Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 9, August 2021: 7700-7705

Research Article

"Studies On the Aero-Mycoflora of Lormi Region of Mungeli District (C.G.)"

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Abstract

The most common agent of dispersal of spore of Ascomycetous and Basidiomycetous fungi is probably air. Because of the importance of this means of dispersal of plants pathogens and allergens, the specialized discipline known as Aeromycology has developed.The air sample from following site were isolated for further analysis. The different site were given below, Govt Rajiv Gandhi college, Sharda shishu vidya mandir, Bus stand, Teshil chowk Lormi. During present investigation altogether 14 fungal species were obtained in the period from September 2020 to February 2021. Among them, *Rhizopus, Aspergillus, Penicillia, Alternaria and Fusarium* werw dominant mycoflora. *Penicillium Fusarium* was present in all the six months of study like other fungal strains mentioned above. Environmental factors are responsible for occurrence of aerofungi in different regions, viz relative humidity and temperature affected their occurrence.

Keywords:- Fungi are ubiquitous in nature, spore Aeromycology .

INTRODUCTION

Industrial and agricultural activities by men have created environmental pollution in a number of ways. Besides chemical pollution causing agent, biological pollutant have been found to pose serious problem to human beings. Fungal spores present in air are important biological pollutant. Such agent which have been reported to cause allergy in human beings in various ways. Every organism of biosphere including the micro-organism of very minute size too continuously struggle for its existence. None of the micro-organism of the air can be considered indigenous to the atmosphere, as air is not a medium suitable for the growth and reproduction of micro-organisms. A wide variety of organisms dwell upon earth. They have originated and evolved in different periods and eras of geological time-table.

The quality of various gases in the earth's atmosphere and indeed many other compounds on the earth's surface represent the net balance between their rates of formation and utilization in biological and geological processes (*Steiner et al., 1995*). The feature of fungi is besed on their role in decomposing complex organic matter in to simple compounds (*Kurmbein, 1983; Revelle, 1982).* Equipment used in Aeromycology usually consists of special trapping devices that ensure the collection of even small spores that impact on the collecting surface. In some of the traps spores are sorted by size class and time of collection. In this regard a number of mathematical formulae have been developed for modeling spore fall under different conditions *(Aylor, 1982*; *Mc Cartney and Fitt, 1987*). Fungi are ubiquitous organism and in the atmosphere they are mostly found in the troposphere extending up to 10 km, only rarely wandering into the stratosphere. During the last two decades, the fungus has been used to test various biological processes. Since they grow very fast and require a short period to complete their life cycles, the fungi are best suited for use as test organisms. Fungi form very good research material for genetic studies and other biological processes Genus *Neurospora* has become very good material for genetic studies while *Physarum polycephalum* is used to study steps in DNA synthesis, morphogenesis and mitotic cycle.

Studies on the pattern of distribution, their seasonal variation, physiological behavior and biochemical distribution of different aerial fungi have been done by various workers. (*Krebs, 1985 ; Tiwary 1987 et al; 1990). (Arya and Arya, 2007; Nayak and Behaera, 1995). (Piliponyte-Dzikiene et al. 2014).*

MATERIALS AND METHODS

The mycoflora germinates in defined minimal medium (M.M.) of complex medium (C.M.). plus appropriated nutritional supplements for auxotrophic strains of some fungi. This type germination is best between 28.c and 37.c . Some strains are temperature (heat or cold) sensitive. Germination is faster on complex medium than minimal medium, and is favored by high inoculums levels.

The diversity of fungi can be seen in multitude of structure and functional aspects of cell morphology and in nations in metabolic strategies, motility, cell division, development biology, auxotrophic studies and characterization.

Culture media and stock solutions:-

A variety of defined media have been suggested by a number of workers but in the present investigation following media as described by *pontecorvo et al. (1953*) werw used. All the chemicals were of analytical grade and obtained form commercial sources. Glass distilled water was used for preparing the minimal media (MM) while ingredients of the complete medium were dissolved in tap water.

Minimal MEDIUM (MM)

Supplemented Czapec-dox agar medium

Composition per liter of medium

Dextrose	–	10.00g
NaNo3	_	06.00g
KCL	_	00.52g
MgSo4	–	01.52g
KH2Po4	–	Traces
CuSo4	–	Traces
FeSo4	_	Traces
ZnSo4	–	Traces
Agar-Difco-bacto	_	15.00g
Peptone	–	2gm.
Yeast Extract	–	2 gm.
Casein Hydrolysate	–	1.5gm.
Vitamin Mixture	–	1.0 Ml

[Containing Riboflavin (1.0mg) Biotin (0.02 mg) Nicotinamide (1.0mg) Para-amino benzoic acid (0.5mg) Pyridoxine hydrochloride (0.5mg), Thiamin HCL (0.2mg.)]

Distilled water to make 1 liter. pH of the medium adjusted to 6.5-6.7 with 1 N NaoH / HCL. Vitamins were added after adjustment of pH.

Potato dextrose Agar (PDA) Medium.

Potato infusion	_	200gm.
Dextrose	_	20gm.
Agar-Agar	_	15gm.

Distilled Water	_	1 litre
pH	_	5.6 to + 0.2

SITE UNDER STUDY

The mycoflora are abundant and ubiquitous in our environments. They occur in air, soil, water,food, sewage, decomposing matter, living plants and on body surfaces. The isolation and identification of aquatic fungi from different water bodies in an example in which a mycological ecosystem and can be studied.

For the study of the fungal aerospora of the entire Lormi, Mungeli (C.G.) town during present investigation four sampling sites were selected which represented four different viz. east, west,north,south. The air sample from followings site were isolated for further analysis. The different sites were given below:

Sampling - 1 Govt.Rajiv Gandhi College ,Lormi

Sampling - 2 Sharda Shishu Vidya Mandir, Lormi

Sampling - 3 Bus Stand Lormi

Sampling -4 Teshil Chowk Lormi

Air Sampling, Gravity Slide,Settle-plate, Purification of fungal strain,Maintence of fungal strains,Ecological studies.

Frequency determination:

Percentage frequency of each and every fungal species was calculated by dividing the total number of colonies of a particular species by total number of colonies of all the species and multiplying the figure with 100.

$$\text{Percentage (\%) frequency of fungal Species} = \frac{\text{Total No. of colonies of the species}}{\text{Total No. Of colonies of all the species}} \times 100$$

Identification of fungal strain:

The fungi seen in a microbiological laboratory are referred to either as yeast or molds which are descriptive, not formal , taxonomic terms. Characteristically the yeasts, have moist to waxy colonies in culture with a predominance of budding cells (3-5µm in diameter). The molds have leathery to velvety, powdery, granular, or cottony colonies, made up of tubular cells the hyphae. Some fungi are dimorphic, i.e. they grow as molds in culture at room temperature (25oC) and as yeasts at 37oC.

RESULT AND DISSCUSION

Isolation of Fungal Flora:

Fungal flora of different sites of Lormi, Mungeli was assessed by Petri piated culture method. For this purpose, samples were collected as described in chapter -3. In order to find out the prevalence of fungi in different sites in different time duration, samples were analyzed continuously from September, 2020 to February 2021. The results indicated that fungi were most prevalent in the month of January 2021 Whereas least fungi were found in the month of February 2021 . From the 04 different sites of the town of Lormi total number of 14 species of mycoflora were isolated.

Identification of Fungal Isolates:

Identification of isolated fungal species, as soon as they were isolated in a pure form, were made by recognition of characteristic structure seen in culture which includes colonial morphology, hyphae structure, asexual spores, sexual spores, reproductive bodies and arrangement of conidia. These characteristics were examined by the

preparation of the lacto phenol cotton blue microscopic mount and identified the culture on the basis of the characteristic features produced.

Discussion:

Wind is commonaly used as a mechanism to disperse fungi and as a consequence that air we breathe contain spores of many different fungi. Because of high irradiance and low water availability air is a hostile environmental for fungi. Spore of most fungi don't survive significant periods in air because of the absence of energy. Those that survive have quite specific mechanism to prevent damage from desiccation and irradiation. Since the supplemented Czapek dox culture medium provides better nutritional support, this was used for all type of studies during present investigation.

Table 1

Fungal species and isolate numbers obtained during present investigation.

S.No	Isolate No	Identified fungal species
1.	ML 101	*Aspergillus Flavus*
2.	ML 102	*A.niger*
3.	ML 103	*A. fumigates*
4.	ML 104	*A. nidulans*
5.	ML 105	*Rhizopus stolonifer*
6.	ML 106	*Penicillum funiculosum*
7.	ML 107	*P. species*
8.	ML 108	*Fusarium oxysporum*
9.	ML 109	*F. moniliforme*
10.	ML 110	*F. solani*
11.	ML 111	*Alternaria alternate*
12.	ML 112	*Trichoderma viridae*
13.	ML 113	*Curvalaria lunata*
14.	ML114	*Mycelia sterilla*

CONCLUSION:

Air contains enormous fungal spore which are disseminated from various substrata on the earth surface. Most of this spore belonging to different species are either saprophyte or facultative in nature. Number of isolated strains and their frequency may throw light on the prevalence of fungal species in air.

Mycoflora present in air of no importance to man but when they come to rest, may be beneficial or harmful because of there role in hay fever. Several diseases, like influenza (*Trichoderma viridae)*. Colds, mycoses are spread by air-borne micro-organism. Lormi town is located at the tarai region of Amarkantak hills. The later is full of forest and dense vegetation. Environmental factors are responsible for occurrence of aerofungi in different region.

Air samples were collected from different months in the present investigation. Maximum fungal species were noticed in the month of September and January. While least fungi were found in the month of February 2021. Investigation will throw light on the nature of mycoflora prevalent in the atmosphere of Lormi region and their seasonal and monthly variation.

References

1. Aylor, D. E. 1982. Modeling spore Dispersal in a Barley Crop. Agric. Meterol. **26** ; 215-219.
2. Arya. C. and Arya, A. (2007) Aeromycoflora of fruit market of Baroda, India and associated diseases of certain fruits. *Aerobiologia* **23**: 283-289.
3. Krebs C. J. (1985) Ecology : The experimental analysis of distribution and abundance. Harper and Row public, New York.
4. Krumbein, W. E. (1983) Microbial Geochemistry. Blackwell publication, Boston.

5. McCartney, H. A. and B. D. L. Fitt. 1987. Spore Dispersal Gradients and Disease Development. Pp. 109-118. In : Populations of plant Pathogens : Their Dynamics and Genetics. Eds. M. S. Wolfe and C. E. Caten. Blackwell Scientific, Oxford.
6. Nayak, B. K. and Behera, N. (1995) Prevalence of atmospheric fungal spores in an industrial area. Abstract : 18 th All India Botanical Conference **74** : 29.
7. Piliponyte-Dzikiene, A., Kaczmarek, J., Petraitience, E., Kasprzyk, I., Brazauskiene, I., Brazauskas, G. and Jedryczka, M. 2014. Microscopic and molecular detection of airborne ascospores of *Leptosphaeria maculans and L. biglobosa* in Lithuania and Poland. Zemdirbyste- Agriculture, 101 (3): in press.
8. Pontecorvo, G., Roper, J. A. Hemmons, L. K., Macdonald, K.D. and Bufton, A. W. J. (1953). The genetics of Aspergillus nidulans. *Adv. Genet***. 5** : 151-238.
9. Revelle, R. (1982) Carbon di-oxide and world climate. *Scientific American***. 247** : 35.
10. Stanier, R. Y., Longarahm, J. L., Wherelis, M. L. and painter, P. R. (1995) General Microbiology, Macmillan Press Publication, Hong Kong.
11. Tiwary, B. N., Bisen, P. S. and Sinha, U. (1987) Genetic control of amino acid transport in *Aspergillus nidulans. Curr. Microbiology*. **15** : 305-311.