

Bioprospecting of Marine Actinobacteria: The Leading Way for Industrially Important Enzymes and Bioactive Natural Products

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Abstract : It is well accepted by last 35 years of research and on-going programmes that marine environment harbours abundant and unique biodiversity, which is currently playing as an important source in bioprospecting. It has become apparent that marine microorganisms are lead in the biodiscovery. Among marine organisms, actinobacteria are a target phylum for discovering novel antibiotics against increasing the multi-drug resistant human pathogens because of these taxa representing for novel genera and species. Marine actinomycetes are a proven source of new antibiotic leads and novel enzymes with important industrial applications. A total of 183 streptomycete and 25 non-streptomycete strains were isolated from different marine samples collected from north-eastern part of the Indian Ocean. Among them, 111 isolates displayed antibacterial activity against human pathogens and 151 exhibited antifungal activity against phytopathogens. Importantly, most of them produced various extracellular enzymes and 58 of them produced exopolysaccharides. Totally eight small bioactive compounds and a thermostable alkaline protease have been purified from a selected strain, *Streptomyces fungicidicus*. Besides, our on-going studies on non-streptomycete strains (rare actinomycetes) are most likely promising resource for new and unique compounds against current emerging drug-resistant pathogens. We have just recognised the chemical diversity in marine microorganisms. Therefore it is worthwhile to continue the exploration of marine microorganisms for new drug leads, novel enzymes and other bioprospecting research.

Keywords : bioactive compounds, industrial enzymes, marine actinobacteria, microbial metabolites, marine natural products

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