Journal of Indian Research (ISSN : 2321-4155)
Vol.3, No.2, April-June, 2015, 117-123

Botany

EVALUATION OF PHYLLOPLANE MYCOFLORA IN CINNAMOMUM ZEYLANICUM (DALCHINI) AT DHAMDHA, DURG

Seema Verma*
Dr. Arunima Karkun**
Dr Deepak Karkun****

ABSTRACT

The mycoflora of any habitat varies with host type, environmental condition and relation among them. The present study deals with the isolation of fungal species from leaf surface mycoflora of Cinnamomum zeylanicum (Dalchini). Cinnamon is a spice obtained from the inner bark of several trees from the genus Cinnamomum that is used in both sweet and savoury foods. A total of 24 species were isolated among which Deuteromycotina were dominant (16 species), followed by Ascomycotina (2 species), Zygomycotina (4 species) and mycelia sterilia (2 species). Aspergillus species, Penicillium species, Rhizopus species, Fusarium species were common in the season. The growth of fungi was dominant during rainy and winter season and less in summer season.

Keywords: Aspergillus, Mycoflora, Penicillium**.**

INTRODUCTION

The phylloplane, the surface of plant leaves, is a complex terrestrial habitat that is characterized by a variety of microorganisms including bacteria, filamentous fungi and yeast. Pathogens, saprobes and epiphytes occur in this habitat and numerous studies have described the phylloplane populations from various plant species (Breeze and Dix, 1981; Jager *et al*.,

***Seema Verma**, Department of Botany, G. D. Rungta College of Science And Technology , Kohka Kurud Road, Bhilai , Durg, Chhattisgarh, India. E-mail: seemaverma72@gmail.com
****Dr. Arunima Karkun**, Department of Botany, G. D. Rungta College of Science And Technology , Kohka Kurud Road, Bhilai, Durg, Chhattisgarh,India. E-mail: arunima.karkun@gmail.com.
***** Dr Deepak Karkun**, Department of Botany, G. D. Rungta College of Science And Technology , Kohka Kurud Road, Bhilai , Durg, Chhattisgarh, India

2001; Andrews *et al*., 2002). Leaf surface is a natural habitat which supports heterogeneous fungal population comprising both pathogens and non- pathogens. It can act as good stage for spores. They depend on nutrients exuded from the leaf or those deposited from the atmosphere.

The present study deals with the study of leaf surface fungi of *Cinnamomum zeylanicum***.** The common name of *Cinnamomum zeylanicum* is Dalchini. It is widely found in Srilanka and widely cultivated in India, Brazil, Mauritius and other countries. The part which is used is bark. Cinnamom is an evergreen tree which grows to 20 to 30 feet. The plant has strong branches and thick bark. It can be used as a spice. It is used as a flavouring material. It is astringent, antiseptic in nature. Oil of Dalchini is potential antibacterial. It can be used to stop vomiting, and also useful in diarrhea.

METHODOLOGY

For the study of leaf surface mycoflora, leaves were sampled randomly throughout several months. The sample was kept in sterilized polythene bags. Then collected leaves were brought in laboratory for the isolation of leaf surface fungi. The sampled leaves were placed in 75 ml conical flask in sterilized distilled water and were shaked for 25 – 30 minutes for homogeneous suspension of microorganisms attached to leaf surface. 1 ml suspension was poured into the petriplates that contained PDA media. The plates were incubated at 28°C. After incubation period, fungal colonies were counted and identified by the help of literature and was maintained in pure culture.

% Frequency = *(No. of observations in which a species appeared/ Total no. of observations)* x 100
% Contribution = *Total no. Of colonies of species in all the observations taken together /Total no. Of colonies in all the species* x 100

RESULTS AND DISCUSSION

The leaf surface microorganisms were isolated in potato dextrose media. The screening was performed during winter season on three month that is on October, November and December.

The isolated fungal species were purely cultured.

A total of 24 species were isolated among which Deuteromycotina were dominant (16 species and 65 colonies), followed by Ascomycotina (6 species and 4 colonies), Zygomycotina (4 species and 5 colonies) and Mycelia sterilia (2 species and 7 colonies) (Table 1, Figure 1). *Aspergillus* species, *Penicillium* species, *Rhizopus* species, *Fusarium* species were common in the season. The growth of following fungi was dominant during rainy and winter season and less in summer season**:** *Alternaria alternata, Aspergillus flavus, Aspergillus niger, Penicillium brevicompactum, Penicillium citrinum. Fusarium Oxysporium & F. moniliform*

During the month of October, *Mucor hemalis* was isolated from Zygomycotina family followed by *Alternaria alternata, Aspergillus flavus, Aspergillus fumigatus, Aspergillis Japoniocus, Aspergillus niger, Fusarium oxysporium, F. moniliform, F. caucassum, Penicillium*

brevicompactum, P. citrinum, P.oryzae and P.rubrum from Deteuromycotina family.

During month of November, *Choenophora cucurbitarum* was extracted from Zygomycotina followed by *Emericilla nidulans* and *Talaromyces flavus* from Ascomycotina family. From Deuteromycotina family, *Alternaria alternata, Aspergillus flavus, Aspergillus niger, Curvularia lunata, Fusarium oxysporium, F.moniliform, Penicillium brevicompactum, Penicillium citrinum. Penicillium digitatum* and Mycelia sterilia (peach) were isolated.

During the month of December, from Zygomycotina family, *Rhizopus oryzae and R.stolonifer* was extracted followed by *Emericilla nidulans* from Ascomycotina family. From Deuteromycotina family, *Alternaria alternata, Aspergillus flavus, Aspergillus niger, Aspergillus fumigatus, Curvularia lunata, Fusarium oxysporium, F.moniliform, Penicillium brevicompactum, Penicillium citrinum, Penicillium crysogenum, P. oryzae* and Mycelia sterilia (white) were extracted.

Emericella nidulans, Alternaria alternata, Aspergillus flavus, A.fumigatus, A.niger, Curvularia lunata, Fusarium oxysporium, F. moniliform, Penicillium brevicompactum, P.citrinum has shown 100% contribution during investigation (Figure-3).

Diem (1974) had estimated the mycoflora of the Barley phyllosphere. According to him, *Cladosporium* species was found to be common. *Cladosporium* is one of the most common inhabitants of the phyllosphere. Many authors have accounted for this observation by the abundance of the spores of this genus in the atmosphere. Similarly Levetin and Dorsey (2005) also studied the leaf surface microorganisms from leaf surface of two trees of University of Tulsa campus.

Ten fungal taxa were identified on both leaf surface cultures and the air samples; these included *Cladosporium, Alternaria, Epicoccum, Curvularia, Pithomyces, Drechslera, Fusarium, Nigrospora, Penicillium*, and *Aspergillus.* The presence of these fungi supports the idea that the air spora constitutes the source of many fungi that can potentially colonize the leaf surface (Pedgley 1991, Kinkel, 1997; Aylor 2002). Tiwari and Saluja (2010) also isolated leaf surface microorganism from *Catharanthus roseus*. They isolated 36 species with the help of gravity petriplate method.

CONCLUSION

Results revealed that mostly Deuteromycotina group were dominant. *Aspergillus* and *Penicillium* group mostly occurred during investigation. The present study indicate that fungi prefers phylloplane for their habitat.

Table 1: Fungal isolates from winter season.

Name Of Fungi	Oct.	Nov.	Dec.	Total	% frequency	% Contribution
Zygomycotina	**Colony No.**	**Colony No.**	**Colony No.**			
Choanephora Cucurbitarum		1		1	33.3	1.20
Mucor hemalis	2			2	33.3	2.4
Rhizopus oryzae			1	1	33.3	1.2
Rhizopus stolonifer			1	1	33.3	1.2
Ascomycotina						
Emericella nidulans		1	1	2	100	2.4
Talaromyces flavus		2		2	33.3	2.4
Deuteromycotina						
Alternaria alternata	2	1	4	7	100	8.43
Aspergillus flavus	1	1	1	3	100	3.6
Aspergillus fumigatus	2		2	4	100	4.8
Aspergillus japonicus	3			3	33.3	3.6
Aspergillus niger	2	4	2	8	100	9.6
Curvularia lunata		1	1	2	100	2.4
Fusarium oxysporum	2	1	2	5	100	
Fusarium moniliform	1	2	1	4	100	6.02
Fusarium caucasicum	2			2	33.3	2.4
Penicillium brevicompactum	2	4	1	7	100	8.4
Penicillium citrinum	5	2	3	10	100	12.04
Penicillium crysogenum			2	2	33.3	2.4
Penicillium digitatum		2		2	33.3	2.4
Penicillium oryzae	2		2	4	66.6	6.02
Penicillium rubrum	3			3	33.3	3.6
Phanerochaete chrysosporium			1	1	33.3	1.2
Mycelia sterilia						
Mycelia sterilia (White)			4	4	33.3	6.02
Mycelia sterilia (Peach)		3		3	33.3	3.6

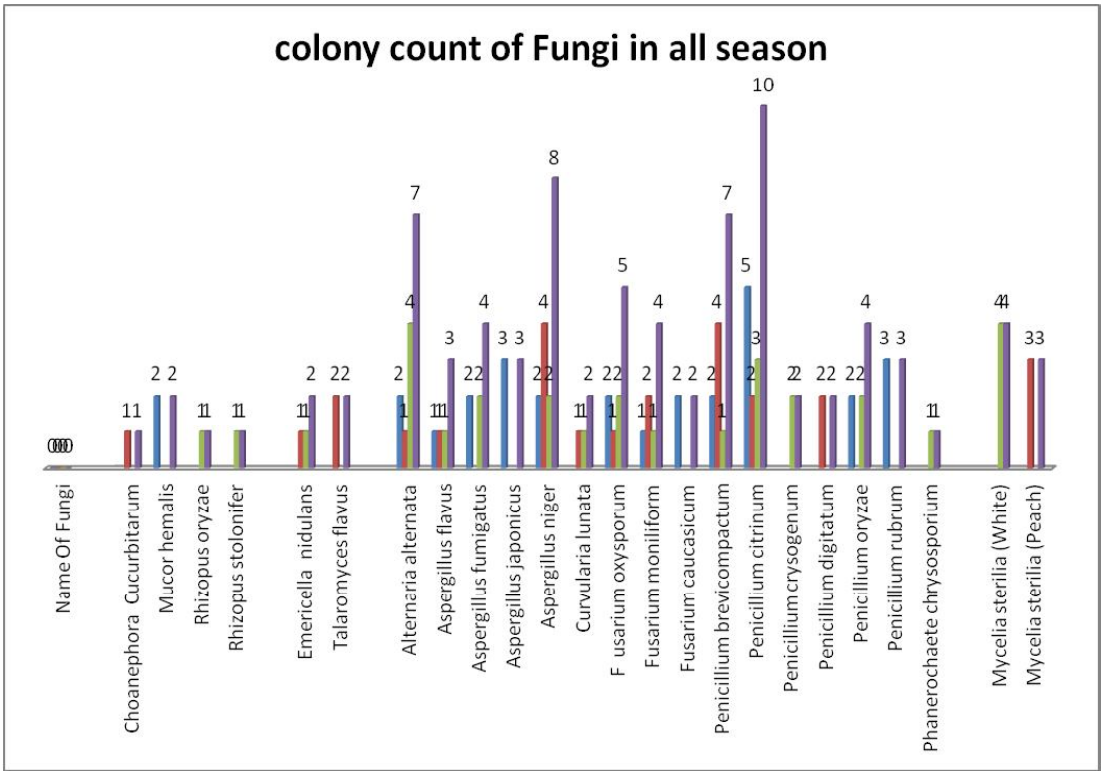

Figure 1: Colony count of fungi in all three seasons

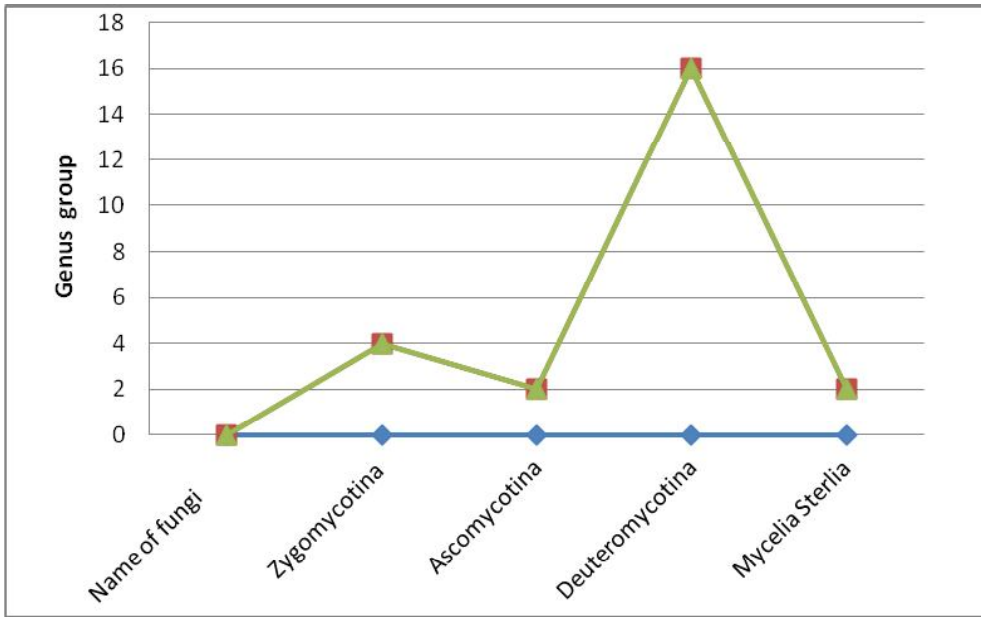

Figure 2: Dominant genus group

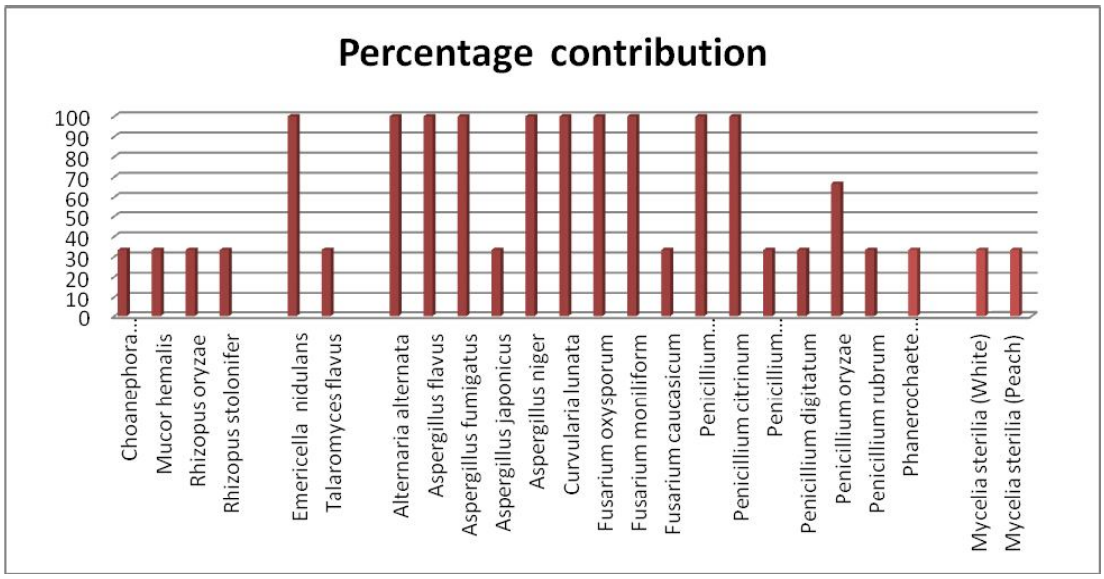

Figure 3: Percentage contribution of Fungi in all season.

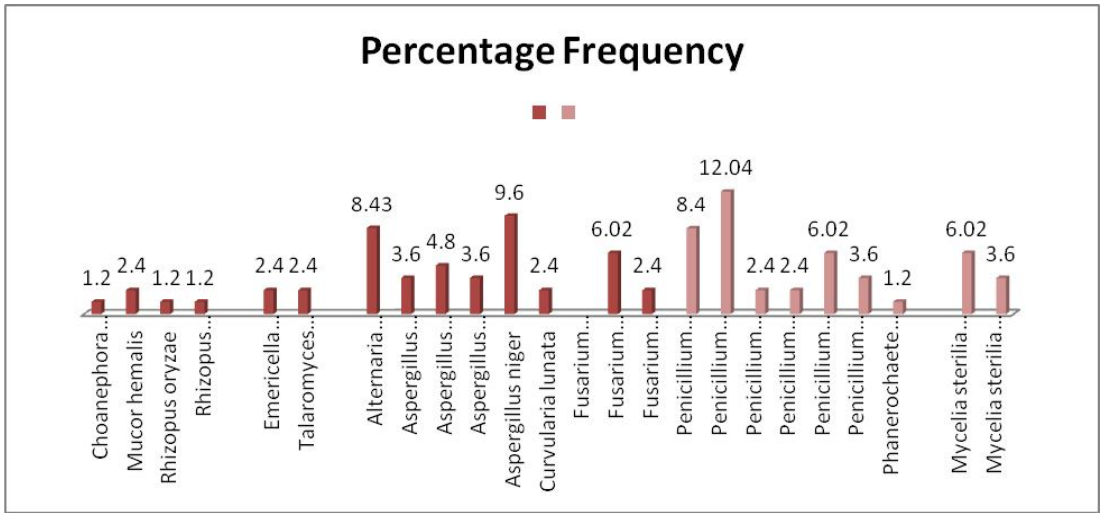

Figure 4: Percentage frequency of fungi in all season

REFERENCE

1. Andrews, J.H., and Harris, R.F. (2000). The ecology and biogeography of microorganisms of plant surfaces. *Annu Rev Phytopathol,* **38**,145-180.
2. Aylor D.E.(2002). *Aerobiology of fungi in relation to capture and release by plants*, in S.E. Lindow, E.I. Hecht-Poinar and V.J. Elliott (eds), *Phyllosphere Microbiology*. St. Paul: APS Press, pp. 341–364.
3. Breeze E.M. and Dix N.J. (1981). Seasonal analysis of the fungal community on Acer platanoides leaves, *Trans. Br. Mycol. Soc*. **77**, 321–328.
4. De Jager E.S., Wehner F.C. and Korsten L. (2001). Microbial ecology of the mango phylloplane, *Microb. Ecol*. **42**, 201– 207.
5. Diem H.G. (1974). Microorganisms of the leaf surface; estimation of the mycoflora of the barley phyllosphere. *J.Gen.Microbiol* **80**: 77-83.
6. Kinkel L.L. (1997). Microbial population dynamics on leaves. *Ann. Rev. Phytopathol*. **35**, 327-347.
7. Levetin Estelle and Dorsey Kip (2006). Contribution of leaf surface fungi to the air spora. *Aerobiologia* **22**: 3-12.
8. Pedgley D.E. (1991). Aerobiology: the atmosphere as a source and sink for microbes, in J.H. Andrews and S.S. Hirano (eds), *Microbial Ecology of Leaves*. New York: Springer-Verlag, pp. 43–59.