

Seed Mycoflora of Kusum (*Schleichera Oleosa* {Lour} Oken, Family Sapindaceae) and Their Frequency Variation during One Year of Fungal Infestation

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Abstract

The tree kusum, *Schleichera oleosa* (Lour.) Oken syn: *S. trijuga* is large and beautiful. The tree yields a high quality lac called Mirzapur lac, which is used in producing varnish of high quality apart from several other things. This work is based on the collected and stored seeds made by forest department, (Minor Forest Produce) Ranchi. The seeds were taken from the store house of the forest department where it was stored for one year at best, for this research work. In view of the review, attempts have been made here to study and record the association of kusum seeds with surface contaminants and persistent seed borne fungi for a period of one year at intervals of one month each. The results have been presented for externally and internally present fungal types isolated as seed borne fungi. It is evident from the study that non sterilized seeds within one month of infestation, fourteen fungal species were found of which many were apparently surface contaminants. These fungal forms were *Aspergillus niger*, *Aspergillus fumigates*, *Aspergillus flavus*, *Penicillium notatum*, *Cercospora concors*, *Alternaria sesame*, *Paecilomyces variotii*, *Rhizoctonia solani*, *Macrophomina phaseolina*, *Curcularia piñata*, *Fusarium solani*, *Fusarium oxysporum*, *Fusarium moniliforme* and *Mucor sp.* On these 14 fungal isolates *Aspergillus niger*, *Aspergillus fumigates*, *Aspergillus flavus*, *Penicillium notatum*, *Paecilomyces variotii*, *Fusarium solani* and *Alternaria sesame* were dominant and were found in large frequencies. This finding will certainly help us to draw the strategies of combating the menace arising out of myco infestation.

KEYWORDS: contaminants, , frequencies, infestation, stored seeds.

Introduction

Seed pathology has acquired a new dimension during the last five decades. It is well understood that storage of seeds under unsanitary conditions, as commonly seen in Jharkhand, results in their molding and subsequent deterioration.

In Jharkhand, the preservation of the seeds is a great problem and a favourable condition of temperature, moisture during storage process make the seeds open to the invasion of pathogens. The seeds were collected just after the onset of the rainy seasons in Jharkhand. Survey of store houses of kusum seeds were found to be heavily infested with rats, moles etc. This together with the fungal infestation, often rodent borne, compounds the situation and the seeds get badly damaged and cause losses in their germinability and total food reserve (CHRISTENSEN, 1970; MONDAL et. al. 1981; MALLICK and NANDI, 1982 a, 82b, 82c). There are many reports which indicate that the fungi are associated with the seeds and are found present there as the surface dwellers as well as internal mycoflora. Such association of infested seeds with fungi have been recorded by several workers (CHRISTENSEN and KAUFMAN, 1965; DELPRADO and

CHRISTENSEN, 1952; FLANIGAN, 1969; MISHRA and KANAUIA, 1973; NANDI and FRIES, 1976; AGARWAL et. al., 1980. There are many reports indicating that fungi are associated with seed surface as well as internal mycoflora (DUTTA & ROY , 1987 . It was worthwhile to seek the extent of colonization of the seeds in terms of fungal species during storage.

MATERIALS AND METHODS

Kusum seeds were obtained from the godown of Ranchi forest department for the preparation of oil and oilcake on regular interval of one month. The work spanned from June 2011, one harvest season to May 2012, just before the other harvest season. The fungal forms were cultivated in CZEPEK sucrose nitrate medium (CONN,1921), malt extract agar and potato dextrose agar medium (RIKER and RIKER, 1949).

RESULTS and DISCUSSIONS

The results have been presented for externally and internally present fungal types isolated as seed borne fungi. It is evident from the study that in non sterilized seeds, within one month of infestation, fourteen fungal species were found of which many were apparently surface contaminants. These fungal forms were *Aspergillus niger*, *Aspergillus fumigates*, *Aspergillus flavus*, *Penicillium notatum*, *Cercospora concors*, *Alternaria sesame*, *Paecilomyces variotii*, *Rhizoctonia solani*, *Macrophomina phaseolina*, *Curvularia lunata*, *Fusarium solani*, *Fusarium oxysporum*, *Fusarium moniliforme* and *Mucor sp.* Of these 14 fungal isolates *Aspergillus niger*, *Aspergillus fumigates*, *Aspergillus flavus*, *Penicillium notatum*, *Paecilomyces variotii*, *Fusarium solani* and *Alternaria sesame* were dominant and were found in greater frequencies. The percentage frequency of occurrence increased regularly and steadily upto eleven months , from July 2011 to may 2012. On the other hand, the percentage frequency of *Cercospora concors*, *Rhizoctonia solani*, *Macrophomina phaseolina*, *Curvularia lunata*, *Fusarium moniliformae*, *F. oxysporum* and *Mucor sp.* diminished at regular intervals. The frequency occurrence of *Aspergillus fumigatus* and *Fusarium solani* steadily increased through eleven months. The frequency occurrence of *Aspergillus niger*, *A. flavus*, *Penicillium notatum*, *Alternaria sesame* and *Paecilomyces variotii* remained constant all through the duration. Two of these fungi, *Cercospora concors* and *Alternaria sesame* that cause leaf rot disease of *Schleichera*, might have contaminated the seeds externally by being carried out to them from infested leaves.

Several literatures are available depicting the association fungi with seeds especially during storage. MISRA and KANAUIA(1973) found frequent occurrence of *Aspergillus flavus*, *A. niger* and *A. fumigatus* on mustard, linseed and sesame seeds during storage. *Curvularia lunata* was associated with *Brassica nigra* seeds. AGARWAL et. al., (1980) reported a very high incidence of *Fusarium moniliformae*, *Aspergillus flavus*, *A. niger* and *A. fumigatus* from the freshly harvested wheat seeds from Madhya Pradesh. NANDI and FRIES (1976) found a few fungi from wheat grains including *Alternaria sp.*. GHOSH et . al., (1981) the incidence of species of *Aspergillus* and *Penicillium* leading to a significant drop in the crop productivity in wheat. MONDAL et. al., (1981) investigated seed mycoflora of oilseeds and reported the presence of the three *Aspergillus* species. SRIVASTAVA and GUPTA (1981) recorded among other forms,

Aspergillus flavus, *A. niger*, *Alternaria alternata*, *Curvularia lunata*, *Fusarium moniliformae*, *Penicillium chrysogenum* and *Fusarium oxysporum*. Of these fungi several were found to contaminate the seeds of kusum also. Thus these findings are in agreement with the current results.

Fungi occurring on non-sterilized Kusum seeds and their frequencies taken at 1 month interval for the duration of one year

FREQUENCY OF OCCURRENCE (PERCENT)

	CONTROL						2011							
	2012	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr		
May	SD	SE												
<i>Aspergillus niger</i>	0	9	10	10	11	11	12	13	12	12	11	10	3.26	0.94
<i>Aspergillus fumigates</i>	0	14	15	16	17	20	22	23	26	33	33	36	10.05	2.90
<i>Aspergillus flavus</i>	0	7	7	8	9	10	11	12	13	13	13	14	3.93	1.13
<i>Penicillium notatum</i>	0	16	16	17	18	18	18	18	16	13	13	10	5.19	1.5
<i>Alternaria sesami</i>	0	7	7	8	7	6	5	5	4	3	3	3	2.33	0.67
<i>Cercospora concors</i>	0	5	6	6	5	3	2	1	0	0	0	0	2.53	0.73
<i>Paecilomyces variotii</i>	0	6	7	7	8	8	8	8	6	6	6	6	2.18	0.63
<i>Rhizoctonia solani</i>	0	6	6	5	5	4	1	1	0	0	0	0	2.61	0.75
<i>Macrophoma phaseolina</i>	0	3	2	1	1	0	0	0	0	0	0	0	0.99	0.29
<i>Curvularia lunata</i>	0	4	3	2	2	1	0	0	0	0	0	0	1.41	0.41
<i>Fusarium solani</i>	0	11	12	13	16	19	21	21	23	20	21	21	6.58	1.9
<i>Fusarium moniliformae</i>	0	5	4	3	1	0	0	0	0	0	0	0	1.83	0.52
<i>Fusarium oxysporum</i>	0	3	3	2	0	0	0	0	0	0	0	0	1.23	0.35
<i>Mucor sp.</i>	0	2	2	1	0	0	0	0	0	0	0	0	0.79	0.23

CONCLUSION

Storage rot is a thing of common incidence and *Schleichera* seeds are no exception. This finding has thrown light on the causes of deterioration of the seeds. The fourteen fungal species found here can be mitigated by cultural and chemical means. It is of great significance as the plant sp is of great economical and ecological value. But the germinability is seriously affected by the mycocolonisers. Thus the population of this tree is gradually reducing . It will certainly help us to draw the strategies of combating the menace arising out of myco infestation

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