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## Air-borne mycoflora of Jowar at Toki Village, Aurangabad

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### Abstract

Present paper deals with aerobiological investigations at Jowar field carried out with the help of continuous Tilak air sampler to determine the concentration of air borne spores over Jowar fields in relation to the meteorological parameters and diseases. The air sampling was carried out during Rabbi Season from 1 October 2016 to 28 February 2017 at Toki Village, Tq Gangapur, Dist. Aurangabad. Total 34 fungal spore types were recorded. Ascomycetes ( 58.82%), Deuteromycetes (35.29%) and Basidiomycetes (5.88%). Fungal spores like *Rust*, *Smut*, *Cladosporium*, *Bispora*, *Alternaria*, *Curvularia*, *Nigrospora*, *Aspergillus*, and *Helmenthosporium* were dominant in the field.

**Keywords-** Jowar, Tilak Sampler, Air-borne spores.

### Introduction

The Jowar ( *Sorghum vulgare*) belonging to the family Poaceae. It is major cereal crop in Marathwada. Jowar is the Indian name for *Sorghum*, A cereal grain native to Africa. Near about 30 species of Jowar recorded. Jowar contain 70% carbohydrates, 12% proteins 3% fat and low vitamins. Jowar is a gluten free, high protein, high fiber, cholesterol free source of variety of essential nutrients, including iron phosphorus and thiamine. Jowar occupies about 8% of the total area of food grain. Maharashtra is occupying highest area 55 lac hectares with 36% of the total cropped area. (According to the Board of Science and Technology for International Development). Jowar grown in both Khariff and Rabbi Season. Jowar successfully grown under atmospheric temperature 15<sup>0</sup>C to 40<sup>0</sup>C and annual Rainfall ranging from 400 to1000 mm and well grown in clay loamy soil.

Due to environmental crises and drought, there is a heavy loss of Jowar in Marathwada even though a meteorological factor leads to affect fungal diseases in Jowar crop and effect on its growth and productivity. Air borne fungal diseases are very difficult to control due to lack of diseased forecasting knowledge. It is also compared with meteorological factors

### Material and methods

Present experiment were carried out with the help of Tilak air sampler and Petri-plate exposed method at Toki Village, Gangapur, Dist Aurangabad, in Marathwada region during Rabbi season in the month of 1st October 2016 to 28th February 2017.

Meteorological data collected from Bajara Research Centre, Agriculture College, and Aurangabad. Spores were identified on the basis of their morphological features. (Aerobiology to astrobiology, Prof. S.T. Tilak 2010).

## Result and Discussion

Total 34 fungal spores were recorded from Jowar field. Majority of fungal spores were belonging to Ascomycotina(58.82%) followed by Deuteromycotina(35.29%) & Basidiomycotina (5.88%). (Figure-1)

From Ascomycotina 20 spore types observed such as *Periconia*, *Hypoxyton*, *Epicoccum*, *Tetracoccusporium*, *Fusarium*, *Cercospora*, *Pseudotorula*, *Diplodia*, *Heterosporium*, *Xylaria*, *Spegazzinia*, *Leptosporium*, *Beltrania*, *Trichoconis*, *Corynispora*, *Hysterum*, *Sporormia*, *Lophiostoma*, *Leptosphaeria* and *Memnoniella*.

Deuteromycotina recorded 12 spore types *Cladosporium*, *Bispora*, *Alternaria*, *Curvularia*, *Nigrospora*, *Aspergillus*, *Helminthosporium*, *Pithomyces*, *Torula*, *Dreschlera*, *Beltraniella*, *Didymosphaeria* and Basidiomycotina recorded 2 spores *Rust* and *Smut*.

Percentage of *Rust* was in month the of October (21.48%), November(12.23%), December(30.13%), January(36.85%), February(55.18%).(Table no-1).

Percentage of *Smut* was in the month of month October(13.11%), November (7.38%), December(11.28%), January(17.12%) and February(17.34%). (Table no-1).

Percentage of spores fluctuated according to growth and development of crop and meteorological condition. (Figure-3). Percentage of *Rust* & *smut* increases with increased Humidity (31-99), Medium Temperature (16C-26C (Figure-3).

*Rust* is a major disease on Jowar. Causal organism of *Rust* is *Puccinia purpurea*. It affects the crop at all stages of growth. The first symptom is small Flecks on the lower leaves (Purple or Red). The Second symptom is pustules (uredospores) appear on both side of leaf sheath as a Purplish spot & on the Stalk of Inflorescence. The infected spots rupture and release reddish powdery masses of uredospores later they develop Teliospores. Low Temperature & Medium Temperature favours Teliospores germination.

*Smut* is also Major disease of Jowar. Short *Smut* caused by *Sphacelotheca sorghi*. It exhibit higher incidence of disease. Loose *Smut* caused by *Spacelotheca cruenta*. Long *Smut* caused by *Sphacelotheca reiliana*. In this Long *Smut*, Spores are embedded in long, thin, dark coloured filaments. *Smut* favours optimum environmental conditions for maximum infection include Temperature between 20 & 25 C and slightly Acidic soil for the development of disease.

## Conclusion

From the result and discussion it was concluded that, Airborne mycoflora over Jowar crop, various types of airborne fungal spores were recorded, Out of which *Rust* & *Smut* were dominant. They affected and caused diseases on Jowar. This study shows that Toki Village, Aurangabad District was highly concentrated with airborne fungal spores. This can be reduce crop health and production..

Table no 1. Showing the data recorded from 1<sup>st</sup> October 2016 to 28<sup>th</sup> february 2017.

Sr.no	Name of spores	October	November	December	January	February
1	<i>Rust</i>	21.48	12.23	30.13	36.85	55.18
2	<i>Smut</i>	13.11	7.38	11.28	17.12	17.34
3	<i>Cladosporium</i>	13.9	16.73	6.18	13.08	7.8
4	<i>Bispora</i>	4.58	6.25	4	10.36	3.7
5	<i>Alternaria</i>	13.27	7.87	9.05	3.8	3.05
6	<i>Curvularia</i>	13.58	5.83	8.85	3.65	3.45
7	<i>Nigrospora</i>	10.9	6.68	5.88	5.17	2.74
8	<i>Aspergilli</i>		15.96	9		0.22
9	<i>Helmenthosporium</i>	3.15	3.23	3.95	2.34	1.58
10	<i>Pithomyces</i>	3.31	3.37	1.58	1.08	0.96
11	<i>Torula</i>	2.21	1.82	1.53	0.99	1.09
12	<i>Dreschlera</i>	2.52	3.58	1.43	0.27	0.38
13	<i>Periconia</i>		3.72	1.58	0.51	0.31
14	<i>Hypoxylon</i>	1.57	0.77	0.49	0.31	0.52
15	<i>Epicoccum</i>		0.07	0.44	1.1	0.29
16	<i>Tetracoccusporium</i>		1.26		0.45	0.46
17	<i>Fusarium</i>		0.91	2.07	0.14	0.03
18	<i>Heterosporium</i>	0.94	0.35	0.34	0.35	0.35
19	<i>Cercospora</i>		0.56	0.54	0.24	0.29
20	<i>Beltraniella</i>	0.31	0.07	0.14	0.49	0.21
21	<i>Pseudotorula</i>	1.42	0.28	0.69	0.14	0.14
22	<i>Diplodia</i>		0.07		0.35	0.15
23	<i>Basidiospore</i>			0.14	0.47	0.02
24	<i>Xyleria</i>		0.63	0.29	0.1	0.03
25	<i>Spegazzinia</i>			0.14	0.1	0.06
26	<i>Leptosporium</i>		0.21		0.14	0.02
27	<i>Didymosphaeria</i>			0.09	0.06	0.07
28	<i>Beltrania</i>					0.01
29	<i>Tricochonis</i>				0.08	0.01
30	<i>Corynispora</i>					0.06
31	<i>Hysterium</i>			0.04	0.06	
32	<i>Sporormia</i>		0.07		0.02	
33	<i>Lophiostoma</i>				0.02	
34	<i>Leptosphaeria</i>					0.01
35	<i>Memnoniella</i>				0.02	

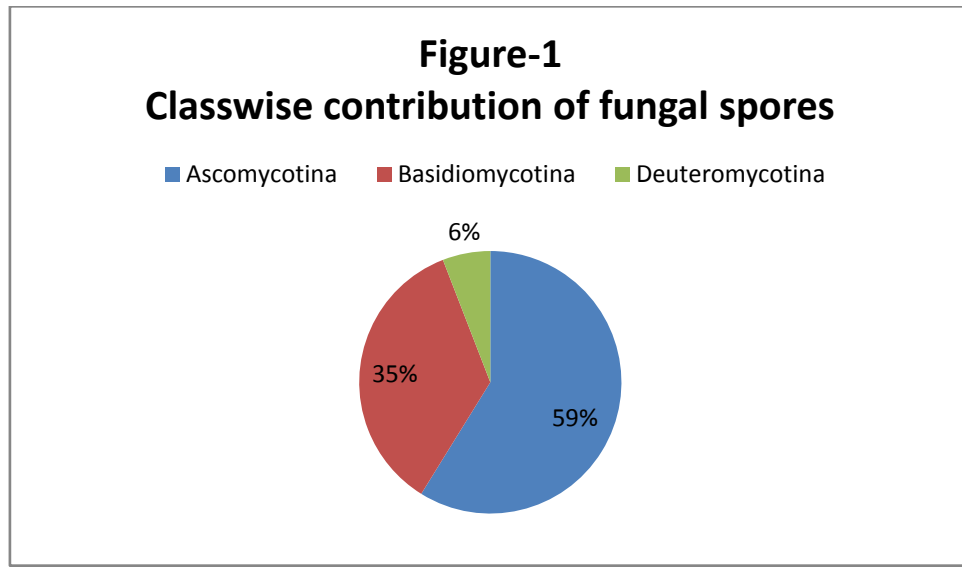


Figure-2 : Percentage of dominant fungal spores

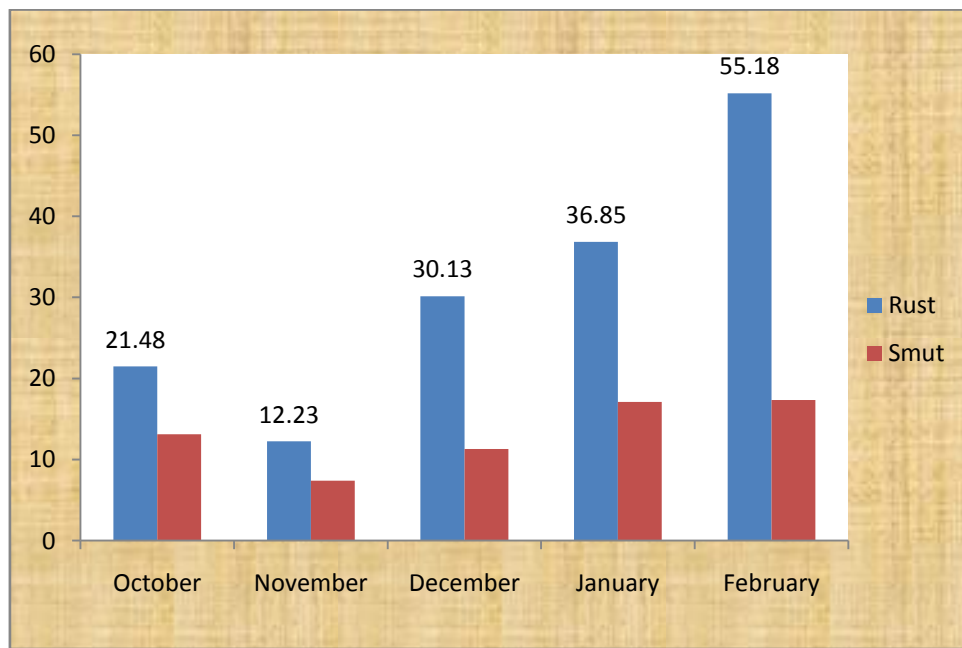


Figure-3 Meteorological data From October 2016 to February 2017

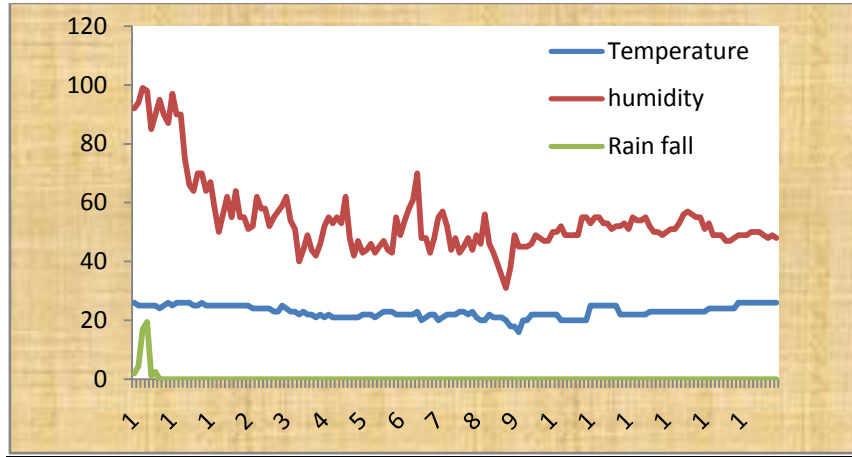


Photo plates of dominant fungal spore



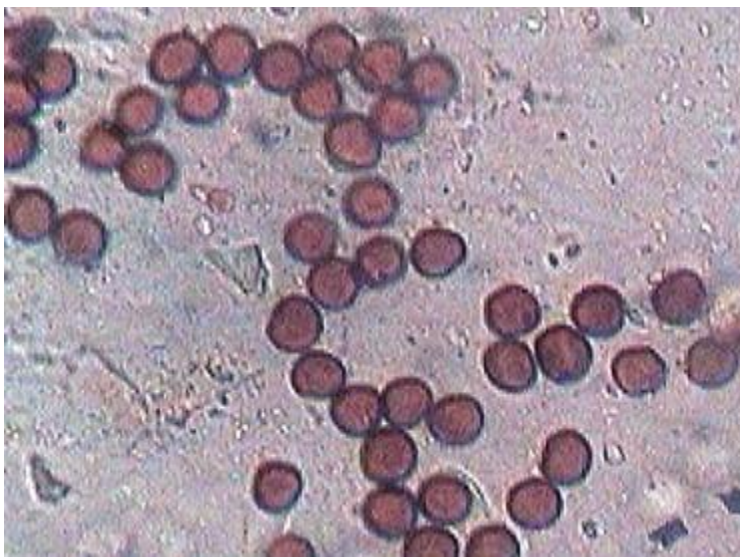
A



B



C



D



E

- A-Smut
- B-Helminthosporium
- C-Curvularia
- D- Rust
- E- Alternaria

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