

DIVERSITY OF MYCOFLORA ASSOCIATE WITH FLORICULTURE PLANT IN JABALPUR. MADHYA PRADESH

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Abstract

Fungal Disease of floriculture plant a important commercial plant clearly indicates that the plant is attacked by many fungi. it was recorded at all the sampling site given in the paper. A total 12 fungi were recorded.), Maximum frequency was observed *Alternaria alternate* (FCFP#02) (91.42 %) followed by *Curvularia lunata* (88.9%) and *Fusarium oxysporum* (81.15 %).

Keywords – Floriculture, Fungi, Disease, *Alternaria alternata* etc.

Introduction

Floriculture or flower farming is a discipline of horticulture concerned with the cultivation and ornamental plants (for gardens and floristry comprising the floral industry). Floricultural crops include flowering plants, few ornamental plants foliage plants or house plants. Ornamental plants are grown most commonly for the display of their flowers.

Historical background of India suggests the gardening has been popular in India from ancient times. Several trees, such as *Michelia champaka*, *Butea monosperma* and *Casia fistula*, have been mentioned in the Ramayana and Mahabharata. Our national flower 'Lotus' *Nelumbo bonucifera* has been maintained in the ancient Sanskrit scripture of the Vedic times and also by kalidasa in his play shakuntala. India, with its wide variability of climate and soil, has potential for growing a wide range of floricultural crops. Though flower cultivation as been practiced in India since time immemorial floriculture has blossomed into a viable business only in recent years. India has a long tradition of floriculture. (Dadlani, 1998).

Several flowers, fruits and their products are used for the treatment of many diseases. For example Rose, Chrysanthemum, sunflower etc. are the flowers which are important both floricultural and medicinally. A predictable trend in the international flower market is the increased emphasis on quality. Quality factors related to Pre-Harvest and post-harvest keeping quality include environment influences on flower longevity, as well as the influence of pathogenic. Microorganisms including fungal and virus diseases. As competition in the world market increase, quality become a more important factor. Increasing vase life or flower life on a pot plant is an important goal.

Although often inconspicuous, fungi occur in every environment on earth and play very important roles in most ecosystems. Along with bacteria, fungi are major decomposers in most terrestrial (and some aquatic) ecosystem, and therefore play a critical role in biogeochemical cycles and in many food webs (Lindahl *et al.*, 2007). As decomposers, nitrogen and Phosphorus), especially as saprotrophs and symbionts degrading organic matter to inorganic molecules, which can then re-enter anabolic metabolic pathways in plants or other organisms. (Barea *et al.*, 2005) Consequently, fungi play an important role in the carbon cycle, and also play important role in science, biotechnology, environmental and biological control, medicine, and food and food production: Although the beneficial effects of fungi far outweigh their negative aspects (Molitoris, 2005).

Therefore present paper is focus on the diversity of mycoflora associate with floriculture plant in Jabalpur. (M.P.)

Material and Methods

1) Survey and collection of Ex-plant -

Extensive and periodical survey of various ecologically different places of Jabalpur survey was more during post monsoon season and it was also conducted as per availability of plants. Necessary equipments like collection containers (carries bags, polythene bags, etc) Hand lens, pruning shears, blotting papers, pencil, and field note book were used for collecting parasitic and saprophytic fungi in the field.

2) Laboratory processing

2. (i) Identification of host plant

The specimen packed with data recorded on the envelopes were brought to the laboratory. Attempts were made to confirm the identity of host plant (floricultural plant) and whose identity remained doubtful or undecided it was done with the help of experts, literature and web sites available.

2. (ii) Preliminary observations/Examinations:

In the laboratory each infected sample was first examined carefully with the naked eyes to have a clear picture of symptomatology. Further processing of infected samples was carried out by microscopic studies by preparing the slides.

2. (iii) Isolation of fungi

Some fungi (non-obligate) collected abundantly were isolated and brought into pure culture for studies. In general Fungi were isolated from diseases samples by employing following methods.

(i) From infected parts of the plants

Clean tissue with lesions in running water. Blot dry on sterile filter paper. Cut out-3-4 mm tissue sections ($\frac{1}{2}$ diseases, $\frac{1}{2}$ healthy tissues) from the advancing margins of actively growing lesion and surface sterilized with 0. 25% NaOCl for 3 min. then rinsed with sterile distilled water. Transfer the tissue on to the sterilized isolation plate (PDA Plate). Add rose Bengal and chloramphenicol /streptomycin stock solutions to avoid bacterial growth in PDA (Potato Dextrose agar) media (Martin, 1950). And incubate in a BOD incubator at 25+1°C. Colonies appeared on the surface were transferred to the slants (Agarwal and Hasija, 1986).

(ii) Isolation of fungi from seeds

Randomly selected 10 gram seeds were transferred to 150 ml Erlmeyer flasks containing 100 ml of sterile distilled water shaken thoroughly for 20 min. in water bath shaker at room temperature to separate the spores adhering to the seed surface. After shaking suspension was centrifuged for 5 min. and then serial dilution were prepared, which was employed for isolation.

2. 4 Purification and maintenance of culture

The fungal species isolated earlier were purified by streak-plate and sub culturing techniques (Agarwal and Hasija, 1986) and brought to pure culture by single culture, prepared with the help of dummy cutter objective. The stock cultures of the microorganisms were maintained on the PDA slants stored at 4°C temperature in the refrigerator.

2. 5 Microscopic studies and identification of fungi

Identification of fungi was done after studying the morphological and cultural characteristic with the help of manuals monographs and papers of various workers. Identification of isolated of fungi was made on the basis of the morphological characteristics with the help of available literature (Subramaniam 1971; Barnet and Hunter 1972; Ellis 1971, 76; Ellis and Ellis 1985'; Sutton 1980).

2.6 Determination of Frequency

The frequency of different fungi was determined by using following formula.

$$\frac{\text{Total no. of colonies of Individual fungus in a plate}}{\text{Total no. of different fungi in a plate}} \times 100$$

$$\text{Percentage (\%) Frequency} = \frac{T1}{T2} \times 100$$

Where T1 = Total no. of colonies of Individual Fungus in a plate
T2 = Total no of different fungi in a plate

Results & Discussion

Jabalpur is located centrally in the Madhya Pradesh. The climatic conditions of Jabalpur including high humidity and temperature are ideal condition for the growth and development of fungi and other micro organisms. Such ideal conditions causes increase in the number of outbreaks of fungal diseases on economically important crops such as floricultural crops. Considering the importance of floricultural plants in Jabalpur extensive and periodical survey for fungal diseases occurring on floricultural plants were conducted at various places of Jabalpur during the course of four months. Several specimen were collected during survey out of which 9 most important and common floricultural plants were selected which are *Bougainvillea Sectabilis* Wild., *Catharanthus roseus* L. synonym *Vincarosea*, *Chrysanthemum* sp., *Gladiolus* sp., *Hibiscus rosa-sinensis* L., *Rosa indica* L and *Zinnia elegans* Jacq., total 12 fungal genera were isolated and identified from these plants.

A total number of 12 fungal pathogens were isolated (Table no. 1), and maximum frequency was observed *Alternaria alternata* (FCFP#02) (91.42 %) followed by *Curvularia lunata* (88.9 %) and *Fusarium oxysporum* (81.15 %). (Bilgrami *et al.*, 1979,81,91) these were also encountered in the infected part at considerable frequencies (Bilgrami *et al.*, 1979,81,91). The antifungal properties of many saprophytic fungi were also recorded abundantly in almost all the samples during the study.

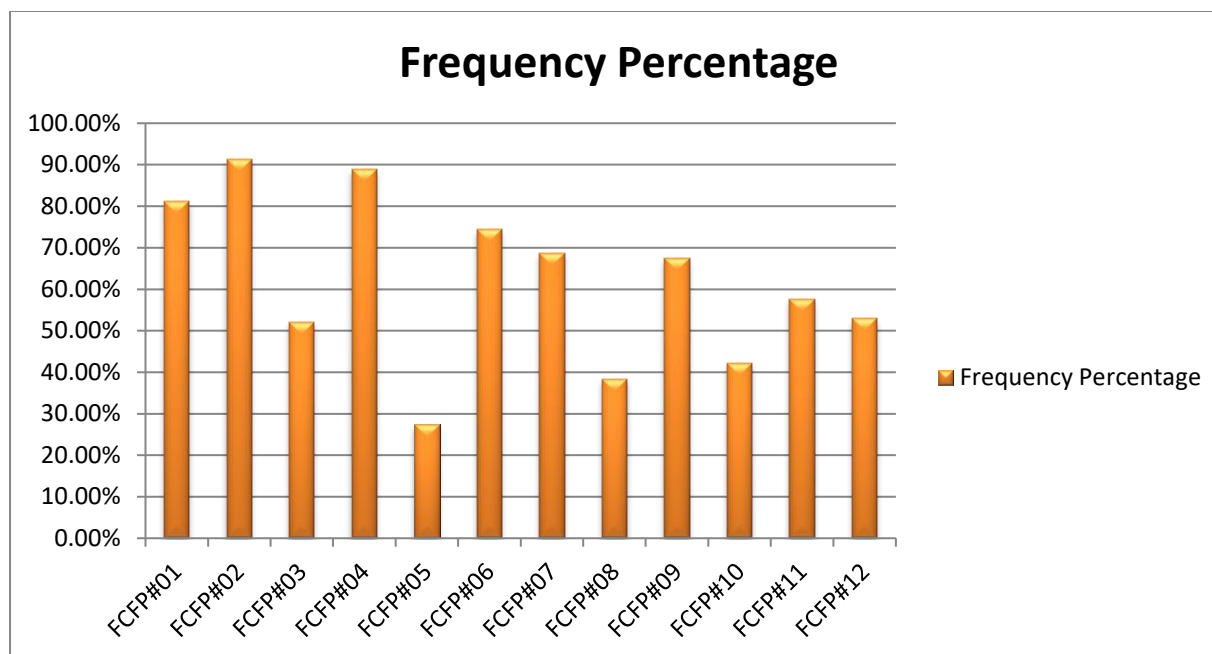
Table No 1. Percentage Frequency of various fungi associates with floriculture plants.

S. No.	Pathogen	Isolate Number	Name of Plant	Associated Parts	Frequency Percentage
1	<i>Fusarium oxysporum</i>	FCFP#01	Rose, Zinnia, China rose, Chrysanthemum	Stem, Flower, Leaf	81.15 %
2	<i>Alternaria alternata</i>	FCFP#02	Rose Periwinkle, Bougainvillea	Stem, Flower, Leaf, Seed	91.42 %
3	<i>Alternaria tenuis</i>	FCFP#03	Gladiolus, Rose	Stem, Leaf	52.1 %

			Periwinkle, China rose		
4	<i>Curvularia lunata</i>	FCFP#04	Rose Periwinkle, Chrysanthemum	Flower, Leaf	88.9 %
5	<i>Alternaria</i> sp.	FCFP#05	Bougainvillea, Gladiolus, Zinnia, Rose	Stem, Flower, Leaf	27.43 %
6	<i>Fusarium</i> sp.	FCFP#06	Gladiolus, Rose Periwinkle, China rose	Stem, seed	74.47 %
7	<i>Drechslera biseptata</i>	FCFP#07	Rose, Zinnia, Chrysanthemum	Leaf	68.55 %
8	<i>Cheatomium</i> sp.	FCFP#08	Rose Periwinkle, Bougainvillea	Seed, Stem	38.42 %
9	<i>Curvularia</i> sp.	FCFP#09	Gladiolus, Rose	Leaf	67.42 %
10	<i>Phoma</i> sp.	FCFP#10	Rose Periwinkle	Seed	42.2 %
11	<i>Aspergillus niger</i>	FCFP#11	Rose, Bouginvilla	Flower, Leaf, Stem	57.71 %
12	<i>Aspergillus</i> sp.	FCFP#12	Chrysanthemum, Zinnia	Leaf	52.94 %

FCFP = Fungal Culture Floriculture Plant.

Graph No 1. Percentage Frequency of various fungi associates with floriculture plants.



Conclusion

The survey on fungal diseases was done in various places of Jabalpur and several specimens were collected during survey out of which 9 most important and common floricultural plants were selected. Total 12 fungal were isolated and identified as *Fusarium oxysporum* (FCFP#01), *Alternaria alternata* (FCFP#02), *Alternaria tenuis* (FCFP#03), *Curvularia lunata* (FCFP#04), *Alternaria* sp. (FCFP#05), *Fusarium* sp. (FCFP#06), *Drechslera biseptata* (FCFP#07), *Cheatomium* sp. (FCFP#08), *Curvularia* sp. (FCFP#09), *Phoma* sp. (FCFP#10), *Aspergillus niger* (FCFP#11) and *Aspergillus* sp. (FCFP#12) from selected plants.

On the basis of data recorded in the present investigation it can be concluded that *Alternaria alternata* (FCFP#02) was observed highly frequency in this study. The work Provide an excellent opportunity to understand the biology of pathogenic fungi of floricultural plants which may become a basis for the managements of important disease of such valuable plants.

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