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RESEARCH ARTICLE

EFFECT OF BACTERICAL COMPOST ON THE GERMINATION OF GREEN GRAM (*Vigna radiata* (L.) R. Willczek)

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ABSTRACT

Organic farming is the need of the hour to sustain Agriculture. Organic manure and Organic fertilizer not only improves the quality of the Soil but also control all types of Pollution. There are several organic resources available for growing plants such as Natural Compost (Cow dung), Vermicompost, Panchakavyam, Fish Amino acid etc. The present investigation aimed to study the effect of new compost obtained from decomposing sugarcane leaf waste by using Bacteria obtained from cashew nut shell waste and groundnut shell waste processing sites, on the germination of green gram *Vigna radiata* (L.) R. Wilczek, which has been compared with Natural compost, Vermicompost and Inorganic Fertilizer and control. The study revealed that the bacterial compost was more effective in bringing about germination and seedling growth compared to vermicompost, Natural compost and Inorganic Fertilizer. Poor results were observed in Inorganic fertiliser treatment

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INTRODUCTION

Organic farming is the need of the hour, organic fertilizer improves the quality of the soil and crop yield. In the current scenario the increased demand for organic fertilizer is felt. The growing population completely exploits the resources available for Chemical Agriculture. Nature seeks to conserve and maintain its quality by providing biodegradable and eco friendly fertilizers. There are several organic resources available for growing plants such as Natural Compost (Cowdung), Vermicompost, Panchakavyam, Fish Amino acid etc. The Bacteria collected from decomposed cashew nut shell waste and groundnut shell waste is a major source for preparing organic fertilizer, which is not only unique in the nutrient level but provide the best yield for plant growth. The bacterial compost is much better than the vermicompost, Natural compost and the Inorganic fertilizer. Hence in the present study the efficacy of Bacterial compost in bringing about seed germination in *Vigna radiata* (L.) R. Wilczek, has been investigated.

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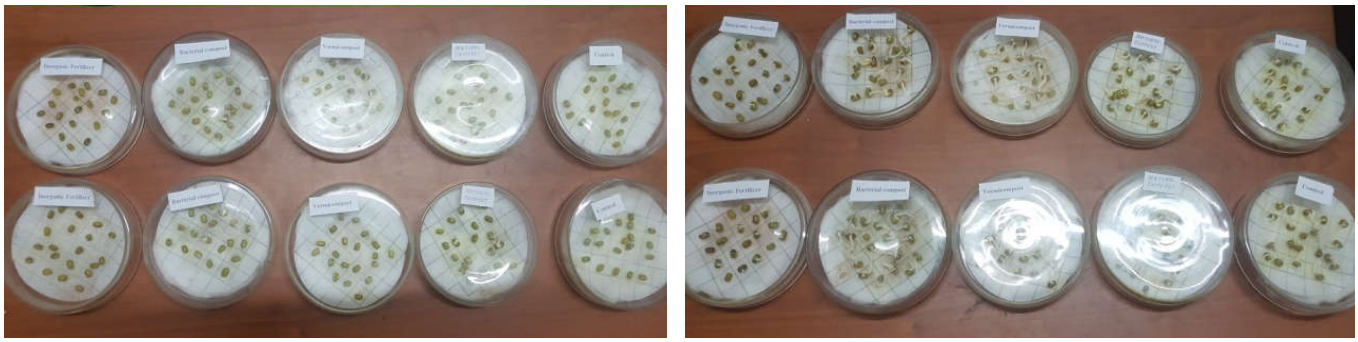
MATERIALS AND METHODS

The green gram (*vigna radiata* (L.) R. Wliczek is also known as golden gram belongs to the family Fabaceae. The compost solution used for the experiment was prepared by dissolving 10 grams of compost in 100 ml distilled water to make a 10% solution for Natural compost, vermicompost Bacterial compost and in the case of inorganic fertilizer 10 grams of complex fertilizer was used. The control setup was treated with distilled water alone. (Table: 1) Three petriplates were used for each setups and 20 seeds were taken in each petriplate. The petriplates were lined with cotton and whatman No:1 filter Paper. They were moistured with water and irrigated with the respective test solutions at the rate of 3 ml per petriplate. The data was recorded every day for 5 days. After germination the petriplates were maintained at a temperature of 28º C ± 2º C under natural light condition in a temperature controlled Laboratory and periodically observed. Then the total number of seed germinated was calculated for the control and treated seed from this the percentage of germination was calculated. The Root length and Shoot length was recorded for all treatments from day 1 to day 5. The result obtained was statistically analysed according to Snedecor and William (1967) for seedling characters. Every treatment had ten samples analyzed for each of the parameters.



Day 1 Day 2

Day 3

Day 4

Day 5

Fig. 1. Effect of bacterial compost on seed germination of *Vigna radiata*

They were randomly selected and numbered for analyses, in further experiments to maintain uniformity. The Mean and Standard Error was calculated for each parameters according to the standard methods.

RESULTS AND DISCUSSION

The different parameters of the experiment, such as germination percentage, plumule length and radical length were recorded in the petriplate grown seeds of *Vigna radiata* (L.) R. Wilczek. The effect of bacterial compost on germination of green gram in comparison with natural compost, Vermicompost, Bacterial compost and Inorganic fertilizer was studied.

After 24 hours the seeds started germinating. In Bacterial compost treatment maximum number of seeds germinated i.e.18 out of 20was germinated. Whereas in vermicompost only 14 seeds germinated. Only 4 seeds were germinated in natural compost while no germination was observed in Inorganic fertilizer. After 48 hours, all seeds had germinated in all the treatments except Inorganic fertilizer. The length of the radical and the plumule were recorded for a period of 120 hours (5 days) as seen in Table 2 and Table 3. The germination percentage was observed in seed germination after 24 hours. In Control treatment 20% germination of seeds was observed. The Bacterial treatment showed 90%.of seed germination. In vermicompost treatment it was observes as 70% seed

Table 1. The different treatments of compost used

SNo	Treatment	Concentration of the Compost
1	Control	Distilled Water
2	Vermicompost	10% of Vermicompost
003	Natural Compost	10% of Natural Compost
4	Bacterial Compost	10% of Bacterial Compost
5	In Organic Compost	10% of Complex

Table 2. Effect of bacterial compost on seed germination of *Vigna radiate*

S.No.	Treatment	Germination %	
		24 h	48 h
1	Control	20	100
2	Bacterial compost	90	100
3	Vermicompost	70	100
4	Natural Compost	20	100
5	Inorganic fertiliser	5	70

Table 3. Effect of bacterial compost on seed germination of *Vigna radiate*

Days/ HRS	Control (cm)		Natural Compost (cm)		Vermicompost (cm)		Bacterial Compost (cm)		Inorganic Fertilizer (cm)	
	Radical	Plumule	Radical	Plumule	Radical	Plumule	Radical	Plumule	Radical	Plumule
2(48HRS)	1.03± 0.58	-	1.2± 0.6	-	1.52± 0.55	-	1.6± 0.66	-	0.42± 0.12	-
3(72 HRS)	2.08± 0.50	-	2.66± 0.78	-	2.96± 0.58	0.6	5.75± 1.48	0.25± 0.17	0.7± 0.27	-
4(98 HRS)	4.63± 1.57	0.13± 0.25	4.11± 1.11	-	4.8± 1.07	0.45± 0.34	7.31± 2.06	0.66± 0.26	0.77± 0.28	-
5(120HRS)	5.65± 2.29	2.47± 0.54	7.32± 1.14	3.12± 0.58	6.05± 0.94	2.12± 0.64	9.07± 1.29	4.96± 0.65	0.8± 0.33	-

germination and in Natural compost was 20% of seed germination while 5% of germination of seeds was observed in Inorganic fertilizer. Table 2. All treatments showed 100% seed germination. But in the inorganic fertilizer treatment it was 70%.The length of the Radical was measured for all the treatments and maximum length was observed in the Bacterial compost treatment. The Plumules started to emerge on the day 3rd onwards (i.e., 72 Hours). In Bacterial compost treatment and Vermicompost but the length of the Bacterial compost was more in Bacterial Compost. On 4th day (i.e., 92 Hours) Plumule was observed in all the treatment. Except in Inorganic fertilizer treatment the plumule was not observed throughout the experimental processes. The maximum length of the plumule and radical was observed in Bacterial compost treatment. The length of the Plumule and Radical was maximum in Bacterial compost treatment than other treatments. Inorganic fertilizer. Table-3. The above results are seen to be in accordance with the observation of Adil Ansari and Kumar Sukhraj (2010). Lalitha *et al.,* (2000) and Ansari *et al.,* (2008)and Mujeera Fathima and Malathy Sekar (2014). The present study has thrown light on the fact that Bacterial compost solution has the maximum efficiency to trigger seed germination compared to other compost and thus could be effectively used to grow crops in degraded soils by enhancing the seed germination capacities.

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