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ADDITIONAL RECORD OF *PTEROIS MILES* (SCORPAENIDAE) IN CROATIAN WATERS (EASTERN ADRIATIC SEA)

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ABSTRACT

One specimen of Pterois miles *was caught by a spearfisherman on 15 August 2023, at a depth of 17–18 m, near Račišće (Island of Korčula, southern Adriatic). This is the first record for this species based on a caught and deposited specimen, and the second documented occurrence for Croatian waters. It confirms the hypothesis that the species is capable of reaching and expanding in the Adriatic Sea.*

Key words: Scorpaenidae, *Pterois miles*, alien species, Croatia, Adriatic Sea

ULTERIORE SEGNALAZIONE DI *PTEROIS MILES* (SCORPAENIDAE) NELLE ACQUE CROATE (MARE ADRIATICO ORIENTALE)

SINTESI

Un esemplare di Pterois miles *è stato catturato da un pescatore subacqueo il 15 agosto 2023, a una profondità di 17-18 m, vicino a Račišće (Isola di Korčula, Adriatico meridionale). Si tratta della prima segnalazione di questa specie basata su un esemplare catturato e depositato e della seconda presenza documentata nelle acque croate. Ciò conferma l'ipotesi che la specie sia in grado di raggiungere ed espandersi nel mare Adriatico.*

Parole chiave: Scorpaenidae, *Pterois miles*, specie aliena, Croazia, Adriatico

INTRODUCTION

The devil firefish, *Pterois miles* (Bennett, 1828), is considered as one of the most invasive species in the Mediterranean Sea (Galanidi *et al.*, 2018). Originally from the Red Sea, the species was first recorded in the eastern Mediterranean in 1991 (Golani & Sonin, 1992). After a lag of approximately twenty years, the devil firefish invasion started and has since continued in the Levantine and the Aegean Seas (Kondylatos *et al.*, 2023), showing a progressive expansion westward into the central and western Mediterranean, and northward into the Adriatic Sea (see Dragičević *et al.*, 2021, Ulman *et al.*, 2022). The last confirmed sightings placed the species in the Adriatic (Montenegro) and the Alboran Seas (Fortič *et al.*, 2023), as well as in the Calabrian Ionian Sea (Langeneck *et al.*, 2023).

This paper reports on an additional record of *P. miles* (Scorpaenidae) in Croatian waters (eastern Adriatic coast).

MATERIAL AND METHODS

A single specimen of *Pterois miles* was caught by a spearfisherman (Fig. 1) on 15 August 2023 at a depth of 17–18 m, near Račišće (Island of Korčula, southern Adriatic) (approx. 42.978813° N, 17.019692° E). The specimen was deeply frozen upon collection from the fisherman and sent to the Institute of Oceanography and Fisheries (Split, Croatia) for analysis. During laboratory analysis, meristic counts of the specimen were recorded and the species was identified according to morphological characters provided by Golani & Sonin (1992).

Fig. 1: The specimen of** Pterois miles **caught in August 2023 by a spearfisherman in the Adriatic Sea, Croatia. (Photo: Luka Srzić).
Sl. 1: Primerek vrste** Pterois miles**, ki ga je ujel podvodni ribič avgusta 2023 v Jadranskem morju, Hrvaška (Foto: Luka Srzić).

Fig. 2: The specimen of** Pterois miles **caught near Račišće (Island of Korčula, Adriatic Sea, Croatia).
Sl. 2: Primerek vrste** Pterois miles**, ujet blizu Račišća (otok Korčula, Jadransko morje, Hrvaška).

Prior to the dissection, the fresh specimen was measured to the nearest 0.1 millimetre using a digital caliper and weighed to the nearest 0.01 gram. The ovaries and the digestive tract were analysed macroscopically. Due to a severe head wound, it was not possible to extract otoliths from the fish.

The specimen was preserved in 95% ethanol and deposited in the Ichthyological Collection of the Institute of Oceanography and Fisheries in Split under the catalogue number IOR – 1 – PMILES.

RESULTS AND DISCUSSION

The specimen of *Pterois miles* (Figs. 1, 2) was a female measuring 28.1 cm total length and weighing 317 g. Meristic counts were as follows: dorsal fin rays: XIII +11; pelvic fin rays: I + 6; anal fin rays: III +7; pectoral fin rays: XIV. The counts and general characters of the sample were in total agreement with previous descriptions of the species by Golani & Sonin (1992).

The dissected specimen exhibited large and developed ovaries weighing 2.93 g, which allowed us to conclude it was mature and able to reproduce. The stomach contained partly digested remains of four unidentified fish species ranging approximately from 2.3 cm to 4.4 cm in standard length (Fig. 3).

The finding described in this note represents the first record based on a caught specimen of *P. miles* and the second documented for Croatian waters (see Dragičević *et al.*, 2021).

The first sightings of the devil firefish in the Adriatic Sea were along the coasts of Puglia (Italy) and Albania, in July 2019 and August 2020, respectively (Di Martino and Stancanelli, 2021). Additional but unconfirmed sightings of this species have been reported from the southern part of Croatia during 2023. For example, a photo of one specimen supposedly caught near the Pelješac Peninsula was sent to us by a citizen, but we were unable to confirm the record.

This new record now confirms the hypothesis that this species is capable of reaching and expanding in the Adriatic Sea, as Karachle *et al.* (2017) had predicted when they included *P. miles* among the species expected to spread in the ESENIAS (East and South European

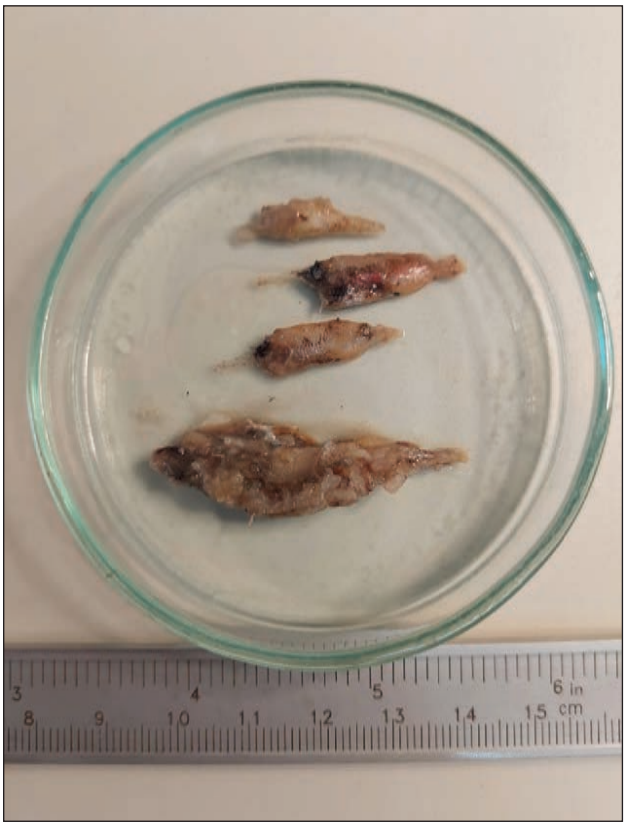

Fig. 3: Four fish of unidentified species found in the stomach of the** Pterois miles **specimen from Croatian waters.
Sl. 3: Štiri primerki nedoločenih rib v želodcu navadne plamenke iz hrvaških voda.

Network for Invasive Alien Species, www.esenias.org/) countries along the coasts of the basin, such as Albania and Montenegro. Keeping track of records of alien species such as *P. miles* by involving fishermen and the general public and motivating them to report such occurrences, is of essential importance, as it helps to foresee and recognize the purposes and significance of eradication and plan population control measures. Currently, there is no evidence that a self-sustaining population exists in this area, and the presence of this species can also be a result of propagule transport from areas with established populations. Migrations of adults are less probable, given that adults are known to exhibit site fidelity (Bos *et al.*, 2018).

The present report highlights the importance of citizen science in the early detection and monitoring of invasive species (Kletou *et al.*, 2016; Özbek *et al.*, 2017; Tiralongo *et al.*, 2024). In fact, the collaborative efforts of local fishermen and marine enthusiasts have already contributed to a timely detection of both previous and herein described records of *Pterois miles* fish in Croatia. Further research is necessary to explore the potential ecological repercussions of this and other alien species on native ecosystems, including their interaction with fisheries, in order to envisage effective management strategies.

ACKNOWLEDGEMENTS

The authors are thankful to Mr. Luka Srzić for providing a specimen of *Pterois miles* and to Mr. Pero Ugarković for informing us about the catch.

DODATNI ZAPIS O POJAVLJANJU NAVADNE PLAMENKE *PTEROIS MILES* (SCORPAENIDAE) V HRVAŠKIH VODAH (VZHODNO JADRANSKO MORJE)

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POVZETEK

*Petnajstega avgusta 2023 je podvodni ribič na globini med 17 in 18 m blizu Račišća (otok Korčula, južni Jadran) ujel primerek navadne plamenke (*Pterois miles*). To je prvi zapis o pojavljanju vrste na podlagi ujetega in shranjenega primerka in drugi dokumentiran zapis o pojavljanju za hrvaške vode. To potrjuje hipotezo, da se lahko vrsta pojavlja in razširja v Jadranskem morju.*

Ključne besede: Scorpaenidae, *Pterois miles*, tujerodna vrsta, Hrvaška, Jadransko morje

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