

RRST-Zoology

Assessment of Physicochemical Parameters from Vermicompost of *Eudrilus eugeniae* and *Eisenia foetida*

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Article Info	Abstract
Article History <i>Received</i> : 27-01-2011 <i>Revised</i> : 25-03-2011 <i>Accepted</i> : 25-03-2011	In present investigation attempt has been made to investigate the physicochemical parameters like pH, temperature, moisture, salinity, nitrogen, electrical conductivity, nitrate, phosphate, chemical oxygen demand (COD) and biological oxygen demand (BOD) from vermicompost of <i>Eudrilus eugeniae</i> and <i>Eisenia foetida</i> species. The shade of size 10x10 meter and height 1.98 meter was constructed for rearing <i>Eudrilus eugeniae</i> and <i>Eisenia foetida</i> species. The production of vermicompost was found better in <i>Eudrilus eugeniae</i> than <i>Eisenia foetida</i> .
*Corresponding Author <i>Tel</i> : +91-2442276146 <i>Mob</i> : +91-9850982493 <i>Email</i> : ram.tambe@rediffmail.com	Key Words: Physicochemical parameter, <i>Eudrilus eugeniae</i> , <i>Eisenia foetida</i>

Introduction

Earthworms are tubular creature of somewhat lower evolutionary status than insects. However they have many distinctly advance feature to their adaptabilities for life in soil. They are now being exploited man for economic returns as well as for use in ecological management for soil fertility with organic waste recycling. Therefore earthworm attends a high status in present day in economic Zoology with application in many distinctly related fields. Earthworm constitutes a large part of the biomass inhabitant soil. In some situation they may constitute 80% of the biomass. Vermiculture and vermicomposting are two interlinked and interdependent processes. Vermiculture can only be done on decomposable organic matter and composting is the outcome of the Earthworm activities. So biomass processes can be brought about simultaneously. The vermicompost is a rich source of beneficial microorganisms and nutrients [2] and is used as a soil conditioner or fertilizer [1], [4]. Increase in crop yield, soil nutrients status and nutrients uptake was reported due to application of vermicompost [3] [5]. The developed vermicompost from this technology has high nutrient values (offer a whole range of socio- economic benefits such as saving time, electricity, man power for farmers of the developing country). The aim of the research work is to develop an innovative HBOB to maintain aerobic condition during composting (bedding) and to study the biophysicochemical interactions involved during the vermicomposting.

Literature survey revealed that the vermicomposting using the vegetable wastage using the hydro based bioreactor design various physicochemical parameter has been studied. The effect on physicochemical parameter on the earthworm using the correlation analysis and also the various parameters was studied such as earthworm populations, soil moisture, soil

temperature, nitrogen and soil organic carbon was reported. The *Eisenia foetida* and *Eisenia andri* species was used for the reduction for the pH, EC, organic carbon of this physicochemical parameter and increased the micronutrient and macronutrient from the initial substrate. The *Perionyx excavatus* species was used for the vermicomposting of kitchen wastes and the various physicochemical parameters was studied. The municipality wastage was month wise study for the recycling of the vermicompost management form various selected sites and various physicochemical parameters have been studied. The effect of pH and temperature effect on the species *Eisenia foetida* was reported in vermicomposting and municipality waste water. In present investigations the *Eudrilus eugeniae*, *Eisenia foetida* species was used to study the effect on physicochemical parameter.

Materials and Methods

Earthworms were collected by hand picking and identified by various books, journals and experts. The shade was constructed for rearing of earthworms and production of vermicompost and vermiwash.

Technique

Container: Shade size of 10 m X 10m and height 1.98 m.

Shelter: For protection from direct sun light.

Feed mixture: Organic waste like sugar cane trash, coir pith, leaf litter, kitchen waste, cow dung etc.

Procedure

The garbage collection from the colony is to dump at a common place and make 4x4x4 feet heap in a shady place. Before the scorching heat start, sprinkle water in 1:10 ratio (10 bucket of garbage and 1 bucket of water). Spray microbial

slurry in the evening every day. On the next day morning more garbage was added on top of the heap. From fourth day onwards the temperature rised and goes up to 70°C this gets rid of the harmful pathogen. The process of adding fresh garbage and sprinkling microbial slurry should be carried on for one week. On the eighth day turn the garbage up side down using shovel. Continue to add fresh garbage and slurry for another week to the same dump after fourteen days no more fresh garbage should be added to the heap. For the next coming week water and slurry treatment should be done on alternate days. By the twenty two day the garbage will have turn into rich mannure. The mannure so obtained can be used either in proportion with soil or directly in garden for flowering plants, trees, lawns. Material for vermicompost: Collection of

Earthworm by hand picking construction of shade for rearing of earthworm.

Results and Discussion

The physicochemical parameters like moisture, pH, temperature, electrical conductivity, nitrate, phosphate of *Eudrilus eugeniae* and *Esienia foetida* were given in table 1. The physicochemical parameters were found in vermicompost of *Eudrilus eugeniae* are moisture 45.1, pH 7.1, temperature 37°C, EC 0.14, nitrates 1.6, phosphate 0.9, Cu 14 ppm and Zn 45 ppm.

The physicochemical parameters were found in vermicompost of *Esienia foetida* are moisture 37.2, pH 8.2, temperature 39°C, EC 0.13, nitrates 1.1, phosphate 0.8, Cu 13 ppm and Zn 42 ppm.

Table 1. Physicochemical parameters of vermicompost *Eudrilus eugeniae* and *Esienia foetida*.

Sr. No.	Parameter	Vermicompost Sample	
		<i>Eudrilus eugeniae</i>	<i>Esienia foetida</i>
1	Moisture (%)	45.1	37.2
2	PH	7.1	8.2
3	Temperature	37	39
4	EC	0.14	0.13
5	Nitrate	1.6	1.1
6	Phosphate	0.9	0.8
7	Cu ppm	14	13
8	Zn ppm	45	42

Composting and vermicomposting are bioxidative processes that stabilize the organic matter. Composting includes a thermophilic phase during which labile organic matter degradation occurs and pathogens are effectively reduced. Vermicomposting includes coupled activities of earthworms and microorganisms, stabilizing the organic matter and does not involve a thermophilic phase [6].

The results of this work showed the simultaneous application of different approaches including physicochemical parameters provides a more thorough description of the entire period of the composting and vermicomposting process. The vermincompost developed was found to have high value of nutrients.

Conclusion

The production of vermicompost was found better in *Eudrilus eugeniae* than *Esienia foetida*.

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