



## INFLUENCE OF ALTERNARIA BELONGING TO GROUP DEUTEROMYCOTINA OVER THE GROUNDNUT FIELD DURING KHARIF AND RABBI SEASON AT NASHIK DISTRICT, MAHARASHTRA, INDIA

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**ABSTRACT** Aerobiology plays a fundamental role in transmission of infectious diseases. It is a scientific approach focused on biological microorganisms in the air their release in atmosphere, dispersion, deposition and their impact on living beings. Air contains different particles suspended in it. Fungal spores, pollen grains, viruses, bacteria, dust particles, insect part etc. The present aerobiological investigation of microbial components deals with *Alternaria* spores for one Kharif season during the period of 23-6-13 to 20-9-13 and one Rabbi season during the period of 29-01-2014 to 31-04-2014 by using continuous volumetric Tilak air sampler over the groundnut field (*Arachis hypogaea* L.) at Makarandwadi near Deola Tahsil of Nashik District. Investigation of spore concentration and the role of metrological parameters are studied during the investigation period. The spore concentration was maximum during the month of July 2013 in Kharif season 9128 spores per m<sup>3</sup> of air (6.65 % contribution) and minimum during the August 2013 was 9604 spores per m<sup>3</sup> of air (5.29 % contribution). The spore concentration was maximum during the month of February 2014 in Rabbi season was 10668 spore concentration per m<sup>3</sup> of air (6.37% contribution) and minimum during the April 2014 was 7854 spore concentration per m<sup>3</sup> of air (4.71 % contribution). The air borne transmission of disease depends on environmental factors that is temperature, relative humidity, wind velocity, rainfall etc.

**KEYWORDS :** Groundnut, Kharif ,Rabbi, Deuteromycotina, Alternaria

### INTRODUCTION-

The aerobiological studies in Maharashtra is initiated by Prof. Dr. S.T.Tilak. Aerobiology means study of airborne bio-particles (Singh & Mathur,2012). Aerobiology is a scientific discipline that, deals with the transport of organisms and biologically significant materials through the atmosphere (Isard and Gage, 2000) the availability and concentration of microorganisms in the air mainly depends on climatic factors such as rainfall, humidity, temperature, wind, velocity etc. The concentration of airspora may differ according to the availability of substrate (Helfman et al, 2012) the wind velocity is very important for dispersion of spores. Different spores float on wind and travels over long distance the dispersion of pollutants as well as aerobiological agents is studied in environmental science which becomes a new emerging inter disciplinary branch of science (Tilak et al, 1983: Subba Reddy and Janakibai, 1977). Air contains different particles, fungal spores, pollen grains, insect parts, bacteria, viruses, dust particles etc. Diversity of organisms depends on environmental conditions; it is always dynamic but not static. The changes are always observed in an environment. Aerobiology is the study of dispersion of air borne microorganisms.

### MATERIALS AND METHODS:

Deola is a taluka of Nashik District in Maharashtra, India. It is situated on confluence of the rivers Kolati and Bhawadi. It Comes under Dindori Loksabha Constituency and Chandwad Vidhan Sabha Constituency. The site for the study was a groundnut field situated at a

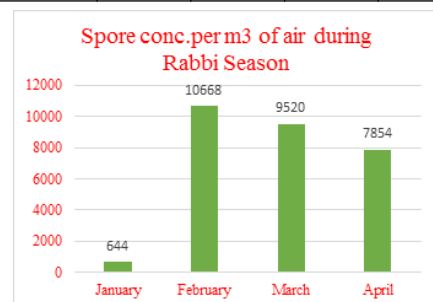
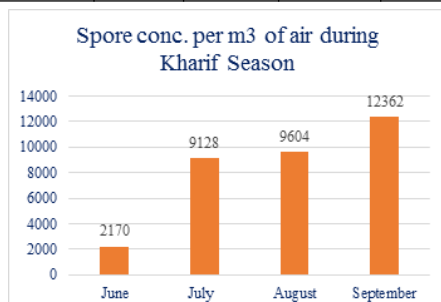
distance of 7 kms from Deola. The present study was carried out during the period, one Kharif season during the period of 23-6-13 to 20-9-13 and one Rabbi season during the period of 29-01-2014 to 31-04-2014 by using Tilak air sampler (Tilak and Kulkarni, 1970).

The air sampler was Operated continuously for every week for entire study period. In the present study Aerobiological investigation involved qualitative and quantitative analysis of airspora over ground field at Nashik Dist. in Maharashtra state. Air monitoring survey was carried out by using Volumetric Tilak Air Sampler (Tilak and Kulkarni, 1970). Tilak Air Sampler was installed in the centre of 1.62 hector area of a groundnut field and placed on the stool with its orifice facing west and at constant height of 2 feet above the ground level. Tilak Air Sampler is an electrically operated device which has a rotatory drum. The drum completes one rotation in eight days. A cellophane tape has one surface sticky, wrapped around the drum while other surface was smeared with petroleum jelly as adhesive so as to stick spores. Continuous air was sampled at the rate of five (5) liters per minute of a year after each eight days when drum completed one rotation, previous cellophane tape was removed & replaced by a new cellophane tape. A Cellophane tape was brought to the laboratory & cut into 16 (sixteen) pieces of equal length. Each division provides a qualitative and quantitative data of airborne bio-components of day & night. The slides were prepared and scanned.

### RESULT-

**Table 1 : Spore concentration per m<sup>3</sup> of air and percentage contribution during the investigation period**

Sr. No.	Spore type for Kharif season	June		July		August		September		Total Spore conc. per m <sup>3</sup> of air	% contribution to the total airspora
		Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution		
1	Alternaria	2170	6.37	9128	6.65	9604	5.29	12362	5.37	33264	5.70
Sr. No.	Spore type for Kharif season	January		February		March		April		Total Spore conc. per m <sup>3</sup> of air	% contribution to the total airspora
		Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution	Spore conc. per m <sup>3</sup> of air	% contribution		
1	Alternaria	644	5.17	10668	6.37	9520	5.87	7854	4.71	28686	5.64



**DISCUSSION–**

Groundnut crop is susceptible to a many kind of soil borne, seed borne and air borne diseases caused by fungi, viruses, bacteria and nematodes results into low yield of kernel & poor quality of fruits. Some of the important and major fungal diseases of groundnut crop are early Groundnut bud necrosis disease (Groundnut bud necrosis virus), Rust disease (*Pucciniaarachidis*), Viral disease are Rosette (Groundnut rosette assistor virus), late leaf spot (*Cercospora personata*), Root rot (*Macrophomina phaseolina*), Collar rot or seedling blight (*Aspergillus niger*), leaf spot (*Cercospora arachidicola*), however during present investigation more trace has been given to the assessment of *Alternaria* species of airspora. They are present everywhere in the natural environment. The spores are airborne and found in the soil and water. They can grow thick colonies which are usually green, black or gray. In the groundnut crops they mainly affects the leaves shows chlorosis and the leaves become prematurely senescent the disease is known as *Alternaria* Leaf Spot of Groundnut. The maximum monthly mean concentration (5726 per m<sup>3</sup>) was recorded in the month of August 2007 and minimum (4242 per m<sup>3</sup>) of air in June 2007. Mane (1978) of Vaijapur, Thube (1992) reported 7.25% incidence of these spores over wheat field of Ahmednagar Thite (1998) and Pawar (1998) reported these spores over groundnut fields of Shrigonda and Nanded respectively. Mali (2002) and Pathare (2005) also reported these spore types at Kada, while performing aerobiological survey obtained similar results.

The effect of rains, relative humidity and wind velocity are correlated with the increase in spore release and dispersal. Present results match with the findings of the earlier workers like Tilak, 1984, 1996 Kalkar and Patil (1997), Pande (2001), Mahajan and Pande (2002), Aher et al (2002, 2004), Aher and Pande (2004), Kadam et al (2008), Arsule and Pande (2012).

During the period of investigation in Kharif season *Alternaria* spore conc. per m<sup>3</sup> of air was maximum during the month of September 12362 (5.37%) and minimum during the month of August 9604 (5.29%).

In the same year during the Rabbi season the maximum *Alternaria* spore concentration was 10668 (6.37%) and minimum in the month of April 7854 (4.71%). It is well known that weather conditions influence the day to day variability as well as seasonal levels of atmospheric spore concentration. Peak spore loads were found during the wet season with lower spore abundance in the dry season. Air monitoring for invention of disease causing organisms is helpful for forecasting the information to the farmers which is important boon. So the metrological parameters showed significant effect on liberation of spores of *Alternaria* in the air spores composition qualitatively and quantitatively.

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