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Short Note

Evaluation of Botanicals against *Phoma tropica* Causing Leaf Spot Disease in *Lablab purpureus*

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The aqueous phytoextracts of commonly available seventeen plant species were evaluated *in vitro* by poisoned food technique against their inhibitory effect on the mycelial growth and micro-sclerotial formation in *Phoma tropica*. The extract of Gando baval (*Prosopis juliflora* L.) proved excellent in inhibiting mycelial growth and micro-sclerotial production. Extracts of nilgiri, turmeric, marigold. Pink barmasi, tulsi, ardusi, Jetropha, Bougainvillea, karanj, Lantana, onion, ginger, garlic, Dhatura and neem were found slightly inhibitory.

Key words: *Phoma tropica,* Botanicals, *Lablab purpureus,* Leaf spot.

Indian bean is one of the important pulse cum vegetable crop of India. Leaf spot [*Phoma tropica* Schneider and Boerema] disease of Indian bean has become a major problem in recent past with a threat to successful and profitable cultivation in south Gujarat. The hazardous effects of chemicals used in plant disease management have diverted plant pathologists to find out the alternative methods of plant disease control which may cause little or no adverse effect on environment. Notable success of disease control through use of botanicals in the laboratory, glass house and field have been achieved during past several years. On the basis of this information, there is a possibility of development of biological control for plant diseases through botanical pesticides. Use of botanicals is an ecofriendly way to manage the disease so present work was carried out.

Materials and Methods

Healthy fresh plant parts *i.e.*, leaves, bulbs or rhizomes were washed thoroughly with fresh water and finally rinsed with sterilized distilled water. Fifty gram of plant parts was cut into small pieces and homogenised with the help of a grinder by adding 50 ml sterilized distilled water. The phytoextracts were filtered through double-layered muslin cloth in 150 ml conical flasks and plugged with non-absorbent cotton. These filtered extracts were autoclaved at 1.2 kg cm^{-2} pressure for 20 minutes. Autoclaved extract was individually added into previously sterilized PDA @ 10 per cent (*i.e.* 2 ml extract + 18 ml PDA $plate^{-1}$) and mixed thoroughly at the time of pouring in the previously sterilized petriplates. The petriplates were inoculated aseptically after solidification by placing 5 mm diameter mycelial disc at the centre, cut aseptically with cork borer from 7 days old pure culture of *P. tropica*. Three replications of each treatment were maintained. The plate without phytoextract served as control. The petriplates were incubated at 27 ± 2°C temperature for 5 days.

The observation on radial mycelial growth was recorded by taking the average of two diameters of colony at right angles to one another for each Petriplate in each replication by subtracting 5 mm of the mycelial discs kept at the time of inoculation. The amount inhibition of growth was calculated by using the formula given by Vincent (1927)

$$PI = \frac{100\ (C-T)}{C}$$

Where,

PI = Per cent growth inhibition

C = Average growth diameter of mycelial colony of control set (mm)

T = Average growth diameter of mycelial colony of treated set (mm)

Results and Discussion

The results presented (Table 1.) revealed that the least average colony diameter was recorded in the leaf extracts of Gando baval (*Prosopis juliflora* L.). The next best in order of merit was leaf extracts of nilgiri (*Eucalyptus citriodora* Hook.) followed by turmeric which was on par with marigold. Pink barmasi was at par with tulsi. The remaining phyto extracts exhibited minimum growth inhibition over control.

The leaf extract of Gando baval produced maximum inhibition (49.42%) followed by extracts of nilgiri (46.77%), turmeric (41.82%), marigold (41.44%) pink barmasi (39.53%) and tulsi (38.78%). While extracts of *ardusi, Jatropha, Bougainvillea, karanj, Lantana, kadvi mehandi*, onion, ginger, garlic and Dhatura had moderate inhibitory effect

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Table 1. Effect of botanicals on growth and micro-sclerotial formation in *P.tropica*

Botanicals	Scientific name	Average colony diameter (mm)	Growth inhibition over control (%)	Micro-sclerotial formation
Gando baval	*Prosopis juliflora* L.	6.69 *(44.33)**	49.42	+
Nilgiri	*Eucalyptus citriodora* Hook	6.86 (46.67)	46.77	+
Turmeric	*Curcuma longa* L.	7.17 (51.00)	41.82	+
Marigold	*Tagetes erecta* L.	7.19 (51.33)	41.44	+
Pink barmasi	*Vinca rosea* L.	7.31 (53.00)	39.53	+
Tulsi	*Ocimum sanctum* L.	7.35 (53.67)	38.78	++
Ardusi	*Adhatoda vasica* L.	7.69 (58.66)	33.08	+
Jetropha	*Jatropha curcas* L.	7.75 (59.67)	31.94	+
Bougainvillea	*Bougainvillea glabra* Choisy	7.84 (61.00)	30.41	++
Karanj	*Pongamia glabra* L.	7.90 (62.00)	29.27	++
Lantana	*Lantana camara* L.	7.90 (62.00)	29.27	++
Kadvi mehandi	*Lowsonia inermis* L.	7.90 (62.00)	29.27	++
Onion	*Allium cepa* L.	7.96 (63.00)	28.13	++
Ginger	*Zingiber officinalis* Rosa	8.05 (64.33)	26.61	++
Garlic	*Allium sativum* L.	8.09 (65.00)	25.84	++
Dhatura	*Datura stramoneum* L.	8.23 (67.33)	23.19	++
Neem	*Azadirachta indica* L.	8.80 (77.00)	12.16	++
Control (PDA only)		9.38 (87.67)		+++
	S.Em. ±	0.04		
	C.D. at 5 %	0.11		
	C.V. %	0.90		

*Figures indicate SQR + 0.5 transformed values, **Figures in parentheses indicate retransformed values, Microsclerotial formation (no. of microsclerotia per low power (10X) microscopic field), + Low (10-20), ++ Medium (21-30), +++ High (more than 30)

and neem was least effective. The micro-sclerotial formation was more in PDA plate without phytoextract while it was moderate in *tulsi*, *Bougainvillea*, *karanj*, Lantana, *kadvi mehandi*, onion, ginger, garlic, neem and Dhatura. Micro-sclerotial formations were least in *ardusi*, Jatropha, *Gando baval, nilgiri,* turmeric, marigold and pink barmasi.

Thus, leaf extract of Gando baval showed significantly maximum inhibitory effect. The next best were nilgiri followed by turmeric, marigold, pink barmasi and tulsi (38.78%) while extracts of ardusi, Jetropha, Bougainvillea, karanj, Lantana, kadvi mehandi, onion, ginger, garlic, Dhatura and neem also recorded inhibition of *P. tropica* to some extent.

Ezhilan *et al.* (1993) recorded maximum inhibition of micro-sclerotial germination of *Rhizoctonia solani,* causal agent of sheath blight of rice with *T. peruviana* (31.7%) followed by *P. juliflora* (39.7%) and *E. globulus* (40.3 %). Both hot and cold water extracts of all the treatments significantly inhibited the mycelial growth of *Macrophornia phaseolina* and garlic proved to be the most effective remaining at par with carbendazim (Raza and Kurucheve 1998). Sindhan *et al*. (1999) studied the efficacy of different leaf extracts at 5, 10 and 20 % concentrations against *Rhizoctonia solani* and *M. phaseolina* and reported extracts of onion, ginger and garlic to be more inhibitory to the mycelial growth of pathogen at all the concentrations.

The effective phytoextracts *viz.*, *Gando baval*, nilgiri, turmeric and marigold reported here suggests the possible alternative to over come the hazardous effect of chemicals which requires detail investigation for their active principle involved for inhibitory effect and testing at different concentrations in the field against *Phoma tropica* leaf spot disease in Indian bean (*Lablab purpureus*).

The extract of *Gando baval* (*Prosopis juliflora* L.) proved superior in inhibiting mycelial growth and microsclerotial formation followed by *nilgiri* (*Eucalyptus citriodora* Hook), turmeric (*Curcuma longa* L.) and marigold (*Tagetes erecta* L.) against *Phoma tropica* in *in vitro* causing leaf spot disease in Indian bean (*Lablab purpureus*).

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