, 2010). 4. Tunis Southern Lagoon (this study). B – details of the Tunis Southern Lagoon.

Sl. 1: A – Zemljevid Sredozemskega morja z označenimi lokalitetami, kjer so bili ujeti primerki vrste *Lobotes surinamensis* (Bloch, 1790) v južnih predelih. Legenda: 1. Gabeški zaliv (Bradai, 2000). 2. Obala Alžirije (Hemida *et al.*, 2003). 3. Malteške vode (Deidun *et al.*, 2010). 4. Tuniška južna laguna (ta raziskava). B – detajli Tuniške južne lagune.

On 19th March 2015, captures of two specimens of *L. surinamensis* occurred in the Tunis Southern Lagoon. The local fishermen aware of the fishing grounds informed us that both captures were carried out by trammel net with a 16 mm stretched size at a depth of 3.6 m approximately, on soft bottom, partially covered by seagrass, at 36°47'35" N and 10°13'48" E (Fig. 1), together with small crustacean and teleost species. Total length (TL) and other morphometric measurements were carried out to the nearest millimetre, meristic counts followed Hemida *et al.* (2003), while total body weight (TBW) and total eviscerated body weight (TEBW) were recorded to the nearest gram (Tab. 1). Both specimens were preserved in 10% buffered formalin and deposited in the Ichthyological Collection of the Faculté des Sciences de Tunis, catalogued under numbers FST-Lobo-suri-01 and FST-Lobo-suri-02, respectively.

RESULTS AND DISCUSSION

Both specimens were females and their stomachs contained remains of crustacean species, such as spher-

Tab. 1: Morphometric measurements (in mm and as % of standard length), meristic counts and masses (in grams) recorded in the tripletail *Lobotes surinamensis* (Bloch, 1790) collected in the Tunis Southern Lagoon.

Tab. 1: Morfometrične meritve (v mm in izražene v % standardne dolžine), meristična štetja in masa (v gramih) primerkov vrste *Lobotes surinamensis* (Bloch, 1790) v Tuniški južni laguni.

Reference	FST-Lobo-suri-01		FST-Lobo-suri-02	
Sex	Adult Female		Adult Female	
Morphometric measurements	mm	%SL	mm	%SL
Total length (TL)	390	116.77	250	125.63
Standard length (SL)	334	100.00	199	100.00
Fork length	311	93.11	175	87.94
Space between tip of snout to caudal fin origin	302	90.42	149	74.87
Head length	55	16.47	51	25.63
Interorbital space	20	5.99	16.5	8.29
Space between tip of snout to dorsal fin origin	67	20.06	51	25.63
Space between tip of snout to pelvic fin origin	57	17.07	47	23.62
Space between tip of snout to anal fin origin	225	67.37	158	79.40
Space between snout and vent	245	73.35	166	83.42
Dorsal fin length	260	77.84	170	85.43
Pectoral fin length	61	18.26	45	22.61
Pelvic fin length	81	24.25	53	26.63
Anal fin length	77	23.05	49	24.62
Caudal fin length	38	11.38	30	15.08
Caudal fin width	35	10.48	28	14.07
Meristic counts				
Pelvic fin rays	I + 5		I + 5	
Dorsal fin rays	XII + 16		XII + 15	
Anal fin rays	III + 13		III + 12	
Pectoral fin rays	12		12	
Caudal fin rays	18		18	
Ctenoid scales on tail	10		10	
Weight (gram)				
Total body	1450		950	
Eviscerated body	1280		820	
Gonad	7.5		6.8	
Stomach content	95		74	

omatids and amphipods, and algae. The specimen referenced FST-Lobo-suri-01 measured 390 mm TL and weighed 1450 g (TBW), while the specimen referenced FST-Lobo-suri-02 measured 250 mm TL and weighed 950 g (TBW). Carpenter & Robertson (2015) noted that

50% maturity is attained at 485 mm for females, therefore both specimens were still immature females.

Both specimens were identified by the following combination of characteristics: body deep, compressed; head small, concave behind the eye in profile, looks



Fig. 2: Specimen of *Lobotes surinamensis* (Bloch, 1790) collected in the Tunis Southern Lagoon (Ref.: FST-Lobo-suri-01), scale bar = 40 mm.

Sl. 2: Primerek vrste *Lobotes surinamensis* (Bloch, 1790) ujet v Tuniški južni laguni (Ref.: FST-Lobo-suri-01), merilo = 40 mm.

like a hump above gill cover; dorsal and anal fins long, rounded, symmetrical; pectoral fin short, rounded; preopercle strongly serrated; mouth large, oblique with protractile upper jaw; colour grey to yellow brown to dark brown with various mottling, sometimes with 2-3 dark lines radiating from the eye, posterior margin of caudal fin yellow (Fig. 2).

Description, morphometric measurements, meristic counts and colour are in total accordance with Fischer *et al.* (1981), Roux (1986), Hemida *et al.* (2003), Kharin *et al.* (2009), Dulčić & Dragičević (2011) and Dulčić *et al.* (2014a) and, therefore, confirm the proper identification of *Lobotes surinamensis* in the Tunisian waters and its northernmost extension range in this area. Addition-

ally, these two new captures constitute the first records of *L. surinamensis* in a peri-Mediterranean lagoon (*sensu* Quignard & Zaouali, 1981).

Lobotes surinamensis is known to inhabit bays, muddy estuaries and river mouths (Carpenter & Robertson, 2015); it is a sluggish species, which lives solitary or in pairs, floating on its side on the water surface together with other objects (Smith & Randall, 1997), and it is possible that both specimens were carried by the currents into the Tunis Southern Lagoon. This species preferentially feeds on small crustacean species (Franks *et al.*, 2003), the stomachs of the present specimens contained large quantities of spheromatids and amphipods, which abound in the Tunis Southern Lagoon (Ounifi-Ben Amor *et al.*, in press a). This means that *L. surinamensis* probably found in this brackish area a favourable biological environment; similar patterns were reported for other fish species (Mėjri *et al.*, 2004; Ben Souissi *et al.*, 2004, 2005; Ben Amor *et al.*, 2009; Ounifi-Ben Amor *et al.*, in press b).

Tortonese (1975) noted that tripletail was occasionally captured in Italian waters and that its behaviour pattern served as camouflage against predators. However, for at least a decade, Mediterranean records of the species appear to be more frequent (Hemida *et al.*, 2003; Dulčić & Dragičević, 2011; Dulčić *et al.*, 2014a; Minos & Economidis, 2015). The theory by Hemida *et al.* (2003) about a progressive invasion of the Mediterranean from the eastern Atlantic remains speculative, although it cannot be totally ruled out, because the waters of this sea are becoming warmer (Francour *et al.*, 1994) and this promotes the introduction of allochthonous species (Ben Rais Lasram & Mouillot, 2009). Additionally, Carpenter & Robertson (2015) noted that the species is widely distributed and popular in recreational fishing, and there are no known major threats to the global population of *L. surinamensis* nor to the population that has successfully established in the Mediterranean, but monitoring of recreational landings is necessary to avoid over-harvesting.

NEOBIČAJEN ZAPIS O POJAVLJANJU VRSTE *LOBOTES SURINAMENSIS* (OSTEICHTHYES: LOBOTIDAE) IZ TUNIŠKE JUŽNE LAGUNE (SEVEROVZHODNA TUNIZIJA, OSREDNJE SREDOZEMSKO MORJE)

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POVZETEK

V pričujočem prispevku avtorji poročajo o ulovu dveh samic vrste *Lobotes surinamensis* (Bloch, 1790) v perimediteranski Tuniški južni laguni v severovzhodni Tuniziji. Avtorji opisujejo primerka in razlagajo pojavljanje te vrste v tovrstnem somornem okolju. Kaže, da je v zadnjih desetletjih vse več primerov pojavljanja vrste *L. surinamensis* v Sredozemskem morju. Pojav dveh primerkov najverjetneje kaže, da se je vrsta v novem okolju uspešno ustalila. Vsekakor pa ni možno ovreči možnosti, da primerki te vrste prihajajo iz tropskega Atlantika in iz Rdečega morja.

Ključne besede: *Lobotes surinamensis*, somorno okolje, selitve, morfometrične meritve, meristična štetja.

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