

Antibacterial Activity of *Rosmarinus officinalis* (Rosemary) and *Murraya koenigii* (Curry Leaves) against Multidrug Resistant *S. aureus* and Coagulase Negative Staphylococcus Species

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Abstract : Staphylococcus species are the most versatile and adaptive organism. They are widespread and naturally found on the skin, mucosa and nose in humans. Among these, Staphylococcus aureus is the most important species. These organisms act as opportunistic pathogens and can infect various organs of the host, causing minor skin infection to severe toxin mediated diseases, and life threatening nosocomial infections. Staphylococcus aureus has acquired resistance against β -lactam antibiotics by the production of β -lactamase, and Methicillin-Resistant Staphylococcus aureus (MRSA) strains have also been reported with increasing frequency. MRSA strains have been associated with nosocomial as well as community acquired infections. Medicinal plants have enormous potential as antimicrobial substances and have been used in traditional medicine. Search for medicinally valuable plants with antimicrobial activity is being emphasized due to increasing antibiotic resistance in bacteria. In the present study, the antibacterial potential of *Rosmarinus officinalis* (Rosemary) and *Murraya koenigii* (curry leaves) was evaluated. These are common household herbs used in food as enhancer of flavor and aroma. The crude aqueous infusion, decoction and ethanolic extracts of curry leaves and rosemary and essential oil of rosemary were investigated in the present study for antibacterial activity against multi-drug resistant Staphylococcus strains using well diffusion method. In the present study, 60 Multi-drug resistant clinical isolates of *S. aureus* (43) and Coagulase Negative Staphylococci (CoNS) (17) were screened against different concentrations of crude extracts of *Rosmarinus officinalis* and *Murraya koenigii*. Out of these 60 isolates, 43 were sensitive to the aqueous infusion of rosemary; 23 to aqueous decoction and 58 to ethanolic extract whereas, 24 isolates were sensitive to the essential oil. In the case of the curry leaves, no antibacterial activity was observed in aqueous infusion and decoction while only 14 isolates were sensitive to the ethanolic extract. The aqueous infusion of rosemary (50% concentration) exhibited a zone of inhibition of 21(\pm 5.69) mm. against CoNS and 17(\pm 4.77) mm. against *S. aureus*, the zone of inhibition of 50% concentration of aqueous decoction of rosemary was also larger against CoNS 17(\pm 5.78) mm. then *S. aureus* 13(\pm 6.91) mm. and the 50% concentrated ethanolic extract showed almost similar zone of inhibition in *S. aureus* 22(\pm 3.61) mm. and CoNS 21(\pm 7.64) mm. whereas, the essential oil of rosemary showed greater zone of inhibition against *S. aureus* i.e., 16(\pm 4.67) mm. while CoNS showed 15(\pm 6.94) mm. These results show that ethanolic extract of rosemary has significant antibacterial activity. Aqueous infusion and decoction of curry leaves revealed no significant antibacterial potential against all Staphylococcal species and ethanolic extract also showed only a weak response. Staphylococcus strains were susceptible to crude extracts and essential oil of rosemary in a dose depend manner, where the aqueous infusion showed highest zone of inhibition and ethanolic extract also demonstrated antistaphylococcal activity. These results demonstrate that rosemary possesses antistaphylococcal activity.

Keywords : antibacterial activity, curry leaves, multidrug resistant, rosemary, *S. aureus*

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