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ORIGINAL ARTICLE

Antifungal activity of Leaf extract on Growth of Macrophomina phaseolina on Soyabean seed.

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Abstract:
Effect of leaf extract of some medicinal plant on the survival of Macrohomina phaseolina was studied. Improper storage of the oilseed like Soybean makes it vulnerable to storage fungi. They bring the variety of biochemical changes in the suitable conditions. Considering this fact, experiment were undertaken to understand nutritional changes like change in reducing sugar due to Macrohomina phaseolina.
Five different plant used in Indian medicine were examined against Macrohomina phaseolina. The water and alcoholic extract of Azadirachta indica, Ocimum sanctum, Ocimum basilicum, Lantana camara and Aloe vera exhibited varying degrees of inhibition against the fungi. The alcoholic Neem powder extract shows most effective in decreasing the survivability of test pathogen. While Aloe vera and Ocimum sanctum extract shows adequate inhibition.

Ocimum basilicum and Lantana camara extract shows significantly variable activity against fungal growth ranging from 70% to 80% to reduction in Macrohomina phaseolina fungus.

The alcoholic fresh leaf extract was more effective than water extract. Use of plant leaf extract Aloe vera minimized the number of infected seed and increased the seedling growth.

KEY WORDS:- Macrohomina phaseolina, Soyabean.

INTRODUCTION

India is one of the largest producers of oilseed in the world. India contributes about eight percent of the world oilseed Crops, Soyabean is major traditionally cultivated oil seed.

Soyabean (Glycine max L.merr.) is one of the major oil yielding plant found not only in India but throughout the world due to presence of high calorie protein and edible oil. Macrohomina phaseolina Tassi (Gold) is one of the pathogens that cause Charcoal rot of soybean resulting in great economic loss.

Some selected medicinal plant has a potential for controlling various phytopathogenic fungi due to presence of a Variety of compound. Neem has antifungal activity (Tewari 1992). Effectiveness of Neem extract and oil as a fungicide has been reported by several worker. (R.C.Dubey, 2009), Dwivedi and Dubey 1986, Sharma and Basandrai 1997. Different plant extract shows the antifungal activity for number of fungi (Aqsa Aslam, Farah naz et al 2010, R.Harish kumar et al 2009, Zainab Mushtaq Ahmed et al 2009).

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Macrohomina phaseolina along with other fungi was reported to cause significant inhibition in germination of Soybean in Tarai region of Uttarakhand (Uma et al 1999).

So in this work, ecofriendly, nonchemical technique was carried out. In the present study an attempt has been made to evaluate the antifungal activity of selected medicinal plant leaf extracts on the survival of Macrohomina phaseolina sclerotia and growth of soybean seedling.

MATERIAL AND METHOD

Macrohomina phaseolina was isolated from infected growing seed of Soybean. These sample were washed with sterilized distilled potato dextrose agar (PDA) medium, plates were incubated at 250c and observed daily for emergence of colonies. Sub culturing was done from single spore to obtain pure culture.

Then fresh and healthy leaves were collected from Azadirachta indica, Ocimum Sanctum, Ocimum basilicum , Lantana camara and Aloe vera plants, Washed it with distilled water and dried in shade. The leaves were used to make a paste with different solvent like alcohol and water by using mortar and pestle. The leaf powder was mixed with distilled water in a ratio of 2:1 (W/V) and filtrated was collected from Soxhlet assembly.The collected extracts was sterilized in autoclave and were used within one day.

DISCUSSION AND CONCLUSION:-

Macrohomina phaseolina is one of the pathogens that cause charcoal rot of Soybean resulting the great economic loss hence the different botanicals has been tested as antifungal agents against this disease.

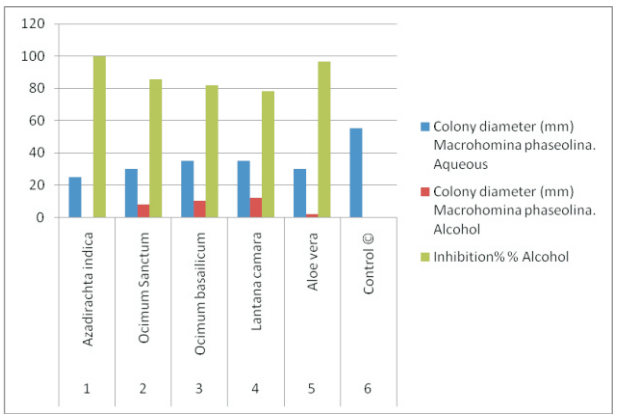
All plant, Azadirachta indica, Ocimum Sanctum, Ocimum basilicum , Lantana camara and Aloe vera inhibited the mycelial growth of fungi with varying degree of sensitivity.

The antifungal activity of screened plants against Macrohomina phaseolina is shown in table.

TABLE 1 ANTIFUNGAL ACTIVITY AGAINST MACROHOMINA PHASEOLINA.

Sr. no.	Treatment of dry powder of extract	Colony diameter (mm) *Macrohomina phaseolina.*		Inhibition%
		Aqueous	Alcohol	% Alcohol
1	***Azadirachta indica***	25	00	100
2	***Ocimum Sanctum***	30	08	85.45
3	***Ocimum basailicum***	35	10	81.81
4	***Lantana camara***	35	12	78.18
5	***Aloe vera***	30	02	96.36
6	**Control ©**	55	-	-

FIGURE 1 ANTIFUNGAL ACTIVITY OF DIFFERENT SOLVENT DRY POWDER EXTRACT OF PLANT MACROHOMINA PHASEOLINA.



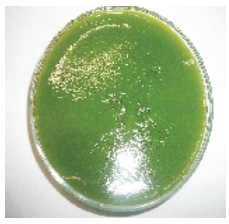


Plate A

Plate B

Plate c

INHIBITORY EFFECT OF NEEM EXTRACTS ON GROWTH MACROPHOMINA PHASEOLINA

A - Growth of Macrophomina phaseolina in alcoholic Neem extract + PDA
B - Growth of Macrophomina phaseolina in water Neem extract + PDA
C - Growth of Macrophomina phaseolina in control

The above observations noted in the table revealed that dry powder leaf extract of Azadiracta indica in alcohol was most effective (100%) in reducing the mycelial growth of Macrohomina phaseolina.

Leaf extract of Aloe vera in alcohol shows better antifungal activity. Alcoholic leaf extract was more effective than water extract hence it shows that presence of antifungal agent released in alcohol due to its solubility.

The leaf extract of Ocimum sanctum and Ocimum basilicum in alcohol shows moderate type of inhibition followed by Lantana camara leaf extract . Thus these leaf extract can be used instead of chemical fungicides to control the disease.

The crude leaf extract of these plant were used as a fungicides which are eco friendly and does not show adverse effect. The use of synthetic fungicides affects soil fertility as well as quality of seed. These are so costly as compared to herbal leaf extract.

The selected medicinal plant extract used in the above experiment are easily and locally available and effective as a antifungal agent so can be recommended to the farmer after field test and leaf extracts does not affect environment adversely but improve the quality of seed and the soil fertility.

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