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**Bioconversion of rubber seed to produce protein and oil rich-biomass employing black soldier fly larvae assisted by microbes****Muhammad Yusuf Abduh**

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A co-conversion process using black soldier fly larvae (*Hermetia illucens*) and microbes was studied to convert rubber seed into insect biomass containing high amount of protein and oil. De-oiled rubber seeds (cake to shell ratio of 2.5 wt.%) was mixed with water (water to biomass ratio of 1.5-2.3 wt.%) and pre-treated with two types of microbes; liquid culture of *Aspergillus niger* ( $10^7$  spore/ml) and biostaff solution containing consortium of microbes ( $10^7$  cell/ml). Black soldier fly larvae were reared in rearing containers (6.8×6.8 cm) with a larval density of 5 larvae/cm<sup>2</sup> and a feeding rate of 68 mg/larvae/d. The rearing containers were subjected with different shade rate (25-98%). After 12 days of treatment, the final average weight of the prepupae lies in the range of 7.2 to 19.5 g with an estimated biomass productivity of 133 to 358 g/m<sup>2</sup>.d. The efficiency of black soldier fly larvae in converting the digested feed is 12.5 to 25.9% with an assimilation efficiency of 22.9 to 28.7%. The waste reduction index is estimated at 2.1 to 2.6. The protein and oil content of the prepupae was analyzed to evaluate the potential of pre-treated rubber seed as a substrate for the cultivation of black soldier fly larvae to produce protein and oil-rich biomass. The prepupal biomass has a relatively high protein (28.6-55.2 wt.%, d.b.) and oil content (18.9 to 28.3 wt.%, d.) and is suitable for application as cattle feed.

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