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A NEW ICHTHYOLOGICAL RECORD AND DISTRIBUTIONAL UPDATE FOR *EPIGONUS DENTICULATUS* DIEUZEIDE, 1950 IN TURKISH MEDITERRANEAN WATERS

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ABSTRACT

In July 2024, a single specimen of Epigonus denticulatus was captured off Silifke, Mersin, in the northeastern Mediterranean, Türkiye, at a depth of approximately 555 m. The specimen measured 14.20 cm in total length and weighed 27.8 g. Although E. denticulatus is known to occur in the Mediterranean Sea, it remains a rare species in eastern Mediterranean waters. This finding represents the second recorded occurrence of E. denticulatus in Türkiye's northeastern Mediterranean waters, contributing to the documentation of its presence in the Turkish Mediterranean region. The record provides valuable data for understanding biodiversity and the distribution of deep-sea fishes in the eastern Mediterranean, offering a foundation for future research in this field.

Key words: Pencil cardinal, Epigonidae, deep-sea fish, ichthyological record, northeastern Mediterranean

NUOVO RECORD ITTIOLOGICO E AGGIORNAMENTO SULLA DISTRIBUZIONE DI *EPIGONUS DENTICULATUS* DIEUZEIDE, 1950 IN ACQUE MEDITERRANEE TURCHE

SINTESI

Nel luglio 2024, un singolo esemplare di Epigonus denticulatus è stato catturato al largo di Silifke, a Mersin, nel Mediterraneo nord-orientale, in Turchia, a una profondità di circa 555 m. L'esemplare misurava 14,20 cm di lunghezza totale e pesava 27,8 g. Sebbene E. denticulatus sia noto per la sua presenza nel Mediterraneo, rimane una specie rara nelle acque della parte orientale. Questo ritrovamento rappresenta la seconda presenza registrata della specie nelle acque del Mediterraneo nord-orientale della Turchia, contribuendo alla documentazione della sua presenza nella regione mediterranea turca. La documentazione fornisce dati preziosi per la comprensione della biodiversità e della distribuzione dei pesci di profondità nel Mediterraneo orientale, offrendo una base per future ricerche in questo campo.

Parole chiave: re di triglie bruno, Epigonidae, pesce di profondità, record ittologico, Mediterraneo nord-orientale

INTRODUCTION

The family Epigonidae is comprised of six genera and over 45 valid species (Fricke & Couperus, 2024; Fricke *et al.*, 2025; Okamoto *et al.*, 2024; 2025), distributed across the Atlantic, Pacific, and Indian Oceans (Abramov, 1992; Fricke, 1999; Froese & Pauly, 2025). In the Mediterranean Sea, the genus *Epigonus* is represented by three valid species: the deepwater cardinalfish (*Epigonus constanciae* Giglioli, 1880), the pencil cardinalfish (*Epigonus denticulatus* Dieuzeide, 1950), and the black cardinalfish (*Epigonus telescopus* Risso, 1810) (Froese & Pauly, 2025; IUCN, 2025). All three species have broad geographical distributions and have been recorded in Turkish marine waters (IUCN, 2025). Their presence in the Mediterranean enhances the region's ichthyofaunal diversity while underscoring the need for further studies on their distribution, population dynamics, and ecological roles within deep-sea ecosystems.

In the Mediterranean, the pencil cardinalfish was first documented in the Aegean Sea (Fischer *et al.*, 1987). Subsequent reports have confirmed its presence in various regions, including the eastern Ionian Sea and the Adriatic Sea (Mytilineou *et al.*, 2005), the Catalan Sea (Coll *et al.*, 2006), Turkish Mediterranean waters (Ergüden *et al.*, 2017), and Syrian waters (Ibrahim *et al.*, 2023). These records suggest a wider distribution of *E. denticulatus* in the Mediterranean Basin than previously recognised, emphasising the importance of continued ichthyofaunal surveys to improve the understanding of the species' range and ecological significance.

While the pencil cardinalfish (*E. denticulatus*) has hitherto been recorded along the Mediterranean coast of Türkiye, no prior studies documented its sexual characteristics. Here, we determine, for the first time, the sex of an *E. denticulatus* specimen from Turkish Mediterranean waters – identifying it as male – and provide associated

morphological data.

This ichthyological note is significant as it constitutes the second documented occurrence of *E. denticulatus* in the northeastern Mediterranean waters of Türkiye and contributes new distributional data for the species in the region, underscoring the need for further research into its population structure and ecological characteristics.

MATERIAL AND METHODS

A male specimen of *E. denticulatus* was collected during a trawl survey off Silifke, Mersin, Türkiye (36°12'840" N, 34°24'315" E) on 18 July 2024 (Fig. 1). Following capture, the specimen was identified and photographed on board before being transported to the laboratory for further analysis (Fig. 2). Morphometric measurements were recorded to the nearest 0.1 mm using a calliper, with meristic counts conducted under reflected light using a stereomicroscope. Sexual identification and gonadal assessment were completed through binocular microscopy. This specimen was confirmed as *E. denticulatus* based on diagnostic morphological characteristics following Gon (1986), Mayer (1974), Maugé & Mayer (1990), and Froese & Pauly (2025). After the examination, the specimen was preserved in 4% formaldehyde solution and deposited in the Marine Life Museum collection of Mersin University under catalogue number MEUFC-25-11-149.

RESULTS AND DISCUSSION

The Mediterranean specimen of *E. denticulatus* exhibited distinct morphological features, including the following meristic counts: dorsal fin rays VII, I+10; anal fin rays II+8; ventral fin rays I+5; pectoral fin rays 18; and caudal fin rays 26. The body was elongated, the head moderately sized, with a large mouth and a round to slightly oval eye. The opercular spine was absent; in contrast, the membranous

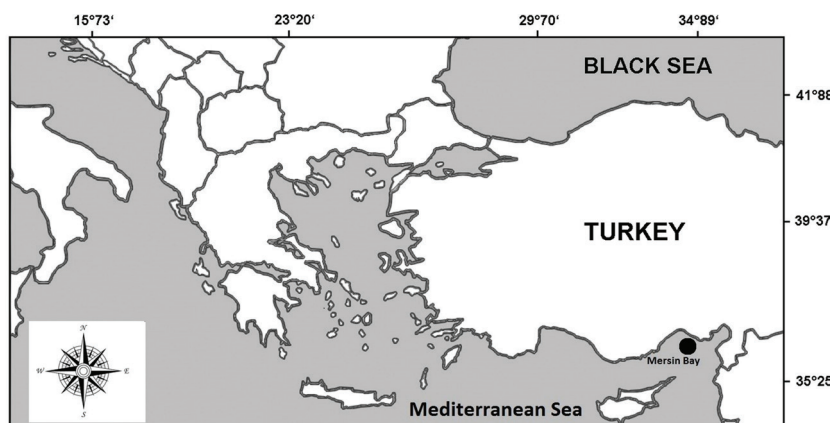


Fig. 1: Capture site (•) of *E. denticulatus* Dieuzeide, 1950 in Mersin Bay (northeastern Mediterranean Sea, Türkiye).
Sl. 1: Lokalizeta ulova primerka vrste (•) *E. denticulatus* Dieuzeide, 1950 v zalivu Mersin (severovzhodno Sredozemsko morje, Turčija).



Fig. 2: Specimen of *E. denticulatus* (14.2 cm TL), captured in Mersin Bay, northeastern Mediterranean Sea, Türkiye (Photo: Deniz Ergüden).

Sl. 2: Primerek vrste *E. denticulatus* (14,2 cm telesne dolžine), ujet v zalivu Mersin, severovzhodno Sredozemsko morje, Turčija (foto: Deniz Ergüden).

edge along the upper margin of the gill cover was well-developed. The caudal peduncle was elongated. The body coloration ranged from uniformly brownish to yellowish, with a darker dorsal side and numerous brown-black melanophores visible within the scale pockets and contributing to the specimen's distinct pigmentation pattern.

Relative to standard length (SL), the examined *E. denticulatus* exhibited the following morphometric proportions: head length (HL), 30.33%; pre-dorsal length, 33.88%; pre-anal length, 61.73%; and body depth, 20.33%. Relative to head length (HL), measurements were: eye diameter, 43.05%; pre-orbital length, 23.16%; interorbital distance, 35.42%. All diagnostic meristic and morphometric data for this specimen are presented in Table 1.

Cardinalfish of the genus *Epigonus* exhibit an extensive, near-global distribution, occurring across tropical to cold-temperate latitudes, including subantarctic regions. These bathydemersal fish inhabit continental and insular slopes, at depths ranging from 50 to 1,200 m (Gon, 1994; Okamoto & Gon, 2018). However, studies by Mytilineou *et al.* (2005) and Okamoto *et al.* (2011) indicate that most species within this genus are predominantly found along continental slopes, with recorded depths typically ranging between 100 and 1,000 m.

The pencil cardinalfish (*E. denticulatus*) is a bathydemersal species typically encountered along the upper continental slope, at depths ranging from 75 to 850 m (Abramov, 1992; Okamoto & Gon, 2018). Tortonese (1986) noted that its maximum depth distribution is somewhere between 300 and 600 m. While adults generally occupy deeper waters, juveniles are pelagic, typically found between 130 and 425 m (Maugé & Mayer, 1990; May & Maxell, 1986). The species reaches a maximum total length (TL) of 20 cm in males (Gon, 1986) and feeds predominantly on small fishes and planktonic invertebrates (Tortonese, 1986).

According to Dieuzeide (1950) and Matallanas (1982), *E. denticulatus* attains sexual maturity at 12.0 cm

TL. Our *E. denticulatus* specimen was a male (14.2 cm TL), with gonads in stage 3 of sexual maturity (maturing phase) (Balbontín & Bravo, 1993; Moyano *et al.*, 2020).

Meristic and morphometric characters of the pencil cardinalfish specimens are provided in Table 1, with comparative data from Ergüden *et al.* (2007) and Ibrahim *et al.* (2023). Our specimen exceeds the size range previously reported for Mediterranean specimens off Türkiye (Ergüden *et al.*, 2017) but remains slightly smaller than the individual documented from the Syrian coast (Ibrahim *et al.*, 2023).

Deep-sea fisheries in Türkiye's northeastern Mediterranean waters have operated for over two decades, with recent bottom trawling efforts expanding to deeper, newly explored continental slope areas. This has resulted in the capture of numerous rare and previously unrecorded demersal fish species (Ergüden & Bayhan, 2015). Our study confirms the presence of the pencil cardinalfish, *E. denticulatus* – considered exceptionally rare in the easternmost Mediterranean – in these waters, providing further evidence of the species' expanding distribution in the region. This finding underscores the need for continued monitoring and research of deep-sea fish biodiversity.

CONCLUSIONS

The pencil cardinalfish, *E. denticulatus*, is widely distributed throughout the western and northern Mediterranean, including the Aegean Sea. However, it has rarely been recorded in Turkish Mediterranean waters, except for Mersin Bay, where it has been documented twice. This study represents the second documented record of the species' occurrence along the northeastern Mediterranean coast of Türkiye. The reappearance of *E. denticulatus* along Syrian and Turkish coasts – following an approximate seven-year absence – may indicate an eastward range expansion. This

Tab. 1: Comparative morphometric and meristic data for the pencil cardinal fish, *E. denticulatus*, from Turkish marine waters.**Tab. 1: Primerjalni morfometrični in meristični podatki za rjavega veleokca, *E. denticulatus*, iz turških morskih voda.**

Reference	This study	Erguden <i>et al.</i> (2017)	Ibrahim <i>et al.</i> (2023)
Number of Specimen (n)	1	2	1
Morphometric (cm)			
Total length	14.20	8.10-12.90	15.40
Standart length	12.10	7.25-11.55	12.00
Fork length	12.70	7.44-11.85	
Head length	3.67	2.27-3.62	4.50
Pre orbital length	0.85	0.50-0.80	0.80
Post-orbital length	2.22	0.65-1.02	2.70
Eye diameter	1.58	1.10-1.50	-
Interorbital distance	1.30	0.77-1.22	-
Pre pectoral fin length	3.34	2.44-3.89	4.00
Pectoral fin length	1.90	1.20-1.91	2.60
Pre pelvic length	4.10	2.40-3.83	4.50
Pelvic fin length	0.50	0.40-0.65	2.30
Pelvic fin height	1.60	1.01-1.43	-
Body depth	2.46	1.30-2.10	-
1st Pre dorsal length	4.10	2.42-3.86	3.80
1st Dorsal fin length	1.79	0.99-1.58	1.50
1st Dorsal fin height	1.63	1.16-1.85	-
2nd Dorsal fin length	1.19	0.67-0.92	1.30
2nd Dorsal fin height	1.95	1.13-1.80	-
Pre anal length	7.47	4.33-6.90	7.70
Anal fin length	1.46	0.65-0.97	1.20
Anal fin height	2.03	1.14-1.82	-
Caudal peduncle depth	1.12	0.68-1.06	-
Maximum mouth height	1.68	0.95-1.53	-
Maximum mouth width	0.87	0.61-0.81	-
Body weight (g)	27.80	6.10-20.40	-
Meristic			
First dorsal-fin rays	VII	VII	VII
Second dorsal-fin rays	1+10	1+10	10
Pectoral fin ray	18	18	14
Pelvic fin ray	I +5	I +5	I +5
Anal fin ray	II +9	II +8	II +8
Caudal fin ray	24	26	20
Lateral line scales	47	46-48	-
Total gill rakers	29	29-30	-
Opercular membranous spines	6	6-7	-
Pyloric caeca	11	10-11	-

observation underscores the need for continued ichthyofaunal surveys to monitor the species' population dynamics and identify the environmental factors potentially influencing its distribution in the eastern Mediterranean.

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NOV IHTIOLOŠKI ZAPIS IN PODATKI O RAZŠIRJENOSTI RJAVEGA VELEOKCA, *EPIGONUS DENTICULATUS* DIEUZEIDE, 1950 V TURŠKIH SREDOZEMSKIH VODAH

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POVZETEK

Primerek rjavega veleokca (Epigonus denticulatus) so julija 2024 ulovili pri Silifkeju v Mersinu v severovzhodnem Sredozemlju (Turčija) na globini približno 555 m. Primerek je meril v dolžino 14,2 cm in tehtal 27,8 g. Čeprav je znano, da se rjavi veleokec pojavlja v Sredozemskem morju, je v vodah vzhodnega Sredozemlja redka vrsta. Ulov tega primerka predstavlja drugi zabeležen pojav vrste E. denticulatus v severovzhodnih sredozemskih vodah Turčije, kar potrjuje njegovo prisotnosti v turški sredozemski regiji. Zapisi o pojavljanju nudijo dragocene podatke za razumevanje biotske raznovrstnosti in porazdelitve globokomorskih rib v vzhodnem Sredozemlju ter zagotavljajo osnovo za prihodnje raziskave na tem področju.

Ključne besede: rjavi veleokec, Epigonidae, globokomorke ribe, ihtiološki zapis, severovzhodno

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