

Assessment of Freshwater Red Algae *Batrachospermum* sp. for Phytochemicals, Antioxidant and Antibacterial Activity

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Marine red algae have been used in traditional medicine for centuries while the therapeutic and biological properties of freshwater red algae are almost unknown. The present study was conducted with the aim of identifying the phytochemical constituents, the antioxidant and antibacterial activity of freshwater red algae, *Batrachospermum* sp., collected from headwater region of Wathurawa-Ela, in Deniyaya. Methanol and aqueous extracts of *Batrachospermum* were subjected to seven qualitative phytochemical screening tests, and the antioxidant activity for the methanol extract was evaluated using 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay. Further, their potential antibacterial activity against human pathogenic bacteria, *Bacillus cereus* and *Escherichia coli* were evaluated using Kirby-Bauer disk diffusions test, for both extracts. Qualitative phytochemical analysis identified the presence of flavonoids, steroids and alkaloids in both methanol and aqueous extracts while terpenoids and glycosides were detected only in the aqueous extract. The methanol extract of *Batrachospermum* showed an IC₅₀ (half-maximal inhibitory concentration) of 99.70 µg/mL of antioxidant activity while, the methanol extract of the standard reference, ascorbic acid showed an IC₅₀ of 71.14 µg/mL, indicating its antioxidant activity. The antibacterial activity of methanol extract tested against *B. cereus* was moderately strong compared to the inhibition induced by the solvent (99.8% methanol). The diameter of the inhibition zones was, 10.50±2.12 mm, 11.00±1.41 mm, 7.00±0.00 mm and 10.00±2.83 mm for undiluted (8 µg/mL) and 1:1, 1:2 and 1:4 diluted methanol extracts respectively. For methanol, it was 7.00±0.00 mm. The antibacterial activity of methanol extract against *E. coli* was weak compared to the inhibition induced by the solvent in which the diameter of the inhibition zone for methanol was greater than that of methanol extracts of phytochemicals. The diameter of the inhibition zones was, 0.00±0.00 mm, 7.00±0.00 mm, 10.00±0.00 mm and 8.00±0.00 mm for undiluted (8 µg/mL) and 1:1, 1:2 and 1:4 diluted methanol extracts respectively. For methanol, it was 9.50±0.71 mm. Aqueous extracts did not show any inhibition towards either the bacterial isolates. These results implicate the presence of antibacterial compounds, phytochemicals, and antioxidants in *Batrachospermum* that could be a potential source for medicinal and therapeutic applications.

Keywords: Algae, *Batrachospermum* sp., Phytochemicals, Antioxidant activity, Antibacterial activity