

Assessing the efficiency of the black soldier fly (*hermetia illucens* L.) larvae as bioconversion agent for ground Banana peels

ABSTRACT

Black Soldier Fly larvae (BSFL) are insect larvae that can be utilized as a bioconversion agent. In this research, BSFL larvae were used as a bioconversion agent on ground banana peels (GBP) and chicken feed (CF). This research determined the effect of GBP as diet on larval weight increment (LWI), larval development time (LD), and the ability of BSFL to convert the GBP based on Approximate Digestibility (AD), Weight Reduction Index (WRI), and Efficiency of Conversion of Digested food (ECD). The study used 10-day-old BSFLs, which were fed with constant food amount of CF and GBP at levels of 50 g/day and different numbers of larvae (100, 200 and 300) were utilized. The experiment was arranged as a randomized complete block design, with four replicates for each diet. Results showed that BSFL fed with CF has a better LWI (ranging between 1.33 ± 0.38 g/d to 1.38 ± 0.39 g/d). The LD results show that CF fed larvae resulted in faster development time (12 ± 0.000001 days) compared to GBP fed larvae (30 ± 0.14 days). The study also found that a greater number of larvae resulted in a more efficient bioconversion activity, where 300 larvae resulted in higher values for key parameters such AD (%), WRI (%) and ECD (%), compared to 200 and 100 larvae. The correlation analysis revealed no significant and weak negative relationship between the number of larvae and LD that were fed with CF ($R^2 = -0.237$, $P > 0.05$). Similarly, when fed with GBP, there was no significant and weak positive relationship ($R^2 = 0.118$, $P > 0.05$) between the number of larvae and LD. Conversely, there was a highly significant strong positive relationship between the number of larvae with ECD when fed with CF ($R^2 = 0.946$, $P < 0.001$) and GBP ($R^2 = 0.946$, $P < 0.001$). In conclusion, the findings indicate that BSFLs fed with GBP have low WRI (%) and ECD (%).