LATITUDINAL GRADIENT IN FUNCTIONAL DIVERSITY OF MARINE MOLLUSK ASSEMBLAGES FROM THE LOWER MIOCENE (~20 Ma) OF THE SOUTHEAST PACIFIC COAST OF CHILE

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Understanding latitudinal variations in diversity is central for biogeography. Along the coasts of the SE Pacific, several taxa show inverse latitudinal patterns of diversity, i.e., increasing species numbers from lower to higher latitudes. A plausible explanation for these patterns is that fjords, formed during the Pliocene-Pleistocene glaciations, generated niche opportunities that allow for higher diversity in high latitudes. Testing this hypothesis requires to analyze functional diversity (which is intimately related to niche use) and latitudinal patterns of biodiversity in the absence of fjords; that is, earlier than the formation of fjords. In this study, we propose to test if the fossil record earlier than the generation of fjords will show higher functional diversity at the lower latitudes than at higher ones (a “classical” diversity gradient). To test this prediction, we analyzed several components of functional diversity (functional richness, functional divergence, and functional evenness) for a fossil marine mollusk fauna from the lower Miocene (~23-16 million years ago) along the Chilean Southeast Pacific coast. We characterized the change in various elements of functional diversity of Miocene fossil gastropods and bivalves across four regions spanning more than 10 latitudinal degrees of the Chilean coast. With this work, we hope to enhance our mechanistic understanding of the spatiotemporal variation of diversity observed today.