

Bioassay on the Stability of Pigments Extracted by Bacteria Isolated from Wastewater

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Abstract

Microbial pigments are substances that can absorb light in the visible range and emit color while playing an important role in the physiology and molecular processes of microorganisms. Pigment production is a method of adaptation to various extreme environments and was the reason for choosing waste sources to isolate pigment-producing bacteria in this study. Microbial pigments have a massive commercial potential in the food, agriculture, pharmaceutical, textile, cosmetic and dietary industries due to their biodegradability and environmental compatibility and are anticipated to reach 33 to 49 billion dollars by 2027. This study aimed to screen and identified bacteria that could produce pigments, extract them, and determine how they behave at different pH and temperature levels. Three bacterial species namely *Corynebacterium* sp., *Streptococcus* sp., and *Staphylococcus* sp. capable of producing pigments were isolated from various water samples, including canals, gutters, and industrial wastewater dumping sites, using the enrichment culture plate technique, and were morphologically and biochemically identified. Out of three isolated species the *Streptococcus* sp., was carried forward. The pigment was extracted using solvent-solvent extraction and centrifugation techniques. A significant increase in light absorption was observed at 9°C and 40°C when compared with that of 30°C for the beta-carotene produced by *Streptococcus* sp. and stability was observed at a temperature of 30°C ($P < 2.2 \times 10^{-16}$). The stability of the pigment was observed at pH 7 and a significant increase in light absorption was observed for pH 1 when compared with pH 4, 7, 10 and 13 ($P < 2.2 \times 10^{-16}$).

Keywords: *Extraction, Microbial pigments, Stability, Streptococcus*