
The Role Of *Epicoccum* as a biopollutant in asthma

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ABSTRACT

Human beings are known to suffer from major allergens such as fungal spores, pollen grains and house dust present in the atmosphere. Inhalation of air borne fungal spores is the main causative factor for respiratory allergic diseases in human beings. Indoor survey of aeromycoflora was performed by using Roto Rod air sampler, petriplate exposure and eosinophil count of asthmatic patient in Ambajogai. *Epicoccum* spores are potential sensitizers in human being and their prevalence is important for Diagnosis and environmental management of asthma. The highest concentration of *Epicoccum* spores was recorded in the house of patient 'F' (3.02%) in the month of Feb 2002.

Key Words: *Epicoccum*, asthma, eosinophil count, Aeromycoflora.

INTRODUCTION

Asthma is an allergic disorder of the respiratory tract involving hypersensitivity i.e. increased irritability of an airway of the various stimuli leading to narrowing of airway characterized by cough periodic or episodic wheezing and feeling of tightness in chest.

It is estimated that 20% population of India suffers from allergic diseases, which are attributed to several causative agents like fungal spores, pollen grains, house dust mites, feathers, other pollutants and climatic factors.

After inhalation of fungal spores and pollen grains they get deposited in the uppermost ciliated parts of the respiratory tract. The symptoms of asthma develop in the deeper non-ciliated part of the lung with accumulation of fluid and secretion in the terminal bronchioles.

Nobel and Clayton investigated fungal flora of air of hospital ward by using slit sample, they reported that the spore concentration in the air increases with human activity within the building due to sweeping, bed making and building and repair work. Giri and Saoji⁵ at Nagpur sampled the indoor air from hospital wards and recorded 69 species of fungi, the prominent was *Epicoccum* spp.

In clinical practice, four major groups of fungi i.e. Phycomycetes, Ascomycetes, Basidiomycetes and Dueteromycetes are considered to be potential allergens. *Epicoccum* is generally considered to be important cause of both allergic rhinitis and allergic asthma²⁻⁷.

MATERIALS AND METHODS

The present work was carried out in the houses of 26 allergic patients from 2000-2002 in Ambajogai in Maharashtra. Two halves of the years as per convenience were made; the first half (period A) counting March to August and second half (period B) September to February. Air sampling is carried out using Roto Red air sampler. It has been used for a wide variety of airborne particle. Airborne particles are deposited on narrow cylinder oriented at right angle to high velocity of wind. The pieces of cello tape 1.5cm long smeared with petroleum jelly were stuck on each arm of W shaped brass rod. After 30 minutes sampling,

tapes were removed and mounted on the glass slides for examination. Prepared slides were scanned under the microscope. The bio-pollutant occur in the houses of asthmatic patients were analyzed qualitatively and quantitatively.

The exposed petriplates were incubated at $27 \pm 2^{\circ}$ and allowed to develop colonies which were examined on the characteristic of the colonies like colour, and other diagnostic features of spores, fungal colonies were identified by referring to Ainsworth et al³.

Eosinophil count of patients were enumerated in the department of pathology, Government medical college and hospital at Ambajogai to count percentage of eosinophil in the blood can be determined by differential leukocyte counts.

RESULTS AND DISCUSSION

The results indicate that fungal spores comprised about 72% of total airborne bio-components (fungal spores and pollen grains) in the atmosphere of the asthmatic patients in Ambajogai.

Fungal spores were present throughout the year with high incidence between June to January and attaining peak period during August to December but spore like *Epicoccum* occurred in the month of March.

Epicoccum spores were chief constituent of aeromycoflora and spores were recorded throughout the year. The highest percentage contribution of *Epicoccum* was recorded in the of patient 'F' in the month of feb 2002 (3.02%). This patient was suffering from severe bronchial asthma since 14 years and found poor sanitation condition. Second highest percentage of *Epicoccum* was recorded in the house of patient 'A'(2.49%) in the month of November 2001. All the patients belong to poor families and residing in slum area. Hence sanitation was not found up to the mark. It was proved that the *Epicoccum* was found in the house of 9 and 12 asthmatic patient out of 26, respectively. Cholke and Mahajan⁴ reported in his two year study using Petriplates exposure method *Epicoccum* colonies 4.41%,

In total, seven fungal genera, *Epicoccum* being one of the most important genera, were encountered by direct exposure of Petriplates at five different sites at Solan.

Epicoccum was reported to the most dominant spore type at Secunderabad. The present study eosinophil count of 14 and 17 patients during March to August and September to February was more than 6 out of 26 in the season respectively. During July to January, more severity of attacks of asthma were confirmed due to high humidity even after more doses of drugs taken by the patient.

Hence, it is concluded that *Epicoccum* as an allergen may cause asthma.

Table.1

Percentage contribution of *Epicoccum* monitored by roto Rod Air sampler (RRAS), petriplate exposure (PPE) and eosinophil count (EC) in asthma patients from March-August (period A) and September-February (Period B) in the houses of asthmatic patients.

patients	RRAS Period A	RRAS Period B	PPE Period A	PPE Period B	EC Period A	EC Period B
A	0.69 Apr 2001	2.49 Nov 2001	-	+	6	7
B	-	0.24 Nov 2001	-	+	6	6
C	1.79 Mar 2001	2.32 Oct 2001	+	+	6	6
D	-	0.31 Feb 2002	-	-	7	7
E	-	0.36 Feb 2002	-	+	7	6
F	1.94 June 2001	3.02 Feb 2002	+	+	7	7
G	0.46 May 2000	-	-	-	6	7
H	1.12 Apr 2001	-	+	-	7	7
I	-	-	-	-	6	7
J	-	-	-	-	6	6
K	0.9 July 2001	-	-	-	7	7
L	0.51 April 2001	0.41 Dec 2001	-	-	6	6
M	1.73 July 2000	1.8 Oct 2000	+	+	7	6
N	0.95 Apr 2001	0.3 Dec 2001	+	+	6	7
O	0.13 Sep 2001	0.21 Feb 2002	-	-	7	5
P	0.22 Aug 2000	0.72 Feb 2001	-	-	7	7
Q	1.41 July 2000	1.6 Nov 2000	+	+	7	6
R	0.82 June 2000	1.58 Feb 2001	+	+	6	7
S	-	-	-	-	7	7
T	0.67 July 2001	0.64 Jan 2002	+	-	7	7
U	-	0.3 Dec 2001	-	-	6	6
V	0.26 May 2001	-	-	-	7	7
W	-	1.11 Oct 2000	-	+	5	7
X	0.47 Aug 2000	0.39 Dec 2000	+	+	7	7

Y	0.4 June 2001	0.4 Dec 2001	-	-	7	7
Z	-	1.23 Feb 2001	-	+	6	7

- indicates absence of *Epicoccum*.

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