

Municipal Solid Waste Treatment by using Combination of Effective Microorganisms and Cow dung

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Abstract

This study explore how to convert solid wastes into a valuable resource fertilizer its subsequent utilization. Improper solid waste disposal poses a major threat to the environment and high risks to human health. Most of these wastes are biodegradable and can be converted into valuable resources. Combined solid waste includes vegetable and fruit wastes, garden wastes, etc. The wastes are characterizing by chemical, physical and biological test. Then these waste are segregated depends upon size and density. When the solid wastes are composed mainly by combination of EM solutions and cow dung, the decomposition process is prolonged from 25 days to 30 days. We applying windrow techniques for enhance the aerobic bacteria for conversion of solid waste into organic fertilizer. This project helps to prevent the land, soil, and water pollution. Also the reduction of waste, being Eco-friendly.

Keywords: EM solutions, Cow dung, Solid wastes, Windrow techniques

1. Introduction

Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash. Public living in settlements and residential areas, facing the issues like garbage or solid waste disposal. Solid wastes also result in Air pollution, Water pollution and Soil pollution. The current composting techniques were initially employed as a contingency plan to alleviate the problems associated with waste reduction at the sources and land filling. It is, therefore, necessary to establish and develop an efficient collection and composting system for the fruit and vegetable wastes that allow solution to problems coped with collection (offensive smell and sanitation) and production of quality composts. Microorganisms are tiny units of life that are too small to be seen with the naked eye and they exist everywhere in nature.

Microorganisms are crucial for maintaining the ecological balance. They carry out chemical processes that make it possible for all other organisms including humans to live. There are friendly guys of the microbial worlds known as beneficial microorganisms and a not so friendly group called pathogens that are harmful and capable of producing disease, decay and pollution.

2. Materials and Method

2.1 Solid wastes

Waste may be defined as an unwanted material generated after the manufacturing process of industrial, or from agricultural, or from house hold activity. It is the discarded material which is essential requirement of disposal. Waste causes many nuisances in the environment. It produces many types of viral or bacterial infection for the human and animal which create bad effect on health.

2.2 EM solutions

EM is sustainable microbial inoculants that achieve synergistic effects by combining beneficial microorganisms which exist in nature. EM activates local and native microorganisms that live in soil and water to boost performance. One of the strengths of EM is that it is a diverse combination of microbes, and this gives it versatility in terms of a wide scope of applications that it can be used on.

2.3 Preparation of EM solution

One litre of 'instant solution' is made by mixing 10 ml of EM, 40 ml of molasses and 950 ml of water and leaving it for five to seven days, depending on temperature. The solution is then added to 1 litre of molasses and 98 litres of water to obtain 100 litres of ready-to-use EM solution. This amount is enough for three pits. The EM solution functioning as accelerator reduces the composting period from three months to one month.

2.4 Cow Dung

Cow Dung can be defined as the undigested residue of consumed food material being excreted by herbivorous bovine animal species. Being a mixture of faeces and urine in the ratio of 3:1, it mainly consists of lignin, cellulose and hemicelluloses. It also contains 24 different minerals like nitrogen, potassium, along with trace amount of sulphur, iron, magnesium, copper, cobalt and manganese.

2.5 Windrow Process

In agriculture, windrow composting is the production of compost by piling organic matter or biodegradable waste, such as animal manure and crop residues, in long rows (*windrows*). This method is suited to producing large volumes of compost. These rows are generally turned to improve porosity and oxygen content, mix in or remove moisture, and redistribute cooler and hotter portions of the pile. Windrow composting is a commonly used farm scale composting method. Composting process control parameters include the initial ratios of carbon and nitrogen rich materials, the amount of bulking agent added to assure air porosity, the pile size, moisture content, and turning frequency.

3. Result and Discussion

Table 1.Final characteristics of solid wastes(organic fertilizers)

Nitrogen content	62.5%
pH	6.99
COD	89mg/l
BOD	220mg/l
Temperature	36°C
Moisture content	12%
Microorganisms	68%

4. Conclusion

Based on this treatment, test results and further analysis conclusions are drawn. The organic substance such as food, vegetable, fruit, paper, and agricultural etc such organic substance is biodegradable in nature. Now a day's generation of large amount of organic solid waste so there is provides conventional solid waste management system. However, for isolated institutional complex it is very difficult to provide conventional solid waste management system.

From the present study, it can be concluded that cow dung are potentially important creatures that are capable of transforming garbage into gold. It promotes environmental sustainability by converting a waste to a value-added product that improves our environment.

Future Implementation

As it reduces the municipal solid wastes in an effective manner without having any side effects to environment as well as human. By using EM solution and cow dung we can adopt this treatment in any kind of environment.

In future the burning of wastes will become high due to the increase in the rate of municipal solid wastes in India. It will lead to the increase of CO₂ concentration in the atmosphere.

Hence, this is the one way to reduce the waste from the burning of fossil fuels. Now, India has many cities which are lost their living suitability due to the increase of integrated solid wastes.

Example: Delhi, Mumbai and some cities of Chennai.

We recommend this municipal solid waste treatment in enlarged manner to reduce the air land and water pollution and bring back the cities to their previous status without wastes .

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