



STUDIES ON COMPOSITION AND COMPONENTS OF ASCOSPORES BELONGING TO ASCOMYCETS OVER SUNFLOWER FIELDS

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Abstract

Present paper deals with the aerobiological investigation over Sunflower fields by using Volumetric continuous Tilak Air Sampler was employed for exploring fungal ascospores over a Sunflower field at Kada, Taluk-Ashti and District-Beed. 5th July to 30th September 2003 for second kharif season and 10th November 2003 to 29th February 2004 for rabi season. During the present studies composition & component of the ascospores belonging to ascomycetes over the Sunflower field was studied. For this study of spore catches were prepared, mounted and spore scanning was carried out regularly. Fifteen types of fungal spores belonging to the ascomycetes were trapped during second Kharif and First Rabi season. Apart from these various dust particles were also seen in abundance.

Keywords: Airspora, Ascomycetes, Air Sampler, Sunflower field.

Introduction

Aerobiology is an interdisciplinary science which deals with the study of biological component like pollen grains, fragments of fungal spores, hyphal fragments, bacteria, viruses, algae, lichens, minute insects & insect parts, protozoanycyst, etc. In the atmosphere a biotic particulates & gases affecting living organisms have been recently included in the concept of aerobiology. The aerobiological studies are mainly concern with interrelationship between the biological component in the atmosphere, source of biological component, their release in the atmosphere, their deposition & impact on health of plants & animals including human beings. Airborne infections & the resulting diseases threaten the lives & productivity of plants. Airborne diseases still pose a challenge to mankind. The role of fungi in causing diseases to crop plants, man, domestic animal, in bringing deterioration of food grains in storage, valuable monuments has been subject of great interest for long time. Standing vegetation has a great influence of aerospora of any place and it changes with changes in weather. Aerobiological survey conducted in various part of India revealed richness of aerospora. Sunflower (*Helianthus annuus* L.) is one of the most important oil seed crops being grown all over the world. It is mainly grown for its oil, which is generally for culinary purposes in preparation of vanaspati and in manufacture of soaps and cosmetics. The sunflower oil is chemically a triglyceride. It contains 68% linoleic acid, so it is especially recommended for patients having heart troubles. Sunflower seed cake or meal is a protein rich feed and is used as a concentrate for cattle, animals like pig, sheep, goat and poultry feed. Sunflower is native of North America. In

Germany and Russia it is grown on large scale. Now a day's sunflower crop cultivation has become more popular among the farmers of Marathwada region. As considering survey of this crop that since last few years sunflower is subjected to various type of fungal diseases which may be soil borne, seed borne, airborne. However detail studies on Aerospora over the sunflower field in respect to the seasonal conditions are meagre. Considering these facts studies on Aerospora belonging to ascomycetes over the sunflower field is carried out.

Materials and Methods

Continuous Volumetric Tilak air sampler (Tilak and Kulkarni 1970) was installed in the sunflower fields of a constant height at 1.5 meters above the ground level at Kada, Taluk- Ashti, District-Beed. From 5th July to 30th September 2003 for second Kharif season and 10th November 2003 to 29th February 2004 for Rabi season. The air was sampled at the rate of 5 liters/minute which left traces of deposition over the cellophane tape, affixed on the outer surface of drum. The slides were prepared after eight days and scanned regularly. The identification of spores was done which was based on visual characteristic of spores such as shape, size, colours, wall structure and ornamentation etc. The daily record of meteorological data was regularly maintained

Results and Discussion

Analysis of spore catches from the result presented in table I revealed that fifteen types of fungal spores belonging to the ascomycetes were trapped on the cellophane tape fixed on the drum of the sampler during second kharif and first rabi season.

Table : Total spore concentration and percentage contribution of during two different seasons

Sr. No.	Spore Type	Season's total fungal spore conc/m ³ in air		% contribution of fungal spores in season's total airspora	
		Kharif	Rabi	Kharif	Rabi
	Ascomycotina				-
1)	Chaetomium	434	630	0.08	0.11
2)	Claviceps	210	350	0.04	0.06
3)	Didymospharia	6272	1414	1.23	0.26
4)	Hypoxyton	1400	2296	0.27	0.41

5)	Hysterium	1316	1484	0.26	0.27
6)	Lecanidion	168	42	0.03	0.01
7)	Leptosphaeria	3794	10654	0.74	1.92
8)	Massarina	168	140	0.03	0.03
9)	Melanospora	1064	1218	0.21	0.22
10)	Parodiella	322	280	0.06	0.05
11)	Pleospora	742	1106	0.15	0.20
12)	Pringsheimia	70	-	0.01	-
13)	Rossellinia	-	28	-	0.01
14)	Sporomia	532	28	0.10	0.01
15)	Teichospora	434	154	0.08	0.03

Enumeration of the identified spores of fungi belonging to the ascomycets over the sunflower field for Second Kharif season and First Rabi season.

(1) *Chaetomium Kunz ex Fr.*

Spores are dark one celled, lemon shaped, tapering at both ends. Their contribution to the total airspora was recorded as 0.08% and 0.11% during the second Kharif season and first Rabi season. The Maximum Monthly Mean Concentration ($224/m^3$ and $154/m^3$) was recorded in the month of August 2003 & December 2003.

Gaikwad (1974) reported 0.04% spores from Ahmedpur. Mane (1978) reported 0.15% spores from Vaijapur; Jogdand (1987) reported the spores over the Jowar field at Aurangabad. Mali (2002), Gopan (2004) and Pathare (2005) recorded these spores at Beed & Kada. To trace the Source, the fungus was collected on decaying dead branches of different plant around the crop fields during Kharif season.

(2) *Claviceps Tul.*

Spores elongated filiform with many transverse septa, slightly curved, hyaline spores occurred frequently. Their contribution to the total airspora was recorded as 0.04% during second Kharif season and 0.06% during first Rabi season. The Maximum Monthly Mean Concentration ($196/m^3$ and $252/m^3$) was recorded in the month of September 2003 and January 2004. Pande (1976) reported 0.11% spores over orange fields at Nanded. Pawar (1997) recorded of these spores over Bajara field at Aurangabad.

(3) *Didymosphaeria Fuck :*

Spores two celled with single transverse septum, brown elliptic or cylindrical spores occurred continuously. Their contribution to the total air spora was recorded 1.23% during the second Kharif season and 0.26% during first Rabi season. Spores were collected from sampling sites in saprophytic form on stem of Cajanus. The maximum monthly mean concentration ($2828/m^3$ and $574/m^3$) was recorded in the month of August 2003 & December 2003. The occurrence of this spore's type could be correlated with prevailing weather parameters like rainfall & humid conditions. Pande (1976) reported 2.41% from Nanded, Mane (1978) reported 0.94% from Vaijapur. Reddy (1987) reported 0.85% from Aurangabad, Tuljapurkar (2000) & Garje (2000) at Aurangabad.

(4) *Hypoxylon Bull. Ex. Fr.*

Spores elliptic fusiform to bean shaped, dark brown in colour. Their contribution to the total airspora was recorded as 0.27% during the second Kharif season and 0.41% during first Rabi season. Spores are saprophytic on bark of Acacia. The maximum monthly mean concentration ($700/m^3$ and

$1218/m^3$) was recorded in the month of August 2003 & December 2003.

Mane (1978) reported 0.72% spores to the total airspora at Vaijapur & recorded high concentration during night hours & pointed out its "night spora" pattern. Bhalke (1981), Babu (1983) reported 1.72% & 0.45% over Jowar & Banana field at Aurangabad.

(5) *Hysterium Tode. Ex Fr*

Spore three septate, elliptic, cylindrical, uniformly brown. Their concentration to the total airspora was recorded as 0.26% and 0.27% during the second Kharif season and first Rabi season. The maximum monthly mean concentration ($658/m^3$ and $546/m^3$) was recorded in the month of July 2003 & November 2003.

Tilak & Srinivasulu (1967) reported Hysterium spores from the air spora of Aurangabad for the first time. Mali (2002) & Pathare (2005) reported these spores at Kada.

(6) *Lecanidion Endl.*

Spores fusiform, clavate usually slightly curved 7-11 septate, hyaline. Spores eventually saprophytic form on stem of Ipomea and Lantana. The spores contributed 0.03% and 0.01% during the second Kharif season and first Rabi season. The maximum monthly mean concentration ($98/m^3$ and $42/m^3$) was recorded in the month of August 2003 & November 2003. Earlier these spores were also reported from Aurangabad (Tilak, 1989), Kotwal (1992) at Nashik, reported 0.05%, Pawar (1997) reported 0.46% of these spores over bajara fields at Aurangabad.

(7) *Leptosphaeria Ces. And de Not*

Spores yellow to yellowish-brown, elliptic to fusiform, generally three septate. Their contribution to the total airspora was recorded as 0.74% and 1.92% during the second Kharif season and first Rabi season. The maximum monthly mean concentration ($1372/m^3$ and $6762/m^3$) was recorded in the month of August 2003 & November 2003. Tuljapurkar (2000) reported these spores over sunflower field at Aurangabad. Mali (2002) and Banswadkar (2002) also recorded this spores at Kada and Udgir respectively.

(8) *Massarina Sacc.*

Spores elliptic, fusiform, dark brown, three septate, septum surrounded by thick, hyaline, gelatinous sheath. The spores contributed 0.03% during second Kharif season and first Rabi season. The maximum monthly concentration ($112/m^3$) was recorded in the month of September 2003 & December 2003. Spores occurred frequently. Meghraj (1989) reported 0.02% of these spores to the total Aerospora at Aurangabad. Aher (1993) recorded these spores from Ahmednagar. Garje (2002) recorded 0.03% spores over bajra fields at Aurangabad.

(9) *Melanspora Corda*

Spores one celled, oval discoid, often in equilateral with prominent germ pores at both ends, brown to blackish green. Their contribution to the total airspora was recorded as 0.21% & 0.22% during the second Kharif season and first Rabi season. The maximum monthly mean concentration ($574/m^3$ and $504/m^3$) was recorded in the month of August 2003 & November 2003.

Wankhede (1983) Meghraj (1989) recorded incidence of these spores over different field at Aurangabad. Kotwal (1992) recorded 0.27% incidence of these spores over grapevine yards at Nasik. Garje (2000) recorded 0.23% to the total airspora over jowar fields at Aurangabad.

(10) *Parodiella* (Speg.) Thesis & Syd.

Spores two celled, elliptic, distinctly striated. Their contribution to the total airspora was recorded as 0.06% & 0.05% during second Kharif season and first Rabi season. The maximum monthly mean concentration ($168/m^3$) was recorded in the month of September 2003 and November 2003. Sreeramulu and Ramalingam (1966) reported these spores over the paddy fields at Visakhapatnam.

Venugopalchari (1986) recorded 0.22% to the airspora over cotton field at Nanded. Narsimha (1996) reported these spores over paddy fields at Siddipet

(11) *Pleospora Rash*

Spores oblong, fusiform or ovoid, yellowish brown or golden brown, with several cross & one or usually 2 longitudinal Septa. Their contribution to the total airspora was recorded as 0.15% and 0.20% during the second Kharif season & first Rabi season. The maximum monthly mean concentration ($308/m^3$ and $448/m^3$) was recorded in the month of July 2003 & December 2003.

Dye & Vernon (1952) reported these spores from New Zealand. Richard (1956) from England, Paddy & Kapica (1956) from Canada. The occurrence of these spores in air was favoured by high humid conditions. Ahuja (1991) recorded these spores at Aurangabad. Garje (2000) recorded 0.49% incidence of these spores to the total airspora over bajara field at Aurangabad.

(12) *Pringsheimia Schultz.*

Spores hyaline, 3-5 septate, septa horizontal but in mature spores a vertical septum in each cell. Their occurrence was rare. The spores contributed 0.01% during second Kharif season only. The maximum monthly concentration ($56/m^3$) was during second Kharif season only. The maximum monthly mean concentration ($56/m^3$) was recorded in the month September 2003. Tilak and Srinivasulu (1967), reported this spore type for the first time from the airspora at Aurangabad. Mane (1978), reported their occurrence in airspora of bajra fields at Vaijapur. Mali (2002) also reported these spores at Kada.

(13) *Rosellinia Ces and de Not.*

Spores one celled, elliptical, dark brown to black, flattened, bearing longitudinal furrow with oil globule often

with minute colourless appendages at each end spores occurred rarely.

Their contribution to the total airspora was recorded as 0.01% during Rabi season only. The maximum monthly mean concentration ($28/m^3$) was recorded in the month of November 2003. Bhalke (1981), Shastri (1981), & Patil (1983) reported these spores from Aurangabad with 0.67%, 0.13%, & 0.06% to the total airspora over different fields respectively.

(14) *Sporormia de Not.*

Spores dark brown, uniseriate, dull colored, three septate. Spores occurred frequently. Their contribution to the total airspora was recorded as 0.10% & 0.01% during and second Kharif season & first Rabi season. The maximum monthly mean concentration ($308/m^3$ and $28/m^3$) was recorded in the month of September 2003. & January 2004.

Tilak & Kulkarni (1972) reported 1.3% spores to the total airspora at Aurangabad. Babu (1983) pointed to count it peak at 10.00 hours. Goud (1993) recorded 0.22% incidence of these spores over groundnut fields at Narayankhed (A.P.) Garje (2002) 1.08% incidence of these spores over bajra fields at Aurangabad.

(15) *Trichospora Fuck.*

Spores oblong - fusiform, yellowish brown up to 7 transverse Septa & one - two longitudinal Septa. Spores occurred frequently. Their contribution to the total airspora was recorded as 0.08% & 0.03% during the second Kharif season & first Rabi season. The maximum monthly mean concentration ($196/m^3$ and $112/m^3$) was recorded in the month of September 2003 & November 2003. Babu (1983), Patil (1983), Wankhade (1983) over Jowar fields at Aurangabad.

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