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ANTIOXIDANT, ANTI-INFLAMMATORY ACTIVITIES AND NUTRIENT CONTENT OF FOUR CYANOBACTERIA SPECIES

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ABSTRACT

Cyanobacteria are considered as a rich source of bioactive compounds as they are able to produce a great variety of secondary metabolites characterized by a broad spectrum of biological activities including antiviral, antibacterial, anti-inflammatory, anticancer and antioxidant activities. In the present study, *Oscillatoria* sp., *Lyngbya* sp. *Chroococcus* sp. and *Nostoc* sp. were screened to find their antioxidant, anti-inflammatory activity and nutrient content. Antioxidant activity in the crude extract was evaluated using DPPH scavenging test, ABTS assay, phosphomolybdenum reduction assay. Total Phenolic Content (TPC), Total Flavonoid Content (TFC), protein inhibition reducing assay, Total Soluble Protein (TSP), Total Lipid Content (TLC), and phycobiline protein of cyanobacterium extract were evaluated. Among the tested cyanobacteria the highest DPPH activity (IC50 53.34±1 mg L^{-1}) was found in *Oscillatoria* sp. methanol crude extract whereas lowest activity (IC50 170.47±1 mg L^{-1}) recorded in the methanol extract of *Lyngbya* sp. ABTS activity of the cyanobacterial extracts were ranged from IC50 45.21±1.25 mg L^{-1} (*Chrococcus* sp.) to IC50 74.24±1 mg L^{-1} (*Lyngbya* sp.). The total antioxidant capacity of the *Oscillatoria* sp. crude extract was found as 13.24 ± 1.21 mg GAE g^{-1} at 1000 mg L^{-1}. High quantity of TPC was recorded in *Oscillatoria* sp. (212.23 ± 2.15 mg GAE g^{-1}) whereas *Lyngbya* sp. and *Chroococcus* sp. recorded as 147.15±1.34 mg GAE g^{-1} and 52.07± 1 mg GAE g^{-1} respectively. The highest TFC was found in *Oscillatoria* sp. 496.34±1.73 µg QE g^{-1}).

All the tested cyanobacteria contained high amount of allophycocyanine compared to the other phycobiline protein present in cyanobacteria. Maximum content of total lipid (28.15±0.21 mg g^{-1} fresh wt) and total protein (0.011 mg L^{-1} fresh wt) was recorded from *Chroococcus* sp. and *Oscillatoria* sp. Considering the anti-inflammatory activity of the cyanobacteria extracts highest activity was found in *Oscillatoria* sp. (IC 50 124.24±1.34 mg L^{-1}). The results revealed that the cyanobacteria rich with antioxidant, anti-inflammatory activity and nutrient properties. Therefore the tested organisms can be used as potential candidate to produce pharmaceutical and food supplement.

Keyword: Antioxidant, Anti-inflammatory, Total soluable protein, Total fatty acid