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Invitro Screening of Selected Plant Extracts on Germination of Spores of *Helminthosporium sativum*

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ABSTRACT

*In-vitro screening of ten selected plant extracts for antifungal activity against spore germination of *Helminthosporium sativum*, which causes leaf blight in Wheat. A study was undertaken to explore the effect of ten selected plant extracts against spore germination of *Helminthosporium sativum*. In-vitro study was done on effect of plant extracts on germination of spore. Inhibition of spore germination of *Helminthosporium sativum* seen at 10% concentration of leaf extract of some selected plants. Based on the study, it was concluded that some plant extracts and plant products have potential for the control of phytopathogenic fungi because fungal spores are main disease inciting agents .*

Introduction :

The use of synthetic fungicides in plant disease management, no doubt increases the yield of crop but has too hazardous effect on environment and human beings. The excessive and continuous use of synthetic fungicides in disease management induces problems with development of resistance in pathogen against synthetic fungicides. The use of synthetic fungicides causes air, water and soil pollution, which is harmful to human being and useful micro product of soil including other non-pathogenic living organisms. By considering these drawbacks, the use of natural plant products in plant disease



management came into light from last century throughout to world including India, the work on this aspect started in laboratory and at the field level. India the significant work done on use of neem, karanja, Aloe in plant disease management.

MATERIAL AND METHODS :

Plant materials used in testing are collected from local area and ground completely and filtered twice through Whatman filter paper. The plant product Neemarc also used for the study. Plant extract and plant products were tested at 10 % concentration for antifungal activity. Spore suspension of selected fungi was made by adding distilled water into the petri-dishes which were kept for three weeks after inoculation at the temp. 27 °c. the concentration of selected spores was 10 mL measured by Hemacytometer (Hausser scientific, Hosham PA USA). Plant extract of selected plant dropped on slides by micropipette with 20uL of spore suspension of selected fungi and 20 mL of each one of extracts. Each treatment contained three replication. The slides were put into a plastic box with wet paper underneath in order to keep saturated humidity inside the box. The box was put into refrigerator at 4 c for 20 minutes and then into incubator for 24 hrs at 27 ° c. The germination rates of spores of selected fungi were count under the microscope. Result was mentioned in following table.

Effect of Extract of Ten Selected Plants on Spore Germination of *Helminthosporium sativum*

S.No.	Plant Species	Comparison	% inhibition
1	Acalypha indica	A	7.12
2	Adhatoda Vasica	B	73.05
3	Allium sativum	C	70.00
4	Azadirachta indica	D	78.80
5	Calotropis gigantea	E	76.50
6	Catharanthus roseus	F	28.42
7	Lowsonia inermis	G	72.50
8	Pongamia glabra	H	73.40
9	Vitex negundo	I	65.80
10	Lantana camara	J	6.05
11	Dithane M-45 (0.25%)		95.80



RESULTS :

The results of the present study regarding effect of ten selected plant extract and Neemarc as plant products deals with in vitro study of effect of plant extracts and plant products on germination of spores of *H. sativum*.

The effect of plant extract and plant products on germination of spores of selected fungi reveals that, the plant extract of *A. indica*, *A. vasica*, *A. sativum*, *C. gigantia*, *L. inermis*, *P. galbabara* shows strong inhibitory effect on germination of spores of *H. sativum*, which causes leaf blight in Wheat. The Neem seed oil and Neemarc, shows strong inhibitory effect on germination of spores of *H. sativum* than the leaf extract of selected plants, at low concentration

DISCUSSION AND CONCLUSION :

In modern agriculture, for crop plant disease control, different types of synthetic toxic chemicals are used, which causes harmful hazards on ecosystem and on human life. To find alternatives to synthetic chemicals, from last two decades many investigators in the field of plant pathology try to investigate natural plant products, which are eco-friendly and low cost.

In the present investigation of effect of plant extracts on spore germination of *H. sativum*, the in vitro study shows that plant extract of *A. indica*, *A. vasica*, *A. sativum*, *C. gigantia*, *L. inermis*, *P. galbabara* and Neemarc shows positive effect on spore germination of *Helminthosporium sativum*, which causes leaf blight diseases in Wheat.

Pandey V. N. And A. K. Srivastava (1995) recorded that, the growth of *Aspergillus*, *Penicillium* and *Paecilomyces* inhibited by oils obtained from *Cinnamomum cassia* and *Trachyspermum ammi*. Dr. V. Mariappan (1995) from Tamil Nadu Agricultural university Coimbatore, recorded positive efficiency of neem extract and neem products on growth of *Pyricularia oryzae*, *Rhizoctonia solani*, *Helminthosporium oryzae*, *Cercospora personata* and *Cercospora arachidicola*.

The same type of results are also confirmed by Herger et al (1988) i.e use of plant extract of Reynoutria and Olive oil for the control of powdery mildew of squash.



The same results are also recorded by Haberic and Schlossor in 1993.

Clydette M Alsup (2004) done screening for active ingredient in plant extract that inhibit the growth of *A. tumefaciens* and concluded that the ingredient of *A. indica*, Jojoba oil, Cinnamon oil, Soyabin oil and Garlic can show antimicrobial activity against *Agrobacterium tumefaciens*, which causes crown galls in woody plants.

H. Ramezani, H. P. Singh, D. R. Batish, R. K. Kohli and J. S. Dargan in 2002 confirm the effect of volatile oils of *Eucalyptus citriodora* against two well-known rice pathogens, *Rhizoctonia solani* and *Helminthosporium oryzae*. They concluded that, complete inhibition of *R. solani* and *H. oryzae* was observed at 10 and 20 ppm concentration and from this study they also concluded that Eucalypt volatile oils have potential for the suppression of phytopathogenic fungi.

P. B. Bhende and V.V. Deshmukh (2003) recorded in-vitro effect of leaf extract of Ashok and Kawach against *Alternaria alternata* which causes leaf spot diseases in sunflower and concluded that 70.98% of Kawach leaf extract inhibit growth of *Alternaria alternata* and 49.11% leaf extract of Ashok inhibit growth of *Alternaria alternata*.

Srinivas T, Rao K. C., Chattopadhyay C. (1997) confirm the effect of plant extracts on the management of blight of sunflower caused by *Alternaria alternata*.

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