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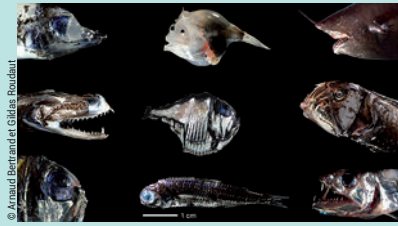
LUNDI 26 AOÛT 2024 / 09H00 AU BRÉSIL / 14H00 EN FRANCE

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Diving into diversity: taxonomic and functional diversity of demersal and mesopelagic fishes from the Southwestern Tropical Atlantic

ABSTRACT Marine ecosystems face increasing anthropogenic threats. There is a growing interest in marine usage and exploitation, which in many cases can negatively impact fish communities, such as mineral exploitation, fishing, pollution, habitat destruction, and tourism. These anthropogenic activities can affect and endanger important ecosystem functioning and services, particularly those associated to demersal and mesopelagic fish communities, due to the unique functions and services they provide. Demersal fish, in particular, are highly relevant for food security, while mesopelagic fish, though still poorly studied, directly contribute to the carbon pump, meaning they help mitigate the impacts of climate change. However, conservation efforts for these communities remain ineffective due to a lack of information about their biology, diversity and distribution. To understand the functional and dynamic aspects of demersal and mesopelagic communities, this thesis is structured around three main complementary research axes to fill these gaps. The first axis investigated different functional traits related to locomotion, feeding, and survival of mesopelagic fish. Based on observations of sampled data and literature reviews, it is proposed to categorize traits, such as skin color and teeth, to standardize these characteristics and to assist in future ecological work. This allowed the development of a robust database of features for a unique community, that poses several challenges for its collection and storage. The second axis examined the distribution of traits within the mesopelagic fish community in the north-western Atlantic of Brazil, and their variation between diurnal and nocturnal periods, thus highlighting the community's dynamics and changes in functional space. This axis also investigated the environmental factors determining the distribution of these characteristics. Finally, the third axis investigated the distribution and partition of beta diversity in two facets of demersal communities: taxonomic and functional diversities. Different environmental and spatial aspects of the region were incorporated into the analyses of demersal fish, aiming to identify the influences of these predictors on beta diversity. A predominance of turnover in the taxonomic facet was highlighted, with influences mainly from depth, as well as particle dispersion, and substrate type. The functional facet exhibited high diversity, and turnover and nestedness processes showed moderate values. This demonstrates significant functional variation in the region, with community structuring processes contributing equally. Overall, these results provide a robust basis for marine spatial management and planning, contributing to the conservation of important demersal and mesopelagic fish communities.

KEYWORDS Beta diversity / Functional diversity / Mesopelagic fish / Demersal fish Conservation Species distribution / Niche partition / Ecological processes



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