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Effect of fungicide treatment on seedborne fungi and seed germination in certain medicinally important tree species

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SUMMARY

Seed pathogens of trees have attracted considerable attention over the last few decades. There is a conspicuous need to understand the impact of these pathogens in tree seeds and means to manage them and reduce losses. Studies were conducted to collect seed samples from infected seed bearing trees (*Holarrhena antidysenterica*, *Lagerstroemia lanceolata*, *Madhuca latifolia* and *Wrightia tinctoria*) in forests of Bhadra Wildlife sanctuary and to test them for the occurrence of seedborne fungi and germination. Results of incubation test indicated that seed samples harboured 21 species of 15 genera of seedborne fungi. Some of the pathogenic fungi are species of *Alternaria, Cercospora, Colletotrichum, Curvularia, Fusarium, Macrophomina, Myrothecium, Pestalotiopsis, Phoma* and *Phomopsis*. Seed samples were treated by dusting with fungicides – captan, indofil Z-78 or zineb individually and a combination of captan and zineb. Zineb and its combination with captan were very effective in significantly reducing the incidences of seed mycoflora as well as improving the seed germinability of the selected tree species. Since the seed treatment with fungicides is easy, economical and effective, it helps to generate healthy and disease-free seedlings in nursery and avoid spread of seedborne disease to out plantings in plantations and forests.

Key words : Medicinal tree species, Seed germination, Seedborne mycoflora, Fungicides, Bhadra Wildlife Sanctuary.

Seeds are of paramount importance for the propagation of a majority of forest trees. The requirement for good quality seeds has increased tremendously in recent years in view of the demand for tree species being planted under afforestation and reforestation programmes. Seeds are also in great demand for their valuable oils and other products by seed based industries. Although seeds loose their viability and even die in storage through natural ageing, storage fungi, such as species of *Aspergillus* and *Penicillium*, do contribute significantly towards a reduction in the viability or death of seeds (Mittal and Wang, 1993). Tree seeds of forest origin, like those of agricultural crops, are known to carry fungi in or on seeds as surface contaminants and might attack seed coat, cotyledons and even embryo and cause damage to seedlings. There has been a lot of reports on the incidence of seedborne diseases of tree species (Purohit *et al*., 1998; Singh and Khan, 1999; Naik *et al*., 2001) grown in social forests, avenues or in other places. However, literature on seedborne diseases of medicinally important tree species growing in protected forests like sanctuaries is scanty. Tree species like *Holarrhena, Lagerstroemia, Madhuca* and *Wrightia* growing widely in and around the sanctuary have medicinal values in their leaves, bark, fruits and seeds (Anon., 1992; Nadakarni, 1976 and Kirtikar and Basu, 1995). The purpose of the present investigation is to detect and record fungi associated with seeds of certain medicinally important forest tree species like *H. antidysenterica, L. lanceolata M. latifolia,* and *W. tinctoria* and management of seed borne fungi with fungicidal seed treatment.

MATERIALS AND METHODS

Collection of seed samples:

Bhadra Wildlife Sanctuary of the Western Ghats, occupying an area of about 492.46 sq km, is located in the Western Ghats region of Karnataka. The forest types are mainly semi-evergreen, tropical moist deciduous and dry deciduous forests, scrubs, forest plantations as well shola-like forests and grasslands. The sanctuary is an abode for a variety of tree species with medicinal values.

Seed bearing trees, which produced infected foliages in twelve state forest regions - Aldara, Gangegiri, Hebbegiri, Kagemanegiri, Kakanahosudi, Kemmannugundi, Lakkavalli, Madhuguni, Madla, Muthodi, Singanamane and Thammadihalli - of the sanctuary were identified and labelled during April-May, 2002. Seeds (200 g/tree) were collected separately in cloth bags from five labelled trees of the same species in each state forest region and composite samples (1000 g) were prepared by mixing individual seed samples. In case of *L. lanceolata*, only 500 g of seeds (from five trees) were used for deriving the composite. From this composite sample, working samples were derived for determining

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