

EXPLORING THE ANTIMICROBIAL EFFICACY OF METHANOLIC LEAF EXTRACTS FROM CASSIA SPECIES AGAINST COMMON PATHOGENS

Nadeeshana W. D. L. and Safeena M. I. S.*

Department of Biological Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka.

** safeenim@seu.ac.lk*

The overuse of synthetic antibiotics has led to antibiotic resistance, prompting a new focus on plant-derived compounds for the development of new antimicrobial agents. This study investigates the antimicrobial properties of methanolic leaf extracts of five species of *Cassia*, *C. tora*, *C. alata*, *C. occidentalis*, *C. absus* and *C. sophera* against four common pathogens, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans*. *Cassia* species were selected based on their traditional use in Sri Lankan Ayurvedic medicine. The antimicrobial properties of the extracts were evaluated using the disc diffusion method of antimicrobial susceptibility testing and the minimum inhibitory concentration. In addition to antimicrobial testing, a preliminary phytochemical analysis of the extracts was undertaken to determine the presence of alkaloids, phenolics, tannins, and flavonoids. All extracts showed remarkable antimicrobial properties, with *C. alata* and *C. tora* showing the most significant zones of inhibition. Zones of inhibition for *S. aureus* were particularly evident, with *C. alata* showing a maximum zone inhibition of 16.22 ± 0.04 mm. *C. tora* showed a zone of inhibition of 11.81 ± 0.02 mm against *E. coli*, while *C. alata* showed 9.57 ± 0.06 mm. Other *Cassia* species also showed remarkable activity across the tested pathogens, For *C. albicans*, all extracts proved their antifungal capabilities but required greater doses for efficacy and produced smaller inhibition zones compared to bacteria. In the reported MIC values, *C. alata* and *C. tora* consistently outperformed other *Cassia* species, demonstrating the lowest MIC values against the tested pathogens. The phytochemical analysis revealed that leaf extracts contain alkaloids, phenols, tannins and flavonoids, all known for their antimicrobial properties. The combined action of these components likely boosts the overall antimicrobial activity of *Cassia* leaf extracts, emphasizing their potential as a source of new antimicrobial agents for medicinal applications.

Keywords: *Antimicrobial susceptibility testing, Cassia species, Disk diffusion method, Methanolic extracts, Minimum inhibitory concentration.*