AntiInflammatory Potential in Experimental Models of Phycocyanin Obtained from *Spirulina platensis* through a Green Method

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Abstract

Phycocyanin (PC) is a water-soluble biliprotein derived from Spirulina platensis, which, beyond its photosynthetic function, exhibits distinct biological activities of pharmacological significance. The present study aimed to evaluate the anti-inflammatory potential of phycocyanin extracted from *Spirulina platensis* using modern green extraction techniques on experimental models. Phycocyanin was isolated by ultrasonic extraction at 40 °C and 40 kHz, followed by purification and lyophilization, yielding 14.88 mg/g with a purity index of 1.60. To evaluate the anti-inflammatory properties, histamine- and carrageenan-induced rat paw edema models were used. Oral administration of PC at doses of 50, 200, and 300 mg/kg bw resulted in a statistically significant, dose-dependent inhibition of inflammatory edema. The observed activity is probably associated with modulation of TLR and NF-κB signaling pathways, reduction of pro-inflammatory cytokines, as well as antioxidant and anti-apoptotic mechanisms.

These results confirm that phycocyanin, extracted by an environmentally friendly method, combines high safety with marked anti-inflammatory potential. These features position it as a promising candidate for the development of nutraceuticals and pharmaceutical products targeting inflammatory disorders.

Keywords

Phycocyanin, *Spirulina platensis,* anti-inflammatory potential, rat paw edema.

Acknowledgements

This study is financed by the project № 21001.