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Isolation, Identification and Screening of Marine Fungi for Potential Tyrosinase Inhibitor, Antibacterial and Antioxidant for Future Cosmeceuticals

Authors : Shivankar Agrawal, Sunil Kumar Deshmukh, Colin Barrow, Alok Adholeya

Abstract : A variety of genetic and environmental factors cause various cosmetics and dermatological problems. There are already claimed drugs available in market for treating these problems. However, the challenge remains in finding more potent, environmental friendly, causing minimal side effects and economical cosmeceuticals. This leads to an increased demand for natural cosmeceutical products in the last few decades. Plant derived ingredients are limited because plants either contain toxic metabolites, grow too slow or seasonal harvesting is a problem. To identify new bioactive cosmetics ingredients of marine microbial bioresource, we screened 35 marine fungi isolated from marine samples collected from Andaman Island and west coast of India. Fungal crude extracts were investigated for their antityrosinase, antioxidant and antibacterial activities for the purpose of identifying anti-aging, skin-whitening and anti-acne biomolecule with the potential in cosmetics. In the tyrosinase inhibition and 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assays, two fungal extracts, including “P2”, Talaromyces stipitatus and “D4”, Aspergillus terreus showed high inhibitory activity at 1mg/mL for tyrosinase inhibition and 0.5mg/mL for DPPH scavenging. The in vitro antimicrobial activity was investigated by the agar well diffusion method. In the tyrosinase inhibition assay, 8 extracts showed significant antibacterial activity against bacteria causing skin and wound infection in humans. In the course of systematic screening program for bioactive marine fungi, strain “D5” was found to be most potent strain with MIC value of 1mg/mL, which was morphologically identified as Simplicillium lamellicola. The effects of the most active crude extracts against their susceptible test microorganisms were also investigated by SEM analysis. Further investigations will focus on purification and characterization major active components responsible for these activities.

Keywords : antioxidant, antimicrobial activity, tyrosinase, cosmeceuticals, marine fungi
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