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Diversity and Characterization of Culturable Fungi from Marine Sediment Collected from St. Helena Bay, South Africa

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Marine fungi are known to originate from a wide variety of habitats within the marine environment. Marine sediment represents one environmental niche, with most fungi occurring in these sediments being facultative marine fungi with terrestrial origins. It has not been proven whether these fungi merely survive the harsh environmental conditions presented by the ocean sediment, as opposed to playing an active role in this ecological niche. During this study, marine sediment was collected from St. Helena Bay, on the west coast of theWestern Cape, South Africa. Using dilution, enrichment, and repetitive culturing techniques, 59 fungal isolates were obtained from marine sediments and identified to at least genus level using morphological and molecular methods. Moreover, a series of tests were performed to characterize the physical and physicochemical attributes of the isolates. Results showed that the isolates not only survived but also had the potential to grow in the natural conditions present in this environment. Extracellular cellulase was produced by the filamentous fungal isolates indicating their probable role in detrital decay processes and therefore the carbon cycle on the ocean bed. Also, denitrification patterns were observed when isolates were grown in liquid media amended with NaNO2, NaNO3, and (NH4)SO4, implicating that these fungi have the potential to play an active role in denitrification, co-denitrification, and ammonification phases of nitrogen cycles occurring in the marine sediments.