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RECENT RECORD AND SOME BIOLOGICAL CHARACTERISTICS OF PAINTED EEL (*Echelus myrus* Linneaus, 1758) IN THE NORTHERN AEGEAN SEA, TÜRKIYE

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Abstract
A specimen of the painted eel *Echelus myrus* (Linnaeus, 1758) was incidentally caught on May 24, 2025, by Serdar BAYRAM from the Darpane fishing vessel with a bottom longline from the northern Aegean Sea, Türkiye. The individual measured 546 mm in total length and weighed 98.25 g. In addition to these, other morphometric measurements were taken, and the meristic characteristics were recorded. The specimen was identified as a female with mature gonads (ripe stage). Oocyte diameters ranged from 0.63-1.22 mm with the mean of 0.90±0.015 mm. The stomach content of *Echelus myrus* revealed only the fragment of cuttlefish bait associated with the longline hook and line. These findings contribute to the limited existing knowledge of the biological characteristics *Echelus myrus* in by providing an additional record from Türkiye. This study also includes the recent observation of rarely recorded *Echelus myrus* in the northern Aegean Sea, Türkiye.

Keywords: Longline, rare species, Ophichthidae, bait fishing, Bozcaada Island

Introduction
The painted eel *Echelus myrus* (Linnaeus, 1758) is a teleost fish species from the order Anguilliformes and the family Ophichthidae. Although it is not economically significant, it is a remarkable species due to its contribution to marine biodiversity (Taylan & Aydın, 2021). This species is globally listed as Least Concern by the IUCN (International Union for Conservation of Nature) due to insufficient knowledge (Tighe, 2015). *E. myrus* inhabits sandy and muddy substrates in shallow coastal lagoons and estuaries, where it constructs burrows

with only its head protruding from the sediment. This species is distributed at depths ranging from 3 to 550 meters. The length of this specimen reaches up to around 60 cm (Froese & Pauly, 2025).

E. myrus is distributed in the Mediterranean Sea, the eastern Atlantic Northward from the Bay of Biscay to Pointe Noire, Congo, and southward to Angola (Whitehead et al., 1986; Froese & Pauly, 2025). It is considered common around the Cape Verde Archipelago in the Atlantic Ocean (Menezes et al., 2004). In Türkiye, *E. myrus* has been documented in the coast of the Mediterranean Sea and the Aegean Sea, (Bilecenoglu et al., 2014), it is rarely reported, especially in the Northward Aegean Sea.

In the previous studies in the Türkiye seas, *E. myrus* has been reported from the especially trawls and sometimes longlines in the Mersin Bay in the Mediterranean Sea (Çiçek et al., 2006), the northeastern Mediterranean Sea (Sangun et al., 2007), Izmir Bay, Aegean Sea (İlkyaz et al., 2008; Gurbet et al., 2013), the southern Aegean Sea (Bilge et al., 2014), and Ildır Bay, Çeşme in the Aegean Sea (Taylan & Aydın, 2021). Çoker and Akyol (2018) included *E. myrus* in their study on the ichthyofauna of Saroz Bay and Gökçeada, the southern Aegean Sea. These studies were focused on basic morphometric data such as the length-weight values, but the biological characteristics of this rare species were not mentioned. Also, the abundance of *E. myrus* decreases towards the north. The present study aims to document a new record the occurrence of *E. myrus* in the northern Aegean Sea and to describe some of its biological characteristics.

Material and Method

A single specimen of the painted eel (*Echelus myrus*) was caught as bycatch using a bottom longline by a commercial fisherman from the west of Bozcaada Island in the northern Aegean Sea, Türkiye, on May 24, 2025. This individual was caught at a depth of approximately 60 meters by a fish finder device (Figure 1).

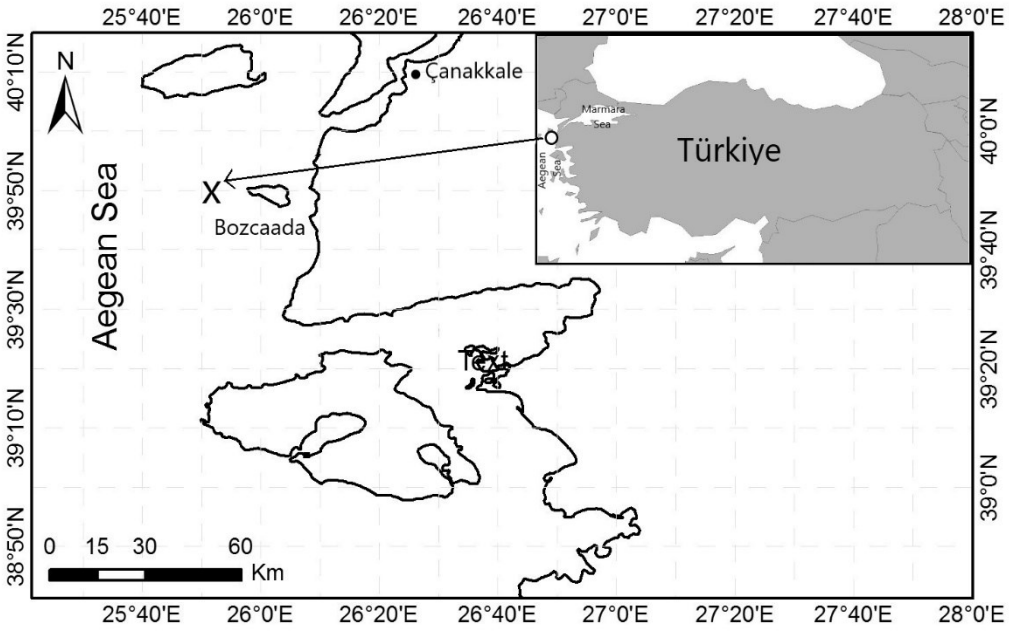

Figure 1. Sampling location (X showing) of *E. myrus* in the Northern Aegean Sea.

This specimen was transferred to the fish biology laboratory. This specimen was subsequently photographed and species identified using Whitehead et al. (1986) (Figure 2).

Figure 2. *E. myrus* specimen caught from the Northern Aegean Sea.

The technical properties of the fishing gear used to catch this species was expressed by Serdar BAYRAM from Darpane fishing vessel. This bottom longline has monofilament mainline with a diameter of 1.20 mm and the branchline was 1 m long, 0.80 mm in diameter and yellow color. Each branchline was connected to the mainline at an interval of 10 m. The thick type was used with 8/0 sized flat hooks. The common cuttlefish (*Sepia officinalis* Linnaeus, 1758) was used as bait on the longline (Figure 3).

Figure 3. The bait and longline used to catch *E. myrus*.

The morphometric measurements of this individual were measured with a digital clipper and a measuring board in the laboratory. The meristic characteristics were counted in there. The total weight was recorded to the nearest 0.01 g. This individual was dissected, following sex and maturity stages determined by macroscopic observation of gonads.

The sexual maturity stages were determined based on Holden & Raitt (1974) as; Stage I (Immature), Stage II (Maturing), Stage III (Ripening), Stage IV (Ripe), and Stage V (Spent). The gonad weight was recorded. Three subsamples were taken for oocyte diameter measurements, and a total of 78 oocyte diameters were measured. The oocyte diameters were measured using a stereomicroscope and Q-Capture digital imaging program. The stomach was dissected, and its weight was recorded.

Results

The total length of *E. myrus* was measured as 546 mm, and the total weight was 98.25 g. The total length constituted 4.3% of body depth and 10.5% of head length. The morphometric measurements with percentages of the total length and meristic counts of *E. myrus* were summarized and compared with previous studies in Table 1.

Table 1. Morphometric measurements (mm) with percentages of total length (%TL) and meristic counts of *E. myrus* recorded and compared with the previous studies.

Morphometric measurements	Rafrafi-Nouira et al. (2015)		Khrema et al. (2023)		This study	
	mm	%TL	mm	%TL	mm	%TL
Total length	550	100.0	591	100.0	546	100.0
Body depth	23	4.1	29	4.9	23.3	4.3
Head length	42	7.6	57	9.6	57.38	10.5
Preanal length	250	45.4	250	42.3	228	41.8
Predorsal length	91	16.6	80	13.5	80.14	14.7
Prepectoral length	68	12.3	61	10.3	59.17	10.8
Dorsal fin length	457	83	491	83	435	79.7
Anal fin length	304	55.2	331	56	323	59.2
Pectoral fin length	7	1.2	17	2.8	19.7	3.6
Eye diameter	11	1.8	7	1.2	8.36	1.5
Preorbital length	15	2.7	12	2	12.87	2.4
Interorbital length	8	1.4	10	1.7	8.46	1.5
Length of upper jaw	28	5.0	18	3.1	19.35	3.5
Length of lower jaw	26	4.6	16	2.7	16.37	3.0
Meristic counts						
Number of pores in linea lateralis	103		114		104	
Pectoral fin soft rays	13		12		12	
Dorsal fin rays	-		-		348	
Anal fin rays	-		-		228	
Total weight (g)	129		220		98.45	

The sex of this individual was determined as female, and the gonad was determined to be at stage IV (ripe) due to the ovary being 2/3rds to the full length of the body cavity and the ovary with conspicuous superficial blood vessels (Figure 4a).

The gonad weight was measured at 8.22 g. The gonad shape was observed as ovoidal. The minimum, maximum, and mean with standard error of oocyte diameters were determined as 0.63 mm, 1.22 mm, and 0.90±0.015 mm, respectively (Figure 4b).

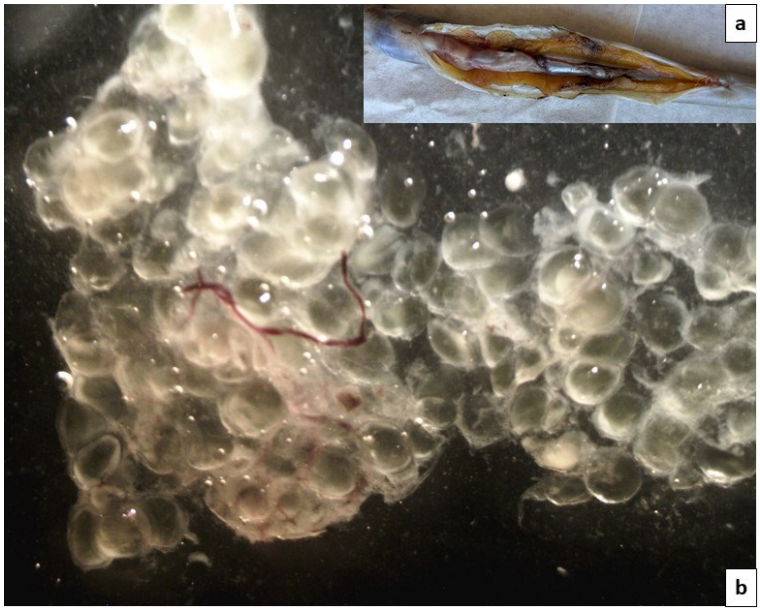

Figure 4. Female specimen (a) and Stage IV (ripe) with oocytes (b).

The total weight of *E. myrus* stomach was recorded as 7.79 g. Only the bait fragment of cuttlefish and the longline hook and line were found in the stomach content (Figure 3). These items were used to catch *E. myrus*. The weight of the digested cuttlefish and the longline hook with the line was determined as 3.64 g and 1.25 g, respectively. No additional prey items were observed in the stomach content.

Discussion

Bycatch represents a serious problem in global fisheries (Kennelly et al., 2021; Dewanti et al., 2022). In the present study, an individual of *E. myrus* was incidentally caught using a longline with bait operated by a commercial fisherman targeting primarily Sparidae species. In the previous studies were reported that *E. myrus* was caught especially in trawls and sometimes longlines in the Mediterranean Sea (Çiçek et al., 2006; Sangun et al., 2007; İlkyaz et al., 2008; Gurbet et al., 2013; Bilge et al., 2014; Taylan & Aydın, 2021). No items were found in the stomach content of this individual except for the bait and hook with line. This can be indicate opportunistic feeding behavior of this species. It was observed that *E. myrus* preferred the common cuttlefish used as bait in its fisheries in this study. Although there are very few studies on the diet of *E. myrus*, this study also showed that it is a carnivorous species, as reported in Froese and Pauly (2025).

The abundance of *E. myrus* declines progressively toward the north. In the present study, a single specimen collected from the northern Aegean Sea measured 546 mm in total length and weighed 98.25 g. This is consistent with regional variability in total length, as previous studies document a broad range of total lengths. Whitehead et al. (1986) noted that the total length of *E. myrus* reaches up to 1000 mm. Among the most extensive sampling efforts in Türkiye, Çiçek et al. (2006) analyzed 310 specimens, reporting total lengths between 44 and 495 mm (mean: 194.8 ± 82.7 mm) and weight ranging from 0.23 to 182.7 g (mean: 16.46 ± 24.19 g). Similarly, Sangun et al. (2007) evaluated 114 individuals with total lengths ranging from 309 to 675 mm (mean: 524 ± 11.4 mm) and weight between 4.19 and 213.68 g (mean: 116.36 ± 57.46 g). Taylan and Aydın (2021) reported total lengths of 555-970 mm (mean: 706±128 mm) and weights of 180.84-420.83 g (mean: 276.50±70.50 g) from 8 individuals. Also, the total length was measured at 312–855 mm among 39 individuals (İlkyaz et al.,

2008), while the total length ranged from 397 to 726 mm among 57 individuals in the Aegean Sea (Bilge et al., 2014). Variations in size distributions among these studies may be attributed to differences in sampling locations, seasonal timing, fishing gear, and sample sizes. The morphometric measurements and meristic counts of the *E. myrus* in the present study closely align with those reported in specimens of the comparable total length from previous studies, as summarized in Table 1.

A mature *E. myrus* individual was sampled in May in the present study. The finding of a ripe female could suggest possible reproductive activity in the region. Taylan and Aydın (2021) obtained 8 specimens and reported that 7 of their ovaries were in the 4th stage and 1 of them was in the 2nd stage. They reported that the ovaries of seven individuals obtained from the southern Aegean Sea were mature in March-April. These populations with ovary development detectable in the south of the Aegean Sea may exhibit earlier maturation depending on water temperatures. Reproduction of *E. myrus* has been reported to occur at the end of summer along the Algerian coast of the Mediterranean Sea (Dieuzeide et al., 1954). Compared to the oocyte diameter findings of Taylan and Aydın (2021), who reported a range of 0.84 to 1.09 mm (mean: 0.95 ± 0.06 mm), the present study observed a slightly broader range (0.63–1.22 mm) with a lower mean diameter (0.90±0.015 mm), potentially reflecting regional or temporal variability in reproductive biology of this species.

Conclusion

Although based on a single individual, this study presents a valuable contribution due to the rarity of *Echelus myrus* in the northern Aegean Sea. Further studies with larger sample sizes are required to validate reproductive patterns and regional variations. It a present, a mature female specimen with comprehensive morphometric, meristic, biological characteristics, highlighting its ecological significance. These findings contribute to the limited knowledge of *E. myrus* and emphasize the species' sparse distribution and the expansion of its distribution in northern waters.

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Ethical approval

Ethics committee approval is not necessary for this study.

Informed consent

Not available.

Data availability statement

The authors declare that data can be provided by the corresponding author upon reasonable request.

Conflicts of interest

The authors declare that there are no conflicts of interest or competing interests.

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Contribution of authors
Yusuf ŞEN: Designing of the study, laboratory study, data analysis, writing original draft preparation.
Uğur ÖZEKİNCİ: Sample collections, checking-original draft preparation.
İsmail Burak DABAN: Supported the laboratory study for species identification.
All authors have read and agreed to the published version of the manuscript.

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