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RECORDS OF THE CRITICALLY ENDANGERED CUCKOO RAY *LEUCORAJA NAEVUS* (RAJIDAE) FROM THE ALGERIAN COAST (SOUTHERN MEDITERRANEAN SEA)

SUMMARY

Cuckoo ray *Leucoraja naevus* (Müller and Henle, 1841) is caught in relative abundance in the eastern Atlantic from the North Sea to Mauritania and probably entered the Mediterranean Sea where viable populations were observed. The captures of *L. naevus* decreased in the latter sea, and completely disappeared in some regions. This paper presents some specimens captured from the Algerian coast. They are considered rare specimens sporadically caught, such pattern being corroborated by information provided by local fishermen.

INTRODUCTION

Cuckoo ray *Leucoraja naevus* (Müller and Henle, 1841) occurs in the eastern Atlantic from the North Sea, the Faroe Islands and also including Skagerrat and Kattegat (ELLIS *et al.*, 2004). The species was abundantly caught the Bay of Biscay (DU BUIT, 1972, 1974), and the population remains relatively stable (EBERT and STEHMANN, 2013). The cuckoo ray is one of the most frequently landed species at the Portuguese ports (MACHADO *et al.*, 2004) with about 5% (around 66 tons) of the total elasmobranch landings in 2009 (MIA, 2010). Despite their increasing landings and significant income for fisherman in recent years, *L. naevus* as other skate species skates trend to receive less attention than some exploited bony fishes, probably because of their low economic value.

South the Strait of Gibraltar, *Leucoraja naevus* occurred off the Moroccan coast (COLLIGNON and ALONCLE, 1972; LLORIS and RUCABADO, 1998), the coast

of Mauritania and the waters surrounding the Canary Islands (MAURIN and BONNET, 1970). However, the species is unknown southward from the coast of Senegal (DIATTA, pers. comm., 2023).

Leucoraja naevus probably was caught in the Mediterranean Sea where BOUGIS (1959) cited its presence from the French coast, however since QUIGNARD (1965) no specimen was caught to date corroborating CAPAPÉ *et al.* (2006). Similar patterns occurred from the Italian Seas where the species was previously reported (TORTONESE, 1956; BINI, 1967). Additionally, *L. naevus* is absent from the marine waters surrounding Malta Islands (BORG *et al.*, 2023). Eastward, the species is not reported in the Adriatic Sea (SOLDO and LIPEJ, 2022), considered as rare in the Greek Seas (GIOVOS *et al.*, 2022), known from the coast of Türkiye, the Sea of Marmara, not in the Black Sea, but reached the Levantine Sea (BILECENOGLU *et al.*, 2014). Conversely, the species was not recorded off Israel (GOLANI, 2005), Syria (ALI, 2018) and Lebanon (BARICHE and FRICKE, 2020), and additionally, it is not also reported from the Mediterranean coast of Egypt (EL SAÏED *et al.*, 2017).

Three specimens of *Leucoraja naevus* were captured for the first time from the northern Tunisian coast, off Tabarka (CAPAPÉ, 1975). Since, no specimen was reported in this latter area (RAFRAFI-NOUIRA *et al.*, 2016, pers. com., 2023), where at present, the occurrence of a viable population remains questionable.

Following SILVA *et al.* (2012), rajid species (skates) remain an important component of fish assemblages from several marine areas. It is also the case for the Algerian coast where investigations continuously conducted since DIEUZEIDE *et al.* (1953) to date (see HEMIDA, 2005; REFES *et al.*, 2010) allow to conclude to the occurrence of about 15 skate species.

Recent observations indicated that some species are always regularly captured from the Algerian marine waters following information provided by local fishermen, conversely, other species appear to be very rare and sporadically or not found at the stalls of fishmarkets. The present paper aims to report unusual records of a species considered as rare and endangered in the area cuckoo ray *Leucoraja naevus* (Müller and Henle, 1841).

MATERIAL AND METHODS

The present specimens of *Leucoraja naevus* were observed at the main fish markets of Algiers, in which are landed specimens from areas located throughout the entire Algerian coast, from the Moroccan border to the Tunisian border. On 16 October 2016, three specimens were captured by trawler at a depth of 330 m, on sandy-muddy bottoms, off Bouzedjar, in the western region, by 35°42'35" N and 1°22'17" W (Fig. 1). They were caught together with angler fish *Lophius piscatorius* Linnaeus, 1758 and slender rockfish

Scorpaena elongata Cadenat, 1943 (Fig. 2). The specimens were carefully examined, identified using field guides and ichthyological fauna. They were photographed and when possible measured. It was generally difficult to get morphometric measurements because the specimens were rapidly sold mainly in large quantities for local consumption.

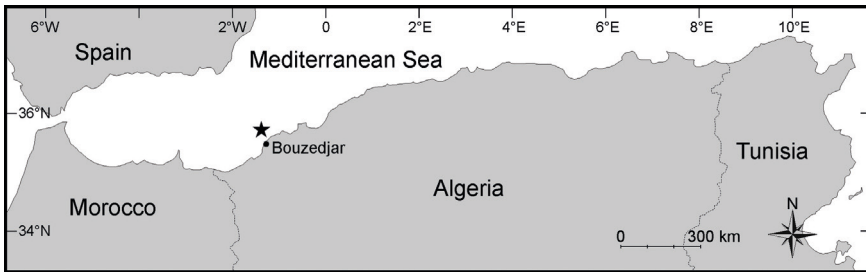


Fig. 1 - Map of the Algerian coast indicating the capture site of cuckoo ray, *Leucoraja naevus*, off Bouzedjar (black star).



Fig. 2 - Specimen of *Leucoraja naevus*, caught off Bouzedjar from the western Algerian coast.

RESULTS AND DISCUSSION

Leucoraja naevus was previously reported off the Algerian coast, and mature females were recorded in spring following DIEUZEIDE *et al.* (1953). However, a constant decrease of captures was observed from the landing sites of the area, following information reported by local fishermen. The specimens were identified as *L. naevus* via the combination of the following morphological characters: disc subcircular with broadly rounded outer corners; snout short with tip a little pronounced; tail strong with two parallel rows of thorns of each side and two small dorsal fins; upper surface entirely spinulose, with dermal denticles around each orbital edge and a large triangle of many thorns over shoulder region; the colour of dorsal surface greyish-brown with on each inner pectoral centre a large circular black eye-spot; belly beige. These features are in total accordance with previous descriptions of the species (CLARK, 1926; TORTONESE, 1956; BINI, 1967; STEHMANN and BÜRCEL, 1984; SERENA, 2005; EBERT and STEHMANN, 2013; LAST *et al.*, 2016).

The present *Leucoraja naevus* were large female specimens having in size more than 320 mm disc width (DW) and 600 mm total length (TL). They probably were mature specimens, DU BUIT (1974) noted that size at sexual maturity occurred at 590-600 mm TL for both males and females from the north-eastern Atlantic. MAIA (2010) reported that maturity occurred between 473 and 718 mm TL, and 505 and 682 mm TL for females and males, respectively, from the southern Portuguese coast. EBERT and STEHMANN (2013) globally noted that size at maturity occurred about 550 mm TL, while maximum length is 750 mm TL for females and 680 mm TL for males.

EBERT and STEHMANN (2013) consider the conservation status of *Leucoraja naevus* as globally Least Concern but Near Threatened in the Mediterranean Sea. A review of the distribution of the species showed that *L. naevus* is critically endangered and disappeared from areas where it was previously known (ALDEBERT, 1997; CAPAPÉ *et al.*, 2006), and viable populations are no longer reported. Such phenomenon could be due to the particular morphology (flattened shape) and *K*-selected reproductive characteristics of skate species that appear to be vulnerable and threatened by over-exploitation (SILVA *et al.*, 2012). These patterns concern precisely the case of *L. naevus* which is not a species endemic to the Mediterranean Sea. The specimens found in this sea probably originated from adjacent waters, such as the eastern Atlantic where it is captured in relative abundance (MAIA, 2010). It could explain the rarity or total absence of *L. naevus* in regions remote from the Strait of Gibraltar, probably due to low recruitment that therefore enhances difficulties in establishing viable populations. These difficulties are increased by the global warming of the Mediterranean Sea (see FRANCOUR *et al.*, 1994). *L. naevus* inhabits waters of the northeastern Atlantic displaying lower tem-

peratures than those recorded in the Mediterranean Sea. It clearly appears that only fish species incoming from the Red Sea (Lessepsian migrant *sensu* POR , 1971) or for the eastern tropical Atlantic (Herculean migrant *sensu* QUIGNARD and TOMASINI , 2000) are able to live, develop and reproduce at present in the Mediterranean Sea (GOLANI *et al.*, 2021).

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