

STUDIES ON COMPOSITION AND COMPONENTS OF AIRSPORA BELONGING TO PHYCOMYCETES OVER THE CAMPUS OF ACSCOLLEGE SHANKARNAGAR TQ. BILOLI DIST. NANDED

S. S. Kadam*

¹Department of Botany Shree Madhukarrao Patil Khatgoankar Mahavidyalya, Shankarnagar,
Dist. Nanded.

Article Received on
05 April 2023,

Revised on 25 April 2023,
Accepted on 15 May 2023

DOI: 10.20959/wjpr20238-28141

***Corresponding Author**

S. S. Kadam

Department of Botany Shree
Madhukarrao Patil
Khatgoankar Mahavidyalya,
Shankarnagar, Dist. Nanded.

ABSTRACT

Present Paper deals with study of composition and components of airospora belonging to Phycomycetes over the campus of ACS College Shankarnagar. Slides of spore catches were prepared, mounted and spore scanning was carried out regularly. Four types of fungal spores belonging to the Phycomycetes were trapped on the cellophane tape fixed on the drum of the sampler. Apart from these various dust particles were also seen in abundance.

KEYWORDS: Phycomycetes, Nanded, Fungi, Aerobiology.

INTRODUCTION

Aerobiology is an interdisciplinary science which deals with the study of biological components like pollen grains, fragments of fungal spores, hyphal fragments bacteria, viruses, algae, lichens, plant seeds and other propagules, protozoa, minute insects and insect parts etc. in the atmosphere. Abiotic particulates and gases affecting living organisms have been recently included in the concept of aerobiology. The aerobiological studies are mainly concerned with the interrelationships between the biological components in the atmosphere, sources of biological components, their release in the atmosphere, their deposition and impact on health of plants and animals including human beings. Airborne infections and the resulting diseases threaten the lives and productivity of plants. Airborne diseases still pose a challenge to mankind.

It is evident from the literature that investigations on outdoor (Extramural) atmosphere for the detection of microorganisms have got manifold significance and utility. The aero allergenic

pollen grains, fungal spores and other biologically significant particles detected from the atmosphere have their impact on human health. The detection and trapping of the significant plant pathogenic airborne fungi over crop fields are ultimately helpful in formulating a better and efficient forecasting system.

It is also clear from the literature that many workers have focused attention towards the relationship between airborne fungi and phytopathological problems. In India several workers like Cunningham (1873), Mehta (1952), Padmanabhan (1953), Ramlingam (1966), Sreeramalu (1970), and Tilak (1970) carried out the systematic and classic aerobiological work on rust spores with reference to wheat, jowar bajra, rice, sugarcane, cotton, banana, citrus and vegetables at various research centers.

In Maharashtra particularly in the Marathwada region aerobiological work with reference to many crop plants was extensively carried out by various workers like Tilak (1970), Nagpurne (1973), Bhalke (1979), Chakre (1979), Balkhanale (1980), Babu (1983) Meshram (1990), Naik (1995), Pawar (1997), Kadam (2002), Bembrekar (2005), Dhaware (2007) and Patil (2008) at various centres. However detail studies on air spora over Botanical gardens in respect seasonal conditions are meager. Considering these facts studies on air spora belonging to the Phycomycetes over Botanical garden of Yeshwant Mahavidyalaya, Nanded is carried out.

MATERIALS AND METHODS

Composition of airspora belonging to Phycomycetes over the the campus of ACS College Shankarnagar during two consecutive kharif seasons (Table-1, Pate-2)

In order to study composition and components of the airspora belonging to the Phycomycetes over the campus of ACS College Shankarnagar, slides of spore catches were prepared, mounted and spore scanning was carried out regularly. Before the scanning, the slides were marked with a ball-point pen in to six equal parts, each part indicating the spore catch of two hours of sampling period. Area of 9600sq. micron of the total area of the trace obtained was scanned under 10X x 45X eye piece objective combination of binocular research microscope. The identification of fungal spore types was made on the basis of morphological characters, visual identification by comparison with reference slides.

RESULTS AND DISCUSSION

Analysis of spore catches from the results presented in table-1 revealed that four types of fungal spores belonging to the phycomycetes were trapped on the cellophane tape fixed on the drum of the sampler. Apart from these various dust particles were also seen in abundance.

Enumeration of the identified spores of fungi belonging to Phycomycetes over the campus of ACS College Shankarnagar during the two consecutive kharif seasons

1. *Acaulopage drechs*

Mycelium slender, aseptate, sparsely branched, Conidia aerial, hyaline, borne singly on prostrate hyphae.

During the present studies the spore concentration in the first test kharif season from 21-06-2009 to 30-09-2009 and second test kharif season from 21-06-2010 to 30-09-2010 was recorded 1498/m³ and 1190/ m³ of air respectively. They contributed 0.91% and 0.74% to the total airspora in the first and second kharif seasons respectively. The average percentage contribution for both the test seasons was recorded 0.82% to the total airspora over the the campus of ACS College Shankarnagar.

2. *Albugo pers*

The spore one celled, nearly globose, thick walled, smooth, hyaline to yellow coloured, 14-16 μ m, born in chain on aseptate club shaped conidiophores.

During the present studies the spore concentration in the first test kharif season from 21-06-2009 to 30-09-2009 and second test kharif season from 21-06-2010 to 30-09-2010 was recorded 4830 /m³ and 5334 / m³ of air respectively. They contributed 2.95% and 3.32% to the total airspora in the first and second kharif seasons respectively. The average percentage contribution for both the test seasons was recorded 4.61% to the total airspora over the campus of ACS College Shankarnagar.

3. *Mucor micheli ex Fr.*

Spores one celled globose to oval, thin walled, smooth dark in mass 3-5 μ m diameter, common during wet months of rainy seasons, saprophytic on a variety of substrates.

During the present studies the spore concentration in the first test kharif season from 21-06-2009 to 30-09-2009 and second test kharif season from 21-06-2010 to 30-09-2010 was recorded 2408/m³ and 238/ m³ of air respectively. They contributed 1.47% and 0.14% to the

total airspora in the first and second kharif seasons respectively. The average percentage contribution for both the test seasons was recorded 0.80% to the total airspora over the the campus of ACS College Shankarnagar.

4. *Rhizopus ehren*

The spores of *Rhizopus* are unequal, irregular, round, oval, angular, striate, 9-11 x 7.5 μ m in size. It is common saprophyte and facultative parasite on mature fruits, vegetables and on many other substrates. During the present studies the spore concentration in the first test kharif season from 21-06-2009 to 30-09-2009 and second test kharif season from 21-06-2010 to 30-09-2010 was recorded 462/m³ and 2772/m³ of air respectively. They contributed 0.28% and 1.72% to the total airspora in the first and second kharif seasons respectively. The average percentage contribution for both the test seasons was recorded 1% to the total airspora over the the campus of ACS College Shankarnagar.

Table 1: Composition of airspora belonging to Phycomycetes over the the campus of ACS College Shankarnagar, during two consecutive kharif seasons.

Sr. No.	Spore type
1	<i>Acaulopage</i> Drechs
2	<i>Albugo</i> Pers.
3	<i>Mucor</i> Micheli ex Fr.
4	<i>Rhizopus</i> Ehren.

REFERENCES

1. Babu, M. Aerobiological studies at Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad, 1983.
2. Bembrekar, S. K. Studies in airspora of cotton field. Ph.D. Thesis, Swami Ramanand Teerth Marathwada University, Nanded, 2005.
3. Bhalke, S.P. Airspora over some fields. Ph.D. Thesis, Marathwada University, Aurangabad, 1981.
4. Chakre, O.J. Studies in microbial population of air at Aurangabad. Ph.D. Thesis, Marathwada University, Aurangabad, 1979.
5. Cunningham, D.D. Microscopic examination of air. Govt. Printer, Dhaware, D.A.(2007): study of aeromycoflora and Phyllosphere flora over some edible fruit plants, Ph.D. Thesis, Swami Ramanand Teerth Marathwada University, Nanded, 1873.
6. Kadam, S.S. Aerobiological investigations over sugarcane fields at Shankarnagar, 2002.

7. Mehta, K.C. Further studies of cereal rusts in India-II. Sci. Monogr. Coun. Agric. Res. India, 1952; 18: 1-368.
8. Meshram, B.M. Studies in airspora at Udgir. Ph.D. Thesis. Marathwada University, Aurangabad, 1990.
9. Nagpurne, S. D. Studies in airspora at Kandhar. Ph.D. Thesis, Marathwada University. Aurangabad, 1973.
10. Naik, M.N. Atmospheric microbial population studies at Aurangabad (M.S.). Ph.D. Thesis, Marathwada University, Aurangabad, 1995.
11. Padmanabhan, S.Y. Specialization in pathogenicity of *Helminthosporium oryzae*. Proc. 40th Indian Sci. Congr, 1953; III: 18.
12. Patil, T.M. Studies in air spora over black gram fields. Ph.D. Thesis, Dr. Babasaheb Ambedkar Marathwada university, Aurangabad, 2008.
13. Pawar, S. R. Studies in airspora over some crop fields at Aurangabad. Ph.D. Thesis, Dr. Babasaheb Ambedkar Marathwada university, Aurangabad, 1997.
14. Ramalingam, A. A volumetric survey of the atmospheric pollen over paddy fields at Visakhapatnam in 1960 and 1961. Palynol. Bull, 1966; 2 and 3: 11-17.
15. Sreeramulu, T. Conidial dispersal in two species of *Cercospora* causing Tikka leaf spots on groundnut (*Arachis hypogea*). J. Agri. Sci, 1970; 40: 173-178.
16. Tilak, S.T. Aerobiology and cereal crop diseases. Rev. Trop. Pl. Path. (Ed. S.P. Raychaudhari), 1984; 1: 329-354.
17. Tilak, S.T. Aeropalynolgy of Maharashtra. Recent Advances in Palynolgy, 1989; 101-116.
18. Tilak, S.T. Airborne airborne pollen and fungal spores. Vijianti prakashan, Aurangabad, 1989.
19. Tilak, S.T. Fungal spora and allergy. J. Palynol, 1991; 27: 36-386.
20. Tilak, S.T. and M. Babu Incidence of *Cunninghamella* spores in the atmosphere. Poll. Res, 1982; 1: 55-58.
21. Tilak, S.T. and S.P. Bhalke Aeromycology at Aurangabad-11 Deuteromycetes. Indian J. Bot, 1978; 1: 113-115.
22. Tilak, S.T. and B.V. Srinivasulu Airspora of Aurangabad. Ind. J. Microbiology, 1967; 7: 167-170.
23. Tilak, S. T. and B. V. Srinivasulu: Airspora of Aurangabad. Indian J. Microbiol, 1967; 7: 167-170.

24. Tilak, S. T. and M. Babu Incidence of *Cunninghamella* spores in the atmosphere. Poll. Res, 1982; 1: 55-58.
25. Tilak and S. P. Bhalke Aeromycology at Aurangabad.-II. Deutermycetes. Indian J. Bot, 1978; 1: 113-115.
26. Tilak, S.T. and O.J. Chakre Atmospheric concentration of *Claviceps microcephala* over bajara fields in relation to their environmental factors. Iv Int. Palyno. con. Lucknow. (Abstract.), 1978; 181-182.
27. Tilak, S.T. and R. L. Kulkarni A new air sampler. Experiential boil, 1970; 26: 443.
28. Tilak, S.T. and R.L. Kulkarni Airspora over sugarcane fields. International Symp. Patho; New Delhi, 1971.
29. Tilak, S.T. and R.L. Kulkarni Atmospheric concentration of *Rhizopus* spores in air. Biovigyanam, 1975; 1: 91-94.
30. Tilak, S.T. and K. S. Ramchander Rao Aerobiology of Sunflower disease. Environmental Ecology and Aerobiology, edited by S.T. Tilak, 1989; 3: 41-66.
31. Tilak, S. T. Air borne pollen and fungal spores. Vaijayanti Prakashan, Aurangabad, 1980.
32. Tilak, S. T. Aerobiology and its practical applications. Proc. I Nat. Conf. Env. Bio, 1982; 33-38.
33. Tilak, S. T. and B. V. Srinivasulu Airspora of Aurangabad. Indian J. Microbiol, 1967; 7: 167-170.
34. Tilak, S. T. and D. B. Vishwe microbial content of air inside library. Biovigyanam, 1975; 1: 91-94.
35. Tilak, S. T. and S.P. Bhalke Aeromycology at Aurangabad-II Hyphal reagments. Advancing Frontiers of Mycol. and Pathol. Today and Tommarrow Publ. Delhi, 1981; 55-54.
36. Tilak, S. T. Atlas of airborne pollen and fungal spores. Vaijayanti prakashan, Aurangabad, 1987.
37. Tilak, S. T. and K.S. Ramchander Rao Trapping *Cunninghamella* spores from air, Poll. Res, 1989; 18(1): 37-40.