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A comparative aerobiological studies on urban and rural belts of West Bengal

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Aerobiological studies of urban and rural areas of West Bengal were conducted using Rotorod Sampler for one year. The most dominant type of fungal spore was *Alternaria* showing the presence of 35.83% in rural area and 24.88% in urban area followed by *Cladosporium, Curvularia, Bipolaris, Tetraploa, Helminthosporium* etc. The *Alternaria* spores were predominant in the atmosphere compared to other spore types. The study will help in the compilation of fungal spore calender for urban and rural areas.

Key words : Aerobiology, urban belt, rural belt, Burdwan, Katwa

INTRODUCTION

The urban environmental problem is a dynamic complex concept which reflects the growth of urban population and their relationship with land, air and water resources of the urban settlement than rural environment (Ahasan, 1988). Environmental pollution is the unfavourable alteration of our surroundings partly or largely as an impact of increasing industrialisation and associated human activities and also due to activities of plants and animals. Spores can be used as effective bioindicators in environmental monitoring (Tilak, 1988). Airborne spores have already been proved to cause major upper respiratory tract disorders. This biotic elements in combination with some organic particles and gases attacks the mucous membrane causing seasonal rhinitis, conjunctivitis, asthma and other bronchial diseases. So, to find out the remedy of allergic diseases, it is essential to study the spore types and their concentration in atmosphere in different seasons.

This report gives some information regarding the comparative aerobiological studies on urban (Burdwan town) and rural (Katwa) belts of Burdwan district. The Burdwan district is an industrial town with a polluted atmosphere. People of the industrial town have reported to have a high incidence of asthma, sneezing, nasal obstruction, itchy eyes and frequent coughing, which may be due to the inhalation of air infested bioparticles like fungal spores (Mandal and Dasgupta, 1993). An anlysis of airborne bioparticles trapped by Rotorod Sampler during December, 1992 to Noverber, 1993 revealed a total of 15 types of fungal spores.

MATERIALS AND METHODS

Atmospheric fungal spore trapping was done by the Rotorod sampler of Perkins (1957). Samples were collected twice in a week, once in the morning and once in the evening for half an hour from the two biozones of Burdwan district i.e. Burdwan town proper as urban and Katwa - a sub-division town as rural area. The trapped bioparticles were characterised into fungal spores. Two sites were selected in both the biozones, namely Burdwan town area and University campus in Burdwan and in Katwa the college campus and one side of the bank of the river Ganga were selected for the purpose. The kind and various patterns of ornamentation of fungal spores were considered as the basic criteria for identification. The total area of the slide on which the airspora deposited was scanned to identify and recorded the number of airborne particles. The counting was normally done by using the 40x objective and 10x eye piece of an Olympus Microscope. It was possible to identify most of the atmospheric fungal spores either up to family, genus or even up to species level. The reference slides were used to identify the trapped spores prevalent in the atmosphere of the selected biozones.

RESULTS AND DISCUSSION

Comparative aerobiological studies have been previously done in other places of West Bengal (Mandal and Chanda, 1981)

The data about qualitative and quantitative analysis are given in Table 1. The most

Table 1. Percentage representation of spores at Katwa (rural belt) and Burdwan town (urban belt) of Burdwan District, West Bengal

(a).

Fungi	Katwa			
	College	Ganga side	Total	Percentage of spore
Alternaria sp.	193	132	325	35.83
Bipolaris sp.	17	18	35	3.86
Cladosporium sp.	87	50	137	15.10
Curvularia sp.	23	41	64	7.06
Helminthosporium sp.	5	25	30	3.31
Rust/Smut	67	34	101	11.14
Tetraploa sp.	13	17	30	3.31
Basidiospores sp.	18	6	24	2.64
Unidentified	97	64	161	17.75

(b).

Fungi	Burdwan			
	Town	University	Total	Percentage of spore
Alternaria sp.	321	205	426	24.88
Bipolaris sp.	168	22	190	8.99
Cladosporium sp.	213	54	277	13.10
Curvularia sp.	130	55	185	8.75
Helminthosporium sp.	21	10	31	1.47
Rust/Smut	222	93	315	14.90
Tetraploa sp.	56	0	56	2.65
Basidiospores	102	179	281	13.29
Unidentified	144	109	253	11.97

predominant fungal spore was *Alternaria*. Among the fungal spores the dominant types were *Basidiospores* (13.29%), *Cladosporium* (13.10%), *Bipolaris* (8.99%) and *Curvularia* (8.75%). Fungal spores were most predominant in the atmosphere. The same observations were followed for the rest of the year. The *Alternaria* spores were predominant in the atmosphere compared to other spore types. This study will help in the compilation of spore calender for urban and rural areas of West Bengal.

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