Biocontrol of Post-harvest Fungal Diseases of Citrus Scinensis (Sweet Orange) Using Leaf Extracts of Azadirachta Indica (Neem) and Chromolaena Odorata

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Abstract

Post-harvest deterioration is a major problem of sweet orange (C. sinensis) production in Akwa Ibom State, Nigeria. Miicrobial infection of the fruits is mainly responsible. The present study was therefore, carried out to identify and biologically control the micro-organisms responsible for orange fruit rot during storage. Aqueous leaf extracts of Azadirachta indica and Chromolaena odorata were used as biological agents against fungal isolates. Samples of rotten orange fruits were collected from different markets across the state. Four fungal isolates (Penicillium digitatum, Aspergillus niger, Aspergillus flavus and Cladosporium herbarum) obtained from naturally infected fruits were confirmed to be causal agents through pathogenicity testing. Phytochemical analysis of the extracts revealed higher amounts of polyphenols, flavonoids, saponin, tannin and alkaloids in A. indica compared to C. odorata. In-vitro investigations showed that 30% concentration of A. indica leaf extracts caused highest mycelial growth inhibition of the four pathogens (70, 75, 83 and 88% respectively) compared to the control, while extracts of C. odorata caused relatively lower inhibition of mycelial growth (50, 61, 61, 62% respectively) at the same concentration. Percentage inhibition increased with increase in extract concentration. These results indicate that aqueous leaf extract of A. indica is a better biocontrol agent of post-harvest orange fruit fungal diseases. Further studies are ongoing to test the validity of these results in the field.