

OP 01

Formulation and Evaluation of Herbal Underarm Gel

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Background: Sweating is a normal physiological function which helps to regulate body temperature. Bacterial degradation of organic compounds present in the human sweat causes body odour. This imposes a significant negative impact on the quality of life. Therefore, deodorants and antiperspirants are used to reduce body odour. However, synthetic deodorants may cause harmful health effects. *Nymphaea pubescens* (commonly known as “Pink water-lily”) is a plant known for its versatility in therapeutic and cosmeceutical applications due to its rich phytochemical constituents. Extracts of different parts have shown various medicinal activities.

Objectives: To evaluate the antibacterial and anti-oxidant properties of crude methanolic extracts of *N. pubescens* flower petals and formulation and evaluation of a herbal underarm gel.

Methods: Acidified aqueous alcoholic petal extract of *N. pubescens* was employed as antibacterial agent. Phytochemical screening was evaluated using the extract. Five different formulations were used to evaluate anti-bacterial effects by agar well diffusion method. The minimum inhibitory concentration (MIC) was determined by broth microdilution method against *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*. Antioxidant property was evaluated by 2,2-diphenyl-2-picrylhydrazyl (DPPH) assay. The stability of the product was evaluated over 45 days.

Results: Qualitative phytochemical screening exhibited the availability of main phytochemicals in the extract. Crude extract of pink water-lily petals revealed high phenolic content of 33.92±0.92 mg GAE/g and flavonoid content of 21.92±2.66 mg QE/g and demonstrated a significant anti-bacterial activity. Formulation demonstrated potent free-radical scavenging activity with 53.99±0.11 mg AAE/g. The prominent antibacterial activity was observed in the formulation containing *N. pubescens* (2% w/v) which exhibited more antibacterial activity against *Staphylococcus aureus* (MIC-156.25 µg/mL) and *Escherichia coli* (MIC-156.25 µg/mL) and less activity against *Pseudomonas aeruginosa* (MIC-312.50 µg/mL). No microbial contamination observed after 45 days.

Conclusions: Secondary metabolites present in the crude extract of *N. pubescens* may reduce body odour. It inhibits the growth of bacteria in sweat due to its prominent antibacterial activity.

Keywords: *Antibacterial activity, Antioxidant, Nymphaea pubescens, Underarm gel*