



## Research Article

# EFFECT OF BOTANICAL LEAF POWDERS AS SOIL AMENDMENTS AGAINST *Rhizoctonia solani* KUHN CAUSING ROOT ROT OF MUNGBEAN (*Vigna radiata* L. WILCZEK)

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**Abstract-** The experiment was conducted under pot conditions in the Department of Plant Pathology, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, by incorporating the plant leaf powders @ 30 g/kg soil. The mortality was recorded at the intervals of 20, 30 and 40 days after sowing the mungbean seeds. Among all the treatment botanical leaf, powder of Neem (*Azadirachta indica*) was found most effective against *Rhizoctonia solani* followed by botanical Neelgiri leaf powder (*Eucalyptus globulus*).

**Keywords-** Neem leaf powder, *Rhizoctonia solani* root rot of mungbean, Pathogenicity

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## Introduction

Green gram (*Vigna radiata* L. Wilczek) is the key crop of Leguminosae family. India is the world's leading pulses producing as well as consuming country. In India mungbean is grown in almost all the states due to its triple use as food, fodder and fertility. The crop is attacked by a number of pathogens causing various diseases. Amongst them seed rot, pre and post emergence mortality, seedling rot and web or leaf blight. The organism *Rhizoctonia solani* is responsible to cause pre and post emergence rot in mungbean resulting in maximum mortality of seedlings [1]. The Disease becomes serious during kharif season under continuous rains [2]. *Rhizoctonia solani* is a soil borne pathogen and attacks on seeds, seedlings and collar region of the young plants and causes considerable losses in yield [3]. Bearing in mind the destructive effect of fungicides in alarming the ecological balance, residual in ecological pollution, this study was carried out to find out secure and eco-friendly technique to deal with *Rhizoctonia solani*

## Materials and Methods

Plant leaves of Neem (*Azadirachta indica*), Karanj (*Pongamia pinnata*), Babul (*Acacia nilotica*), Neelgiri (*Eucalyptus globulus*), Ashok (*Polyalthia longifolia*), Tulsi (*Ocimum sanctum*), Bougainvillea (*Bougainvillea sp.*), Jatropa (*Jatropa curcas*) and Mehdi (*Lawsonia inermis*) were collected from the trees located in the botanical garden of College of Agriculture, Jabalpur. Collected fresh leaves thoroughly washed in running tap water so as to remove undesirable contents powder was prepared by drying these at room temperature till complete dryness. Leaves were grind with the help of pestle and mortar in to a fine powder. The experiment was conducted in pots under glass house conditions. The test fungus *Rhizoctonia solani* was cultured on paddy straw and mixed with the soil @ 40g / Kg soil. At the same time the plant leaves powder was incorporated @ 30 g / Kg soil along with test fungus. The soil mixture was filled in pots and 25 sterilized seeds of mungbean were sown in each pot irrigated with sterilized tap water. The glass house temperature ranged between 18 – 30 °C during the period of investigation. The pots were observed for seed germination, seedling mortality

and appearance of wilt symptoms. The data recorded was subjected to statistical analysis following complete randomized design (CRD).

## Results and Discussion

The experiment was conducted under pot conditions by incorporating the plant leaf powders @ 30 g/kg soil. The mortality was recorded at the intervals of 20, 30 and 40 days after sowing the mungbean seeds.

The data in [Table-1] indicated that minimum (1.00) plant mortality was recorded within 20 days were Neem (*A. indica*) leaf powder was incorporated with the pot soil followed by *P. pinnata* (1.66) and *E. globulus* (2.00) against maximum (6.33) in control. These treatments followed by *O. sanctum* (3.00) and *Polyalthia longifolia* (3.33). Rest of the treatments was at par with each other but superior over control.

During 30 days of plant growth, minimum plant mortality was recorded with *A. indica* (3.33) which are followed by *P. pinnata* (4.00) against maximum (9.33) in control. Rest of the treatments were at par among themselves in reducing the plant mortality but showed their superiority over unamend control pots.

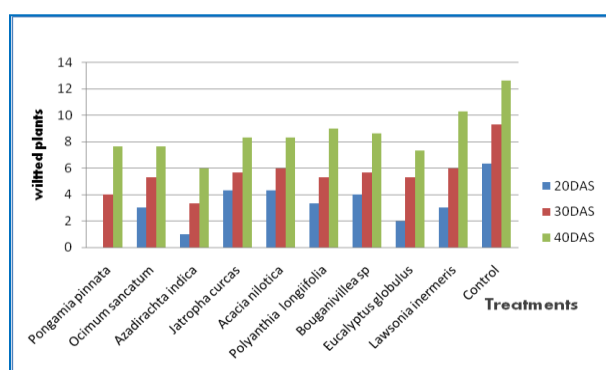
The plants grown on Neem amended pot soil remained healthy up to 40 days where the plant mortality was six followed by *E. globulus* (7.33), *P. pinnata* and Tulsi *O. sanctum* (7.66 each) maximum (12.66) plant mortality was recorded in control. *J. curcas* and *A. nilotica* (8.33 each) *P. longifolia* (9.00) and *Bougainvillea sp* (8.66) remained statistically at par among themselves but showed superior efficacy over control after 40 days of plant growth. The result was found that all the treatments were significantly effectual in managing *Rhizoctonia solani* and raising the plant stand. *Azadirachta indica* showed minimum mortality up to 40<sup>th</sup> days out of the botanicals tested when the experiment was terminated. These results are in confirming with the findings of [4] who reported that neem was found toxic when applied as soil drench and reduced the club rot severity significantly in crucifers. [5] also observed reduced incidence of *Rhizoctonia bataticola* infecting chickpea in *A. indica* amended soil. The performance of these plant leaves may be due to presence of antifungal substances, which inhibited the growth of the pathogen, but

not so inhibitory against natural antagonistic microbiota especially fungal antagonists present in soil [6-8].

**Table-1** Effect of leaf powders as soil amendments on Plant Mortality of Mungbean.

S.No	Plants leaves	Number of wilted plant*		
		Days		
		20	30	40
1	<i>Pongamia pinnata</i>	1.66*	4.00	7.66
2	<i>Ocimum sanctum</i>	3.00	5.33	7.66
3	<i>Azadirachta indica</i>	1.00	3.33	6.00
4	<i>Jatropha curcas</i>	4.33	5.66	8.33
5	<i>Acacia nilotica</i>	4.33	6.00	8.33
6	<i>Polyalthia longifolia</i>	3.33	5.33	9.00
7	<i>Bougainvillea sp</i>	4.00	5.66	8.66
8	<i>Eucalyptus globulus</i>	2.00	5.33	7.33
9	<i>Lawsonia inermis</i>	3.00	6.00	10.33
10	Control	6.33	9.33	12.66
	S.E.m±	0.881	0.942	1.145
	P =0.05	1.83	1.96	2.38

\* Each value is mean of three replications.



**Fig-1** Effect of leaf powders as soil amendments on Plant Mortality of Mungbean.

**Conflict of Interest:** None declared

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