



A New Locality Record of Fangtooth Moray *Enchelycore Anatina* (Lowe, 1839) in Mersin Bay, Türkiye

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Abstract

A single specimen of fangtooth moray eel *Enchelycore anatina* (Lowe, 1839) was observed during scuba diving in Mersin Bay (Akkum-Erdemli, Turkey) at a depth of 10 m in May 2024. This study provides an additional record of this species from Turkish waters and a new locality record from Mersin Bay (northeastern Mediterranean coast, Turkey). It indicates a successful adaptation of the moray eel specimen to the new locality.

Research Article

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1. Introduction

Four species of morays have been described in the Mediterranean Sea. These species are *Gymnothorax unicolor* (Delaroche, 1809), *Enchelycore anatina* (Lowe, 1839), *Murena helena* Linnaeus, 1758, *Gymnothorax reticularis* Blotch, 1792. *G. reticularis* is common in the Red Sea (Golani et al. 2002) and has only been reported once from the Mediterranean by Stern et al. (2013).

The fangtooth moray *E. anatina* is a subtropical fish of the family Muraenidae. It is distributed throughout the

eastern Atlantic, including the Azores, Madeira, the Canary Islands, Cape Verde, Ascension, St. Helena, and the Mediterranean (Frose and Pauly 2024).

The first record of fangtooth moray *Enchelycore anatina* in the Mediterranean Sea from the Israeli coast (off Tel Aviv Jaffo) was recorded in 1979 by Ben Tuvia & Golani (1984). Later, this moray eel species was observed and reported from shallow waters of the eastern and central Mediterranean (Golani et al., 2002; Saad, 2005; Kalogirou, 2010; Katsanevakis et al., 2009; Pirkenseer, 2013; Katsanevis et al., 2014; Iglésias and Frotte, 2015;

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Deidun et al., 2015; Ibrahim et al., 2022), from Adriatic waters (Lipej et al., 2011; Dulcic et al., 2014), from the Ionian Sea (Guidetti et al., 2012; Marletta and Lombardo, 2020; Tiralongo et al., 2020; Perzia et al., 2022).

Recently, this species has been reported from Libyan, Tunisian, and Greek waters and its additional records have been reported from southern Italy (western Ionian Sea by Ibrahim et al., 2022; Ragkousis et al., 2023), from the Italian coasts of the Adriatic Sea and the western Mediterranean Sea (Sardina and Sciliy) by Di Martino and Stancanelli (2023).

On the Turkish coast, *E. anatina* was first reported from the Fethiye (Sarigerme) coast by Altan (1998) and then from Antalya Bay (Yokes et al., 2002). Later, this species was reported several times by researchers from the Aegean Sea (Okuş et al., 2004; Şenbahar and Özaydın, 2020) and the Mediterranean Sea (Cinar et al., 2005; Can and Bilecenoglu, 2005; Ergüden et al., 2013; Teker et al., 2019).

This paper reports an additional record of *E. anatina* from the Mediterranean waters of Türkiye. This finding observation is a new locality record in the Mersin Bay (Northeastern Mediterranean, Türkiye). The presence of moray eel specimens indicates a successful adaptation in this area.

2. Method

A single specimen of *E. anatina* was observed by scuba diving on May 11th 2024 from the coast of Akkum (Erdemli, Türkiye), (coordinate: 36°27'16.6"N 34°07'47.3" E) (Fig. 1). The specimen of *E. anatina* was photographed at night from the rocky habitats rich in a crevice at about 10 m depth with a Canon Powershot G12 digital camera and housing. The surrounding habitat is covered with algae (*Jania rubens* and *Corallina officinalis*) (Fig. 2). The identification of *E. anatina* agrees with that of Bauchot (1987) and Golani et al. (2006).

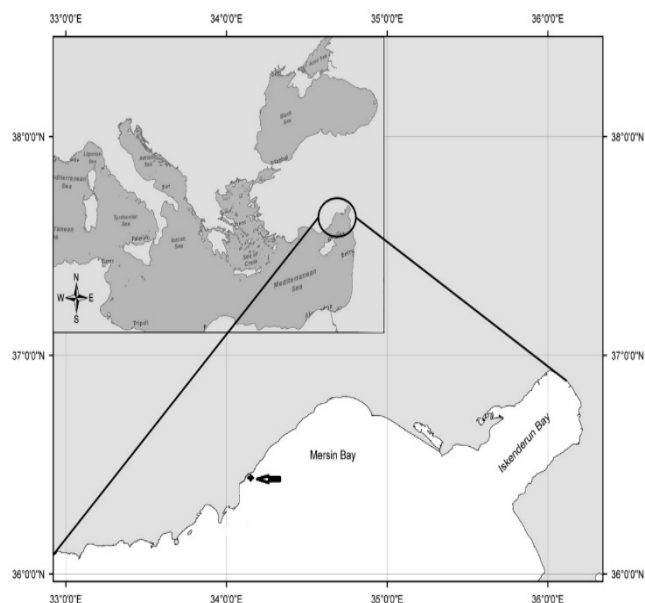


Figure 1. Map showing the capture site (▲) of the fangtooth moray *E. anatina* (Lowe, 1839) in the Mersin Bay.



Figure 2. A side view of *E. anatina* individual was observed at Akkum-Erdemli coast, Northeastern Mediterranean Sea.

3. Results

In May 2024, an individual of *E. anatina* was recorded during the monitoring study on the coasts of Akkum-Erdemli at a depth of 10 meters. Another individual was seen on another day, at a depth of about 12 m, while scuba diving. However, as there was no underwater camera available, no photographs of this species could be taken. The place where the observation was made is in the middle of Mersin Bay.

E. anatina was estimated to be about 90 centimeters long. The individual was observed in a rocky area densely covered with red, green and brown algae. The head is pointed and the mouth has numerous conical and pointed teeth. The observed specimen has a dark brown body with numerous yellow spots and dots arranged in longitudinal rows, while the snout and cheeks are light brown with yellow spots.

4. Discussion

The fangtooth moray *E. anatina* is a demersal coastal species that lives on crevice-rich rocky bottoms and is generally found between 3-60 m depth in Atlantic and Mediterranean waters (Golani et al., 2002). Although in previous years this species was considered rare for the Mediterranean, in recent years it has become mostly abundant in the central and eastern parts of the Mediterranean basin (Di Martino and Stancanelli, 2023).

The fangtooth moray *E. anatina* is easily distinguished from *Murena helena* which is commonly found along our coasts. Features such as teeth visible when the mouth is closed, the presence of large yellowish spots on the body, and the dorsal fin beginning above the branchial opening are characteristic of the species.

E. anatina is an active predator that could severely impact native communities directly through predator-prey interactions and indirectly through food web or habitat alterations (Stergiou and Karpouzi, 2002). This species waits for its prey by hiding in crevices, holes, under stones, and rocks. Its diet consists mainly of fish, crustaceans, and cephalopods (Maigret and Ly, 1986). Although the common length for this species has been reported as 50 to 100 cm, it can reach a maximum total length of up to 120 cm for adult specimens (Golani et al., 2002).

In our study, the moray eel was observed in the Akkum-Erdemli coast (Mersin Bay) at approximately 10 m. To date, this species has been reported from shallow waters (1-50 m) in the Mediterranean and Adriatic by previous studies (Ergüden et al. 2013; Marletta and Lombardo 2020; Di Martino and Stancanelli 2023). Ben-Tuvia and Golani (1984) stated in their study that they found this species in a deeper rocky area on the coast of Israel in the eastern Mediterranean. Our specimen was observed in shallow water (10 m) during the survey, the depth of the current record seems to be consistent with the previous literature.

The occurrence of *E. anatina* in the Mediterranean is most likely due to migration from the Atlantic (Golani et al., 2002). According to Albérola and Millot (1995) and Lasram et al., (2009), this phenomenon is explained by several factors. One of them is that the superficial Atlantic currents entering the Mediterranean Sea have pushed the eggs, larvae, and propagules of the Atlantic species towards the eastern sectors of the Mediterranean Sea along the coast of North Africa. However, Lipej et al., (2011) mentioned that the specimen in the Adriatic Sea could probably be explained by the passive dispersal of Leptocephali larvae and/or by transport in ship ballast. With a similar approach, Golani et al., (2002) and Guidetti et al., (2012) mentioned that the rapid spread of *E. anatina* could be attributed to its long pelagic larval stage, which allows it to cross long distances. According to Marletta and Lombardo, (2020), the ballast water pathway seems to be the most feasible due to the long pelagic larval stage of the species. Also, Lasram et al. (2009) reported that the colonization success of Atlantic fish species entering the Mediterranean Sea is related to climatic factors and similar environmental conditions between their native and colonized environments.

Although the presence of this non-native species in the Mediterranean is due to several hypotheses, especially climate change and tropicalization of the Mediterranean is the process accelerating the introduction of non-native fish species in Turkish Mediterranean waters.

5. Conclusion

The increased presence of the species in Mersin Bay in recent years may indicate that this species is feeding and reproducing successfully. Therefore, further scientific studies and monitoring need to be conducted to have increasingly reliable data on the real consistency of the populations of *E. anatina* in the Mediterranean waters.

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Author contributions

Deniz Ayas (DA): Scuba diving expedition, underwater photo, data collection, and editing. Sibel Alagöz Ergüden [SAE]: Investigation, data curation, and editing. Deniz Ergüden (DE): Investigation, data analysis, writing, sample design, and methodology.

Conflicts of interest

The authors declare that they have no conflict of interest.

Statement of Research and Publication Ethics

For this type of study formal consent is not required.

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