

Quality Evaluation of the Compost Produced From Water Hyacinth and Cow Dung at Different Mixing Ratios

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Abstract

Eichhornia crassipes (water hyacinth) is a noxious aquatic weed which can cause series of problems in aquatic eco-systems. In Sri Lanka there is an island wide distribution of water hyacinth and currently 45% of the water bodies have infested by water hyacinth. However, if they are properly managed, it will help to community in numerous ways such as improving the water quality, producing alternatives for fertilizer animal feed, etc. The objective of this study were to produce compost from water hyacinth in combination with cow dung as the co-composting material and saw dust as the bulking agent, and to evaluate the compost quality at different mixing ratios of raw materials. The experiment was conducted with 5 treatments and 3 replicates and the treatments were allocated based on the C:N ratios (within the accepted range) and the percentage of bulking agent. Five treatments were, T1-C:N ratio of 20:1 with 10% sawdust, T2-30:1 with 10% sawdust, T3-40:1 with 10% sawdust, T4-30:1 with 5% saw dust and T5-30:1 with no sawdust. Compost piles were tested for temperature, moisture, EC and bulk density throughout the composting process at weekly intervals and the quality of the composts was analysed (after 12 weeks) and compared with the Sri Lankan standards. Maximum temperature at the beginning of the second week was recorded as 54.2 °C in treatment 1. Compared to the final compost quality standards C, N, K, Ca and Cr all the treatments were within the recommended levels. However, C:N ratio was low (high N) in all treatments except treatment T3 (~25:1) and EC was in the recommended level in all the treatment except treatment T3 (~4.8 dS/m). The moisture was higher than that of the recommended range (20-40%). Maintaining the moisture during the composting is essential since it affects the final compost quality. Based on the results of the study, all mixing ratios of raw material can be used for the production of compost since all treatments matched the greater than 6 important quality parameters out of 10. However, phyto-toxicity test should also be performed before application to ensure the safety of compost.

Keywords: Compost, Compost quality, Cow dung, Water hyacinth

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