

Ciências Biológicas

Soil microbial diversity and abundance is driven by pH at Trindade Island/Brazil

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Resumo

Oceanic islands are increasingly recognized as model systems for understanding various ecological processes related to evolution, conservation, community assembly, and biogeography. Despite their significance, the soil environment on these islands remains an underexplored habitat. Only recently has the biological and functional diversity of soil been acknowledged as a critical factor in maintaining ecosystem stability. This study aims to elucidate the factors driving microbial diversity assembly in different soil types on Trindade Island, the most distant Brazilian oceanic island from the continental coast. We employed advanced molecular methodologies, including Next Generation Sequencing (NGS) of ribosomal genes and spacers (16S rRNA for Bacteria/Archaea and ITS for Fungi), alongside quantitative PCR (qPCR) to quantify bacterial (16S) and fungal (18S) populations. These analyses were complemented by comprehensive physicochemical soil assessments. Our results indicate that pH is the primary determinant influencing shifts in soil microbial community structure on Trindade Island. Specifically, variations in soil pH correlated strongly with changes in the relative abundance and composition of bacterial and fungal communities across the sampled sites. These findings suggest that pH not only shapes microbial diversity but also plays a pivotal role in the functional capacity of soil ecosystems on the island. This study underscores the importance of considering soil pH in conservation and management strategies aimed at preserving the unique microbial diversity of oceanic island ecosystems.

Palavras-Chave: Soil microbial diversity, Brazilian oceanic island, molecular microbial ecology.

Instituição de Fomento: CAPES, CNPq, FAPEMIG and Brazilian Microbiome Project

Link do pitch: https://youtu.be/_EGS7wHIXal