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A RARE OCCURRENCE AND CONFIRMED RECORD OF SCALLOPED RIBBONFISH *ZU CRISTATUS* (OSTEICHTHYES: TRACHIPTERIDAE) IN THE GULF OF ANTALYA (EASTERN MEDITERRANEAN), TURKEY

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ABSTRACT

*On 25 October 2022, a juvenile specimen of scalloped ribbonfish *Zu cristatus* was captured in the Finike coast, Gulf of Antalya (Eastern Mediterranean, Turkey) by a commercial trawler at a depth of 50 m. The paper reports the first occurrence and confirms the presence of *Z. cristatus* in the Antalya Bay. The morphological and colour descriptions of the captured *Z. cristatus* specimen agree with previous descriptions of the species. This record is the first evidence of a juvenile specimen of *Z. cristatus* in the Mediterranean coast of Turkey. Additionally, the study documents the historical records of the species in the Mediterranean Sea and can contribute to the field of fisheries science and aid in fisheries management.*

Key words: Trachipteridae, ribbonfish, record, Antalya Gulf, Mediterranean Sea

CASO RARO E RITROVAMENTO CONFERMATO DI PESCE FALCE *ZU CRISTATUS* (OSTEICHTHYES: TRACHIPTERIDAE) NEL GOLFO DI ANTALYA (MEDITERRANEO ORIENTALE), TURCHIA

SINTESI

*Il 25 ottobre 2022, un esemplare giovane di pesce falce *Zu cristatus* è stato catturato lungo la costa di Finike, nel Golfo di Antalya (Mediterraneo orientale, Turchia) da un peschereccio a strascico commerciale a una profondità di 50 m. Il lavoro riporta il primo ritrovamento e conferma la presenza di *Z. cristatus* nella baia di Antalya. Le descrizioni morfologiche e cromatiche dell'esemplare di *Z. cristatus* catturato concordano con le precedenti descrizioni della specie. Questo ritrovamento è la prima prova di un esemplare giovanile di *Z. cristatus* lungo la costa mediterranea della Turchia. Inoltre, lo studio documenta i ritrovamenti storici della specie nel Mediterraneo e può contribuire al campo della scienza della pesca e alla gestione della pesca.*

Parole chiave: Trachipteridae, pesce falce, ritrovamento, Golfo di Antalya, Mediterraneo

INTRODUCTION

The family Trachipteridae is composed of two main genera, *Trachipterus* (Goüan, 1770) and *Zu* (Walters & Fitch, 1960). The *Zu* genus is represented in the Mediterranean Sea only by the native species, the scalloped ribbonfish *Z. cristatus* (Bonelli, 1819) (Nelson, 2006). This species occurs in the Mediterranean Sea (Fischer *et al.*, 1987; Quignard & Tomasini, 2000; Bianco *et al.*, 2006; Bradai & El Ouaer, 2012), as well as in the Atlantic, Indian and Pacific Oceans (Mundy, 2005; Froese & Pauly, 2023).

In the Mediterranean, *Z. cristatus* is distributed throughout the basin (Bonelli, 1820; Oliver, 1955; Tortonese, 1958; Gavagnin, 1976; Fischer *et al.*, 1987; Papakonstantinou, 1988; Golani *et al.*, 2006), as supported by several records, including a few from the Adriatic waters (Dieuzeide *et al.*, 1953; Tortonese, 1958; Palmer, 1961; Ibanez & Gallego, 1974; Gavagnin, 1976; Cau, 1980; Jardas, 1980; 1996; Roig & Demestre, 1982; Dulcic, 2002; Bianco *et al.*, 2006; Psomadakis *et al.*, 2006; Psomadakis *et al.*, 2007; Dhora, 2010; Bradai & El Ouaer, 2012; Mytilineou *et al.*, 2013; Dulcic *et al.*, 2014; Quigley and Henderson, 2014; Garibaldi, 2015; Sperone and Giglio, 2015; Garcia-Barcelona *et al.*, 2016; Falsone *et al.*, 2017; Tiralongo *et al.*, 2019; Albano *et al.*, 2022a). Most recently, *Z. cristatus* was caught in July 2020 by a bottom trawler targeting deep water off the Gulf of Patti, the Tyrrhenian Sea, and western Mediterranean (Stipa *et al.*, 2022), while the last confirmed report in the Mediterranean Sea is of two specimens captured in the Israeli coast in June 2022 and in the Levantine coast by Golani *et al.* (2023). The historical records of this species in the Mediterranean basin are documented in Table 1.

Although *Z. cristatus* has been found throughout the Mediterranean Sea and is mentioned in the checklists of species found in Turkish marine waters (Bilecenoglu *et al.*, 2002), including the Turkish Mediterranean coast (Akyuz, 1957), it is only rarely seen in the eastern Mediterranean. In fact, until now, no specimens of this species were reported from the Gulf of Antalya (Eastern Mediterranean, Turkey). In the present study, we thus report the first record of *Z. cristatus* from the western Mediterranean coast of Turkey (Finike coast, Antalya).

MATERIAL AND METHODS

A single juvenile specimen of *Z. cristatus* was caught by a commercial trawler at a depth of 50 m in the Finike coast, Antalya Bay (36°25' N, 30°21' E) on 25 October 2022 (Fig. 1). After being photo-

graphed and recorded by a video camera on deck, it was measured for total length and weight by the fishermen, and released back into the sea alive. The specimen was identified from a photograph supplied by the vessel's captain. The morphological descriptions and colour of the captured *Z. cristatus* are in agreement with those by Palmer (1986) and Olney (1999) (Fig. 2).

RESULTS AND DISCUSSION

The juvenile specimen of scalloped ribbonfish measured 786 mm in total length (TL) and weighed 940 g. Its body was naked and compressed, eyes large, dorsal fin formed by elongated rays and continuing along the entire length of the body to the tail and the two lobes constituting the caudal fin. The caudal part of the body was scalloped, anal and pelvic fins absent. The body was silvery with approximately six vertical bars on the dorsal part and four on the ventral, and about six complete black bars in the tail. The caudal fin was blackish, the fin base pale.

Zu cristatus is a mesopelagic fish species that has a wide depth distribution of 0 to 950 m, but is usually found at 90 m (Fricke *et al.*, 2011; Froese & Pauly, 2023). Juvenile specimens have occasionally been observed swimming freely in the upper water layers with a trailing elongated dorsal fin and pelvic fin rays that give them a jellyfish-like appearance (Heemstra & Kannemeyer, 1984; Bianco *et al.*, 2006). While adult specimens may prefer deeper waters – Tiralongo *et al.* (2019) reported the maximum depth recorded for *Z. cristatus* in Mediterranean waters to be about 2000 m – Albano *et al.* (2020b) observe that juvenile specimens are frequently encountered in shallow waters. The recorded depth range (50 m) of the observed juvenile specimen is in accordance with the literature (Froese & Pauly, 2023).

Heemstra & Kannemeyer (1984) stated that *Z. cristatus* undergoes various body changes during its life cycle. Significant differences can occur in the 600–800 mm TL size range, which coincides with the transition from pre-juvenile to juvenile stages. These changes include the loss of long anterior dorsal fin rays and pelvic fins. Also, juvenile specimens are characterized by a ribbon-shaped body (Bini, 1970; Tortonese, 1970; Olney *et al.*, 1993), have a short head and a narrow mouth, with a distinctly protruding upper jaw (Heemstra & Kannemeyer, 1986; Olney *et al.*, 1993). Our present specimen measured 786 mm (SL), which qualifies it as juvenile and makes this first record of occurrence of a juvenile specimen of *Z. cristatus* on the Mediterranean coast of Turkey.

Tab. 1: Historical records of *Zu cristatus* from the Mediterranean Sea during the period 1820–2022.**Tab. 1: Historični zapisi o pojavljanju vrste *Zu cristatus* v Sredozemskem morju v obdobju med 1820 in 2022.**

References	Number of samples	Year(s)	Location/Country	Depth (m)	Gear	Length, TL (mm)	Weight (g)
Bonelli (1820)	1	1818	off the coast of Lerici, Gulf of La Spezia, Italy	-	-	700	-
Ben-Tuvia (1953)	1	1953	Eastern Mediterranean shores, Israel	-	-	190	-
Oliver (1955)	1	1955	Palma de Mallorca (Spain)	-	-	1000	-
Postel (1955)	1	December 1954	Gulf of Tunis, (southern Mediterranean Sea), Tunisia	-	Trammel net	285	-
Tortonese (1958)	1	August 1958	off Genova (Ligurian Sea), Italy	700-800	Bottom long-line	1105	2800
Ibanez, & Gallego (1974)	1	1969	off the coast of Blane, Iberian Sea, Spain	600	Bottom Trawl	875	-
Gavagnin (1976)	1	1976	Ligurian Sea, Italy	20	-	-	-
Roig & Demestre (1982)	1	June 1980	Arenys de Mar, Spain	-	Bottom Trawl	700	500
	1	1981	Malgrat de Mar, Spain	380	Bottom Trawl	1115	2160
Bianco <i>et al.</i> (2006)	2	June 1998	Gulf of Castellamare (central Tyrrhenian Sea), Italy	2	Hand net	180-150 (SL)	-
Psomadakis <i>et al.</i> (2006)	1	2001-2022	off the coast of Anzio, (central Tyrrhenian Sea), Italy	500-600	Bottom Trawl	800	-
Psomadakis <i>et al.</i> (2007)	2	May-August 2003	Gulf of Genova (Ligurian Sea), (NW Mediterranean Sea), Italy	150-400	Bottom Trawl	1219 1031	4400 2292
Sperone & Giglio (2015)	1	July 2014	Calabria (Southern Tyrrhenian Sea), Italy	Surface	Rod fishing	980	2000
Garcia-Barcelona <i>et al.</i> (2016)	2	May 2013- July 2014	Balearic Sea, Spain	-	Longline	1030 878	2400 1300
Falsone <i>et al.</i> (2017)	1	2016	Southwestern Tyrrhenian Sea, Italy	-	Longline	876	1301
Bradai & El Quaer (2012)	1	October 2009	Tunisian waters, (central Tunisia) Tunisia	50-80 (cm)	Casting Net	170	-
Albano <i>et al.</i> (2022a)	1	2022	off the coast of Noto, Ionian Sea (Sicily, Italy)	720	Longline	1210	4000
Stipa <i>et al.</i> (2022)	1	July 2020	Gulf of Patti, Tyrrhenian Sea (western Mediterranean Sea), Italy	600	Bottom Trawl	998.7	1548
Golani <i>et al.</i> (2023)	1	1978	Mediterranean coast, Israel	surface	-	234	-
Golani <i>et al.</i> (2023)	1	June 2022	Mediterranean coast, Israel	250-400	Longline	1275	-
This study	1	October 2022	eastern Mediterranean, Gulf of Antalya, Turkey	50	Bottom Trawl	786	940

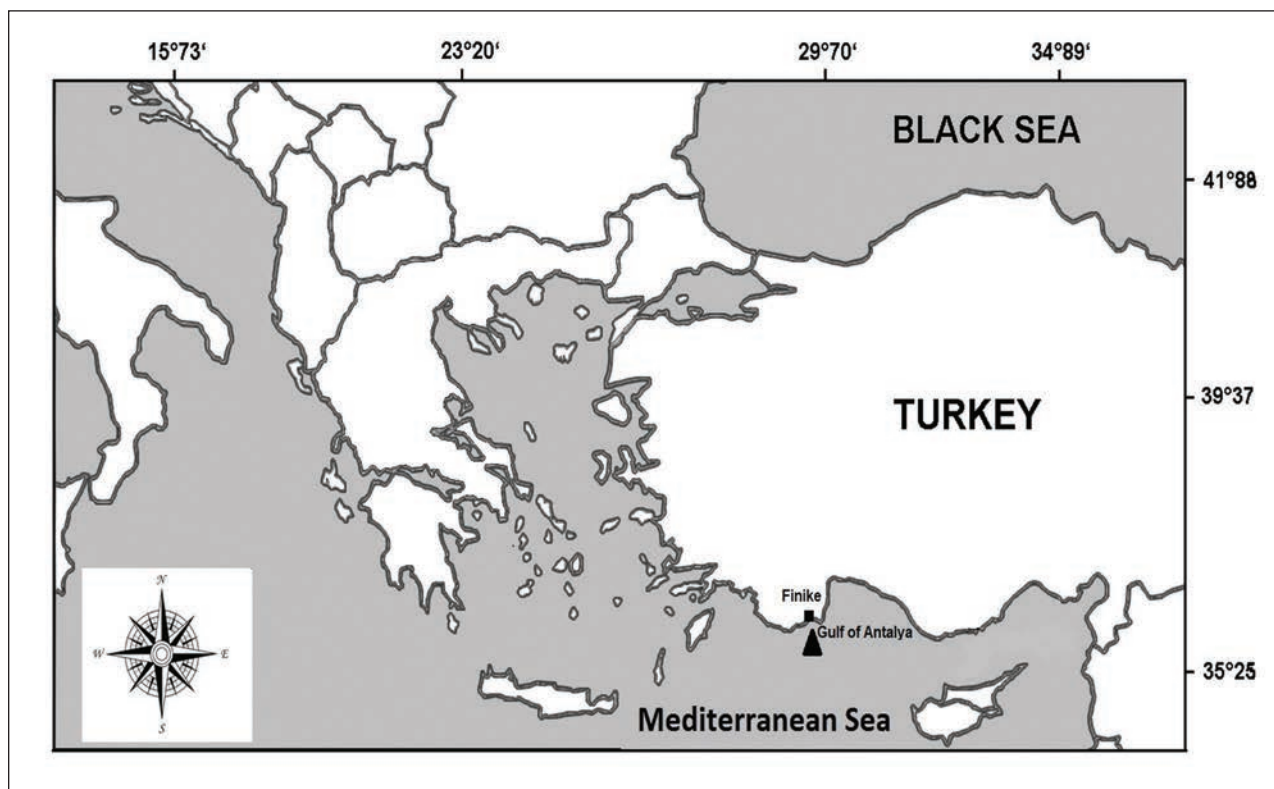


Fig. 1: Map of the study area indicating the capture sites (•) of *Zu cristatus* in the Gulf of Antalya (western Mediterranean coast of Turkey).

Sl. 1: Zemljevid obravnavanega območja z označeno lokaliteto (•) ulova vrste *Zu cristatus* v Antalijskem zalivu (zahodna sredozemska obala Turčije).

While Heemstra & Kannemeyer (1984) found that specimens of *Z. cristatus* longer than 800 mm SL were rarely reported in the Mediterranean Sea, several studies report captions of large specimens measuring over 800 mm TL (Tortonesi, 1958; Roig & Demestre, 1982; Psomadakis *et al.*, 2006; Bradai & El Quaer, 2012), with Psomadakis *et al.* (2007) documenting two specimens measuring over 1000 mm in TL (1219 and 1031 mm, respectively) from NW Mediterranean (Gulf of Genoa, Italy).

Information on the occurrence of *Z. cristatus* in the Turkish coast is scarce, as is the general knowledge of this species in the Mediterranean Sea (Stipa *et al.*, 2022), especially with regard to the biology of the adult stage, the species' reproduction and environmental habits. According to the fairly limited data on *Zu cristatus*, both eggs and larvae are planktonic, large, and red (Charter & Moser, 1996). Adult specimens feed on small cephalopods, fishes, and large invertebrates (Palmer, 1986; Albano *et al.*, 2022b).

Finally, species from the Trachipteridae family are in general considered by-catch species and thus often discarded. While *Z. cristatus* is sometimes incidentally caught in longline fishing, such fishing



Fig. 2: Specimen of *Zu cristatus*, 786 mm TL, captured in the Gulf of Antalya, Turkey.

Sl. 2: Primerek vrste *Zu cristatus*, dolg 786 mm, ujet v Antalijskem zalivu (Turčija).

gear does not pose a significant threat to this species' population. Consequently, it has been categorized as Least Concern (LC) on the IUCN Red List (Arnold, 2015; IUCN, 2023).

CONCLUSIONS

In this study, we confirm the presence of *Z. cristatus* in the Mediterranean waters of Turkey, and our finding in Antalya Bay is the first evidence of a

juvenile specimen of this species in the western Mediterranean coast of Turkey. The present study has the potential to be a valuable contribution to the field of fisheries science by offering insights that may inform and improve fisheries management practices.

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O REDKEM POJAVLJANJU IN POTRJENI NAJDBI ČOPASTE KOSICE *ZU CRISTATUS* (OSTEICHTHYES: TRACHTERIDAE) V ANTALIJSKEM ZALIVU (VZHODNO SREDOZEMSKO MORJE), TURČIJA

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POVZETEK

*Petindvajsetega oktobra 2022 so ob obali Finike v Antalijskem zalivu (vzhodno Sredozemsko morje, Turčija) na globini 50 m s povlečno mrežo ujeli mladostni primerek čopaste kosice *Zu cristatus*. Avtorji poročajo, da gre za prvi potrjeni zapis o pojavljanju te vrste v Antalijskem zalivu. Morfološki opisi in barva ujetega primerka *Z. cristatus* se ujema z znanimi opisi vrste. Ta zapis je prva najdba mladostnega primerka vrste *Z. cristatus* ob sredozemski turški obali. Poleg tega raziskava navaja zgodovinske zapise o tej vrsti v Sredozemskem morju, je pomemben prispevek s področja ribiške znanosti in pomaga pri upravljanju ribištva.*

Ključne besede: Trachteridae, čopasta kosica, zapis o pojavljanju, Antalijski zaliv, Sredozemsko morje

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