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Research Article

Seasonal variation in Ascomycotina Fungi over *Sorghum* crop at Barshi Tehsil of Solapur District Maharashtra

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Abstract

Incidence of the ascospores over the *Sorghum* fields at Barshi were carried out by using Volumetric Tilak Air Sampler. 20 ascospores were found in both kharif and rabi seasons. The occurrence and seasonal variation of ascospores is described first time from Barshi tehsil. The ascomycotina group was dominant in kharif season as compared to rabi season. From the aeromycological sampling, more or less concentration of ascosp ores were observed.

INTRODUCTION

The aeromycological investigations were carried out for two consecutive years 2015 to 2017 during kharif and rabi seasons. The *Sorghum* field was selected to know the incidence of various fungal spores during the study period. The different types of fungal spores affects on the crop and causes severe diseases.

Several workers like Hasnian *et al*., 2005; Ceter and Pinar., 2009; Burton and Katelaris, 2010 and Quintero *et al*., 2010 studies on ascospores in tropical region. The weather parameters like temperature, humidity and rainfall affected on ascospores. Some of the ascospores found commonly while some are rarely. Hence the attempt was taken to study the occurrence of various types of spores of Ascomycotina.

MATERIALS AND METHODS

The present study was carried out at Barshi area for the period of two seasons (June 2015 to January 2016). Aeromycological investigations were carried out by operating continuous volumetric Tilak air sampler (Tilak and Kulkarni, 1970) located in the middle portion of one acre jowar field crop.Sampler kept at constant height of 3 feet above the ground level. Tilak air sampler is electrically operated device, Sampler run continuously for twenty four hours. The rotating drum of the samplerrequire eight days to complete one rotation. The cellotape was fixed on the rotating drum of sampler to catch the spores. After operating for one week cellotape was cutinto 16 divisions of equal size. Cellotape loaded on sampler replaced weekly. Slides mounted in melted glycerine jelly. The spore number trapped in the sampler was expressed as number of spores per cubic meter of air. Identification of spore was done on morphological characters and by using standard books, monographs and from experts etc. Ainsworth's (1973) classification has been used during the study.

RESULTS AND DISCUSSION

Seasonal variation play significant role in distribution of fungal species of a particular area. During investigation period 20 ascospore observed among all these spore *Hysterium* and *Ascotricha* was found to be the most dominant spore type followed by *Amphispharella*, *Claviceps*, *Chaetomium* and *Rosellina* in *Sorghum* fields (Table. 1).

From the sub-division Ascomycotina 20 types of fungal spores were collected. Daily catches showed that the spores of *Didymosphaeria, Leptospharia, Rosellina* showed immediate spore released after rainfall whereas the spores of *Chaetomium, Melanospora,* released the spore after long period of the rains. Ascospores concentration was high in a rainy days with high humidity and moist air. The highest ascospore concentration was recorded in July and August month in both the seasons. These findings similar with the Tilak (1991). The spores of *Amphisphaerella, Ascotricha, Chaetomium, Cucurbitaria, Leptospharia, Melanospora, Pleospora, Rosellina* and *Xylaria* were commonly found during the kharif seasons (Table 1).

The *Chaetomium* spores counts during night time and indicated their affinity to night spora group. Patil (1985) studied its circadian periodicity has showed that the *Chaetomium* was maximum at night. Jogdand (1987) reported the *Chaetomium* spores over jowar field at Aurangabad and Dhulia. Murdhankar and Pande (1991) and Karne (2013) reported *Claviceps* in various crop fields. *Xylaria* spores were studied by Pole (1995) from Udgir airspora.

Table 1: Ascospores and their spore percentage contribution during Kharif and Rabi seasons of Barshi 2015-2016

Subdivision Ascomycotina	Total spore conc./m^3 of air			
	Kharif- I (10/06/2015 to 10/10/15)	Kharif- II (20/06/2016 to 15/10/2016)	Rabi - I (15/10/2015 to 01/02/16)	Rabi - II (25/10/2016 to 28/02/2017)
Amphisphaerella sp.	616	1386	-	-
Ascotricha sp.	784	1624	-	-
Chaetomium sp.	434	1106	308	1078
Claviceps sp.	350	1204	224	560
Cucurbitaria sp.	462	812	-	-
Didymosphaeria sp.	70	574	42	126
Hypoxylon sp.	14	420	-	-
Hysterium sp.	966	1624	-	-
Lecanidon sp.	14	728	-	-
Leptosphaeria sp.	224	882	182	840
Lophiostoma sp.	70	392	28	84
Massaria sp.	266	350	126	364
Melanospora sp.	84	126	70	420
Nodulosphaeria sp.	28	686	-	-
Pleospora sp.	112	560	182	294
Pringsheimia sp.	14	504	-	-
Rosellina sp.	210	1078	84	322
Sordaria sp.	14	686	-	-
Sporomia sp.	56	364	-	-
Xylaria sp.	14	_	-	-
Total	4802	15106	1246	4088

Patil (1992) noticed 1.86% mean contribution of *Didymosphaeria* over jowar field at Jalgaon. Kadam (2002) recorded 1.06% *Didymosphaeria* spore over sugarcane field at Shankarnagar. Lacey (1996) reported *Leptosphaeria* potentially allergenic in Great Britain. *Leptosphaeria* was also recorded by Trejo *et al.* (2011) at Merida (Spain). Grinn-Gofron and Mika (2008) and Dawidziuk *et al*. (2012) recorded *Leptosphaeria* maximum in the month of August from Poland. Abu-Dieyeh and Barham (2014) noticed circadian periodicity in the incidence of this spore in Pune region.

The occurrence of *Hypoxylon*, *Hysterium*, *Pringsheimia* observed during decrease in temperature and increase relative humidity. Babu (1983) reported 1.72% and 0.45% *Hypoxylon* spores over jowar and banana fields at Aurangabad. Jogdand (1987) recorded 0.04% *Hypoxylon* spores to the total airspora from Aurangabad. Patil (1985) reported *Pringsheimia* percentage contribution 0.94% to the total aerospora over jowar fields at Aurangabad. Nagpurne (1993) reported 0.73% and 0.03% *Pringsheimia* spores during first kharif and second kharif seasons over jowar fields at Kandhar.

The present investigation will help to understand various types of ascospores present in the *Sorghum*. The dominance of ascospore is favoured by humid conditions.

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