

Increasing Sustainability of Melanin Bio-Production Using Seawater

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Abstract : Melanin has immense applications in the field of agriculture, cosmetics and pharmaceutical industries due to its photo-protective, UV protective and anti-oxidant activities. However, its production is limited to costly chemical methods or harsh extractive methods from hair which ultimately gives poor yields. This makes the cost of melanin very high, to the extent of US Dollar 300 per gram. Some microorganisms are reported to produce melanin under stress conditions. Out of all melanin producing organisms, *Pseudomonas stutzeri* can grow in sea water and produce melanin under saline stress. The objective of this study was to develop a sea water based bioprocess. Effects of different growth media and process parameters on melanin production using sea water were investigated. The marine bacterial strain *Pseudomonas stutzeri* HMGM-7(MTCC 11712) was selected and the effect of different media such as Nutrient Broth (NB), Luria Bertini (LB) broth, Bushnell- Haas broth (BHB) and Trypticase Soy broth (TSB) and various medium components were investigated with one factor at a time approach. Parameters like shaking frequency, inoculum age, inoculum size, pH and temperature were also investigated in order to obtain the optimum conditions for maximum melanin production. The highest yield of melanin concentration, 0.306 g/L, was obtained in Trypticase Soy broth at 36 hours. The yield was 1.88 times higher than the melanin obtained before optimization, 0.163 g/L at 36 hours. Studies are underway to optimize medium constituents to further enhance melanin production.

Keywords : melanin, marine, bioprocess, pseudomonas

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