Exploring Marine Fungal Diversity for Biotechnological Applications

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Résumé

The diversity, phylogeny, and ecological interactions of marine fungi remain largely unexplored despite their critical role in marine ecosystems. These fungi contribute significantly to nutrient cycling and ecosystem stability by interacting with other marine organisms, such as algae. While the biotechnological potential of terrestrial fungi has been extensively studied, marine fungi remain largely an untapped resource. Given the unique cell wall polysaccharide composition of seaweeds, these fungi likely possess novel enzymatic capabilities that could be harnessed for biotechnological innovations.
In this study, we investigated marine fungal diversity and enzymatic potential using a collection of approximately 200 fungal isolates obtained during a North Sea and Atlantic Ocean expedition. Through phenotypic screenings and comparative enzymatic activity analyses, we identified species with promising abilities to degrade macroalgal cell walls. This is particularly relevant for enzyme-aided extraction of proteins and bioactive compounds from macroalgal biomass, a promising alternative protein source for sustainable bioprocessing.
Our findings contribute to a better understanding of marine fungal biotechnological potential, paving the way for their application in marine biotechnology. By leveraging marine fungi for production of novel enzymes, we aim to support the development of sustainable, circular economy-based approaches for macroalgal biomass valorization.

Mots-Clés: marine fungi, CAZymes, macroalgae, biomass valorization

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