



## Rapid Communication

## First record of the silver-cheeked toadfish *Lagocephalus sceleratus* (Gmelin, 1789) from Malta

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### Abstract

The occurrence of the silver-cheeked toadfish, *Lagocephalus sceleratus*, is reported for the first time from Maltese waters. The specimen was caught at a depth of 15 m in a sparse sea grass *Posidonia oceanica* meadow. The need for a public information campaign on the danger to human health posed by the species, and to develop an early warning system of its spread, is discussed.

**Key words:** invasive species, fish, Mediterranean Sea, Tetraodontidae, Lessepsian

### Introduction

One of the ‘worst’ invaders of the Mediterranean Sea (Streftaris and Zenetos 2006), the silver-cheeked toadfish *Lagocephalus sceleratus* (Gmelin, 1789) (Tetraodontidae) has exhibited a remarkable westward expansion within the Mediterranean Sea since its first record from Gökova Bay, Turkey, in 2004 (Filiz and Er 2004). Subsequently, this Lessepsian immigrant species has established large populations along the coasts of many countries of the eastern basin such as Israel, Lebanon, Turkey (Mediterranean and Aegean coasts), Cyprus, and Greece (Aegean and Ionian coasts), whilst still rapidly expanding westwards along the coasts of Egypt, Libya, and along the entire Tunisian coastline (Ben-Soussi et al. 2014). The species has been also recorded from the Strait of Sicily within the central Mediterranean, with individuals being caught off Lampedusa Island in October–November 2013 (Azzurro et al. 2014a) and off the eastern coast of Sicily in

January 2014 (Tiralongo and Tibullo 2014). Šprem et al. (2014) document the northernmost record of the species from the Adriatic. *L. sceleratus* reached the coasts of Spain in July 2014 (Izquierdo-Muñoz and Izquierdo-Gomez 2014) after being recorded off the coast of Algeria over the December 2013–January 2014 period (Kara et al. 2015).

The high degree of attention to the members of the Tetraodontidae family by scientists and fishery operators is due to the tetrodotoxin contents in their tissues (mainly liver and gonads, but also skin and intestine) which, if ingested, may block vasomotor nerve function in mammals (including humans), ultimately causing death by paralysis of the respiratory muscles (Civera 2003; Katikou et al. 2009; Rodriguez et al. 2012). *L. sceleratus* is one of the most dangerous members of this family and, for this reason, its occurrence requires to be strictly monitored and promptly communicated to competent authorities in order to avoid health complications to humans (Azzurro et al. 2014a). The first record of *L. sceleratus* from Malta Island is here reported.

**Figure 1.** Lateral view of the *L. sceleratus* individual (568 mm total length) caught in Maltese waters in August 2014. Photograph by Alan Deidun.



## Materials and methods

The University of Malta was alerted to the potential capture of an individual of *L. sceleratus* during the first week of August 2014, by the Veterinary Affairs and Fisheries Division within the Ministry for Sustainable Development, the Environment and Climate Change. The specimen was promptly deposited at the Ministry by the fisherman making the catch. The same fisherman was interviewed to collect as many details as possible about the capture. Identification of the specimen, which was returned to the fisherman, upon his request, for taxidermic preservation, was in agreement with previous descriptions of *L. sceleratus* (Akyol et al. 2005 and literature therein). Morphometric measurements were taken to the nearest millimeter and relative length proportions were calculated.

## Results and discussion

Morphometric data of the specimen of *L. sceleratus* collected in Maltese waters and relative length proportions (Table 1) generally corresponded to those reported in the literature for the specimens recorded from the Mediterranean Sea. The only exceptions were proportions involving head length (in particular preorbital length), which were higher than those reported in the relevant literature, likely because the head length of our specimen was relatively short. Its total length

**Table 1.** Morphometric characters measured for the *L. sceleratus* individual caught within Maltese waters.

| Morphometric character       | Dimensions in mm | Relative proportions |
|------------------------------|------------------|----------------------|
| Total length (TL)            | 568              |                      |
| Fork length (FL)             | 533              | 93.8%TL              |
| Standard length (SL)         | 480              | 84.5%TL              |
| Body depth (BD)              | 98               | 20.4%SL              |
| Head length (HL)             | 100              | 20.8%SL              |
| Eye diameter (ED)            | 33               | 33.0%HL              |
| Caudal peduncle length (CpL) | 111              | 23.1%SL              |
| Preorbital length (PoL)      | 71               | 71.0%HL              |
| Prepectoral length (PpL)     | 142              | 29.6%SL              |

corresponded to that of an adult based on other *L. sceleratus* specimens collected in the Mediterranean (Kalogirou et al. 2013; Rousou et al. 2014, and literature therein).

The *L. sceleratus* specimen (Figure 1) was caught by means of a bottom long-line, baited with cuttlefish, from a depth of 15 m set on a seabed characterised by a sparse sea grass (*Posidonia oceanica* (Linnaeus) Delile, 1913) meadow. The location was at the mouth of Gnejna, a bay located along the north-west coast of Malta (geographical coordinates: 35°55'25.04"N, 14°20'27.83"E).

The sea surface temperature (SST) and salinity of the capture site were 28.0°C and 38, respectively.

There is a direct relationship between environmental conditions and the speed of spread and adaptation of new settlers (Mavruk and Avsar 2007). Water temperature is often considered the most important abiotic factor affecting dispersal of

Lessepsian species (Ben-Tuvia and Golani 1995), and the present warming trend of the Mediterranean waters appears to facilitate their westward spread from the already invaded eastern part of the basin (Bianchi 2007). The rapid spread and successful establishment of *L. sceleratus* in the Mediterranean Sea could be due to its somewhat broad thermal tolerance (e.g. Raitsois et al. 2010). Indeed, this tropical species has already penetrated colder Mediterranean areas, such as the north Aegean Sea.

*L. sceleratus* is reported to inhabit sandy or muddy substrates near shallow coral reefs at depths reaching 100 m, but it has been recorded from as deep as 250 m in the Red Sea (Kalogirou et al. 2012). According to the same authors, juveniles of the species are associated with sandy bottoms, with adults moving over to sea grass (*Posidonia oceanica*) meadows. The reported habitat preferences of the adult stage are consistent with those observed for the adult *L. sceleratus* individual from Maltese waters, which was caught over a seabed dominated by *P. oceanica* meadows.

The present record increases the number of alien species from the Maltese waters, recently reviewed by Evans et al. (2015).

The purported expansion of *L. sceleratus* within the Strait of Sicily strengthens the case for a greater monitoring effort targeting non-indigenous marine species within the same geographical area. The setting up of a transboundary observatory within the Sicily Strait in the Central Mediterranean, as proposed by Azzurro et al. (2014b), could be one of the ways to spearhead such enhanced effort.

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