DATA PAPER

ECOLOGY
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GLOSSAQUA: A global dataset of size spectra across aquatic ecosystems

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Abstract

Body size is a key trait in ecology due to its influence on metabolism and many other life-history traits that affect population and community responses to environmental variation as well as ecosystem properties. The size spectrum represents the relationship between abundance (or biomass) and body size, independent of species identity. Size spectrum parameters, such as the slope or intercept, have been applied extensively as indicators of ecological status across multiple ecosystem types. The GLOSSAQUA dataset includes data from mainly heterotrophic communities composed of single (e.g., zooplankton, macroinvertebrates, or fish) to multiple taxonomic groups (e.g., from primary consumers to apex predators, and phytoplankton to large zooplankton), across diverse spatial and temporal scales, from surveys in freshwater (43% studies), marine (52% studies) and brackish (5% studies) ecosystems. In total, we compiled a unique global dataset of 8459 size spectrum slopes or exponents, 5237 intercepts, and 4,497 linearity coefficients (i.e., defined by the R^2 of the linear fit of the size spectrum) from 127 articles and gray literature (i.e., unpublished

For affiliations refer to page 2

datasets). The current dataset aims to help identify the main drivers shaping aquatic size spectrum parameters at a global scale and contribute to cross-ecosystem comparisons. GLOSSAQUA can serve to explore questions such as factors influencing spatial and temporal dynamics of community size structure, comparing the response of community size structure between natural versus human-impacted sites, and comparing global patterns in different aquatic ecosystems. We encourage researchers, especially those from underrepresented geographical areas (e.g., South Hemisphere and Asia) to fuel this dataset in the future. The dataset is provided under a CC-BY-NC-S4 4.0 license, and users are encouraged to cite this data paper when using the data.

KEYWORDS
biodiversity database, body size distribution, community assembly, food web, global scale, multiple surveys

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CONFLICT OF INTEREST STATEMENT

DATA AVAILABILITY STATEMENT

The dataset is available as Supporting Information in Data S1. Additionally, data and the R code used for data processing are available in Zenodo at https://doi.org/10.5281/zenodo.14701391.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.