

PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF *ARTEMISIA AFRA* AND *LPPIA JAVANICA* LEAF EXTRACTS AGAINST SELECTED PATHOGENS

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BACKGROUND:

Respiratory tract infections remain a major global health burden and are increasingly exacerbated by rising antimicrobial resistance. This growing challenge underscores the urgent need for novel, evidence-based antimicrobial agents. Medicinal plants such as *Artemisia afra* and *Lippia javanica*, long used in traditional medicine, represent promising reservoirs of bioactive compounds with potential translational applications.

OBJECTIVE:

This study evaluated the antibacterial efficacy of crude leaf extracts of *A. afra* and *L. javanica*, individually and in combination, against *Streptococcus pneumoniae* and *Klebsiella pneumoniae*, with the aim of assessing their potential as alternative antimicrobial agents.

METHODS:

Crude leaf extracts were prepared using solvents of varying polarity, including water, methanol, acetone, dichloromethane, and n-hexane. Antibacterial activity was assessed using the disc diffusion assay, while minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were determined through broth microdilution followed by subculturing. Qualitative phytochemical screening was performed to identify major bioactive constituents.

RESULTS:

Phytochemical analysis revealed the presence of phenolics and terpenes across all extracts, while flavonoids were predominantly detected in acetone, methanol, and dichloromethane extracts, and alkaloids were mainly present in acetone extracts. Antibacterial activity varied according to both solvent type and extract combination ratio. Acetone, dichloromethane, and n-hexane extracts exhibited the most consistent inhibitory effects. The 2:1 extract combination

demonstrated the highest antibacterial activity, with an MIC of 2500 µg/mL against *S. pneumoniae* and moderate inhibition of *K. pneumoniae*. MBC assays indicated predominantly bacteriostatic activity, with no bactericidal effect observed against *K. pneumoniae*.

CONCLUSION:

The findings provide evidence supporting the antibacterial potential of *A. afra* and *L. javanica*, reinforcing their relevance in natural product-based antimicrobial research. Although the observed activity was primarily bacteriostatic, the results highlight their promise as sources of lead compounds for further optimization. Future studies should focus on bioassay-guided fractionation and structural characterization to facilitate the development of clinically relevant antimicrobial agents.

Keywords: *Artemisia afra*, *Lippia javanica*, antimicrobial resistance, MIC, MBC, medicinal plants, natural products, translational research.