PRINT: ISSN 0970-9274 ONLINE: 2456-6608
J Hum Ecol, 26(3): 205-207 (2009)
DOI: 10.31901/24566608.2009/26.03.07

Seasonal Incidence of Air Borne Fungi in Coastal Belt of Orissa

T. Panda[1], B. Panda[1] and N. Mishra[2]

1. Department of Botany, S.N.College, Rajkanika, Orissa, India
E-mail: taranisenpanda@yahoo.co.in
2. Department of Zoology, Chandbali College, Chandbali 756 133, Orrisa, India

KEY WORDS Plantation. Seasonal Variation. Fungi. Coastal Belt

ABSTRACT Composition and intensity of fungal spores in a coastal sandy belt of Orissa was studied using gravity petri plate method. Concentration of spores was more at inside plantation less at outside and least at far outside the plantation. The dominant species recorded were *Cladosporium cladosporioides, Pestalotia* sp., *Alternaria alternata, Aspergillus awamori* and *Curvularia lunata*. Higher number of fungal isolates and lesser number of taxa were recorded inside the field at the spot far off the plantation.

INTRODUCTION

The air spora in coastal belt is supposed to consist of large number of as well as types of microbial population. These spores are potentially allergic to human beings and many are pathogenic to agricultural crops (Shivpuri and Agarwal 1969). Concentration of pathogenic fungal spores in air and the disease aspect of crop plants have been studied in certain cases. But studies on the impact of vegetation and agricultural crops on composition and incidence of fungal spores in air are scarce and fragmentary (Satpute et al. 1987). This paper reports the pattern of incidence of air borne spores, their composition and seasonal variation in coastal belt as affected by extensive uni-culture plantation of *Casuarina equisetifolia* L.

MATERIALS AND METHODS

Site for spore trapping was Ganjam district of Orissa, 19°.15' latitude and 84°. 50' longitude having 60 kms of sea coast along the Bay of Bengal, at a height of 6 - 8mtr above MSL. Three spots i.e. in side the plantation (IF), outside the plantation (OF) and far outside the plantation (FOF) were selected for isolation of microbes. Gravity petri plate method was employed for fungal population and GYEA medium was used for bacterial population. The exposed plates were incubated in culture room maintained at 25 ± 3° C, bacterial plate count was made after 48h and fungi were studied after 3 – 7 days of incubation.

RESULTS AND DISCUSSION

In an average maximum propagules were isolated from inside followed by outside and far outside the plantation (Fig.1). Bacterial population shows a reverse trend as fungi. Total population aero spora are greatly influenced by the increase in relative humidity and decrease in temperature and rain fall (Fig.1). The lowest population of microorganisms was counted in May and in the subsequent months with gradual fall in temperature and rise in relative humidity, the total population air spora enhanced continuously (Kumar and Gupta 1976; Panda and Behera 1991). In the present study, there was a decrease in total number of colonies in rainy season and increase in winter (Kumar 1984). Considerable variation in number of fungal propagules recorded in Fig.1 was to found to have maximum aero spora in inside plantation during most of the study period and the influence of plantation on aeromycoflora was quite evident (Bartzakas 1975; Reddy and Ramakrishna 1978).

The maximum population of inside plantation possibly may be due to relatively cool and humid atmosphere prevailing inside the plant canopy, besides the gravitational force exerted upon the spore. It is probable that spores liberated from soil microflora together with the air spora resulted in higher population of micro organisms inside the plantation (Phukan and Baruah 1991). Out of 1250 colonies the inside plantation contributed 476 colonies, 40 genera and 84 species; out side 420 colonies, 43 genera and 99 species and far outside 354 colonies, 39 genera and 78 species. Besides this 3 sterile forms were also isolated. Deuteromycotina shared maximum followed by Zygomycotina and Ascomycotina. Species of *Aspergilli* contributed highest to the total aerospora in all the 3 sites (Table.1) corroborating

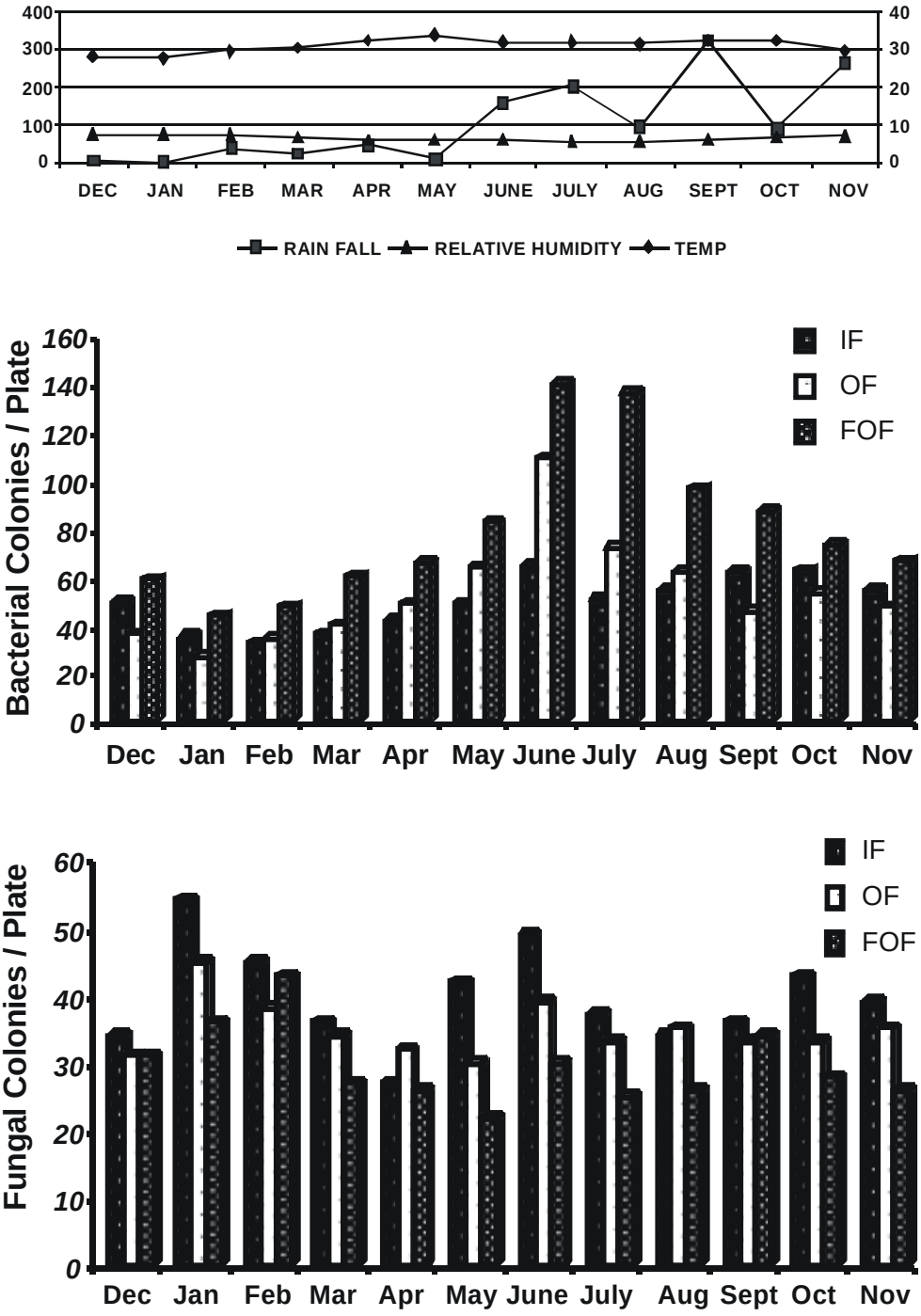

Fig.1. Monthly variation in number of fungal and bacterial colonies in relation to Rainfall, Relative Humidity and Temperature in inside (IF), outside (OF) and far outside (FOF) the field

Table 1: List of fungi and their percentage contribution (above 2.0 %) recorded at inside, outside and far outside the plantation.

Fungi	*IF*		*OF*		*FOF*	
	No. of isolates	*% contribution*	*No. of isolates*	*% contribution*	*No. of isolates*	*% contribution*
Alternaria alternata	100	6.99	120	9.6	87	8.18
Aspergillus awamori	110	7.69	91	7.28	82	7.71
A. fumigatus	92	6.43	59	4.72	69	6.49
A. nidulans	29	2.03	78	6.24	-	-
A. niger	80	5.59	81	6.48	62	5.83
A. terreus	41	2.87	-	-	-	-
Cladodporium cladosporioides	157	10.97	139	11.12	157	14.77
Curvularia lunata	75	5.24	82	6.56	69	6.49
C. eragrostidis	42	2.94	32	2.56	-	-
Cytosporina sp.	89	6.22	-	-	-	-
Fusarium sp.	64	4.77	-	-	38	3.57
Nigrospora sphaerica	49	3.42	86	6.88	95	8.94
Penicillium nigricans	-	-	43	3.44	-	-
Pestalotia sp.	179	12.51	26	2.08	-	-
Phoma sp.	-	-	38	3.04	-	-
Tricoderma viride	43	3.0	71	5.68	31	2.98
Black sterile	-	-	-	-	56	5.27

to Ranjan et al. (1952). Presently, *Cladosporium*, *Pestalotia*, *Curvularia* and *Fusaria* have major share to the total aerospora.

The study clearly indicates the impact of plantation on spore concentration in air, as there was low incidence of spores at the spots far off from the plantation site.

CONCLUSION

Now it is the concern of the time to study our environment in general for a productive and healthy life. The spores in air are the represen-tatives of the member growing in that habitat. In this context this study shall certainly enlighten the scientists and planners to make a better environment. Some pathogenic and harmful micro-organisms can be detected through this study and methods may develop to eradicate them. Some economically important and beneficial micro-organisms can be detected by extension of this work which can be of some better use in future. This work can add for better understanding of unseen organisms not reported by any other worker till date. There is a need of aerobiological research in special environments for better human sustenance.

REFERENCES

Bartzakas CA 1975. Relationship between the meteorological conditions and the air borne fungal flora of the Athens Metropolitan area. *Mycopathol,* 57: 35-38.

Kumar R 1984. A two year studies of the aeromycospora of Dehradun suburi. *Ind J Mycol Pl Pathol,* 14(3): 260-265.

Kumar R, Gupta JS 1976. Seasonal and diurnal variation in the air spore over a potato field (ii). *Ind Phytopathol,* 29: 181-185.

Panda T, Behera N 1991. Seasonal incidence and succession of fungal spores in air after rain fall. *Acta Bot Ind,* 19: 136- 138.

Phukan SN, Baruah CK 1991. Studies on the air spora over a potato field in relation to incidence of *Phytopthora infestans* Mont de Berry. *Acad Plant Sci,* 4: 113-117.

Ranjan ESV, Nigam SA, Shukla RK 1952. A study of the atmospheric fungal flora at Kanpur. *Proc Ind Acad Sci,* 35: 33-37.

Reddy CS, Ramakrishna V 1978. Vertical profiles spore concentration of within and above a Sorghum crop. *Phytopath,* Z 93: 35-40.

Satpute M, Dutta BK, Rao RR 1987. A comparative study of the air, phyllosphere and soil mycoflora of potato and paddy fields of Shilong. *J Ind Bot Soc,* 66: 381-387.

Shivpuri DN, Agarwal MU 1969. Studies on the allergic fungal spores of Delhi (India) clinical aspect. *J All,* 44: 204-208 .