IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 4, Issue 4, March 2024
Impact Factor: 7.53

Aerobiological Spectrum of Airborne Ascospores over Bajra Fields

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Abstract: *The present investigation deals with the incidence and atmospheric concentration of air borne ascospores, recorded while conduction of aerobiological experiment over Bajra as a Kharif crop. Occurrence and variations of air borne ascospores at two different seasons, I (05/07/2022 to 09/10/2022) and II season (20/06/2023 to 22/09/2023) have been observed over Bajra fields. The investigation was carried out with the help of 'Tilak air sampler.' From the present investigation, it was evident that, the maximum concentration of ascospores were recorded (90440/m3 of air) during the rainy season. It also becomes very clear that, there is a close relation between rainfall and release of ascospores, which is evident from the lowest concentration of ascospores during dry weather conditions. The maximum numbers of ascospores were found more during the night hours than day hours. The meteorological data was maintained throughout the seasons of the crop to find out the corelation with airborne ascospores in the atmosphere..*

Keywords: Ascospores, Airspora, Kharif, Bajra fields, Tilak air sampler

I. INTRODUCTION

Bajra (*Pennisetum typhoids* Stapf. & Hubb.) is important cereal crop in India. It is extensively cultivated in Marathwada region of Maharashtra State and most of the farmers are depend on the Kharif crop seasons. It suffers from a large number of fungal diseases, causing heavy loss to the economy of farmer. The paper constitutes variations in occurrence of pathogenic and saprophytic ascospores in two seasons and an attempt has been made to compare with meteorological conditions and growth stages of the crop.

II. MATERIALS AND METHODS

The spores catches were obtained by operating a continuous 'Tilak air sampler' (Tilak and Kulkarni, 1970) in the Bajra fields for a period of two seasons I (From 05/07/2022 to 09/10/2022) and II (from 20/06/2023 to 22/09/2023) at a village Murdhav in Renapur tehsil of Latur in the Marathwada region of Maharashtra. Other materials and methods used in the present study are same as described by Tilak and Srinivasulu (1967).The identification of spore types made with the help of standard literature by Ellis (1971), Tilak (1980) and Nair (1986).These are also identified with the visual identification by comparing with the reference permanent spore slides.

III. RESULT AND DISCUSSION

The composition of airspora over bajra comprises Phycomycetes-3, Ascomycetes - 15, Basidiomycetes - 4 and Deuteromycetes - 53. The other group included hyphal fragments, pollen, insect parts and miscellaneous were also encountered. The ascomycetes group was found to contribute 6.89% and 4.02% to the total airspora over Bajra during I and II season respectively. Their occurrence and seasonal variation has been studied, which indicating maximum spore concentration was found during rainy period and gradual increase also observed according to the rainfall. It is evident form Table-I that, the spores of *Chaetomium* (1.40% and 1.50% to the total airspora) recorded a highest percentage contribution and lowest was recorded as *Teichospora* (0.03% and 0.01% to the total airspora). These spores are non-pathogenic to the crop except *Claviceps*. (Tilak and Chakre 1978).

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High frequency of ascospores were encountered only when environment was favorable for their formation and release. The incidence of most of the ascospores in the air depend upon the occurrence of rainfall, even a little rainfall leads to abundant release of ascospores. The maximum numbers of ascospores were recorded in the month of October during both the seasons.

The increase in the ascospores concentration in the rainy season is in accordance with the results of Ingold (1965), Sreeramulu and Ramalingam (1966), Harvey *et al.* (1969), Tilak and Chakre (1978),Tilak and Bhalke (1979).The ascospores and their percentage contribution to the total airspora over bajra had shown in the Table-I. It is revealing that spore concentration found to be closely associated with rainfall, high humidity and low temperature.

The present investigation clearly shows that, the rainfall has its immediate impact on the spore release of ascomycetes as has been suggested by Meredith (1962). The presence of many types of ascospores in the airspora reveals the abundance of parasitic and saprophytic ascomycetes in and around the field.

ACKNOWLEDGEMENTS

My sincere thanks to Prof. (**Dr.) Milind J. Jadhav**, Head Department of Botany, Sir Sayyad College, Roshan Gate, Chhatrapati Sambhajinagar for his guidance and encouragement. I extend my special thanks to principal, **Dr. R. S. Awasthi, Principal Shivaji Mahavidyalaya Renapur** for inspiration and providing necessary laboratory and library facilities to carry out these investigation.

Table - I

Incidence of different spore types and their percentage contribution to the total airspora over Bajra fields during first (from 05-07-2022 to 09-10-2022) and second (from 20-06-2023 to 22-09-2023) seasons.

Sr. No.	Spore type	Percentage Contribution to the total airspora	
		I Season	II Season
1)	*Apiorhynchostoma*	0.70	0.33
2)	*Bitrimonospora*	0.13	0.10
3)	*Calospora*	0.26	0.19
4)	*Chaetomium*	1.40	1.50
5)	*Claviceps*	0.23	0.21
6)	*Didymosphaeria*	0.84	1.29
7)	*Hypoxylon*	0.60	0.39
8)	*Leptosphaeria*	1.08	0.50
9)	*Pleospora*	0.49	0.38
10)	*Pringsheimia*	0.87	0.19
11)	*Sordaria*	0.69	0.53
12)	*Sporormia*	0.39	0.22
13)	*Teichospora*	0.03	0.01
14)	*Valsaria*	0.07	0.10
15)	*Xylaria*	0.09	0.16

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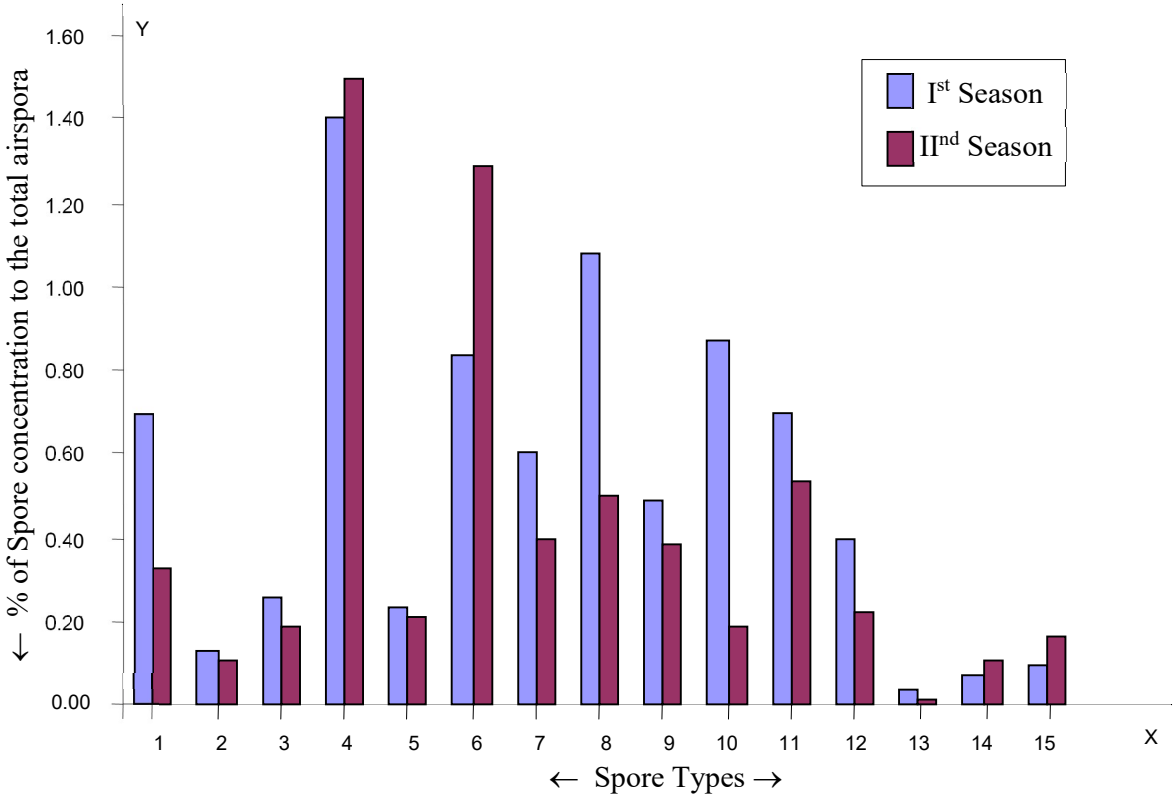

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