



PREVALENCE OF ALLERGENIC FUNGAL SPORES IN THE ATMOSPHERE OF DECCAN PARK OF TOLICHOWKI AREA OF HYDERABAD, TELANGANA STATE, INDIA.

Air Pollution

Humera Shabnam

Research Scholar, Palynology and Paleobotany Research Lab, Department of Botany, University College of Science, Saifabad, Osmania University, Hyderabad-500004.

Chaya Pallati*

Assistant Professor, Palynology and Paleobotany Research Lab, Department of Botany, University College of Science, Saifabad, Osmania University, Hyderabad-500004. *Corresponding Author

ABSTRACT

The present paper deals with the atmospheric survey of Deccan Park, situated in Tolichowki area of Hyderabad, Telangana State, India and results of the study revealed the various aerospores viz., Pollen grains, fungal spores, epidermal shreds, trichomes, fibers, small Insects, Insect parts, dust mites etc. Out of various elements present study focused on the allergenic fungal spores recorded during July to October, 2019. A total of eight fungal spores viz., *Alternaria*, *Bispora*, *Curvularia*, *Cladosporium*, *Drechslera*, *Nigrospora*, *Sporidesmium*, and *Tetraploa* were recorded. These fungal taxa belong to six families. The common allergenic fungal spores of this area have diversity of morphological characteristics viz; Shape, Size, Color, Septation, attachment of Scar and wall characteristics of the spores.

KEYWORDS

Fungal spores; aeroallergens; aerosols; Spore morphology; Deccan Park; Tolichowki; Hyderabad; Telangana state; India.

INTRODUCTION

Aeromycological studies play an important role in allergic studies. Fungal spores, form a significant part of the bio-particles present in the atmosphere and can be found in the air throughout the year. The count, diversity, production and transport of fungal spores in the atmosphere varies based on weather conditions and seasons. Airborne fungal spores have been known to cause various allergic problem to the humans. Deccan Park, situated next to Qutub Shahi tombs in the Tolichowki area of Hyderabad, is a public park with dense greenery and is visited by many people. Efforts are made to study the air borne fungal spores of the Deccan park and the present paper deals with the aeromycological survey of the ongoing aerobiological studies during July - October 2019 in order to identify the fungal aeroallergens.

MATERIAL AND METHODS

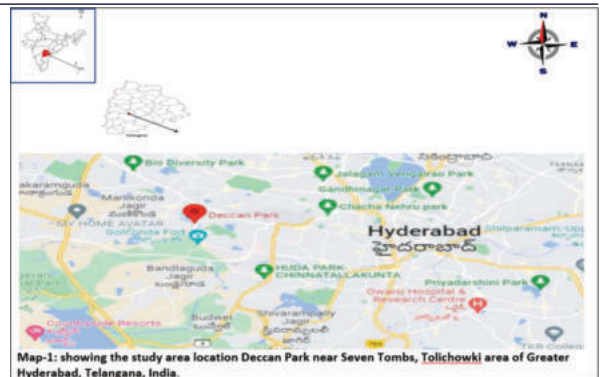
The present study deals with the atmospheric survey and identification of diversity of fungal spores having allergenic nature with morphological characters from Deccan Park, Tolichowki area with the help of published literatures (Tilak, 1989, Nayar. J and Ramanujam C.G.K. (1989), Reddy K. M.& Ramanujam, C.G.K. (1989), Reddy P.R. and Reddy R.R. (1996), Bhiwagade. S.D and Kalkar. S.A. (2014)). Outdoor survey of atmospheric bio-aerosols was conducted from July - Oct. 2019 by using a gravimetric air sampler, which is modified version of Lakhnupal and Nair's 1958 fabrication and the sampler is installed at the terrace of a building near Deccan Park, Tolichowki area in central zone of Greater Hyderabad, Telangana State (Map-1), at a height of about 25-30 feet from the ground level.

Three slides were exposed per day and exposed slides smeared with glycerin jelly were replaced every 24 hours, at 9 am.

The airborne bio-particles are impacted by the wind on the greased slides were then critically scanned under the microscope for the aerospora. The slides were studied and photomicrographs of the fungal spores were taken by using a Olympus trinocular microscope with Sony digital camera.

Table-1: Morphology of the airborne fungal spore types recorded from the Deccan Park study area in city of Hyderabad T.S. India.

S. No.	Name of the fungal spore	Family	Shape	Color	Septa	Wall Cha.,
1.	<i>Alternaria</i> Nees.	Pleosporaceae	variously shaped obclavate to elliptical ovoid, beaked, beak conical or cylindrical with appendages	dark brown	Highly septate	smooth or verrucose
2	<i>Bispora</i>	Helotiaceae	Spores without stalk	brown or dark brown,	dark band at the septum	smooth.
3	<i>Cladosporium</i>	Davidiellaceae	Spores in chain [A] ovoid to cylindrical, acropetal claims usually branched ellipsoidal or limoniform,	hyaline to pale brown, some are dark	One or two cells	Smooth to rough with protuberant scars at each end



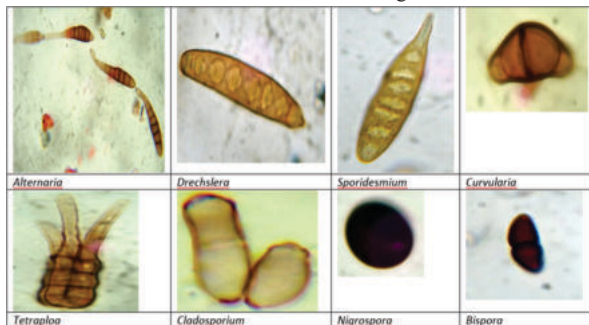
RESULTS AND DISCUSSION

In the present aeromycological study conducted at Deccan Park at Tolichowki area of Hyderabad during July-Oct. 2019, eight fungal spores referable to six families were identified. The fungal spores recorded include *Alternaria*, *Bispora*, *Curvularia*, *Cladosporium*, *Drechslera*, *Nigrospora*, *Sporidesmium*, and *Tetraploa*. The fungal taxa belongs to Davidiellaceae, Helotiaceae, Pleosporaceae, Sporidesmiaceae, Trichosphaeriaceae, Tetraplophaeriaceae, families. The recorded spores studied showed diversity in fungal spore morphological characters (Table-1). The color of the fungal spores varied from brown to dark brown except *Nigrospora* with black and *Cladosporium* with hyaline to pale brown in color. The wall of the spores dominantly showed smooth or verrucose followed by scar and pore on the tips, 6 genera dominantly show septate condition viz., *Alternaria*, *Bispora*, *Curvularia*, *Cladosporium*, *Drechslera*, *Sporidesmium*, and where as *Nigrospora* and *Tetraploa* shows aseptate condition. Shape of the spore is also important consideration in identification, in these study all fungal taxa showed different shape (Table 1). These recorded fungal spores are proved aeroallergens and cause allergic reactions to the human beings.

4	<i>Curvularia</i> Boid.	Pleosporaceae	ellipsoidal, typically curved or bent	brown	3-4 septate, one of the central cells distinctly larger and darker than the terminal cells	smooth or verrucose
5	<i>Drechslera</i> Ito.	Pleosporaceae	straight or curved or cylindrical or elliptical	brown, Cells paler while intermediate cells were darker	7-12 Pseudo septate, only transversely septate	Smooth with apical pore
6	<i>Nigrospora</i> Zim.	Trichosphaeriaceae	spherical to polygonal, compressed dorsiventrally,	black, Shining,	aseptate	Smooth
7	<i>Sporidesmium</i>	Sporidesmiaceae	Erect, unbranched, straight or flexous, cylindrical	Brown to dark brown	5-8 septate, slightly constricted at the basal septum,	Smooth or verrucose with a flat basal scar
8	<i>Tetraploa</i>	Tetraplospiraeriaceae	Dome- shaped or wedge – shaped, broadly ellipsoidal to fusoid,	Brown	Aseptate, 4 rows of cells each with 4 cells, Cells diverge apically and terminate in a setiform appendage.	Thick walled

Acknowledgements:

The Authors are grateful to the Principal of University College of Science, Saifabad, Osmania University, Hyderabad for providing the Lab facilities and our teachers for their encouragement.



REFERENCES

1. Bhiwagade. S.D and Kalkar. S.A. (2014) Preliminary aerospora survey at outdoor and indoor environment in western part of Nagpur region Int. J. of Life Sciences. Special Issue A2: 105-107.
2. Lakhnupal R.N., Nair P.K.K. 1958. Survey of atmospheric pollen at Lucknow. J. Sci. Inds. Res. 17C: 80-87.
3. Nayar. J and Ramanujam C.G.K. (1989), "Studies on the aerospora of a semi- urban area in the vicinity of secunderabad, A.P., Ind.J. Aerobiol. vol 2 No. 1 & 2 : 7-12.
4. Reddy P. R. and Reddy R.R. 1996 "Aeromycological survey of Vikarabad Ranga Reddy (A.P)", Indian J. Aerobiol.: 9-13.
5. Reddy K. M.& Ramanujam, C.G.K. (1989) "An Aerobiological study of Hyderabad (A.P)", Asian J. Pl. Sci., Vol. 1: 7-21
6. Tilak S.T. (1989): Airborne pollen and fungal spores. Vijjayanti Prakashan, Aurangabad.