

TEST OF SOME SELECTED MEDICINAL PLANTS AS AN ALTERNATE SOURCE OF COMMERCIAL FUNGICIDES AGAINST PATHOGENS OF IMPORTANT CROP PLANTS INCLUDING MAKHANA

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Article Received on 29/05/2021

Article Revised on 19/06/2021

Article Accepted on 09/07/2021

ABSTRACT

Medicinal plants are beautiful gift of nature which contain different medicinal ingredients and can be applied to cure suffering crop plants from ravages of harmful pathogensthat not only disturb their production rather disturbs the economy of our country. With view to Mahadevan, 1970 they contain secondary metabolites in form of phenols and their derivatives, called as Prohibitin. This biochemical controls successfully the different diseases of crop plants which become the pray of different fungal pathogens.

KEYWORDS: Pathogens, Antifungal, Secondary metabolites, Pathogens, Biochemicals.

INTRODUCTION

The fungicides are sold commercially in market by different trade names. Farmers apply them on their infected crop plants without knowing their appropriate concentration. No doubt these chemicals control the spread of pathogens but they become potent harmful for human health. Today it is the essential aspects of people to manage their health. We engulf daily the chemically treated food stuffs and become the patient of different physical disorders.

Makhana (*Euryalepherox Salisbury*) is an important aquatic plant which is more important either nutritionally or medicinally. It is the direct source of the rich amount of protein, Jha et al (1991). It has different usage so it is cultivated worldwide. In North Bihar different districts like Darbhanga, Madhubani, Saharsa and Purnea are dominant in the production of these plants. They grow in shallow water generally rich in organics. It grows at low cost but gives more money. But they fail to produce more when they become infected by harmful fungus. Among various infecting fungi *Alternaria* itself is sufficient to damage the plant by damaging their leaves. Generally they appear on their leaves in the form of black spot and covers entire surface resulting the black rotting, Farmers apply different chemicals available in the market without having proper knowledge of their application.

Large scale use of artificial fungicides has created different health hazards like gastroenteritis, liver damage, peptic ulcer and intestinal cancer etc. This has

seriously attracted attention of world people to think alternatives of these chemicals which will be proved a safeguard in protecting the health of people. In this context scientists from different corners of the world are thinking about the chemicals obtained from the herbal source because they become less or nontoxic both for host plants and human beings who consume their products.

Considering the above facts some medicinal plants were tested for their antifungal properties and it has been found that they act in the same way like fungicides which are commercially available in the market.

Plants of Interest: In this experiment four important medicinal plants were selected and they are: *Thevetia peruviana*, *Eclipta alba*, *Ocimum sanctum* and *Vetiver*.

MATERIAL AND METHODS

Formation of plant extracts

At first the chopped leaves of all the four medicinal plants were washed carefully with tap water and then with the distilled water. Now they were dried inside thermostat incubator at 80°C at the room temperature about 26-28°C for four days. Now the dried leaves were crushed with mortar and pestle till fine powder. Now they were dissolved in distilled water and filtered with fine muslin cloth. Now the filtered liquid was taken inside bolted centrifuge tubes and centrifuged with centrifuge machine of 5000rpm speed for 10 minutes. The supernatant of the mixture was separated and collected in a separate tube for antifungal test. This is the

standard extract which will be used for test pathogens for antifungal test.

Antifungal test: For this test at first four conical funnels of 250ml volume were taken and washed with distilled water. They were dried and sterilized. Now Richards solid media were taken into it and mixed with the fixed concentration of standard plant extract to poison the food for pathogens. They were shaken well and poured into sterilized petriplates and freed to solidify. When culture media get solidified in petriplates then 2mm of source of

inoculum from 7 days old petriplates grown on PDA media were lifted and were placed in the centre of petriplates. Inoculation was made carefully in sterilized environment over a flame of spirit lamp. Now each petriplates containing the test pathogens were packed tightly with rubber bands and kept in a BOD incubator for growth. After seven days the inoculated petriplates were monitored and mycelium diameter of fungus was measured in mm and presented in table. For this the triplicate series were maintained.

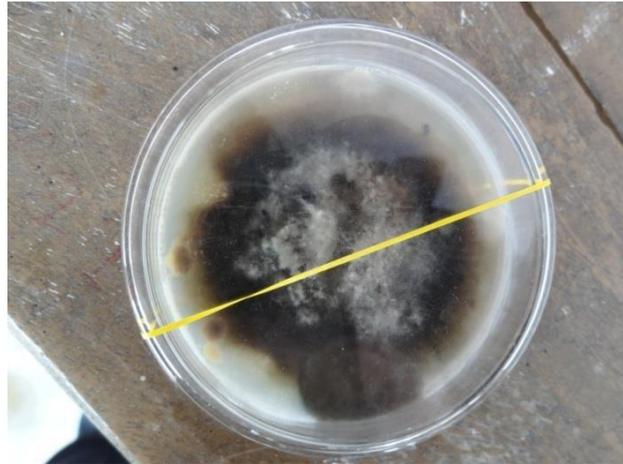
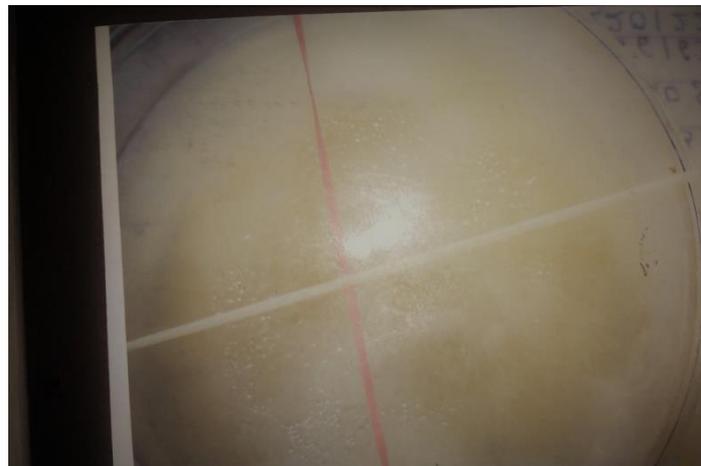


Plate - *Alternaria* in culture condition.



Petriplate after treatment.

Table 1: Mycelial growth of different fungi treated with extract of *Thevetia peruviana*.

S.N.	volume	<i>A.alternata</i>	<i>R. solani</i>	<i>F. oxysporum</i>	<i>Cladosporium</i>
		Mycelium	mycelium	Mycelium	mycelium
1	5ml	12mm	11mm	22mm	15mm
2	10ml	3mm	8mm	32mm	11mm
3	15ml	--	2mm	48mm	6mm
4	control	32mm	42mm	38mm	36mm

Cd5%=0.153

Cv1%=0.858

Table 2: Mycelium growth of different fungi treated with the extract of *Eclipta alba*.

S.N.	volume	<i>A. alternata</i> Mycelium	<i>R. solani</i> Mycelium	<i>F. oxysporum</i> Mycelium	<i>Cladosporium</i> Mycelium
1	5ml	10mm	15mm	20mm	12mm
2	10ml	3mm	10mm	18mm	8mm
3	15ml	-----	3mm	11mm	5mm
4	control	25mm	35mm	40mm	28mm

Cd5%= 0.146

Cv1%=0.870

Table 3: Mycelium growth of different fungi treated with the extract of *Ocimum sanctum*.

S. N.	Volume	<i>A. alternata</i> Mycelium	<i>R. solani</i> Mycelium	<i>F. oxysporum</i> Mycelium	<i>Cladosporium</i> Mycelium
1	5ml	15mm	18mm	8mm	12mm
2	10ml	12mm	15mm	6mm	10mm
3	15ml	8mm	16mm	2.5mm	6mm
4	Control	28mm	22mm	40mm	35mm

Cd5%= 0.176

Cv1%= 0.817

Table 4: Mycelium growth of different fungi treated with the extract of *Vetiver*.

S. N.	Volume	<i>A.alternata</i> Mycelium	<i>R. solani</i> Mycelium	<i>F. oxysporum</i> Mycelium	<i>Cladosporium</i> Mycelium
1	5ml	8mm	11mm	14mm	16mm
2	10ml	7.6mm	6,5mm	11,6mm	8.5mm
3	15ml	3mm	6mm	8mm	9mm
4	Control	28mm	32mm	38mm	35mm

Cd5%= 0.159

Cv1%= 0.886

RESULT AND DISCUSSION

From the different tables presented above it is clear that almost all medicinal plants have antifungal properties. More or less all have shown their antifungal efficacy. It has been also observed that some plants have special efficacy in controlling specific type of fungus. For example *Thevetia peruviana* has shown more potent action against *A. alternata* prevalent on Makhana plants but medium effect for *F. Oxysporum*. Similarly *O. Sanctum* has shown more efficacy for *F. Oxysporum* and *Cladosporium* but less effects for *A. alternata*. *Vetiver* has been found effective against all kinds of pathogens. This result justifies the result of Shrivastava and Lal (1997) while working on biofungicidal properties of leaf extract of some plants. They found the leaf extract of *Calotropis procera*, *Lantena camara*, *Ocimum basilicum* and *Azadirachta indica* stopped the mycelia growth of *Curvularia tuberculata* and *Alternaria alternata*. They also reported the maximum toxicity against spore germination. Further this result Justifies the result of Bansal and Gupta (2000) who evaluated some plant extract against *Fusarium oxysporum*, a Wilt pathogen of Fenugreek. They have reported the inhibition of growth and sporulation by the extract of *Calotropis procera*, *Atropa belladonna*, *Azadirachta indica* and *Lantena camara*. This research is in accordance with the findings of Zewain et al (2004) who

studied the effect of fungicides and Neem extract on the mycelial growth of *Sclerotinia sclerotiorum* and reported the mycelial growth only 2mm in length.

CONCLUSION

From research it can be concluded that the nature has provided a lot of facilities to man for their protection but there is need of proper search and investigation. Medicinal plants grow in nature and contain a lot of chemical constituents which can be applied to treat the infected plants. These chemicals do in the same way like commercial fungicides. As we know that these commercial chemicals by no means are useful for the health of mankind but we are applying these chemicals on our infected crops. Finally we engulf the produce of these crops loaded with these chemicals and get result in the form of different health disorders. If such type of research work is carried out and eco-friendly chemicals will be found out then our infected crops will be treated with these beneficial chemicals which at any doge will be no harmful for our health. In this way we will provide some beneficial aspects to the suffering society. In this way we will be successful for producing makhana crops without any harmful fungicides and pesticides. Doing so our crop will be tested healthy for global trades and our farmers will get more money in results.

ACKNOWLEDGEMENT

Thanks goes to the principal M.L.S.M. College, Darbhanga for providing the lab facilities to carry on this research work. I am grateful to the statistic department, RAU, Pusa for finding the statistical data of the research findings.

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