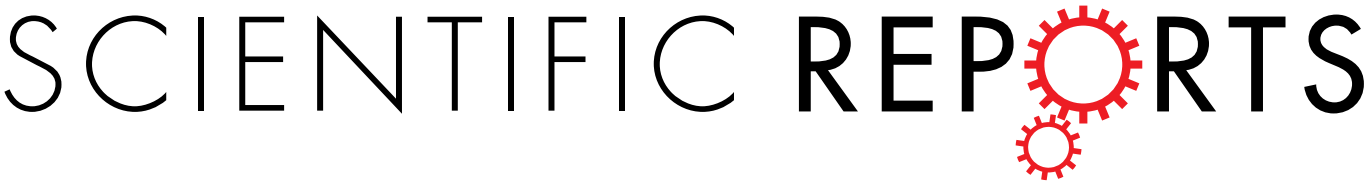

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# Searching for signatures across microbial communities: Metagenomic analysis of soil samples from mangrove and other ecosystems

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**In this study, we categorize the microbial community in mangrove sediment samples from four different locations within a vast mangrove system in Kerala, India. We compared this data to other samples taken from the other known mangrove data, a tropical rainforest, and ocean sediment. An examination of the microbial communities from a large mangrove forest that stretches across southwestern India showed strong similarities across the higher taxonomic levels. When ocean sediment and a single isolate from a tropical rain forest were included in the analysis, a strong pattern emerged with Bacteria from the phylum *Proteobacteria* being the prominent taxon among the forest samples. The ocean samples were predominantly Archaea, with *Euryarchaeota* as the dominant phylum. Principal component and functional analyses grouped the samples isolated from forests, including those from disparate mangrove forests and the tropical rain forest, from the ocean. Our findings show similar patterns in samples were isolated from forests, and these were distinct from the ocean sediment isolates. The taxonomic structure was maintained to the level of class, and functional analysis of the genes present also displayed these similarities. Our report for the first time shows the richness of microbial diversity in the Kerala coast and its differences with tropical rain forest and ocean microbiome.**

The mangrove ecosystem plays a crucial role by acting as a buffer zone between land and sea, maintaining the sea level and protecting the coast[1]. Mangroves are a crucial component of the food chain in the saline coastal biome of the tropics and subtropics. Mangrove trees convert solar energy into organic matter via photosynthesis, with their leaves and branches serving as a source of energy and providing a habitat for a variety of aquatic organisms, which in turn, support a higher level in the food chain. This ecosystem is an enormous food web, supplying a myriad of microorganisms with both protection and nutrients[2,3]. It is considered to be one of the most critical in tropical regions, and also one of the most vulnerable to global climate change[4].

The complexity of the mangrove microbial communities has generated deep interest among microbial ecologists. The dynamic environment of the mangrove ecosystem, brought about by the regular tidal variations, pH, temperature, salinity, light, rainfall and nutrient availability provides an excellent environment for a wide range of organisms with diversified functional roles[5]. Studies have shown that microbial communities play a vital role in this ecosystem, being essential for biogeochemical cycles and biocycling of most nutrients, including nitrogen[6,7].

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