

Antibacterial Effects of Some Medicinal and Aromatic Plant Extracts on Pathogenic Bacteria Isolated from Pear Orchards

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Abstract : Bacterial diseases are very destructive and cause economic losses on pears. Promising plant extracts for the management of plant diseases are environmentally safe, long-lasting and extracts of certain plants contain alkaloids, tannins, quinones, coumarins, phenolic compounds, and phytoalexins. In this study, bacteria were isolated from different parts of pear exhibiting characteristic symptoms of bacterial diseases from the Central Anatolia, Turkey. Pathogenic bacteria were identified by morphological, physiological, biochemical and molecular methods as fire blight (*Erwinia amylovora* (39%)), bacterial blossom blast and blister bark (*Pseudomonas syringae* pv. *syringae* (22%)), crown gall (*Rhizobium radiobacter* (1%)) from different pear cultivars, and determined virulence levels of the pathogens with pathogenicity tests. The air-dried 25 plant material was ground into fine powder and extraction was performed at room temperature by maceration with 80% (v/v) methanol/distilled water. The minimum inhibitory concentration (MIC) values were determined by using modified disc diffusion method at five different concentrations and streptomycin sulphate was used as control chemical. Bacterial suspensions were prepared as 10^8 CFU ml⁻¹ densities and 100 µl bacterial suspensions were spread to TSA medium. Antimicrobial activity was evaluated by measuring the inhibition zones in reference to the test organisms. Among the tested plants, *Origanum vulgare*, *Hedera helix*, *Satureja hortensis*, *Rhus coriaria*, *Eucalyptus globulus*, *Rosmarinus officinalis*, *Ocimum basilicum*, *Salvia officinalis*, *Cuminum cyminum* and *Thymus vulgaris* showed a good antibacterial activity and they inhibited the growth of the pathogens with inhibition zone diameter ranging from 7 to 27 mm at 20% (w/v) in absolute methanol in vitro conditions. In vivo, the highest efficacy was determined as 27% on reducing tumor formation of *R. radiobacter*, and 48% and 41% on reducing shoot blight of *E. amylovora* and *P. s. pv. syringae* on pear seedlings, respectively. Obtaining data indicated that some plant extracts may be used against the bacterial diseases on pome fruits within sustainable and organic management programs.

Keywords : bacteria, eco-friendly management, organic, pear, plant extract

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