

Original article

First sighting of the fangtooth moray, *Enchelycore anatina* (Lowe, 1839) (Muraenidae) in Central Aegean Sea coast of Turkey

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Abstract: During scuba diving, one specimen of the fangtooth moray *Enchelycore anatina* (Lowe, 1839) was seen and photographed in the area of the coast of Central Aegean Sea (Izmir Bay) of Turkey in July 2017. The aim of this record is to point out the new locality for the fangtooth moray *E. anatina* from the Karaburun (Central Aegean Sea/Izmir Bay) and also this report indicating the north most occurrence of *E. anatina* within the Turkish seas.

Keywords: Central Aegean Sea, scuba diving, Karaburun, Izmir Bay

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Introduction

The fangtooth moray *Enchelycore anatina* (Lowe, 1839) is a subtropical species widely distributed in eastern Atlantic, including the main insular systems, Azores, Madeira, Canary, Cape Verde, Ascension, and St. Helena Islands (Whitehead et al., 1986; Bohlke et al., 1989; Golani et al., 2013). The fangtooth moray occurs occasional among rocks and rubble to depths of at least 10 m. They stay concealed among rocks, waiting for prey to come along. They are active predators which feed on crustaceans and fish (Maigret and Ly, 1986). The first record of the species in the Mediterranean was in Israel off Tel-Aviv-Jaffo in 1979 (Ben-Tuvia et al., 1984) and afterward in Greece waters (Golani et al., 2013), Turkey (Yokes et al., 2000; Cinar et al., 2005; Bilecenoglu, 2010; Erguden et al., 2013), Cyprus (Katsanevakis et al., 2009; Iglésias & Frotté, 2015). So far, *E. anatina* have been reported from 5 localities (Fethiye Bay, Antalya Bay, Datca Peninsula, Mersin Bay, Iskenderun Bay) in the Mediterranean coast of Turkey between in 1998-2017. Now we can add another locality, which is Karaburun Peninsula. It has been reported that one specimen of *E.*

anatina was captured by the underwater camera from Büyük Ada, Diving spot (Karaburun Peninsula).

Material and Methods

It has been reported that one specimen of *E. anatina* was photographed with a digital camera (Olympus tough TG-810 compact camera; Olympus PT-051 housing) in July 2017, near Karaburun (Central Aegean Sea, Izmir Bay) (Fig. 1). The specimen of *E. anatina* was photographed on rocky bottoms in a crevice about 5 m depth.

Results

The occurrence of this species was evidenced by photographs (Fig. 2, 3). The SCUBA diving techniques were monitoring tools used regularly for assessing the presence of many lesser-known species only rarely found as catch in nets of fishermen. There are many cases of overlooked fish species, e.g. cryptobenthic species (Lipej et al., 2011).

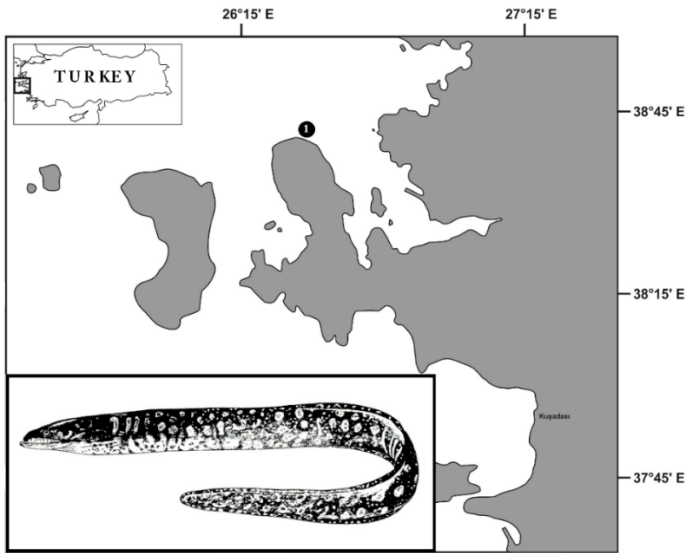


Figure 1. Occurrence of *Enchelycore anatina* in the Central Aegean Sea coast of Turkey. 1) Karaburun Peninsula (Present study)

Based on the original photographs of the *E. anatina* specimen, identification features of the body and the coloration are enough sufficient to carry out a precise identification according to Bauchot (1987). Therefore, the determination of the specimen was based on photographs. However, important diagnostic features were clearly visible and the main characteristics are defined as very elongated body; pectoral and pelvic fin absent; pointed head with a distinctly elevated occipital region; tubular anterior nostril; posterior nostril round to oval opening in front of the eye; large mouth, with cleft extending well back behind the eye; arched jaw, with many conical and sharp fang-like teeth visible even with the mouth closed; dark brown body with numerous yellow blotches and dots arranged in longitudinal rows; light brown snout and cheeks with yellow dots. Whole prior-records of occurrence along the Levantine Sea and the Aegean Sea so far proves that tropical Atlantic *E. anatina* expansion movements towards Turkish seas (Table 1).

Discussion

Until now, in the Mediterranean Sea basin, *E. anatina* has been reported in several different areas as occurrence or 1st & 2nd records. The first specimen was caught in 1979 (Ben-Tuvia et al., 1984), off the Israel coast and since then within the Mediterranean, the species has been exclusively recorded within the eastern and central sectors (Deidun et al., 2015). The diagnosis characters well defined by Bauchot (1987) and *E. anatina* can be distinguished from

the two other Mediterranean morays, *Muraena Helena* (Linnaeus, 1758) and *Lycodontis unicolor* (Revised name: *Gymnothorax unicolor* (Delaroché, 1809)) by its distinct color pattern of large, round blotches in four longitudinal rows and by the location of the fin rays of the dorsal fin which is mostly above the branchial opening in *E. anatina* but much anterior to the branchial opening in the other species (Ben-Tuvia et al., 1984). But we regret to say that, due to preservation of the species richness of Karaburun sea land, we did not have a chance to take morphological measurements of *E. anatina* specimen. Therefore, coloration pattern of the fish was only used as identification feature.



Figure 2. Side view of *Enchelycore anatina* individual was observed at Karaburun Peninsula, Central Aegean Sea [Photo: Barış Şendemir].



Figure 3. Frontal view of the *Enchelycore anatina* (Lowe, 1839) [Photo: Barış Şendemir]

Table 1. Previous records of occurrence of *Enchelycore anatina* along the Levantine Sea and Aegean Sea (UO: under water observation).

Reported locations	Author	Year	# of individuals	Depth (m)	Sampling method
off Tel Aviv-Jaffo	1	1979	1	~ 50 m	Hook, line
Elafonissos Island (S.W. Aegean Sea)	2	1987	5	-	UO
Sarigerme, Fethiye Bay	3	1998	1	-	UO
Antalya Bay	4	2000	1	-	UO
Tunel, Mersin coast	5	2001	2	10 m	UO
Tisan, Mersin coast		2002	1	~10 m	
Datca Peninsula (S. Aegean Sea)	6	2004	1	-	UO
Coast of Syria	7	2005	-	-	long line
Coast of Cyprus	8	2009	1	-	UO
Kolimbia Bay, Rhodes Island	9	2010	1	20-25 m	gill net
Hertliyya (north of Tel-Aviv)	10	2010	3	30 m	UO
Northern Haifa Bay	10	2010	1	8 m	UO
Iskenderun Bay	11	2011	1	12 m	UO
Mediterranean Sea	12	2015	1	7.5 m	UO
Karaburun Peninsula	13	2017	1	5 m	UO

1) Ben-Tuvia and Golani, 1984; 2) Golani et al., 2002; 3) Altan, 1998; 4) Yokes et al., 2000; 5) Can & Bilecenoglu, 2005; 6) Okus et al., 2004; 7) Saad, 2005; 8) Katsanevakis et al., 2009; 9) Kalagirou, 2010; 10) Lipej et al., 2011; 11) Erguden et al., 2013; 12) Iglésias & Frotté, 2015; 13) Present study

So far, prior-records indicating westward expansion of *E. anatina* is incontrovertible. The westward expansion in the range of *E. anatina* has been observed in recent years (Lipej et al., 2011; Guidetti et al., 2012; Pinkenseer, 2013). Unlike lessepsian species, these ingressions are not considered as exotic or alien species but simply species which have explained their natural range through non-anthropogenic means (Anonymous, 2014; Deidun et al., 2015). Cause of this expansion movements might be related to several occasions. Lipej et al., 2011 mentioned the first record of two *E. anatina* specimens in the Adriatic could probably be explained by the passive dissemination of the leptocephali larvae and/or via transport in ship ballast, which is an agreement with other authors (Golani et al., 2002; Corsini-Foka and Economidis, 2007). According to this statement, the same circumstances might have occurred in the Central Aegean Sea. The other occasions might be related global warming and the related rise in sea surface temperature. According to Iglésias and Frotté (2015) result of the reported individual of *E. anatina* observation and additional observations by locals, support the hypothesis idea that *E. anatina* is now established in South Cyprus. Our observation report reflects the same circumstances for the Central Aegean Sea. Although Golani et al. (2002) regarded the species as very rare in the Mediterranean Sea, underwater observations from Turkey indicate widespread and locally abundant populations (Bilecenoglu, 2010).

As a conclusion, *E. anatina* is non-indigenous species in the Central Aegean Sea, also in the Mediterranean Sea,

for now, this fish is not considered as an invasive species but invasive species have the ability to change ecosystem functioning (Kalagirou, 2010). Due to this fact, expansion movements and occurrence reports of non-indigenous species information are carrying high valuable importance for future studies. Furthermore, we should extend our knowledge and gather our findings to clarify the movement of fish species which are non-indigenous. In this present study, *E. anatina* was recorded for the first time along the Central Aegean Sea coasts of Turkey, which represents a significant northerly range expansion of the species and also, this is the north most occurrence report of *E. anatina* in the Turkish seas.

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