Formulation development and evaluation of polyherbal gel for bacterial skin infection

Janith U.I.P.[1], Imesha P.D.[1], Nimesh K.M.S.G.[1], Ganakarunyan T. [2], Dilakshana K. [1], and Sathya S.[2*]
[1]Department of Pharmacy, Faculty of Allied Health Sciences, University of Jaffna, Sri Lanka
[2]Department of MLS , Faculty of Allied Health Sciences, University of Jaffna, Sri Lanka
[*]*sathyas@univ.jfn.ac.lk*

Bacterial skin infections are common among hospitalised patients, for which topical antibiotics are used. Antibiotic resistance, toxicity and high cost have led to the need for the development of herbal formulations that are comparatively safer and less expensive. Using herbal gel for topical application ensures faster release of active ingredients at the site of action. This study aims to formulate a topical antibacterial polyherbal gel containing leaf extracts *of Atalantia ceylanica, Ocimum tenuiflorum, Azadirachta indica,* and gel extract of *Aloe vera* and evaluate antibacterial activity against *Staphylococcus aureus* and *Pseudomonas aeruginosa.* A polyherbal gel with carbopol 940 gel base containing *Aloe vera* gel with 1% methanolic leaf extracts of *A. ceylanica*, *O. tenuiflorum* and *A. indica* in the ratio of 1:1:3 was formulated and evaluated for antibacterial activity using agar well diffusion method against Gram-positive (*S. aureus*) and Gram-negative (*P. aeruginosa*) bacteria using gentamicin (20 μg/mL) as the positive control. Physical parameters (organoleptic characteristics, pH, spreadability, viscosity) of the prepared gel formulations were evaluated at both room temperature (RT) and 4 ^{o}C for 21 days. A green colour gel with an initial pH of 6.94±0.01, spreadability of 38.09±0.02 g.cm/s and a viscosity of 51.7% was formulated. pH and spreadability of the gel kept in both RT and refrigerator (4 ^{o}C) remained constant throughout the study period. The gel formulation (100 mg/ml) exhibited a zone of inhibition against *S. aureus* (24.77±1.71 mm), but not against *P. aeruginosa*. Therefore, this gel formulation can be further evaluated for its antibacterial potential to formulate a promising topical antibacterial gel for *S. aureus* skin infections.

Keywords: *Aloe vera, Antibacterial activity, Atalantia ceylanica, Ocimum tenuiflorum, Pseudomonas aeruginosa*