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Extension of the Striped Eel Catfish *Plotosus lineatus* to the western Mediterranean Sea (Antalya Bay, Türkiye)

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Research Article

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Abstract

Striped eel catfish *Plotosus lineatus* (Thunberg, 1787) was observed during scuba diving at a depth of 13 m at the Pirates' Cave dive site off the coast of Alanya in the Antalya Bay on the Mediterranean coast of Türkiye on 23 September 2024. In this study, *Plotosus lineatus*, which entered the marine waters of Türkiye for the first time in 2016 from Iskenderun Bay, was observed to continue its westward progress from the coasts of the Mediterranean Sea.

Keywords: *Invasive species, striped eel catfish, Plotosus lineatus, westward extension, Antalya Bay*

Introduction

The Mediterranean Sea is connected to the Red Sea via the Suez Canal and to the Atlantic Ocean via the Strait of Gibraltar, which allows for the penetration of alien species into the Mediterranean Sea (Gökoğlu et al., 2024). The number of alien species in the Mediterranean is increasing day by day

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(Golani et al., 2007; Galil, 2008; Uyan et al., 2024; Turan et al., 2024a; Doğdu and Turan, 2024a). Although the most important reason for this is climate change, the opening of the Suez Canal in 1869 significantly changed the biodiversity of the Mediterranean by facilitating the passage of species (Albouy et al., 2012; Azzurro et al., 2019; D'Amen and Azzurro, 2020; Turan et al., 2016; 2024b).

The striped eel catfish, *Plotosus lineatus* (Thunberg, 1787) has become an increasingly prevalent species in the Mediterranean Sea benthic community (Doğdu and Turan 2024b). The first record of *P. lineatus* in the Mediterranean was by Golani (2002), and the species has been colonized along the entire Israeli coast. Temraz and Ben Souissi (2013) gave the second record of *P. lineatus* from the Egyptian coast of El-Arish city. Ali et al. (2015) gave the third record of the species from the Syrian coast of Tartous city. Subsequently, the species has been recorded for the first time from Turkish marine waters by Doğdu et al. (2016). The fifth record was made from the northern part of Cyprus (Tiralongo et al., 2022). The sixth record of *P. lineatus* was given from the Mersin Bay coast of Türkiye (Turan et al., 2022; Bayhan and Ergüden, 2022).

This study reports the third different locality of the striped eel catfish *Plotosus lineatus* from the Turkish coast and the seventh record from the Mediterranean coast.

Material and Methods

One group of the striped eel catfish Plotosus lineatus was photographed from Alanya Pirates' Cave diving region in Antalya Bay at a depth of 13 m on 23 September 2024 (Figure 1).

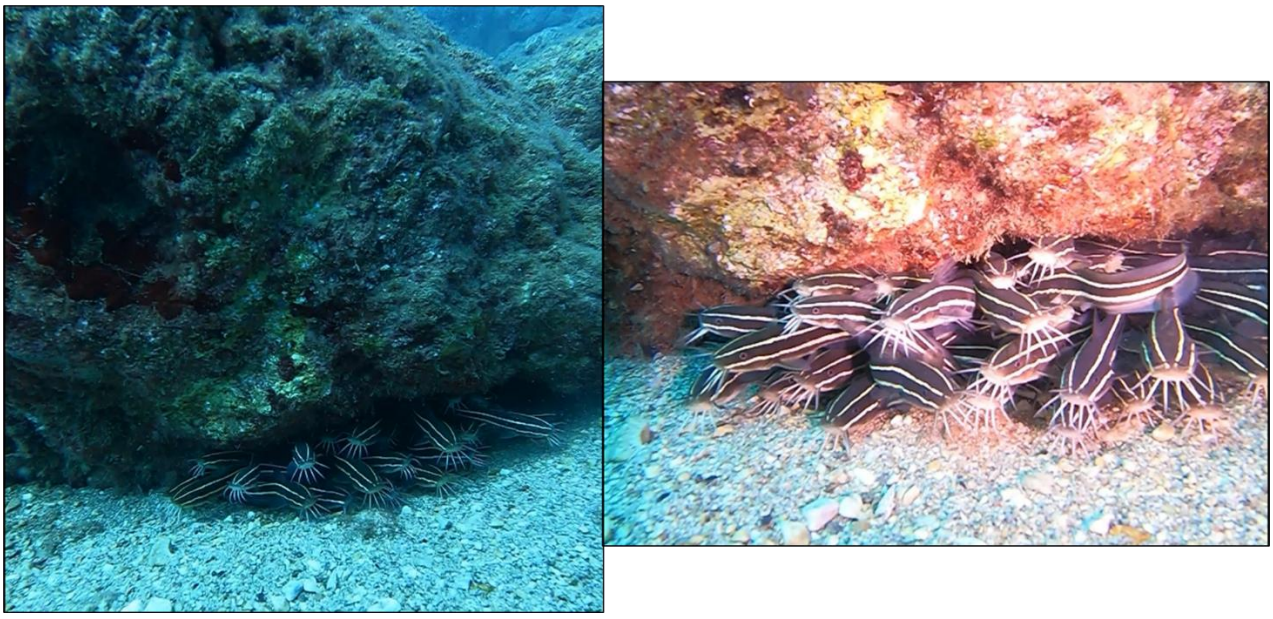

Figure 1. *Plotosus lineatus* group observed under a rock during scuba diving in Alanya Pirates' Cave diving region.

Based on underwater observations and photographs taken during scuba diving, all morphological descriptions and colors are consistent with those of Golani (2002) and Dogdu et al. (2016). The habitat of *P. lineatus* seen during scuba diving is Alanya Pirates' Cave diving region, which has a rocky and sandy bottom structure.

Results and Discussion

The family Plotosidae comprises 10 valid genera and 42 valid species distributed globally (Fricke et al., 2023). However, only a single species, the striped eel catfish *Plotosus lineatus* has been documented in the Mediterranean Sea. *P. lineatus* exhibits a wide Indo-Pacific distribution (Froese and Pauly, 2024; Turan et al., 2024c). *P. lineatus* is found on reefs, along open coasts in estuaries, and in tidal pools from the Red Sea and East Africa to Japan and Samoa (Golani et al., 2002). They feed on crustaceans, molluscs, worms, and sometimes fish (Fisher et al., 1990).

The pathway of the *Plotosus lineatus* in the Mediterranean Sea was first documented by Golani (2002). Subsequently, Temraz and Ben Souissi (2013) provided the second record, which was obtained from the Egyptian coast of El-Arish city. The third record was subsequently provided by The fourth record was provided by Ali et al. (2015), who observed the species off the coast of Tartous in Syria. The fourth record was from the Turkish marine waters, as observed by Doğdu et al. (2016). The fifth record was documented by Tiralongo et al. (2022), who observed the species in Northern Cyprus. The sixth record of *P. lineatus* was given from the Mersin Bay coast of Türkiye (Turan et al., 2022; Bayhan and Ergüden, 2022). It is shown that the westward extension pathway of *P. lineatus* in the Mediterranean coasts (Figure 2). The data presented in these reports demonstrate that the population of this species has exhibited a remarkable distribution in recent years following its first recorded appearance in the Mediterranean Sea. In the *P. lineatus* monitoring study conducted by Turan and Doğdu (2023) on the coasts of Iskenderun, it was reported that the species showed a rapid population increase after it was seen for the first time in 2016 and became the dominant species in Iskenderun Bay, which is located on the eastern Mediterranean coast of Türkiye and is a region where alien species have been recorded extensively.

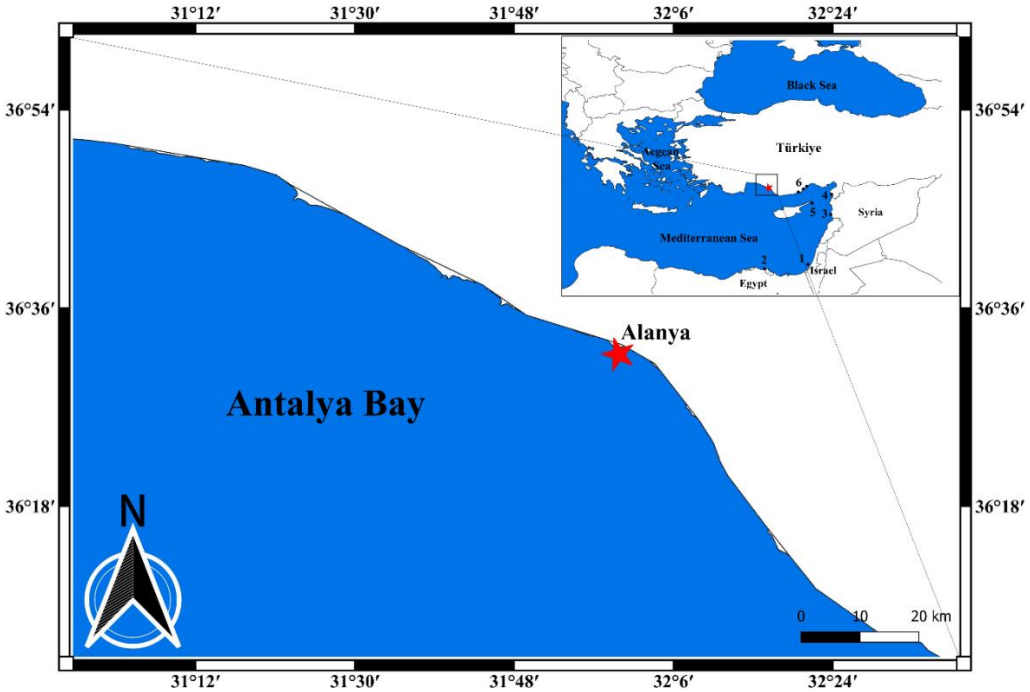

Figure 2. Recording location (★) of *Plotosus lineatus* from Alanya costs in Antalya Bay, and its occurrence range as records in the Mediterranean (●: previous records)

Due to the venom found in the dorsal and pectoral spines, *P. lineatus* can cause injury and allergic reactions in humans. Therefore, the striped eel catfish is one of the potentially risky species for human health, as it can cause severe pain and fatal health problems (Uysal and Turan, 2020). Although only one case of harmful effects of *P. lineatus* has been reported so far from Iskenderun Bay (Turan et al., 2020), it is inevitable to observe an increase in such cases due to the rapid spread of the species on our coasts.

The number of alien or nonindigenous species has increased dramatically for a few decades in Turkish marine waters (Turan et al., 2018; 2024b; Langeneck et al., 2023; Ergüden et al., 2024). It seems probable that they will exert an influence on food webs in the future, with the potential for significant alterations in Mediterranean biodiversity (Arndt et al., 2018). Furthermore, overfishing threatens the biodiversity of the Mediterranean Sea, while facilitating the spread of Lessepsian fish species within the Mediterranean Sea. It is important to consider additional factors that contribute to the success of lessepsian fishes, such as the destruction of habitats and the introduction of harmful pollutants. Many species of nonindigenous fishes have established large populations with considerable effects on the local biota, such as pufferfish (Edelist et al., 2012), lionfish (Turan and Doğdu, 2022) and goatfish (Turan et al., 2021). The presence of *P. lineatus* has the potential to negatively impact the biodiversity of economically significant native species, including *Mullus barbatus* and *Mullus surmuletus* (Arndt et al., 2018; Galanidi et al., 2019). Although the ecological effects of *P. lineatus* in the habitats it invades have not been studied so far, its potential effects are thought to be competition with native species for food and habitat, harmful effects on native predators and the potential to change the structure of native communities in the areas it invades (Otero et al., 2013).

This study is very important in terms of reporting that *P. lineatus* continues to spread towards the western Mediterranean. The westward spread of the species continues and the possibility of its entry into the Aegean Sea soon is increasing day by day.

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Conflict of Interest

The authors declare that they have no competing interests.

Author Contributions

C.T. and S.A.D. defined the species and drafted the main text. H.Ş and K.B made a video recording of the species.

Ethical Approval Statements

In this study, no experimental animals were used. Therefore, Local Ethics Committee Approval is not required.

Data Availability Statement

The data used in the present study are available upon request from the corresponding author.

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