

Prevalence of *Aspergillus* in the phyllosphere of *Ocimum sanctum*

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Abstract

Leaf surface is the platform of the numerous fungal spores present in the air. During suitable microhabitat these spores are settled down on this having platform and try to colonised. After settle down fungal spores, a triangular relationship appears among the micro-organisms, leaf surface and the environment. The present paper deals with the study of leaf surface mycoflora of *Ocimum sanctum* with the help of petriplate method in one year. *Ocimum sanctum* plant grown in hindu families in India. 447 colonies of 33 fungal species belonging to 18 genera of fungi were isolated during the present investigation from the leaf surface mycoflora of *Ocimum sanctum*. Out of 447 colonies, 212 colonies of 8 species of *Aspergillus* observed during the investigation period i.e. *A. flavus*, *A. fumigatus*, *A. luchensis*, *A. nidulans*, *A. niger*, *A. sulphureus*, *A. sydowii* and *A. terreus*. It was also observed that *A. niger* (12.52%) showed maximum percentage contribution and most frequent fungi among all 33 fungal species. During the study, it was also recorded that *A. niger* and *A. fumigatus* were observed throughout the year. The effect of leaf exudates and leaf tissue sap of *Ocimum sanctum* plant on spore germination of *Aspergillus* species was also observed. The spore of *Aspergillus* failed to germinate on both sap as well as exudates. Species of *Aspergillus* are important medically and commercially. Some *Aspergillus* species cause serious disease in humans and animals. The most common causing pathogenic species are *Aspergillus fumigatus* and *Aspergillus flavus*.

Keywords: *Aspergillus*, phyllosphere

INTRODUCTION

Leaf surface is the platform of the numerous fungal spores present in the air. During suitable microhabitat these spores are settled down on this having platform and try to colonised. After settal down fungal spores, a triangular relationship appears among the micro-organisms, leaf surface and the environment. Fungal spores are almost always present in this air but their number and types vary with time of the day, seasons and the environmental factors etc. The phyllosphere represents the habitat provided by the aboveground parts of plants, and on a global scale supports a large and complex microbial community. Davi and Singh (2003) studied phylloplane mycoflora on *Cycus* and *Gnetum*. Singh (2006) studied aeromycoflora in relation to leaf surface mycoflora of *Mentha arvensis* Linn. plant. Mali *et al.* (2009) studied aeromycoflora over green gram field.

Ocimum sanctum (holy basil), called Tulsi in India, is ubiquitous in Hindu tradition. Tulsi is an erect sweet -scented pubescent herb. Its leaves, seeds and whole plant is useful. Ayurvedic practice recommends Tulsi in several formulations to enhance immunity and metabolic functions as well as in the management of respiratory problems (Shwas -Kasa).

The present paper deals with the study of leaf surface mycoflora of *Ocimum sanctum* with the help of petriplate method.



Fig 1.

METHODOLOGY

For the leaf surface mycoflora, leaves were collected when the A plants in seedling stage. The collected leaves were placed in conical flask containing sterilized distilled water. The flask was hand shaken for 30 minutes to make a homogenous suspension of micro-organisms. This suspension was used for the leaf surface mycoflora. One ml. of this suspension poured into the petri plates containing Modified Martin's Medium. At the end of incubation period the percentage of frequency and percentage contribution of the fungal flora was calculated.

RESULT AND DISCUSSION

Fungal colonies were varying in different months and season due to environmental factors. Maximum number of fungal population was recorded during winter season due to favourable temperature (27.8°C, R.H. 93.5). Moderate number of fungal species during rainy season due to temperature slightly favourable (30.7°C, R.H. 92).

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Minimum number of fungal population in summer season was due to unfavourable temperature (34.4°C, R.H. 65.7).

Overall 447 fungal colonies were observed during the present investigation from the leaf surface mycoflora of *Osimum sanctum* plant. Out of total fungal colonies 33 fungal species belonging to 18 genera, 8 fungal species of *Aspergillus* species- *Aspergillus flavus*, *A. fumigatus*, *A. luchensis*, *A. nidulans*, *A. sulphureus* *A. terreus* and *A. sydowii* observed. *Aspergillus Niger*, *Aspergillus fumigatus*, were most frequent on leaf surface mycoflora. *Aspergillus flavus*, *Aspergillus nidulans*, were frequent fungi, *Aspergillus sulphureus* *Aspergillus sydowii*, *Aspergillus terreus*, were least frequent fungi. The month wise percentage contribution of the leaf surface mycoflora shows the marked variation. Maximum percentage contribution was observed in the month of November while minimum percentage contribution was reported in the month of June.

During the present investigation period it was also observed that maximum fungal population was observed in winter season, due to favourable temperature and relative humidity, moderate in rainy season and minimum number of fungal population was recorded in summer season, possibly due to unfavourable temperature and relative humidity for mycoflora. The periodicity and occurrence of various fungi in relation to environmental conditions are in conformation with similar studies conducted by Jadhav (1996) over rice field, Tiwari and Saluja (2007), in *Catharanthus roseus*, Baraskar and Jogdand (2009) over Jowar crop environment, Pathare *et al.* (2009) over sunflower fields.

REFERENCES

- [1] Baraskar, S. N. and Jogdand, S. B. 2009. Impact analysis of biocomponents over jowar crop environment. Abstract 15th Nat. Conf. on Aerobiology and Nat. Symposium on "Airsports Impact on Plant, Animal and Human Health. M.U. Imphal. APHC-01: P 13
- [2] Davi, M. R., Das, B. and Sarmah, R.2003. Phylloplane mycoflora on *Cycus* and *Gnetum*. *Ad. Plant Sci.* 16 (1): P 333-335
- [3] Jadhav, S. K.1996. Studies of Aeromycoflora over rice field at Balodabazar, Raipur (M.P), Ph.D Thesis, Pt. R.S.U. Raipur (M.P)
- [4] Mali, V. P., Sayyed, I.G., Karudule, S. R. and Baraskar, S. M. 2009 Aeromycoflora over green gram field. Abstract, 15th Nat. Conf. on Aerobiology and National Symposium on "Airsports Impact on Plant, Animal and Human Health M. U. Imphal. APHC-02: P 13
- [5] Pathare, G. M., Mali, V. P. and Pande, B. N.2009. Atmospheric fungal diversity over sunflower fields. Abstract, 15th Nat. Conf. on Aerobiology and National Symposium on "Airsports Impact on Plant, Animal and Human Health M. U. Imphal. APHC-03: P 14
- [6] Singh, N. B. 2006. Studies of aeromycoflora in relation to leaf surface mycoflora of *Mentha arvensis* Linn. Ph.D. Thesis, Pt. R. S. U., Raipur (C.G.).
- [7] Tiwari, K. L. and Saluja, P. K.2007. Seasonal variation of aeromycoflora of *Catharanthus roseus* Linn. Abstract 14th Nat. Conf. on Aerobiology, Pt. R. S. U. Raipur. A-1: P 5