

A record of the invasive Blue Crab Rathbun, 1896 (Arthropoda: Crustacea) in Black Sea waters near Cape Shabla, Bulgaria

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Abstract. The Black Sea is a closed brackish-water intercontinental sea, part of the Mediterranean basin, with which it is connected through the Bosphorus Strait, the Sea of Marmara, and the Dardanelles Strait. Due to this connection, many organisms from the Mediterranean Sea migrated to the Black Sea. One of these migratory organisms is the invasive blue crab. In the present study, we report the occurrence of one male *Callinectes sapidus* Rathbun, 1896 (carapace length: 70.09 cm, width: 15.69 cm, weight: 166.9 g) caught during commercial fishing on 26 April 2024 Black Sea waters near Cape Shabla, Bulgaria. Additional monitoring activities should be undertaken in the Black Sea to clarify the possibility of reproduction and determine the reproductive season of blue crab.

Key words: Black sea, Blue crab, invasive species.

Introduction

The Black Sea is a closed brackish-water intercontinental sea, part of the Mediterranean basin, with which it is connected through the Bosphorus Strait, the Sea of Marmara, and the Dardanelles Strait. Due to this connection, many organisms from the Mediterranean Sea migrated to the Black Sea (Öztürk 2021). Recently, with climate changes and increased marine water temperature the intensity of invasion has risen significantly. The last studies indicated the presence of 156 alien species in the Black Sea (Varshanidze et al. 2022). One of these migratory organisms is the invasive blue crab. The first recorded blue crab in the Black Sea was in 1967 in the western part of the Varna Bay in Bulgaria (Bulgurkov, 1968). Subsequently, the blue crab has been reported in different locations in the Bulgarian seacoast of the Black Sea: Burgas Bay (2006), Galata Cape (2007), Balchik (2007), Ahtopol (2008), Tsarevo (2009), Sveti Vlas (2012), Sunny Beach Resort (2015), Sozopol (2016), Kiten (2017) (Stefanov 2021). The present study aimed to update the locations of blue crab in the Bulgarian water of the Black Sea.

Material and Methods

The specimen was collected from commercial fishing (coordinate: 36° 47' 21.72" N; 31° 4' 34.74" E; 36° 46' 40.74" N; 31° 10' 14.04") on 26th April 2024 at the bottom of the trawl as bycatch and was brought to the laboratory of the Department of Fisheries, Trakia University for identification. The blue crab identification was based initially on morphometric and meristic measurements, colouration and gonopods in males according to

Williams (1974). The crabs' carapace length (70.09 cm), carapace width (15.69 cm) and fresh weight (166.9 g) were measured and the specimen was photographed.

Results and Discussion

Nowadays the appearance of the blue crab is reported in many localities in the Black Sea (Öztürk *et al.* 2020, Stefanov 2021) including the Danube River Delta (Năstase *et al.*, 2023). In previous studies, scientists from different countries in the Black Sea also described the morphological similarities and size, as in the caught specimen (Aydın *et al.*, 2024). The crab had an oval and flattened carapace, twice as wide as long and very firm (Figure 1). The carapace was bluish-green and had two broad, triangular, frontal teeth in the centre, with a smaller, two-pointed tooth on each side. For the difference of dorsal carapace, the ventral part of the body was white-coloured (Williams 1984). The claws had a granular surface and were bright blue below, with red spines. The fifth pair of legs were flattened and expanded, suggesting they are useful in the swimming process. The sex of the specimens was determined based on the specific shape of the abdomen apron. It was shaped as an inverted capital letter T, with a broad base, which narrowed into the tip (Williams 1984). Based on size (>11 mm CW) specimen was designated as an adult, while according to the morphological parameters the crab was identified as *Callinectes sapidus*.

After the process of conservation and preservation through the modern method of plastination of hydrobiont bodies with new generation heteropolymer (Tsandev *et al.*, 2024) the specimen was deposited at the Trakia University, Stara Zagora, where stored and exhibited at the collection of natural specimens.



Fig. 1. The mature Blue crab (*Callinectes sapidus*) specimen (dorsal view) registered during present study.

Conclusion

In conclusion, this study suggests that *Callinectes sapidus* due to its easy acclimatization process and rapid growth, additional monitoring activities should be undertaken in the Black Sea to clarify the possibility of reproduction and determine the reproductive season.

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