

Fungicidal Evaluation of Essential Oils of Medicinal Plants for the Management of Early Blight Pathogen (*Alternaria solani*) in Pakistan

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Abstract : Early blight caused by *Alternaria solani* Sorauer is one of the most serious foliage diseases of the potato (*Solanum tuberosum* L.). This disease causes huge crop losses and has major economic importance worldwide. The antifungal activity for three medicinal plants (*Foeniculum vulgare*, *Syzygium aromaticum*, and *Eucalyptus citriodora*) against *Alternaria solani* has been evaluated. The inhibitory potential of selected essential oils on the radial mycelial growth and germination of spore was measured in vitro at various concentrations (5%, 2.5%, 1.25%, 0.625%, and 0.312%) using agar well diffusion assay. Essential oil of *E. citriodora* was most effective causing 85% inhibition of mycelial growth and 88% inhibition of spore germination at 0.625% and 1.25% concentrations. Essential oil of *Foeniculum vulgare* also caused 80% and 82% inhibition of the above mentioned parameters but at double the concentrations 1.25% and 2.5%. While essential oil of *Syzygium aromaticum* was least effective in controlling the mycelial growth and spore germination with 76% and 77% inhibition at 1.25% and 2.5%. All the selected essential oils, especially *E. citriodora*, showed marked antimicrobial activity significant at higher concentration. These results suggest that the use of essential oils for the control of *A. solani* can reduce environmental risks related with commercial fungicides, lower cost for control, and the chances for resistance development. Additional studies are essential to evaluate the potential of essential oils as natural treatments for this disease.

Keywords : clove, essential oils, fennel, potato

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