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Aquatic Invasions Records

New records of *Lobotes surinamensis* (Bloch, 1790) in Maltese coastal waters

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Abstract

Lobotes surinamensis is considered as a rare occurrence in the Mediterranean Sea, being mainly encountered in the eastern and central areas of the basin. The species was previously recorded only once from the Maltese Islands, from offshore waters 45 miles south of the islands. Numerous recent records of the species in Maltese nearshore waters suggest that the same species is becoming more common in such waters, possibly hinting at the geographical expansion of populations of this thermophilic fish species in the Mediterranean.

Key words: Mediterranean, meridionalisation, thermophilic, fish species

Introduction

The Atlantic tripletail (synonyms: Black perch, Black grunt), *Lobotes surinamensis* (Bloch, 1790), is a cosmopolitan species, with a wide distribution extending within the tropical and sub-tropical waters of all oceans and ranging from 45°N to 42°S and from 100°W to 161°E (Froese and Pauly 2003). Juveniles of the species are considered to be epi-pelagic and may occur in floating *Sargassum* and mimic a floating leaf (Myers 1999). Adults are bentho-pelagic and may occasionally drift over reefs (Lieske and Myers 1994), they generally feed on benthic crustaceans and small fish (Sommer et al. 1996) and they may reach a total weight of 14kg (Wheeler 1985).

The fish species is considered as a rare occurrence in the Mediterranean, being reported as a localised catch in restricted areas of the Eastern and Central Mediterranean waters (Tortonese 1975; Fischer et al. 1987), athough records from the Strait of Sicily (especially from the Gulf of Gabes, Tunisia) have recently become more common (Camilleri et al. 2005). In fact, the species has recently been reported from the Pelagian islands (http://www.monitamal.net/segnalazioni02.htm) and off the Algerian coast (Minos and Economidis 2007). The species was previously recorded from the Maltese Islands, with a specimen having been caught 45 miles south of Malta through a drifting long-line targeting swordfish (Camilleri et al. 2005), but never from nearshore waters in the Maltese Islands. This paper documents the increasing frequency of the species in Maltese coastal waters through the listing of a number of separate records.

Materials and methods

Two *Lobotes surinamensis* individuals were caught in 2009 and one in 2010, with only one of these specimens being used for morphometric measurements. In the laboratory, all relevant lengths were measured parallel to the longitudinal axis of the body, whilst depths were measured perpendicular to the axis, to the nearest 0.5mm. Other individuals of the same species were only observed, and Table 1 summarises details of all the occasions in which the species was encountered in Maltese coastal waters, whilst Figure 1 illustrates the location for each *L. surinamensis* collection or sighting. Details from other anecdotal sources are also reported in this paper.

Results

A number of specimens of *Lobotes surinamensis* have been observed by amateur fishermen and SCUBA divers in Maltese coastal waters in recent years, but none have been published to date. Morphometric measurements could be

Table 1. Summary of collections and observations of *Lobotes surinamensis* in Maltese coastal waters.

Date	Location (reference in Figure 1)	Geographic coordinates		Caught/ Observed	Details
		Latitude, N	Longitude, E		
27/09/09	Marsamxett Harbour (1)	35°53'57"	14°30'18"	Caught	Individual (adult), at the surface by hand – used for morphometric measurements
10/09/09	Zonqor Point (2)	35°52'02"	14°34'31"	Caught	Individual (adult), at 5m depth over a rocky seabed by harpoon
25/10/10	Marsascala Bay (2)	$35^0$51'52"	$14^0$33'54''	Caught	Individual caught and kept alive in aquarium
10/09/09	Spinola Bay (A)	35°55'07"	14°29'31"	Observed	Numerous juveniles, at the surface, in association with entangled floating ropes in shallow (<5m) water
11/09/09	Msida Creek (dominated by yacht marina) (B)	35°53'47"	14°29'38"	Observed	Numerous juveniles, at the surface, in association with entangled floating ropes in shallow (<5m) water
10/09/09 and summer 2010	Delimara powerstation thermal effluent (C)	35°50'13"	14°33'35"	Observed	Numerous juveniles (60-90mm), at the surface, in the vicinity of the powerstation thermal effluent
31/10/09	Marsalforn (D)	36°04'20"	14°15'34"	Observed	Single individual, observed at 2m from the shore, associated with a piece of rope and approx. 85mm in length

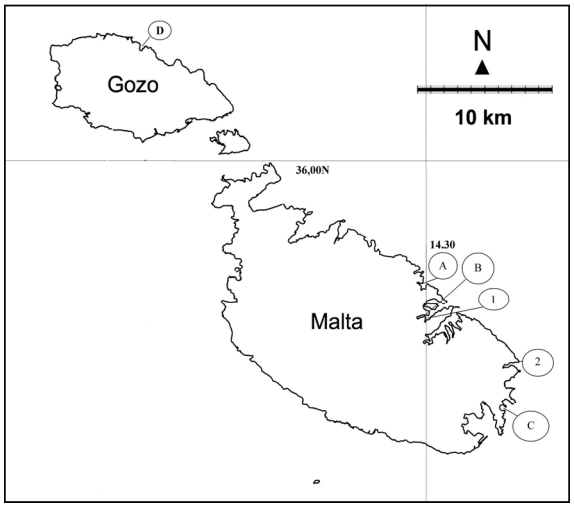

Figure 1. Map of the Maltese Islands, indicating locations where *Lobotes surinamensis* individuals have been recorded in the present study.

taken on the only preserved specimen, shown in Figure 2. This adult specimen had a length of 83 mm and a fork length of 77mm, and exhibited a small snout, a slight toothed pre-operculum, a rounded caudal fin with yellow margins and a dark brown colouration above and a silvery grey colouration below. The specimen weighed 9.6g and its greatest body depth was that of 36.5mm. The opercular head length of the specimen was 23mm, whilst its ventral and pectoral fin length was 18.5mm and 12mm, respectively. The anterior and the posterior dorsal fin base lengths were 4mm and 31mm respectively, whilst the perpendicular anal length of the individual was 34mm. The reported appearance is consistent with that of a young adult (Froese and Pauly 2010). A second adult individual of *L. surinamensis* harpooned by sports fishermen in October 2009 off Zonqor Point was not preserved but its length was estimated to have been that of 250mm.

Contrary to the caught individuals, the observed *L. surinamensis* individuals exhibited a mottled appearance, with yellow-green pigmentation characterizing their sides (Figure 3). Although these *L. surinamensis* individuals were not caught, their total length is estimated to range between 900 and 1300mm. Anecdotal recounts from sports fishermen include the sightings of small shoals of juveniles (60-90mm in length) of the species beneath FAD's used for dolphinfish fisheries in offshore waters where the juveniles were observed to mimic drifting vegetation. According to one local fisherman, the species has been caught for at least the past four years in coastal waters off the north-western coast of the island of Malta, through the deployment of the trammel net, but no further information is available regarding such captures.

Conclusions

The observations on the habit of the *L. surinamensis* individuals encountered in the present study are consistent with descriptions

Figure 2. *Lobotes surinamensis* specimen caught at Marsamxett Harbour, September 2009 (Photograph by Mr. Patrick Vella).

Figure 3. *Lobotes surinamensis* specimen observed at the surface at Spinola Bay, October 2009 (Photograph by Mr. Arnold Sciberras).

given by Froese and Pauly (2010) and by Massuti and Morales-Nin (1999) which state that individuals of the species are often observed floating on their side near the surface, under or in close vicinity to floating objects.

As evident from past records of the species from the Mediterranean which date back to at least 1874 (a specimen caught off the northern Sicilian coast – Bini 1970), the Mediterranean must be considered as part of the native range of *L. surinamensis*. Most definitions of "alien species" (e.g. FAO 2002; IUCN 2002; UNEP 2004) make reference to species which occur outside their historically known ranges – in view of the numerous records from the Mediterranean of the species, the Mediterranean Sea must be considered as part of the natural range of the species, albeit located at the boundaries of such a range (in view of the relatively rare occurrence of the species in the Mediterranean, compared with other marine areas such as Atlantic and Pacific Ocean coastal waters).

In view of the sightings of numerous juveniles of *L. surinamensis,* as well as the repeated sightings of the species in Maltese coastal waters, it is plausible to suggest that established, self-sustaining populations of the species occur in the same waters and that the individuals encountered in this study were not vagrants. In addition, the nature of these sightings may suggest that the species, for which the majority of Mediterranean records hailed from the Eastern Mediterranean (Tortonese 1975), is extending westwards and northwards its range within the same basin, with well-established populations replacing vagrant individuals. Although *L. surinamensis* is not entirely unknown from the western Mediterranean, it is a rare occurrence in this part of the basin, as suggested by Riera et al. 1999, who, in their overview of the ichthyo-fauna associated with drifting floating objects in the Balearic Islands, report just one *L. surinamensis* individual, captured through purse-seining during the month of September and having a total length of 56.3cm.

The high dispersal potential, ecological differentiation, general non-resilience, temperature sensitivity, large size and ease of identification make fishes ideal candidates for the study of the effects of climate variability (Wood et al. 1997). Recent changes in distribution of indigenous fish species as a putative result of climate change has been well documented (Beare et al. 2004; UNEP-MAP-RAC/SPA 2008; CIESM 2008). For example, the Tetraodontidae constitute a striking example of the tropicalization of the Mediterranean fish fauna, with the number of pufferfish species recorded for the Mediterranean waters rising from three (*Ephippion guttiferum* (Bennett, 1831), *Lagocephalus lagocephalus* (Linnaeus, 1758) and *Lagocephalus spadiceus* (Richardson, 1845)) to 10 species, with seven novel tetraodontids of Lessepsian or tropical-Atlantic origin (Vacchi et al. 2007).

The phenomenon of "meridionalisation", involving the shift of thermophilic species to relatively colder waters, has been documented for a number of species (e.g. Bianchi and Morri 1993; Azzurro 2008), including *Thalassoma pavo* (Linnaeus, 1758), previously only abundant in the Eastern Mediterranean and now well

established in the Western Basin as well. From a literature review, Azzurro 2008 identifies 51 fish species which have expanded their range northwards in the Mediterranean, of which 34 were native and 17 non-native (11 Lessepsian, 6 Atlantic). Many of these fish species were described as of subtropical or tropical affinity, being found mainly in coastal waters – *Lobotes surinamensis* is included by the same author in such a list, being described as a native Mediterranean species whose range is expanding northwards.

Results from the current study tend to support the hypothesis that the increasing abundance of *L. surinamensis* in Maltese coastal waters constitutes a westward expansion of the fish species within the Mediterranean. This hypothesis is subject to confirmation from further quantitative records of the same species from other localities in the Central and the Western Mediterranean.

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