

First record of the nudibranch *Elysia gordanae* T. E. Thompson & Jaklin, 1988 (Gastropoda: Plakobranchidae) in Bosnia and Herzegovina

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Abstract: Heterobranch sea slugs represent one of the most diverse groups of marine gastropods in the Mediterranean Sea; however, their diversity and distribution along the short coastline of Bosnia and Herzegovina remain insufficiently documented. In this study, we report the first confirmed record of the sacoglossan nudibranch *Elysia gordanae* T. E. Thompson & Jaklin, 1988 from the marine waters of Bosnia and Herzegovina. A single specimen was observed and collected in the intertidal zone of Neum Bay during field surveys conducted in August 2023. Morphological characteristics correspond well with published descriptions of the species. This finding represents the easternmost confirmed record of *E. gordanae* in the Adriatic Sea to date and contributes to the growing knowledge of heterobranch diversity in Bosnia and Herzegovina, highlighting the need for continued systematic surveys of its poorly explored marine habitats.

Keywords: Heterobranchia, Sea slug, Adriatic Sea, Neum Bay, Bosnia and Herzegovina

Introduction

Heterobranch sea slugs constitute a taxonomically and ecologically diverse assemblage of marine gastropods, with approximately 660 species recorded from the Mediterranean Sea (Costello et al 2001). Within the Adriatic Sea, bordered by the coasts of Italy, Slovenia, Croatia, Montenegro, and Albania, 271 heterobranch species have been documented to date (Zenetos et al 2016; Prkić et al 2018). Despite this relatively well-studied regional context, the heterobranch fauna of Bosnia and Herzegovina remains poorly investigated, largely due to the country's limited coastline and the historical lack of targeted malacological surveys.

The earliest records of heterobranch sea slugs from Bosnia and Herzegovina were published by Šoljan (1980), who reported the presence of *Philine quadripartita* Ascanius, 1772 and *Tethys fimbria* Linnaeus, 1767 (originally listed as *Tethys leporina* Linnaeus, 1758; taxonomy following WoRMS). After a gap of more than three decades, subsequent studies substantially increased the number of known species, adding records of *Berthella aurantiaca* (Risso, 1818), *Aplysia fasciata* Poiret, 1789, *Aplysia punctata* Cuvier, 1803, *Elysia timida* (Risso, 1818), *Berthellina edwardsii* (Vayssière, 1896), *Felimida luteorosea* (Rapp, 1827), *Thuridilla hopei* (Vérany, 1853), *Dendrodoris grandiflora* (Rapp, 1827), *Camachoaglaja africana* (Pruvot-Fol, 1953), and *Felimare villafranca* (Risso, 1818). In addition, the presence of the non-indigenous species *Bursatella leachii* Blainville, 1817 and *Melibe viridis* (Kelaart, 1858) has been confirmed (Nahić et al 2016; Delić et al 2019; Kahrić et al 2021, 2022; Fortić et al 2023).

Although *Elysia gordanae* has been reported from several parts of the Adriatic Sea, including Italian, Slovenian, and Croatian waters, it had not previously been recorded from Bosnia and Herzegovina. The present study documents the first confirmed occurrence of this species in the country's marine area.

Materials and Methods

Field observations were carried out in Neum Bay, Bosnia and Herzegovina, during a coastal biodiversity survey conducted from 23 to 26 August 2023. Heterobranch sea slugs were recorded at location within Opuće Bay on the Klek Peninsula (42.931435° N, 17.567228° E) on 25 August 2023 (Fig. 1).

Neum Bay is approximately 6 km long, about 1.2 km wide, and reaches depths of up to 30 m. It is situated along the central part of the eastern Adriatic coast and is entirely enclosed by Croatian territorial waters. The area is characterized by predominantly muddy and sandy substrates, with a rocky intertidal zone.

The specimen was observed in the intertidal zone at a depth of approximately 1 m, on green macroalgae. After documentation in situ, the individual was photographed, preserved in 70% ethanol, and deposited in the invertebrate collection of the National Museum of Bosnia and Herzegovina. Species identification followed Prkić et al. (2018), while taxonomy and nomenclature are consistent with the World Register of Marine Species (WoRMS 2021). Data on Adriatic distribution were compiled based on Zenetos et al (2016) and Prkić et al (2018).



Fig 1: The map of the study area and the finding sites of recorded species *Elysia gordanae* T. E. Thompson & Jaklin, 1988 (photo: Dejan Kulijer)

Results

The recorded individual displayed the key morphological features characteristic of *Elysia gordanae* T. E. Thompson & Jaklin, 1988 (Fig. 2a). The specimen measured 28 mm in total length. The general body coloration was greenish, with distinct white streaks that produced a lighter appearance along the outer margins of the body. Distinct pink markings (Fig. 2b) were also visible across the body surface, contributing to the mottled patterning. Additionally, bluish pigmentation was observed in the head region (Fig. 2c).

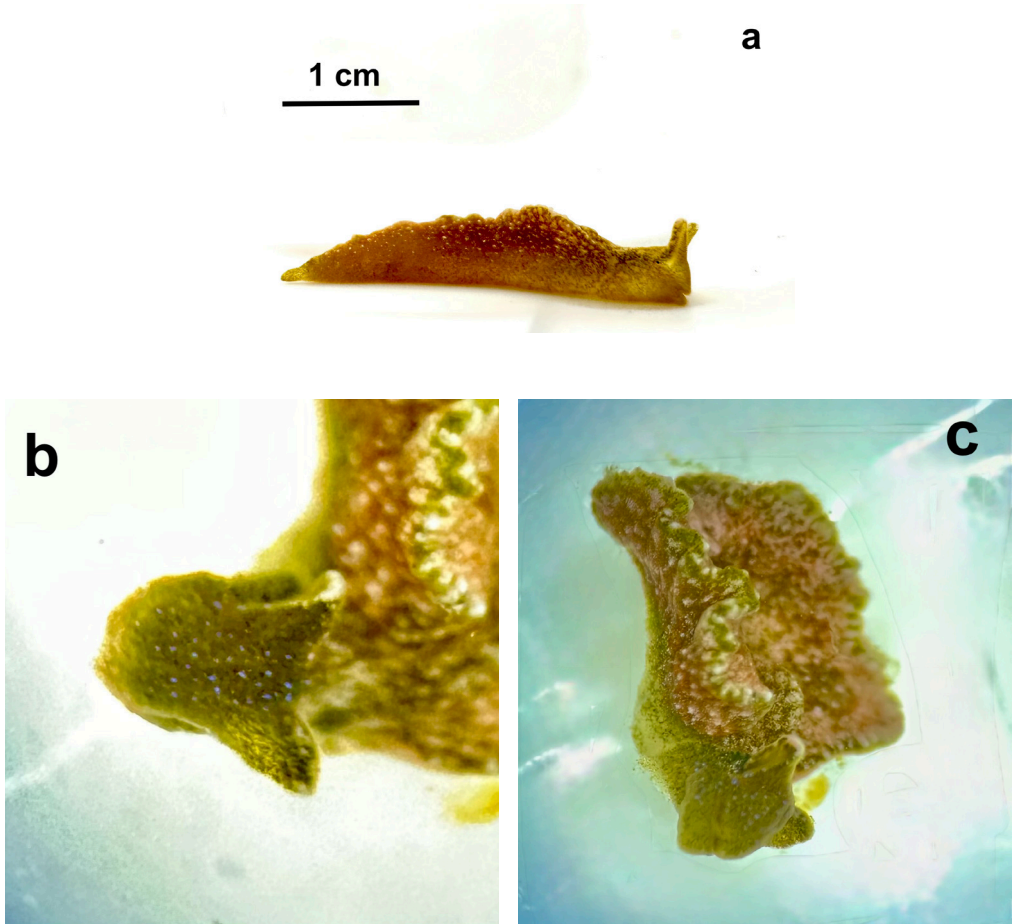


Fig 2: a) External morphology of a live specimen of *Elysia gordanae* T. E. Thompson & Jaklin, 1988; b) Detail of pink pigmentation patterns (stereomicroscope view) c) Detail of bluish pigmentation on the head (stereomicroscope view) (photo: Adla Kahrić)

Discussion

According to the available literature, *Elysia gordanae* has been recorded from the western, northern, and eastern parts of the Adriatic Sea, including western part of Italy (western Adriatic), Slovenia (northern Adriatic), and Croatia (eastern Adriatic) (Zenetos et al 2016; Prkić et al 2018). To date, the species has not been reported from the Adriatic coasts of Montenegro or Albania. The present record from Neum Bay therefore represents the easternmost confirmed occurrence of *E. gordanae* within the Adriatic Sea.

Given its known distribution in the Mediterranean and adjacent Adriatic regions, the presence of *E. gordanae* in Bosnia and Herzegovina was not unexpected. Nevertheless, the lack of prior confirmed records underscores the limited exploration of the country's marine heterobranch fauna. Although only a single specimen was observed, its occurrence indicates that suitable environmental conditions exist in Neum Bay and the wider Mali Ston Bay area.

This finding further demonstrates the importance of continuous field surveys, combined with photographic documentation and specimen collection, for improving knowledge of marine biodiversity in Bosnia and Herzegovina. As coastal habitats in this region remain understudied, additional research is likely to reveal further new records and contribute to a more complete understanding of Adriatic heterobranch diversity.

Conclusion

The present study documents the first confirmed record of *Elysia gordanae* T. E. Thompson & Jaklin, 1988 in the marine waters of Bosnia and Herzegovina. This record extends the known distribution of the species to the easternmost part of the Adriatic Sea and contributes to the growing checklist of heterobranch sea slugs recorded from the country. The finding highlights the need for continued and systematic surveys of Bosnia and Herzegovina's marine habitats, which remain insufficiently explored despite their biogeographical importance within the Adriatic region.

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