TO PRODUCE AN ENRICHED QUALITY OF COMPOST USING KITCHEN FOOD WASTE & ANALYSIS OF THE COMPONENTS.

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Abstract*: Kitchen food waste management has become a serious problem in urban areas and the major portion is organic matter, almost 40-60% component of waste organic matter. Composting is the controlled conversion of degradable organic products and wastes into stable products with the aid of microorganisms. Composting is a long-used technology, though it has some shortcomings that have reduced its extensive usage and efficiency. The shortcomings include pathogen detection, low nutrient status, long duration of composting, long mineralization duration, and odor production. These challenges have publicized the use of chemical fertilizers produced through the Haber–Bosch process as an alternative to compost over time. Chemical fertilizers make nutrients readily available to plants, but their disadvantages outweigh their advantages, it is important to know the quality of compost to assess its toxicity. The use of compost for gardening purposes can be a sustainable option for waste disposal. To enhance the quality of compost different additives were added to compost. Samples have shown a decrease in the C: N ratio with a maturation period of 45 days. The results show that the quality of compost can improve by adding different additives.*

Keywords: Urban waste compost, Nutrient potential, Co-composting, additives, Gardening, suitability

I. INTRODUCTION:

In developing countries, the management of municipal solid waste (MSW) is a major problem. The MSW contains 50% of organic waste which can be treated effectively so as to get nutrient rich material called as compost. Composting is the process of waste stabilization by the action of waste decomposing microbes transforming organic waste into stable and safe material called 'compost'. The compost can be used as source of nutrients and manure/soil conditioner in agricultural applications. In recent years, much importance is given to the composting of MSW due to various advantages such as; easy operational process, low cost, resource generative and eco-friendly. Various disadvantages such as time and space requirement and the manpower needed is a major obstacle in adopting the eco-friendly composting process.

The composting process typically consists of three phases: first is the initial activation stage, followed by thermophilic phase and then maturation phase. The initial activation stage generally lasts for 1–3 days, during which simple organic compounds such as sugars are consumed and mineralized by microbial communities, producing CO2, NH3, organic acids and heat due to which the temperature of compost pile increases Peak temperature value up to 60°C is attained during the thermophilic phase. The optimum temperature range for composting process is 40-65°C, the pathogens present in the waste are killed at temperature above 55°C. During this phase, thermophilic microorganisms degrade lignin, fats and cellulose structure. Finally, during the maturation stage, temperature of the pile slowly decreases due to reduced microbial activity resulting from a decrease of biodegradable compounds. The temperature profile during composting is influenced by the composition of the initial composition of raw waste, effective aeration through pile turning, moisture content and the addition of additives.

Typically, the initial C/N ratio of the raw waste should be maintained in range of 20-40 for the composting of wet Waste. The process of composting can be accelerated by shortening the composting time. This can be achieved by

cocomposting using different wastes, rapid composting using additives and accelerators containing effective microorganisms (EM). Additives are basically a mixture of various microorganisms, nutrients or readily available forms of carbon, enzymes, etc. which enhances the microbial activity when the additives are in contact with the organic waste. The addition of commercially available bio-culture containing effective microorganisms can assist in production of good quality compost.

Thus, proper technique is required to improve the quality of manures in the shortest possible time, where farmers can prepare the compost easily and improve its nutritional quality by the addition of cheap amendments. Therefore, the present investigation aims at studying the effects of various additives such as Rice straw, Raw bone, Neem powder & Rock phosphate on composting process through assessing their influence on organic matter degradation, compost maturity and the quality of finished compost. is discussed and a proper technique is explained.

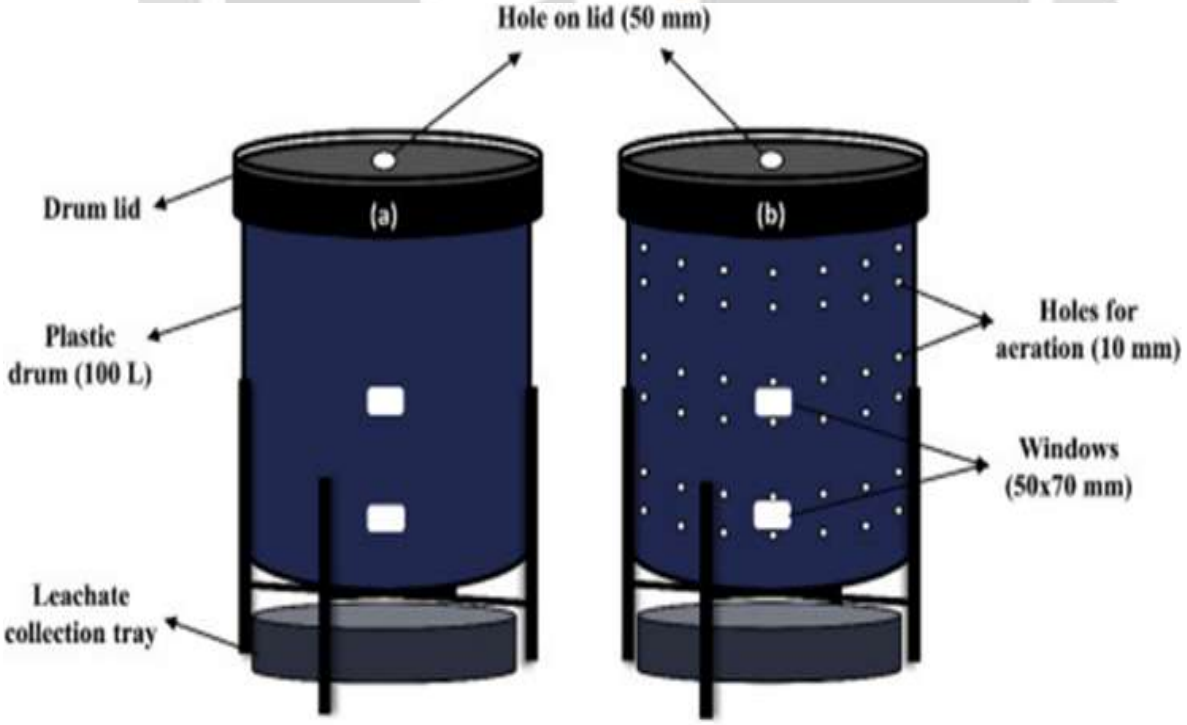
II. METHODOLOGY:

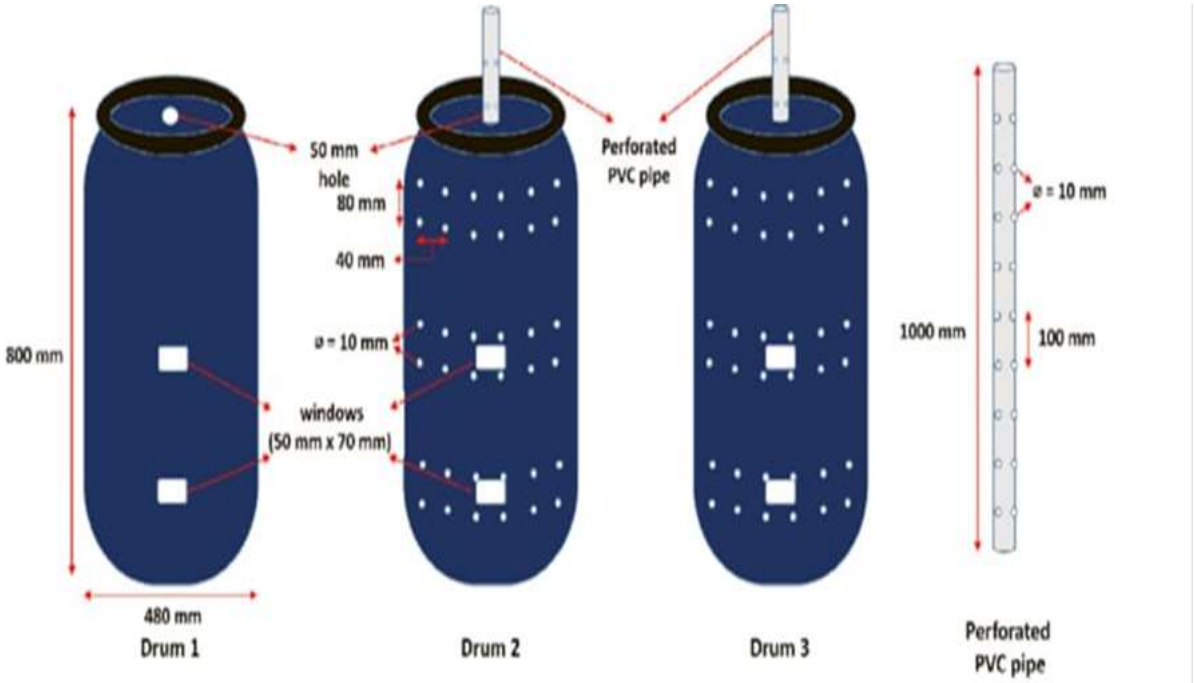
The process of composting is carried out through DRUM COMPOSTING:

Suitability: The technique of drum composting would work for 10-15 households.

Apparatus:

1. 1 drum of 300 liters
2. A pedestal for the drum
3. Plastic vessel of 5-liter capacity
4. Plastic net bags
5. Two bricks
6. Gloves





Composting process

Take a plastic drum and fix the holes on the entire drum & bottom of the drum. Place this drum on a pedestal of suitable height to accommodate the plastic vessel below the drum. Prepare the liquid culture by mixing an adequate amount of bio-culture in water (For treating 80-100 kg of waste, mix 250 ml of culture in 3 liters of water. Segregate the waste and keep the waste which can be converted into compost in the net bags. Do not put papers or materials which can be further used after recycling. In a large container, mix the waste with the prepared culture solution by wearing gloves in the hands. Put some bricks inside the drum in such a way that the bags carrying the waste do not block the holes7. After mixing the waste with the solution, put the waste in the plastic net bags and tie a knot by the plastic rope when it gets filled. Put the plastic net bags in the drum. Continue this process until the drum gets filled. Pour the remaining leftover solution of the container into the drum from the top and close the lid of the drum. Place a container at bottom of the drum. The container will collect the liquid.

Pour back the liquid collected till the third day back in the drum through the top, after opening the lid. Also, when the drum is opened on the third day, see whether the compost is uniformly converting or not. If not, then add more liquid solution (250ml culture mixed with 3 liters of water) to it. Put the container beneath the bottom holes after pouring the liquid for collection of liquid compost. Whenever during the composting, if the process starts to smell then add some more culture (mixed with water) to it from the top of the drum. Increase in foul smell is an indication that composting is not going properly. On the 20th day of composting, take out all the net bags from the drum and spread the contents of the net bag on the ground to dry. The liquid left inside the drum is also the liquid compost, so collect it in the container. After drying the solid waste for 2 days, sift it with a sieve. The collected solid is the solid compost.

Time frame - This technique is one of the efficient way to convert waste into compost. One composting cycle usually takes 40-45 days.

OUR AIM IS TO ADD ADDITIVES TO PRODUCED COMPOST FOR GETTING THE BEST COMPOST

1) As chemical fertilizers are rich in nitrogen, phosphorus & potassium which satisfy 's the demand for plants growth which organic fertilizer cannot provide.

2) The additives are the part of the waste product which are going to recycle in purpose to satisfy the nutrients need for good compost.

3) Each additive is rich in different elements & is a waste product.

4) The whole organic waste will properly decompose for a different purpose to make an overall good compost obtain from kitchen food waste for gardening purposes.

ADDITIVES

1) ROCK PHOSPHATE:(RP) is an important natural source of P and is used as raw material for the production of chemical phosphatic fertilizers. The direct application of RP has been found suitable for acidic soils as low pH helps to solubilize the RP and increases the available form of P to the plants. it contains phosphorus elements that can be utilized for enhancing a good amount of phosphorus in compost.

2) RICE STRAW: Rice straw is an abundant material that can be utilized as an ingredient in organic fertilizer or compost. Especially since various laboratories test also found that rice straw, which tends to be viewed as farm waste, contains beneficial nutrients, which aid in plant growth and in maintaining soil fertility. As it contains a good amount of cellulose, hemicellulose & lignin. Rice straw is rich in nitrogen, potassium, and silicon. which can be helpful for enriching the soil.

3) RAW BONE: Bone meal fertilizer contains elements that can improve the health of flowering plants like roses and tulips. Bone meal fertilizer offers different benefits than other fertilizers made from animal parts like blood meal and fishbone meal. As a natural nutritional source for protein, fat, minerals, calcium, and phosphorous, which is helpful for the growth of plants.

4) NEEM: Neem reduces the number of soil insect pests, fungi, bacteria, and nematodes and also protects the crop from damage caused by these organisms. Neem can reduce alkalinity in the soil by producing organic acids when mixed with the soil. Neem leaves possess antimicrobial, insecticidal, and nitrification inhibitory biochemicals that may influence compost stability, it can prove useful by providing fertilizer-cum-pesticide properties

RESULT AND CONCLUSION:

Sr.no	Test	Present compost
1.	Moisture content	18.5
2.	pH value	7.19
3.	Potassium Oxide	0.60
4.	Phosphorus Trioxide	0.32
5.	Nitrogen	0.18

Sr.no	Test	Conventional compost
1.	Moisture content	25.6
2.	pH value	8.6
3.	Potassium Oxide	3.0
4.	Phosphorus Trioxide	3.0
5.	Nitrogen	2.5

It enriches garden soil and improve health and workability of soil, it also presents a new technique in urban society and , it decreases the waste in urban society and helps to reduce waste pollution.

FUTURE SCOPE:

- Compost can replenish and stabilize soil in garden, helping to boost and sustain food production in the future.
- It can also help pull carbon out of the atmosphere, helping to tackle global warming.
- Replace polluting chemical fertilizers.
- Protecting public health.

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