

OP 05

Antibacterial activity of Ulvan from *Ulva fasciata*, Sri Lanka

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Introduction: In recent years, ulvan, a sulfated water-soluble polysaccharide derived from algae, has received considerable attention for its potent antibacterial activity for wound healing. However, the antibacterial potential of *Ulva fasciata* from Sri Lanka has not been extensively explored, leaving a significant research gap.

Objective: To extract ulvan polysaccharide from *Ulva fasciata* and evaluate its antimicrobial activity against *Staphylococcus aureus* (ATCC 25923) and *Escherichia coli* (ATCC 25922).

Methodology: *Ulva fasciata* was collected from Matara, Sri Lanka. Dried *Ulva fasciata* powder was depigmented with hexane, followed by ethanol to remove small molecules, then heated in distilled water (1:20 w/v) at 85–90 °C for 6 h. The extract was filtered, concentrated under vacuum, and precipitated with cold ethanol to obtain crude ulvan, confirmed by FTIR-ATR. Antibacterial activity was assessed using agar well diffusion assays at concentrations of 50 mg/mL and 100 mg/mL against *S. aureus* and *E. coli*. Whereas ciprofloxacin (0.5 mg/mL) and distilled water were used as positive and negative controls, respectively. The test was replicated.

Results: The yield in percentage of ulvan polysaccharide from *Ulva fasciata* powder was 14.032%. The appearance of stretching bands of sulfate ester at 843.74 cm⁻¹, sulfate group at 1219.81 cm⁻¹ and polysaccharide band at 1073.53 cm⁻¹, along with –OH stretch at 3253.11 cm⁻¹ in the FTIR confirmed the presence of sulfated polysaccharide. Ulvan polysaccharide demonstrated antibacterial activity in a concentration-dependent manner, with 50 mg/mL producing a zone of inhibition of 13.75 mm and 22.75 mm against *S. aureus* and *E. coli*, respectively, while 100 mg/mL produced 15.75 mm and 27.75 mm, whereas the standard showed 34 mm and 38 mm, respectively.

Conclusion: The extracted ulvan polysaccharide from *Ulva fasciata* was confirmed by FTIR analysis as a sulfated polysaccharide. It exhibited notable antibacterial activity against both *S. aureus* and *E. coli* in a concentration-dependent manner. Although its activity was lower than the standard, the results highlight its potential as a natural antibacterial agent. Further purification of the crude ulvan and determination of the MIC are recommended to validate this study.

Keywords: Antimicrobial activity, Polysaccharide extraction, *Ulva fasciata*, Ulvan.