

## Abstract

### A Study on Dry Leaf Composting in Reused Small-Size Bottle

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**Abstract**— Daily falling tree leaves generate a large number of dry leaves that requires a proper management. Among traditional waste disposal methods, composting is considered more sustainable and eco-friendly for handling the leaf waste. The final product of the process is an organic fertilizer (compost) which is very useful to apply for soil amendment. However, the composting of dry leaves has difficulties because a degradation of the material is a time-consuming process. This paper proposed a way to increase the rate of dry leaf degradation in a composting process. A survey of literature to investigate major factors affecting composting process and experiments on dry leaf composting in a small-size reactor made of discarded water bottles were conducted. Operational conditions in the experiments were based on the most recommended values including the C/N ratio of 25, the moisture of 60%, and the particle size of 3.35-20 mm. From experimental results, the co-composting of dry leaves and vegetable waste under the above conditions resulted in 31.2% reduction of organic matter within three weeks. The final product of the co-composting contained a C/N ratio of 14.3 indicating the maturity of the obtained compost. It was found that the initial ratio of C/N in composting material played a key role among other factors. This was evidently indicated by comparing degradation rates in terms of organic matter reduction between the composting of dry leaves with the C/N ratio adjustment and that without the C/N adjustment. The reduction of organic matter in the first case was nearly twofold that of the second one within the same period.

**Keywords**— compost, dry leaves, C/N ratio, reused bottle, organic waste, waste management