

Standardisation of seed health testing in *Albizia lebbbeck*

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Abstract: Seed health testing was carried out for twelve different seed lots of *Albizia lebbbeck* collected from different agroclimatic zones of Tamil Nadu, using blotter and agar medium. A total of eight and six fungal genera were recorded in blotter and agar medium respectively. *Aspergillus niger*, *A.flavus*, *Penicillium* spp., *Alternaria* spp., *Geotrichum* spp. and *Chaetomium* spp. were the dominant and most frequently occurring fungal species in most of the seed lots. Overall occurrence of fungal organisms was recorded more in blotter method and this method is the most suited for the identification of the fungal species associated with *A.lebbbeck* seeds compared to the agar medium.

Key words : *Albizia lebbbeck*, Seed health test, Blotter method, Agar medium.

Introduction

Albizia lebbbeck a nitrogen fixing, semi deciduous tree that are widely planted as avenue tree and in gardens belongs to the family Mimosaceae. By virtue of its better growth rate, good coppicing power, fodder as well as wood value, it is preferred for the afforestation programmes and in farm forestry. Pods and seeds of *Albizia lebbbeck* are infected by disease causing organisms, starting from maturity till harvest, which extends in storage also. Such infected seeds could be expected to ultimately result in the introduction of variety of diseases, which cause damage to seedlings and field establishment. Therefore, identification of fungal pathogen that causes diseases and recommendation of a suitable fungicidal treatment are highly essential for this tree species. Hence, a seed health test was conducted to standardize a suitable medium for identification of seed microflora associated with *Albizia lebbbeck* seeds.

Materials and Methods

The pods were collected from the candidate plus trees of different regions viz. Tirunelveli, Kamanathapuram, Madurai, Aruppukottai, Anaimalai, Aliyar, Coimbatore, Mettupalayam, Erode, Salem, Chengalpet and Trichy. After the extraction of seeds, standardisation of seed health test was carried out at the Department of Seed Science and Technology, TNAU, Coimbatore during 2000-2001 with the seeds collected from twelve seed lots with blotter

and potato dextrose agar (PDA) method. A sample of 4 x 100 seeds were drawn from the working sample of twelve seed lots. In blotter method, seeds were placed at equal distance in sterile petri plates containing three layers of moist filter paper (blotters). Then, they were incubated at $30 \pm 2^{\circ}\text{C}$ under 12 hr of alternate cycles of light and darkness in a growth chamber fitted with two white fluorescent tubelights. As the blotter became dry by 4th and 5th day of incubation, sterile distilled water was added to moisten the filter paper. In Agar method, PDA was used as the medium to identify the presence of seed-borne fungi. The procedure was the same as followed in blotter medium except addition of water. After 8-10 days of incubation, using stereoscopic binocular microscope, the presence and frequency of seed borne fungi were identified to the generic level in both the methods.

Results and Discussion

Under blotted method, a total of eight different fungal genera were recorded in the seed lots of *A.lebbbeck*. *Aspergillus niger*, *A.flavus*, *Penicillium* spp., *Alternaria* spp., *Geotrichum* spp. and *Chaetomium* spp. were the frequently recorded fungal species in most of the seed lots.

Aspergillus tenuis was recorded only in Tirunelveli seed alone. *Mucor* spp. was found to occur in seeds from Tirunelveli, Anaimalai, Coimbatore and Erode. *Geotrichum* spp. was

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Table 1. Seedborne fungi and their frequency (%) on various seed lots of *A. lebbeck* seeds in blotter test.

Seed lot	<i>Aspergillus niger</i>	<i>Aspergillus tenuis</i>	<i>Aspergillus flavus</i>	<i>Mucor</i> spp.	<i>Penicillium</i> spp.	<i>Alternaria</i> spp.	<i>Geotrichum</i> spp.	<i>Chaetomium</i> spp.	<i>Curvularia</i> spp.	<i>Fusarium</i> spp.
Tirunelveli	42	5	27	8	-	10	-	-	-	-
Ramanathapuram	9	-	25	-	3	28	-	20	-	-
Madurai	-	-	9	-	-	-	-	18	-	-
Aruppukottai	-	-	-	-	-	-	-	-	-	-
Anamalai	17	-	32	9	2	9	-	5	5	-
Aliyar	3	-	18	-	-	13	10	7	-	5
Coimbatore	15	-	15	5	-	-	-	5	-	-
Mettupalayam	5	-	6	-	-	-	-	5	-	-
Erode	28	-	29	4	-	-	-	4	-	-
Salem	64	-	69	-	36	31	-	-	-	21
Chengalpet	33	-	31	-	19	28	5	-	-	11
Trichy	44	-	19	-	-	10	-	-	-	5

No analysed statistically.

Table 2. Seedborne fungi and their frequency (%) on various seed lots of *A. lebbeck* seeds in agar medium.

Seed lot	<i>Aspergillus niger</i>	<i>Aspergillus flavus</i>	<i>Aspergillus fumigatus</i>	<i>Aspergillus clavatus</i>	<i>Penicillium</i> spp.	<i>Alternaria</i> spp.
Tirunelveli	28	-	-	-	-	-
Ramanathapuram	8	16	-	-	-	-
Madurai	-	4	4	4	-	-
Aruppukottai	4	-	-	-	-	-
Anamalai	8	8	4	-	-	-
Aliyar	4	8	-	-	-	-
Coimbatore	12	4	-	-	8	4
Mettupalayam	8	4	8	8	-	-
Erode	16	-	8	-	-	4
Salem	36	20	-	8	24	4
Chengalpet	24	4	-	-	-	-
Trichy	32	4	-	-	-	-

Not analysed statistically.

identified in Aliyar and Chengalpet while occurrence of *Curvularia* spp. was confined to Anaimalai alone. Among the seed lots, the seeds collected from Madurai recorded less number of fungal

species i.e., *Aspergillus flavus* and *Chaetomium* spp. whereas presence of *Aspergillus niger* and *A. flavus* were abundant in seeds collected from Salem and Chengalpet (Table 1). Assessing the

seed borne fungi under agar method revealed that a total of six fungi, mostly *Aspergillus* spp. were isolated from the seeds. Among them, the fungal species *A.niger* and *A.flavus* were predominant in almost all the twelve seed lots. Seeds from Madurai, Mettupalayam and Salem recorded the presence of *Aspergillus clavatus*. Seeds from Salem, Chengalpet and Trichy showed higher percentage of fungal infection of *Aspergillus flavus*, whereas the fungal association was less in seeds of Madurai (Table 2).

Compared to agar method, the blotter method has an effective medium, which exhibited more number of fungal pathogens. The most commonly occurring fungi in both the methods were *Aspergillus flavus*, *A.niger*, *Penicillium* spp., *Trichoderma* spp. and *Alternaria* spp. The moist blotter medium would have provided the ideal substratum for the growth of fungi. Davan (1986) also stated that presence of fungi was much higher in blotter method than on the agar plate method. Among the seedlots of *A.lebbbeck*, Mettupalayam (56) followed by Madurai (27) recorded minimum fungal colonies, whereas Salem seedlot had shown maximum of 221 fungal colonies followed by Chengalpet (127).

A plethora of literatures revealed that seeds of *Pinus*, *Cedrus*, *Dalbergia*, *Cassia* and *Eucalyptus citridora* the seed borne fungi *Aspergillus* and *Penicillium* spp. were the most prevalent (Munjal and Sharma, 1975; Mittal and Sharma, 1979; 1980; 1981; 1982). Presence of seed mycoflora was also recorded in *Butea monosperma* (Purohit and Jamaluddin, 1993); *Leucaena leucoloba*, *Cassia siamea*, *Bauhinia variegata* and *Acacia catechu* (Bharadwaj and Paul, 1995). Mohan (1997) assessed the seed health of four selected tropical tree seeds and found few fungal species that cause seed borne disease.

From this study, it can be concluded that the blotter medium is the best for the assessment of the seed health test for *A.lebbbeck*.

Reference

- Bharadwaj, L.N. and Paul, V.S. (1995). Studies on seed mycoflora of some forest tree species and their control. *J. Trop. For.* 11: 41-43.
- Davan, M.P. (1986). Fungi associated with different forest tree seeds of the Forest Research Institute, Seed bank. *Environ.* 2: 28-39.
- Mittal, R.K. and Sharma, M.R. (1979). Studies on the mycoflora and its control on the seeds of *Eucalyptus citridora* Hook. In: Symposium on the vegetation wealth of Himalayas. University of Garhwal, Srinagar, U.P.; October 1979, p.79.
- Mittal, R.K. and Sharma, M.R. (1980). Seed mycoflora of *Dalbergia sissoo*. In: The 7th Annual Session of the Society for Advancement of Botany, India, June, 1980 in Dehradun, p.28.
- Mittal, R.K. and Sharma, M.R. (1981). Seed mycoflora of *Cassia fistula* L. *Indian J. For.* 4: 70.
- Mittal, R.K. and Sharma, M.R. (1982). Seed mycoflora of *Albizia lebbbeck*. *Indian J. For.* 5: 156-157.
- Mohan, C. (1997). Seed health problems in selected tropical recalcitrant and orthodox forest tree seeds and their impact on seedling production. IUFRO symposium on "Innovations in forest tree seed science and nursery technology", November 22-25, Pt.Ravi-shankar Shukla University, Raipur, India, p.72.
- Munjal, R.L. and Sharma, A.D. (1975). Mycoflora of conifer seeds. *Indian J. Mycol. Pl. Pathol.* 5: 145-148.
- Purohit, M. and Jamaluddin (1993). Seed mycoflora of palas (*Butea monosperma* (Lam) Taub.) during storage. *Seed Res.* 21: 126-127.

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