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Microfungi Associated with Floral Parts of *Vigna Sinensis* (L.) Savi Ex Hassk

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Abstract: ***The present work is of microfungi associated with floral parts of Vigna sinensis, it was observed that, in all 20 species belonging to Zygomycotina(4) and Deuteromycotina(16) were encountered during four samplings. Numerical distribution of average number of fungi broadly increased from the first to the last stage of sampling. On sepals only one fungal species belonged to Zygomycotina and 9 from Deuteromycotina were recorded. On petals, the fungi isolated 4 belonged to Zygomycotina and 14 belonged to Deuteromycotina. 9 and 8 species were isolated from stamens and carpels respectively and all belonging to Deuteromycotina. Fungal species which were consistently associated with flowers consisted Alternaria alternata, Aspergillus flavous, Cladosporium cladosporioides, Curvularia lunata and Fusarium moniliforme. The whole mount preparations of stamens along with pollen grains revealed that thick, dark brown, branched and septate hyphae of Alternaria alternata were surrounding the exine of some of the pollen grains with dense aggregation of hyphae was observed which finally invading them.***

Keywords: Fungal Flora, Floral parts, *Vigna sinensis*

1. Introduction

The aerial surface microbial community of plant parts has been explored from different view points and the floral parts of the plants exhibit an unique ecological habitat (Dickinson and Preece, 1976). The present work aims at the study of microfungi associated with floral parts of Vigna sinensis belongs of the family fabaceae. Inflorescence of *Vigna sinensis* is axillary, 2-4 flowered, crowded near tips on short peduncle. The flower is bracteates, pedicellate zygomorphic, bisexual, complete, pentamerous and papilinaceous. The calyx is campanulate; corolla dull white to yellowish; petal papilinaceous; stamen 10, diadelphous; Carpel monocarpellary; style long, flattened and hairy.

2. Material and Methods

2.1 Isolation of fungi from flower

The flowers were selected from apparently healthy plants growing in the experimental plots of the Botany Deptt. Meerut. Collection of flower was done at each stage, viz. the flower bud stage (S_1), flower just opening stage (S2), flower setting stage(S3), flower fallen on the ground stage (S4). Five flowers from each experimental plot of different stages were removed with sterilized foreceps and pair of sterilized scissors, placed in clean polyethylene bags separately and brought in the laboratory. All the four parts of the flower namely sepals, petals, stamens and carpels were dissected carefully so that there was no mixing of the different parts of the flowers. The parts of each flower were placed separately into 250 ml. Borosil conical flasks containing 100 ml. of sterilized distilled water and were hand shaken for 20 min. to get a homogeneous suspension of the fungal propagules. Now the floral parts were removed and washing water was further diluted to 1:1000 with sterilized distilled water. From this dilution, 1 ml. of the suspension per Petri dish was added into each of ten sterilized Petri dishes of 9 cm diameter. Approximately, 15 ml. of molten, cool, sterilized potato dextrose agar rose bengal medium was poured in each Petri dish. The medium was sterilized by autoclaving at 15 lbs pressure of 15 minutes. Streptomycin was added to the molten cooled liquid medium, Platings were always done in pre-sterilized inoculation chamber.

Now the floral parts which were removed from the conical flasks were cut (5 cm. long). After 5 serial washings, in separate flasks containing 50 ml. sterilized distilled water, the bits were dried with sterilized filter paper to remove excess of water. The floral bits were put in each 9 cm. diameter Petri dishes containing 15 ml. of molten, cool, sterilized PDA medium. All Petri dishes were incubated at 28+ 1^{O} C for 7 days and determination of fungal colonies was made after every four days until no new colonies appeared. The total numbers of colonies of individual fungal species growing in each Petri dish were recorded to determine their frequencies. Each Petri dish was considered a unit of study like a quadrat for phytosociological study of higher plants. The frequency class was expressed as mentioned by Saksena(1955).

3. Result

In the present study (Table1) shows that one sterile form and19 fungal types were isolated. Of the 20 types, on sepals one fungal species belonged to Zygomycotina and 9 from Deuteromycotina were recorded. On petals the fungi isolated 4 belonged to Zygomycotina and 14 belonged to Deuteromycotina. 9 and 8 fungal species were isolated from stamens and carpels respectively and all fungal species were belong to Deuteromycotina. Species of fungi which were consistently associated with floral parts include *Alternaria alternate, Aspergillus flavous, Cladosporium cladosporioides, Curvularia Lunata, Drechslera sp. and Fusarium monilifrome.*

Kumar and Dwivedi (1981) also recorded that Alternaria alternate, Curvularia lunata, Drechslera bicolor and Rhizopus stolonifer were consistently associated with floral parts of sunflower. Aspergilli and penicillia showed dominance at flower fallen on ground stage of all floral parts in the present study. The fungal species encountered from all floral parts were *Alternaria alternate, Aspergillus flavus, A niger, Cladosporium cladosporioides, Curvularia lunata, Fusarium moniliforme and Penicillium nigricans*. There

were some fungi which were recorded from sepals and petals were *Colletotrichum lindemuthiamum* and *Mucor racemosus*. The fungi recorded from petals only were Cunninghamella echinulata, *Phoma humicola, Rhizopus arrhizus, Sclerotium sp. and Syncephlastrum racemosum* while *Trichoderma viride* was confined to carpels.

4. Observation and Discussion

The quantitative variations in the fungal population on the floral part of different age do not follow the scheme describe for the leave surface by Sindhu (1985) and Naaz (1992) whowever the increase in the number of fungal taxa with age of the flower is similar to the finding of these worker. The quantitative variation in the mycoflora on the floral part of different ages were noticed in the present study. This increase in the micro fungai in the present study was similar to the findings of Kumar and Dwivedi (1981).

In the present study petals harboured maximum number of fungi followed by stamens and sepals. Minimum number of fungi were recorded from carpels. The variation in distribution of fungi with the age of the organ in the present case appeared to be related to microclimatic condition Arora (1993). The flower buds because of their close structure provide higher relative humidity and ambient temperature required for growth of fungi. Lipton (1971) showed higher temperature differences between lettuce bud and air during day time. The lower number of fungal species in younger bud in the present study was similar to the findings of Leben (1971) who reported the occurrence of a few microbes from the scales of unopened buds. The increase in the number of fungal species in open flower i.e. S_3 stage, is because of their longer exposer to the atmosphere, microbial activity and also to the deposit of pollens which provide additional nutrients as shown by Warren (1972). The flower fallen on the ground showed maximum fungal population in the present study (Stage4). This may be due to soil fungi got mixed up with fallen flower and started colonizing them.

5. Acknowledgement

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Table 1

		S1				S2				S3				S4			
Name of fungus	Sampling Stages	S	P	St.	C	S	P	St.	C	S	P	St.	C	S	P	St.	C
Alternaria alternata		3	3	4	1	4	2	3	2	5	5	3	3	4	4	4	3
Aspergillus flavus		-	-	-	-	2	2	-	1	2	2	1	-	5	5	1	3
Aspergillus niger		-	-	-	1	2	2	-	-	2	3	2	1	1	3	4	-
Cladosporium cladosporioides		-	1	-	-	1	1	2	1	2	2	1	1	2	3	3	1
Colletotrichum lindemuthianum		-	-	-	-	-	2	-	-	1	-	-	-	1	1	-	-
Cunninghamella echinulata		-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-
Curvularia lunata		1	1	1	-	1	2	-	-	1	1	2	1	1	3	1	1
Drechslera australiensis		-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-
Drechslera sp.		-	3	-	-	-	3	-	-	2	3	-	-	1	2	-	-
Fusarium moniliforme		3	2	1	-	2	3	2	2	3	4	2	3	5	5	4	3
Fusarium semitectum		-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Mucor racemosus		-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-
Pencillium nigricans		-	1	-	-	1	1	-	-	-	1	-	-	4	4	3	3
Penicillium sp.		-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-
Phoma humicola		-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-
Rhizopus arrhizus		-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
Sclerotium sp.		-	1	-	-	-	2	-	-	-	2	-	-	-	-	-	-
Sterile brown hyphae		-	-	-	-	-	2	-	-	-	-	2	-	-	2	2	-
Syncephiastrum racemosum		-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-
Trichoderma viride		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total number of fungal species.		3	7	3	2	7	11	4	4	8	15	8	5	10	17	9	7

Frequency of occurrence of fungi at different stages of sampling different parts of flowers of *Vigna sinensis*
(**S1**=Flower bud stage, **S2**=Flower just opening stage, **S3**=Flower setting stage, **S4**=Flower fallen on the ground stage)
(**S**=Sepals, **St.**=Stamen, **P**=Petals, **C**=Carples)