

ISSN 2249-9598 (Online)  
Since 2011



# Online International Interdisciplinary Research Journal

(An International Multidisciplinary Journal)  
Bi-Monthly, Peer Reviewed, Refereed and  
Indexed Open Access Journal

Chief Editor  
Dr. Somnath Kisan Khatal  
[www.oijrj.org](http://www.oijrj.org)  
[editoroiirj@gmail.com](mailto:editoroiirj@gmail.com)



PRINCIPAL  
Gyan Vigyan Mahavidyalaya



## Efficacy of some Rare Medicinal Plant Species on Incidence of Seed Mycoflora, Seed Germination and Seedling Emergence of Wheat (*Triticum aestivum* L.)

Sanjay M. Dalvi

Department of Botany, Shri Guru Buddhiswami Mahavidyalaya, Purna (Jn.) Dist.  
Parbhani (M.S.) India

### Abstract

During the present studies an experiment was conducted on efficacy of extracts of rare medicinal plants on seed mycoflora, seed germination and seedling emergence of Wheat var. Local. The seeds of Wheat (*Triticum aestivum* L.) 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 the root extracts of *Clerodendrum serratum* (L.) Moon showed much reduced incidence of seed mycoflora, maximum seed germination and seedling emergence, followed by the extracts of *Helicteres isora* L., *Soymida febrifuga* (Roxb.) A. Juss. and *Leonotis nepetifolia* (L.) R. Br. The extracts of *Gloriosa superba* L. showed maximum seed mycoflora, least seed germination and seedling emergence in Wheat 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 alongwith medicinal uses the rare plant species are of immense use in agriculture field and sufficient attempts should be done to conserve these rare plants.

**KEYWORDS:** Wheat, seed mycoflora, seed germination.

### INTRODUCTION

Plant resources have made substantial contribution to human welfare. Apart from the ethical values and aesthetics, plant diversity provides the mankind with enormous direct economic benefits in the form of timber, food, fiber, industrial enzymes, food flavours, fragrance, cosmetics, emulsifiers, dyes, plant growth regulators, bio-pesticides, bio-fertilizers and medicines. 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 by Eman *et al* (2013), Shuping *et al* (2017), Masangwa *et al* (2017) in variety of crops. Abubakar *et al* (2018), Islam *et al* (2015), Shobiya *et al* (2007) and Rajput *et al* (2005) have worked on the seed mycoflora of wheat. Human beings have cultivated more than 7000 plant species for food throughout the history, though, today only 20 species provide 90% of the world's food and just three species mainly wheat, rice and maize supply more than 50% of the world's food. Increase in production of these crops is the need of the hour.

India has one of the oldest, richest and most diverse cultural traditions associated with the use of medicinal plants. The remarkable fact is that it is still a living tradition. The herbal vendors and local medicine men practice the traditional medicine systems like Ayurveda, Siddha, Unani and the Tibetan systems (Retnam and Martin, 2006). The

availability of medicinal plants is already under serious threat. Population explosion, unplanned development and lack of knowledge about the plants and their utilization, have pushed these plants to threatened status. The rare medicinal plants need to be conserved. An attempt has been made in this work coordinate conservation of rare plant species and increase agriculture production by eco-friendly methods. Thus the studies aim at utilization of selected rare plant species to enhance production of Wheat.

## MATERIALS AND METHODS

### Collection of plant material for extracts:

During the present studies thirteen rare medicinal plant species were selected. The plant parts of the selected rare plants used in the traditional medicines such as leaves, roots, barks, rhizomes and whole plants, were collected, surface-sterilized with 0.1%  $\text{HgCl}_2$  and washed separately with sterile distilled water for several times and kept in Hot Air Oven (Metlab) for 48 hours at  $60^\circ\text{C}$ . After drying, the plant parts were preserved in polythene bags at room temperature ( $27 \pm 10^\circ\text{C}$ ) for further studies. (Dalvi and Bodke, 2010)

### Preparation of plant extracts:

The dried plant parts of the selected rare plants were crushed separately into fine powder with the help of grinder (Remi). 5 gm powder each of the plant parts was dissolved separately in 100 ml sterilized hot distilled water in 250 ml Borosil glass conical flask. The flasks were kept in oven (Metlab) for 24 hours at  $60^\circ\text{C}$  and the content was filtered through Whatman filter paper No.1. The filtrates were used as 5% plant extracts. (Bodke, 2000).

### Effects of Plant Extracts on Incidence of Seed Mycoflora of Wheat var. Local:

During the present studies the seeds of Wheat var. Local were soaked separately in the 5% plant extracts of the selected rare plants for 24 hours. The soaked seeds were plated on Agar plates, incubated for seven days at room temperature and their seed mycoflora was detected, identified and recorded. Similarly the seed germination, root and shoot lengths and seedling emergence of the soaked seeds of the test crop plants were studied by seed germination and seedling emergence methods. The seed germination test was conducted according to a modified method of the procedure used by the International Seed Health Testing Association (ISTA, 2014). The seeds soaked in sterile distilled water served as control.

### Composition of Media.

Potato Dextrose Agar.	
Peeled Potat:	200 gm
Dextrose:	20 gm
Agar:	20 gm
Distilled Water:	1000ml

## EXPERIMENTAL RESULTS:

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

  
Co-ordinator  
IQAC

Shri Guru Buddhiswami Mahavidyalaya  
Purna (Jr.) Dist. Raichur  
www.gurubuddhiswami.org



  
PRINCIPAL

Shri Guru Buddhiswami Mahavidyalaya  
Purna (Jr.) Dist. Raichur



From the results it is evident that the seeds of Wheat var. Local, soaked in the root extracts of *Clerodendrum serratum* (L.) Moon showed much reduced incidence of seed mycoflora, maximum seed germination and seedling emergence, followed by the extracts of *Helicteres isora* L., *Soymida febrifuga* (Roxb.) A. Juss. and *Leonotis nepetifolia* (L.) R. Br. The extracts of *Gloriosa superba* L. showed maximum seed mycoflora, least seed germination and seedling emergence in Wheat var. Local. It was observed that 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.

#### DISCUSSION:

Studies were carried out on utilization of selected rare plant species in agriculture. For this, the plant extracts of parts of the thirteen rare plant species were screened for seed mycoflora, seed germination and seedling emergence of Wheat var. Local. 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 Wheat var. Local.

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), Shafique *et al* (2007), Mohana and Raveesha (2006), Bodke S.S. (2000). Control of seed borne fungi by different plant extracts has been proved very successful by Lukman and Zaidi (2018), Baka (2015), Eman *et al* (2013), Ahmed *et al* (2013) Shuping *et al* (2017), Masangwa *et al* (2017), Satish *et al* (2007), Mohana and Raveesha (2006) in variety of crops. Abubakar *et al* (2018), Islam *et al* (2015), Shobiya *et al* (2007), Rajput *et al* (2005), Hasan *et al* (2005), Iram *et al* (2003) and Desjardin *et al* (2000) have worked on the seed mycoflora of wheat.

Present work confirmed their findings. The results of present investigation clearly demonstrated that the in vivo antifungal efficacy of rare medicinal plants by reducing the incidence of seed mycoflora, enhancement of seed germination and seedling emergence in Wheat var. Local. The experiment also proved that along with medicinal uses the selected rare plant species are of immense use in agricultural field and sufficient attempts should be done to conserve these rare plants.

#### REFERENCES:

- Abubakar, A. J., Ahmed, M.I., Kamal, M. M. and Isse, Y. (2018). Effects of Selected Plant Extracts on Seed Borne Fungi and Seedling Parameters of Wheat. *IOSR Journal of Agriculture and Veterinary Science*. 2(5): 48-53.
- Ahmed, M., Hossain, M., Hassan, K. and Dash, C.K (2013). Efficacy of Different Plant Extracts on Reducing Seed Borne Infection and Increasing Germination of Collected Rice Seed Sample. *Universal Journal of Plant Sciences*, 1(3): 66-73.
- Baka, Z. A. M. (2015). Efficacy of Wild Medicinal Plant Extracts Against Predominant Seed-Borne Fungi of Broad Bean cultivars. *Acta Phytopathologica et Entomologica Hungarica* 50 (1), pp. 45-65.

- Bodke, S. S. (2000). *Studies on seed-borne fungi of cereals*. Ph. D. Thesis, S. R. T. Marathwada University, Nanded.
- Dalvi, S. M. and Bodke, S.S. (2010) *studies on diversity, utilization and conservation of some rare flowering plants of Nanded district*. Ph. D. thesis. S. R. T. Marathwada University, Nanded.
- Desjardins, A.E., Manandhar, G., Plattner, R.D., Maragos, C.M., Shrestha, K. and McCormick, S.P. (2000). Occurrence of *Fusarium* species and mycotoxins in Nepalese Maize and Wheat and the effect traditional processing method on mycotoxin levels. *J. Agri. Food Chem.*, 48: 1377-1383.
- Eman S.H. Farrag, Moustafa H.A. Moharam and El-Sayed H. Ziedan(2013).Effect of plant extracts on morphological and pathological potential of seed-borne fungi on cucumber seeds. *International Journal of Agricultural Technology*, 9(1): 141-149
- Hasan, M.M., Choudhari, S.P., Alam, S., hossain, B. and Alam M.S. (2005). Antifungal Effects of Plants Extracts on Seed Borne Fungi of Wheat Seed Regarding Seed Germination, Seedling Health and Vigour Index. *Pakistan Journal of Biological Sciences*, 8(9): 1284-1289.
- International Seed Testing Association (ISTA). (2014). *International Rules for Seed Testing*. Bassersdorf, Switzerland: ISTA.
- Iram, S., A. Ifikhar and M. Ashraf (2003). A study on fungi and soil born diseases associated with rice-wheat cropping system of Punjab Province of Pakistan. *Pak. J. Biol. Sci.*, 6: 1-6.
- Islam, M.S, M.A. Ali and M.N.I. Sarkar (2015). Efficacy of Medicinal Plants Against Seed Borne Fungi of Wheat Seeds. *International Journal of Natural And Social Sciences*, 2(1): 48-52.
- Lukman, A. and Zaidi, R. K. (2018) Effect of Chemical and Biological Treatment for the Control of Seed-Borne Mycoflora of Barley (*Hordeumvulgare* L.) *Acta Scientific Agriculture*.2(6): 06-11.
- Masangwa J. I. G., Q. Kritzing and T. A. S. Aveling(2017).Germination and seedling emergence responses of common bean and cowpea to plant extract seed treatments. *Journal of Agricultural Sciences*, 155: 18-31.
- Mohana, D. C. and Raveesha, K. A. (2006). Anti-bacterial activity of *Caesalpinia coriaria* (Jacq.) Willd. against plant pathogenic *Xanthomonas* pathogens: an eco-friendly approach. *Journal of Agricultural Technology*, 2: 317-327.
- Rajput, M. A., Mumtaz. A. Pathan, A. Mubeen Lodhi, G. Sarwar Shah And Khalil A. Anzada (2005). Studies on seed-borne fungi of wheat in Sindh Province and their effect on seed germination. *Pak. J. Bot.*, 37(1): 181-185.

Co-ordinator  
IQAC



PRINCIPAL

Shri Guru Buddhiswami Mahavidyalaya  
Purna (Jn.) Dist. Parbhani



Satish, S., Mohana, D. C., Ranhavendra, M. P. and Raveesha, K. A. (2007). Antifungal activity of some plant extracts against important seed borne pathogens of *Aspergillus* sp. *Journal of Agricultural Technology*. 3(1): 109-119.

Shuping, D.S.S., J.N. E. Shuping and Eloff(2017). The Use of Plants To Protect Plants And Food Against Fungal Pathogens: A Review. *Afr J Tradit Complement Altern Med.*, 14 (4): 120-127

Sobiya, S., Arshad, J., Rukhsana, B. and Shazia, S. (2007) Effect of Aqueous Leaf Extracts Of Allopathic Trees On Germination And Seed-Borne Mycoflora of Wheat. *Pak. J. Bot.*, 39(7): 2619-2624.

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

Sr.	Name of the rare plant	Plant part used	Incidence of mycoflora (%)	Seed Germination			Seedling emergence (%)
				%	Root length (mm)	Shoot length (mm)	
	Control (sterile water)	--	100	41	37.0	27.0	36
1.	<i>Andrographis paniculata</i> (Burn.F.) Wall	Whole plant	13	89	57.0	43.9	64
2.	<i>Dolichandrone falcate</i> (Wall.exDc.) Seem.	Leaves	33	73	46.8	36.0	53
3.	<i>Jatropha glandulifera</i> Roxb.	Fruits	82	34	21.9	16.8	24
4.	<i>Crotalaria verrucosa</i> L.	Leaves	45	64	40.0	31.0	46
5.	<i>Psoralea corylifolia</i> L.	Root bark	70	44	28.0	21.5	32
6.	<i>Leonotis nepetifolia</i> (L.)R.Br.	Inflorescence	10	92	58.0	45.0	67
7.	<i>Gloriosa superba</i> L.	Rhizome	28	22	16.4	17.0	17

8.	<i>Soymida febrifuga</i> (Roxb.) A. Juss.	Inner bark of stem	10	93	49.0	46.0	67
9.	<i>Adenanthera pavonia</i> L.	Seeds	80	36	23.0	17.0	26
10.	<i>Aegle marmelos</i> (L.) Corr.	Inner Bark of stem	59	53	33.6	26.0	38
11.	<i>Salvadora persica</i> L.	Leaves	62	50	32.0	25.0	36
12.	<i>Helicteres isora</i> L.	Fruits	08	93	60.0	46.0	67
13.	<i>Clerodendrum serratum</i> (L.) Moon.	Roots	04	97	62.0	48.0	70

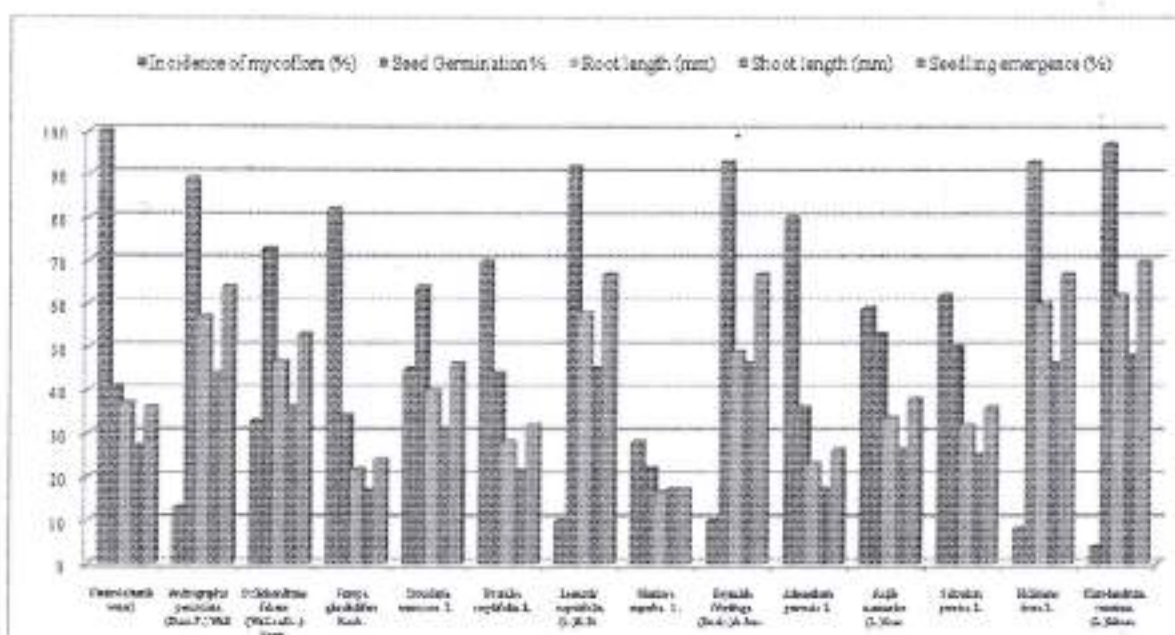


Figure: Effect of plant extracts of rare plants on incidence of mycoflora, seed germination, and seedling emergence of Wheat var. Local.

Co-ordinator  
IQAC

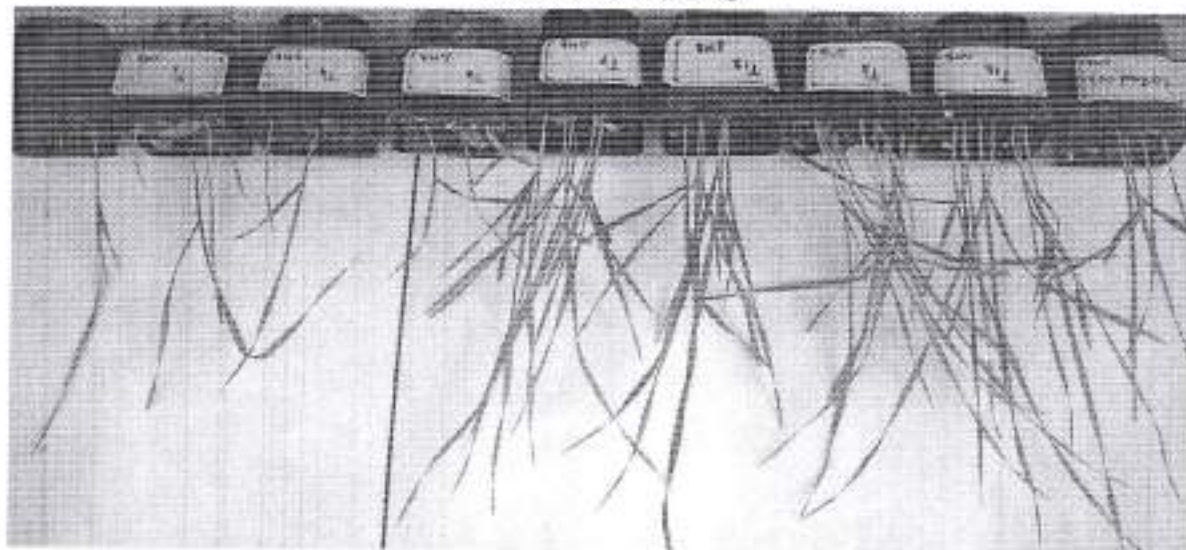
Shri Guru Buddhiswami Mahavidyalaya  
Purna (Jn.) Dist. Parbhani - 431511 (M.S.)



PRINCIPAL  
Shri Guru Buddhiswami Mahavidyalaya  
Purna (Jn.) Dist. Parbhani



Seedling emergence



Seed germination

