



Editorial: Biodiversity and Distribution of Benthic Invertebrates - From Taxonomy to Ecological Patterns and Global Processes

Marcos Rubal^{1*}, José M. Guerra-García², Juan Moreira³, Carlos Navarro-Barranco², Macarena Ros² and Puri Veiga¹

¹ Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), University of Porto, Matosinhos, Portugal,

² Laboratorio de Biología Marina, Departamento de Zoología, Facultad de Biología, Universidad de Sevilla, Seville, Spain,

³ Departamento de Biología (Unidad de Zoología), Centro de Investigación en Biodiversidad y Cambio Global (CIBC-UAM), Universidad Autónoma de Madrid, Madrid, Spain

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Editorial on the Research Topic

Biodiversity and Distribution of Benthic Invertebrates - From Taxonomy to Ecological Patterns and Global Processes

Biodiversity loss due to human activities is increasing worldwide at an alarming rate, and the oceans are not an exception to this pattern (O'Hara et al., 2021). Biodiversity loss weakens the ability of ecosystems to function efficiently and can influence their capacity to provide vital goods and services to humanity (Roe, 2019). We are still far away from a complete inventory of all habitats and lifeforms harbored by Earth's oceans. With the exception of few charismatic (e.g., corals), commercially valuable (e.g., mussels or oysters) or harmful (e.g., jellyfish) invertebrate species, general public and scientific community attention is focused on vertebrates (Troudet et al., 2017). However, invertebrate phyla represent about 75 % of all described animal species both in ocean and land (Eisenhauer and Hines, 2021). The marine benthic realm is one of the largest and probably more diverse habitats on Earth, harboring a huge taxonomical and functional diversity of invertebrates (Snelgrove, 1999, 2016). Unfortunately, knowledge about patterns of biodiversity of benthic invertebrates is still very focused on the most accessible intertidal and shallow subtidal domains; there is also a geographic bias because large areas of the planet remain almost unexplored as well, and because research efforts often focus in well-known biodiversity hotspots (Mugnai et al., 2021).

The main objective of this special topic collection is to improve our knowledge in the above-described gaps on benthic invertebrate biodiversity. We have selected 15 articles by 82 authors encompassing a wide range of phyla and including 12 (ten species, one genus and one family) new invertebrate taxa. Therefore, we are also contributing to the overwhelming but urgent need of discovering and describing as much invertebrate species as possible. Specifically, the new family and five new species belong to deep-sea tanaids (Gellert et al.); three new amphipods and one tanaid came from phytal habitats in an oceanic island (Iwasa-Arai et al.) and the last new species is an harpacticoid copepod described by integrative taxonomy (Yeom et al.). The collection also includes: (1) a comprehensive revision of the poorly studied deep-sea wood-borer bivalves by Romano et al. which resulted in the erection of a new genus while providing important biogeographical information, (2) a revision of the ecology and taxonomy of the amphipod genus *Ampelisca* from the North-East Atlantic (Dauvin et al.), which provided valuable insights on these ecologically relevant

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Daniel Martin,
Spanish National Research Council
(CSIC), Spain

*Correspondence:

Marcos Rubal
marcos.garcia@fc.up.pt

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and diverse benthic crustaceans, and (3) two analyses of the role of ecosystem engineers and its conservation in shaping invertebrate biodiversity, focusing on the reef-building annelids of the genus *Sabellaria* (Muller et al.; van der Reijden et al.). Muller et al. together with Srinivas et al. (who studied amphipods in coralline habitats within a Marine Protected Area) also compared functional diversity with taxonomic diversity patterns, and their relevance for biodiversity management.

The collection also incorporates analyses of the effect of human disturbances on natural biodiversity patterns. These include the value of long-term monitoring of intertidal invertebrates in detecting climate change effects (Mieszkowska et al.) and that of soft bottom infauna and epifauna as quality indicators in an industrial harbor (Dreujou et al.) and an estuary (Isabel et al.). We have also selected two articles on economically relevant species: (1) on the role of intraspecific diversity in the fitness and adaptation of different population of *Crassostrea ariakensis* (Li et al.) and (2) on the genetic diversity of different oyster species from a relevant culture area (Liu et al.). The last article provides new evidence on the poorly studied deep-water emergence of many species along the Chilean coasts, changing our traditional view on the relationship between bathymetry and invertebrate distribution (Häussermann et al.).

There are still many unexplored gaps in the knowledge of benthic invertebrate diversity, hindered, for example, by the complex logistics and budgetary constraints of deep-sea exploration or the lack of experts in invertebrate taxa (Boero, 2010). In fact, many gaps identified in the topic description, such as the invertebrate biodiversity in scarcely studied habitats (e.g.,

marine caves) or among poorly known taxa (e.g., soft bodied meiofaunal gastrotrichs, gnatostomulids, etc.) were not included in this volume due to the lack of submitted manuscripts.

Therefore, we would like to highlight that only by improving our understanding on invertebrate biodiversity, we will be able to improve our ability to manage and preserve marine biodiversity. Having this in mind, we have compiled this volume hoping both to encourage more research in this particular field and to boost benthic diversity knowledge globally.

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MR planned and wrote the text. All authors contributed to the discussion and writing. All authors contributed to the article and approved the submitted version.

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