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Aeromycoflora of Government General Hospital at Gondpipari, Chandrapur (M.S.), India

Sanjay Kumar^{1,2*} Sandip Shende³

Chintamani College of Arts and Science, Gondpipari, Chandrapur, India¹

Department of Botany Janata College Chandrapur, India²

Dr. C.V. Raman Science College, Sironcha, Gadchiroli, India³

ABSTRACT: In the today scenario the air surrounding us is getting polluted which cause several diseases to human beings. The pollutant can be biological or non biological, like pollen grains, fungal spores, insect fragments etc., diesel exhaust particles, ashes, sand and mineral fragments etc. Fungal spores play significant role in concentration in the bioaerosol of various environmental conditions which may have potential health threats. Thus aeromycoflora of the Government General Hospital at Gondpipari, Chandrapur district, was carried out using Rotorod Air Sampler. The aim of this investigation was to monitor the densities and distribution of indoor airborne fungi in different areas of gondpipari Government Hospital (Chandrapur, Maharashtra). The study was started from the post-monsoon to the middle winter (July 2019 to December 2019) The maximum fungal spores were seen in O.P.D. section followed by general ward and pathology laboratory of while minimum fungal spores were seen in Operation Theatre. The different fungal spores in all the sites are in the order of dominance are *Aspergillus* (13.45%), *Alternaria* (8.36%), *Curvularia* (6.48%), *Mucor* (5.99%), *Cladosporium* (4.98%), *Smuts* (2.48%), *Helminthosporium* (2.47%), *Nigrospora* (1.06%) and Other types (33.97%) in including pollen grains, hyphal fragment, insect part, epidermal hair and unidentified spores respectively. Among the fungal groups, Deuteromycotina in Hospital contributed most at all the sites viz. Hospital (44.07%) followed by Zygomycotina (10.47%), Ascomycotina (9.02%) & Basidiomycotina (2.47%) respectively. Our results showed the diversity of airborne mycoflora which promotes the trend to health difficulties and therefore the hospital environment monitoring regular along with proper control measures is essential.

KEYWORDS: Aeromycoflora, fungal spore, pathology, Allergies, Environment, Hospital, OPD

I. INTRODUCTION

The major part surrounding ecosystem is air which includes various particles like as bacteria, fungal spores, very small insects, pollen grains and viruses, aerosols fern and moss spores, algal colonies, plant fragments, small seeds, protozoa, mites and insect fragments) soot, diesel exhaust particles, ashes, sand and mineral fragments such as silicate minerals) which are passively transported by the air (Spielsma, 1995). Aeromycoflora indicate the composition of the various airborne fungal spores of a particular area. Both beneficial and harmful fungal species are present ubiquitously in various environmental conditions. The airborne fungal spores are important in the differential diagnosis of respiratory disorders (Bajaj, 1998; Durham, 1998; Verma and George, 1997). A large percentage of airborne fungal spores are significant contributors to adverse health effects. They cause a dangerous ill effect to the human health with some health hazard materials like mycotoxins. These types of fungal spores are already making significant contributions to plant pathology, human respiratory disorders and other undesirable effects such as infections, hypersensitivity pneumonitis, and toxic reactions (Palm, 2001). With great access to indoor and outdoor environments, fungi restore allergy to almost 10 per cent of the global population (Pasanen, et al., 1996). Indoor Air Quality (IAQ) is a crucial factor in hospital facilities for preventing hospital-associated infections, sick hospital syndrome, and a range of occupational risks (Wan, et al., 2011). Various investigations continued to monitor the diversity of mycoflora composition and bioaerosol characteristics of the hospitals worldwide to determine the possible health risks of this airborne mycoflora (Rainer, et al., 2001; Molina, et al., 2002). The aeromycoflora in hospital environment may have great epidemiological concern and cause significant economic loss in terms of human mortality and morbidity (Douwes, et al., 2003; Sattar, et al., 2016). Air does not natural environment for the multiplication of fungal spores, but it is a



perfect medium for their dispersal from one place to another. Large numbers of studies have been undertaken in different parts of India and other countries which have established the prevalence of airborne fungi (Mishra, et al., 2008). In recent past increased attention is being directed to indoor environments as a source of biopollution. The occupational environments (ie. bakery, granary, hospitals etc.), which deal with the organic source and the by products provide a conducive atmosphere for the growth and proliferation of fungal allergens (Singh, 1998; Singh, et al., 1998 and Rafiyyuddin, et al., 1997). The present paper deals with the study of fungal species from air present inside hospital of Government General Hospital, Chandrapur, Maharashtra, India.

II. MATERIAL AND METHODS

The present study was carried out at two different sites Government General Hospital from August 2019 to December 2019 at Gondpipari City, Chandrapur District, Maharashtra. The present qualitative and quantitative study was carried out to determine the fungal spores count types and their seasonal variation during the period of investigation by rotorod air sampler (Perkins, 1957). It was placed constant height of 1 meter above the ground level for 30 minutes at regular intervals. Studies carried out in OPD and general ward. The exposed cello tape after that mounted on the glass slides by applying glycerine jelly. Slide preparation and scanning was carried out by the method after Tilak and Shrinivasulu (1967). Spores counts on strip was expressed as number of spore/m³. Identification of fungal spores was done by comparison with reference slides and by available literature after Burnett and Hunter (1972). The aeromycoflora is co-related with weather parameters and also with the incidence of allergy in the area.

III. RESULT AND DISCUSSION

The observation and data obtained during the course of investigation at Government General Hospital using rotorod air sampler from July 2019 to December 2019, the major contributors are *Aspergillus* which is followed by *Alternaria*, *Curvularia*, *Mucor*, *Cladosporium*, *Penicillium* and minor contributor in present investigation are *Nigrospora*, *Helminthosporium*, *Fusarium*, *Diplodia*, *Ganoderma*, *Smut* spores. A total no of 5464 spore /m³ of air belonging to various fungal spore were recorded from Hospital. Among these percentage of contribution of Deuteromycotina is 44.07, Zygomycotina 10.47, Ascomycotina 9.02 and Basidiomycotina 2.47. Highest incidence of fungal spores were recorded in the months of July & August. The largest spore conc. of *Aspergilli* (13.45%) followed by *Alternaria* (8.36%), *Curvularia* (6.48%), *Mucor* (5.99%), *Cladosporium* (4.98%), *Pleospora* (4.87), *Rhizopus* (4.48%), *Penicillium* (4.33%) least spore concentration, *Helminthosporium* (2.47%), *Nigrospora* (1.06%), and *Smut* spores (2.47%). In other types Hyphal Fragments (7.50%) contributes most percentage which is followed by Insect Parts (4.05%), Epidermal Hair (0.82%), Pollen grains (0.49%), Unidentified spores (21.10%) and this data was also reported by others (Tilak & Talib, 1980; Tilak & Saibaba 1984; Vittal & Glory 1985; Tripathi 1987; Santra & Chanda, 1981; Singh & Chatterji 1990)

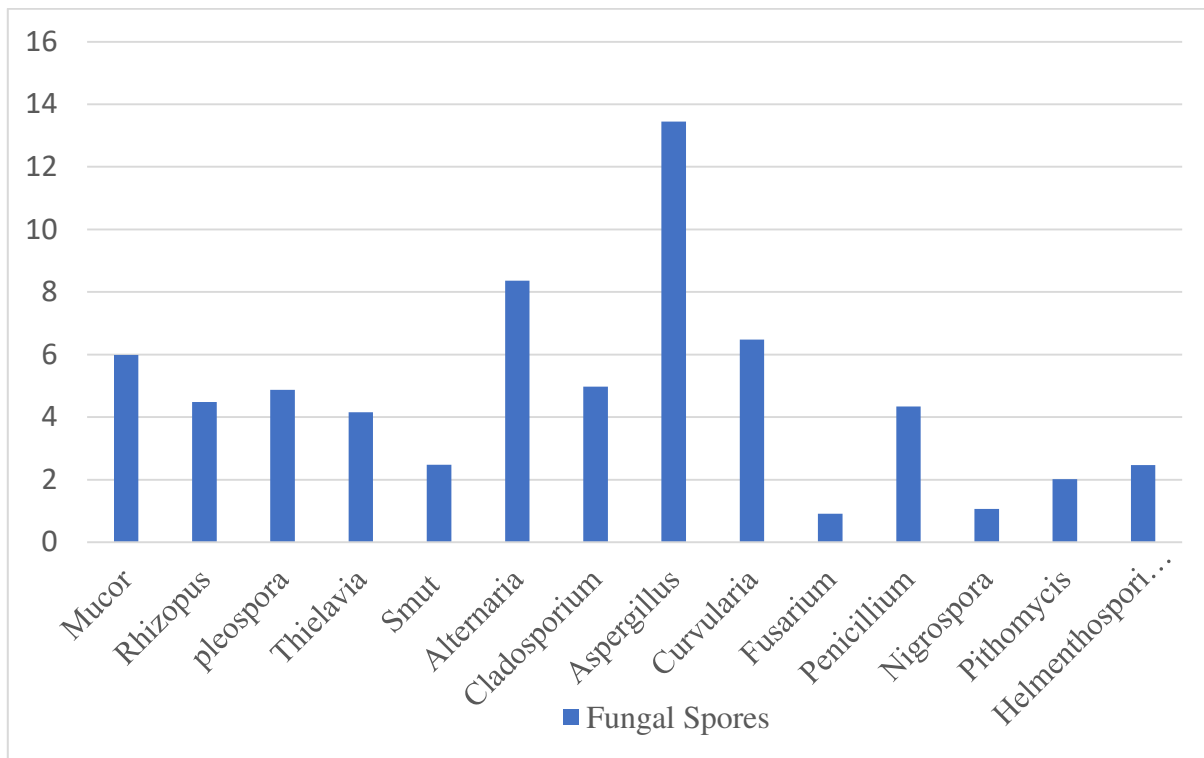


Fig.1 Percentage of Fungal Species At Hospital

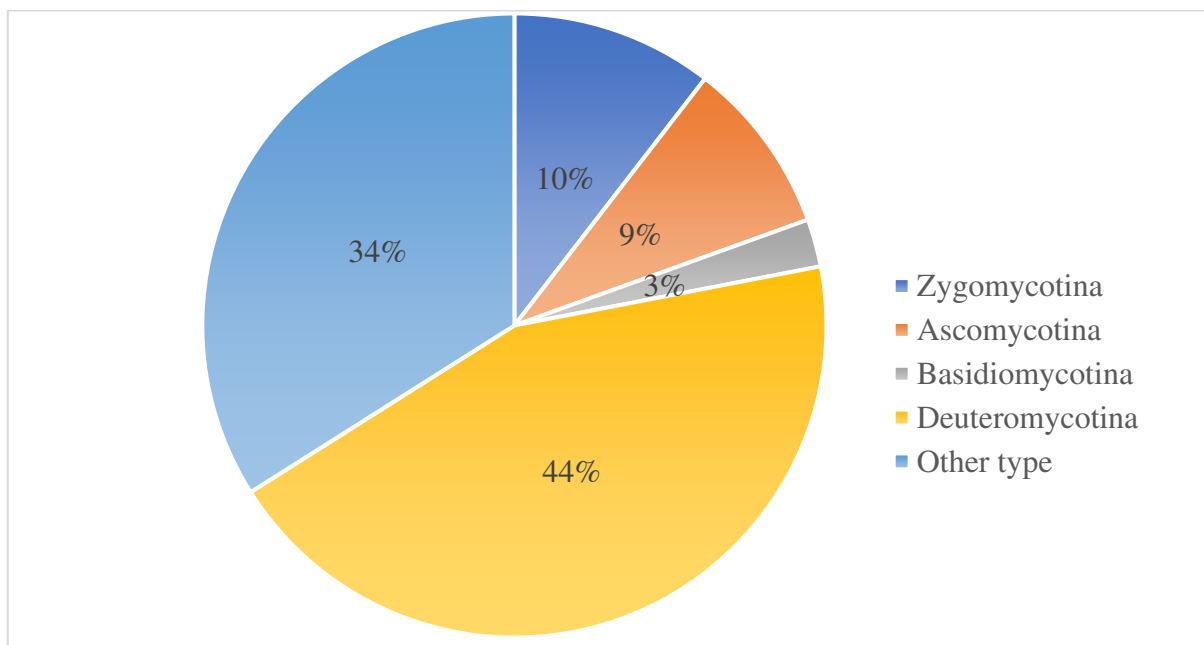


Fig.2 Percentage Contribution of Fungal Spore type in Hospital

Frequency of fungal spore population is closely associated with seasons variation and climatic conditions. It was found that moderate temperature, high relative humidity, and mild rains favoured fungal growth. The observation suggests the fact that, higher temperatures do not favour fungal growth in the atmosphere.

IV. CONCLUSION

Fungi are responsible for a variety of respiratory disease in humans, plants and animals. It is necessary to have sterilizes environment inside the hospital.measures can be taken against these fungi. It was also noticed that the fungi exhibit seasonal variations and grow best in moderate temperature and in humidity. In this present investigation of aeromycoflora at Government General Hospital,Gondpipari it was found that the concentration of fungal spore and fungal spore type are vary in all the location. The concentration of fungal spores is more in O.P.D. and found low concentration in general ward,different fungal spores were recorded i.e. *Aspergillus* Sp., *Alternaria* Sp,*Curvularia* *Cladosporium*, *Penicillium* Sp., *Mucor*, , *Fusarium* , *Rhizopus*, . *Aspergillus* Sp., *Alternaria*, *Curvularia*, *Mucor* *Penicillium* Sp. Are commonly observed, but *Aspergillus* Sp. Are most dominant fungal spore. The hygienic and unpolluted environment is essential to reduce the contamination of fungal spores and help in reducing different allergies. The present study and survey clearly shows that fungal population growth is firmly connected with different seasonal variation, climatic condition, rain, moister, humidity and other environmental factors. These aspects plays a significant role in the concentration of aeromycoflora. there is a need to study aeromycoflora of hospital environment to record and analyse data based on fungal spore present in that particular area of different section and ward of hospital area.Air monitoring is essential and must be performed continuously in order to find out the status of various types of allergic and pathogenic spores at various places and their role in causing health hazards to human beings. The present study strongly supports that the various fungal pathogens isolated in Government General Hospital of Gondpipari city, Chandrapur , Maharashtra ,India causing air pollution and creating health hazard to human being.

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