

STUDY ON THE EFFICIENCY OF MICRO-ORGANISMS - SUITABLE FEEDING MATERIAL FOR VERMICASTING

EP No: 43/2007-08; **Research centre:** Kalamavoor Modern Nursery Centre,

Range:Dindigul Modern Nursery Range, Modern Nursery Division, Dharmapuri;

Scheme:TAP scheme

Introduction:

Vermicasting, or vermicomposting, is a biological process that transforms organic waste into nutrient-rich compost through the activity of earthworms and microorganisms. Microorganisms play a crucial role in breaking down organic matter, enhancing nutrient availability, and improving soil health. The efficiency of vermicasting depends on the interaction between earthworms and microbial communities, as well as the quality of feeding materials used. Different organic substrates, such as agricultural residues, animal manure, and food waste, influence microbial activity and vermicast composition. The selection of suitable feeding materials can optimize microbial efficiency, accelerate decomposition, and enhance the nutrient profile of the final vermicast product. Studies have shown that microbial diversity and enzymatic activity significantly impact the rate of organic matter breakdown and nutrient mineralization.

This study aimed to evaluate different organic waste materials to determine the most suitable medium for vermicasting production as the choice of feeding material significantly influences both the production of vermicasting and the multiplication of earthworms. The experiment was conducted at the Modern Nursery Centre, Kalamavoor, under the Modern Nursery Division, Dharmapuri, during 2006-2007 (EP No. 43/2007-08). The objective was to analyze different feeding materials and their impact on vermicasting productivity and earthworm multiplication.

Objectives:

1. Identify the most suitable feeding material for vermicasting production.
2. Evaluate the impact of different feeding materials on earthworm multiplication.
3. Analyze the macro- and micronutrient composition of the vermicasting produced.

Materials and Methods:

Materials:

The experiment was conducted using three vermicasting production tubs, each measuring 1m × 1m × 0.30m. The feeding materials tested were:

- **T1:** Vegetable waste (100%)
- **T2:** Vegetable waste + Farmyard Manure (50:50)
- **T3:** Vegetable waste + Coir Pith (50:50)

Each tub was initially inserted with 100 earthworms and monitored for vermicasting production and earthworm count.

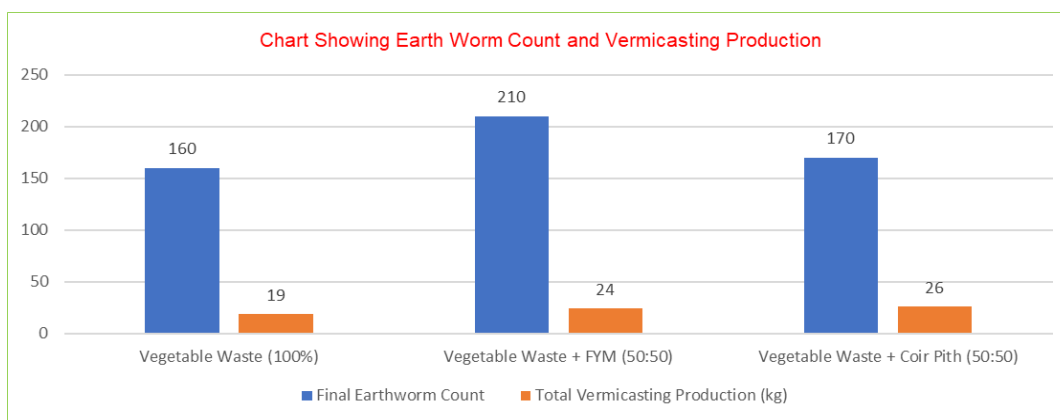
Methods:

The experiment was conducted over three months. The total vermicasting yield and earthworm count at the end of the study were recorded. Nutrient composition analysis of the vermicasting samples was performed at the Soil Science Laboratory, State Forest Research Institute (SFRI), Chennai. Data were recorded on total vermicasting yield, final earthworm population, and nutrient composition to assess the most efficient feeding material for vermicasting production.

Results and Discussion:

The study revealed variations in vermicasting production and earthworm multiplication across different feeding materials. The results are summarized below:

Feeding Material	Final Earthworm Count	Total Vermicastings Production (kg)
Vegetable Waste (100%)	160	19
Vegetable Waste + FYM (50:50)	210	24
Vegetable Waste + Coir Pith (50:50)	170	26



Among the tested treatments, Vegetable Waste + FYM (50:50) demonstrated the highest vermicasting production (210 kg), followed by Vegetable Waste + Coir Pith (170 kg). In terms of earthworm multiplication, Vegetable Waste + Coir Pith (50:50) showed the highest count (26), indicating its suitability as a breeding medium.

A comparative analysis of the vermicasting nutrient values showed variations among feeding materials. The following table presents the macro- and micronutrient composition of the vermicast samples:

Feeding Material	N (%)	P (%)	K (%)	Fe (%)	Mn (%)	Cu (%)	Zn (%)
Vegetable Waste (100%)	1.39	0.59	0.58	3.11	0.96	1.98	1.29
Vegetable Waste + FYM (50:50)	1.36	0.43	0.61	1.99	2.50	2.41	4.30
Vegetable Waste + Coir Pith (50:50)	1.44	0.59	0.54	4.89	1.65	3.21	3.11

The results indicate that Vegetable Waste + FYM (50:50) had the highest vermicasting production, while Vegetable Waste + Coir Pith (50:50) was the most effective for earthworm multiplication. Both combinations demonstrated improved nutrient content compared to vegetable waste alone. Though Vegetable Waste + FYM (50:50) has slightly increased production of vermicasting production, Vegetable Waste + Coir Pith (50:50) outwits the other treatments in respect of other parameters.

Recommendations:

Based on the overall analysis, Vegetable Waste + Coir Pith (50:50) is recommended among the treatments tried Vermicasting production, earthworm multiplication and better nutrient.