

## Production of Vermicompost through Biodegradable Organic Waste Utilization in Bhadrawati Region of Chandrapur District

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### Abstract

The biodegradable organic waste of plant origin can be recycled successfully to produce vermicompost of commercial importance having a high market demand using earthworms. Vermicompost is a product of biodegradation of organic material through interaction between the earthworms and microorganisms present in its gut. The vermicompost has high porosity, water holding capacity and microbial activity. It contains nitrates, phosphates, exchangeable calcium and soluble potassium.

In India about 60% of the solid wastes are of organic nature which can be successfully utilized to produce vermicompost and it can be stated that the vermitechnology is a economically viable technology which can be adopted by common man. In this context at rural level in Bhadrawati tehsil of Chandrapur district vermicompost is produced at field level utilizing biodegradable organic waste of plant origin successfully using earthworm species *Eisenia fetida*.

**KEYWORDS:** Vermicompost, biodegradable organic waste, Bhadrawati, *Eisenia fetida*.

### INTRODUCTION

The vermicomposting refers to the use of earthworms for composting organic matter. Vermicompost i.e earthworm casts are the final product of vermicompost. Vermicomposting is an aerobic, non thermophilic process of organic waste degradation which is dependent upon the earthworms to fragement, mix and promote microbial activity (Gaundi, 2002). During this process of cast formation by earthworms the substrate surface area is increased for further microbial colonization (Chan, 1988). Earthworms can be cultured and put to various uses viz. improving and maintaining soil fertility, conversion of organic waste into useful manure, for livestock (Paoletti et al, 1991) and a bait for fish (Ghosh, 2004).

Worldwide studies on earthworms are done by prominent investigators like Barley (1959), Kale et. al, (1982), , Arellano et. al, (1994), Gunathilagaraj K and Ravignanam (1996), Atlanvinyte O and Vanagas J. (1982), Dominguez et al (1997), Riggle and Holmes (1994), Tomatti and Galli (1995), Chan and Mead (2002), Singh et. al, (2005), Verma and Shweta (2011), Pizl and Novakova (2003), Sumathi and Thaddeus (2013).

### MATERIALS AND METHODS

The vermiculture tank is fabricated in Bhadrawati region of Chandrapur district using bricks and cement and were provided outlet at the bottom for draining the excess water.

The earthworms *Eisenia fetida* used for experiments were procured from Anandwan Vermiculture unit of Warora tehsil of Chandrapur district and introduced in the unit.

The biodegradable organic waste of plant origin is collected from the N.S.College botanical garden of Bhadrawati tehsil, chopped into small pieces and filled in the vermicompost tanks. The bottom of the tank is filled with broken bricks and alternate layers of sand and soil are kept over it. The chopped plant leaves are mixed with cow dung and spread over it. A layer of green leafy plants is added alternately for proper aeration in tanks. A thin paste of cow dung is applied for smooth functioning of the unit.

The unit is moistened from time to time for the survival of earthworms. The biodegradable waste is decomposed for about 20 days before introduction of the earthworms in the unit. The upper layer is covered with jute bags and moistened for keeping the earthworms fit for degrading the organic waste.

## RESULT AND DISCUSSION

It has been noted that earthworms were multiplied and the compost has been formed in the upper of the tank after a time span of about 40 days.

The filled vermicompost unit is ready for harvesting in about 40 days in hot dry climate of Bhadrawati region of Chandrapur district of Maharashtra state. The top layer is daily upturned for getting good results and proper aeration to worms. The most efficient degradation will be attained if there is no drastic change in temperature. Too high temperature will kill the earthworms and the production will hamper. The accumulated vermicompost is removed after a period of 40 days and the collected vermicompost is removed from the tanks and stored under shade and afterwards sieved and then dried and used as a manure for plants. This commercially important vermicompost can be successfully use as very cheap source of fertilizer for improving health of crops without any side effects like the chemical fertilizers.

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