Indian J. Aerobiol., Vol. 34, (2), pp 31–33 [2021]

ISSN No. 0971-1546

Short Communication

FUNGAL SPORES OF SUNFLOWER FIELD – BASIDIOMYCOTINA

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The present studies deals with general airspora and impact of weather on prevalence of air-borne mycosporophyte form, especially of Basidiomycotina over Sunflower field from October 2004 to January 2005 in Rajuri (Navgan), District Beed, Maharashtra. The spores varied under different weather conditions. The analysis of total types of trapped microbiological components clearly indicated that the spores of Basidiomycotina, especially smut spores, uredospores and *Ganoderma* dominated the spectrum of microbial population.

Key Words: Sunflower field, airspora, Basidiomycotina, Rajuri, Maharashtra

Received: 27.11.2021 Revised: 05.12.2021 Accepted: 14.12.2021

INTRODUCTION

Crop diseases caused by air-borne mycosporophyte constitute an important aspect of agriculture. Plants continuously affected from various diseases, out of which fungal diseases are dominant. Sunflower (*Helianthus annus* L.), as photo-thermo sensitive plant was subjected to air borne fungal diseases. The qualitative and quantitative analyses of the air-borne spores were worked out. The present paper also epitomizes the dispersal of Basidiomycotina spores in the atmosphere, their concentration in respect to meteorological parameter.

METERIALS AND METHODS

The aerobiological studies was carried out by using "Volumetric Tilak Air Sampler" (Tilak & Kulkarni)[1] installed in the middle of the sunflower crop fields at a height of 2 m above the ground level at Rajuri (Navgan), District Beed, Maharashtra.

The air sampling was carried out from October 2004 to January 2005. Slides were prepared and scanned. Diseased plant materials were collected for preparing the reference slides. Daily records of temperature, relative humidity and rainfall were procured from Water and Land Management Institute, Aurangabad (WALMI).

RESULTS AND DISCUSSION

The correlations among air-borne microbial compo nents, weather conditions, growth stages of the crop ar their subsequent effects on disease incidence on the cr were studied. All the trapped air-borne fungi we included under " Spore types". In addition pollen grai insect scales, protozoan cysts etc. were included un the "other types" group.

On an average 74 types of air-borne compon were recorded, of which 39 belong to Deuteromyco 21 to Ascomycotina, 5 to other types, 4 to Basi mycotina and 3 to Zygomycotina. Deuteromyco contributed the highest percentage of 71.28% to the airspora followed by Basidiomycotina 14.88 %, types 4.79%, Ascomycotina 6.88% and Zygomy 2.17% (Fig. 5.1).

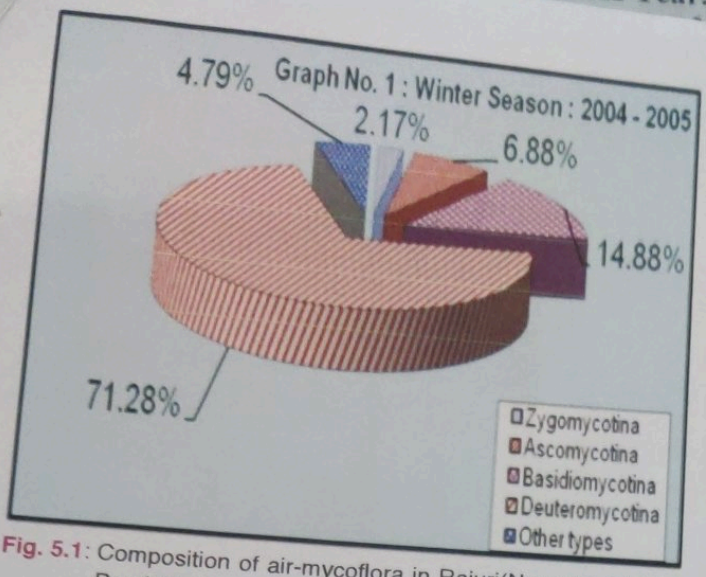

Fig. 5.1: Composition of air-mycoflora in Rajuri(Navgan), District Beed, Maharashtra

In total four basidiospore types were trapped and identified. The basidiospore stood second in order of dominance and contributed 14.88 % (Fig. 5.1)

The analysis of total types of trapped microbiological components clearly indicated that the spores of Basidiomycotina, however, dominated the spectrum of microbial population. Incidentally Smut spores, Uredospores and Ganoderma were also trapped.

Comparative analysis of epidemiology of different diseases of sunflower showed that the moderate temperature, moderately high humid conditions, artificial irrigation and growth stages of crop favoured in inciting the diseases to sunflower crop. Under such congenial conditions, the concentration of pathogenic spores in air was found to be maximum (data not provided).

During the course of this investigation, incidence of uredospore was noted throughout the season. However, there was record of moderate incidence of rust disease on crop. Moderately low temperature (19-25°C) and moderately high humid conditions were found very much congenial for increasing the concentrations of uredospores in the ambient air over the field of sunflower. Contribution of uredospore to the total airspora was found to be 10.46% in winter season (Table 5.1). The highest spore catch of uredospores were recorded between October – November and December – January (Fig. 5.2). The highest spore catch 1932/m³ of air) was recorded on 13th December 2004 in winter season, when there was a record of moderate temperature, moderately high humidity and traces of precipitations during winter season.

Uredospores also played a significant role in inciting serious allergenic disorders. The role of uredospores in inciting various types of allergy has been pointed out by earlier workers[2-5].

Contribution of smut spore type to the total airspora was found to be 4.38 % in winter season. The maximum monthly concentration of smut spore was (9.422/m³ of air) recorded in the months of December 2004 during winter season (Fig. 5.2). The smut spore were quite prevalent and occurred regularly in all the seasons during the period of present investigation. However, there was a standing crop of sugarcane near by the trapping site, varieties of grasses were also there across the demarcated boundaries of fields, which were perhaps the sources of smut spores. Rees 6 also recorded smut spores during dry season.

The total airspora was rich during intermittent irrigation periods and dry periods[7]. The maximum concentration was observed in the months of January and February as it constituted as "wet spora" consisting of groups of ascospores and basidiospores. The absence of suitable substratum with sufficient moisture and vegetation had

Table 5.1: Composition of air-mycoflora (Basiodiomycotina) in Rajuri (Navgan), District Beed, Maharashtra

Sr. No.	Spore type	Winter Season 2004-2005		Total spore conc./m³ of air	Percentage contribution to the total airspora
		Spore conc./m³ of air	Percentage contribution		
1.	Basidiospores	392	0.03	392	0.05
2.	Ganoderma	140	0.04	154	0.02
3.	Smuts	15316	4.38	56378	7.76
4.	Uredospores	36568	10.46	88410	12.17
	Total	52024	14.88	145334	20.01

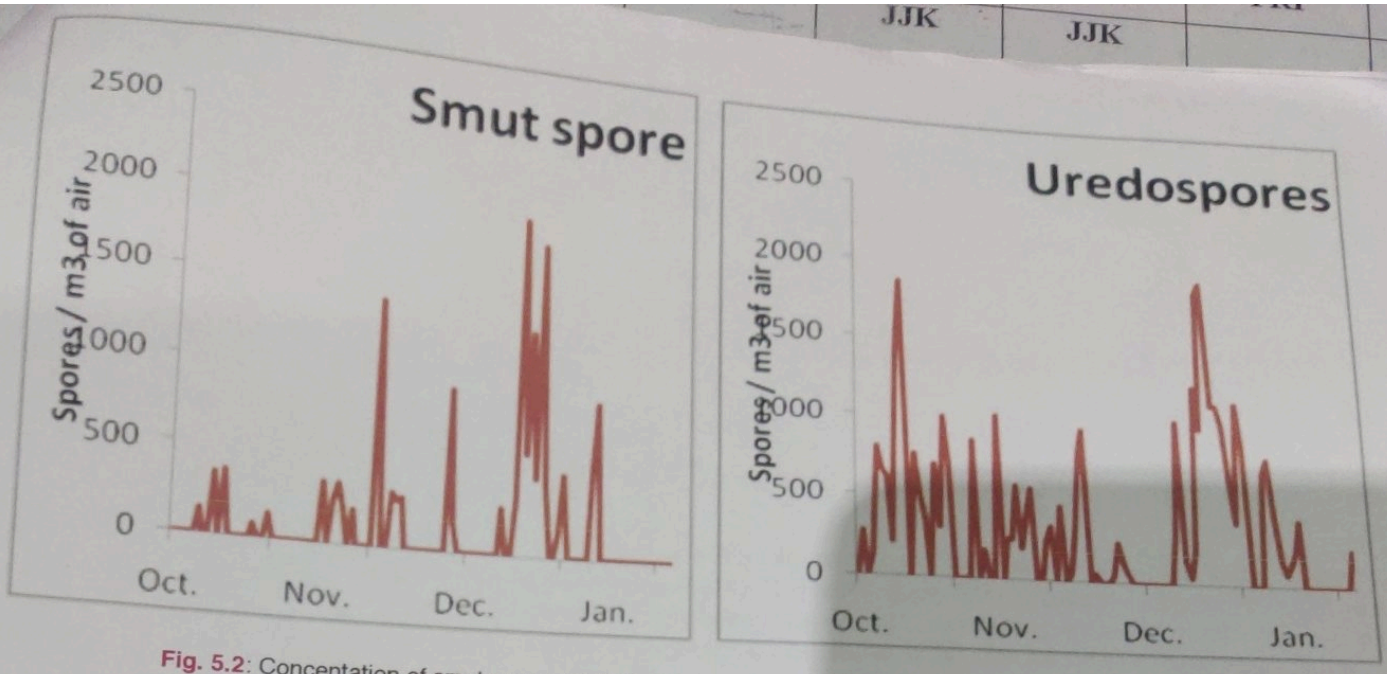

Fig. 5.2: Concentation of smut spores and uredospores in in Rajuri (Navgan), District Beed, Maharashtra.

adverse effect on composition and concentration of airspora. The temperature and high humidity had profound effect on growth and development of spores. This probably justifies high incidence of spores in the months of January and February. The air monitoring surveys undertaken during winter season of the year 2004-2005 showed the peak total airspora concentrastion in winter season (349552/m^3 of air). The weather parameters like monthly mean temperature 22.08°C, monthly mean relative humidity 48.08%, regular irrigation facilities and 4.41 km/hr. wind speed were recorded during the first winter season which incidentally might have favoured increase in the spore load.

The change in humidity occurred during night and early morning hours affect conidial, ascospore and basidiospore liberation[7, 8]. Gregory[7] noted that the atmospheric spore concentration fluctuated with frequent changes in meteorological factors.

Human activities like weeding, interculturing, spraying and dusting affected the composition and concentration of airspora. The fluctuations brought about by such activities were temporary and differed from diurnal and seasonal variations.

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