

## Abstract

Skin infections caused by *Staphylococcus aureus* are a health problem that often hinders the wound healing process due to the bacteria's ability to form biofilms and resistance to antibiotics. The increasing cases of resistance require the development of alternative therapies based on natural ingredients. Lime peel (*Citrus aurantifolia*) contains flavonoids, saponins, tannins, alkaloids, and glycosides that have the potential to be antibacterial agents and wound-healing agents. This study aims to evaluate the antibacterial activity of an ethanol extract from lime peel against *S. aureus* and its effectiveness in accelerating the healing of infected wounds in vivo. Phytochemical screening showed positive results for flavonoids, saponins, tannins, alkaloids, and glycosides. Characterization tests showed a water content of 8.64%, a total ash content of 5.62%, and an ethanol-soluble extract content of 18.14%, in accordance with the Indonesian Herbal Pharmacopoeia standards. Antibacterial activity showed an increase in the diameter of the inhibition zone from  $8.07 \pm 0.05$  mm at a concentration of 20% to  $22.47 \pm 0.05$  mm at 100%, approaching the positive control ciprofloxacin ( $28.32 \pm 0.12$  mm). Statistical analysis using the Kruskal–Wallis test showed significant differences between groups ( $p < 0.05$ ) with homogeneous data. Histopathologically, the extract group showed a lower number of fibroblasts ( $28.22 \pm 0.72$ ) and blood vessels ( $5.00 \pm 4.80$ ) compared to the negative control, as well as an increase in collagen density at a score of 2, indicating an optimal healing process. It was concluded that the ethanol extract of lime peel has antibacterial activity and accelerates the healing of wounds infected with *S. aureus* by increasing collagen formation and regulating the inflammatory response.

**Keywords:** *Citrus aurantifolia*, flavonoids, antibacterial, wound healing, *Staphylococcus aureus*.