

# ANNALES



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## FIRST RECORD OF *EPINEPHELUS AREOLATUS* (EPINEPHELIDAE) FROM THE SOUTH-EASTERN MEDITERRANEAN, TURKEY

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### ABSTRACT

The present paper represents the first report of areolate grouper *Epinephelus areolatus* Forsskal, 1775, from the Mediterranean coast of Turkey. A specimen of *E. areolatus* was caught by hook and line, at a depth of 8 m, off the coast of Arsuz in the Bay of Iskenderun, on 22 April 2023. The captured specimen of *E. areolatus* measured 28.5 cm in total length and 23.5 cm in standard length. This species entered the Mediterranean via the Suez Canal. The current record increases the number of exotic grouper species reported in the Mediterranean Sea, Turkey, to five.

**Key words:** exotic grouper, new record, migration, Turkish coast

## PRIMA SEGNALAZIONE DI *EPINEPHELUS AREOLATUS* (EPINEPHELUS) NEL MEDITERRANEO SUD-ORIENTALE, TURCHIA

### SINTESI

L'articolo riporta la prima segnalazione della cernia areolata *Epinephelus areolatus* Forsskal, 1775 lungo la costa mediterranea della Turchia. Un esemplare di *E. areolatus* è stato catturato con un amo e una lenza a una profondità di 8 m, al largo della costa di Arsuz, nella baia di Iskenderun, il 22 aprile 2023. L'esemplare catturato di *E. areolatus* misurava 28,5 cm di lunghezza totale e 23,5 cm di lunghezza standard. Questa specie è entrata nel Mediterraneo attraverso il Canale di Suez. Il presente ritrovamento aumenta a cinque il numero di specie esotiche di cernia segnalate nel Mediterraneo, in Turchia.

**Parole chiave:** cernia esotica, nuovo record, migrazione, costa turca

## INTRODUCTION

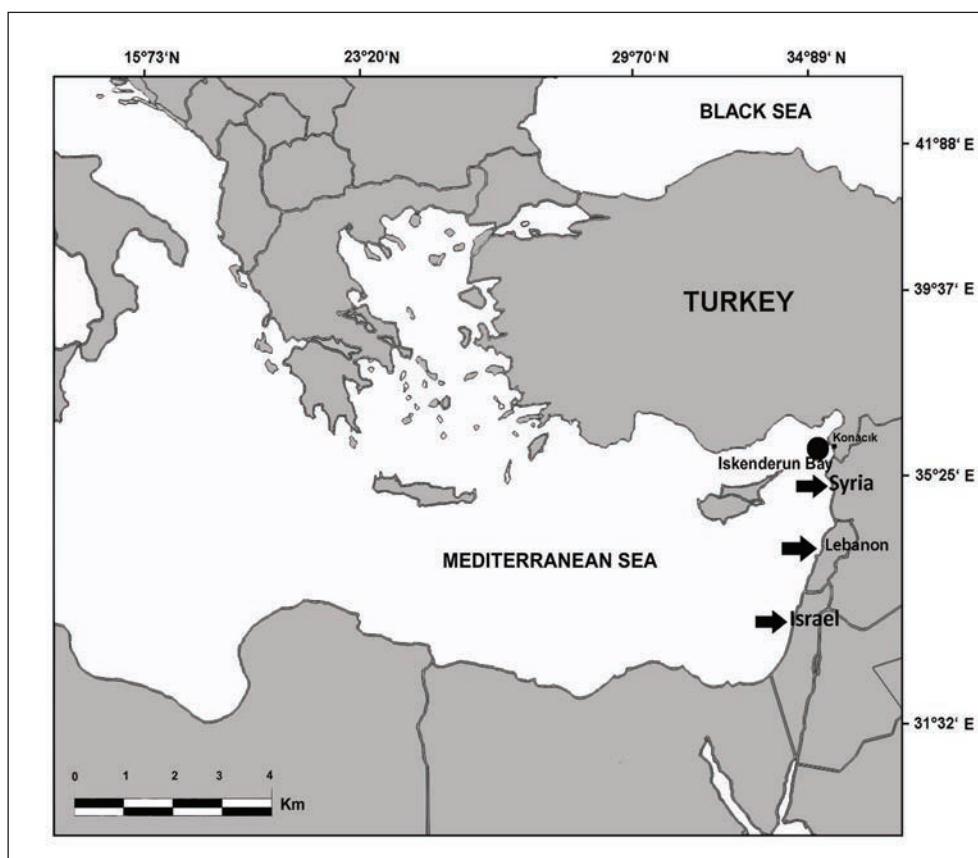
The opening of the Suez Canal in 1869 allowed many species originating in the Red Sea to enter the Mediterranean Sea. This ongoing process continues to exert a significant ecological impact on the Mediterranean (Heemstra & Randall, 1993).

To date, ten grouper species of the Epinephelidae family have been known to inhabit the Mediterranean Sea (Heemstra & Randall, 1993; Froese & Pauly, 2023). Among these, six species are Lessepsian migrants, i.e., originating from the Red Sea: *Epinephelus areolatus* (Forsskål, 1775), *E. coioides* (Hamilton, 1822), *E. fasciatus* (Forsskål, 1775), *E. geoffroyi* (Klunzinger, 1870), *E. malabaricus* and *E. merra* Blotch, 1793 (Parenti & Bressi 2001; Golani et al., 2002; Lelelong, 2005; Golani et al., 2015; Schembri & Tonna, 2011; Bariche & Heemstra, 2012; Rothman et al., 2016); and four come from the Atlantic Ocean: *E. aeneus* (Geoffroy Saint-Hilaire, 1817), *E. caninus* (Valenciennes, 1843), *E. costae* (Staindachner, 1878), and *E. marginatus*

(Lowe, 1834) (Heemstra & Randall, 1993; Heemstra & Randall, 1999; Froese & Pauly, 2023).

The areolate grouper *E. areolatus* was first recorded in 2015 in the Mediterranean Sea off the coast of Israel and documented by Rothman et al. (2016). Subsequently, this species was captured the second and third times off the coast of Lebanon, as reported by Bariche & Edde (2020). More recently, *E. areolatus* has been reported in Syrian waters by Al Mabruk et al. (2021).

Previously, there have been four exotic grouper species recorded in Turkish Mediterranean waters (Engin et al., 2016; Gokoglu & Ozvarol, 2015; Erguden et al., 2021; Yapici & Sevingel, 2020; Gokoglu & Bicer, 2022), namely the yellowfin hind *Cephalopholis hemistiktos* Rüppell, 1830, the orange-spotted grouper *E. coioides* (Hamilton, 1822), the blacktip grouper *E. fasciatus* (Forsskål, 1775), and the creole fish *Paranthias furcifer* (Valenciennes, 1828). With the addition of this new record, a new exotic grouper species has been identified within the marine ichthyofauna of Turkey.



**Fig. 1:** Map of the Eastern Mediterranean indicating the capture sites of the specimen presented in the study (black dot) and of previous records of *Epinephelus areolatus* (arrows).  
**Sl. 1:** Zemljevid vzhodnega Sredozemskega morja z označeno lokaliteto, kjer je bil ujet primenjak vrste *Epinephelus areolatus* (črni krogec) in prejšnji zapisi o pojavljanju vrste (puščice).



**Fig. 2: The *Epinephelus areolatus* captured in the Iskenderun Bay.**  
**Sl. 2: Primerek vrste *Epinephelus areolatus* ujet v zalivu Iskenderun.**

Although *E. areolatus* has been sighted in eastern Mediterranean waters, there have been no previous reports of its presence in Turkish waters. Thus, the present marks the first record of this species from the Mediterranean Sea coast of Turkey (Bay of Iskenderun).

#### MATERIAL AND METHODS

A single specimen of *E. areolatus* was caught by hook and line off the coast of Arsuz (Konacik) in the Bay of Iskenderun (at 36°29' N, 35°78' E) on 22 April 2023 (Fig. 1). The fish was solitary and swimming at a depth of 8 m. The surface temperature of the sea was 22.5 °C. The morphometric measurements were taken using digital calipers and recorded to the nearest 0.1 cm, and the specimen's total body weight was determined and recorded to the nearest 0.1 g (Fig. 2). The morphological and colour descriptions used for the identification of this specimen of *E. areolatus* have been presented by Heemstra & Randall (1993) and Rothman et al. (2016).

#### RESULTS AND DISCUSSION

The captured specimen of *E. areolatus* measured 28.5 cm in total length (TL), 23.5 cm in standard length, and weighed 529.0 g in total weight. The species typically exhibits a moderately elongated body and a large head, with a large mouth containing two rows of teeth. The continuous dorsal fin

with interspinous membrane is slightly incised. The anal, pectoral, and pelvic fins are rounded, while the caudal fin is slightly emarginated in adults. The posterior edge of the pre-operculum is serrated with larger serrations (Golani et al., 2002). Dorsal fin with XI, 15 rays, pectoral fin rays 17, anal fin rays III, 8. Caudal fin rays 17. Head length (HL) is 33.16% of TL; body depth is 26.84% of TL; eye diameter is 14.73% of HL; interorbital width is 12.63% of HL; snout length is 18.84% of HL.

**Colour:** The body's background colour was whitish, with closely-set orange-brown or greenish-yellow spots, most of which were sub-equal to the diameter of the eye. The posterior margin of the caudal fin was white and the pectoral fins pale, featuring small dark spots on the rays (in agreement with Heemstra & Randall, 1999; Allen & Erdmann, 2012).

Although *E. areolatus* shares similarities with other grouper species, such as *E. coioides*, *E. marginatus*, and *E. geoffroyi*, it differs from them in the size of spots on its body and its distinct colour pattern.

The areolate grouper *E. areolatus* is widespread in the Indo-Pacific Ocean, its range extending from the Red Sea, the Persian Gulf and Natal in South Africa in the west, to Fiji in the east, Japan in the north, and northern Australia in the south (Froese & Pauly, 2023). The distribution of the species in Mediterranean waters, as presented in Fig. 1, is based on previous capture records and the present

report from the Bay of Iskenderun.

*E. areolatus* is a reef-associated species, typically found in seagrass beds or near rocky habitats (Heemstra & Randall, 1993) in shallow continental waters. It feeds on fish and large invertebrates (Randall & Heemstra, 1991). The areolate grouper is a protogynous hermaphrodite, with females maturing at 20 cm TL, and males at 30 cm TL. Most individuals measure between 20 and 40 cm TL, with a recorded maximum length at 47 cm TL (Moran et al., 1988).

In this study, *E. areolatus* was captured at a depth of 8 m in the Bay of Iskenderun (Arsuz, Turkey), within a rocky area partly covered with algae. Randall et al. (1990) reported a depth range of 6 to 200 m for this species. Thus, the observed depth of 8 m aligns with the literature (Froese & Pauly, 2023).

## CONCLUSIONS

Our finding from the Bay of Iskenderun represents the first occurrence and evidence of *E. areolatus* along the south-eastern Mediterranean coast of Turkey. This current record brings the number of exotic grouper species recorded in the Mediterranean Sea coast of Turkey to five. The presence of this new grouper species is likely a result of migrations from the eastern Mediterranean basin. However, further monitoring studies are necessary to confirm the establishment of a viable population in this region.

## ACKNOWLEDGMENTS

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## PRVI ZAPIS O POJAVLJANJU RDEČEPIKČASTE KIRNJE *EPINEPHELUS AREOLATUS* (EPINEPHELIDAE) V JUGOVZHODNEM SREDOZEMSKEM MORJU (TURČIJA)

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*POVZETEK*

Avtorji poročajo o prvi najdbi rdečepikčaste kirnje *Epinephelus areolatus* Forsskal, 1775, iz sredozemske turške obale. Primerek vrste E. areolatus so ujeli 22. aprila 2023 na trnek na globini 8 m ob obali Arsusa v zalivu Iskenderun. Ujeti primerek je meril 28,5 cm totalne dolžine in 23,5 cm standardne dolžine. Ta vrsta je v Sredozemsko morje prišla skozi Sueški prekop. Pričajoči zapis povečuje število eksotičnih vrst kiranj, potrjenih v turškem Sredozemskem morju, na pet vrst.

**Ključne besede:** eksotična kiranja, nova najdba, migracija, turška obala

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