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Short Communication

Effect of Leaf Extract of Acacia Niltica on seed Mycoflora of Legumes

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Abstract

The seeds of legumes are associated with three dominant fungi fusarium oxysporum, Alternaria alternata and Dreschsleria longirostrata. The leaf extract of Acacia nilotica is most effective show more fungitoxic property. As concentration of leaf extract increases a linear growth of dominant fungi decreases, the leaf extract also reduces percentage of seed mycoflora and increases seed germination percentage.

Keywords: Seed samples, seed mycoflora, agar media, leaf extract.

Introduction

Seeds of legumes or pulses form an important source of dietary proteins, they provide essential amino acids to our pre-dominantly vegetarian population. There are major pulse crops like Bengal Gram, Green Gram and Black Gram. The seeds are also found to be responsible for disease transmission because they carry number of pathogens which get associated either in the field or in the post harvest storage condition[1-4].

Among different types of seed mycofloras, the three types of fungi were studied namely Alternaria alternata (fr.) Keissler, Drechslera longirostrata (Drechs) Richardson and Fraser and Fusarium oxysporum (Scheldon). The medicinal plant Acacia nilotica (L) has the antifungal activity. In present investigation control of seed borne fungi by bio control agent is achieved by using leaf extract of Acacia nilotia (L). An attempt has made to know the effect of leaf extract on three types of fungi[5-7].

Material and Methods

Collection of Seed Samples: Bengal Gram, Green Gram, Seed samples were collected from Agriculture Research Centre, Badnapur.

Assessment of Seed Mycoflora: The seed borne fungi of pulse seeds were detected by Agar Plate and Blotter paper methods are recommended by ISTA.

Agar Plate Method: Firstly glucose nitrate agar medium was prepared. Taken nine petriplates for each sample of seeds. Then GNA medium and petriplates made sterile in autoclave. After sterilization the medium allowed to solidify for sometime. Then the seeds were treated with 0.1% of $HgCl_2$ for two minutes. Washed the seeds with sterilized water for removal of excess of $HgCl_2$. Placed 10 seeds at equal distance in each petriplate. After that incubated these petriplates in incubating chamber for 6-8 days. The ultraviolet light were bombarded for 5-10 minutes each day. Then examined the plates after 8 days and noted the characteristics fungal colonies associated with each seed. Prepared the slides and examined them under microscope. Recorded the percentage of infection of different fungi. Observed the changes taking place in infection of seeds.

Blotter test method: Taken nine petriplates and nine blotters. Written sample number and data with marker pen. Dipped them in sterilized water with the help of forcep. Kept blotters in vertical position till the excess of water was removed. Then placed the blotters in the petriplates. The seeds were treated with 0.1% $HgCl_2$ i.e. mercuric chloride for 2 minutes. Taken 10 seeds at random with the help of forcep. Placed 10 seeds at equal distance on the moist blotter, 8 seeds in a outer ring and 2 in the middle at the centre. Written samples name on dish with the help of marker pencil. In such a manner prepared nine plates with 10 seeds of each sample. After that kept these petriplates for one week at a fixed temperature at above 25^0C in an incubating chamber.

Selection of medicinal plants: Medicinal plants have been used as biological control agent to control the plant pathogenic fungi. The medicinal plant Acacia nilotica is selected to control the growth of Fusarium oxysporum schlecht, Alternaria alternata keissler and Drechslera longirostrata (Drechs) Richardson and Fraser.

Results and Discussion

The effect of leaf extract of Acacia nilotica was observed. The results were depicted in table 1, 2 and 3. From the results it was clear that as the concentration of Acacia nilotica increased there was decrease in linear growth of fusarium oxysporum was 7 mm on 8th day of incubation, when treatment of extraction of Acacia nilotica was given, at 4% concentration showing the maximum inhibition. On the other hand the growth of fusarium oxysporum

on control plate on 8th day of incubation was 65 mm. At 1.0% it was 58 mm, at 2.0% it was 48 mm, at 3.0% it was 25 mm and at 4.0% it was 7 mm. This means that at 4.0% concentration there was complete inhibition of the fungus.

Results in table 2 indicated that linear growth of Alternaria alternata was 18 mm on 8th day of incubation when treatment of Acacia nilotica was given at 4.0% concentration showing the maximum inhibition. On the other hand, the growth of alternaria alternata on control plate on 8th day of incubation was 65 mm. At 1.0% it was 55 mm, at 2.0% it was 47.5 mm, at 0.3% it was 39 mm and at 4.0% it was 18 mm. This means that the 5.0% concentration there was complete inhibition of fungus take place[8-10].

Results in table 3 indicated that linear growth of Drechslera longirostrata (Drechs) Richardson and Fraser was 10 mm on 8th day of incubation, when treatment of Acacia nilotica was given at 4.0% concentration showing the maximum inhibition. On the other hand, the growth of Drechslera longirostrata (Drechs) Richardson and Fraser on control plate on 8th day of incubation was 65 mm. At 1.0% it was 56 mm, at 2.0% it was 48 mm, at 3.0% it was 27 mm and at 4.0% it was 10 mm. This means that at 4.0% concentration the maximum inhibition occurred. At 5.0% concentration there was complete inhibition of the fungus occurred.

Table-1
Effect of Acacia nilotica (L.) Del. on linear growth of Fusarium oxysporum Schlecht

Sr. No.	Leaf extract concentration (%)	Linear growth (mm) Incubation period (days)							
		1	2	3	4	5	6	7	8
1	1.0	10.00	14.50	16.00	26.00	32.00	45.00	50.00	58.00
2	2.0	09.00	12.00	14.00	24.00	30.00	38.00	40.00	48.00
3	3.0	08.00	11.00	13.00	18.00	19.00	20.00	24.00	25.00
4	4.0	00.00	00.00	00.00	03.00	04.00	05.00	06.00	07.00
5	5.0	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
6	Control	20.00	25.00	30.00	35.00	40.00	50.00	60.00	65.00
7	S.E.+	3.20	4.26	4.98	7.23	8.53	10.79	12.29	13.86
	C.D.at P=0.01	27.32	36.38	42.52	62.00	72.84	92.14	104.95	118.36
	C.D.atP=0.05	18.33	24.40	28.53	41.42	48.87	61.82	70.42	79.41

Table-2
Effect of Acacia nilotica (L.) G. Don. on linear growth of Alternaria alternata (Fr.) Keissler

Sr. No.	Leaf extract concentration (%)	Linear growth (mm) Incubation period (days)							
		1	2	3	4	5	6	7	8
1	1.0	13.50	16.50	21.50	27.40	35.00	40.50	45.50	55.00
2	2.0	12.00	15.00	19.00	23.50	28.00	35.00	42.00	47.50
3	3.0	11.00	14.00	17.00	20.00	24.00	30.50	32.00	39.00
4	4.0	00.00	00.00	00.00	00.00	08.00	09.00	10.00	18.00
5	5.0	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
6	Control	20.00	22.00	25.00	32.00	42.00	55.00	61.00	65.00
7	S.E.+	3.85	4.61	5.63	7.02	9.35	11.61	13.01	15.33
	C.D.at P=0.01	32.87	39.36	48.08	59.95	79.84	99.14	111.10	130.91
	C.D.atP=0.05	22.06	26.41	32.25	40.22	53.57	66.52	74.54	87.84

Table-3
Effect of Acacia nilotica (L.) Del. on linear growth of Drechlera Longirostrata (Drechs) Richardson and Fraser

Sr. No.	Leaf extract concentration (%)	Linear growth (mm) Incubation period (days)							
		1	2	3	4	5	6	7	8
1	1.0	11.00	15.00	20.00	22.00	35.00	45.00	50.00	56.00
2	2.0	10.50	12.00	15.00	20.00	30.00	40.00	47.00	48.00
3	3.0	09.00	10.00	13.00	19.00	25.00	26.00	26.50	27.00
4	4.0	00.00	00.00	00.00	07.00	08.00	09.00	09.50	10.00
5	5.0	00.00	00.00	00.00	00.00	00.00	00.00	00.00	00.00
6	Control	20.00	22.00	25.00	30.00	38.00	45.00	52.00	65.00
7	S.E.+	3.44	4.02	4.98	6.69	9.28	11.27	12.63	14.06
	C.D.at P=0.01	29.37	34.33	42.52	57.13	79.25	96.24	107.86	120.07
	C.D.atP=0.05	19.71	23.03	28.53	38.33	53.17	64.57	72.36	80.56

Conclusion

In the summary we can conclude that as the concentration of Acacia nilotica increases there is decrease in linear growth of fusarium oxysporum.

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