

Study of Influence of Vermicompost on the Growth Parameters of Fenugreek (*Trigonella Foenum Groecum*) Seeds

D. Sharmila, L. Jeyanthi Rebecca

Abstract: Vermicomposting is a process of manuring with the organic decomposition products produced by earthworms and related microbes. Vermicompost is considered better compost compared to chemical compost due to its biocompatible composition. The present study deals with the effects of vermicompost on growth, plant components and also the morphological characteristics of the Fenugreek (*Trigonella foenum-graecum*) plant. The seedlings were grown on various composition of the vermicompost ranging from 20% - 100% with soil. The morphological properties and physical analysis indicated a proportionate positive variation with regards to different concentration.

Keywords: Vermicompost, *Trigonella foenum-graecum*, germination, Thermophilic, plant growth, morphological analysis.

I. INTRODUCTION

The advent of green revolution has increased both the quality and quantity of the food by means of advanced biotechnological processes and technologies but as time passed mankind is facing many unprecedented problems due to this. Presently there is an understanding about the need to go back to natural forms of manuring. [1]. The long-term use of inorganic fertilizers have drastically changed the soil condition and it must be stopped as early as possible. Organic manures help in rejuvenating the soil fertility by adding nutrients and also microbes. Vermicompost contains higher level of organic matter and micronutrients, microbial and enzyme activities which is an excellent fertilizer and soil conditioner. [2, 3]. A number of reports have indicated that many experiments have conclusively shown that earthworms can increase the yield of cereals in temperate countries [4]. Many field experiments indicated the positive effects of earthworms on agriculture [5, 6, 7, 8, 9]. The positive role of vermicompost and vermivash on fenugreek plant crop is reported by Ali et al, 2018. The present report deals with the effect of vermicompost on some growth parameters of fenugreek plants.

II. MATERIALS AND METHOD

Fenugreek (*Trigonella foenum-graecum*) seeds obtained from the local seed farm at Chennai, India. Before using seeds, they were first washed thoroughly so as to remove any kind of dirt and contaminating agents that might be present. Vermicompost and red soil, which is needed for the experiment was also obtained from a local farm. The experiment was conducted in a block design in 6 transparent disposable glass including 5 treatments and 1 control as mentioned below:

Glass Cup 1: 20% vermicompost + 80% red soil (Sample 1)

Glass Cup 2: 40% vermicompost + 60% red soil (Sample 2)

Glass Cup 3: 60% vermicompost + 40% red soil (Sample 3)

Glass Cup 4: 80% vermicompost + 20% red soil (Sample 4)

Glass Cup 5: 100% vermicompost (Sample 5)

Glass Cup 6: 100% red soil (Control)

The fenugreek seeds were soaked in water for one day and fifty seeds were sowed in each transparent cups. The experimental seeds were kept under observation with normal sunlight and proper irrigation. Within two days the sprouts were visible and were continuing to grow. Proper irrigation and sunlight helped in the germination of the seeds, and as a result, within 8-9 days the seeds grew into plants with green leaves and long roots. Various study parameters such as percentage germination of seeds, root length, shoot length, wet weights and dry weights of shoots etc. were tabulated and results analyzed.

III. GERMINATION PERCENTAGE

The formula used to calculate the percentage of germination is mentioned below:

$$\% G = \frac{\text{No. of germinated seeds}}{\text{Total No. of sown seeds}} \times 100$$

IV. RESULTS AND DISCUSSION

The positive role of various proportions of vermicompost on germination percentage of *Trigonella foenum-graecum* shown in Table 1. Table 2 indicates the root and shoot lengths of

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Trigonella foenum-graecum plants due to the influence of vermicompost and Table 3 indicates the fresh and dry weights of plants. Figure 1 and Figure 2, indicated the growth and germination of seeds and lengths of roots and shoots of fenugreek plant grown under various concentrations of vermicompost, respectively. There are earlier reports on the

positive role of vermicompost and vermiwash on fenugreek plant crop [10, 11, 12]. Our results on the germination pattern of seeds and saplings also indicated a very positive result with reference to the increasing concentrations of Vermicompost.

TABLE 1: Changes in the germination of seeds and germination percentage of *Trigonella foenum-graecum* (fenugreek)

Concentration	Number of seeds sown	Number of seeds germinated	Germination percentage (G %)
Control 100% soil	50	26	52%
Sample 1 20% compost	50	28	56%
Sample 2 40% compost	50	30	60%
Sample 3 60% compost	50	37	74%
Sample 4 80% compost	50	40	80%
Sample 5 100% compost	50	48	96%

Thus with the increasing concentration of vermicompost the germination of the fenugreek seeds increases.



Fig 1: Growth and germination of fenugreek plant with different concentration of vermicompost.

EFFECT OF VERMICOMPOST ON THE LENGTH OF *Triognellafoenumgroecum*(FENUGREEK)

TABLE 2: Changes in the root and shoot length of fenugreek plant

Concentration	Root Length(cm)	ShootLength(cm)	TotalLength(cm)
Control 100% soil	3.5	5.7	8.2
Sample 1 20% compost	4	6	10
Sample 2 40% compost	5.5	6.2	11.7
Sample 3 60% compost	6.5	6.8	13.3
Sample 4 80% compost	7	7.5	14.5
Sample 5 100% compost	9	8.1	17.1

It was observed that the root and shot lengths of fenugreek seedlings increased correspondingly with the increase in amount of vermicompost.

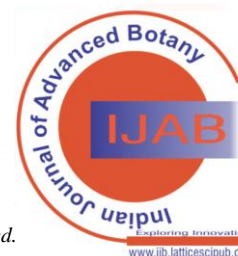


Fig 2: Fenugreek plant grown under various ratios of vermicompost.

THE FRESH AND DRY WEIGHT OF FENUGREEK (*Trigonellafoenumgraecum*) PLANT Corresponding to ratio of vermicompost

TABLE 3: Changes in the fresh and dry weights of fenugreek plants Corresponding to ratio of vermicompost

Concentration	Fresh weight (g)	Dry weight (g)
Control 100% soil	0.46 g	0.03g
Sample1 20% compost	0.60 g	0.05 g



Sample 2 40% compost	0.76 g	0.06 g
Sample 3 60% compost	0.85 g	0.07 g
Sample 4 80% compost	0.90 g	0.08 g
Sample 5 100% compost	1.0 g	0.09 g

V. CONCLUSION

Thus the present study indicated the positive role of vermicompost on the various yield parameters of fenugreek plant compared to plants grown in plain soil. It can also be said that the more the concentration of compost, more the growth of the plant occurs. The use of vermicompost increases the length of the roots and shoots of the plants and also it increases the germination percentage of the plant.

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