

**POMEGRANATE FRUIT EXTRACT FOR THE  
FORMULATION OF NATURAL LIP BALM**

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**POMEGRANATE FRUIT EXTRACT FOR THE FORMULATION OF  
NATURAL LIP BALM**

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## **ABTRACT**

### **POMEGRANATE FRUIT EXTRACT FOR THE FORMULATION OF NATURAL LIP BALM**

This study focuses on the formulation of a natural lip balm using pomegranate seed and peel extracts, addressing concerns related to skin sensitivity and environmental sustainability. Many conventional lip care products contain harsh chemicals that may cause irritation and allergic reactions, while also contributing to environmental pollution through harmful residues. To develop a safer alternative, pomegranate extracts were obtained via maceration using methanol as a solvent, with an extraction yield exceeding 80%. The extracts were analyzed for their physicochemical and biological properties using Fourier Transform Infrared Spectroscopy (FTIR), High-Performance Liquid Chromatography (HPLC), and Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES), along with antioxidant and antibacterial assays. Results showed that heavy metal concentrations were within permissible limits, with no traces of mercury detected. Antioxidant analysis revealed that the extracts exhibited higher antioxidant properties compared to ascorbic acid, with IC50 values of 379.87 ppm (seeds) and 365.52 ppm (peels). Additionally, antibacterial assays demonstrated significant inhibition against *Staphylococcus aureus*, with the highest inhibition zone of  $26.00 \pm 0.50$  mm at 60% concentration. The formulated lip balm underwent physicochemical evaluations, including pH, melting point, spreadability, and stability tests, confirming its suitability for lip application. User evaluation further indicated minimal irritation potential, validating its safety for human use. These findings suggest that pomegranate extract-based lip balm offers a promising, natural, and effective alternative for lip care, with potential benefits for both consumers and the environment.

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