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CHEMICAL CHARACTERIZATION AND IN VITRO EVALUATION OF SOURSOP (Annona muricata) SEED OIL ON FIBROBLAST PROLIFERATION AND NITRIC OXIDE INHIBITION: A POTENTIAL BIOINPUT

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Soursop seed oil (SSO) is rich in fatty acids and acetogenins, which are associated with various pharmacological properties. This study aimed to determine the chemical composition of SSO, investigate its wound-healing potential using a scratch assay on L-929 fibroblast cells, and its ability to inhibit nitric oxide (NO) release in a cell-free system. The chemical composition was determined using Fourier Transform Ion Cyclotron Resonance Mass Spectrometry (FT-ICR MS), operated in positive ion mode. For the scratch assay, L-929 fibroblasts (1×10^5 cells/mL) were seeded in 24-well plates. After 24 h, a linear scratch was made, and cells were treated with SSO (6.25–100 µg/mL) in unsupplemented DMEM. Control wells received only the medium. After 24 h of incubation, wound areas were imaged and analyzed using an inverted microscope. The assay was performed in duplicate, and results were expressed as mean wound closure rates. In the NO inhibition assay, sodium nitroprusside (1.25 mM) was prepared in a phosphate buffer (0.1 M, pH 7.0). In 96-well plates, SSO (3.125–100 µg/mL) was incubated with NPS for 1 h under intense light. Griess reagent was added, and absorbance was measured at 540 nm. Gallic acid served as a positive control. FT-ICR MS revealed that SSO contains high levels of hydroxy stearic, palmitic, and stearic acids, and confirmed the occurrence of potent acetogenins, including squamocin, annonacinone, gonionenin, and montanacin. Notably, SSO achieved a near doubling of wound healing rate at 100 µg/mL compared to the control ($p < 0.05$), indicating strong stimulation of fibroblast migration and/or proliferation. Furthermore, SSO significantly inhibited NO release, and this inhibitory effect was maintained even after substantial dilution (20 mg/mL), clearly demonstrating potent anti-inflammatory potential. Overall, these results strongly suggest that SSO holds considerable promise as a multifunctional ingredient for topical applications, warranting further investigation.

Keywords: *Fatty acids, Vegetable fixed oils, Scratch assay, Wound healing, Nitric oxide inhibition, Acetogenins*

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