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Review Paper on Utilization and Degrade of floral waste generated from temples

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Abstract—**This study presents the Collection,handling, utilisation and management of the waste flowers that are coming out of the temples . As a part of clean India, this paper gives an idea to reduce the volume of Temple waste flowers by converting into compost ,biogas ,dye's extraction ,incense sticks etc. The flower waste mixed with cattle dung and perform vermicomposting process using Eisenia foetida earthworm species. Results of the study are highly encouraging. It was concluded that vermicomposting of Temple flower waste is an excellent method and eco-friendly to get valuable product.**

***Index Terms*— Floral waste, Vermicomposting, Temples, Eisenia foetida.**

I. INTRODUCTION

Environmental degradation is a major threat confronting the world. The primary causes of environmental degradation in a country could be attributed to rapid growth of population, over utilization of environmental resources, establishment of different multinational companies and local industries which adversely affect the natural resources and environment. Air pollution, water pollution, deforestation, thinning of the ozone layer, global warming, sanitation and outbreaks of diseases are the problems that are endangering human lives. Besides these, the problem of waste disposal can not be ruled out. Waste gets generated from almost each and every activity which we do and it eventually degrades the quality of human health and accelerates the deterioration of the environment in alarming proportion.

Recycling of wastes should be given priority in waste management practices and land disposal should be avoided as far as possible (Battacharayya et al., 1996).Recycling and reuse of solid waste helps to reduce the problem of waste disposal. As we intend to maximize the efficiency of resources to meet our growing needs, let us not neglect the fact that waste products have magnificent potential waiting to be harnessed. Nowadays we have a number of methods which are used for waste disposal like biomethanation, sanitary land filling etc; but the most economically viable method is vermicomposting. Organic matter in the waste stream can be used as a resource rather than going to landfills where it creates a range of environmental problems that are costly to ameliorate. All the biodegradable part of the community waste like agro industrial waste, food industry waste, vegetable market waste, kitchen waste etc can be converted into a vermicompost.A portion of this community waste also includes the waste that is coming out of the religious practices from places like Residential areas, Community centres, Temples, Mosques, Gurudwaras, etc which is still being neglected and requires due consideration. There is no segregation of this waste at the source of generation. It is well known that many of us avoid throwing the flowers and other items which are used in prayers in the garbage because of our religious beliefs and instead put it in the plastic bags and throw them directly into the water bodies. Some of it is also thrown near sacred trees with no suitable mode of disposal. Such disposal of waste creates problems like water pollution, foul odour, land pollution moreover it is not good aesthetically. So to solve this problem we can adopt sustainable techniques like vermicomposting and using microbes to enhance degredation as it is good for soil and promotes sustainable agriculture. Nevertheless, the biological process of vermicomposting presents a viable opportunity to decompose and convert the organic fraction of solid wastes into agriculturally useful organic fertilizers using earthworms. Also; the deleterious impact on the environment by chemical fertilizer urges the need for production of organic manure out of waste.

On one hand, these wastes are converted into agriculturally useful organic fertilizers which in turn have the potential to reduce the dependency on nonrenewable chemical fertilizers and pesticides, and, on the other, it controls waste which is a major pollutant and a consequence of increasing population, urbanization and intensive agriculture (Kaushik and Garg 2003). The widespread adoption of this technology can be interpreted as one with a double interest. The floral waste

generated can also be used for making natural Holi colours, rose water, essence and various ornamental purposes.

Biological processes such as composting followed by vermicomposting to convert flower waste into useful fertilizers.

Flowers are thoroughly washed and dried in the sun they are powdered and mixed with natural resins to make incense sticks. Coconut sales burned in open hair for three hours can produce coconut shell ash that can be used in partial replacement of cement.

Marigold flower extract and can be used as an additive in food Industries, Mahua flowers can be used in preparation of sugar syrup. The main objective of present study are to develop efficient technology like vermicomposting for environmentally safe management of temple solid waste.

The aim of the present study is to investigate the potential of bioconversion of floral waste of temples to vermicompost through biological process of vermicomposting and using microbes to enhance degradation. Vermicomposting by using microbes is one of the ecofriendly and ecologically sustainable technologies for waste management, since it overcomes the problem of organic waste disposal and also alleviates the odour problem.

II. REVIEW OF LITERATURE

A. Shweta et al (2006)

She concluded that flower waste is combination with dung gave faster multiplication but mixed dung for was best found substrate to increase the Biomass production.

B. Gaurav and Pathade (2011)

They used effluent produce from biogas digester and mixed with temple waste and cattle dung which was then allowed to decompose for a period of 30 days at 30 degree Celsius. The prepared vermicompost was also used for pot culture studies fertilizers with five flowering plant good growth parameters were obtained in terms of height, flowering time and number of flowers produced as compared to control sets which were not treated with vermicompost .

C. Shouche et al (2011)

Used various process like composting followed by vermicomposting to manage floral waste. They used different proportion of mixture of cattle dung and flower waste to prepare vermicompost various parameters like temperature, PH and moisture content ,which showed some periodic changes in the beginning were found stable in the end.

D. Jadhav et al (2013)

Have reportedly develop a microbial Consortium for the effective degradation of flower waste generated from temples. They collected small samples from the areas near and around the temples and isolated bacteria culture from them. Flower waste collected was dried and mixed with other medium solution and streaking were performed with selected soil sample for isolation. It was observed that microbial Consortium in has the digestion of the waste and the bio manure Consortium was found to have good quality without causing any harm to the environment.

E. Sailaja et al (2013)

As a result of their faster colouring and efficient ability of binding to natural and synthetic fibres and diverse color combination.

F. Singh P et al (2017)

Shown the potentiality of temple floral waste for extracting various valuable products. Study aimed to extract natural dye by using ultra sonic technique.

G. Hemant samadhiya (2017)

It concluded that one part of temple waste and one part of dung (1:1) are highly suitable combination of Eudrilus Eugeniae.

H. Akansha Mahindrakar 2018

It concludes that the challenges to utilization of waste and minimizing losses can be fulfilled by utilizing floral waste for or the other useful product .

I. Vermi Co 2001,

Tara Crescent 2003Earthworms serve as “nature’s plowman” to facilitate these functions. They form nature’s gift to produce good humus, which is the most precious material to fulfill the nutritional needs of crops. In short, earthworms, through a type of biological alchemy, are capable of transforming garbage into ‘gold’ .

J. Thakur,2006

Just any earthworm from the garden would not suffice.Vermicomposting requires a specific species of worms that is adapted to living in decomposing organic materials rather than the soil.Two such species are *Eisenia foetida*,more commonly known as the red worm,manure worm or red wiggler and *Lumbricus rubellus*.

K. Reinecke et al., 1992; Ghosh et al., 1999

The magnitude of the transformation of phosphorus forms is considerably higher in the case of earthworm-inoculated organic wastes, showing that vermicomposting may prove to be an efficient technology for providing better phosphorus nutrition from different organic wastes .

L. .Basker et al., 1993

The castings of earthworms may contain two to three times more available potassium than the surrounding soil . Earthworm castings have a higher ammonium concentration and waterholding capacity than bulk soil samples, and they constitute sites of high denitrification potential .

M. .Annual Budget 1998

In 1998, the Government of India announced exemption from tax liability to all those institutions, organizations and individuals in India practicing vermiculture on a commercial scale **.** Vermicomposting technology is known throughout the world. Normally, vermi-composting is preferred to microbial composting in small towns as it requires less mechanization and it is easy to operate.

N. Sinha, 1996

A few vermi composting plants generally of small size have been set up in some cities and towns in India, the largest plant being in Bangalore of about 100 MT/day capacities . Chennai, Mumbai, Indore, Jaipur and several other Indian cities are also setting up vermiculture farms.

O. Bhawalkar and Bhawalkar 1994

The Bhawalkar Earthworm Research Institute (BERI) at Pune in India is one of the largest non-governmental organizations involved in vermiculture practice and is operating a

vermiculture plant on a commercial scale for the management of municipal wastes .

III. PLAN OF WORK

1. Selection of Temples
2. Regular visit to temples
3. Data will be collected through questionnaire regarding the quantity of the floral waste generated and methods of disposal used.
4. Characterization of waste
5. Flowers will be segregated from the pile of waste, than the flower present in the maximum amount will be selected for analysis
6. Floral waste will be shredded, air dried and precomposted
7. The earthen pots with the hole at the bottom for aeration will be used Verm beds will be prepared by mixing the processed waste with cow dung in different proportions viz., 50:50, 60:40,70:30,80:20 and 90:10
8. Control (floral waste+cowdung) experimental medium will also be prepared in the same proportion
9. Experiments will be carried out in triplicates Pots will be left undisturbed for 60 days and regular monitoring will be done at 30, 45 & finally 60 day.
10. Watering will be done once in a day
11. Vermicompost will be collected, sieved, air dried and analyzed
12. Quality of vermicompost will be assessed through analysis and will be compared with other organic wastes.

The present study will involve the following steps

- **Selection of Temples-**

Popular temples have been selected.

- **Visit to Temples-**

Regular visit to the selected temples will be made for collecting primary and secondary data.

- **Collection of data-**

The questions will be asked regarding visitors, the quantity of the waste generated in a month and during festive season and the method of disposal used by different temples.

- **Collection of waste-**

Floral Waste will be collected from the selected temples.

- **Characterization of waste-**

The waste that is coming out of the temples contains flower, cotton, matchsticks, incense sticks, kumkum, food items, coconut etc.This waste will be characterized as biodegradable and nonbiodegradable.

- **Segregation of Biodegradable waste(flowers):**

From the biodegradable waste, flowers will be segregated from this the different flower will further be separated.

- **Sample Processing—Pre-Composting-**

The selected floral waste will be air dried spreading over a polythene sheet for 48 hours. The air dried samples will then be pre-composted for three weeks before putting into vermicomposting and composting process. Pre-composting is the pre processed and pretreated practice of raw waste. The pre-composting because of its thermophilic nature prior to vermicomposting will help in mass reduction and pathogen reduction (Nair, Sekiozoic, & Anda, 2006). The waste materials, in the precomposting process will be decomposed aerobically by the active role of bacteria.

- **Experimental Design-**

In each pot a measured amount of the substrate (floral waste), mixed with cow dung (will act as inoculant) in different proportions viz., 50:50, 60:40,70:30,80:20 and 90:10 will be taken for vermicomposting and composting. The cow dung will be used as an inoculant in the vermicomposting process to enhance the quality of feeding resource attracting the earthworms and to accelerate the breakdown of wastes (Suthar and Singh, 2008). All the above ratios will be in triplicates and a control (without worms) will be maintained in the same proportion. All the pots will be covered on the top by a jute cloth and a wire mesh to prevent and protect the earthworms from the predators—centipedes, moles and shrews. Small holes will be drilled at the bottom of each pot for air circulation and easy drainage. The process of vermicomposting and composting will be carried out for a period of 60 days. The temperature and moisture content will be maintained by sprinkling adequate quantity of water at frequent intervals.

IV. CONCLUSION

During composting, organic matter does not only undergo processes of degradation but is also involved in re-synthesis and polymerization reactions that result in the formation of humic- like substances. The term evolution refers to the general transformation of compost organic matter between the non-humic and humic-like fractions. The phenomena that occur during the composting process, that describe the changes in stability and maturity as well as the evolution of organic matter, are closely related and amongst the indices used to evaluate these changes.

All the three composting processes studied showed a good efficiency in reducing feedstock oxygen demand with composting time. On comparing all the values at last, the tray T4 added with Microbes for Composting was more efficient among all the samples because the parameters like organic carbon value was less compared to remaining samples and also plants would grow better when we provided ambient nutrients to them. Nutrients were rich in Sample T4, incorporated with Microbes for Composting while compared to other four samples. So that we can conclude that the compost which was done by Microbes for Composting was better with compared to Industrial microbes, bio-microbes, molasses, and natural.

It was expected that the work would result in better and low cost option for the composting of solid waste and it would help the players in the field of waste management and plant growth promotion. The self-prepared Em can be used at larger scale. The self-prepared Em has potential for large production.

The tray without any inoculum showed satisfactory result in terms of rate of composting but other trays with inoculum added had advantage of achieving thermophilic phase early.

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