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Occurrence of the Sponge Crab *Dromia personata* (Linnaeus, 1758) from the Mersin Bay, Northeastern Mediterranean

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Research Article

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Abstract

This study recorded a single female specimen of the sponge crab *Dromia personata* (Linnaeus, 1758) found in the shallow coastal waters of the Erdemli coast (Akkum) of Mersin Bay in July 2024. The present record confirms its presence in the northeastern Mediterranean (Türkiye). It is recommended that further research be conducted to determine the ecological significance of *D. personata* and to consider possible strategies for studying this species in this region.

Keywords: *Sponge crab, Dromia personata, Erdemli coast, Mersin Bay, Türkiye.*

Introduction

The sponge crab *Dromia personata* (Linnaeus, 1758), belonging to the family Dromiidae, is known to inhabit a wide range of marine habitats. The species is distributed from the Mediterranean Sea to

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the eastern Atlantic Ocean from the western Sahara, Ascension, Azores, and Canary Islands north to Anglesey (Wales), the Clyde Sea (Scotland), and the English Channel (van Moorsel et al., 2017). The sponge crab lives in shallow marine waters, usually on stony, sandy and gravelly seabeds, seagrass beds, rocky shores, caves and vertical rocky slopes where large sponge populations are found (Noël, 1992; Falciai and Minervini, 1996; Ng et al., 2008).

D. personata is also known for living in association with sponges and ascidians; this symbiotic relationship forms a protective cap that provides the crab with physical protection and camouflage from predators, increasing its defenses. When *D. personata* first sponges after moulting or when it acquires a new sponge, the fourth and fifth pairs of pereiopods tear off the sponge from its edges, and it acquires a spherical size and shape. The same legs support the sponge on the crab's back. As the sponge grows, it adapts to mimic the shape of the cephalothorax. It also exhibits protective behavior for its sponge (Dembowska, 1926). The ability of the sponge crab to adapt to different substrates is essential for its survival (van Moorsel et al., 2017; Harada et al., 2020). *D. personata* is commonly distributed on rocky or stony substrates in coastal waters, from the sub-shore to depths of 75–100 m (Clark, 1986; Ingle, 1996, 1997; Moyse, 2003).

The sponge crab have been reported in many countries in the Mediterranean, including Spain, France, Italy, Greece, Tunisia, Libya, Syria and Türkiye (Türkay, 2015). In addition, this species is found in the shallow Croatian waters, where sponges are abundant (Ammar and Hmaesha, 2022). According to Bianchi et al. (2022), its presence is often associated with environments rich in sponges, providing shelter and protection from predators.

D. personata plays a crucial role in the ecosystems of the Mediterranean and northeastern Atlantic, depending on sponges and ascidians for protection. The species' presence is well recorded in sponge-rich coastline areas, with recent findings proving its spread to the southeastern coast of Türkiye. Nonetheless, there is no specific data regarding the distribution of the sponge crab in Mersin Bay. Therefore, this study presents the first occurrence of *D. personata* on the Erdemli coast of Mersin Bay, northeastern Mediterranean.

Material and Methods

In July 2024, a female *D. personata* specimen was found during a SCUBA survey from a rocky habitat covered with *Ganonema farinosum* algae at a depth of 3 m in Mersin Bay (Figure 1). The species identification was carried out based on morphological characteristics suggested by McLay (1993). The carapace length and width of the sponge crab were quantified using a digital caliper (to the nearest mm). The specimen was registered at the Marine Life Museum of Mersin University with catalog number MEUDC-24 13-016 and preserved in ethanol.

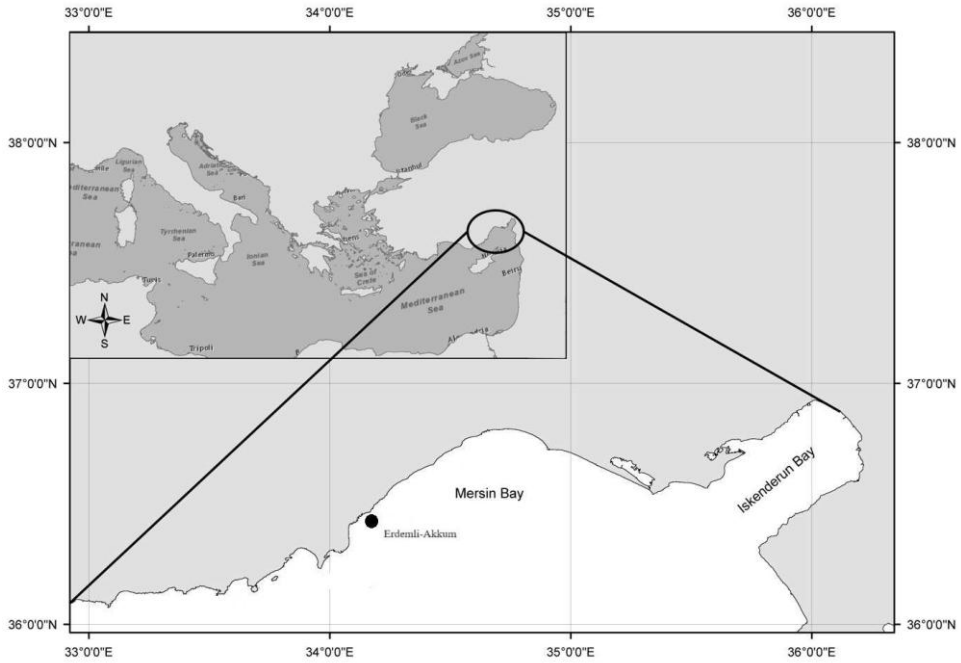

Figure 1. The location where the specimen of *Dromia personata* was collected in Mersin Bay, northeastern Mediterranean.

Results

A female sponge crab, *Dromia personata*, with a carapace length of 31.58 mm and a carapace width of 31.19 mm was recorded in Mersin Bay, Türkiye (Figure 2). The sponge crab individual recorded in July 2024, when the surface sea water temperature was 32°C, was not observed to use any substrate as camouflage material. However, the hairs covering its entire shell were covered with muddy material to create a sufficient camouflage cover.

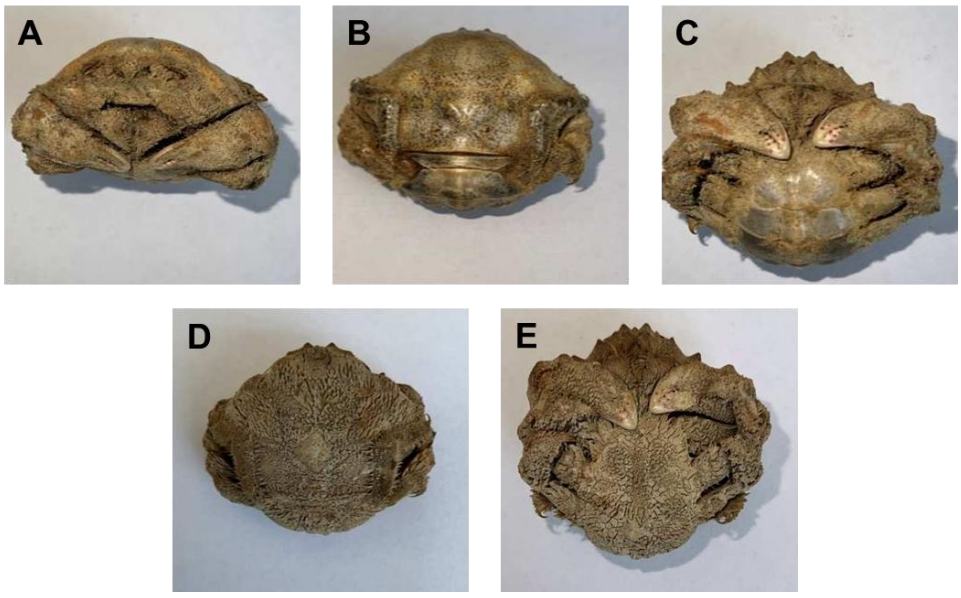

Figure 2. Cleaned face (A), dorsal (B), and ventral (C) views and uncleaned dorsal (D) and ventral (E) views of a female *Dromia personata* specimen from Mersin Bay.

The identity of *D. personata* was confirmed by the following diagnostic features: the body is often concealed by a shelled sponge, with unique pink pincers and diminutive fourth and fifth legs. The shell is oval, with three small teeth between the eyes and five robust teeth on each side. Small dark brown hair covers the body and legs, giving it a smooth or velvety texture. Large, hairless chelipeds, usually tipped with white or pale pink, are consistent in size and shape and are ventrally situated. The morphometric characteristics of *D. personata* caught from the Erdemli coast in Mersin Bay are consistent with the above-mentioned descriptions of McLay (1993), Hayward et al. (1996) and Shen et al. (2020).

Discussion

In the present study, *D. personata* was collected by hand during scuba diving under a temperature condition of 32°C from a rocky habitat covered with *Ganonema farinosum* algae at a depth of 3 m on the Erdemli coast of Mersin Bay. Although the relationship between the species and water temperature is unknown, increasing seawater temperatures are likely to support the successful reproduction and habitat expansion of the crab species in the northeastern Mediterranean waters (Turan et al., 2016, 2024; Uysal et al., 2024).

D. personata is known for its distinctive camouflage habit of using sponges and ascidians. It is easily recognized when not well camouflaged and cannot be confused with other crabs. This study confirmed our knowledge about the habitat preference of this species, especially rocky bottoms. van Moorsel et al. (2017) stated in their study based on historical records that the changing habitat conditions that play a role in the distribution of this species are probably affected by anthropogenic and environmental changes.

In conclusion, it is possible that the sponge crab was previously seen in this region by local fishermen and discarded because it had no commercial importance. Although the sponge crab was detected incidentally during a SCUBA dive in this study, the fact that it was recorded for the first time in Mersin Bay is important in filling the gap regarding the distribution of this rare species in the northeastern Mediterranean. Therefore, further research is needed to understand the species' presence in the region and to determine its ability to adapt to changing habitat conditions.

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Conflict of Interest

The authors declare that for this article they have no actual, potential or perceived conflict of interest.

Author Contributions

A.U., S.A.E., D.E., and D.A. performed all the experiments and drafted the main manuscript text. Authors reviewed and approved the final version of the manuscript.

Ethical Approval Statements

No ethics committee permissions are required for this study.

Data Availability

The data used in the present study are available upon request from the corresponding author.

References

Ammar, I. A., Hmaesha, Y. B. (2022). New Records of Rare Species of Marine Invertebrates in the Eastern Mediterranean, Syria. *The Scientific Journal of King Faisal University: Basic and Applied Sciences*, 23(2), 48-53.

Bianchi, C. N., Gerovasileiou, V., Morri, C., Froglia, C. (2022). Distribution and ecology of decapod crustaceans in Mediterranean marine caves: a review. *Diversity*, 14(3), 176.

Clark, P. F. (1986). North-East Atlantic crabs: an atlas of distribution. Marine Conservation Society.

Dembowska, W. S. (1926). Study on the habits of the Crab *Dromia vulgaris* M.E. *The Biological Bulletin*, 50-(2), 163-178.

Falciai, L., Minervini, R. (1996). Guide des homards, crabes, langoustes, crevettes et autres crustacés décapodes d'Europe. Delachaux et Niestlé.

Harada, K., Hayashi, N., Kagaya, K. (2020). Individual Behavioral Type Captured by a Bayesian Model Comparison of Cap Making by Sponge Crabs. *PeerJ*, 8, e9036.

Hayward, P., Nelson-Smith, T. Shields, C. (1996). Collins pocket guide: sea shore of Britain and Europe. HarperCollins.

Ingle, R. (1996). Shallow-water crabs (Synopses of the British Fauna (Series Number 25). Cambridge University Press.

Ingle, R. (1997). Crayfishes, lobsters and crabs of Europe: an illustrated guide to common and traded species. Springer Dordrecht.

McLay, C. L. (1993). Crustacea Decapoda: the sponge crabs (Dromiidae) of New Caledonia and the Philippines with a review of the genera. In Résultats des Campagnes MUSORSTOM (pp. -111-251). Mémoires du Muséum national d'Histoire naturelle.

Moyse, J. (2003). Crustacea III Malacostraca Eucarida. *In* The marine fauna of the British Isles and North-West Europe: introduction and protozoans to arthropods (pp. 489-552). Oxford Science Publications.

Ng, P. K. L., Guinot, D., Davie, P. J. F. (2008). Systema Brachyurorum: Part I. An annotated checklist of extant Brachyuran crabs of the world. *The Raffles Bulletin of Zoology*, 17, 1-286.

Noël, P.Y. (1992). Clé Prélimaire d'identification des Crustacea Decapoda de France et des principales autres espèces d'Europe. Muséum National d'Histoire Naturelle.

Shen, H., Braband, A., Scholtz, G. (2020). Mitogenomic analysis of decapod crustacean phylogeny corroborates traditional views on their relationships. *Molecular Phylogenetics and Evolution*, 66(3), 776-789.

Turan, C., Ergüden, D., Gürlek, M. (2016). Climate change and biodiversity effects in Turkish Seas. *Natural and Engineering Sciences*, 1 (2), 15-24.

Turan, C., Ergüden, D., Gürlek, M., Doğdu, S. (2024). Checklist of Alien Fish Species in the Turkish Marine Ichthyofauna for Science and Policy Support. *Tethys Environmental Science*, 1(2), 50-86.

Türkay, M. K. (2015). Personal Decapoda Distribution Database for Europe. Available at: https://doi.org/10.14284/205 (25.08.2024).

Uysal, A., Ayas, D., Ergüden, D. (2024). Expansion of the Invasive Moon Crab *Matuta victor* in Turkish Waters: A New Record from Mersin. *Tethys Environmental Science*, 1(2), 99-104.

van Moorsel, G. W. N. M., Bennema F. P., Nijland R. (2017). First records of the sponge crab *Dromia personata* (Brachyura) in the Netherlands and its historical findings in the North Sea. *Marine Biodiversity Records*, 10(28), 1-5.