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COMBATING MULTI-DRUG RESISTANCE: POTENTIALS OF KALANCHOE PINNATA EXTRACTS AGAINST BACTERIAL PATHOGENS

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Abstract

Background: The rapid rise of microbial resistance to traditional antibiotics has caused grave concerns for the treatment of infectious diseases. This serious problem increases the demand for significant plant-based antibacterial and antimicrobial drugs. Kalanchoe pinnata is one of the plants that has had significant antibacterial effects due to the presence of a wide range of bioactive compounds, so it could be an effective substitute for the current synthetic antibiotics.

The study aimed to evaluate the anti-bacterial and antioxidant properties of a methanolic extract of Kalanchoe pinnata leaves.

Materials and Methods: The preliminary phytochemical screening was performed using standard biochemical assays. The anti-bacterial activity was determined against multidrug-resistant E. coli and S. aureus using the well-diffusion method. The 2,2-diphenyl-1-picrylhydrazyl and ferric ion reducing antioxidant potential assays were used to evaluate the antioxidant activity.

Results: The methanolic extract of Kalanchoe pinnata leaves showed the presence of flavonoids, saponins, steroids, phenol, quinones, and proteins. The remarkable anti-bacterial activities were displayed against multidrug-resistant E. coli and S. aureus, with minimum inhibitory concentration values of 50 mg/mL and 12.5 mg/mL, respectively. The significant antioxidant activity was exhibited in 2,2-diphenyl-1-picrylhydrazyl and ferric ion reducing antioxidant potential assays.

Conclusion: The results of this investigation suggested that the Kalanchoe pinnata extract may be useful as an alternative for antibiotics and may have pharmacological promise in the treatment of many diseases.

Keywords: *anti-bacterial, antibiotics, antioxidant, E. coli, S. aureus, Kalanchoe pinnata, multidrug resistance.*

Introduction

Infectious diseases are regarded as a serious concern for global health, and their consequences are on the increase throughout the globe, owing mostly to drug resistance to pathogenic bacteria, which has been widely documented across the world [*Sahin A et al., 2019*]. It is a major issue when harmful bacteria become resistant to specific drugs, and the rise of multidrug-resistant strains

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