



Aeromycological study of hospital area

Navale Mahesh¹, Tambe AN¹, RJ Sawant²

¹ Department of Botany, Sangamner Nagarpalika 1Arts, D.J. Malpani Commerce and B.N. Sarda Science College, Sangamner, Ahmednagar, Maharashtra, India

² Department of Botany, Vinayakrao Patil College, Vaijapur, Maharashtra, India

Abstract

The fungal organisms can't live and grow at any region of earth surface. Aeromycological is a scientific and multidisciplinary biological science which deals with the source release, dispersion of different microorganisms found in the air and their impact on the ecosystem or life of plant, animal & human being. Now a day it becomes a part and parcel of the curriculum in various universities of our country & abroad. Aeromycological is a scientific and multidisciplinary approach focused on the transport of organisms & biologically significant material; it is also interdisciplinary science & is closely related to Mycology, Palynology, Pathology, Meteorology, Entomology and Air-pollution science. & also has been further extended to include investigation of air borne material of biological programs. Fungal spores are commonly called mold spores, are a normal component of the outdoor air. They are present in the atmosphere anytime that the ground is not covered with ice or snow. The spores are discharged from fungi growing as saprophytes The number and the kinds of microorganisms in any sample of air vary according to location, weather and the number of people present in the given area. Study of fungal spore of Gagangeri Hospital Near Sangamner.

Keywords: Aeromycology, ecosystem, microorganism, hospital

Introduction

Fungal spores are commonly called mold spores, are a normal component of the outdoor air. They are present in the atmosphere anytime that the ground is not covered with ice or snow. The spores are discharged from fungi growing as saprophytes (existing on dead or decaying organic matter is the soil or elsewhere in the environment) or parasites (infecting living tissues - most are plant pathogens). Many species of fungi are found as leaf surface microorganisms where they exist on organic matter produced by the plant. Concentrations outdoors can be high, especially in the late summer or fall. Air is most important component of the environment of soil & water. All living organisms the surface either on land or water out of the 3 component living organism can be selective for food and water but air is essential. air is the most vital component of environment without nobody can survive human being required about 1.26 kg of food, 2.04 kg water & 13.6kg of air normally. airborne micro-organism especially bacteria & fungi attack the biotic flora & deteriorate food & damage crop. Thus microbes & fungal spore are disseminated by the fruiting bodies of fungi & blown by air to the attacking sites. Than the aerobiology come in to existence.

The air in many indoor environments also contains spores; however, indoors we speak of these spores as contaminants when the fungi have colonized indoor substrates. Actually the outdoor air may be the source of the spores whenever fresh air is introduced. In addition, many indoor locations may serve as amplification sites for the growth of fungi. Such sites include carpeting, upholstered furniture, showers, shower curtains, other bathroom fixtures, potted plants, and the soil around potted plants The term aerobiology came in to use in 1930 as a collective term for the studies of airspora. Like air-born fungal spore. Pollen grain & other

air-born microorganism [4-9]. Fungal, spore, pollen, bacteria, & Virus, in fact all forms of life belonging to both plant & animal which becomes air-born air transported partly or wholly in the atmosphere now induced in the studies of aero-biology.

Material and methods

Air sampling is conducted for various purposes it may be qualitative & quantitative in nature. In qualitative analysis one can determine the specific nature of microbes within some selected group, and other hand quantitative analysis is concentration of different microbes occurring in the sampled air can be determine.

Different kinds of sampler are employed varied from non-volumetric.

Andersen sampler, Tilak air sampler: Tilak & Kulkarni (1970) and Rotorod sampler: Perkins (1957)

When air is travelling towards an object such as a narrow cylinder, or vice-versa, it is deflected around the object. Any particles in the air will tend to continue along their original trajectory, but their ability to do this (and to impact onto the object) is governed by their momentum (defined as mass x velocity). At any given air speed, the heavier particles are most likely to impact (a in the diagram) whereas smaller (lighter) particles are likely to be deflected round the object. Very high air speeds would be required to impact the smaller particles and such air speeds are seldom found in natural conditions.

In practice, therefore, fungal spores and other airborne particles can be grouped into two broad categories - those that can impact on surfaces and those that are smaller and are only removed from the air by sedimentation in prolonged calm conditions or that are removed from the air by rain.

One of the advantages of the rotorod sampler is that it can be used to precisely locate a source of spores of a particular fungus. The famous aerobiologist, PH Gregory, did this in the 1950s by placing rotorod samplers at different positions in a field and "homing in" on a source of spores of the fungus *Pithomyces chartarum*, which causes a condition known as facial eczema of sheep.

Mountant used & its preparation

Glycerin jelly was used as Mountant which has best optical properties in visual examination, the composition and the preparation of the jelly as follow, Glycerin and Distilled Water mixed in beaker and heat in water bath 2-3 hours, while heating the mixture, gelatin was added slowly by stirring with glass rod to avoid clumping after completed dissolution gelatin & phenol crystal is added.

Scanning

Sampling of the slide was started after slide preparation and was continued regularly throughout the period of investigation, Every small segment of the slide marked by ink, give tow hours data of the collection, analysis of aeromicrobiota was qualitative estimation. quantification of number of spore of air was computed from time to time, according the total number of spore from the catches was calculated by simple method,

Factor of sample 1

Site of the air sampling and location of the sampler
Aerobiological studies were carried out by keeping the rotorod sampler on the ground level in the Gagangeri hospital.

Result

Analysis of spore catches while scanning over Gagangeri hospital for one season along with the inorganic particles present, hype fragment, pollen, insect part, also observed, mostly 10 type different fungal spore identified unto general level.

Fungal Spores

Ascomycotina

1. Chaetonium
2. Cladosporium
3. Epicoccum
4. Stachybotrys

Basidiomycotina

1. Smut

Deutoromycotina

1. Curvularia
2. Alternaria Nees
3. Pithomyces

Other Type

1. Epidermal Hair
2. Hyphal Fragment

Discussion

Present investigation report the aeromicrobiota over Gagangeri hospital. The exploration of different biocomponent found in the Hospital. The experiment was study the aeromicrobiota over Hospital carried out for one

season. An attempt was made to study the general aeromicrobiota along with some pathogenic spore type in Hospital region, during the investigation the influence of different meteorological parameter, particularly atmospheric temperature, relative humidity & rainfall. The experement were carried out mainly to estimated the different fungal spore type population in the Hospital, the different fungal spore type were identified & incarpoted in to their respective group. In addition of pollen, insect part, hypal fragment & unidentified spore was also taken into concentration. The identification of spore type was essentially based on comparative spore morphology & description. In some doubt full cases it was further confirmed by comparing the spore type which reference slide prepared from fungal material collected from with in the around the crop field.

The spore which could not be identified due to its obscure nature was placed under a heterogeneous group called unidentified spore. The glance at the enlist 10 Aeromicrobiota component

Deutoromycotina	= 03
Ascomycotina	= 04
Basidiomycotina	= 01
Other type	= 02

Sufficient of high contribution by other type was due to heterogeneous collection of the unidentified type of insect part, During the rainy seasons as fungal spore were high even on some rainless day, because of high relative humidity on this day, the time of high incidence of a spore was taken as identification of possible time of spore liberation. The result of present investigation clearly indicated that rainfall had it direct & indirect impact or ascospore released. The fact was earlier pointed out by "Meredith "(1961). That the temperature &rainfall are two external factor which greatly affected the development of reproductive structure, The occurrence was more in the month August to October, Smut spore was mostly found in Hospital the highest spore found on October, but some Smut spore not play any pathogenic role. Fungal diseases are often caused by fungi that are common in the environment. Most fungi are not dangerous, but some types can be harmful to health. Mild fungal skin diseases can look like a rash and are very common. Fungal diseases in the lungs are often similar to other illnesses such as the flu or tuberculosis. Some fungal diseases like fungal meningitis and bloodstream infections are less common than skin and lung infections but can be deadly.

Superficial fungal infections are often diagnosed on the basis of their appearance and their location on the body. Most skin infections respond well to topical antifungal creams, some of which are available over the counter, which means they do not require a doctor's prescription. Other skin infections, however, do not respond to such treatment. They require a doctor's attention and systemic treatment with prescription antifungal medications. Systemic fungal infections often are chronic and develop slowly, taking weeks or months to become a problem. Symptoms are sometimes similar to those of the common cold, but sometimes, especially in people with weakened immune systems, symptoms may be sudden and severe, requiring hospitalization. Symptoms may include cough, fever, chills,

night sweats, anorexia weight loss, general fatigue, and depression.

If the infection spreads from the lungs to other organs, it may be particularly severe, especially if the patient has a weakened immune system. which causes inflammation and swelling of the lining around the brain and spinal cord.

Superficial fungal infections attack tissues on the surface of the body, which include the skin, nails, or hair. Some common examples are ringworm, athlete's foot, jock itch, and yeast infections. Candida yeast * infections are usually found on the skin, in the mouth, in the vagina, on the head of the penis, or around the nails. Superficial fungal infections are somewhat contagious and pass from person to person through direct contact or, less commonly, through clothes or contact with surfaces of other objects in the environment.

References

1. Gregory PH. The Microbiology of the Atmosphere, 2nd ed., Halstead Press, New York, 1973.
2. Levetin E. "Fungi". In: Bioaerosols, ed. H. Burge, Lewis Publishers, Boca Raton, 1995, 87-120.
3. Burge H. Bioaerosols, Lewis Publishers, Boca Raton, 1995.
4. Macher J. Bioaerosols: Assessment and Control, ACGIH, Cincinnati, 1999.
5. Patil BY. Aerobiological study of Aurangabad, 1985.
6. Patil CR. Aerobiological study of Aurangabad, 1983.
7. Pande BN. Airspora of some field, Nanded.
8. Babu M. Aerobiological studies at Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad, 1983.
9. Bhalke SP. Airspora over some fields. Ph.D. Thesis, Marathwada University, Aurangabad, 1981.
10. Ahuja SR. Airspora of Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad, 1992.
11. Chaubl PD, Deodikar GB. Airborne spores aaround Poona. J. Univ. Poona, 1964:26:123-136.
12. Gaikwad YB. Studies in air spora and taxonomy of pyrenomycetes. Ph.D. Thesis, Marathwada University, Aurangabad, 1974.
13. Gregory PH, Hirst JM. The summer airspora at Rothamsterd in 1952. J. Gen. Microbiol, 1957:17:135-152.
14. Gregory PH. The dispersion of airborne spores. Trans. Brit. Mycol. Soc, 1945:28:26-(13). JaganMohan Reddy N, 1988. Airspora studies at Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad.
15. Jogdand & Tilak Aerial transport of plant pathogen vistas in plant pathogen, 1986.
16. Jogdand SB. Airspora at Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad, 1987.
17. Karnik CR. A contribution to the rain water forms and airspora of jalgaon district". Sci. and cult, 1962:28:475-476.
18. Kotwal SG. Aerobiological investigation at Nashik. Ph.D. Thesis, Marathwada University, Aurangabad, 1992.
19. Pande BN. Studies in airspora over some fields at, 1976.