

First occurrence of rudderfish *Centrolophus niger* (Gmelin, 1789) in the Edremit Bay (Northern Aegean Sea, Türkiye) with the maximum length record for Turkish Seas

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ABSTRACT

Climate change is one of the crucial factors affecting the geographical distribution of fish species. However, the maximum size is an indication of whether there is overfishing pressure on a fish species or the current ecological conditions in which it is located. A single specimen of recently died (rigor mortis has not yet formed) *Centrolophus niger* was incidentally found inshore on January 27, 2023, off the Burhaniye coast (Edremit Bay, Northern Aegean Sea, Türkiye). The present study indicates both the first observation of *C. niger* for Edremit Bay and its maximum length for Turkish seas.

Keywords: *Centrolophus niger*, Maximum size, Occurrence, Edremit Bay, Türkiye.

1. INTRODUCTION

The measurements such as maximum size, weight, and age are important parameters used in life-history studies and fishery science (Dulčić and Soldo, 2005) and these data are applied directly or indirectly in most stock assessment models (Legendre and Albaret, 1991; Borges, 2001). Especially, size-based analyses of marine animals are becoming increasingly popular methods for improving the understanding of community structure and function (Jennings and Dulvy, 2005) and could be used as a tool for rapid evaluation of growth rates in the absence of primary data (Froese and Binohlan, 2000; Filiz and Sevingel, 2015).

The Centrolophidae, containing blackfishes, barrelfishes, and ruffs, is a family of the order Scombriformes and is represented by 8 genera with 30 valid species in the world (Fricke et al., 2023). In the Mediterranean, there are four species belonging to the family, namely *Centrolophus niger* (Gmelin, 1789), *Hyperoglyphe perciformis* (Mitchill, 1818), *Schedophilus medusophagus* (Coco, 1839), and *Schedophilus ovalis* (Cuvier, 1883) (Quignard and Tomasini, 2000), two of which, *Centrolophus niger* and *Schedophilus ovalis*, are distributed in the Mediterranean and Aegean coasts of Türkiye (Froese and Pauly, 2022). According to Golani et al. (2006) and Ergüden et al. (2012), *Centrolophus niger* and *Schedophilus ovalis* are rare in the Levantine basin.

The rudderfish (*Centrolophus niger* Gmelin, 1789) is a pelagic, mesopelagic, and epibenthic deep-water fish and generally inhabits over the continental shelf at depths of 40-1050 m. This species is distributed in the North Atlantic from Nova Scotia and the Grand Banks to Massachusetts and in the Northeast Atlantic and Mediterranean Sea, while in the Southeast Atlantic and Indian Ocean, along the coasts of South Africa and Australia, and New Zealand (Froese and Pauly, 2022). It feeds predominately on large pelagic crustaceans, small fishes, squid, and plankton (Cengiz et al., 2019a; Froese and Pauly, 2022). Previously, the rudderfish has been reported from İzmir Bay (central Aegean Sea) (Akyol, 2008; Ceyhan and Akyol, 2011), İskenderun Bay (northeastern Mediterranean) (Ergüden et al., 2012), Gökçeada (northern Aegean Sea) (Gönülal, 2017), Mersin Bay (northeastern Mediterranean) (Ayas et al., 2018), and Saros Bay (northern Aegean Sea) (Cengiz et al., 2019a). This study provides both the first observation of *C. niger* for Edremit Bay (Northern Aegean Sea, Türkiye) and its maximum length record for Turkish seas.

2. METHODOLOGY

The Mediterranean Basin has an oligotrophic feature, whereas the eastern Mediterranean exists its highest oligotrophic part (Psarra et al., 2000). There is a trend parallel to the decreasing primary production values along the North-South line of the Aegean Sea (Antoine et al., 1995; Gönülal and Dalyan, 2017). The northern part is qualified by an extended continental shelf, smooth muddy/sandy grounds, and top nutrient concentrations (Maravelias and Papaconstantinou, 2006) and when compared with the southern part, these areas are higher for zooplankton and phytoplankton abundance (Theocharis et al., 1999).

The northern Aegean coasts of Türkiye are divided into sub-regions as the Saros Bay, the Gallipoli Peninsula, the Gökçeada and Bozcaada Islands, and the Edremit Bay (Cengiz, 2021a; Cengiz, 2022a; Cengiz, 2022b). Edremit Bay is a place where two currents meet and it is rich in plankton because of upwelling. In addition, because the bottoms are suitable for trawl fishing and the area is fed by waters rich in nutrients from erosion through the vicinity of the bay and the Black Sea, there is a rich bottom fish fauna (Torcu and Aka, 2000). However, the bay had been closed to bottom trawl fishing since 1995 (Uçkun, 2005).

On January 27, 2023, a single *C. niger* specimen was found dead off the Burhaniye coast (Edremit Bay) (Fig 1). Morphometric measurements were taken with a caliper to the nearest 0.1 mm. The weight was measured with a 0.01g precision balance. The specimen was identified based on Mater et al. (2009), photographed and some meristic characters were measured.

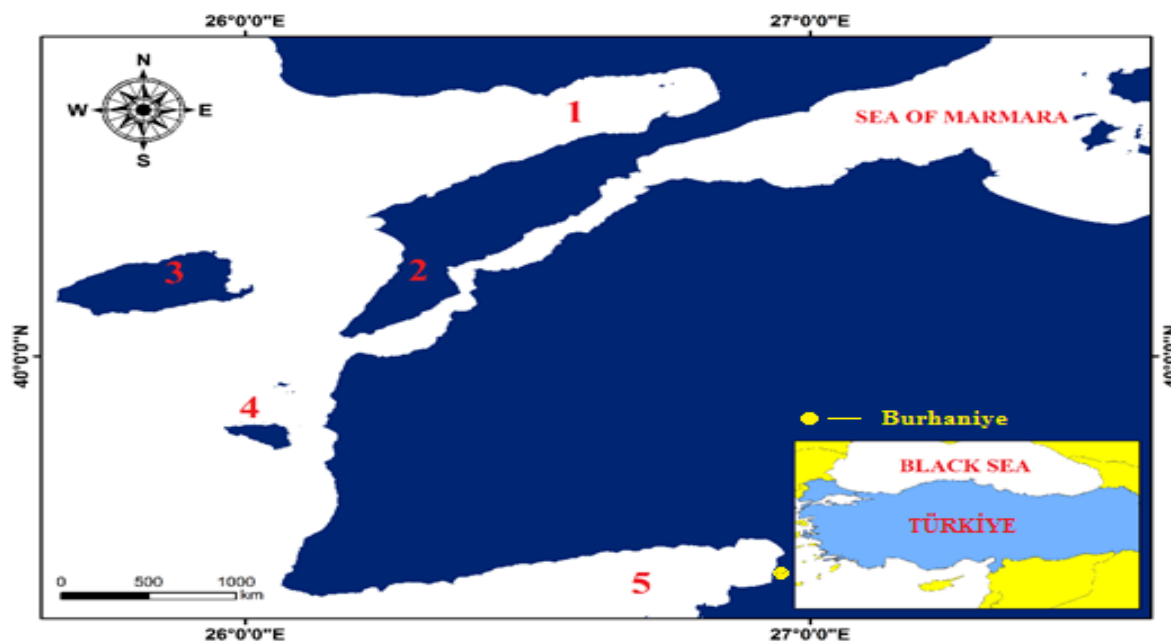


Figure 1. Northern Aegean coasts of Türkiye (1: Saros Bay; 2: Gallipoli Peninsula; 3: Gökçeada Isl.; 4: Bozcaada Isl.; 5: Edremit Bay).

3. RESULTS

A single *C. niger* specimen has a total length of 65.1 cm (Fig 2). Diagnostic characters were dorsal fin rays IV+33, anal fin rays III+21, pectoral fin rays 21, and pelvic fin rays 6. Body elongate, color bluish/purplish, pectoral and pelvic fins darker than body color. Large mouth with no teeth on the palate, snout longer than eye diameter. All these characters closely correspond to those listed by Muus and Nielsen (1999), Ceyhan and Akyol (2011), Ayas et al. (2018), and Cengiz et al. (2019a).



Figure 2. *Centrolophus niger* from Burhaniye coast, Edremit Bay.

4. DISCUSSION

This study presents both the first occurrence of *C. niger* for Edremit Bay and the maximum length for this species in Turkish seas. Although several studies have been conducted on fish communities in Edremit Bay (Çakır et al., 2008; Torcu and Aka, 2000; Ünlüoğlu et al., 2008), *C. niger* has never been observed in this region. As highlighted by Cengiz et al. (2019b), climate change controls the rate of change in the geographical distribution of marine species (Papaconstantinou, 2014) and these changes may affect the biodiversity of the Turkish marine fauna and lead to rare records in Northern Aegean Sea (Cengiz, 2014a; Cengiz and Tunçer, 2015).

Until the present study, the maximum length of the *C. niger* was reported as 61.0 cm by Gönülal (2017), but with this study, the maximum length of this species in Turkish seas is now 65.1 cm. Since maximum length is a key component in many fisheries models such as the von Bertalanffy and Gompertz growth models (Quinn and Deriso, 1999), information on the maximum length of fish species in Turkey is constantly updated [(*Alectis alexandrina*, (Akyol and Çoker, 2019); *Argyrosomus regius* (Tokaç et al., 2017); *Balistes capriscus* (Cerim et al., 2021; Kale and Tan, 2022); *Belone belone* (Acarli et al., 2018); *Boops boops* (Ceyhan et al., 2018; Cengiz, 2021b); *Chelidonichthys lucerna* (Akyol, 2013; Hasimoğlu et al., 2016; Özdemir et al., 2019); *Dentex dentex* (Akyol, 2020); *Diplodus annularis* (Cengiz et al., 2019c); *Diplodus puntazzo* (Aydın, 2019; Cengiz, 2019a); *Diplodus sargus* (Paruğ and Cengiz, 2020a); *Diplodus vulgaris* (Cengiz et al., 2019d); *Gonostoma denudatum* (Ayas et al., 2020); *Fistularia commersonii* (Koç et al., 2019); *Lithognathus mormyrus* (Aydın, 2018a; Cengiz, 2019b); *Mullus barbatus* (Filiz, 2011); *Mullus surmuletus* (Cengiz, 2019c); *Oblada melanura* (Akyol et al., 2014; Cengiz, 2020a); *Pagellus bogaraveo* (Paruğ and Cengiz, 2020b); *Phycis phycis* (Filiz and Sevingel, 2014); *Pomatomus saltatrix* (Cengiz, 2014b; Bal et al., 2018); *Pterois miles* (Soykan and Ulaş, 2022); *Sardina pilchardus* (Cengiz and Sepil, 2018); *Sarpa salpa* (Cengiz, 2020b); *Sciaena umbra* (Cengiz et al., 2019e); *Scomber japonicus* (Cengiz, 2020c); *Scomber scombrus* (Cengiz, 2020d); *Siganus rivulatus* (Soykan et al., 2021); *Solea solea* (Cengiz, 2018a; Aydın and Karadurmuş, 2021); *Sparisoma cretense* (Filiz and Sevingel, 2015); *Sparus aurata* (Aydın, 2018b; Cengiz, 2018b); *Spicara flexuosa* (Karadurmuş et al., 2021); *Spicara maena* (Cengiz, 2020e); *Spondyliosoma cantharus* (Cengiz, 2021c); *Stephanolepis diaspros* (Akyol et al., 2018; Metin and Akyol, 2021); *Symphodus melops* (Aydın, 2020); *Trachurus mediterraneus* (Cengiz, 2021d), *Trachurus trachurus* (Cengiz, 2022c); *Umbrina cirrosa* (Aydın and Sözer, 2020; Aydın, 2021; Cengiz and Paruğ, 2021)].

Size structure and maximum length of individuals within fish populations are influenced by several abiotic, biotic, and anthropogenic factors (VanderBloemen et al., 2020). If a fish population within any ecosystem is exposed to overfishing, fish sizes will gradually be smaller over time. Therefore, individuals who are not subjected to overfishing could reach such a length (Filiz, 2011). In addition, nutrient availability, feeding, light regime, oxygen, salinity, temperature, pollutants, current speed, nutrient concentration, predator density, and genetic relationships of inter and intra-populations can also be listed as factors affecting growth (Helfman et al., 2009).

5. CONCLUSION

Although the occurrence of *C. niger* does not fully indicate that it had an established population, our findings and previous studies (Gönülal, 2017; Cengiz et al., 2019a) on the Northern Aegean coasts of Türkiye suggest that this species has expanded its range and may re-occur in the North Aegean Sea. In this context, monitoring studies could be carried out to identify this rare fish's constant occurrence and probable spawning sites in the future. Consequently, this study will be a reference for ongoing fishery and biodiversity studies.

6. ACKNOWLEDGEMENTS

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7. CONFLICT OF INTERESTS

No conflict of interests.

8. REFERENCE

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