

Study of composting in a Portuguese urban area

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The municipal solid wastes (MSW) can be treated by several process such as anaerobic digestion, composting and incineration (Kundariya *et al.*, 2021). The production of organic waste (e.g. food waste and grass) in urban zones is a relevant environmental problem in view of the growth in high population density areas. In Europe the household recycling target is 70% by 2030 to move towards a sustainable and resource efficient society (Araya, 2018).

Portugal has the target to implement the separative collection of biowaste from MSW by 2023 and to improve the treatment of biowaste by 2030, contributing to recycling municipal waste and reducing landfill of MSW. According to the Portuguese Decree-Law No. 102-D/2020 biowaste is defined as a “biodegradable waste from gardens and parks, food and kitchen waste from homes, offices, restaurants, wholesalers, canteens, catering and retail units and similar waste from food processing plants”. All these biowaste sources are undergo alterations in order to contribute to achieve the desired goal.

To promote the circular economy with the lowest environmental impact, solutions such as composting, should be applied as close as possible to the place of waste production. Composting is a biological process that occurs under aerobic conditions, consisting in the organic waste’s transformation into compost, a mixture of materials suitable to fertilize and improve the soils. In the composting biological process, it is essential to create the adequate temperature and moisture conditions (Azim *et al.*, 2018), being important to carefully advise the operatives about the process details. Several Portuguese municipalities are nowadays promoting domestic composting in urban areas, particularly in house with a yard, apartment balconies and community gardens. Also, schools and universities are contributing to the process awareness, implementing domestic composting for biowaste produced in campus, namely in canteens, bars, and gardens.

Currently the equipment used for domestic composters have a typical capacity between 300 – 480 L (Figure 1.a) and the community composter a larger capacity, about 1,000 L (Figure 1.b).

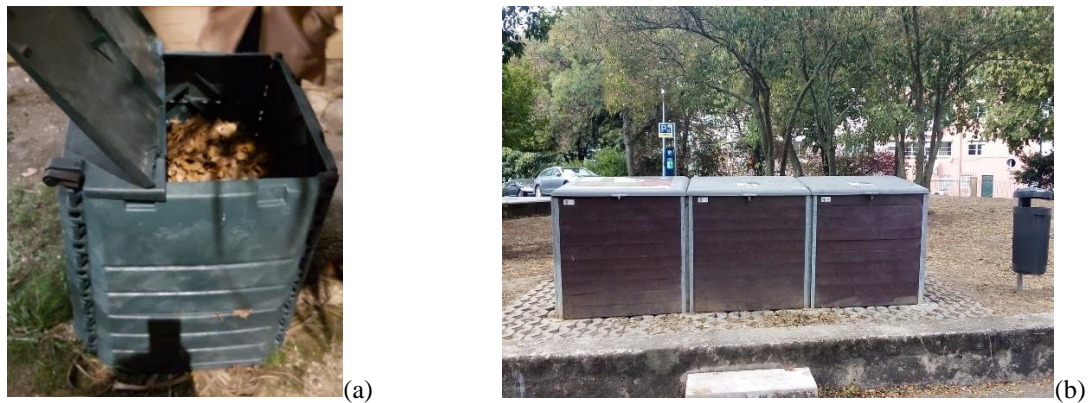


Figure 1. Typical composters: (a) domestic type and (b) community type (CMLisboa)

The present work intends to analyse and evaluate the community composting of an urban area, in order to collect data to contribute for reduction of the waste sent to further treatment system. Also aiming the circular economy with the application of the compost product as a fertilizer for urban and vegetable gardens. To achieve the objective of the present work, several topics will be carried out: the characterization of community composting in the selected population, analysis of the adequacy of existing composting equipment, monitoring of community composter by analysing over time different parameters (e.g. temperature, humidity, total and volatile solids, etc.), application of numerical modelling and proposal for measures to improve community composting.

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