

Effect of Extracts of Some Rare Plant Species on Incidence of Seed Mycoflora, Seed Germination and Seedling Emergence of Soyabean Var. Local

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Abstract

During the present studies, the seeds of Soyabean var. Local were soaked in 5% plant extracts of the selected thirteen rare ethnomedicinal plant species and the incidence of seed mycoflora, seed germination and seedling emergence were studied. The seeds soaked in sterile distilled water served as control. The seeds of Soyabean var. Local soaked in the plant extracts of *Helicteres isora* L. showed much reduced incidence of seed mycoflora, maximum seed germination and seedling emergence. It is followed by the extract of inflorescence of *Leonotis nepetifolia* (L.)R. Br. while the seeds soaked in the plants extract of *Adnanthera pavonia* L. showed maximum incidence of seed mycoflora and reduced germination and seedling emergence of Soyabean var Local. The extracts of all the test plants were found to be inhibitory in more or less degree for the incidence of seed mycoflora while with a few exceptions, they were found to be stimulatory for seed germination and seedling emergence. The experiment proves that along with medicinal uses the rare plant species are of immense use in agricultural field and sufficient attempts should be taken to conserve these rare plants.

KEYWORDS: ethnomedicinal, seed mycoflora, seed germination.

INTRODUCTION

Apart from the ethical values and aesthetics, plant diversity provide the mankind enormous direct economic benefits in the form of timber, food, fibre, industrial enzymes, food flavours, fragrance, cosmetics, emulsifiers, dyes, plant growth regulators, bio-pesticides, bio-fertilizers and above all medicines. Plant resources have made substantial contribution to human welfare. The progress of human beings has been associated with his use of plant resources. Plant diversity is a great source of medicines. The biochemicals present in the vast majority of the plant species are the great reservoirs of new and potential drugs. The plant resources are the major sources of the antimicrobial agents. Along with medicinal uses the plant species are of immense use in agricultural field.

Control of seed borne fungi by different plant extracts has been proved very successful. Satish et al(2007, 2008), Mohana and Raveesha (2006), Hasan, et al (2005), Dangat and Patil (2010), Embaby and Abdel-Galil (2006) and Sobiya et al (2007) have worked on use of plant extracts for control of the seed borne fungi and for seed germination and seedling development. In the present an attempt was made to control of seed borne fungi of Jowar by different plant extracts. Particularly the rare plant species

are used for plant extracts aiming to prove the importance of the rare plants. This should lead to conservation of the rare plant species.

MATERIALS AND METHODS

I. Collection of Plant Material for Extracts

During the present studies 13 rare plants were selected. Depending on the ethnomedicinal uses of the selected plants, their roots, stem and the leaves were collected, surface-sterilized with 0.1% HgCl₂ and washed separately with sterile distilled water for several times and kept for drying in hot air oven (Metlab) at 60 °C temperature for 48 hours. After drying the roots, stem and leaves were preserved in polythene bags at room temperature (27±10°C) during the studies.

II. Preparation of Plant Extracts:

The dried roots, stems and leaves of selected plants were crushed separately into fine powder with the help of blinder (Remi). 5gm powder each of the plant parts was dissolved separately in 100ml sterilized hot distilled water in 250ml Borosil glass conical flask. The flasks were kept in oven (Metalab) for 24 hours at 60 °C and the content was filtered through Whatman filter paper No.1. The filtrates were used as 5 % plant extracts.

III. Effects of Plant Extracts on Seed Mycoflora of Soyabean Plants:

During the present studies the seeds of Soyabean (Local variety) were soaked in the 5 % plant extracts of the selected plants. The soaked seeds were plated on agar plates, incubated for 7 days at room temperature and their seed mycoflora was detected, identified and recorded. The seeds soaked in sterile distilled water were served as control.

IV. Effects of Plants Extracts on Incidence of Seed Mycoflora:

During the present studies, the seeds of Soyabean were soaked in either the root, stem, leaf or bark extracts (5%) of the selected plants for 24 hours. The effects of extracts on percent incidence of seed mycoflora of test crop plant seeds was studied by agar plate method. Similarly the seed germination, seedling emergence, root and shoot lengths of the soaked seeds of the test crop plants were studied by seed germination and seedling emergence methods as described earlier. The seeds soaked in sterile distilled water were served as control.

Composition of Media

Potato Dextrose Agar:

Peeled Potato - - - 200 gm.

Dextrose - - - - - 20 gm.

Agar - - - - - 20 gm.

Distilled water - - 1000 ml.

EXPERIMENTAL RESULTS

During the present studies, the plant extracts of the thirteen rare plant species were screened against seed mycoflora, seed germination and seedling emergence of local varieties of Soyabean, to prove their utility in agriculture. The results are presented in the following table, figure and plate.

From the results it is evident that, the plant extracts of all the test plants were

found to be inhibitory in more or less degree for the incidence of seed mycoflora while with a few exceptions, they were found to be stimulatory for seed germination and seedling emergence. The seeds of Soyabean var. Local soaked in the plant extracts of *Helicteres isora* L. showed much reduced incidence of seed mycoflora, maximum seed germination and seedling emergence. It is followed by the extract of inflorescence of *Leonotis nepetifolia* (L.)R. Br. while the seeds soaked in the plants extract of *Adnanthera pavonia* L. showed maximum incidence of seed mycoflora and reduced germination and seedling emergence of Soyabean var Local.

DISCUSSION

Studies were carried out on utilization of selected rare plant species in agriculture. For this, the plant extracts of the thirteen of the selected rare plant species were screened for seed mycoflora, seed germination and seedling emergence of four commonly grown field crop like Soyabean. From the results it is evident that, the extracts of all the test plants were found to be inhibitory in more or less degree for the incidence of seed mycoflora while with a few exceptions, they were found to be stimulatory for seed germination and seedling emergence, in Soyabean.

Use of plant extracts for control of the seed borne fungi and for seed germination and seedling development has been studied by many workers such as Dalvi and Bodke (2010), Bodke (2000), Mohana and Raveesha (2006), Patil and Karadge (2010), Satish et al (2007), Hasan et al (2005), Embaby and Abdal-Galil (2006), Sobiya et al (2007), Somda et al (2007), Agrawal et al (2008), Satish et al (2008) and Dangat and Patil (2010). Present work confirmed their findings. The experiment proves that along with medicinal uses the rare plant species are of immense use in agricultural field and sufficient attempts should be done to conserve these rare plants.

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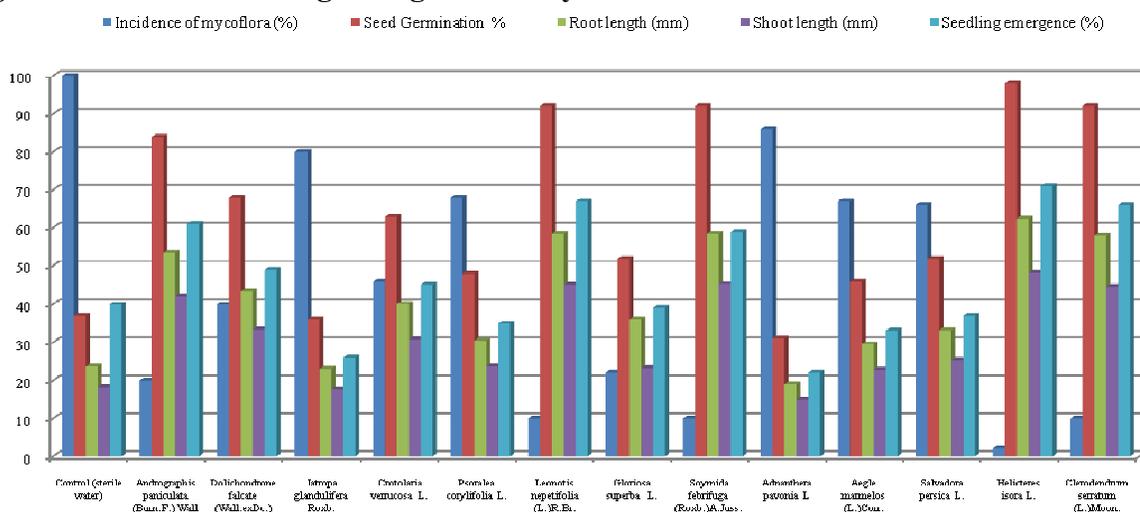
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Table: Effect of plant extracts of rare plants on incidence of seed mycoflora, seed germination and seedling emergence of Soyabean var. Local :

Sr. No.	Plant Name	Plant part used	Incidence of mycoflora (%)	Seed Germination			Seedling emergence (%)
				%	Root length (mm)	Shoot length (mm)	
	Control (sterile water)	--	100	37	23.5	18.1	40
1.	<i>Andrographis paniculata</i> (Burn.F.) Wall	Whole plant	20	84	53.5	42.1	61
2.	<i>Dolichandrone falcate</i> (Wall.exDc.) Seem.	Leaves	40	68	43.3	33.3	49
3.	<i>Jatropha glandulifera</i> Roxb.	Fruits	80	36	22.9	17.6	26
4.	<i>Crotalaria verrucosa</i> L.	Leaves	46	63	40.1	30.8	45
5.	<i>Psoralea corylifolia</i> L.	Leaves	68	48	30.5	23.5	35
6.	<i>Leonotis nepetifolia</i> (L.)R.Br.	Inflorescence	10	92	58.5	45.0	67
7.	<i>Gloriosa superba</i> L.	Fruits	22	52	36.0	23.1	39
8.	<i>Soyimida febrifuga</i> (Roxb.)A.Juss.	Inner bark of stem	10	92	58.5	45.3	59

9.	<i>Adenanthera pavonia</i> L	Seeds	86	31	19.0	15.0	22
10.	<i>Aegle marmelos</i> (L.)Corr.	Inner Bark of stem	67	46	29.5	22.7	33
11.	<i>Salvadora persica</i> L.	Leaves	66	52	33.1	25.4	37
12.	<i>Helicteres isora</i> L.	Fruits	02	98	62.6	48.2	71
13.	<i>Clerodendrum serratum</i> (L.)Moon.	Roots	10	92	58.0	44.5	66

Fig: Effect of plant extracts of rare plants on incidence of seed mycoflora, seed germination and seedling emergence of Soyabean var. Local



Untreated seeds



Incidence of seed mycoflora

Treated seeds



Seed germination



Seedling emergence

Plate: Effect of plant extracts of rare plants on incidence of seed mycoflora, seed germination and seedling emergence of Soybean var. Local