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In-vitro Evaluation of Botanicals against *A. brassicae* Causing Alternaria Blight of Mustard

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ABSTRACT

Extract of all thirteen botanicals significantly inhibited mycelia growth in comparison to control against Alternaria brassicae at both the date. Among the extract Allium sativum (Bulb), Nicotiana tabacum L., Eucalyptus globules L., Parthenium hysterophorus L.are inhibiting mycelial growth at both dates of observation .It also resulted 100% reduction growth in Datura alba and were significantly superior to all other tested extracts Curcuma longa and Azadirachata indica inhibited growth followed by Lawsonia inermis and Lantana camara over control.

Key words: *Indian Mustard, Alternaria brassicae, Botanicals.*

INTRODUCTION

Rapeseed-mustard is the major oilseed crop of Madhya Pradesh .Major rapeseed mustard growing state are Madhya Pradesh, Rajasthan, Gujarat, Maharashtra, Karnataka and Andhra Pradesh. M.Prank 4th in area 8.00 lakh ha with 11.40 MT production and 1425 Kg/ha productivity. Alternaria blight play a prominent role in reducing the yield of rapseed mustard. Alternaria is most necrotrophic fungus, occurs in seed and responsible for causing disease[5]. Alternaria leaf blight of mustard is a serious disease in India[1,4]. In recent years, an increasing consciousness about environmental pollution due to used of fungicides, chemical-resistant strain in plant pathogen has challenged to the plant pathologist to searching for non toxic fungicides or botanicals against Alternaria blight of mustard.

MATERIALS AND METHODS

The experiment was laid out in a complete randomized design (CRD) with fourteen treatments including untreated control and replicated thrice. The botanicals were evaluated through Poisoned food techniques[6].

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For evaluation of plant extract, the leaves, rhizome and bulb were collected and washed with sterilized distilled water and air dried at room temperature, crushed and suspended in 80% ethanol and filtered after one hour through Whatman No.1 filter paper. These were evaporated to dryness on a water bath (40 ± 20C), on cooling, their aqueous suspension was prepared in the ratio of 1:1 (W/V) by sterilized distilled water. The extract of 10ml of each was taken from each botanicals and was poured in 90 ml luke warm PDA in 250 ml conical flask. For the plant extract of 5 mm mycelia disc was placed at the center. Suitable check was maintained without addition of plant extracts. Seven days old culture 5mm disc mycelia disc of *Alternaria brassicae* was placed in the centre of Petriplates and incubated at 24 ± 20C.

RESULTS

There are 13 botanicals were evaluated in the form of crude extract @10% against *A. brassicae* under *In-vitro* condition. The fungal mycelia growth was recorded at 3,5 and 7 days after inoculation and the data is summarized in **table–1.** The data indicate that all the botanicals were significantly superior over control. At 7 days after inoculation *A. sativum*, *Eucalyptus procera*, *Parthenium hysterporus* and *Tobacoo nicotiana* was absolutely checked the mycelium growth (0.00 mm) followed by *Datura alba* (10.00 mm), *Zingiber officinale* (31.83 mm), *Curcuma longa* (36.66 mm), *Calotropis procera* (37.66), *Lwasonia inermis*(38.33), Piper *nigrum* and *Ocimum* sanctum (46.66 mm),Azadirachta indica (53,33 mm) and *Lantana camera* (58.33 mm) while a maximum of (90.00mmm) growth was recorded in control.

Standardization of concentration of effective botanicals against *Alternaria brassicae*

The data summarized in the **table-2** clearly shows that all the tested botanical *viz*, *Allium sativum*, *Eucalyptus procera*, *Parthenium hysterporus* and *Tobacoo nicotiana* significantly inhibited the growth of *A. brassicae* in all the tested concentrations *viz*, 7, 5, and 3 percent,.*Allium sativum* have present *(*Allicin, di-allyl di sulphide) chemical ingredient that having the property to inhibited the mycelium radial growth and of *A. brassicaein-vitro.*The maximum inhibition was recorded in *A. sativum* crude extract followed by *A. indica*,*E. amyladin* and *O. sanctum* At 5 concentration the minimum growth (0.00mm) was recorded in *A. sativum* crude and *Tobacco nicotiana* extract followed by *E. procera* ((11.66mm) and *Parthenium hysterophorus* (18.33 mm) ,while maximum of (85.33 mm) growth was recorded in control. At 3 % concentration the mycelial growth was also absolutely checked by *A. sativum* and *Tobacco nicotiana* extract followed by *E. procera* (20.00 mm) and *Parthenium hysterophorus* (25.0 mm). In all the three concentrations, the garlic and tobacco leaves crude extract was significantly superior over other extract at 7,5 and 3 percent concentration.

Table 1: Evaluation of botanicals against Alternaria brassicae in in vitro condition

S.No	Name of botanicals	Mycelial growth (mm)			Mean	% inhibition			Mean
		3 DAS	5 DAS	7 DAS		3 DAS	5 DAS	7 DAS	
1	*Ginger officinalis*	10.4	22.43	31.83	**21.55**	65.78	56.58	64.63	**62.33**
2	*Lawsonia inermis*	15.26	28.7	38.33	**27.43**	49.8	44.44	57.41	**50.55**
3	*Curcuma longa*	6.96	21.23	36.66	**21.61**	77.1	58.9	59.26	**65.08**
4	*Allium sativum*	0	0	0	**0**	100	100	100	**100**
5	*Eucalyptus globules*	0	0	0	**0**	100	100	100	**100**
6	*Piper nigrum*	20.66	26.83	46.66	**31.38**	32.4	48.06	48.15	**42.87**
7	*Datura alba*	0	5.16	10	**5.053**	100	90.01	88.88	**92.96**
8	*Calotropis procerea*	11.86	23.33	37.66	**24.28**	60.98	54.83	58.15	**57.98**
9	*Parthenium hysterophorus*	0	0	0	**0**	100	100	100	**100**
10	*Ocimum sanctum*	10.46	30.83	46.66	**29.31**	65.59	40.32	48.15	**51.35**
11	*Lantana camara*	26.66	40.16	58.33	**41.71**	12.3	22.26	35.18	**23.24**
12	*Nicotiana tabacum*	0	0	0	**0**	100	100	100	**100**
13	*Azadirachta indica*	10.5	21.53	53.33	**28.45**	66.33	58.32	40.74	**55.13**
14	Control	30.4	51.66	90	**57.35**				
	Sem±	**1.25**	**1.21**	**1.32**					
	CD at 5%	**3.64**	**3.59**	**3.86**					

Table 2: Standardization of botanicals against *Alternaria brassicae*

S.No	Name of botanicals	Mycelial growth (mm)			Mean	% inhibition			Mean
		7 %	5%	3%		8%	5 %	3 %	
1	*Allium sativum,*	0.00	0.00	0.00	**0.00**	100.0	100.0	100.0	**100.0**
2	*Eucalyptus globules*	0.00	11.66	20.00	**18.32**	100.0	85.42	75.0	**86.80**
3	*Parthenium hysterophorus*	6.66	18.33	25.0	**16.64**	91.67	77.08	75.0	**81.25**
4	*Nicotiana tabacum*	0.00	0.00	0.00	**0.00**	100.0	100.0	100.0	**100.0**
5	**Control**	**80**	**80**	**80**	**80**				
	Sem±	**0.833**	**1.179**	**0.670**					
	CD at 5%	**2.760**	**3.903**	**2.710**					

DISCUSSION

Extract of all thirteen botanicals significantly inhibited mycelia growth in comparison to control against *Alternaria brassicae* at both the date**.** Among the extract *Allium sativum* (Bulb), *Nicotiana tabacum* L., *Eucalyptus globules* L., *Parthenium hysterophorus* L.are inhibiting mycelial growth at both dates of observation .It also resulted 100% reduction growth in *Datura alba* and were significantly superior to all other tested extracts *Curcuma longa* and *Azadirachata indica* inhibited growth followed by *Lawsonia inermis* and *Lantana camara* over control .The present investigation of various botanicals inhibiting the growth of *Alternaria brassicae.* Kavita *et al*. (2013) Among the 46 plant extract 10 per cent the minimum growth was recorded in *Cyperus rotundus* followed by *Piper nigrum*, *Eucalyptus*, *Datura stramonium* and *Chenopodium album*. *Piper nigrum* L. was significantly superior under other botanical extract. Extract of five plants viz., *Azadirachta indica*, *Ocimum sanctum*, *Eucalyptus globules* and *Calotropis procera* were evaluated *in Vitro* against *Alternaria brassicae. O. sanctum* was found most efficacious with growth inhibition of (31.85%) followed by *E. globulus* (28.97%) [2].

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REFERENCES

1. Chahal, A.S., Losses and chemical control of Alternaria blight in rapeseed and mustard in Punjab. Plant Dis. Res. **1:** 46-50 (1986).
2. Ganie, S. A., Pant, V. R., Ghani, M. Y., Hussain, Lone, Ashiq, Qaisar, Anjum and Razv, S. M., In vitro evaluation of plant extracts against *Alternaria brassicae* (Berk.) Sacc. causing leaf spot of mustard and *Fusarium oxysporum* f. sp. *lycopersici* causing wilt of tomato. *Academic Journals* **8(37):** pp. 1808-1811 (2013).
3. Kavita and Dalbeer, Efficacy of Different Botanicals Against *Alternaria brassicae* in in vitro Condition. *International Journal of Science and Research* (IJSR) ISSN (Online): 2319-7064 (2013).
4. Kolte, S.J., Diseases of Annual Edible Oil Seed Crops. **2:** CRC Press, Inc. (1985).
5. Mehrotra, R.S. and Aneja, K.R., An introduction to Mycology. New Age International (P) Ltd., New Delhi, pp. 594-610 (2003).
6. Nene, Y.L., Thapliyal, P.N., Fungicides in Plant Disease Control. III edition. Oxford and IBH Publishing Company, New Delhi, India, pp 531-532 (1993).