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Expansion of the distribution of the Indo-Pacific areolate grouper *Epinephelus areolatus* (Forsskål, 1775) (Perciformes: Epinephelidae) on the Mediterranean coast of Türkiye

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ABSTRACT

On January 3, 2026, an amateur fisherman was jigging off the coast of Yeşilovacık neighborhood in the Silifke district of Mersin province, Türkiye (36° 10.538'N; 33° 35.968'E), when he caught a spotted grouper species that was previously unknown. Identification confirmed the fish as *Epinehelus areolatus*, a species that has migrated from the Red Sea. Earlier sightings of this fish have been reported from the easternmost Mediterranean regions, including Israel, Lebanon, Syria, and the Arsuz coast along the Gulf of Iskenderun in Türkiye. However, this new report comes from the Yeşilovacık coast in Silifke, located west of the Gulf of Mersin. This suggests that, like some other Lessepsian species, this grouper is extending its range further west.

Keywords: Grouper, Lessepsian, Mediterranean, Serranidae

INTRODUCTION

The opening of the Suez Canal in 1869 linked the Red Sea and the Mediterranean, both home to diverse species. This link resulted in the blending of Red Sea fauna, which originated from the Indo-Pacific, with Mediterranean fauna from the Atlantic Ocean (Golani, 2025). However, only a few cosmopolitan species have been found in this mix, indicating that migration is largely one-directional toward the Mediterranean (Ben-Tuvia, 1973). Golani (2025) reported that over 120 Lessepsian fish species have migrated into the Mediterranean.

Conversely, climate change, marked by rising global sea temperatures, further accelerates this migration process. The

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increase in sea surface temperatures caused by climate change has made the Mediterranean more hospitable to thermophilic species from the Red Sea, enabling them to move and establish themselves (Khalil et al., 2025). For these and other reasons, the number of invasive species in the Mediterranean continues to increase.

Fish are among the most commonly migrating organisms in the Mediterranean ecosystem. Species from the Epinephelidae family are among the fish that migrate most frequently. So far, ten Epinephelidae species have been reported in the Mediterranean (Ergüden et al., 2023; Heemstra & Randall, 1993). These include *Epinephelus areolatus* Forsskål, 1775; *E. coioides* Hamilton, 1822; *E. fasciatus* Forsskål, 1775; *E. geoffroyi* Klunzinger, 1870; *E. Malabaricus*; and *E. merra* Blotch, 1793, which are species originally from the Red Sea (Bariche & Heemstra, 2012; Golani et al., 2002; 2015; Hassan & Ahmad, 2023; Rothman et al., 2016). The species *E. aeneus* Geoffroy Saint-Hilaire, 1817; *E. caninus* Valenciennes, 1843; *E. costae* Staindachner, 1878; and *E. marginatus* Lowe, 1834 (Froese & Pauly, 2026; Heemstra & Randall, 1993; Heemstra & Randall, 1999) originate from the Atlantic.

Five exotic grouper species have been reported along the Turkish coast: *Cephalopholis hemistiktos, E. coioides, E. fasciatus, Paranthias furcifer*, and *E. areolatus* (Engin et al., 2016; Ergüden et al., 2021; Ergüden et al., 2023; Gökoglu, & Biçer, 2022; Gökoğlu & Özvarol, 2015; Ragkousis et. al., 2020).

The most recently reported Epinephelid species off the Turkish coast is *E. areolatus*. This fish was first identified in 2015 off the coast of Israel in the Mediterranean Sea (Rothman et al., 2016). Subsequently, the species was reported a second and third time off the coast of Lebanon by Bariche et al. (2020), and from the Syrian coast by Al Mabruk et al. (2021) and Hassan and Ahmad (2023). This fish has expanded its distribution to the Turkish coast. Most recently, it was caught by hook and line off Arsuz (Konacık) in the Gulf of Iskenderun (36º29' N, 35º78' E) on April 22, 2023 (Ergüden et al., 2023).

E. areolatus is typically found in coastal waters over soft bottoms close to hard structures like seagrass beds, rocky reefs, or dead corals. This fish feeds on other fish and benthic invertebrates that inhabit these areas (Heemstra & Randall, 1993; Randall et al., 1998).

Examining the current distribution of *E. areolatus* shows that all known locations are in the easternmost part of the Mediterranean. Tracking invasive species in the Mediterranean and understanding the extent of their spread is essential. This study reveals that *E. areolatus* has extended its range westward in the Mediterranean, with this being the most recent record from the westernmost point.

MATERIALS AND METHODS

On January 3, 2026, off the coast of Yeşilovacık neighborhood in Silifke district, Mersin province, Türkiye (36° 10.538'N; 33° 35.968'E) (Figure 1), an amateur angler engaged in jigging caught a spotted grouper (Figure 2), a species different from those commonly found in the area, at depths of 30-40 metres. The angler recorded a video of the catch and requested species identification. The total length and weight of the fish were measured by the angler. The species identification was made based on the video recording. Since the fish was consumed, no physical sample was retained; only the video is available.

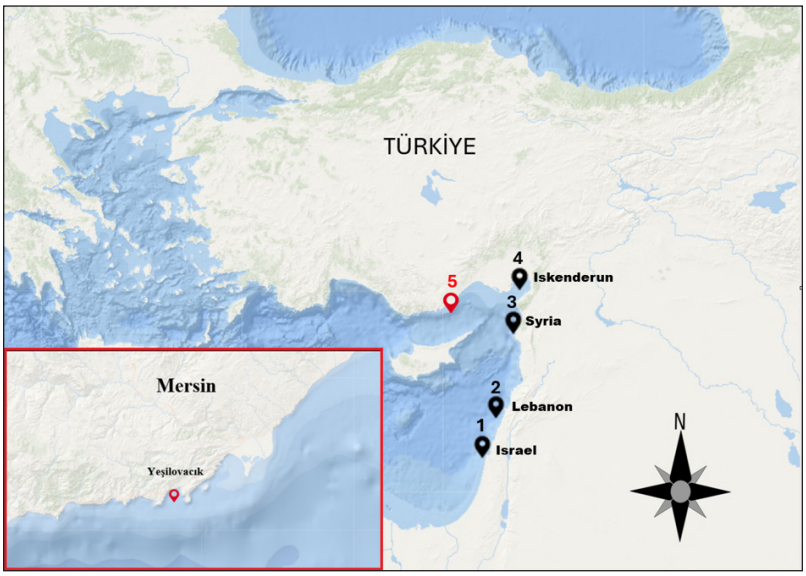

Figure 1. Yeşilovacık, Mersin (Türkiye)



Figure 2. *Epinephelus areolatus* was caught at a depth of 30-40 m off the coast of Yeşilovacık neighborhood in Silifke district, Mersin province

RESULTS AND DISCUSSIONS

The spotted grouper caught off the coast of Yeşilovacık in Silifke district, Mersin province, Türkiye, has been identified as Epinephelus areolatus (Forsskål, 1775). This fish is a member of the Serranidae family. Most species in the Serranidae family are benthic fish found in tropical and temperate regions. The vast majority live in depths of less than 200 m, particularly on continental or islet shelves in the Indo-Pacific, the Red Sea, and the tropical South Atlantic. Serranidae species are generally fish species that live in rocky areas (Heemstra & Randall, 1993; Randall et al., 1998).

In this study, *E. areolatus* was caught during recreational fishing (Figure 2) from a rocky area at depths between 30 and 40 metres at the Yeşilovacık coast. In the Mediterranean, this species has been found at 37 metres off the coast of Israel (Rothman et al., 2016), at 30 and 40 metres off Lebanon (Bariche et al., 2020), at 61 metres off Syria through trawling (Al Mabruk et al., 2021), and at 8 metres in the Gulf of Iskenderun, Türkiye (Ergüden et al., 2023) (Figure 1). Although the maximum depth reported for E. areolatus is 200 metres (Froese & Pauly, 2026), observations of its capture depths in the Mediterranean suggest it is typically found in shallower waters.

Video recordings of *E. areolatus* showed many pale brown, brownish-yellow, or greenish-yellow spots on its body, typically about the size of an eye (Figure 2). Several researchers studying this species have also noted the presence of these spots on the fish's body surface (Al Mabruk et al., 2021; Rothman et al., 2016).

The fisherman reported catching an E. areolatus measuring 22 cm in total length and weighing 250 g. Research shows that this species can reach a maximum total length of 53 cm (Froese & Pauly, 2026). Therefore, it can be concluded that the specimen caught in Mersin Gulf is a juvenile.

E. areolatus is a fish found in the coastal waters of the Indian Ocean, the Indo-Pacific Archipelago, northwestern Australia, the South China Sea, Taiwan, Japan, and the Red Sea (Heemstra & Randall, 1993). It is among the fish species recently introduced into the Mediterranean ecosystem (Ergüden et al., 2023; Rothman et al., 2016). This species probably also reached the Mediterranean through the Suez Canal.

Tracking the arrival of non-indigenous species is critical for understanding ecological shifts in the Mediterranean. This study documents *E. areolatus* in the Gulf of Mersin, marking the westernmost point of its known distribution in the Mediterranean. Such a record confirms that the species is progressively expanding westward.

CONCLUSION

Only a small portion of Lessepsian fish species that migrate to the Mediterranean have economic value. However, *E. areolatus* is an edible species with commercial potential. More research is needed to understand its impact on Mediterranean fisheries, its distribution, its effects on native species, and its population dynamics, including reproduction and growth.

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DATA AVAILABILITY

Data will be made available on reasonable request.

COMPETING INTERESTS

The authors declare no competing interests

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