



TESTING SEVERITY OF THE DISEASES CAUSED BY PATHOGEN

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Abstract

In the present study 10 fungi isolated from the groundnut rhizosphere and pure culture prepared, from these pure culture fungi, fungal filtrate prepared and treated with five groundnut varieties germination and growth of radicle against time 2 hours' time interval up to 10 hours.. In 2 hours treatment Out of ten, seven fungi showed non-significant difference means it did not affect the seed germination and growth of radicle, in four hour treatment The seeds were treated with *Rhizopusstolonifer* culture filtrate showed very less growth of radicle that is 0.07 cm. *Tricodermaviride* and *Fusarium oxysporum* treated seeds also showed a very little growth of the radicle i.e. 0.99 cm and 0.28 cm respectively. In four hours treatment *Curvularialunata* and *Aspergillus fumigates* showed significant difference, also non-significant difference observed in six hours treatment *Penicilliumdigitatum* and *Fusarium oxysporum* showed very less growth of radicle i.e. 0.41 cm and 0.97 cm respectively.in eight hours treatment of the fungal culture filtrate, treated seeds showed non significant growth. *Fusarium oxysporum* showed very less growth i.e. 0.51 cm. *Aspergillus terrus*, *Tricodermaviride*, *Macro phominaphaseolina*, *Rhizopusstolonifer* showed some equal values 2.51 cm, 2.61 cm, 2.71 cm and 2.61 cm respectively and control was of 3.20 cm. *Penicilliumdigitatum*, *Aspergillus niger*, *Curvularialunata*, *Aspergillus fumigates* showed an average length of radicle as 1.50 cm. After 10 hours treatment except *Tricodermaviride* all fungal culture treated seeds showed non significant difference

Keywords -fungal filtrate, Rhizosphere, Germination, pure culture



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Introduction- India is second largest groundnut production country, the annual production of seed and oil is 5-8 and 1.5 million respectively. Groundnut is fifth most important oilseed crop in the world. It is very important source of micronutrient like niacin, falacin, calcium, phosphorus, zinc, iron etc. in india groundnut cultivated in kharip season which is very favourable for pathogenic fungi, due to these fungi tremendous loss of production occurred. For these pathogenic fungi farmer used many kind of pesticides which are the non-degradable in soil and affect the beneficial soil microflora. These fungicides toxic and affect the human being also it is cancerous.

To study the toxicity of these pathogenic fungi, 10 pathogenic fungi isolated from rhizosp here ie. *Aspergillusterrus*, *Tricodermaviride*, *Penicilliumdigitatum*, *Aspergillus niger*, *Curvularia Lunata*, *Aspergillus fumigates*, *Macro phominaphaseolina*, *Aspergillus*

flavus, Fusarium Oxysporum, Rhizopus Stolonifera. Seven days fungal filtrate prepared and treated with five different varieties. Seeds were treated with time interval 2 hours, 4 hours, 6 hours, 8 hours, 10 hours and radicle length recorded, to find out the which fungi is more harmful. To control these fungi biocontrol method was studied.

Research method

Culture filtrate preparation:

A disc (0.5 cm diameter) of mycelia and spores was taken from the periphery of 7-days-old cultures of fungus grown on PDA medium was inoculated into 250 ml conical flasks, each containing 100 ml of Glucose nitrate broth. The broth contained (g/l): glucose 1g, potassium nitrate 0.25 g, potassium dihydrogen ortho-phosphate 0.1 g, magnesium phosphate 0.5 g. The flasks were allowed to incubate at room temperature for 15 days. Three flasks were used for each fungus per incubation period. The fungal filtrates were obtained by passing the culture through sterile Whatman No. 1 filter paper to obtain a cell-free extract.

Effect of fungal culture filtrate on seed germination:

Seeds of groundnut were surface sterilized with 1% Mercuric chloride solution for 1 min and rinsed several times in sterile distilled water. All these five oilseeds were then allowed to pre soak in fungal culture filtrate for 2h, 4h, 6h, 8h and 10h. At the end of pre-soaking period, the seeds were removed from the filtrates and washed in sterile distilled water. It was then transferred into the Petri plates containing two layered blotting papers soaked with sterile distilled water. About 10 seeds were kept per dish and it was then allowed to incubate for two days for room temperature. Germination counts were made after incubation period of 48h and 72h.

Results

Effect of fungal culture filtrate on seed germination and growth of radicle (2 hours treatment) was observed. Ground nut seeds were treated with ten fungal culture filtrates. Out of ten, seven fungi showed non-significant difference means it did not affect the seed germination and growth of radicle. These were *Aspergillus terrus*, *Trichoderma viride*, *Penicillium digitatum*, *Aspergillus fumigates*, *Aspergillus flavus*, *Fusarium oxysporum*, and *Rhizopus stolonifera*. The very less growth of radicle was observed in *Fusarium oxysporum* that is 1.29 cm. Three remaining fungi showed significant difference. These were *Aspergillus niger*, *Macrophomina phaseolina* and *Curvularia lunata*. In this fungal treatment *Curvularia lunata* treated seeds showed highest growth that is 7.35 cm.

Effect of fungal culture filtrate on seed germination and growth of radicle (4 hours treatment) was observed. In four hours treatment eight fungi showed non significant difference with control. These were *Aspergillus terrus*, *Trichoderma viride*, *Penicilliumdigitatum*, *Aspergillus flavus*, *Fusarium oxysporum*, and *Rhizopusstolonifer*, *Macrophominaphaseolina* and *Aspergillus niger*. The seeds were treated with *Rhizopusstolonifer* culture filtrate showed very less growth of radicle that is 0.07cm. *Tricodermaviride* and *Fusarium oxysporum* treated seeds also showed a very little growth of the radicle i.e. 0.99 cm and 0.28 cm respectively. In four hours treatment *Curvularialunata* and *Aspergillus fumigates* showed significant difference, *Curvularialunata* was as equal to the control the difference was only 0.1. The highest growth was observed in *Aspergillus fumigates* as 3.7 cm while in control it was 3.00 cm.

Effect of fungal filtrate on seed germination and growth of radicle (6 hours treatment) was observed. In six hours treatment, *Aspergillus terrus*, *Penicilliumdigitatum*, *Aspergillus niger*, *Macrophominaphaseolina*, *Aspergillus flavus*, *Fusarium oxysporum* and *Rhizopusstolonifer* culture filtrate treated seeds showed non-significant difference and *Penicilliumdigitatum* and *Fusarium oxysporum* showed very less growth of radicle i.e. 0.41cm and 0.97cm respectively. *Tricodermaviride*, *Curvularialunata* and *Aspergillus fumigates* showed significant difference as compare to control. Control was of 3.2 cm and *Curvularialunata* showed maximum seed radicle growth that is 4.97 cm. *Tricodermaviride* and *Aspergillus fumigates* showed radicle growth as 3.91 cm and 3.54 cm respectively which was quite equal to the control.

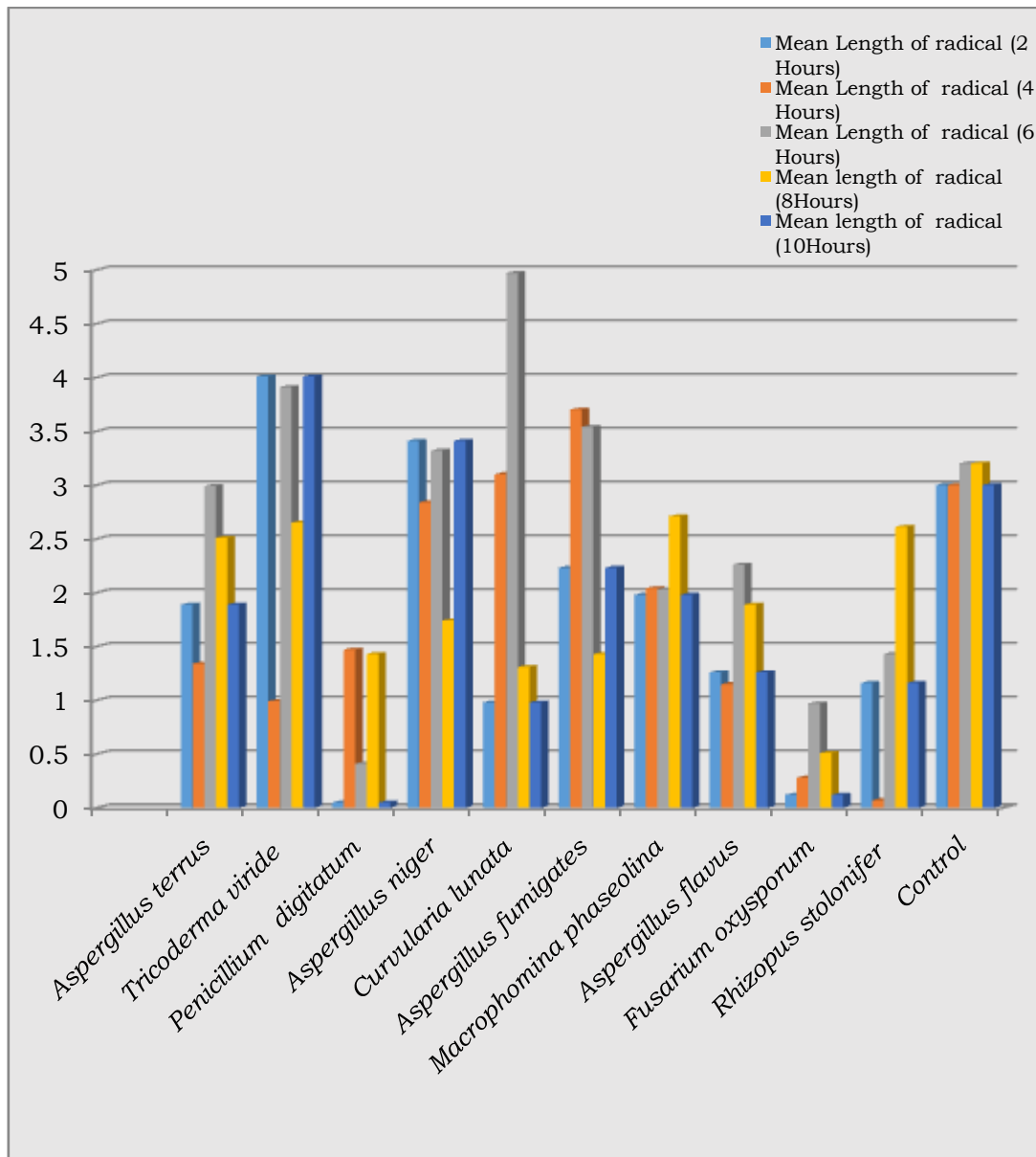
Effect of fungal culture filtrate on seed germination and growth of radicle (8 hours treatment) was observed. After the eight hours treatment of the fungal culture filtrate, treated seeds showed non significant growth. *Fusarium oxysporum* showed very less growth i.e. 0.51 cm. *Aspergillus terrus*, *Tricodermaviride*, *Macrophominaphaseolina*, *Rhizopusstolonifer* showed some equal values 2.51 cm, 2.61cm, 2.71cm and 2.61cm respectively and control was of 3.20 cm. *Penicilliumdigitatum*, *Aspergillus niger*, *Curvularialunata*, *Aspergillus fumigates* showed an average length of radicle as 1.50 cm.

Effect of fungal culture filtrate on seed germination and growth of radicle (10 hours treatment) was observed. After 10 hours treatment except *Tricodermaviride* all fungal culture treated seeds showed non significant difference. *Penicilliumdigitatum* showed radicle growth as 0.05 cm which was lowest growth in 10 hours treatment. *Fusariumoxysporum* showed 0.12

cm and *Rhizopus stolonifer* showed 0.16 cm which was next lower radical growth observed. In *Macrophomina phaseolina* it was 0.98 cm in *Aspergillus flavus* it was 1.26 cm. In *Tricoderma viridens* no significant growth was observed in initial stage but after six, eight and ten hours it showed significant radicle growth and in ten hours treatment it showed 4.01 cm.

Table 9. Effect of fungal culture filtrate on seed germination and radical growth of groundnut.

| Sr. No. | Name of the fungi | Germination (%) | Length of radicle (2 Hours) | Length of radicle (4 hours) | Length of radicle (6 Hours) | Length of radicle (8 Hours) | Length of radicle (10 Hours) |
|-----------|--------------------------------|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| 1 | <i>Aspergillus terreus</i> | 50 | 1.89 | 1.34 | 2.99 | 2.51 | 1.89 |
| 2 | <i>Tricoderma viride</i> | 72 | 4.01 | 0.99 | 3.91 | 2.65 | 4.01 |
| 3 | <i>Penicillium digitatum</i> | 30 | 0.05 | 1.47 | 0.41 | 1.43 | 0.05 |
| 4 | <i>Aspergillus niger</i> | 62 | 3.41 | 2.84 | 3.32 | 1.74 | 3.41 |
| 5 | <i>Curvularia lunata</i> | 79 | 0.98 | 3.1 | 4.97 | 1.31 | 0.98 |
| 6 | <i>Aspergillus fumigatus</i> | 60 | 2.23 | 3.7 | 3.54 | 1.43 | 2.23 |
| 7 | <i>Macrophomina phaseolina</i> | 44 | 1.98 | 2.04 | 2.03 | 2.71 | 1.98 |
| 8 | <i>Aspergillus flavus</i> | 42 | 1.26 | 1.15 | 2.26 | 1.89 | 1.26 |
| 9 | <i>Fusarium oxysporum</i> | 30 | 0.12 | 0.28 | 0.97 | 0.51 | 0.12 |
| 10 | <i>Rhizopus stolonifera</i> | 20 | 1.16 | 0.07 | 1.43 | 2.61 | 1.16 |
| 11 | Control | 94 | 3.00 | 3.0 | 3.20 | 3.2 | 3.00 |
| SD | | | 1.30 | 1.18 | 1.35 | 0.80 | 1.30 |
| CD | | | 0.39 | 0.36 | 0.41 | 0.24 | 0.39 |
| SE | | | 1.01 | 0.92 | 1.05 | 0.62 | 1.01 |



Discussion

Effect of fungal culture filtrate was studied on the germination of groundnut kernels was studied in order to after the deterioration. It was found that initial time treatment did not affect the seed germination but after six hours treatment it was affected the very strongly. Percent seed germination in control was normal. Khairnaret *al.* (2011) reported the fungal culture filtrates effect on some cereals germination, The fungal metabolites of all fungi reduced considerable seed germination in all cereals, Germination was suppressed by the presence of inhibitory substances in the fungal culture filtrate and the secretion of some mycotoxins which caused seed rotting and damage to the embryos. Percent germination was normal in control.

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