

Chapter 2

Post Harvest Disease Management of Root, Tuber and Bulb Crops: A Herbal Approach

Kunja Bihari Satapathy^{1*} and Ashirbad Mohapatra²

¹Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Odisha

²Department of Botany, Sri Jayadev College of Education and Technology, Bhubaneswar, Odisha

*Corresponding author Email: kbs_bot@rediffmailmail.com

Abstract

Studies on the post-harvest fungal decay of some root, tuber and bulb crops in store houses and market places of Odisha revealed that eight genera of fungi comprising of ten species were responsible for causing storage decay in potato, colocasia, amorphophallus, sweet potato, yam, carrot, radish, beet, garlic and onion. Rotten samples were collected from various places of Odisha and the incidence of rotting was observed in frequencies ranging from 9.74% to 50.3% of the samples studied. *Aspergillus*, *Geotrichum*, *Penicillium* and *Rhizopus* were observed to be the dominant fungi causing maximum loss of these vegetables in storage condition.

The data on the growth-inhibition of ten fungal species causing storage decay of vegetables under study by using aqueous, petroleum ether and methanolic leaf extract of sixteen angiospermic plants confirmed that the petroleum ether and methanolic leaf extracts were more efficient than their respective aqueous extracts. Petroleum ether and methanolic extracts of all the sixteen plants tested were found to be severe to moderately efficient against the test fungi while the aqueous leaf extracts resulted in mild to insignificantly efficient as regards to inhibition of the mycelial growth. Out of the sixteen plants tested, extracts of *Ageratum conyzoides*, *Alstonia scholaris* and *Averrhoa carambola* were observed to be more efficient than extracts of other plants tested.

Comparative efficacy of plant extracts (petroleum ether and methanolic extract of *Ageratum conyzoides*, *Alstonia scholaris* and *Averrhoa carambola*) with the commercial fungicides (Blitox-50, Dhanustin, Indofil and Macozeb) revealed that plant extracts were significantly more efficient to inhibit the mycelial growth of ten test fungi than that of commercial fungicides.

Studies conducted with different herbal formulations prepared to be recommended as bio-fungicides for management storage decay of these vegetables revealed that the combination of different plant extracts had comparatively more efficient in inhibiting the mycelial growth of some fungi tested as compared to individual extracts. It was interesting to note that the combination of petroleum ether and methanolic leaf extracts of *Ageratum conyzoides*, *Alstonia scholaris* and *Averrhoa carambola* could completely inhibit the mycelial growth of all the test fungi.

It is suggested that the extracts of effective experimental plants of the present study may be utilized as post-harvest dips for the control of storage decay of root, tuber and bulb