Potential of Composting Kitchen Waste with Black Soldier Fly (*Hermitia illusence*)

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Compost is a cheap source of plant nutrients and a soil amendment. Management of kitchen waste (KW) is a challenging task due to reasons such as development of unacceptable odor and house flies. Black soldier fly (BSF)-aided composting of KW can minimize the challenges mentioned previously; hence, this study was conducted with the objective of determining the potential of BSF larvae for rapid composting of KW. Combination of vegetable waste (VW) and fish wastes (FW) was taken as treatments, simulating KW, with and without BSF larvae. After 15 days, amount of compost in treatments was measured, and compost percentage was calculated on a dry weight basis. In addition, survival of BSF larvae in treatments and effect of temperature on survival of pupae were examined. Composting percentage was significantly different ($F_{(5, 18)}$ =27.8 $P<0.05$) among the treatments (5-79%). The highest composting percentage (79%) was found in the treatment; vegetable and fish waste (1:1) (VFW) with BSF larvae. The least composting percentage was found in VW (5%) without BSF larvae. Adding of BSF larvae has a significant ($P<0.05$) effect on composting. The interaction between media and presence/absence of larvae was not significant ($P>0.05$). There was a significant difference among ($F_{(2, 27)}$ =186 $P<0.05$) the three media in relation to BSF larvae survival; the highest survival (43.9±0.6) was in VFW followed by VW (33.8±0.9) and FW (24.2±0.5). Temperatures (26-34 °C) significantly ($P<0.05$) affected the survival of BSF larvae. The highest survival rate was found at 30 °C. Based on the results, it can be concluded that vegetable and fish waste can be rapidly decomposed by using BSF larvae and it is beneficial to use BSF larvae in composting.

Keywords: Black soldier fly, Composting, Kitchen waste, Temperature, Waste combinations

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