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Fungi and Other Associates from Rice Fields of Bhor and Velhe Talukas of Pune District, Maharashtra State, India

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Abstract: ***Plant pathogens are major cause of diseases in crops and plants. These plant pathogens devastated our crops and led us to devise methods and to search cultivars for resistant. Rice crops suffer from infection of many bacterial, viral and fungal diseases. The aim and objective of present study is to find out information about different plant pathogens caused by fungal infection. The survey of rice fields was carried out in Bhor and Velhe Talukas of Pune district. In case of rice crop, several diseases are reported such as Bacterial Blight, rice blast, Aggregate sheath spot, Black kernel Brown spot, Downy mildew, false smut, etc.***

Keywords: Bhor, Velhe, Pathogen, Paddy, Scouting.

I. INTRODUCTION

Rice is a staple food for majority of population in the world. The production of rice is increased quantitatively and qualitatively and it is generating additional income sources. Rice is the seed of the grass species *oryza sativa.* Bhor and Velhe talukas are known for large production of rice. The farmers chiefly cultivate rice as major food crop. The detail survey was conducted in Bhor and Velhe talukas to study plant pathogens attacking the rice crops. Recently so many studies have been conducted on pathogen of rice. References [9] and [12] have undertaken study of *ustilagonoidea virens.* Reference [8], find out method of management of stem rot disease of paddy by using fungicides. The causative agent was *sclerotium oryzae.* Reference [7], exhibited economic and environmental impact of rice blast pathogen.

II. MATERIALS AND METHODS

To study different types of rice disease in the field of different villages of Bhor and Velhe talukas. The scouting was carried out at the vegetative and seedling growth stage. The symptoms and causes of the disease are noted in the field book. The Photographs have been taken in order to record occurrences. Disease identification was done based on information on related symptoms with the help of Expert, journals, Books, Monograph and research paper.

During the survey of rice fields from Bhor and Velhe, the infected paddy samples were collected during dry season shortly before harvest period. Collected samples were labelled, packed in polythene and taken to the laboratory for further identification. The samples were identified at Agharkar Research Institute in the department of mycology and plant pathology group.

A. Description of Study Area

The survey was conducted during 2011-2012 in cropping season of major rice growing fields of different villages of Bhor and Velhe talukas of Pune district. The average annual rain fall of Bhor is 643.5 to 800mm and Velhe is 2314 to 2645mm.The weather is very extreme in all season with temperature in summer at high 40 degree Celsius and in winter as cool as 8-degree Celsius Bhor and Velhe talukas has mix economy with agriculture, and forest resources, contributing to it.

III. RESULT AND DISCUSSION

A. Following Diseases Were Noted.

1) Downy Mildew of Rice

Pathogen - *Sclerophthora macrospora*

Symptoms

Formation of small, pale yellow or light green spots on the upper leaf surface.

Discoloration of leaf surface.

The white fluffy pathogen develops on lower surface of infected leaf.
Control measures
Cholorothalonil and Mancozeb are the powerful fungicides for Downy mildew

2) Eye Spot of Rice
Pathogen - *Drechslera gigantean*
Symptoms
Formation of eye shaped lesions on leaf sheath in young stage of plant.
Small size water-soaked spots appear on the leaves and finally, olivaceous dots or rings.
Control measures
Plant clean seeds.
Remove collateral weed host from bunds and channels.
Treat seed with fungicides. Crop rotation is also important to control disease.

3) Panicle branch rot of Rice
Pathogen - *Nigrospora oryzae*
Symptoms -
Branches of panicle rot due to fungal infection Nigrospora.
Control measures
Use of resistance varieties.
Treat seeds with suitable fungicides.

4) Blossom Blight of rice
Pathogen - *Cladosporium tenuissimum*
Symptoms
Start Fungus infects the stigma of a flower which led to the blossom blight of rice.
Control measures
The spray of Mancozeb and Carbendazim produced highest protection. Removal of infected plant part from the field.

5) Alternaria Leaf spot of Rice
Pathogen - *Alternaria longissima*
Symptoms
Leaf symptoms shows formation of brown round spot with concentric rings.
Spot occurs first on older leaf and then spread throughout whole plant.
Control Measures
Use of fungicides like pyraclostrobin and azoxystrobin plus difenoconazole.
Fluxapyroxad plus pyraclostrobin also effective for alternaria.

6) Stem Rot of Rice
Pathogen – *Sclerotium oryzae*
Symptoms
Formations of numerous tiny white and black sclerotia.
Small irregular black lesions on the outer sheath near water level. Lesions expand as the disease advance.
Light ear and to throw out green shoot from the base.
Infected culm lodges and caused unfilled panicles and chalky grain.
Control measures
Use of disease resistance variety.
Drain the field to reduce sclerotia.
Burning of straw after harvesting crops.
Proper use of fertilizers and chemicals.

7) False Smut of Rice

Pathogen – *Ustilaginoidea virens*

Symptoms

Infection mainly occurs on grain.

The few spikelet in a panicle only affects.

Control measures

Use of resistance varieties like IR22, IR28, IR26.

Spry of (0.1%) propiconazole at 50% panicle emergence

Table 1

List of Fungi Found from Bhor and Velhe Taluka

Sr. No.	Name of Village	Identified Remark
I	Nazare	*Nigrospora sphaerica* (Sacc.) Mason
II	Bare	*Cladosporium oxysporum* Berk. & Curt.
III	Hatnoshi	*Cladosporium tenuissimum* Cooke
IV	Kari	*Ephelis* sp.
V	Sakhar	*Sporisorium* sp.
VI	Adwali	*Alternaria longissima* Deighton & Mc Garvie
VII	Vinzar	*Volutella* sp.
VIII	Dapode	*Drechslera* sp.

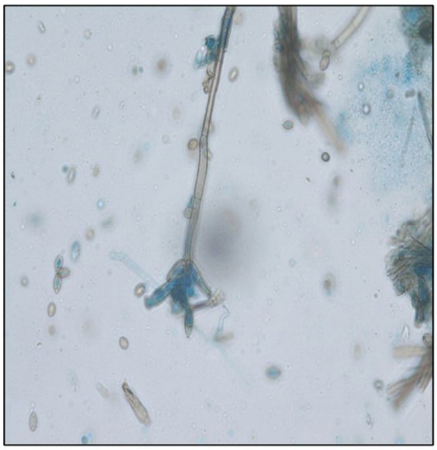

Fig.1 Cladosporium tenuissimum

Fig.2 Alternaria longissima

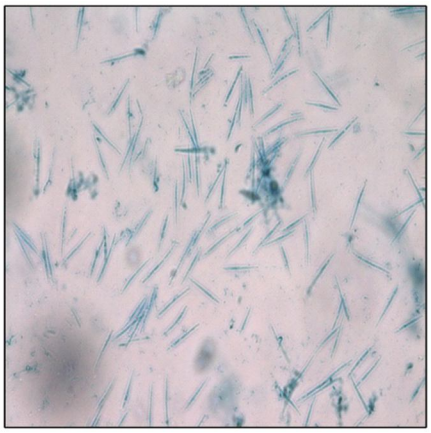

Fig.3 Ephalis sp.

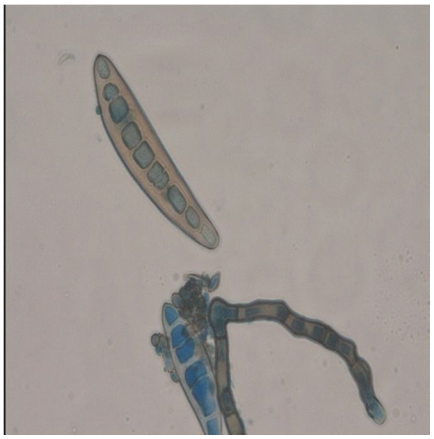

Fig.4 Drechslera sp.

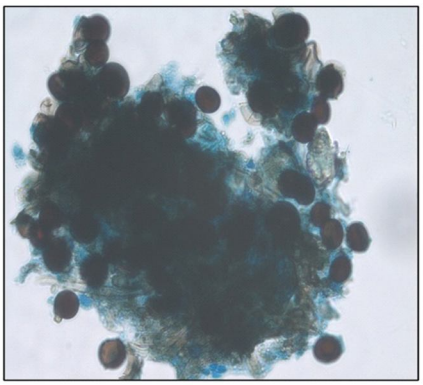

Fig.5 Nigrospora spherical

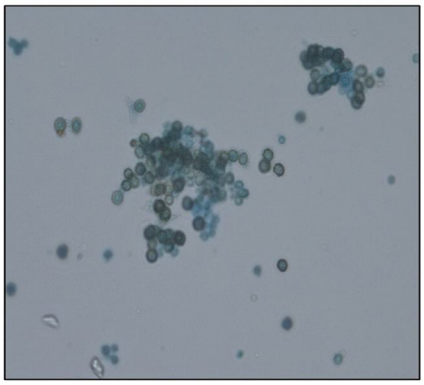

Fig.6 Sporisorium sp.

B. List Of Insects, Vertebrates And Invertebrates In Rice Field

In case of rice fields many insects feed at different stages of growth. Grasshoppers belong to the super family Acridoidea and Pyrgomorphoidea of the order Orthoptera and suborder Caelifera. Acridoidea shows maximum diversity and constitutes only one family i.e., Acrididae whereas pyrgomorphoidea also has only one family i.e., Pyrgomorphidae, widely distributed in India. Grasshoppers are of great economic importance, because they constitute an important group of pests and pose a constant threat to cereal crops, pulses, vegetables, orchards, grassland and forest plantations all over the world. Grasshoppers cause significant damage to tree seedlings and agricultural crops (Joshi *et al.,* 1999), hence considered as oligophagous and according to host preferences classified as graminivorous, forbivorous and ambivorous or mixed feeders (Mulkern 1967). Grasshopper can damage rice in all stage of crop growth. Both nymphs and adults can feed on leaves by cutting the edges of leaves. When found in greater number can feed even midribs and total leaves and cause extensive defoliations. However, in present study some invertebrate pests attack on rice crop during the initial germination and establishment phase of growth.

1) Long horned grass hopper (adult one)
2) Robber flies
3) Meloid bettle (*Mylabris* sp)
4) *Apis cerana* (honey bees)
5) Wasp (unknown sp)
6) Cockroaches (*Pycnoscleus* sp)
7) Earwia (probably *Anrsolabis*)
8) Chrysomelidae beetle (leaf eating bettle)
9) Homopteran bugs
10) Fruit fly (unknown sp)
11) Fishes
12) Earthworms (*Eukerria saltensis*)
13) Aquatic snails (*Isidorella newcombi*): Grazing on young seedling of rice.)
14) Rodents.: These are serious pest for rice crops
15) Crabs & Frogs

Fig.7 Crab

Fig.8 Frog

Fig.9 Aquatic snails

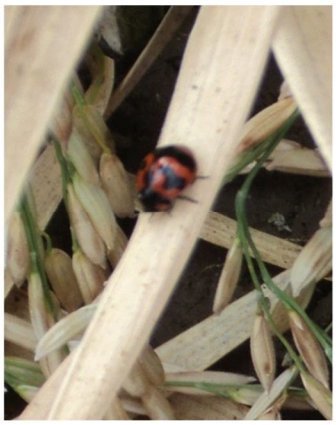

Fig.10 Chysomelidae Beetle

Fig.11 Long horned grass hopper

IV. CONCLUSION

During Rice field survey more than nine diseases like stem rot, false smut, downy mildew, eye spot, panicle branch rot, blossom blight, alternaria leaf spot etc. were found in different places of both talukas. Diseases are favored by long dew period increased by fog, shade and frequent light rain and become worse when temperature slightly cooler. This decreases the yield of rice. Rice fields are a preferred habitat of amphibians and these insectivorous vertebrates function as important natural enemies of pest insects. On this background amphibians, fishes, insects etc. were recorded.

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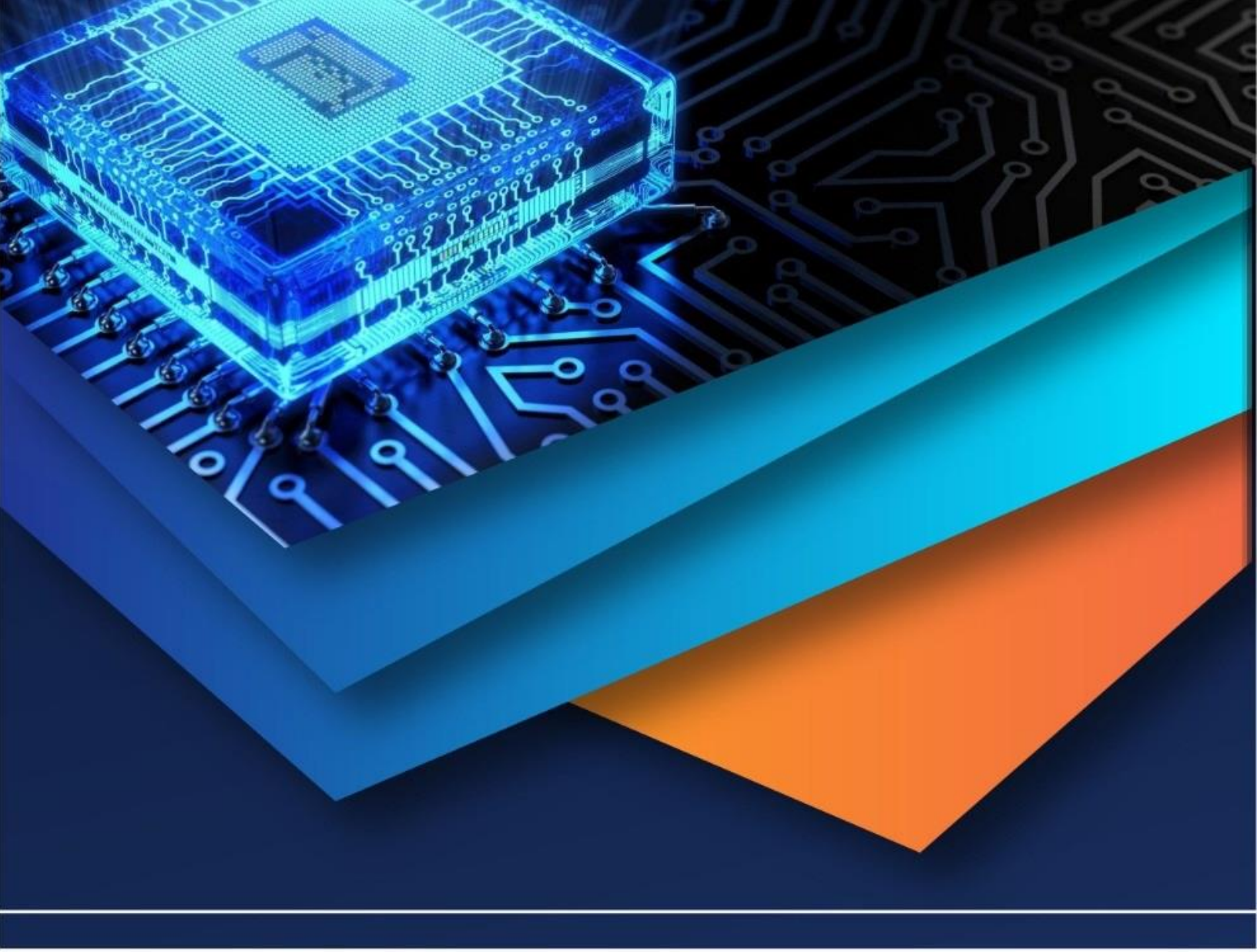

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