

# Effect of Seed Surface Fungi on Seedling, Shoot and Root Growth of *Vicia Faba* Lnn.

**Mahesh Babu**

Department of Botany

Government (P.G.) College, Bisalpur (Pilibhit). U.P

drmaheshbabul@gmail.com

**Abstract:** Effect of seed surface fungi on the percentage germination of seed, shoot and root growth was studied. In case of growth of seedling, all treatments exhibited significant decrease in shoot and root length.

**Keywords:** Shoot and Root length; Seedling; Seed surface fungi.

## I. INTRODUCTION

Effect of seed surface mycoflora and rhizosphere mycoflora on seed germination, on length of shoot and root on plant growth have been studied by various workers viz., Brown et. al (1964), Humphreys Jones and Waid(1963), Roy and Gupta (1969) and Gupta (1971). Barnumn(1924), Brain and Wright (1951), Wang et. al (1962) and Bown and Rovira (1961) reported that for inhibition of root and shoot growth of plants in presence of fungi.

## II. MATERIAL AND METHOD

100 healthy seeds were surface sterilized of *Vicia faba* with 0.1% aqueous HgCl<sub>2</sub> and thereafter washed thoroughly three times with sterilized distilled water. Seeds surface dried with Whatmann filter paper No.44. Five seeds were transferred to each plate containing 15ml. Czapek's media of following composition : Agar-agar 15.0 g; KH<sub>2</sub>PO<sub>4</sub> 1.0 g; MgSO<sub>4</sub>.7H<sub>2</sub>O 0.5 g; KCl 1.0 g FeSO<sub>4</sub> trace, yeast powder 0.5 g; NaNO<sub>3</sub> 2.0 g; dextrose 10.0 g ; distilled water 1000 ml. Plates were incubated for 5 days and fungi were identified. Percentage occurrences of fungi were recorded.

**Table-1 Percentage occurrence of fungi isolated from the seed surface.**

Name of fungi	Percentage occurrence
1. <i>Rhizopus nigricans</i>	2
2. <i>Neocosmospora vasinfecta</i>	4
3. <i>Chaetomella horrida</i>	3
4. <i>Aspergillus flavus</i>	3
5. <i>A. terreus</i>	3
6. <i>A. luchuensis</i>	3
7. <i>A. niger</i>	4
8. <i>A. candidus</i>	14
9. <i>A. sydowi</i>	1
10. <i>Penicillium citrinum</i>	2
11. <i>Paecilomyces fusisporus</i>	6
12. <i>Nigrospora sphaerica</i>	5
13. <i>Cladosporium herbarum</i>	7
14. <i>Cladosporium lignicolum</i>	11
15. <i>Curvularia tetramera</i>	4
16. <i>Curvularia lunata</i>	5

17. <i>Tetracoccosporium paxianum</i>	3
18. <i>Alternaria humicola</i>	8
19. <i>Fusarium udum</i>	4
20. White St. Mycelium	2
21. Black St. Mycelium	3
22. Pink St. Mycelium	2

**Table-2 Effect of seed surface fungi on shoot length.**

Treatment	Shoot length measured in mm					Mean length of shoot	Value of 't'
	Replicates						
	1	2	3	4	5		
Control	75	78	70	82	68	74.6	-
1. <i>Rhizopus nigricans</i>	58	55	51	62	63	57.8	5.54**
2. <i>Neocosmospora vasinflecta</i>	47	45	52	41	55	48	8.33**
3. <i>Trichoderma lignorum</i>	61	63	60	58	52	58.8	5.56**
4. <i>A. flavus</i>	40	48	47	38	39	42.4	10.85**
5. <i>A. terreus</i>	48	42	38	39	35	40.4	11.32**
6. <i>A. luchuensis</i>	20	25	28	34	36	28.6	13.23**
7. <i>A. niger</i>	15	18	20	17	14	16.8	23.30**
8. <i>Penicillium citrinum</i>	45	49	43	36	37	42	10.29**
9. <i>Cladosporium herbarum</i>	35	45	48	44	42	42.8	10.58**
10. <i>Curvularia tetramera</i>	65	61	51	55	57	57.8	5.33**
11. <i>Alternaria humicola</i>	20	26	28	32	29	27.0	16.38**
12. <i>Fusarium udum</i>	35	38	40	32	29	34.8	13.74**

\*Significant at 5% level

\*\*Significant at 1% level

**Table-3 Effect of seed surface fungi on root length.**

Treatment	Root length measured in mm					Mean Length of root	Value of 't'
	Replicates						
	1	2	3	4	5		
Control	45	56	44	54	49	49.6	-
1. <i>Rhizopus nigricans</i>	34	31	38	42	35	36	5.03**
2. <i>Neocosmospora vasinflecta</i>	36	39	43	41	51	42	2.45**
3. <i>Trichoderma lignorum</i>	38	34	30	38	32	34.4	5.93**
4. <i>A. flavus</i>	25	28	35	31	29	29.6	7.71**
5. <i>A. terreus</i>	28	29	34	24	26	28.6	8.06**
6. <i>A. luchuensis</i>	20	19	22	24	28	22.6	10.54**
7. <i>A. niger</i>	10	14	15	18	12	13.8	14.63**
8. <i>Penicillium citrinum</i>	35	38	29	32	36	34	6.11**
9. <i>Cladosporium herbarum</i>	33	28	36	39	33	33.8	5.89**
10. <i>Curvularia tetramera</i>	44	40	45	38	34	40.2	3.38**
11. <i>Alternaria humicola</i>	20	22	19	26	29	23.2	9.74**
12. <i>Fusarium udum</i>	24	28	24	32	35	28.6	7.28**

\*Significant at 5% level

\*\*Significant at 1% level

### **III. RESULT AND DISCUSSION**

In present study twenty-two fungi were isolated from seed surface of test plant. Out of which one species from Phycomycetes, one from Ascomycetes and 20 fungi were from Deuteromycetes. *A. niger*, *Cladosporium herbarum*, and *Alternaria humicola* were dominant whereas *A. candidus*, *Rhizopus nigricans*, white sterile mycelium and pink sterile mycelium were of rare occurrence. (Table- 1).

In case of growth of seedlings all treatment exhibited significant decrease in shoot and root length. *A. niger*, and *A. luchuensis* showed the maximum reduction in shoot and root length (Table-2, 3). Various reason have been proposed by several workers viz., Barnum (1924), Brain and Wright (1951), Wang et. al (1962) and Bowen and Rovira (1961) for inhibition of root and shoot growth of plants in presence of fungi.

### **ACKNOWLEDGEMENT**

The author is thankful to Dr. V. K. Gupta, Reader, Department of Botany, Narain (P.G.) College, Shikohabad, Firozabad for guidance and to Dr. M. C. Yadav for providing facilities.

### **REFERENCES**

- [1]. Barnum, C.C. (1924). The production of substances toxic to the plants by *Penicillium expansum* Linde. *Phytopathology*, 14: 238-243.
- [2]. Brain, P.M. and Wright, D.M. (1951). Uptake of antibiotic Metabolites of soil microorganism by plants. *Nature Lond.*, 167-347.
- [3]. Brown, M.F., Burlingham, S.K. and Jackson, R.M. (1964). Studdies on Azotobactor species in soil III. Effect of artificial inoculation on crop yields. *Plant and soils* 20: 194-214.
- [4]. Bowen, G.D., and Rovira, A.D. (1961). The effect of microorganism on plant growth I. Development of root and root hairs in sand and agar. *Plant and soil*, 15: 166-168.
- [5]. Gupta, V.K. (1971). Rhizosphere Studied in relation to nodulation of *Trigonella foenum-graecum* Linn. Doctoral Thesis, Banaras Hindu, University, Varanasi-5, India.
- [6]. Humphreys-Jones, D.R. and Waid, J.S. (1963). Influence of fungal isolates on germination and growth of perennial rye grass. *Plants and soil*, 19: 139-150.
- [7]. Roy, R.Y., and Gupta, P.C. (1969). Effect of some rhizosphere fungi on seed germination. *Abst. Proc, 56<sup>th</sup> Indian Sci. Congress, Sec. VI. Paper No. 34.*
- [8]. Wang, K.H. and Microchont, T.G. (1962). "Plant absorption of toxin formed by soil fungi. *Zur. Biol. No. 121.*