



Rapid Conversion of Kitchen Waste into Nutritional Composting With use of Effective Micro-Organisms

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Abstract : As we know, every year India faces major environmental challenges related to waste generation and inadequate collection of waste, transporting, treatment and disposing it. The project aims to study the process of composting and reduce the time required to make compost by use of Effective Micro-organism. The paper reviews on the application of EM-1 in kitchen waste composting. It emphasized on the application of EM-1 solution in composting method, the EM-1 properties and therefore the quality of compost with EM-1 in terms of nutrient content. By composting kitchen waste, we are able to preserve resources and produce a valuable by-product which will be used as locally produced fertilizer. The present compost bins are difficult to handle because of foul smell. EM-1 controls the temperature and reduces pathogens within the compost to supply good quality of compost. However, the detailed evaluation is required to evaluate the effect of EM-1 solution compost quality and thus the safety for human well-being.

Keywords - Effective Micro-Organisms, Composting, Kitchen Waste, Indian Household Kitchen, Solid waste Management

I. INTRODUCTION

Urban India (about 377 million people) generates 62 million plenty of municipal solid waste (MSW) annually. Out of this nearly concerning 43 million tons around (70%) is collected and 11.9 million tons (20%) is treated properly. concerning 31 million tons (50%) is drop into lowland sites and dynamical consumption patterns and speedy process it's calculable that urban municipal solid waste generation can increase to a 165 million tons in 2030. because the population is increasing speedily in India, it's inflicting high rate of generation of Municipal Solid Waste (MSW).

The composting method is Clarify as, rotten organic matter through that organism underneath convinced wet, aerobic or anaerobic conditions to provide a product throughout a form of powder (i.e., the compost) that low in wet and free from microorganism the solution from composting method is applied on to soil as bio-fertilizer that contain nutrients like, nitrate, sodium, calcium, magnesium, and chloride for plant growth. The application of Effective Micro-organism (EM) in compost production was proved to hurry up composting method.

The degree of conversion of waste into compost was seen increased to 45 days as a result of the immunization of effective microorganisms as compared to the conventional method of aerobic technique that took nearly 2 months to compost. Kitchen waste is outlined because the left-over organic matter produces from restaurants, hotels and households.

EM is commercially on the market. EM suspension contains a group of microorganisms, specifically, carboxylic acid bacterium, yeast, and chemical action bacterium, that square measure primarily employed in agriculture. In this method, 2 additional species of microorganisms were found in EM suspension specifically as chemical action

fungi and actinomycetes. The application of EM to the soil or plant scheme can even improve soil quality and soil health. It conjointly encourages the plant growth, increase the yield and improve the quality of crops.

II. LITERATURE REVIEW

Publish - International Journal of Recycling of Organic Agriculture.

Title - Studies to judge of conversing yard waste

Publisher - Department of civil & environmental engineering

Year – 2017

Author – Amirho ssein Malak Ahmad, Sara Yavari

Findings - Improve solid waste management. Composting of food waste generated in Malaysia was investigated with addition of effective micro-organism (EM) indicates better quality of compost with EM.

Publish - International journal of environmental research.

Title - Method for rapid conversion of waste to organic fertilizer

Publisher - Department of soil science & agricultural chemistry college of agriculture vellayani Kerla agricultural University, Kerla

Year – 2016

Author – C. R. Sudhar maidevi

Findings - The new thermochemical waste processing method provides a quick & sustainable solution hygienic waste disposal & production of organic fertilizer.

III. METHODOLOGY

1. Stages for the process

1.1 Activation of EM

Maple EM-1 ENVIRON was available in a dormant state and it required activation before application. For the activation of EM-1 environ, 20 lit. of water and 2 kg of jaggery was required for 1 lit. of EM-1 environ solution. The mixture was then transferred into a clean air tight container and kept away from direct exposure to sunlight at ambient temperature for 7 days. The gas was made to escape every day until fermentation was complete. During the period of activation, a white layer of actinomycetes was formed on the top of the mixture accompanied by a sweet smell.



Fig. 1.1. Collected Food Waste



Fig.1.2 Maple Em-1 Environ

1.2 Collection of organic materials

The kitchen waste materials used for compost preparation were collected from the Vedic Heights, Hanuman Nagar, Akurli Road No- 2, Kandivali (east), Mumbai- 400101, India. After Collection Kitchen Waste, in order to increase the composting speed and nutrient content, the bulking agents of cocopeat from the local plant nursery and crushed dry leaves from nearby area were added to the each of the materials during the process of composting.

1.3 Preparation of compost

The degradable wastes were 1st screened and separated per the particle size so dried for a number of hours. The composting method was initialized by preparation of the compost bin. The compost bin of plastic with appropriate size was designated and also the bottom was full of crushed stones and sand that helps in leach of excess water within the bed through the holes provided at all-time low. Above that, a layer of cocopeat, followed by the required solid waste, and once more followed by a layer of crushed dry leaves was unfold one over another as range of layers. The activated EM was sprayed together with them for every layer. This layering method was perennial until the appropriate height was reached. The entire unit was unbroken wet by spraying activated EM at regular intervals until the compost was obtained. Throughout this composting method, the bed was maintained within the temperature vary of 25°C to 30°C. The organic waste was turned sporadically (once each few days) for higher aeration and to combine its contents. Once concerning 30 to 45 days the amount of bed had born considerably and white mould appeared above the biomass within the bin. The product obtained was dark brown colour and humus like material.

2. Tests on composting

2.1 Oven drying method for Moisture Content of Compost

Oven drying provides a correct methodology for measure compost wet (Moisture) content however inaccuracies will be result drying it at a thus high a temperature because it loses organic material or burns.

2.2 Hand-Squeeze Test

1. Reach into your bucket or bin and grab a handful of compost. **It should be a representative sample of the majority of your bin.**
2. Squeeze the material very tightly and check for drops of water.
3. Release your grip and allow the moisture to stay in your hand. **Rub some compost between your thumb and finger.**
4. Inspect the material and your hand.
5. Use the rules of thumb below for estimating moisture content.

2.3 pH test - PH Paper Test Strips

IV. RESULT

The result is based on the, using of Maple EM-1 Environ

1st test is based on the pH test, after using EM-1 Solution the ph value of EMKC- Effective Micro-organism of Kitchen Compost is 6.2

2nd Moisture Content of Compost (Oven drying method) after using EM-1 Solution the result of EMKC- Effective Micro-organism of Kitchen Compost is 50%

3rd Hand-Squeeze (Material feels dry and dusty) after using EM-1 Solution the Result of EMKC – Effective Micro-organism of Kitchen Compost is 30%.

S.N.	Parameters	Unit	EMKC
1	Ph	-	6.2
2	Moisture content	%	50
3	Hand-Squeeze (Material feels dry and dusty)	%	30

“Table 2. Test of Mature Compost”

V. CONCLUSION

The use of EM-1 Environ for kitchen waste composting has produced better quality of compost. The addition of cocopeat and crushed dry leaves has helped stabilizing the mixture and acceleration of composting process. This method has reduced the foul smell that is caused during traditional composting. This method has proven to be hassle free and can be done on household basis as well. The number of days required for composting are significantly reduced to 35 days. This method is experimental so the number of days can vary depending upon observation, environmental conditions and the quality of kitchen waste used.

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