

ISOLATION, CHARACTERISATION AND TOXICITY PROFILE OF A MARINE BACTERIAL BIOPIGMENT: POTENTIAL NATURAL FOOD COLOURING AGENT

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The inherent colour in food degrades during storage and processing, leading to the use of synthetic food colourants. These colourants have been reported to pose health and environmental risks due to their acute toxicity. Biopigments synthesised by marine bacteria emerge as a promising alternative to synthetic food colourants. In the absence of reported studies conducted in Sri Lanka, the present study aimed to investigate the possibility of incorporating marine bacterial crude biopigments as food colouring agents. A marine chromogenic bacterial isolate exhibiting yellow in the visible light spectrum, was isolated from surface marine water samples collected from Fish Pier, Sri Lanka. Biochemical and morphological identification assays confirmed the identity of the bacterial isolate as *Micrococcus* sp. The intracellular crude pigment was extracted using ultrasound-assisted, 99% (v/v) ethyl alcohol. The extracted crude pigment was characterised using UV-spectrometry in the visible region (350-700 nm) and found to comprise carotenoids. The animal model, *Artemia salina* nauplii, was used to assess the toxicity profile of the extracted crude pigment. For comparison, a commercial food colouring agent was tested under the same conditions as the pigment extract. Hydrogen peroxide [3% (v/v)] was used as the positive control, while distilled water was the negative control. According to Meyer's and Clarkson's toxicity indices, the LC₅₀ value (required for 50% mortality) for the ethanolic extract of the crude pigment (2790 mg/mL) and the LC₅₀ value for the commercial food colouring agent (10 mg/mL) showed no cytotoxic effects, with the crude pigment having a lower LC₅₀ value than the commercial food colouring agent. The findings of this study suggest that the ethanolic extract of the marine bacterial isolate, *Micrococcus* sp., can be used as a non-toxic food colouring agent.

Keywords: Biopigments, Chromogenic bacteria, Food colourants, Toxicity