

**Studies on the Natural Antifungal
Compounds from Yam tubers
(Dioscorea Alata. L.)**

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Abstract:

In order to investigate the biochemical basis of natural resistance of yam peel to fungal infection, a preliminary chromatographic bioassay of four varietal species of Dioscorea; Manihot esculentum Crantz; Solanum aethiopicum Linn.; and Xanthosoma sagittifolium Schott was undertaken. The studies revealed the presence of antifungal compounds from the peel extracts of the root crops. Four prominent antifungal components were obtained from the peels of Dioscorea alata L. out of which the component at R_f 0.38 was fully characterized. The component was identified with the aid of nuclear magnetic resonance, mass spectroscopy and colour reaction as sitosterol. It is a white crystalline solid with a melting point of 138°C.

The antifungal activity of the compounds against the germination of spores of four yam pathogens showed a percentage inhibition of below 57% at a concentration of 50 ug/ml while inhibition on the elongation of germ-tubes of Fusarium moniliforme was as high as 82% at the same concentration. However, the ED_{50} for inhibition of germ-tube elongation in the yam compounds for the same organism was below 27 ug/ml.

β - sitosterol was found to have an effective inhibitory dosage against the yam pathogens and the test fungus ranging between $1.21 - 2.4 \times 10^{-4}M$. The role of the yam compounds at high concentrations in disease resistance is discussed. The antifungal compounds have weak bacteriostatic properties with no definite pattern against both gram - positive and Gram - negative bacteria.

Keywords: Biochemical/ yam peel/ fungal infection/ chromatographic/ antifungal/ nuclear magnetic resonance/ β - sitosterol/ pathogens/ microbes

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