

Original Article

Occurrence of Fungi on Indoor Food Grains Storage House

Dr. Vasantrao P. Pawar

Dept. of Botany Arts & Science College Bhalod, Tal. Yawal Dist. Jalgaon. (M.S.)

Email-Vasantraopawar397@gmail.com

Manuscript ID:

JRD -2025-170812

ISSN: 2230-9578

Volume 17

Issue 8|

Pp. 62-63

Aug 2025

Submitted: 08 July. 2025

Revised: 22 July. 2025

Accepted: 06 Aug. 2025

Published: 31 Aug. 2025

Abstract

Microorganism which is including fungi, algae, bacteria virus and organic dust present in air can cause several allergic infections. To study was conducted in 5 different as of indoor food storage house in Bholad to analyze the composition and intensity of fungal spore using petri-plate method. Fungal spores are present in order 1.7×10 to 4.2×10 . Fungal spore identified in there are the most dominating species are *Aspergillus*, *Rhizopus*, *Mucor*, *Alternaria*, *Cladosporium*, *Trichoderma* and *Fusarium*. The presence of airborne microorganisms, particularly fungi, in food grain storage facilities poses significant health risks to workers due to prolonged exposure to grain dust and mycotoxins. This study investigated the occurrence, diversity, and seasonal variation of fungal species in five indoor food storage houses located in Bhalod, Jalgaon District (M.S.), using the Petri-plate exposure method over a two-year period (June 2023–May 2025). A total of six fungal species belonging to seven genera were identified, with *Aspergillus*, *Rhizopus*, *Mucor*, *Alternaria*, *Cladosporium*, *Trichoderma*, and *Fusarium* being the most dominant. The results revealed that fungal spore concentrations were significantly higher during the winter season compared to summer, with *Aspergillus flavus* and *Alternaria alternata* showing the highest prevalence. The study highlights the strong seasonal influence on fungal distribution and underlines the potential occupational health risks, including asthma and respiratory allergies, among workers exposed to contaminated storage environments.

Keyword- Fungi, food store house, season, Fungi, food storage houses, airborne spores, seasonal variation, occupational health

Introduction

There are several food storage houses in around Bhalod for storing food grains for months. A large quantity of dust is generated in storage grain house therefore causing a potential health risk to workers due to inhalation of grain dust. Fungi produce mycotoxin in which can cause allergies to the farm workers (Williams et.,al.,1964, Depico et.,al.1964,ChanYeung et.al.,1979).Improper hygienic conditions may be causes of microbial air pollution (Dopica et.,al.1982).It was reported that grains dust fever and asthma are very much common amongst the workers to grain dust (Dvorackoval1976, Chitnavis S.and Khilare C.J.1997)

Material and Method

Sampling of air was performed from June 2023 to May 2025 in five different food storage house located at the Bhalod, District- Jalgaon.

Air Sampling

The air sample was taken by the use of Petri-plate method. Two samples were collected from one day per months. Plates were exposed to air 10 minute so that the air borne micro flora can be trapped. The Petri plates were placed at 0 ft. to 7 ft. height above the ground.

Microbiological Examination of the Air

Petri plates containing rose Bengal chloramphenicol agar were exposed to air to trap any spore that falls into them. After exposing the open petri plate for 10 min. the plates were closed and incubated at 25 c for 5 days. The fungi developed for five days was observed under a microscope after staining with cotton blue.



Quick Response Code:



Website:

<https://jrdrv.org/>

DOI:10.5281/zenodo.17182332



Creative Commons (CC BY-NC-SA 4.0)

This is an open access journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/) Public License, which allows others to remix, tweak, and build upon the work noncommercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Address for correspondence:

Dr. Vasantrao P. Pawar, Dept. of Botany Arts & Science College Bhalod, Tal. Yawal Dist. Jalgaon. (M.S.)

How to cite this article:

Pawar, V. P. (2025). Occurrence of Fungi on Indoor Food Grains Storage House. *Journal of Research and Development*, 17(8), 62–63. <https://doi.org/10.5281/zenodo.17182332>

The cultural and morphological characteristic of fungi were identified by use of pictorial atlas of soil and seed fungi (Watanabe .T 2002)

Result and Discussion

During the 12 months research work 6 fungal species belonging to 7 genera were recorded in food storage house of Bhalod. The most common fungi were *Aspergillus flavus* 82.4 % during winter season in Bhalod food storage house and the other spores reported were *Aspergillus fumigatus* 35% and *Aspergillus niger* is 51% The *Fusarium* fungal species are 52.6 to 41.6 % in winter season ,rainy season 28 to 20% and winter season were as found in 12.4 to 11.8%. The fungi *Alternaria alternata* fungi were 71 % in winter season and 20.2% are found in summer season. In some other fungal species like *Cercospora*, *Cladosporium*, and *Trichoderma* form season to season as in table 1(See Table) .

The overall mean food grain storage house maximum fungi species are found in winter season and minimum is summer season. The different spore concentrations of air borne microorganism inside the godowns were higher in winter season compared to summer season study also reported as higher presence of microorganism in winter season Grony R. and Dutkiewicz J.(2002).

Table-1 Percentage Fungal Species found in Food Grain storage House.

Fungal Species	Rainy season						Winter season						Summer season					
	1	2	3	4	5	Mean	1	2	3	4	5	Mean	1	2	3	4	5	Mean
1 <i>Alternaria alternata</i>	55	33	20	42	45	39	70	72	34	68	71	63.0	22	25	05	24	25	20.2
2 <i>Aspergillus flavus</i>	44	49	47	48	47	47	90	89	56	90	87	82.4	23	24	-	16	23	17.2
3 <i>Aspergillus fumigatus</i>	30	26	24	14	16	22	38	40	29	35	33	35.0	19	05	04	07	03	07.6
4 <i>Aspergillus nigar</i>	19	13	14	33	35	23	57	57	33	53	55	51.0	09	22	06	11	20	13.6
5 <i>Cladosporium cladosporioides</i>	28	20	21	16	15	20	25	30	30	56	30	34.2	08	-	-	07	04	03.2
6 <i>Fusarium moniliforme</i>	26	28	34	26	26	28	46	52	60	59	44	52.6	14	16	04	12	13	11.8
7 <i>Fusarium oxysporum</i>	12	32	10	33	28	23	44	48	-	33	56	36.2	14	18	-	15	15	12.4
8 <i>Fusarium soloni</i>	18	36	09	12	25	20	52	57	33	52	14	41.6	12	17	-	22	10	12.2
9 <i>Mucro microsporous</i>	30	24	10	14	22	20	40	46	44	43	46	43.8	09	12	03	04	13	08.2
10 <i>Rhizopus stolonifera</i>	19	26	16	28	18	21	38	44	42	39	42	41.0	-	16	04	02	-	04.4
11 <i>Trichoderma sp.</i>	28	38	22	23	34	24	56	59	--	55	50	44.0	12	23	-	-	12	09.4
Overall mean						26.09						47.70						10.92

The human disease like asthma and respiratory tract allergies were noticed in workers of food storage house exposed to *Aspergillus* and *Alternaria* .Rao. C. et., al .(1996).In our study these two genera were present at high leaves

References

1. Chan Yeung .M. Wong R and Maclean L.,(1982). Respiratory abnormalities among grain elevator workers cest,Am .J. respire Cri.Care,Med.75(4) 461-699.
2. Chitnavis .S. and Khilare C.J (1997) .Aero mycological studies of seed godown in Kolhapur (M.S.).India Agashesov aerobiology International conference Bangalore Oxford and IBH publishing Co. New Delhi. 5th Ed 205 10
3. Chatopadhyay B.P. Das S. Adhikar A .and Alam.J(2007) .Exposure to varying concentration of fungal spores in grains storage godowns and its effect on respiratory function status among workers.UIndu.health.45 (3) 449-461.
4. Depica G.A.,Redden w.,Tsiatis A., P odeters M.E ., and Rankin J. (1964) .Epidemiological study of clinical and physiological parameters in grain handlers of Northern United States Am.Rev.Respir.Dis. 130(1) 759-765
5. Dvorackoval.(1976). Aflataxin inhalation and alveolar cell carcinoma. Br. Med. J. 3 (2) 691-699.
6. Dopico G.A.,Flatherty D.,Bhansali P. and Charaje N.(1982).Grain fever syndrome induced by inhalation of airborne grain dust .J.alle.Clin.Immunol,64(3) 453
7. Grony R.L and Dutkiewicz J.(2002).Bacterial and fungal aerosols in indoor environment in central and eastern European countries .J.Agric.Enviro.Med.9(2) 17-23
8. Rao C.Y.,Burge H.A.and Chang J.C.(1996) .Review of quantitative standards and guidelines for fungi in indoor air.AIR.Wast.Manag Assoc.46 (3) 449-461.
9. Singh A.B., Singh A.and Pandit T.(1999)Respiratory disease among agricultural industry workers in India a cross sectional epidemiological study. Ann.Agric. Environ Med.6(3) 115-126
10. Watanabe T.(2002).Pictorial atlas of soil and seed fungi morphologies of cultured fungi and key species.2nd Ed. CRC.Press London.
11. Williams N.Skoulas A. and Merriman J.(1964) Exposure to grain dust, A survey of health effect.J.Occup.Med.6(1) 319.