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Full Length Article

Effect of *Hyptis Suaveolens* (L.) Poit. and *Eupatorium Odoratum* L. Leaf Extracts on Seed Mycoflora of Legume Plants

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ABSTRACT

Seeds are associated with microorganisms which cause an effect on germination. Aqueous leaf extracts of two weed species *viz. Hyptis suaveolens* and *Eupatorium odoratum* were assessed on seeds of *Cicer arietinum* and *Cajanus cajan.* The percentage of infected seeds was recorded after eight days. Six fungal species *viz Alternaria alternata, Aspergillus niger, Aspergillus flavus, Fusarium oxysporum, Rhizopus nigricans and Cladosporium herbarum* were isolated from untreated seeds. Increase in concentration of plant extracts and the soaking period decreases seed mycoflora. *Eupatorium odoratum* extract was more effective than *Hypties suaveolens.*

Key word: Leaf extract, seed treatment, mycoflora.

INTRODUCTION

Pulses have special significance in the dietary of the predominantly vegetarian population of India as they contain more protein. *Cicer arietinum* and *Cajanus cajan* are one of the important pulse crops in India. The fungi associated with the seeds bring about several undesirable changes, making them unfit for consumption (Bhikane 1988). According to (Nath *et al.,* 1970) (Deo and Gupta, 1980) seeds are surrounded with saprophytic or parasitic microorganisms which may flourish in favourable conditions. Therefore, seeds must be free from inoculum with high level of germination and purity before sowing.

Hyptis suaveolens of family Lamiaceae has naturalized in India and considered as potent invader. *Hyptis suaveolens* shows mycotoxic activity against fungus *Candida albicans* (Olayinka *et al.* 1999). *Eupatorium odoratum* is a shrub of the family Asteraceae distributed all over tropical Asia.

Since the last few decades the reckless use of non- target pesticide has been resulted in the loss of biodiversity and distributed our ecosystem. In nature various types of weeds are available and some of them show pesticidal activity. Such pesticides are easily biodegradable and can be locally produced for farmers who cannot afford expensive synthetic pesticides. (Rathod *et al*., 2012) studied seed borne mycoflora of different varieties of ground nut..Effect of extracts of various plant parts on seed mycoflora and seed germination of solanum xanthocarpum was studied (Telang and Baig, 2011). Effectiveness of plant extracts in controlling wilt pathogen of chrysanthemum (Singh and Kumar, 2011). In the present investigation antifungal activity of *Hyptis suaveolens* and *Eupatorium odoratum* leaf extracts is studied on seed mycoflora of legume plants

MATERIALS AND METHODS

Collection of plant material

Fresh leaves of *Hypties suaveolens* and *Eupatorium odoratum* were collected from agriculture fields around the college campus and washed with tap water to remove soil particles. The leaves were shade dried for 10 days. Dried leaves were powered with the help of grinder and stored in polythene bag.

Table: 1 Effect of leaf extracts on seed mycoflora of *Cicer arietinum.*

Name of the plant	Treatments	Soaking period in Hr.	% infected seeds	Fungi isolated from seeds					
				Alternaria alternata	*Aspergillus flavus*	*Aspergillus. niger*	*Cladosporium herbarum*	*Fusarium oxysporum*	*Rhizopus nigricans*
Control	D.W.	2	60	+++	+++	+++	++	++	++
		4	65	+++	+++	+++	++	++	++
		6	70	+++	++	++	++	++	+++
Hyptis suaveolens	5%	2	45	++	++	++	++	++	++
		4	42	++	++	++	+	++	+
		6	40	++	++	++	+	+	++
	10%	2	41	++	++	++	+	+	+
		4	38	+	++	++	+	+	+
		6	35	+	++	++	+	+	+
	15%	2	35	+	++	++	+	+	+
		4	34	+	++	++	+	+	+
		6	33	+	++	++	-	+	+
Eupatorium odaratium	5%	2	28	+	++	++	-	+	+
		4	26	+	++	++	-	+	+
		6	24	-	++	++	-	++	++
	10%	2	22	-	+	+	-	+	+
		4	20	-	++	++	-	++	-
		6	19	-	+	+	-	+	-
	15%	2	18	-	++	++	-	-	-
		4	16	-	+	+	-	-	-
		6	15	-	+	+	-	-	-

(+++) = Severe incidence, **(++) =** Moderate incidence, **(+) =** Low incidence, (-) = No incidence.

Preparation of aqueous extract

Three concentrations viz, 5, 10 and 15 % were prepared by weighing 5, 10, and 15g dry leaf powder respectively, and soaked in 100 ml distilled water for 24 hrs. After soaking the extract was filtered through a double layered muslin cloth and the supernatant used as aqueous extract.

Assessment of seed mycoflora

Seeds of *Cajanus cajan* (Var. ICPL 87) and *Cicer arietinum* (Var. Vijay) were collected from Agricultural Research Institute Karad, during kharif 2013 and analysed for seed mycoflora by employing a standard blotters technique as the international seed testing rules ISTA, (1976). Three hundred sixty seeds of each sample were placed on moist blotters, placed in sterile petri plates of 90 mm diameter. The seeds of *Cajanus cajan* (pigeon pea) and *Cicer arietinum* (Chickpea) were soaked in 5, 10 and 15% aqueous extract for 2, 4 and 6 hours at room temperature. The seeds soaked in distilled water served as control. After eight days incubation, seed mycoflora was recorded by observing fungal growth on seeds with the help of stereo binocular microscope. Further the species were confirmed by conidial structure. Percentage frequency of occurrence was calculated by applying the following formula.

$$\text{Frequency of occurrence (\%)} = \frac{\text{No. of seeds on which fungus appears}}{\text{Total No. of seeds}} \times 100$$

RESULTS AND DISCUSSION

The data compiled in table 1 shows the effect of *Hypties suaveolens* and *Eupatorium odoratum* extracts on seed mycoflora of *Cicer arietinum*. It is observed that, the treatment of *Hypties suaveolens* and Eupatorium *odoratum* increased up to 5 - 15% and fungal incidence get decreased. The treatment with 15% leaf extract of *Hypties suaveolens* at 6 hours soaking period reduces total mycoflora up to 33%. It shows complete inhibition of the *Cladosporium herbarum.* In case of *Eupatorium odoratum* at the same concentration and soaking period reduces the infected seeds up to 15%. It shows complete inhibition to *Alternaria alternata, Cladosporium herbarum, Fusarium oxysporum* and *Rhizopus nigricans* but not able to reduce *Aspergillus flavus* and *A. niger.* It is observed that, the increased concentrations of both species significantly reduce the fungal incidences.

The data compiled in table 2 shows the effect of *Hypties suaveolens* and *Eupatorium odoratum* extracts on infection on *Cajanus cajan.* It observed that extract of *Hypties suaveolens,*it is not much effective against seed mycoflora however, it shows complete inhibition of *Alternaria alternata, and Rhizopus nigricans* at 15% concentration at 6 hours soaking period. *Eupatorium odoratum* extract 15% concentration at 6 hour soaking period show the effect on mycoflora. The treatment of *Eupatorium odoratum* is more effective than *Hyptis suaveolens* against fungal infection of seeds.

Table: 2 Effect of leaf extracts on seed mycoflora of *Cajanus cajan.*

Name of the plant	Treatment	Soaking period in Hr.	% of infected seeds	Fungi isolated from seeds					
				Alternaria alternata	*Aspergillus flavus*	*Aspergillus. niger*	*Cladosporium herbarum*	*Fusarium oxysporum*	*Rhizopus nigricans*
Control	D.W.	2	60	+	+++	+++	+++	++	+++
		4	53	+	+++	+++	++	++	++
		6	54	+	+	+	+	+	++
Hyptis suaveolens	5%	2	33	++	++	++	++	++	+
		4	43	++	++	++	++	+	+
		6	40	+	++	++	++	++	+
	10%	2	35	+	+++	++	++	+	+
		4	30	+	++	++	+	+	+
		6	27	-	+	+	+	+	+
	15%	2	21	-	++	++	+	+	-
		4	19	-	++	++	+	+	-
		6	15	-	++	++	+	+	-
Eupatorium odaratium	5%	2	21	+	++	++	++	++	-
		4	25	+	++	++	+	+	-
		6	20	+	++	++	+	-	-
	10%	2	18	+	++	++	+	-	-
		4	15	+	++	++	+	-	-
		6	14	+	++	++	+	-	-
	15%	2	13	-	++	++	-	-	-
		4	12	-	++	+	-	-	-
		6	10	-	+	+	-	-	-

(+++) = Severe incidence, **(++) =** Moderate incidence, **(+) =** Low incidence, (-) = No incidence.

Alkhail (2005) studied the antifungal activities of *Aliium sativum, Cymbopogon proxims, Carum carvi* and *Eugenia caryophyllus* against *Fusarium oxysporum, Botrytis cenerea* and *Rhizoctonia solani.* Present study correlate with the studies made by Verma and Saxsena, (2012). Shafique *et al.,* (2007) observed that treatment of wheat grains with *Azadirachta indica* and *Mangifera indica* for 10 minutes before sowing, reduce the fungal incidence. Chaithra, (2009) studied that aqueous extract of *Eupatorium odoratum* effective against fusarium species at 5 and 10% concentrations. Present work indicated that the soaking period of seeds and higher concentration of aqueous leaf extracts are effective against some fungi associated with the seeds

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