

Antibacterial and antibiofilm effect of *Andrographis paniculata* ethanol extract against *E. coli* and *S. aureus*

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ABSTRACT

Multi-antibacterial drug resistance represents an important health problem. This research aims to evaluate the antibacterial and antibiofilm activity of *Andrographis paniculata* crude ethanol extract against *E. coli* and *S. aureus*. The phytochemical analysis was confirmed with UV-Visible Spectroscopy and Gas Chromatography-Mass Spectrometry. The interaction of bacterial cell surface with the extract was visualized with Fourier transform infrared spectroscopy (FTIR) and Scanning Electron Microscope (SEM). Antibacterial assay of the different extract's concentrations (0; 0.156; 3.125; 6.25; 12.50; 25.00; 50.00; and 75.00 mg/mL) was performed using the Kirby-Bauer disc-diffusion for 24 h. Fifty-seven compounds were identified, of which palmitic acid, 9-octadecenal, palmitic aldehyde, trans farnesol, and 11-octadecenoic acid were found to be the predominant compounds. The inhibition zones ranged from 0.17 ± 0.30 to 4.59 ± 1.26 mm and from 0.13 ± 0.11 to 5.69 ± 2.08 mm for *E. coli* and *S. aureus*, respectively. The FTIR established that the extract affected the functional groups: OH, NH, CH, CC, CO, and PO, on the bacterial cell; while SEM micrographs demonstrated that the bacteria do not form biofilm when in contact with the extract. In conclusion, crude extract ethanol of *A. paniculata* could become a potential component of antibacterial agent due to its ability to control bacterial growth and biofilm formation.

Kata Kunci: *Andrographis paniculata*, biofilm, crude extract, *Escherichia coli*, *Staphylococcus aureus*