



**EFFICACY OF PHYTOEXTRACTS ON *MACROPHOMINA PHASEOLINA* (TASSI) GOID
CAUSING LEAF BLIGHT OF GREEN GRAM**

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ABSTRACT

The phytoextracts of eleven plant species evaluated *in vitro* against *M. phaseolina* revealed that the extract of onion bulb produced maximum inhibition (98.14%) followed by extract of acacia, ginger, neem, garlic and karanj. The sclerotial formation was also not taken place in all these phytoextracts.

KEY WORDS

Efficacy, Phytoextracts, leaf blight and green gram

INTRODUCTION

Leaf blight caused by *Macrophomina phaseolina* (Tassi) Goid) in green gram was found in serious proportion threatening its successful cultivation in South Gujarat area. Considering the seriousness of the problem, investigation was carried out to find out the suitable control measures for the disease. For this purpose eleven phytoextracts were tested *in vitro* to know their inhibitory effect on the growth of *Macrophomina phaseolina* (Tassi) Goid). Phytoextracts possess the great potentialities being used as botanical fungicide without any adverse effect on the environment for the management of plant disease. Earlier

workers have reported the effect of plant extracts of various plant species to inhibit the growth of *M. phaseolina in vitro*. (Upadhyay and Gupta 1990; Dubey and Dwivedi 1991). Hence, phytoextracts are considered as good alternative for the management of such disease.

MATERIAL AND METHODS

The effect of plant extracts of various plant species were tested *in vitro* by poisoned food technique to know their inhibitory effect on the growth of *M. phaseolina*. Healthy fresh leaves, bulbs and rhizomes were taken, washed thoroughly with fresh water and finally rinsed with

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sterile distilled water. Fifty gram of either leaves or bulbs or rhizomes were cut into small pieces and mixed in a grinder by adding 50 ml distilled sterile water. Extracts thus obtained were filtered through double layered muslin cloth in 150 ml flasks and plugged. The extracts then autoclaved at pressure 1.2 kg cm⁻² for 20 minutes. Potato Dextrose Agar (PDA) medium was prepared and 100 ml was taken in 150 ml conical flasks, plugged and sterilized at 1.2 kg cm⁻² for 20 minutes. The autoclaved extracts were individually added in melted, cooled and sterilized PDA @ 10 percent v/v at the time of pouring in the petriplates containing phytoextracts were incubated at room temperature after placing the 5 mm disc of actively growing 5 days old pure culture of *M. phaseolina*. Three repetitions were made

for each treatment. Medium without phytoextracts served as control. The observations on colony diameter were recorded and statistically analysed and per cent growth inhibition was also worked out. The sclerotial formation was recorded on the basis of following scores:

Sclerotial formation

No. of sclerotia per microscopic field

-	No sclerotial formation	
-		
+	low level (10-20)	
++	(21-30)	Medium level
+++	(more than 30)	High level

RESULTS AND DISCUSSION

The results presented in Table 1 revealed that all the plant extracts tried significantly inhibited the growth of the fungus as compared to the control. The extract of onion bulb (*Allium cepa* L.) proved significantly superior in checking the fungal growth over the rest (98.14%). The next best in order of merit was acacia (*Acacia nilotica* L.) (82.97%). The extracts of ginger (*Zingiber officinalis* L.) (44.44%), neem (*Azadirachta indica* L.) (39.63%), garlic (*Allium sativum* L.) (33.33%), Karanj (*Pongamia glabra* L.) (31.11%) and Nilgiri (*Eucalyptus citridora*

Hook) (28.14%) were moderately effective against the pathogen. Tulsi (*Ocimum sanctum* L.), bougainvillea (*Bougainvillea spectabilis* L.), datura (*Datura stramonium* L.) and Gando baval (*Prosopis juliflora* L.) were comparatively less effective. There was no sclerotial formation observed in onion, acacia, garlic, ginger and Karanj. The sclerotial formation was low in neem, tulsi, Nilgiri and bougainvillea while medium in gando baval and datura. The results indicated that the extract of onion bulb gave maximum inhibition followed by extract of acacia and the sclerotial formation was not observed in onion, acacia, garlic, ginger and



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Karanj, Upadhyay and Gupta (1990) observed antifungal activities of *A. sativum*, *O. sanctum* and *D. alba* on mycelial growth and spore germination of *M. phaseolina*. Dubey and Dwivedi (1991) reported that Onion bulb and *Acacia arabica* leaf extracts completely checked the mycelial growth of *M. phaseolina*. Thiribhuvanmala and Narasinmhan (1998) showed that the leaf extracts from *Delonix regia*, *Pongamia glabra* and *Acacia nilotica* significantly inhibited

the mycelial growth of *M. phaseolina*. Sindhan *et al.* (1999) reported that leaf extract of neem, mint, eucalyptus, tulsi, datura, bougainvillea, ginger, garlic and onion inhibited the mycelial growth of *M. phaseolina*. The effective phytoextracts viz., onion, acacia, ginger, neem, garlic and Karanj reported here suggests the possible alternative of hazardous chemicals which requires detail investigation for their active principle and field efficacy.



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Table-1

Effect of various phytoextracts on the growth and sclerotial formation of M. phaseolina in vitro

Sr. No.	Local name of plants	Botanical name	Average colony dia. of pathogen (mm)	Growth inhibition (%)	Sclerotial formation
1	Onion	<i>Allium cepa</i> L.	1.67	98.14	-
2	Acacia	<i>Acacia nilotica</i> L.	15.33	82.97	-
3	Ginger	<i>Zingiber officinalis</i> L.	50.00	44.44	-
4	Neem	<i>Azadirachta indica</i> L.	54.33	39.63	+
5	Garlic	<i>Allium sativum</i> L.	60.00	33.33	-
6	Karanj	<i>Pongamia glabra</i> L.	62.00	31.11	-
7	Nilgiri	<i>Eucalyptus citridora</i> Hook	64.67	28.14	+
8	Tulsi	<i>Ocimum sanctum</i> L.	69.67	22.29	+
9	Bougainvillea	<i>Bougainvillea spectabilis</i> L.	78.67	12.59	+
10	Datura	<i>Datura stramonium</i> L.	79.33	11.86	++
11	Gandobaval	<i>Prosopis juliflora</i> L.	84.00	6.67	++
12	Control	-	90.00	-	+++
		S.Em. ±	1.41		
		C.D. at 5 %	4.16		
		C.V. %	4.15		

REFERENCES

1. Dubey, R.C. and Dwivedi, R.S. (1991). Fungitoxic properties of some plant extracts against vegetative growth and sclerotial viability of *Macrophomina phaseolina*. *Indian Phytopath.*, **44**(3): 411-413.
2. Sindhan, G.S.; Hooda, I. and Prashar, R.D. (1999). Effect of some plant extracts on the vegetative growth of root rot causing fungi. *J. Mycol. Pl. Pathol.*, **29**(1): 110-111.
3. Thiribhuvanmala, G. and Narasimhan, V. (1998). Efficacy of plant extracts on seed borne pathogens of sunflower.



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Madras Agricultural Journal, **85**(5-6):
227-230.

4. Upadhyay, M.L. and Gupta, R.C. (1990).
Effect of extracts of some medicinal
plants on the growth of *Curvularia*
lunata. *Indian Journal Mycol. Pl. Pathol.*,
20(2): 144-145.