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SHORT COMMUNICATION

BIODIVERSITY OF SOIL FUNGI FROM EAST KHANDESH REGION WITH REFERENCE TO GROUNDNUT CROP (MAH), INDIA

R.M. Bagul[1] Jagruti J. Patil[2]* and K.B. Patil[2]

[1]Dept. of Botany, MGSM's Dadasaheb Dr. Suresh G. Patil College, Chopda, 425107, India.
[2]Department Arts, Science & Com. College, Songir, Dist. Dhule (MH), 424310, M.S. India.
Email: patiljh198@gmail.com

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Abstract: In the parts of East Khandesh region of Maharashtra groundnut is grown as Kharip and Rabbi Crop. The fruits are sold as fresh or in dried form and stored in houses of farmers. Fungi like *Absidia corymbifera*, *Aspergillus acaleatus*, A. flavus, A. niger, A. tereus, A. astus, Curvularia lunata, Fusarium oxysperum, Humicola sp., Penicillium funiculosm, P. varians, Phytophthora undulate and Rhizoctonia bataticola discover and damage. The kernels (Joffe and Borut, 1966; Gupta and Chohan, 1970). Seed borne fungi of groundnut (Arachis hypogaea L.) are responsible to deteriorate and degrade kernels quality during storage practices. In these studies, an attempt was made to note the biodiversity of dominant fungal organisms like Aspergillus flavus, Rhyzoctonia bataticola, and Penicillium sps. *Fusarium* sps and so on.

Keywords: Groundnut seeds, Fungal biodiversity, East Khandesh, Soil fungi

INTRODUCTION

In Maharashtra, groundnut is a significant crop, primarily cultivated during the Kharif season. While it contributes to a relatively small percentage of the total national groundnut production, it plays a crucial role in the livelihoods of small farmers and the local economy, particularly in regions like North Maharashtra (Dhule, Jalgaon, Nashik, Ahmednagar) and Western Maharashtra (Pune, Satara, Sangli, Kolhapur).

Cultivation of groundnut (*Arachis hypogaea* L.) is mainly confine to southern India and Tamil Nadu has the largest acreage followed by Gujarat, Maharashtra and Andhra Pradesh. Groundnut is a valuable energy giving food crop produced in India is pressed to yield of oil and manufacture of vanaspati or vegetable fats. However, this crop suffers from several fungal diseases causing economic losses to the farmers. In this study micro-organism from pre-harvest pods and soil from Khandesh area was made to know the occurrence of fungal frequency. The best storage practices are needed to check the damages. Present paper attempts to highlights Biodiversity of fungal species causing effect on yield of farmers concern with Groundnut Crop only.

MATERIALS AND METHODS

Groundnut pod samples were collected from fields throughout East Khandesh region of Maharashtra from 2006 2008. The mycoflora from suspected concealed pod/kernels was isolated and screened by soil dilution plate techniques (Montegut, 1960 Kenneth, H. (1990),). Some pods and kernels were also directly plated on the medium. Dominant fungi were selected for studying their effect on carbohydrate, lipids & proteins contents (Ward & Diner, 1961), (Singh *et al*. (1974).

20 gm healthy sterilized seeds of groundnut were inoculated with 2 ml. as of individual fungal spores' suspension. Seeds were previously moistened with Czapek Dox liquid medium. Flask was incubated for 14 days at room temperature (26 +/- ºC). Mycelial mat was removed by washing the seeds with sterile water, dried at 60 ºC and powdered sample were analyzed for primary contents detection. Crude fat content was estimated by Soxhlet extractor and defatted samples were analyzed for estimation of total carbohydrates Dubois *et al*. (1956) and total crude proteins Oser, (1960).

Groundnut (SB-$_{11}$) pod samples were collected from fields before the harvest throughout East Khandesh region along with soil samples from same fields. The mycoflora from soil sample was isolated and screened by soil dilution plate techniques Foster, J.W. (1958). Isolated, Purified and Maintained Yeast, independently by using Martin's Rose Bengal and Waksman's acid agar media. The percentage of occurrence of fungal species were recorded and compared.

Geocarposphere of groundnut crop is most important ecological niche in the soil. The fungal species isolated from pre-harvest pod samples showed *Aspergillus flavus* and *Rhyzoctonia bataticola* as dominant.

Various workers showed number of fungal taxa from Geocarphospere kernels or pods from different part

*Corresponding Author

of world (Subrahmanyam and Rao, 1977). However, variations in the species may be attributed to the country, variety of groundnut, ecological factors, handling, transport, storage, soil type, methods of study etc. These organisms transmit the disease in the seeds.

The organisms reported here are also reported by Kang and Chohan (1966) from kernels, Type of soil, variety of groundnut, method of study and media used may account for these variations. Less number of species was recorded from soil sample (Rao, 1962; Garren, 1964 ;). Menon, V.K. and Chohan, J.S. (1965). Noted Effect of Fungicides on leaf-spot pathogens and phylloplane mycoflora of ground nut, *Ghocladium virens* and *Trichoderma viride* appeared which are noted as the biocontrol agents (Gangawane and Choudhary, 1989). Sinha, M.K. and Prasad, T. (1977, 1981) reported deterioration of arhar & mung seeds by *aspergillus*, Lalitha Kumari, D; Govind Swamy,.C.V.& Vidyasekharan 1971 Effect of seed borne fungi on the physiochemical properties of groundnut oil.

More fungi have shown association with pre-harvest pods than the soil. It may be due to source of substances in the soil and ecological conditions. Most of the recorded fungi are potential pathogens and their interactions with others needed to be studied in particular to find antagonistic activity.

RESULTS AND DISCUSSION

The pre-harvest mycoflora of fresh pods collected from different places of Khandesh was studied. The results in Table 1 indicate that 29 fungal species were recorded.

The species such as *Aspegillus flavus, A.aculeatus, Fusarium oxysporum and Rhizoctonia bataticola* showed their higher frequency more than 20%. The species in the pre-harvest pod those showed % frequency less than 20 were: *A.carbonarius, A.nidulans, A.niger, A.terreus, A.ustus, Chaetomium globosum, Cladosporium herbarum, Fusarium solani, Trichoderma wiride,* sterile black septet mycelium and remainings.

From the soil however, only 29 fungal species were recorded. Their frequency ranged from minimum 03.44 - 17.20 % maximum. *Aspegillus ustus, Chaetomium globosum, Colletotrichum sp., Cunninghamella sp., Curvularia lunata, Fusarium moniliforme, F. solani, Helminthosporium tetramera, Penicillium varians* and *Trichoderma sp.* were present in the pods while they were absent in the soil samples. More investigations in this context are awaited.

Table 1. Pre-harvest pod and Diversity of Soil mycoflora of groundnut (SB_{11}) from East Khandesh

Sr.No.	Fungal species	Family	% Frequency	
			Pre-harvest pod	Soil
1	*Absidia corymbifera*	Lichtheimiaceae	-	13.76
2	*Aspergillus aculeatas*	Tricomaceae	20.64	13.76
3	*A. carbonarius*	Tricomaceae	13.76	10.32
4	*A.flavus*	Tricomaceae	24.08	17.20
5	*A.nidulans*	Tricomaceae	06.88	10.32
6	*A.niger*	Tricomaceae	13.76	13.76
7	*A.terrus*	Tricomaceae	13.76	17.20
8	*A.ustus*	Tricomaceae	06.88	-
9	*Chaetomium globosum*	Chaetomiaceae	06.88	-
10	*Cladosporium herbarum*	Davidiellaceae	06.88	10.32
11	*Colletotrichum* graminicola.	Glomerellaceae	03.44	-
12	*Cunnighamella elegans*.	Cunninghamellaceae	13.76	-
13	*Curvularia lunata*	Pleosporaceae	13.76	-
14	*Fusarium moniliformae*	Nectriaceae	17.20	-
15	*F.oxysporum*	Nectriaceae	20.64	06.88
16	*F.solani*	Nectriaceae	13.76	-
17	*Gliocladium virens*	Hypocreaceae	13.76	06.88
18	*Helminthosporium tetramera*	Massarinaceae	06.88	-
19	*Penicillium funiculosm*	Aspergillaceae	17.20	13.76
20	*P.varians*	Aspergillaceae	13.66	-
21	*Rhizoctonia bataticola*	Ceratobasidiaceae	20.64	06.88
22	*Rhizoctoni solani*	Ceratobasidiaceae	17.20	03.44
23	*Rhizopus nigricans*	Mucoraceae	-	10.32

24	*R. stolonifera*	Mucoraceae	-	13.76
25	*Torula jadinii*.	Torulaceae	03.44	06.88
26	*Trichoderma viride*	Hypocreaceae	13.76	06.88
27	*Trichoderma adaptum*.	Hypocreaceae	06.88	-
28	*Zygorynchus sp*.	Mucoraceae	-	06.88
29	*Phytophthora undulate*	Peronosporaceae	-	06.88

- = Absent

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