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Additional record of devil firefish, *Pterois miles* (Bennett, 1828) (Scorpaenidae) from Izmir Bay (NE Aegean Sea, Türkiye)

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ABSTRACT

This ichthyological note presents a recent observation of a *Pterois miles* within an artificial reef shared with an octopus off Urla in the Bay of Izmir (northern Aegean Sea). On 31 May 2024, a *P. miles* specimen was observed and photographed by a GoPro Hero 9 Black video camera during SCUBA diving at a depth of 9 m. This report provides signs suggesting that a very fast-spreading invasive species may use an artificial reef as a long-term habitat as it moves into the Bay of Izmir.

Keywords: Lionfish, Artificial reef, Octopus, Interaction, Mediterranean Sea

Introduction

The devil firefish (herein lionfish) *Pterois miles* (Bennett, 1828) is a species commonly found in the Indian Ocean and Red Sea (Froese & Pauly, 2024). This species is characterised by a very voracious and high reproductive rate, which renders it a significant threat to Mediterranean species (Albins & Hixon, 2008; Kletou et al., 2016). Consequently, it is considered to be one of the hundred of the world's worst invasive alien species (Lowe et al., 2000). Since its initial observation at Haifa Bay, Israel, in the Mediterranean Sea in 1991 (Golani & Sonin, 1992), the species has exhibited relatively rapid reproduction and spread and further expanded to the coasts of Lebanon (Bariche et al., 2013), the northern Aegean Sea (i.e. Edremit Bay) (Aydın et al., 2022), the southern Aegean Sea (i.e. southern Crete) (Dallianis et al., 2016), Adriatic Sea (Dragičević et al., 2021), Italy, (Azzurro et al., 2017), Tunisia (Dailianis et al., 2016) as well as Libyan Sea (Al Mabruk & Rizgalla, 2019) between 2013 and 2022.

In the Aegean Sea, since the initial observation of *P. miles* on Rhodes Island in 2015 (Crocetta et al., 2015), the fish has continued its northern migration as far north as Kokar Bay (Özgül, 2020), Karaburun, Izmir (Oruç et al., 2022) and Edremit Bay (Aydın et al., 2022; Alkan et al., 2023). Nevertheless, the northernmost record of *P. miles* was reported from Croatia in the Adriatic Sea by Dragičević et al. (2021).

This paper presents a recent observation of a *P. miles* within an artificial reef (AR) shared with an octopus off Urla in the central Bay of Izmir, northern Aegean Sea.

Materials and Methods

On 31 May 2024, a *P. miles* specimen was observed and photographed by a GoPro Hero 9 Black video camera during SCUBA diving in an artificial reef area (AR) off Hekim Island, Urla, Izmir Bay (Figure 1) at a depth of 9 m (Figure 2). The water temperature was 20°C. Additionally, an *Octopus vulgaris* Cuvier, 1797, was sheltering in the same reef. One week later (on 7 June 2024), the same fish was re-examined to ascertain its continued presence, and the fish was still there. However, the octopus was absent.

The AR deployed at two different depths (9 and 18 m) in the coastal area of eastern Hekim Island in 1992 was constructed from reinforced concrete. It consisted of 30 blocks in a cubic form with a hollow 1 m³ volume (Lök et al., 2002).

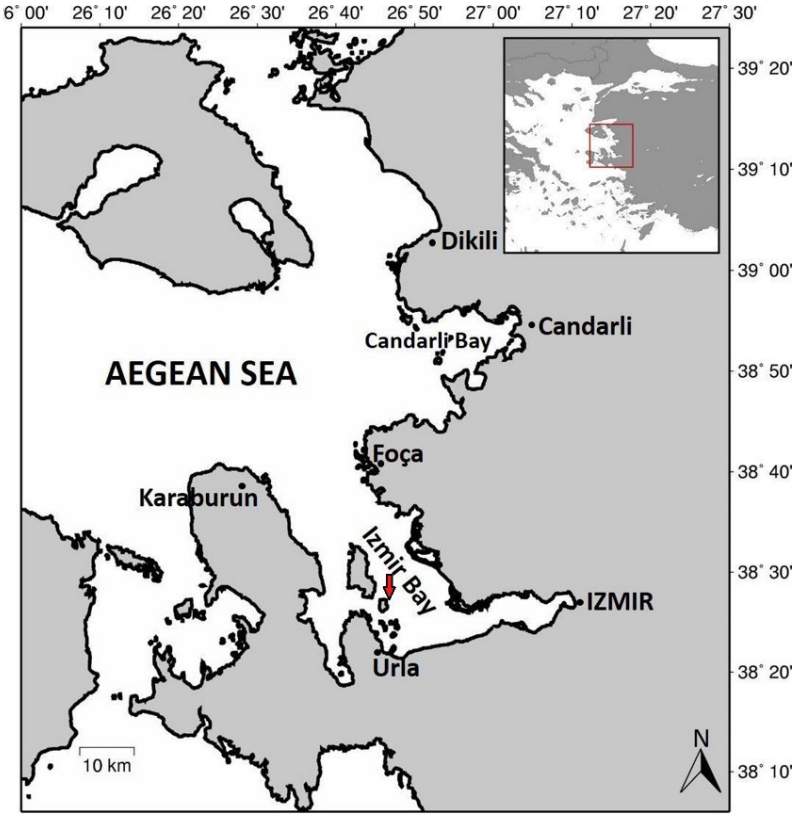

Fig. 1. Artificial reef area where *Pterois miles* were seen (red arrow)

Results and Discussion

The estimated length of *P. miles* was 17–18 cm, and the animal was observed calmly standing near an octopus burrow. Despite the diver's attempts to push *P. miles* away with his hand, the fish initially retreated slightly and then returned to the same location. The *octopus vulgaris* (estimated weight: ~6 kg) sheltered in a hole close to the fish did not leave the area where it laid its eggs and has never been observed interacting with the lionfish. In contrast, the octopus is regarded as one of the few potential predators of *the P. miles* (Crocetta et al., 2021). *P. miles* exhibited a calm behaviour, seemingly aware that the octopus would not harm itself given its protective role in incubating eggs.

Figure 2. *Pterois miles* and *Octopus vulgaris* are sharing a habitat within an artificial reef near Hekim Island, off Urla, Izmir Bay (North-eastern Aegean Sea)

Conclusion

This ichthyological note proves that a highly invasive species may utilise an AR as a long-term habitat as it expands into Izmir Bay. Furthermore, the initial evidence of mutual sharing of habitat with a spawning octopus without any apparent harm to either species may have been identified in this study. In contrast, Crocetta et al. (2021) presented visual material of an octopus catching and eating a lionfish in a similar environment in Famagusta, Cyprus, on 9 February 2021. However, the *P. miles* appeared calm and confident, as though it would not be attacked. We suppose that the octopus is waiting for care of its eggs (it's known that during this time, the female octopus must keep clean eggs and protect them from predators) has played a role in this phenomenon. However, this issue needs to be proven in future studies. Furthermore, the interaction between *P. miles* and the other fishes in ARs should also be examined with further studies. If it settlements in ARs, it is likely to limit the lives of other native fish. The spread of the species in the Bay of Izmir should also be closely monitored.

Compliance with Ethical Standards

Conflict of interest: The author(s) declare no actual, potential, or perceived conflict of interest for this article.

Ethics committee approval: This study does not require an ethics committee or special permission.

Data availability: No funding provided.

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Disclosure: -

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