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OCCURRENCE OF LONGNOSED SKATE, *DIPTURUS OXYRINCHUS*, IN THE SEA OF MARMARA

Hakan KABASAKAL

Istanbul University, Institute of Science, Fisheries Technologies and Management Program, Istanbul, Türkiye
WWF Türkiye, Istanbul, Türkiye
e-mail:kabasakal.hakan@gmail.com

Uğur UZER & F. Saadet KARAKULAK

Istanbul University, Faculty of Aquatic Sciences, Department of Fisheries Technologies and Management, Istanbul, Türkiye

ABSTRACT

On 3 September 2024, a longnosed skate, *Dipturus oxyrinchus* (Linnaeus, 1758), was incidentally caught in a trammel-net fishery in the northern Sea of Marmara at a depth of 100 m. It was a male with a TL of ca. 100 cm and a TW of ca. 3000 g. Surveys conducted in the late 1990s to assess the status of demersal fishery resources in the Sea of Marmara indicated that *D. oxyrinchus* once had a considerable stock in the region, in stark contrast to its current rarity. Despite the confirmation of the current presence of *D. oxyrinchus* in the Sea of Marmara, it would be ecologically challenging for it to persist in a sea faced with overfishing and environmental degradation.

Key words: *Dipturus*, batoids, reoccurrence, shelf, rarity, Sea of Marmara

PRESENZA DI RAZZA MONACA, *DIPTURUS OXYRINCHUS*, NEL MARE DI MARMARA

SINTESI

Il 3 settembre 2024, una razza monaca, *Dipturus oxyrinchus* (Linnaeus, 1758), è stata accidentalmente catturata in un tramaglio nel nord del Mar di Marmara ad una profondità di 100 m. Si trattava di un maschio, con lunghezza totale di circa 100 cm e peso totale di circa 3000 g. Le indagini condotte alla fine degli anni '90 per valutare lo stato delle risorse della pesca demersale nel Mar di Marmara, hanno indicato che *D. oxyrinchus* aveva al tempo uno stock considerevole nella regione, in netto contrasto con la sua attuale rarità. Nonostante la conferma dell'attuale presenza di *D. oxyrinchus* nel Mar di Marmara, la sua persistenza in un mare sottoposto alla pesca eccessiva e al degrado ambientale sarebbe ecologicamente impegnativa.

Parole chiave: *Dipturus*, batoidi, ricorrenza, piattaforma, rarità, Mar di Marmara

INTRODUCTION

In the Mediterranean Sea, the family Rajidae includes 4 genera (*Dipturus*, *Leucoraja*, *Raja*, and *Rostoraja*) and 16 species, one of which is the longnosed skate, *Dipturus oxyrinchus* (Linnaeus, 1758) (Rajiformes: Rajidae) (Barone *et al.*, 2022). The distribution range of *D. oxyrinchus* extends across a wide area in the eastern Atlantic Ocean, from central Norway to Senegal, and into the Mediterranean Sea (Froese & Pauly, 2024). Inhabiting sandy and sandy-rocky bottoms of deeper slope waters, *D. oxyrinchus* is mainly found in the deeper parts of the continental shelf and upper slope waters at depths between 200 and 500 m (Froese & Pauly, 2024; Deval & Mutlu, 2024).

The presence of *D. oxyrinchus* in Turkish seas has been observed since the first quarter of the 20th century (Ninni, 1923) and its current occurrence in the region has been confirmed in several ichthyological (e.g., Mater & Meriç, 1996; Bilecenoğlu *et al.*, 2014) and chondrichthyan-specific (e.g., Kabasakal, 2002; Deval & Mutlu, 2024) studies. This skate species has long been considered rare in the Sea of Marmara (GSA 28), with only a few scientific reports from the late 20th century documenting its presence (Japan International Cooperation Agency – JICA, 1993; Uysal *et al.*, 1996). In fact, its inclusion in recent chondrichthyan inventories of the Sea of Marmara (Artüz & Friecke, 2024) relies not on original studies of *D. oxyrinchus* but rather on secondary references to its occurrence in the region. Furthermore, the absence of *D. oxyrinchus* in the species lists of recent surveys of demersal fishes (Torcu Koç *et al.*, 2012; Karakulak *et al.*, 2017; ÇŞİDB-TUBİTAK-MAM, 2021; Daban *et al.*, 2021) or chondrichthyans (Karadurmuş & Sari, 2024) in the Sea of Marmara suggests that the longnosed skate has likely been extirpated from the region. In this article, we report a recent incidental capture of *D. oxyrinchus* in the Sea of Marmara and discuss the factors that may influence the future presence of the species in the area.

MATERIAL AND METHODS

The specimen of the *D. oxyrinchus* presented was accidentally captured in a commercial fishery, using a trammel net with a knot-to-knot mesh opening of 120 mm when stretched. The fisherman photographed the individual, releasing it alive and emailing its images for taxon identification. While the species was identified based on the descriptions by Ebert and Stehmann (2013) and Barone *et al.* (2022), the taxonomic nomenclature follows Froese and Pauly (2024). Information on the total length (TL), weight (TW), depth of capture, and specifications regarding the fishing gear used was obtained from the fisherman. The angle of the snout preceding the

line that connects the anterior edges of the spiracles in the individual shown in Fig. 1, a key descriptive characteristic used to differentiate rajids (Ebert & Stehmann, 2013), was measured using a freeware digital protractor tool, “Angle Meter 360,” available for download from the Google Play Store. The ratio of preorbital length to interorbital distance is another key descriptive trait in *D. oxyrinchus* (Ebert & Stehmann, 2013). The interorbital distance and preorbital length were measured using the ruler function in Photoshop 7.0. Preorbital length is the distance from the tip of the snout to the front margin of an eyeball, while interorbital distance is the narrowest width between the inner margins of the eyes (Hubbs & Ishiyama, 1968). Photographs of the individual are kept in the personal archives of the first author.

RESULTS AND DISCUSSION

On 3 September 2024, a longnosed skate (Fig. 1) was accidentally caught in a trammel-net fishery off the coast of Silivri (40°57.494' N, 28°19.190' E) in the northern Sea of Marmara (Fig. 2) at a depth of 100 m. It was a male with a TL of ca. 100 cm and a TW of ca. 3000 g. Its claspers extended well beyond the posterior edge of the pelvic fin, thus, based on the MEDITS maturity scale for oviparous elasmobranchs, it was identified as a mature (adult) male (Follesa & Carbonara, 2019). The following is a description of the characters shown in Fig. 1: disc broadly rhombic, with outer corners acutely pointed and anterior margins deeply concave, falling well short of the imaginary line between the tip of the snout and the outer wing tip; snout extremely long and acutely pointed, forming a 52° angle; preorbital length 5.14 times the interorbital distance. No buckler thorns on dorsal surface, but alar patches present near the tips of pectoral fins. Due to the framing of the specimen's dorsal view, only the anterior part of the tail is visible in the photograph, showing 5 thorns along the central line. Upper surface of skate dusky brown, featuring widely spaced creamy whitish spots on disc; two eye spots – light-coloured central spots surrounded by dark brown halos – observed on wings closer to midline of body, and a few dark patches on posterior parts of pectoral fins. Ground colour of ventral surface bluish grey, with a prominent dark brownish area on head and wing tips; mucous and sensory pores visible on the central surface as black dots. Ventral side of disc without the thick coating of dark mucus (Fig. 1). This description is consistent with those provided by Ebert and Stehmann (2013) and Barone *et al.* (2022), identifying the individual as *Dipturus oxyrinchus* (Linnaeus, 1758). The preorbital length to interorbital distance ratio in the examined individual differed slightly from the 5.5 to 7.0 ratio reported by Ebert and Stehmann (2013), but



Fig. 1: A male longnosed skate, *D. oxyrinchus*, accidentally captured in the Sea of Marmara by a commercial trammel-netter and released alive. The arrows indicate the patches of alar thorns. Scale bar = 25 cm. Photo credit: Mr. Barış Köksalan.

Sl. 1: Samec koničaste raže, *D. oxyrinchus*, ki se je v Marmarskem morju slučajno ujel v komercialno trislojno mrežo in so ga ribiči živega izpustili. Puščice označujejo lise trnov na disku. Merilo = 25 cm. Avtor fotografije: g. Barış Köksalan.

this variation is admissible and may be attributed to either the angle of the image, which hindered precise measurements, or to allopatry.

According to Barone *et al.* (2022), the genus *Dipturus* is represented by three species: *D. cf. batis* (Linnaeus, 1758), *D. nidarosiensis* (Storm, 1881), and *D. oxyrinchus* (Linnaeus, 1758). In *D. cf. batis*, preorbital length is 2.5 to 4 (so less than 5.5) times the interorbital distance, in *D. oxyrinchus*, it is 5.5 to 7 (Ebert & Stehmann, 2013; Barone *et al.*, 2022). In *D. nidarosiensis*, the dorsal and ventral sides of the disc are uniformly dark and the abdomen covered with dark mucus (Barone *et al.*, 2022), the preorbital length is less than 5 times the interorbital length, and only a median row of 40 to 50 small thorns is featured along the tail up to first dorsal fin (Ebert & Stehmann, 2013). In the present specimen, the preorbital length was 5.14 times the interorbital distance (the possible reasons for this explained above), the dorsal and ventral sides of the body were not uniformly dark, the abdomen was not covered by a dark mucus

layer, and only 5 thorns were observed along the central line. The descriptive characteristics of *D. cf. batis* and *D. nidarosiensis* differ from those of the present specimen, confirming the latter was a *D. oxyrinchus*.

A critical reading of the literature on the presence of longnosed skate in the Sea of Marmara revealed uncertainty regarding the date of the first *D. oxyrinchus* record from this region. According to the evidence-based criteria for confirmed ichthyological records proposed by Kovačić *et al.* (2020), the records of *D. oxyrinchus* in JICA (1993) and Uysal *et al.* (1996) are classified as “criteria 1”, indicating collected and preserved specimens with verified records. On the other hand, data on the occurrence of *D. oxyrinchus* in the Sea of Marmara, provided in several ichthyological reviews published in this century (e.g., Kabasakal, 2002; Eryılmaz & Meriç, 2005; Bilecenoğlu *et al.*, 2014; Artüz & Fricke, 2024), are based solely on earlier reports from the 1990s. Even the source cited by Artüz and Fricke (2024) for the date of the first record of *D. oxyrinchus* in the Sea of Marmara,

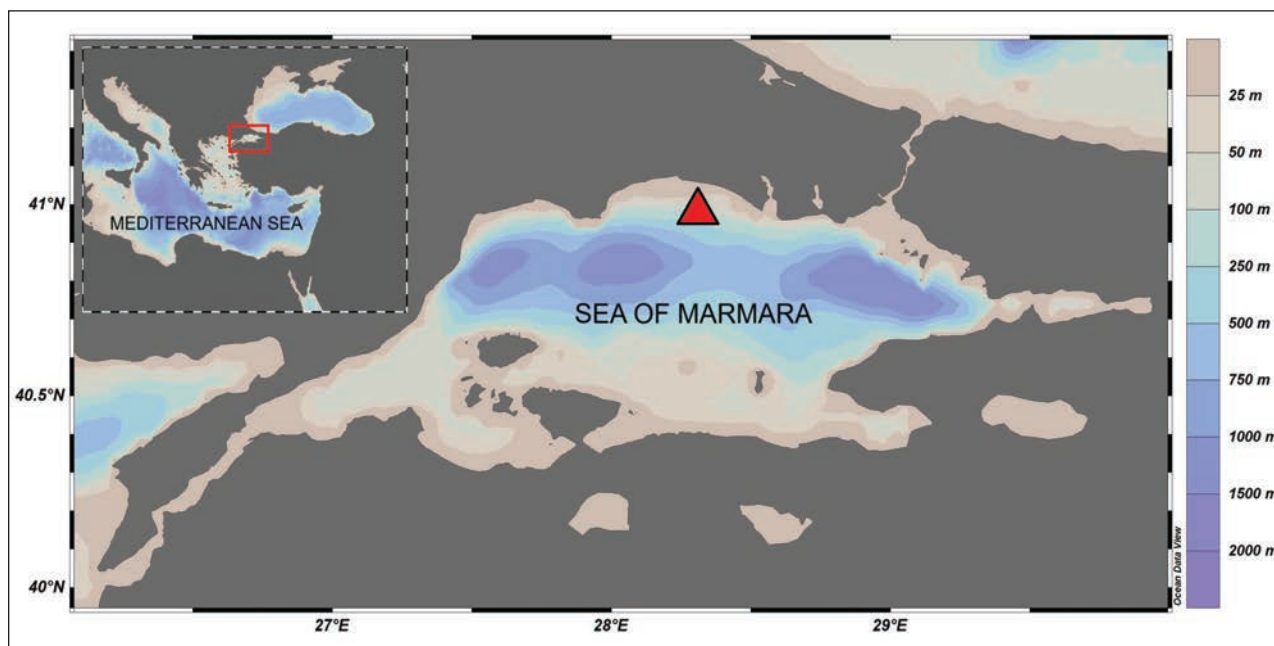


Fig. 2: Map showing the approximate locality (red triangle) of the capture of the longnose skate. The red rectangle in the small map indicates the geographical position of the Sea of Marmara in the Mediterranean ecosystem.

Sl. 2: Zemljevid s približno lokacijo (rdeči trikotnik) ulova koničaste raže. Rdeči pravokotnik na manjšem zemljevidu označuje geografsko lego Marmarskega morja v sredozemskem ekosistemu.

Ninni (1923), is debatable. In his ichthyological inventory study, Ninni (1923) stated, “I saw this species once in the market of Istanbul,” adding that “several specimens were also caught by the Royal Thalassographic Ship Tremiti in the Dardanelles, specifically in the vicinity of Cianac.” (Ninni, 1923; p. 20) Therefore, although Emilio Ninni did see a specimen of *D. oxyrinchus* (referring to it as *Raja oxyrhynchus*; in Ninni, 1923; p. 20) in the market of Istanbul, as inferred from his annotation, he examined the species based on specimens brought into the city from other areas, such as the nearby Strait of the Dardanelles, not from the Sea of Marmara. Also, the species is not included in one of the earliest and detailed ichthyological inventories of the Sea of Marmara (Rhasis Erazi, 1942). Therefore, it would be more appropriate to consider JICA (1993) and Uysal *et al.* (1996) as the first references for records of *D. oxyrinchus* in the Sea of Marmara, rather than Ninni (1923).

In MEDITS surveys evaluating the spatial distribution of demersal cartilaginous fishes in the northern Mediterranean, the frequency of occurrence of *D. oxyrinchus* in the eastern Mediterranean at depths of 200–800 m was reported to be 50% (Follesa *et al.*, 2019). Conversely, the frequency of occurrence of *D. oxyrinchus* as bycatch in recent bottom trawl surveys conducted in Turkish seas is below 25% (Keskin & Karakulak, 2006; Yağlıoğlu *et al.*, 2015), classifying the species as rare. In a recent study conducted in the Aegean Sea, Filiz *et al.* (2018)

reported that *D. oxyrinchus* was rarely encountered in waters deeper than 100 m in the central Aegean. Also, according to Damalas and Vassilopoulou (2011), there has been a significant decrease in the catch rate of *D. oxyrinchus* in bottom trawl fishery in the central Aegean Sea in recent years (from 1.11 kg/h in 1995 to 0.41 kg/h in 2006). Contrary to these findings, a previous study showed that *D. oxyrinchus* had a considerable stock in the Sea of Marmara in the past (JICA, 1993). Its abundance ranged from 47.9 kg/km² (in autumn) to 67.4 kg/km² (in winter) at depths of 101–200 m, and from 9.1 kg/km² (in spring) to 37.6 kg/km² (in winter) at depths of 201–500 m (JICA, 1993). This is consistent with Deval and Mutlu (2024), who stated that *D. oxyrinchus* is a chondrichthyan species mainly found in upper slope waters at depths ≤ 500 m.

In the Sea of Marmara, batoids have faced significant mortality in recent years as a result of environmental degradation, especially severe hypoxia (Karadurmuş & Sarı, 2022; Mantıkçı *et al.*, 2022). As a result, cartilaginous fishes inhabiting the bathyal zone and the deep continental shelf have become more common in the upper areas of the continental shelf (Kabasakal *et al.*, 2023, 2024). The main threat to *D. oxyrinchus* in Turkish seas is fishing, particularly as bycatch in bottom trawls (Yağlıoğlu *et al.*, 2015; Filiz *et al.*, 2018). However, like other cartilaginous fish that are forced into shallow continental shelf waters due to deoxygenation in deeper

areas, *D. oxyrinchus* may also become a target of year-round small-scale fishing in this region.

In conclusion, the absence of *D. oxyrinchus* in recent trawl surveys of deeper areas in the Sea of Marmara (Torcu Koç *et al.*, 2012; Karakulak *et al.*, 2017; ÇŞİDB-TUBİTAK-MAM, 2021; Daban *et al.*, 2021; Karadurmuş & Sarı, 2024), along with the capture of this individual by small-scale fishermen at a depth where the species has not previously been encountered (JICA, 1993), supports this assumption. According to Ellis *et al.* (2016), the population of *D. oxyrinchus* in the Mediterranean Sea has declined by

around 30% over three generations (30 years). While the current record confirms the species' presence in the Sea of Marmara, it would be ecologically challenging for it to persist in a sea faced with overfishing and environmental degradation.

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We thank the fisherman Mr. Barış Köksalan for informing us about the capture of the present longnosed skate and for sending the photographs of the individual seen in Fig. 1.

POJAVLJANJE KONIČASTE RAŽE, *DIPTURUS OXYRINCHUS*, V MARMARSKEM MORJU

Hakan KABASAKAL

Istanbul University, Institute of Science, Fisheries Technologies and Management Program, Istanbul, Türkiye
WWF Türkiye, Istanbul, Türkiye
e-mail:kabasakal.hakan@gmail.com

Uğur UZER & F. Saadet KARAKULAK

Istanbul University, Faculty of Aquatic Sciences, Department of Fisheries Technologies and Management, Istanbul, Türkiye

POVZETEK

Tretjega septembra 2024 so v trislojno mrežo naključno ujeli primerek koničaste raže, *Dipturus oxyrinchus* (Linnaeus, 1758) v severnem delu Marmarskega morja na globini 100 m. Bil je samec, ki je meril približno 100 cm v dolžino in tehtal približno 3000 g. Raziskave, opravljene v poznih devetdesetih letih prejšnjega stoletja za oceno statusa pridnenih ribolovnih virov v Marmarskem morju, so pokazale, da je imela koničasta raža (*D. oxyrinchus*) nekoč velik stalež v regiji, kar je v popolnem nasprotju s trenutno redkostjo. Kljub potrditvi trenutne prisotnosti *D. oxyrinchus* v Marmarskem morju bi bilo ekološko zahtevno, da bi koničasta raža še naprej vztrajala v morju, ki se sooča s prekomernim ribolovom in degradacijo okolja.

Ključne besede: *Dipturus*, skati, ponovni pojav, šelf, redkost, Marmarsko morje

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