Chapter - v

SEED MYCOFLORA

INTRODUCTION

Seeds are vitally significant for healthy production of any crop. They are supposed to carry pathogens. Microorganisms associated with seeds cause extensive damage to them. In some cases, even the nutritive value of seed get deteriorated (Mishra and Kanaujia, 1973; Bilgrami et al., 1976; Sinha and Prasad, 1977). While in others, the changes brought about in seeds by microorganisms affect the process of seed germination (Grewal and Pal, 1965).

The occurrence of fungi in or on seed surface depend on their ability to survive and to proliferate under extreme dry conditions. It seems that the presence of moisture is a prime factor in colonization of seed by fungi.

A major objective of seed health testing is assessment of the planting value of seeds. Such tests reveal not only germination percentage of seed lots but the presence of disease as well.

REVIEW OF LITERATURE

As per surveys of the literature, the first available recorded evidence of realizing the importance of seed borne fungi is that of
Remnant (1937). Presently several informations about seed mycoflora are available viz., Mathur and Flavia (1975); Madhav Rao (1977); Flannigan (1978); Bateman (1979); Narayan and Prasad (1981); Nair (1982); Reddy and Dayanand (1983); Dadwal et al. (1986) & Yadav and Duhan (1992).

Many fungi are serious parasites of seed primordia and maturing seeds and they reduce yield of seeds both qualitatively and quantitatively (Neergaard, 1977).

As regards Vitex negundo a considerable work has been done in India most of them report occurance of different fungi on various part of this plant.

In 1914, Sydow reported a fungus Ramularia viticis from Tamilnadu causing leaf spot on V. negundo. Mitter and Tondon, (1935) observed Poria spp on leaves of this plant from Allahabad. Stevens and Pierce, (1933); Uppal et al., (1935); and Stevens and Rayan, (1939) have noticed leaf spot disease of V. negundo due to the presence of Asterina sphaerotheca. Cercopora viticis also caused leaf spot disease in Karnataka, Hyderabad and Darbhanga (Govindu and Thirumalachar, 1956; Rao, 1962; Yadav, 1963; & Pandotra and Ganguly, 1964). Agarwal and Hasija, (1961) recognized Cercospora agarwali on ‘nirgundi’ leaves from Jabalpur. Pithomyces maydicus and Curvularia lunata were observed on leaves in Bedagara (Kerala) and Bhagalpur (Ponnappa, 1967; and Roy, 1976).
On dead stem of *V. negundo*, the fungi *Ophioceras petrakii* (Tilak and Kale, 1969), and *Massaria kamatti* (Bordoloi et al., 1971) were recorded in Aurangabad. *Crumenula indica* and *Boerlagella indica* (Tilak and Kale, 1970), and *Mytilidon kamatti* (Tilak and Jadhav, 1970), were observed in Awarad whereas, *Tremetasphaeria indica* (Tilak and Jadhav, 1971) was noticed in Hallali Decan.

*Diatrype viticis* was interesting fungi isolated from Khandala in association with the bark of *V. negundo* as saprophyte (Tendulkar, 1970).

*Bagnisiella vitatis* was also recorded on *V. negundo* from Khandala by Vaidya (1980).

However it seems that no work has been carried out so far to study the fungi associated with the seed of *V. negundo*. Thus, an attempt was made to determine mycoflora of ‘Nirgundi’ seeds.

**MATERIALS AND METHOD**

The most common method used in the study of mycoflora of seeds is the standard incubation method i.e the agar plate method (Neergaard, 1977).

In the agar method seeds were directly plated on Potato-Dextrose-Agar (PDA). In other methods seeds were washed in distilled water
PLATE - 1: PDA culture of seed mycoflora in pre-soaked leachates of *Vitex negundo* Linn.

PLATE - 2: PDA culture of seed mycoflora in dry seeds of *Vitex negundo* Linn.
for 5 minutes, then two or three drops of this wash-water were placed on agar medium.

To isolate the external seed mycoflora these plates were incubated at 27-28° C for 7 days under diffused light. Plates were examined every other day starting from 3rd day of incubation.

RESULTS AND DISCUSSION

Total eight fungi were isolated from the seeds of *V. negundo*. One of the belonged to class Ascomycetes, four to Deuteromycetes and three to Zygomyces.

Seed washing test revealed fungal spore of five different genera. The most important and dominating fungi was *Mucor abundance* and *Rhizopus stolonifer*. Other fungi encountered were *Alternaria solani Eurotium spp; Helminthosporium spp;* and *Pacilomyces spp.*

When dry seeds were directly placed on PDA, four fungi of four different genera were recorded. Amongst them *Aspergillus niger, Mucor abundance* and *Rhizopus stolonifer* were dominant. Interestingly fungi known to be serious pathogen of some crop namely *Choanophora cucurbitarum* was also recorded in the present study.
Fungi associated with *Vitex* seeds affected its germination process. However *A. niger*, *M. abundance* and *R. stolonifer* were lost during seed germination.

In a short process of seed imbibition, the fungus may derange the cell organelles. *Russel et al.* (1982) demonstrated ultrastructure change in the fungus infected maize (*Zea Mays*) seed imbibed for 12 hours only.

Results of several workers indicate that externally seed borne fungi may lower the protein content of seed (*Singh et al.* 1973; 1974; *Jamaluddin et al.* 1977; & *Sinha* and *Prasad*, 1978). The phytotoxic effect of fungi present on seed surface may lower or inhibit the seed germination.

Trimodal seed transmission of plant pathogens is a testimony substantiated by cumulative literature (*Baker*, 1972; *Neergaard*, 1977; *Sinha*, 1977; *Khare* and *Sinha*, 1983). Such pathogens are associated with seeds either externally, internally or are accompanied with them. Imbibed seeds are an excellent substrate for the proliferation of microbes either inside or on its surface.