

Potential of Plant Extracts to Combat Various Pathogenic Clinical Isolates: An *In Vitro* Analysis

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ABSTRACT

Introduction: Natural sources such as plants are of great importance for the discovery of new drugs as the antibiotic resistance towards the available antibacterial agents is continuously increasing [1]. Several plants or their extracts can be used as antibacterial agents because of the presence of antimicrobial compounds [2, 3].

Objectives: The purpose of this study is to evaluate the antibacterial activity of fifteen plant extracts against twenty-two pathogenic cultures which can stimulate some serious infections in humans.

Methodology: The pathogenic species are collected from laboratory of various hospitals which were isolated from different sources like urine, sputum, H.S.V, pus and vaginal smear; Extract of plants were prepared and antibacterial activities of plant extracts were determined by disk diffusion method [4].

Results: Thirteen extracts were found to be effective against different pathogenic cultures. *Rosa damascena* and *Quercus infectoria* showed the highest antibacterial activity against eleven different strains, with maximum inhibition zone of 21 mm against *Klebsiella pneumoniae* and 23 mm against *Escherichia coli* respectively; whereas, methanolic extract of *Quercus infectoria*, *Conyza canadensis*, *Grewia asiatica*, *Foeniculum vulgare*, *Withania coagulans*, *Rosmarinus officinalis*, *Chinopodium album* also showed antibacterial effects against some bacterial strains.

Conclusion: Present study showed that the plant extracts such as *Rosa damascena* and *Quercus infectoria* have great potential to inhibit drug resistant pathogens thus could be serving as the source of new antibiotics. Future studies will focus on the purification of antimicrobial compounds from these plant extracts as well as the evaluation of doses of pure compounds by animal studies.

Keywords: Antibacterial, Bacterial pathogens, Disc diffusion, Plant extracts.

REFERENCES

1. Subramani, Ramesh, Mathivanan Narayanasamy and Klaus-D. Feussner. "Plant-derived antimicrobials to fight against multi-drug-resistant human pathogens." 3 Biotech 7 (2017): 1-15 (doi: 10.1007/s13205-017-0848-9).
2. Marina, *et al.* "The Inhibitory Effect of Plant Extracts on Growth of the Foodborne Pathogen, *Listeria monocytogenes*." Antibiotics 9 (2020): 1-13 (doi: 10.3390/antibiotics9060319).
3. Vasant, Swamini P., *et al.* "Antibacterial potential of plant extracts on ESBL and carbapenemase producing pathogens." GSC Biological and Pharmaceutical Sciences 10 (2020):173-183. (<https://doi.org/10.30574/gscbps.2020.10.3.0073>).
4. Balouiri, Mounyr, Moulay Sadiki and Saad Koraichi Ibsouda. "Methods for in vitro evaluating antimicrobial activity: A review" Journal of Pharmaceutical Analysis 6 (2016): 71-79. (<https://doi.org/10.1016/j.jpha.2015.11.005>).