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EVOLUTION OF THE THERMAL NICHE AND ITS IMPACT ON BIODIVERSITY PATTERNS IN SEAWEEDS

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The thermal niche of seaweed species is known to have a strong influence on their distribution ranges. In turn, geographical distributions determine patterns of species richness across the globe. But the thermal niche is not a static feature over evolutionary timescales. Our goal is to incorporate the evolutionary dynamics of thermal niches into assessments of global patterns of species richness. Using evolutionary modeling approaches in a phylogenetic context for three seaweed genera, we show that the thermal niche evolves at different rates in different lineages, and illustrate relationships between microhabitat preferences and rates of thermal niche evolution. We show that niche evolution promotes the diversification of taxa by different mechanisms and reveal its impact on global diversity patterns. In summary, our results show that the thermal niche evolves in a highly taxon-specific manner and that it has a clear impact on the species richness patterns of those taxa.

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THE ROLE OF ADAPTIVE AND NON-ADAPTIVE PROCESSES IN MARINE ALGAL SPECIATION

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Only recently, by a combination of adopting molecular techniques and global sampling, phycologists started to obtain a meaningful idea of algal species diversity, the distribution of the individual species and ultimately patterns of diversity. The emerging information enables us to test hypotheses on the modes of speciation and the role of a divergent natural selection on adaptive traits in diversification. Here we use a global dataset containing over 3000 DNA-verified specimen records belonging to the Dictyotales to elucidate the mechanisms that drive speciation in this brown algal order. The focus is on tropical and warm temperate environments. We characterize the taxonomic structure on large geographic scales (between and within ecoregions) and examine the predictions of various geographic (allopatric, sympatric, and peripatric) models of speciation, using patterns of range overlap and range size symmetry between sister clades. Adaptive processes are addressed on a more local scale in New Caledonia. Focusing on the genus *Lobophora*, we examine up to which extent individual sympatric species are adapted to specific environments. Many species of *Lobophora* engage in allelopathic seaweed-coral interactions, with coral bleaching and mortality resulting from direct contact. We quantify coral-algal interactions by mapping host occupancy of the individual *Lobophora* species and by conducting field experiments whereby coral hosts are exposed to lipid-soluble extracts from different *Lobophora* species. Results from geographic speciation models and adaptation to specific environments at a local scale are combined to draw conclusions on the relative roles of adaptive and non-adaptive processes on diversification of seaweeds.

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ASSESSMENT OF FRESHWATER RED ALGAL (THOREALES AND BATRACHOSPERMALES, RHODOPHYTA) TYPE SPECIMENS IN THE HERBIER CRYPTOGAMIE

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The Batrachospermales and Thoreales are macroscopic algae inhabiting freshwater streams worldwide. French naturalists, such as Bory de Saint Vincent, Montagne, LePrieur and Sirodot, were among the first to collect and study these organisms. Their specimens from 18th and 19th centuries are within the sub-herbaria (Thuret, Montagne, General France, General World and Sirodot) in the Herbier Cryptogamie (PC), Muséum d'Histoire Naturelle, Paris. Recently, researchers have utilized the collections and referred to them in publications. However, most type material was not annotated and due to duplicate specimens within and