

1 Effect of antibiotic and bio-fungicide for control of seed borne fungi of wheat

2 Abstract

3 The present ~~study approach has the objective to study~~ was the ~~effect~~ of antibiotic and bio-fungicide for
4 control of seed borne fungi of wheat during November to April. 2015-2016. In this study, applying different
5 three treatments viz Control, Aureofungin with 100 ml water (Antibiotic), and *Allium sativum* leaf extract with
6 cow urine (Bio-fungicide) for control of seed borne fungi of wheat respectively. In the pots, the result was
7 obtained control 63.20 %, and disease incidence 23.30 % were recorded from *Allium sativum* leaf extract with
8 cow urine (Bio-fungicide) in the T₃ where as control 47.41% and disease incidence 33.33% were recorded from
9 4 gm. Aureofungin with 100 water (Antibiotic) in the T₂. In the pots, the result was obtained control 68.75 %,
10 and disease incidence 20 % were recorded from *Allium sativum* leaf extract with cow urine (Bio-fungicide) in
11 the T₃ where as control 52.09 % and disease incidence 30.66 % were recorded from 4 gm. Aureofungin with
12 100 ml water (Antibiotic) in the T₂. Bio-fungicide was found superior in controlling of seed borne fungi of
13 wheat compare than antibiotic. A bio-fungicide is composed of beneficial microorganisms, such as specialized
14 fungi that attack and control plant pathogens and the diseases.

15 **Key words:** Antibiotic, bio-fungicide, seed borne, wheat

16 Introduction

17 Antibiosis.— The bio-fungicide produces a chemical compound such as an antibiotic or other
18 toxin that kills the target organism. Because of their specificity of action against plant
19 pathogens, relatively low phytotoxicity, absorption through foliage and systemic
20 translocation and activity in low concentration, the use of antibiotic is becoming very popular
21 and very effectively used in managing several plant diseases.

22 Antibiosis is defined as the inhibition or destruction of the microorganism by substances such
23 as specific or nonspecific metabolites or by the production of anti-biotic that inhibit the
24 growth of another microorganism (Benítez *et al.*, 2004; Irtwange, 2006; Viterbo *et al.*, 2007;
25 Haggag &and Mohamed, 2007).

26 Aureofungin is a systemic antifungal antibiotic research product of H.A. Ltd. It is the only
27 Antifungal Antibiotic in the market. Aureofungin is used for seed treatment as well as for
28 sprays. It is also used for root application. It is either used alone for fungal diseases, control
29 or combined with streptomycin when bacterial diseases control is needed.

30 Seed-borne diseases can seriously affect crop yield and quality. The most effective means of
31 control is by exclusion and reduction of the inoculum during seed production (Van der -Wolf
32 *et al.* 2008). Seed-borne diseases have been found to affect the growth and productivity of
33 crop plants (Kubiak & Korbas, 1999; Weber *et al.*, 2001; Dawson & Bateman, 2001). Seed-
34 borne mycoflora of wheat reported recently included *Alternaria alternata*, *Drechslera*
35 *sorokiniana*, *Fusarium moniliforme*, *F. avenaceum*, *F. graminearum*, *F. nivale*, *F. culmorum*,
36 *F. equiseti*, *F. sporotrichioides*, *Cladosporium herbarum*, *Stemphylium botryosum* (Nirenberg
37 *et al.*, 1994; Glazek, 1997; Mirza & Qureshi, 1978).

38 Bio-fungicide means fungicides of biological origin. It may be microorganism such as
39 bacteria, fungi and animal or plant based product like secondary metabolite. Indian economy
40 is dependent upon agriculture and agriculture has major problems of fungal diseases. Fungi

41 can cause serious damage in agriculture, resulting in critical losses of yield, quality and profit
42 (Choudhary *et al.*, 2014).

43 The present investigation has been undertaken to effect of antibiotic and bio-fungicide for
44 control of seed borne fungi of wheat with emphasis for further controlling of seed borne fungi
45 using antibiotic and bio-fungicide.

46 **Material and Methods**

47 The present studies were carried out at Bhargava Agricultural Botany laboratory, Department
48 of Botany University of Allahabad, Allahabad, Uttar Pradesh, India, during Nov. to April
49 | 2015-2016 for effect of antibiotic and bio-fungicide [in the for](#)-control of seed borne fungi of
50 wheat.

51 **Collection of seed samples**

52 Seed samples were collected from different seed corporations, companies and farmer's seed
53 lots from two districts Allahabad. Then these were properly labelled, kept in polythene bags
54 and stored for further studies in a freezer at 10 °C until mycological testing and other
55 | processing Fernandez *et al.*, 1985 [\(this author is not listed in the bibliography\)](#). 10 varieties
56 have been selected, each variety 10 seeds taken in the experiment. Seeds were disinfected
57 with chlorox 1% for 1-2 minutes and then washed three times with distilled water Mittal *et*
58 *al.*, 1999.

59 **Agar plate method:**

60 Agar plate method (Agrawal 1976) as suggested by International Seed Testing Association
61 (ISTA 2005) was used for the detection of fungi. And isolation, seeds were incubated on
62 Agar plates (Anonymous, 1993). Potato dextrose agar (PDA) was used in this method for
63 the isolation of mycoflora. 10 seeds per plate were inoculated and incubated at 22 ± 2 °C.
64 | After 7 days incubated seeds were examined under stereobinocular microscope for fungi and
65 then the isolated mycoflora were sub-cultured by single spore technique for macro- and
66 microscopic studies.

67 **Identification of fungi**

68 Fungal morphology was identified on the basis of colony characteristics and microscopic
69 examinations. Standard books and research papers were consulted during the examination of
70 | these fungi (Aneja, 2004; Rifai, 1969; Barnet [& and](#)-Hunter, 1999). The fungi were identified
71 with the help of keys, monographs and text provided by several authors Barnett and Hunter,
72 1972; Pedro *et al.*, 2009.

73 **Procedure of treatments**

74 The experiment includes three treatments were evaluated each 10 seeds tested with three
75 replications in pot a randomized experimental arrangement and also each 100 seeds tested
76 with three replications in plot. Indra (K-8962) variety of wheat has been taken as test
77 selected to 3.06×2.07 meter plot with plant to plant distance 18 cm and row to row 23 cm.

(Seth, *et.al.* 2014). The treatments were respectively applied:- T₁ = Control, T₂ = 3.500 gm Aureofungin with 100 ml water (Antibiotic) at 4 hours for 100 dipping seeds, T₃ = *Allium sativum* leaf extract with cow urine (Bio-fungicide), the wheat seeds were treated from leaf extract of *Allium sativum* with cow urine, dipping seeds in 1:2 ratio preparations (Seth, *et.al.* 2015). Control percentage and disease incidence of fungal was calculated by applying this formula:-

$$\text{Control \%} = \frac{\text{Maximum infected seed} - \text{Minimum infected seed}}{\text{Maximum infected seed}} \times 100$$

$$\text{Disease Incidence (D.I.) \%} = \frac{\text{No. of Infected plants}}{\text{Total No. of plants}} \times 100 \quad (\text{This abbreviation appear in the table 1 and 2})$$

Results and Discussion

In the experiment, the different two treatments applied for control of seed borne fungi of wheat in the pots. The result was obtained control 63.20 %, and disease incidence 23.30 % were recorded from *Allium sativum* leaf extract with cow urine (Bio-fungicide) in the T₃ where as control 47.41% and disease incidence 33.33% were recorded from 4 gm. Aureofungin with 100 water (Antibiotic) in the T₂ (Table 1).

Table: 1 Control of seed borne fungi of wheat by different seed treatment in pots

Treatment	Total No. of plant	No. of infected seed in Pots			Mean ±SD	D.I.%	Control %
		P ₁	P ₂	P ₃			
T ₁	10	6	7	6	6.33±0.57	63.33	0.00
T ₂	10	3	2	3	3.33±0.57	33.30	47.41
T ₃	10	2	1	2	2.33±0.57	23.30	63.20

The different two treatments also applied for control of seed borne fungi of wheat in the plots. The result was obtained control 68.75 %, and disease incidence 20 % were recorded from *Allium sativum* leaf extract with cow urine (Bio-fungicide) in the T₃ where as control 52.09 % and disease incidence 30.66 % were recorded from 4 gm. Aureofungin with 100 ml water (Antibiotic) in the T₂ (Table 2).

Table: 2 Control of seed borne fungi of wheat by different seed treatment in plots

Treatment	Total No. of plant	No. of infected seed in Plot	Mean ± SD	D.I.%	Control %
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		P ₁	P ₂	P ₃			
T ₁	100	62	66	64	64.00±2.00	64.00	0.00
T ₂	100	32	30	30	30.66±1.15	30.66	52.09
T ₃	100	22	18	20	20.00±2.00	20.00	68.75

It had been observed that the percent disease had been increased under control treatment, while the treated plants were found to have reduced disease per plant. Tests with wheat bunt were also successful, although the seed was injured. Try, please, to reformulate this sentence (in yellow) and explain better. In a later paper, workers at the same station reported obtaining control of bunt with cycloheximide by means of a 1-minute soaking period, or with dust treatments Henry *et al.* (1952). Griseofulvin as a antibiotics is very effective in controlling powdery mildew of wheat, *Pyloricularia oryzae*, *Ascochyta pisi* (Wallen *et al.* 1965) and silver-leaf disease in plums (Bennett, 1962). Its efficacy has been summarized by Rhodes (1962). Mycostatin (nystatin) has successfully been used as post-harvest dip-treatment against peach decay (Dimarko & Davis, 1957). Seed was treatment antibiotic of aureofungin on *Rhizobium* strain of groundnut (Mukewar *et al.* 1969). The treatments of bio-fungicide significantly control percent of seed borne fungi of wheat. They worked on controlling the bacterial leaf blight disease of mango and found bio-fungicide as an effective control measure. The findings of the present study have been supported by Chowdhury (2009) and Akter (2011). The findings of the present study have been supported by Sathe (2011) as she also found bio-fungicide an effective control measure against Bacterial leaf blight disease of litchi.

Conclusion

Allium sativum leaf extract with cow urine (Bio-fungicide) was found superior in controlling of seed borne fungi of wheat compare than Aureofungin with 100 ml water (Antibiotic). ~~A bio-fungicide is composed of beneficial microorganisms, such as specialized fungi that attack and control plant pathogens and the diseases.~~

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