



**Biotica
Research
Today**
Vol 4:6
2022

406
408

Terracotta Composters: A Simple and Space- Efficient Solution for Converting Urban Organic Waste into Black Gold

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Open Access

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Keywords

Biodegradable, Organic, Terracotta composters, Waste

Article History

Received on: 28th May 2022

Revised on: 07th June 2022

Accepted on: 08th June 2022

E-mail: bioticapublications@gmail.com

How to cite this article?

Verma and Adarsh, 2022. Terracotta Composters: A Simple and Space-Efficient Solution for Converting Urban Organic Waste into Black Gold. *Biotica Research Today* 4(6):406-408.

Abstract

Organic or biodegradable waste management is a major problem across the globe especially in growing urban areas. The improper disposal of this waste is polluting the environment requiring urgent action. Composting is a simple and easy solution for biodegradable waste management; however, rapid urbanization and population growth has severely limited the availability of space owing to which traditional composting methods cannot be adopted in these settings. Terracotta composters requiring very limited space can serve as a simple, space-efficient and economical solution for managing the growing problem of organic waste for urban dwellers.

Introduction

Globally, about 2.01 billion tonnes of solid waste is generated each year. Growing population and rapid urban expansion are expected to increase this waste generation by 70 percent to 3.40 billion by 2050 (Kaza *et al.*, 2018). Solid waste can be classified into five major categories viz. recyclable materials (glass, metals *etc.*), composite waste (tetra packs, toys, clothing), biodegradable waste, inert waste (construction and demolition debris, rocks, dirt) and domestic hazardous waste (e-waste, detergents *etc.*).

In India, biodegradable or organic waste (that is, kitchen and garden waste) makes up for about 50 percent of the solid waste produced in the country (World Bank, 2021). This huge amount of organic waste generated on a daily basis is mostly dumped into landfills, burned or disposed into water bodies. This is a serious problem that needs an urgent cost-effective and easy solution. Furthermore, the potential of this soil enriching resource is lost after it is collected from homes and dumped into landfills. The lack of proper management and disposal of this waste has a domino effect on the environment. This waste causes compaction in landfills and its decomposition leads to the production of methane; a potent greenhouse gas associated with global warming.

The effect of this organic waste accumulation is not restricted to air pollution alone. The degradation of this waste along with percolating rainwater leads to the formation of a highly contaminated liquid called 'leachate' which contaminates not only the soil but also the groundwater. Thus, landfill dumping of organic wastes leads to the pollution of air, soil and water.

Composting of the organic waste at household level is a simple way of managing this organic waste crisis.

Composting for Organic Waste Management

Composting is the natural process of breaking down the organic material into manure and serves a dual purpose. It prevents this precious organic resource from being dumped into landfills and at the same time aids in decreasing environmental pollution. However, the lack of space in urban areas which is dominated by apartments and high-rises has been a major barrier for the adoption of composting by the urban population. Outdoor methods such as heap composting, pit composting and trench composting cannot be carried out in apartments owing to their large space requirements.

Terracotta Composters

Composters made from terracotta are a simple tool that addresses this problem of space constraint and can be used for decomposing the household kitchen organic waste into rich compost.

The word 'terracotta' is of Italian origin and literally translates to 'baked earth' or 'cooked earth'. It is a reddish-brown porous clay which is used as a medium for making vessels, bricks, sculptures etc. The clay is shaped in the desired form, dried and heated over a burning material or in an oven.

Terracotta composters are being used for decomposing household organic waste since ancient times. Terracotta is highly suitable for making composters as the porosity of the material facilitates aeration of the compost pile and allows maintenance of optimum moisture. Furthermore, it is available in plenty, is cheap and versatile as it can be moulded into the desired shape.

These composters are easy to set-up and can be easily kept in a small corner of the balcony, terrace or garden. They can also be easily moved around as they are light-weight. Also, no foul odour is produced during the composting process. However, terracotta vessels are easily breakable and hence need to be kept away from pets and children.

Types of Terracotta Composters

Terracotta composters can be categorized into the following three types (Figure 1), as follows.

1. 'Khamba' Type

These are stack composters having 3 or 4 stackable terracotta units with a lid on the top of the uppermost unit. The unit at the bottom is the base whereas the ones placed above it are the working units. They are ideal for single households having 4 to 5 family members and can handle 1 Kg kitchen waste every day. These composters occupy very little space owing to the stackable design and can be kept in the balcony, terrace or utility area in apartments and bungalows.

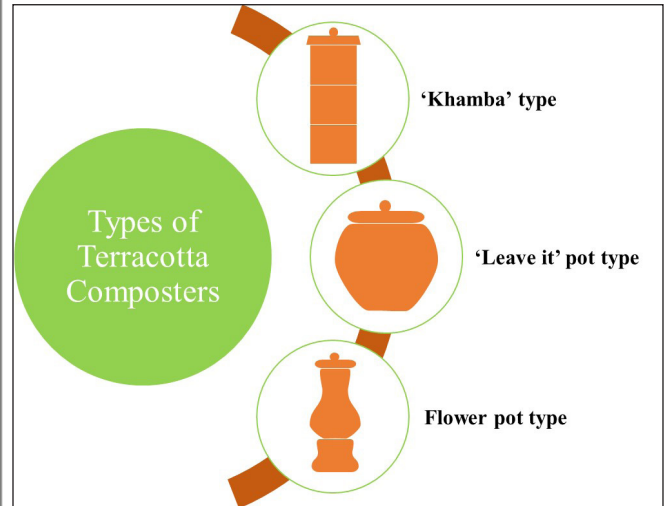


Figure 1: Various types of terracotta composters

2. 'Leave It' Pot Type

The 'leave it' pot composter is a single terracotta unit with lid which can be used for either composting (by using them in pairs as row composters) or as a maturation unit for half-done compost. It can also be used for storing the prepared compost. These are ideal for large family homes or small residential complexes with outdoor spaces. Two or more 'leave it' pots can be lined up as row composters and can serve as an efficient alternative for the 'khamba' type, especially for elderly individuals who want to avoid lifting and shifting units.

3. Flower Pot Type

Flower pot composters are used for decomposing only flower wastes. They consist of a base unit, a top unit and a lid. These occupy very less space and are ideal for composting prayer flowers, leaves and cotton threads.

Composting using Terracotta Composters

The process of composting using these composters is very simple. It takes barely 5-10 minutes for the initial setting up of the composters. Once the setup is ready, the organic kitchen waste needs to be periodically added along with layers of dried leaves and composting/ microbial mixture. Cocopeat powder can be added which acts as an odour and moisture controlling agent. It takes about 4-6 weeks for converting the organic waste into rich manure which can be used for house plants and gardens. Thus, terracotta composters prove to be extremely useful in converting the household organic waste into compost (black gold).

Conclusion

Use of terracotta composters at the household level is a simple solution that can help to tackle the problem of increasing organic waste in space limited urban settings. It decreases the burden on landfills and also reduces

the production of greenhouse gases. Furthermore, the compost that is produced can be used to enrich and increase the productivity of the soil to which it is added. Use of this compost decreases the need of purchasing chemical fertilizers and the sale of the compost can also serve as an alternative source of income for individuals.

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