In vitro and in vivo antifungal activity of botanical oils against Alternaria solani causing early blight of tomato

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Abstract:

In vitro as well as in vivo activities, it was investigated to examine if different botanical oils have any effects on the radial growth of A. solani and are able to reduce early blight incidence and severity in the field condition. Oils from various plant sources such as Jojoba (Simmondsia chinensis), Ginger (Zingiber officinale Roscoe), Garlic (Allium sativum), Clove (Syzygium aromaticum), Sesame (Sesamum indicum), Eucalyptus (Eucalyptus glabulus), Cinnamon (Cinnamon zylanicum) and Castor (Ricinu communis), lemon (Citrus limon) and mustard (Brassica nigra) were tested at concentration of 0.1%, 1% and 3% to determine their effects on the mycelial growth of A. solani. The 3% dosage of oil of ginger, lemon and castor inhibited the maximum radial growth of A. solani by 29.6%, 29% and 27% respectively. Meanwhile, the 1% concentration of lemon oil was also recorded the maximum growth inhibition of the pathogen by 27%. Moderate to lowest inhibition of the fungal growth was observed with cinnamon oil (21.6%) followed by oil of mustard (21%), jojoba (21%) and garlic 20%. In vivo, at 1% concentration, the least disease incidence of 29.7% and 29.8% were achieved on plants treated with oil of garlic and lemon, respectively. Severity of early blight was significantly reduced by 34.9% of clove oil followed by 34.3% and 34.2% of eucalyptus and garlic, respectively. Fruit yield of tomato was totally increased with all oil treatment, clove oil significantly improved plant height and increased fruit yield by 58.3Kg/plot.

Keywords:

Botanical oils, Early blight, Alternaria solani, Tomato

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