

ORAL PRESENTATION ABSTRACT

ACOS24-O-003: Exploring the Potential Applications of Polysaccharides Extracted from Plant Sources

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This study explores the unreported anti-hyperpigmentation effects and tyrosinase inhibitory mechanisms of polysaccharides derived from *Azadirachta indica L.*, commonly known as neem leaves. This study aimed to optimize the extraction of neem leaves polysaccharides (NLP) using a microwave-assisted extraction method. By employing a Box–Behnken design, the optimum extraction parameters were determined, which include extraction time, solid-to-buffer ratio, and microwave power. The optimized parameters resulted in a high yield of polysaccharides with significant anti-hyperpigmentation and antioxidant activities. The quadratic regression equations derived from the experimental data serve as a highly accurate predictive model, with R^2 values ranging from 0.9706 to 0.9999. Under optimal conditions, the polysaccharides exhibited the following characteristics: $7.62 \pm 0.22\%$ extraction yield, $86.16 \pm 0.19\%$ monophenolase inhibition activity, $68.18 \pm 0.20\%$ diphenolase inhibition activity, $45.55 \pm 0.29\%$ 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity, and 0.47 ± 0.02 mM FeSO₄ ferric reducing antioxidant power (FRAP) reducing capacity. Moreover, the NLP has a low molecular weight of 28.15 ± 0.32 kDa, which is beneficial for skin treatment products due to faster solubilization in an aqueous environment and improved skin absorption. The observed tyrosinase inhibitory and antioxidant activities are primarily due to the polysaccharide fraction. In conclusion, polysaccharides extracted from neem leaves show promising potential as a therapeutic alternative for treating skin hyperpigmentation. This study provides valuable insights into the anti-hyperpigmentation properties of neem-derived polysaccharides and highlights their prospective applicability in dermatological treatments.

Keywords: Neem leaves, Polysaccharide, Anti-hyperpigmentation, Tyrosinase inhibitory, Antioxidant