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VERMICOMPOSTING OF VEGETABLE MARKET WASTE

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ABSTRACT

With rapid increase in population, the generation of municipal solid waste has increased several folds during last few years. This study provides the knowledge of composting, better option to tackle these entire problem it helps degradation of solid waste, and also it is cost effective technique. The present study was to convert vegetable market waste in to vermicompost by using earth worm species Eudrilus Eeugeniae and Eisenai Fetida. These were subtract prepare of different composition. With the help of earth worms organic waste is subjected to decomposition and compost is formed after 3-4 months, the vermicompost were harvested and characterized. The parameter such as Moisture, Temperature, C: N ratio, pH value, carbon, nitrogen, Nutrients and protein etc. Result shows that the nutrient content is increased at the end of the day. The process of vermicompost promote plant growth, improves soil quality helpful in managing different kind of agricultural, industrial and domestic waste. Therefore, vermicomposting is highly nutritive organic fertilizer. Chemical analysis was done at the periodic during which pH value, C: N ratio, carbon, nitrogen, phosphorou and potassium. The properly maintain temperature and moisture during process.

Keywords*: Municipal Solid Waste, Vermicomposting, Composting, Vegetable Market Waste, Cow Dung, Nutrients, Eudrilus eugeniae.*

I INTRODUCTION

Today as India population has been increasing continuously, the changing life style and increase in population has increased the waste load in the environment, and the existing waste dumping sites are full beyond capacity, which leads to pollution of water resources, spreading communicable diseases, foul smell etc. The infrastructure development of the boomed structure has not able to keep waste in flux within the cities and the Municipalities are straining their limits providing basic service. The municipal solid waste increases continuously. Solid waste has been major environmental issue in India. MSW in cities is collected by respective Municipalities and transport to the outskirts of the city. There is lack of awareness among the peoples about the proper segregation at the source. Disposal of solid wastes can be done by many methods, like land filling, incineration, recycling, conversion to biogas, disposal in to sea and composting. Composting is biological decomposition and

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stabilization of organic material by microbial action. The widespread use of chemical fertilizers has contributed to environmental degradation especially on soil fertility by reducing the natural nutrients on the soil surface. Though intensive use of chemical fertilizers in agriculture increases the crop

Production but at the same time it causes negative impact on land, air, water and on environmental health. Vermicomposting is one of the recycling technologies which will improve the quality of Products. The present study was undertaken to convert vegetable waste into value added vermicompost. To detained vegetable market waste vermicomposting process will be most suitable from city. The effects of vegetable market waste are as below:

- The vegetable in the solid waste attracts the rats. This may cause the epidemic diseases like plague.
- The soil waste material chokes the surface streams and also the drainage pipes which create water logging conditions.
- Due to decomposing of the solid waste the air gets pouted creating bad odour.
- The percolation of decomposed vegetable dumped on the soil pollutes both the soil as well as the ground water.
- The aesthetic beauty of the urban settlement is lost due to the heaps of the solid waste which get spread over a large area by the pigs and other animals.

1.1 Vermicompost

Vermiculture means artificial rearing or cultivation of worms (Earthworms) and the technology scientific process of using them for the betterment of human beings. Vermicomposting is a simple biotechnological process of composting, in which certain species of earthworms are used to enhance the process of waste conversion and produce a better product. Vermicomposting is the excreta of earthworm, which is rich in humus. Earthworms eat cow dung or farm yard manure along with other farms waste and pass it through their body and in the process convert it into vermicompost. The municipal waste; nontoxic solid and liquid waste of the industries and household garbage can also be converted into vermicompost in same manner. Earthworms not only convert garbage into valuable manure but keep the environment healthy. Conversion of garbage by earthworms into compost and the multiplication of earthworms are simple process and can be easily handle by the farmers.

1.2. General Characteristics of Vermicompost

Vermicompost is the excreta of earthworm, which are capable of improving soil health and nutrient status. Vermiculture is a process by which all types of biodegradable wastes such as farm wastes, kitchen wastes, market wastes, bio-wastes of agro based industries, live- stock wastes etc. are converted while passing through the worm-gut to nutrient rich vermicompost. Vermi worms are used here act as biological agents to consume those wastes and to deposit excreta in the process called vermicompost.

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1.3 Advantages of Vermicomposting

- Least expensive method.
- It works relatively low temperature which is helpful To destroy pathogens.
- It improves the pH of the soil. Earthworm is having characteristics of changing acidic or alkaline soil to neutral soil. Waste land can also be converted to fertile land.
- Vermicompost increases the soil texture, soil aeration, fertility and soil moisture and reduces in the water requirement in long run.
- The optimal carbon/nitrogen (C/N) ratio is available in vermicompost, which determines the quality of compost.

II MATERIALS AND METHODS

We had chosen vermicomposting process using earthworm to tackle the vegetable market waste. In this way we collect vegetable waste from wardha market such as for vermicompost tomato, Vegetable wastes include different leftover putrefied vegetables such as turnip, carrot, brinjal, cabbage, tomato, potato, cauliflower, leafy vegetables and ladies finger. Urine free cow dung was collected. The mature earthworms *Eudrilus eugeniae* and *Eisenia fetida* were collected from centre of science, village Dattapur, Wardha, Maharastrsa, India. The collected waste samples were cut in to small pieces and air dried, by spreading over a ground for 24 hours. The air dried samples were pre-composted up to 4 days for partial decomposition before putting in to vermin composting process.

III EXPERIMENTAL SETUP

The present study was carried out in Vermicompost experimental plots set up by Shri Babulalji Agnihotri School of Technology, Wardha, Maharashtra, India. Earthworms, *Eudrilus eugeniae* and *Eisenia fetida* were collected from plantain farms in and around Wardha. The vegetable wastes were collected from Wardha Market. The vermin shed were prepared using plastic tray (45 x 30 x 30 cm) containing soil + vegetable waste + cow dung with replicates for 60 days. Earthworms will be introduced into tray. The bedding has been kept moist throughout the experiment by regular watering. The experiment shall be terminated on the 60th day and the vermicompost produced by the earthworms will harvest for analysis. The parameters such as pH, the nutrients such as total nitrogen, phosphorus and potassium were analyzed.

IV EFFICIENCY

- Vermicompost quickly restores natural soil fertility, improves its structure and health.
- Vermicompost provide high seedling survival, optimum growth of flowers, and full blossom.
- Vermicompost considerably increase yield capacity and improve taste of the production grown.
- Vermicompost provides high sustained ecologically pure yields.

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V FIGURES

Fig-01- Vegetable waste of market

Fig-02- Compost Pit above ground

Fig-03- Eudrillus Eugeniae

Fig-04-Eisenia Fetida

VI CONCLUSIONS

Vermicomposting is effective process for reduction of solid waste and eco-friendly process. It produces high quality fertilizers which are better compared to other commercial fertilizer in the market. Vermicomposting increases the crop yield and lessens dependence on chemical fertilizers thus mitigating climate change. Vermicomposting to a non- professional simply means making of compost by worms by utilizing worm's innate behaviour. Vermicomposting process improves soil aeration and thereby promotes the survival and dispersal of the useful bacterium within such systems, which is slowly becoming clear day by day. Vermicompost could be prepared from the vegetable market waste even from biodegradable city waste. In the present work, *Eisenia fetida* and *Eudrilus eugeniae*, most common species of earthworms are used and the study shows that the good quality of Organic compost was obtained. The important nutrients present in the soil increase in all treatments. The study area is economical in construction and maintenance.

The problem of solid waste has been increasing rapidly with increase in population, changes in lifestyle and consumption patterns in Wardha. Presently, the total amount of Municipal Solid Waste (MSW) generated varies between 350 to 500 metric tons per day in Wardha. From the above experimental setups, vermicomposting shall

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be resulted in significant increase in total nitrogen (80.8–142.3%), phosphorous (33.1–114.6%) and potassium (26.3–125.2%), whereas decrease in organic C (14.0–37.0%) as well as C:N ratio (52.4–69.8%) in experimental beddings. Therefore, vermicomposting is highly nutritive organic fertilizer.

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