Wimalasena, W.W.Y.
Deshappriya, N.
PAPER

In-vitro Assays on the Effect of Four Commercially available Fungicides on Fungal Pathogens of Commonly Grown Ornamental Foliage Plants in Sri Lanka

W.W.Y. Wimalasena, & N.Deshappriya, Department of Botany & Department of Chemistry, University of Kelaniya

The foliage plant industry continues to expand in Sri Lanka, supplying rooted plants, stem cuttings and cut leaves for foreign and local markets. Diseases caused by fungal pathogens result in loss of plants and plant material as well as rejections from buyers causing extensive economic losses to growers. In order to study the common fungal diseases, plants of export -oriented foliage nurseries; Lucky growers, Bandara growers and Tropiflora International in the Central Province and Aswin Foliage and GreenSac Foliage in Wayamba Province were surveyed during October 2008 to April 2009. Plant species grown for export in these nurseries included *Dracaena, Chrysalidocarpus, Calathea, Cordyline, Aglaonema, Miscanthus, Fittonia, Philodendron* and *Livistonia* varieties. Diseases and symptoms prevalent in the plant varieties were surveyed. Leaf spots (74%), tip burns (13%), anthracnose (4%) and stem rots (9%) were observed as the major symptoms in the plant varieties evaluated and the fungal pathogens associated with these diseases were isolated and the effect of fungicides on them was tested.

Synthetic chemical fungicides could be used in the control of fungal diseases prevalent in ornamental foliage plants. However, it is important that the most effective fungicide(s) and optimal concentrations are selected. Thus the effect of four (04) commercially available fungicides containing active components hexaconazole, carbendazium, mancozeb and propineb were evaluated based on their inhibitory effect on the mycelial growth and spore germination of five (05) pathogenic fungi most frequently isolated from commonly grown foliage varieties in the nurseries surveyed **i.e.** *Fusarium* sp., *Nectria* sp., *Cylindrocarpon* sp., *Curvularia* sp. *and Acremonium* sp. Poisoned food technique was used to test the effect of fungicides on mycelial growth. Fungicides were tested at 10 mg/l, 50 mg/l, 100 mg/l, 250 mg/l, 500 mg/l concentrations incorporated separately into Potato dextrose agar (PDA) medium. Control cultures were grown on PDA plates without fungicide incorporation. There were six replicate plates for each concentration of each fungicide. For determining percentage spore germination inhibition, a concentration series of each fungicide **i.e**. 0.1 mg/l, 0.5 mg/l, 1.0 mg/l, 2.0 mg/l, 5 mg/l and 10 mg/l were tested for their germination inhibitory effect on a spore suspension of 10^8 spores/ml concentration from each fungus. Controls consisted of sterile distilled water in place of fungicides. The number of germinated spores was estimated under the microscope (20 replicate counts for each treatment) and the percentage spore germination inhibition was calculated.

Percentage mycelial growth inhibition at 10 mg/l of hexaconazole was 75% - 85% for all five fungal sp. Inhibition was 100% at 50 mg/l on *Fusarium* sp., *Nectria* sp. and *Curvularia* sp and at 100 mg/l on *Cylindrocarpon* sp. and *Acremonium* sp. Inhibition was 100% at 50 mg/l of mancozeb on *Nectria* sp. and at 100mg/l on the other four genera. Propineb at 100mg/l, showed 100% inhibition on Nectria sp., 94.5% on *Cylindrocarpon* sp and 82.7% on *Acremonium* sp. At 250 mg/l propineb showed an inhibition of 100% on *Curvularia* sp., *Acremonium* sp. and *Fusarium* sp. Carbendazium showed 100% inhibition at a concentration as low as 10 mg/l on each fungus making carbendazium the most effective of all fungicides tested.

Percentage spore germination inhibition (PSGI) is 100% at 0.5 mg/l of hexaconazole on Curvularia sp and at 1.0 mg/l on Fusarium sp., Nectria sp. Cylindrocarpon sp. and Acremonium sp. PSGI is 100% at 0.5 mg/l of mancozeb on Nectria sp., Fusarium sp. and Curvularia sp and at 1.0 mg/l on Acremonium sp. and Cylindrocarpon sp. Propineb showed 100% inhibition at 0.5 mg/l on Nectria sp, Fusarium sp. and Curvularia sp. and at 1.0 mg/l on Acremonium sp and Cylindrocarpon sp. 0.5 mg/l of carbendazium showed 100% inhibitory effect on all five fungal species tested.

Therefore, hexaconazole, propineb, mancozeb and carbendazium at 50 mg/l, 100 mg/l, 100 mg/l and 10mg/l respectively can be used for the control of the mycelial growth of most prevalent pathogens of foliage plants and the same fungicides showed 100% inhibition of spore germination of the same pathogens at 1.0 mg/l, 0.5 mg/l, 1.0 mg/l and 0.5 mg/l respectively.