

EXTRACTION OF MARINE BIO-PIGMENTS AND EVALUATION OF THEIR SUN PROTECTION FACTOR AND ANTIOXIDANT ACTIVITY

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Sunscreen has become a vital part of our daily routine for protection against harmful ultraviolet (UV) radiation and its implications, such as sunburn, skin cancer, and premature ageing. The use of synthetic UV filters in sunscreen causes adverse effects, including skin sensitization, carcinogenicity and genotoxicity. The marine waters host a vast diversity of propitious bacterial bio-pigments that are less toxic, more sustainable, and offer other biological activities. The current study aimed to explore the biological properties of marine bio-pigments as UV protectants. Marine bio-pigments were extracted and isolated from marine bacteria to assess the toxicity of the crude bacterial pigment via brine shrimp lethality assay. The radical scavenging activity was evaluated via the 2,2 Diphenyl-1-picrylhydrazyl (DPPH) method. The sun protection factor was investigated using the Mansur method. Red-pigmented bacteria were isolated from the west coast of Sri Lanka. According to standard morphological and biochemical protocols they were identified as *Bacillus* spp. The crude pigment was extracted by two solvents: surfactant sodium dodecyl sulphate (SDS) and methanol. The methanol pigment extract had a less toxic concentration (1.224 mg/mL) compared to the SDS extract (0.22 mg/mL). At their highest concentration, the maximum DPPH scavenging activity obtained for methanol and SDS extracts was 39.39% and 14.24%, respectively. The maximum Sun Protection Factor (SPF) values of methanol extract and SDS extract were 1.76 and 0.09, respectively. Both DPPH scavenging activity and SPF demonstrated an increase with the concentration of the extracts, showing higher values at their maximum concentrations. The choice of solvent affected their robustness with methanol extract exhibiting significant differences between its concentrations. The bioactive properties of marine bio-pigments propose themselves as promising alternatives to synthetic UV protectants.

Keywords: Bio-pigments, Marine bacteria, Sunscreen, Ultraviolet