Vermicomposting of Earthworm, *Perionyx excavatus* cultured in Leaf litter waste and The effect of growth and yield of black gram, *Vigna Mungo*

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Abstract: Waste management is a recycling practice in which composting of waste is effective technology in making organic fertilizer availability for crop farming as well as in minimizing the waste disposal problem. So the present investigation proves that the conversion of organic leaf litter waste into vermicompost is an effective eco-friendly technology for not only managing the rapid growth of aquatic weeds but also can be fertilized the crops for sustainable production particularly vegetable crops. The present study the production of vermicompost by the earthworm, *Perionyx excavatus* kept in 100, 75, 50, 25 and 0 per cent substrate ratios (PSR) prepared from partly decomposed leaf litter wastes with soil was observed for one month. Mean values of stem length, number of leaves, number of flowers, number of pods, pod length and total seeds produced by Black gram, *Vigna Mungo* cultivated in pots using different per cent substrate ratios (100, 75, 50, 25 and 0) of partly decomposed leaf litter waste and their vermicompost after using them by earthworm, *Perionyx excavatus*. The plants raised in soil alone showed poor growth and yield values over other PSR studied. The results observed in different PSR media revealed a differential growth and yield of black gram and followed the trend in accordance with per cent substrate ratios. Over all the results of all parameters observed in black gram plants revealed a differential and dose dependent effect with more growth and yield if they were in higher doses and less in lower doses.

Keywords: *Vermiculture, Black gram, Perionyx excavates, Vermicompost*

1. INTRODUCTION

In India about 3000 million tons of organic wastes are generated every year from different sources. A major portion of these wastes is not properly recycled for productive uses. Now, they are allowed to decompose in open place, causing atmospheric pollution, contamination of water bodies and other similar problems. Initially it was solved through the conventional techniques such as biogas production and natural decomposition. At present by applying different techniques these wastes can be utilized for recovering important resources like fertilizer, fuel, food and fodder (Dash and Senapati, 1986; Bhattacharjee, 2002).

Earthworms have been used for centuries as a tool to decompose organic wastes thereby improving soil structure. The breeding and propagation of earthworms and the use of their castings has become an important practice followed in the waste recycling throughout the world. Earthworms play a variety of roles in agro ecosystems. Their feeding and burrowing activities incorporate organic residues and amendments into the soil, enhancing decomposition, humus formation, nutrient recycling and soil structural development (Mackay and Kladivko, 1985; Kladivko et al., 1986). Earthworm burrows persist as macro pores which provide low resistence channels for root growth, water infiltration and gas exchange (Kladivko and Timmenga, 1990; Zachmann and Linden, 1989). Quality, quantity and placement of organic matter is a main determinant of earthworm abundance and activity in agricultural soils (Edwards, 1983; Lofs-Holmin, 1983).

Perionyx excavatus, an Indian epigeic (surface dwelling) earthworm was also selected for the current research work due to its usage in effective vermicomposting practice in India for recycling different kinds of organic wastes (Ismail, 1997). This species lives in organic horizons and ingests large amounts of undecomposed litter. It produces ephemeral burrows into the mineral soil during its diapause period. This species is relatively exposed to climatic fluctuations and predator pressures, and tends to be small with rapid generation times. The specimens of this earthworm are generally small to medium sized, deeply pigmented, flat ventrally, tolerant to disturbance and have short life cycle, higher fecundity and regeneration capacity. Utilizing the surface feeding habit of this earthworm, large masses of organic wastes can be converted into organic fertilizer within a short span of time. The biology and life cycle of this earthworm have been studied by Hallatt et al. (1990).

Vermicomposting has been identified as one of the potential process in managing waste, since it is a natural process, cost effective and required only shorter duration. The application of vermicompost helps in increasing the organic matter content of the soil in maintaining soil natural productivity. In vermicomposting, the primary agents of decomposition are worms. They convert raw organic wastes to a nearly stable humus-like material. The main process by which organic materials are converted occurs as the wastes pass through a worms gut and are digested by the worm. Worms stir and aerate the waste pile, so that turning is not required. Worms can stabilize organic materials faster than microorganisms because they grind the material, thus increasing it surface area and speeding decomposition by microorganisms. The material that results from the vermicomposting process is called vermicompost. Material that actually passes through the gut of a worm is called castings. Vermicompost contains a large fraction of castings, but some of the material will have decomposed from microorganisms alone, without passing through a worm.

Earthworms degrade all types of organic wastes such as agricultural wastes, animal droppings, weeds, forest litter and agro – industrial wastes. Agricultural wastes like paddy straw, sugarcane trash, maize stubbles, vegetable wastes, haulms of potato and groundnut, soybean harvest waste favor faster development of worms and eventual compost production. Animal products such as pig and cattle solids and slurries, wastes from chickens, turkeys and ducks, horse manure and rabbit droppings are also converted into reproductive plant growth media by earthworms. Agro – industrial wastes such as bagasse, pressmud, sericulture waste, processed potato waste, brewery waste, paper pulp waste and kitchen waste etc. were also degraded by earthworms. Till early 90's vermicomposting was restricted to laboratory and semi – natural situations with small output of vermicompost. Under sustainable agriculture concept, integrated nutrient management (INM) aims at reduction is usage of chemical fertilizer and providing crop nutrition through various organic components such as composts, biofertilizers, crop residue incorporation along with synthetic fertilizers. Earthworms not only convert garbages and other organic wastes into valuable manure but keep the environment healthly. Conversion of organic wastes by earthworms into compost and the multiplication of earthworms are simple process and can be easily handled by farmers (Uthayakumar, 2006).

Black gram originated in India, where it has been in cultivation from ancient times and is one of the most after paddy. The Guntur District ranks first in Andhra Pradesh for the production of black gram. Black gram has highly prized pulses of India and Pakistan. The coastal Andhra region in Andhra Pradesh is famous for black gram also been introduced to other tropical areas mainly by Indian immigrants. Vigna mungo is used in traditional Indian medicine (Ayurveda). Pharmacologically, extracts have demonstrated immunostimulatory activity in rats.

CLASSIFICATION OF VIGNA MUNGO (BLACK GRAM)

Kingdom	: Plantae
Order	: Fabales
Family	: Fabaceae
Sub family	: Faboideae
Genus	: Vigna
Species	: Vigna mungo

Vigna mungo, known as Urad Dal, black gram, black lentil (not to be confused with the much smaller true black lentil (Lens culinaris)), white lentil, black matpe bean, is a bean grown in the Indian subcontinent. It, along with the mung bean, was placed in Phaseolus, but has since been transferred to Vigna. At one time it was considered to belong to the same species as the mung bean. The product sold as "black lentil" is usually the whole urad bean or urad dal. The product sold as "white lentil" is the same lentil with the black skin removed.

Sustainable productivity of black gram is possible only when best nutrient management practices are adopted. Judicious application of inorganic along with organic sources of nitrogen to crops especially pulses is one of the best management practices. Organic sources like farmyard manure, biogas slurry, poultry manure, coir compost are commonly used. The vermicompost, a rich source of nutrients has gained momentum as a constituent of integrated nutrient management.

The plant cultivation studies made by different workers using composts and vermicomposts of different organic materials under laboratory and field conditions reported that Hampton et al. (1999) have studied the impact of compost derived from municipal solid waste and bio solids on the germination time, root growth and germination index of ivy leaf morning glory, barnyard grass, common purslane and corn under laboratory condition. Jeyabal and Kuppuswamy (2001) have reported an improved growth and yield of rice and black gram administered with vermicompost derived from sugar cane press mud, bio digested slurry, coir pith, cow dung and a mixture of weeds after using them by *Eudrillus eugeniae* through pot and field cultivations.

Parthasarathi and Ranganathan (2002) have compared the impact of press mud vermicompost (after *E.eugeniae* exposure) and chemical NPK on the germination, leaf area, shoot and root length, shoot and root weight, root nodules, chlorophyll, sugar and protein content of leaf, shoot and root, and yield of black gram and ground nut through field cultivation. Parthasarathi et al. (2008) have produced more grains and elevated levels of protein and sugar in the seeds of black gram plant raised in clay loam soil, red soil, sandy loam soil after the application of vermicompost derived from press mud, sugar cane trash and bagasse mixture after using them by *E.eugeniae*. Gondek and Filipek – Mazur (2003) have studied various plant parameters and reported an increase in the weights of stem, leaves, roots, shoots, grain and straw of maize, rape, sunflower and oat after administered with vermicompost of tannery sludge mixed with saw dust, card board and wheat straw (after exposure to *E.fetida*).

Swathi Kadam et al. (2014) have reported that the phosphorus is must incentive coupled with increased use of phosphorus with organic manure (Vermicompost) and bio fertilizers PSB. To compensate the short supply and price hike of chemical fertilizers, use of indigenous sourses like vermicompost has to be encouraged as it supplies essential plant nutrients and improves physical, chemical and biological conditions of the soil, soil microbial activities, soil structure, water holding capacity and thereby increase the fertility and productivity of soil.

OBJECTIVE OF THE STUDY

Hence, the present study was carried out to decomposed organic material of leaf litter. Further, to avoid the burning of leaf waste, it must be used as eco – friendly and economically beneficial manner. The objective of the study is to determine the role of plant leaf litter on vermicompost production of epigeic composting earthworm, *Perionyx excavatus*. To study of vermicompost on the growth and yield of black gram (*vigna mungo*) plant.

II. MATERIALS AND METHODS

2.1. Excavation of Pits

One pit was excavated in the ground at Government Arts College (Autonomous), Salem – 7 for the partial decomposition process of organic waste. The pit has the size of 6×3×3 feet.

2.2. Collection of Leaf Litters

Withered dry tree leaves of about 250 kg were collected from our college campus for 45 days.

2.3. Removal of Non-degradable matter

The unwanted non-degradable matters such as plastics, glass pieces, polyethylene papers and stones were removed from the organic material before proceeding to partial decomposition.

2.4. Collection of Cow Dung

The cow dung was collected from nearby cattle sheds in fresh form and allowed to stabilize for one week and used for the study.

2.5. Partial decomposition of leaf litters

The pit was filled with dry leaf litters. After adding sufficient water, the pit was covered with polyethylene sheets to avoid water evaporation and a possible release of foul smell during decomposition. Once in 3 days decomposing materials in the pit after adding sufficient water were thoroughly mixed with a spade to ensure uniform decomposition. Once in a weak, the cow dung converted as cow dung slurry and added in to pit during decomposition for microbial formation. Ideal semi decomposed leaf litters were obtained only after 90 days of anaerobic decomposition. About 80 kg of dry semi decomposed materials were collected after 2 to 3 days of air drying and stored in polyethylene bags.

2.6. Separation of Core Particles

The partly decomposed materials stored in polyethylene bags were powdered manually using thick wooden rod. The powdered materials were sieved separately through a sieve net (1 mm × 1 mm) to obtain a medium with a particle size less than 1 mm as suggested by Reinecke and Venter, (1985) and were stored in polyethylene bags for vermiculture and nutrients and microbial analysis study.

2.7. Procurement of Earthen Pots

Ten earthen pots of equal size (24 cm diameter and 25 cm height) were purchased from Salem market, Tamil Nadu for vermiculture study.

2.8. Collection of soil

Dry soil taken from the college campus at Government Arts College (Autonomous), Salem – 7 was manually powdered using stone mortar and stored in polyethylene bags for vermicompost preparation and plant cultivation study.

2.9. Maintenance of adult earthworms

The earthworm species of *Perinoyx excavatus*, were kept in cement pots (size of cm height cm in diameter) with substrate medium containing 50% cow dung and 50% soil and maintained under the laboratory condition (medium temperature 25 ± 2° C) during the course of this vermiculture study. The culture pots were covered with cotton clothes to protect the adult earthworms from their predators. Sufficient water was added in these tanks to maintain the optimum moisture condition for better survival and growth of earthworms (Mitchell et al., 1977; Kaplan et al., 1980; Reinecke and Kriel, 1981; Martin, 1982; Loehr et al., 1985; Reinecke and Venter, 1985; 1987; Hallatt et al., 1992; Parthasarathi, 2007).

2.10. Preparation of Vermicompost

One set of five per cent substrate ratios (PSR) such as 100, 75, 50, 25 and 0 were prepared using dry soil and powdered decomposed leaf litter waste with volume by volume basis and mixed well. Four liters of substrate in each per cent ratio was taken in a earthen pot and sufficient volume of water was added into it to ensure optimum moisture condition as suggested by Martin (1982). 12 adult earthworms were introduced into each pot. The control (soil alone as substrate) experiments with 12 adult *Perinoyx excavatus*, earthworms were also maintained simultaneously along with these media. Regular watering is a must for this culture study to provide optimum moisture condition to the earthworms. Survival of earthworm was also observed in the above said media during the course of study.

2.11. Collection of vermicomposts

At the end of 30 days of vermicompost production study, each substrate medium used by earthworms was collected as vermicompost and stored in separate polythene bags for raising black gram in pots.

2.12. CULTIVATION OF BLACK GRAM

PROCUREMENT OF BLACK GRAM SEEDS

The black gram (*Vigna Mungo)* seeds were purchased from the Omalur, Salem.

2.13. COLLECTION OF GROWTH DATA

Twenty days after seed showing, the plants in the pots were measured their shoot height and counted their leaves once in 10 days. Parameters such as total flowers, total pods, pod length, total seeds and total seed weight per plant were also noted in all the plants during the course of this study.

III. RESULTS AND DISCUSSION

3.1. PRODUCTION OF VERMICOMPOST STUDY

The vermicompost production by the earthworm, *Perionyx excavatus* kept in 100, 75, 50, 25 and 0 per cent substrate ratios (PSR) prepared from partly decomposed leaf litters with soil was observed for one month. Very recently the cocoon production study has already made in above said organic wastes by Vasanthi (2013) and Kamala (2014). Since, continuation of this study, the black gram (*Vigna mungo*) plant cultivation study was made here. Like this, vermicompost production study was made in different organic wastes by different authors. Such as A pot experiment with a Vertic Ustropept was conducted to test the changes in soil phosphorus fonns, uptake and grain yield due to integrated nutrient management of black gram through conjuctive use of imported tunisia rock phosphate, vermicompost and phosphobacteria. Growth of blackgram and P uptake was slow in vegetative phase but rapid during reproductive phase. Vermicompost application significantly enhanced grain yield followed by phosphobacteria over 100 per cent P as tunisia rock phosphate. P uptake by blackgram was higher in the combined application of rock phosphate with vermicompost and phosphobacteria. Available phosphorus was higher in the vegetative stage and later decreased at harvest due to P utilisation by blackgram (Thiyageshwari and Rani, 2000).

They liquid extract obtained through earthworm worked soil is referred to as vermi wash indicated the presence of micronutrients in significant quantity (Kale, 1998 and Ismail, 2005). The maximum increase of available nitrogen in chemical fertilizers can be accounted for because of the highest percentage of available nitrate it contained. Using vermiwash and vermicompost may attribute the significant increase in nitrogen of the soil by using vermiwash and vermicompost due to the presence of nitrogen fixing bacteria, which increase the nitrogen content of the soil. The maximum increase in magnesium was observed for vermin wash and vermicompost followed by vermin wash and cattle dung. The maximum increase in vermiwash and vermicompost is due to greater availability of Mg in vermicompost and vermin wash (Ansari, 2008b and Ansari, and Ismail, 2008).

Vermicompost is a potential source due to the presence of available plant nutrients, growth enhancing substances like nitrogen fixing, phosphorus solubilising and cellulose decomposing organism. Vermicompost alone or in combination with fertilizer improve the N, P and K status of soil. Its application realized highest number (24.33) of nodules / plant (Rajkhowa, et al. 2003). Many investigators reported that crop utilizes only 15- 20 % of the applied phosphorus and rest is retained in the form which is not readily available to the crop. The PSB like Pseudomonas and Bacillus also enhance the availability of phosphorus to plant by converting insoluble phosphorus from the soil into soluble form (Swathi Kadam, et al., 2014).

Table 1: Mean values showing the number of leaves and stem height (cm) of black gram (*Vigna mungo*) cultivated in pots using different per cent substrate ratios (PSR) of partly decomposed and vermicompost obtained from leaf litter wastes after using the earthworm *Perionyx excavatus*

DAYS	Per Cent Substrate Ratios (PSR)									
	0		25		50		75		100	
	Number of Leaves	Stem Height	Number of Leaves	Stem Height	Number of Leaves	Stem Height	Number of Leaves	Stem Height	Number of Leaves	Stem Height
20	2.0	6.3	5.0	6.5	5.2	6.9	8.0	7.2	8.0	8.3
	2.2	6.6	5.3	6.7	5.6	7.3	8.3	7.4	8.5	8.5
30	6.0	7.2	7.0	7.7	8.3	7.9	12.0	8.4	13.6	9.3
	6.3	7.6	7.3	7.9	8.6	8.3	12.6	8.6	16.0	10.0
40	9.6	7.9	12.3	8.3	13.6	8.7	17.0	9.3	22.0	10.4
	10.3	8.2	12.6	8.5	14.3	8.9	18.6	9.7	23.6	11.5
50	12.0	8.4	15.3	9.0	17.3	9.3	19.3	9.6	29.3	10.9
	12.3	8.9	16.0	9.2	18.0	9.7	23.3	10.1	33.6	12.9
60	14.3	8.9	18.0	9.6	19.6	9.9	22.6	10.4	34.3	11.5
	15.6	9.3	18.3	9.8	20.3	10.6	23.7	11.2	38.0	14.2

Upper and lower row values indicate mean of 3 plants raised in partly decomposed and vermicompost of leaf litter wastes respectively.

3.2. EFFECTS OF VERMICOMPOST ON THE GROWTH OF BLACK GRAM PLANT

Mean values of stem height, number of leaves, number of flowers, number of pods, pod length and total seeds produced by black gram, *Vigna mungo* cultivated in pots using different per cent substrate ratios (100, 75, 50, 25 and 0) of partly decomposed leaf litters and their vermicompost after using them by earthworm, *Perionyx excavatus* were given in table 1 and 2 respectively. The plants raised in soil alone showed poor growth and yield values over other doses of decomposed and vermicompost of leaf litter studied. The results revealed a differential effect on all the growth parameters of black gram plant in the above media.

Blackgram (*Vigna Mungo L.*) is one of the important pulse crops grown in India. Pulses are the cheapest source of quality protein for human being. Black is also grown as a cover crop as well as catch crop due to short duration. The role legume in improving soil fertility by fixing atmospheric nitrogen in soil. The importance of phosphorus application to black gram crop has been recognized since long (Patil and Jadhav 1994). Application of phosphorus plays an important role in growth, development and maturity of crop. Phosphorus helps to increase grain yield, seed quality, regulate the photosynthesis, govern physic - bio chemical process and also in development of roots and nodulation (Swathi Kadam et al.,2014).

Table 2: Mean values showing the number of flowers, number of pods, pod length and total seeds per plant produced by black gram (*Vigna mungo*) raised through pot cultivation using different per cent substrate ratios(PSR) of partly decomposed and vermicompost obtained from leaf litter wastes after using the earthworm, *Perionyx excavatus*

PSR	Plant Parameters			
	No of Flowers	No of Pods	Pod Length	Total Seeds
0	15.3	13.3	3.0	30.6
	24.0	19.6	3.2	34.6
25	25.6	22.6	4.0	36.3
	30.6	26.3	4.3	65.0
50	29.0	24.0	4.3	73.0
	31.6	28.0	4.8	83.0
75	33.6	28.6	4.7	81.6
	36.0	30.3	5.0	99.0
100	33.6	30.6	4.8	88.3
	39.6	33.6	5.3	120.0

Upper and lower row values indicate mean of 3 plants raised in partly decomposed and vermicompost of leaf litter wastes respectively

Mamta et al. (2012) have reported that the organic amendments of soil increase the height of brinjal plants (*Solanum melongena*), number of leaves and fruit weight and also decreased the disease incidence of brinjal plants. Different forms of organic amendment to soil could be useful for different crops; however, use of vermicompost could be a better option in general. This practice will give boost to the brinjal production in the Northern Province of Madhya Pradesh and thus we recommend that farmers should be educated about the importance of vermicomposting. This will also reduce the additional burden of synthetic fertilizers in our vegetable gardens that in turn will decrease the pollution load on our environment (Mamta et al., 2012). In our field experiments the plant height, number of leaves and fruit weight was significantly higher in the brinjal plants that were amended with vermicompost as compared to control. This may be due to the increase in soil fertility level in the amended soil as vermicompost is rich in nitrogen. However, we also observed that brinjals that were taken from the field with vermicompost did not show any signs of disease as it was observed in the control field (Mamta et al., 2012).

One important observations noted in the growth study of black gram with vermicompost obtained from leaf litter was that the plants raised in higher PSR (50 to 100 PSR) though showed improved growth but are severely affected with insect pest of saprophytic nature due to their tender nature. This adverse effect noticed in the present study may be attributed with more nitrogen and organic carbon present in the vermicompost as suggested by Uthayakumar and Bakthavathsalam (2009).

Rekha et al (2013) carried out during 2010 - 2011 at Arakkonam, Vellore Dist., Tamil Nadu, India, to study the effect of vermicompost and vermin wash on the growth and productivity of Black gram (Vigna mungo). The soil quality was monitored during the experiment followed by growth and productivity. In a vermicompost 50% there has been a significant improvement in soil qualities in plots treated with vermin wash 15% and vermiwash 10%. The growth and yield of black gram was significantly higher in pots treated with vermicompost 50%. They in several ways account for crop nourishment, pests resistance processes and soil fertility enhancement (Kale et al., 1987; Bhawalkar and Bhawalkar, 1992; Buckerfield et al., 1999; Ismail, 1997 and Deasi, 2003). The present work was carried out to study both the combined and individual effect of vermicompost and vermin wash on growth parameters of the growth and productivity of black gram (Vigna mungo).

Similar type of saprophytic infections were also noticed in the studies made by Kumaresan (2015) in green gram raised in vegetable market wastes, Muruganandham and Bakthavathsalam (2009) in chilli plants cultivated in the composts obtained separately from cabbage waste and cow dung, Uthayakumar and Bakthavathsalam (2009) in black gram plants cultivated in decomposed vegetable market wastes, Purushothaman (2011) in the ladies finger plant cultivated in the vermicomposts obtained separately from black gram plant wastes, bagasse, cow dung and organic mixture and Udayakumar (2011) in the black gram plants cultivated in decomposed sheep droppings, press mud, *Pongamia* leaves and organic mixture.

The growing concern for an ecologically sound agricultural system without pesticides has added new dimensions to the economics of bio dynamics. Reliance on organic matter sources is a central feature of organic agriculture. It involves the harnessing of soil organisms like bacteria, earthworms and other micro fauna in recycling organic wastes like straw, grass, leaves twigs, weeds etc. and their transformation to produce slow release nutrients as needed by the crop (Cacco and Dell'Agnola, 1984).

This may be attributed to the pesticide action of vermicompost that aids in protecting crop plants against pests and diseases by suppressing, repelling or by inducing biological resistance in plants to fight them or by killing them (Al-Dahmani et al, 2003 Atiyeh et al, (2002). It was also observed that vermicompost have the potential for improving plant growth when added to the greenhouse container or soil and in some cases it is superior to compost.

The results given in tables 1 and 2 undoubtedly proved that the application of vermicompost has a positive role on the growth and yield of black gram. This observation falls in line with many reports already made on these lines in other plants with vermicomposts obtained from different sources. There have been numerous experiments in which plants have been grown in pots with earthworms or their casts or vermicompost, where an increase in plant growth has occurred. Kale et al. (1987) found that the vegetative growth of plants was influenced by *Eudrilus eugeniae* worm cast in a better way than chemical fertilizers.

The production of vermicompost by the earthworm, *Perionyx excavatus* kept in 100, 75, 50, 25 and 0 per cent substrate ratios (PSR) prepared from partly decomposed leaf litter wastes with soil was observed for one month. Mean values of stem length, number of leaves, number of flowers, number of pods, pod length and total seeds produced by Black gram, Vigna Mungo cultivated in pots using different per cent substrate ratios (100, 75, 50, 25 and 0) of partly decomposed leaf litter waste and their vermicompost after using them by earthworm, *Perionyx excavatus.* The plants raised in soil alone showed poor growth and yield values over other PSR studied. The results observed in different PSR media revealed a differential growth and yield of black gram and followed the trend in accordance with per cent substrate ratios. Over all the results of all parameters observed in black gram plants revealed a differential and dose dependent effect with more growth and yield if they were in higher doses and less in lower doses. Though adverse effect was noticed in survival of *Perionyx excavatus* under higher dose of leaf litter wastes, good impact (yield) on the cultivation of black gram and hence it may be concluded and suggested that it can be used as good manure and good feeding material for *Perionyx excavates*.

CONCLUSION

Over all the results of all parameters observed in black gram plants revealed a differential and dose dependent effect with more growth and yield if they were in higher doses and less in lower doses. Plants that are raised in party decomposed leaf litter showed relatively lesser values in all the parameters over the plants raised in vermicompost of leaf litter. In the present study that included the effects of vermicompost in the growth, production of leaves and fruiting of black gram plants. Further studies earthen pot culture to agriculture field trail for Green gram and Vegetables.

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