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RESEARCH ARTICLE

Curvularia As Bio-pollutant in the Houses of Asthmatic Patients at Ambajogai Dist. Beed (MS)

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ABSTRACT

Indoor *Curvularia* spores are potential sensitizers in human beings, their prevalence is important for diagnosis and environmental management of asthma. 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 Rotorod air sampler, Petri plate exposure and eosinophil count of asthmatic patient in Ambajogai. The highest concentration of *Curvularia* spores was recorded in the house of patient. 'W' (12.08 %) in the month of September 2000.

Keywords: Curvularia, Allergens, Bio-pollutant, Asthma.

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 development in the deeper non-ciliated part of the lung with accumulation of fluid and secretion in the terminal bronchioles.

Nobel & Clayton (1963) 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 & Saoji (2003) at Nagpur sampled the indoor air from hospital wards and recorded 69 species of fungi, the prominent was *Curvularia* spp.

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

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 Rotorod 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 cellotape 1.5 cm 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 Petri plates were incubated at 27 ± 2^{o} 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 al* (1973).

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, Agarwal *et al* (1974) studied the allergic factors and symptomatology of respiratory allergic patients who showed that, there is no significant correlation between the atmospheric allergens and the incidence of respiratory allergy.

Curvularia spores were chief constituent of aeromycoflora and spores were recorded throughout the year. The highest percentage contribution of *Curvularia* was recorded in the of patient 'W' in the month of September 2000 (12.08 %). This patient was suffering from severe bronchial asthma since 14 years and found poor sanitation condition.

Second highest percentage of *Curvularia* was recorded in the house of patient 'T' (11.11 %) in the month of July 2001. Sharma et al (2005) work out indoor survey of fungi in the homes of asthmatic/allergic children In Delhi. All the patients belong to poor families and residing in slum area.

Hence sanitation was not found up to the mark. Choke and Mahajan (2006) reported in his two-year study using Petriplates exposure method *Curvularia* colonies *4.41%*., Verma et al (2007) in survey of microbial allergens reported, seven fungal genera out of total, *Curvularia* being one of the most important genera, were encountered by direct exposure of Petri plates at five different sites at Solan, It was proved that the *Curvularia* was found in the houses of maximum asthmatic patients out of 26 on Petri plate exposure.

CONCLUSION

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 patients. Hence, it is concluded that *Curvularia* as an allergen is responsible for causing asthma.

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Table 1: Percentage contribution of *Curvularia* monitored by roto Rod Air sampler (RRAS)

Patients	RRAS / Period A	RRAS / Period B	PPE Period A	PPE Period B	EC Period A	EC Period B
A	5.53 /Apr 2001	7.75 /Nov 2001	+	+	6	7
B	6.63/ July 2001	9.64 /Nov 2001	-	+	6	6
C	7.92/Mar 2001	4.36 /Oct 2001	+	+	6	6
D	9.31 /June 2001	2.7 /Feb 2002	+	-	7	7
E	9.2 /June 2001	8.37 /Feb 2002	-	+	7	6
F	7.44 /June 2001	10.58 /Feb 2002	+	+	7	7
G	10.16/May2000	7.53 /Feb 2001	+	+	6	7
H	6.76/ Apr 2001	7.8 /Jan 2002	+	-	7	7
I	6.87/ Apr 2001	9.6 /Dec 2001	+	+	6	7
J	11.3/ July 2001	8.02 /Feb 2002	-	-	6	6
K	11.0 July 2001	7.58 /Jan 2002	+	+	7	7
L	7.51 /Apr 2001	8.21 /Dec 2001	-	-	6	6
M	8.30/ July 2000	3.1 /Oct 2000	+	+	7	6
N	10.17 /Apr2001	9.2 /Dec 2001	+	+	6	7
O	5.76 /Sep 2001	3.21 /Feb 2002	+	-	7	5
P	9.36/ Aug 2000	4.73 /Feb 2001	-	+	7	7
Q	6.13/ July 2000	4.62 /Nov 2000	+	+	7	6
R	7.8 /June 2000	4.95 /Feb 2001	+	+	6	7
S	-	7.24/Nov 2001	+	-	7	7
T	11.11/ July2001	6.65/ Jan 2002	+	+	7	7
U	12.08/Aprl2001	8.12 /Dec 2001	-	-	6	6
V	2.2 /May 2001	5.36/Oct2001	+	-	7	7
W	7.9/July2000	12.08/Sep2000	+	+	5	7
X	3.10/ Aug 2000	5.34 /Dec 2000	+	+	7	7
Y	8.5 /June 2001	5.9 /Dec 2001	+	-	7	7
Z	4.9/Jun 2000	4.93 /Feb 2001	-	+	6	7

- indcates absence of *Curvularia*.

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