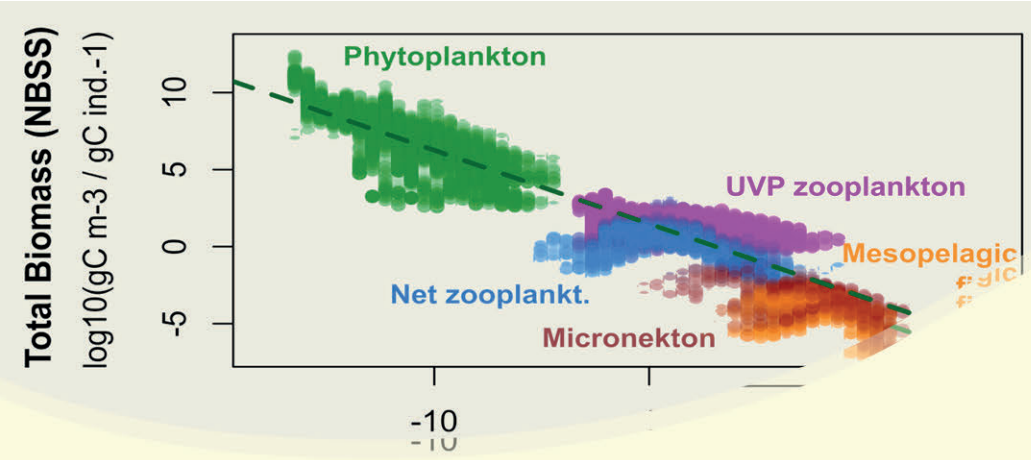


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Les Jeudis de l'UMR

JEUDI 17 OCTOBRE 2024 / 11h30 **Ralf SCHWAMBORN**, Professeur Université Fédérale de Pernambuco, Brésil

Factors affecting size spectra across pelagic food webs (from small cells to big fish) in the Atlantic Ocean - how important are temperature and ecosystem productivity?

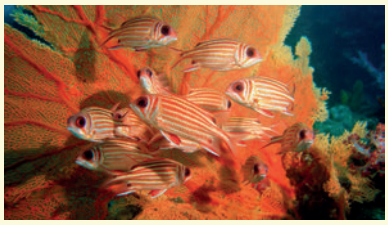
Ralf Schwamborn, Tim Dudeck, Henrike Andresen, Dawit Yemane Ghebrehiwet, Thierry Frédou, Flávia Lucena-Frédou, Simone M. A. Lira, Gabriela G. A. A. Figueiredo, Sabrina Duncan, Leandro N. Eduardo, Arnaud Bertrand, Claire Carré, Werner Ekau, Mathilde Dugenne, Lars Stemmann, José M. Landeira, María Couret Huertas, Javier Díaz Pérez, Santiago Hernández-León, Rainer Kiko, Gabriel B. Farias, Pedro A.M.C. Melo, Cristina González-García, Emilio Marañón, Xiomara Garcia, Florian Lüskow, Heino Fock

Few studies have attempted to compare large food web datasets in a standardized way across trophic levels and between ecosystems. Here we present a unique, comprehensive dataset of abundance, biovolume, and body size of picoplankton, nanoplankton, microplankton, net-caught meso- and macrozooplankton, mesopelagic fish, and macroinvertebrates, and plankton and particles detected by an optical in situ instrument (UVP), to construct normalized biovolume size spectra (NBSS) in distinct marine ecosystems across the Atlantic Ocean (from 50°N to 50°S). We present our results with a special emphasis on three study areas: the oligotrophic Tropical West Atlantic off Northeastern Brazil (TWA), the Benguela Upwelling System (BUS), and the Canary Current Upwelling System (CCU). Comparing NBSS across multiple trophic levels requires a strong effort in standardization and algorithm selection due to the different gears, size ranges, and units used. For each ecosystem, NBSS slopes and intercepts were calculated through non-parametric robust linear regression analysis. NBSS for the upwelling and tropical marine ecosystems were established for each one of the ecoregions. Most stations displayed clearly linear decreasing sections in NBSS, when plotted on a double logarithmic scale (indicating a "Power-law" or Pareto distribution). NBSS slopes varied considerably between sampling methods, assemblages, communities, and data analysis approaches, with huge challenges for data analysis and interpretation. NBSS slopes were shown to vary significantly with sea surface temperature in all linear and nonlinear multivariate models tested. Adding productivity-related parameters (such as nitrate concentration and chlorophyll a) improved the explained variability, after temperature. These results are interpreted with regard to nutrient-cell-size dynamics, photosynthetic light energy utilization, responses of growth and grazing to variations in temperature, trophic efficiency, predator/prey mass ratios, top-down and bottom-up effects, and metabolic scaling. We discuss to what extent temperature effects on NBSS slopes may be mediated by metabolic effects or by physical-chemical processes that affect variations in nutrient flux. We conclude that the strong association between water temperature and NBSS slopes has relevant consequences for marine ecosystem prediction in the context of global warming.

> accès zoom

https://umontpellier-fr.zoom.us/j/96426860643
ID de réunion : 964 2686 0643

> prochainement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Jeudi 07 novembre 2024 : Marine Banse, Laboratoire de Morphologie Fonctionnelle et Evolutive, Univ. Liège, Belgique
« Communication acoustique chez les Holocentridae : une perspective évolutive »

@ contacts

sarah.nahon@inrae.fr
frederic.bertucci@ird.fr
johann.mourier@umontpellier.fr
paul.tixier@ird.fr
laura.mannocci@ird.fr
leila.ezzat@cnrs.fr
melina.grouazel@ifremer.fr
elisa.sniecinski@ifremer.fr

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