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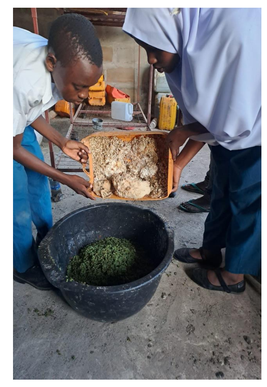
THE USE OF BLACK SOLDIER FLIES IN WASTE MANAGEMENT AND RECYCLING

Mustafa Juma Omary and Hadija Mohamed Ramadhani
Kivinje Secondary School



Introduction

Black soldier fly Larvae are insects that eat dead animals, rotten vegetable plants and recycle food waste into high-quality protein, which can be effective in recycling waste and help our environment at Kivinje community much better. Black soldier fly larvae (BSFL) feed voraciously on various types of organic waste, including food wastes, agro-industrial by-products, and chicken and dairy manure, and reduce the initial weight of the organic waste by about 50% in a shorter period than conventional composting.recycling organic waste material (Bio waste) is still fairly limited especially at Kivinje community, our project deals with organic waste from house holds and commercial activities example food remains, rotten vegetables,banana peels,rotten avocados , cabbages and waste from animal manure. They can eat large quantities of organic waste, converting it into nutrient-dense animal feed in just weeks.

Project objective

This project aims to determine whether the Black solder flies specifically the larvae are able in managing the waste and recycling them in controlling the amount of waste produced.

Project expectation

If successfully proved to be viable, the outcome of the project will help to promote good health as most of the epidermic diseases will be eradicated , clean environment and increase nutritional value to the agricultural industry as a result of recycling of the organic waste [frass] and livestock food rich in protein will be obtained.

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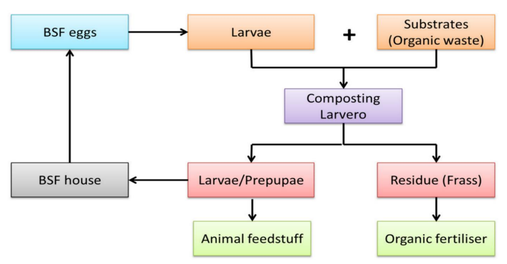
Method

The project was conducted using material below as indicated.

- Nylon net
- Sweep net
- Four big containers
- Water bowl with lead
- Wooden sheets with push pin which creates a gap allowing space for egg package.
- Gloves
- Weighing balance which was used to measure the amount of organic waste consumed.
- Stop watch
- Glucouse

Substrate	subject
Food waste	Carbon and nitrogen conversion in food waste by BSFL.
Fruit and vegetable waste	The potential of fruit and vegetables waste as rearing media for BSFL.
Poultry feed	The BSFL nutrition composition changes throughout its life cycle.
Animal manure	Comparison of the suitability of different manure as a feeding substrate for BSFL.



In conducting our experiment, two sets were prepared set A and set B.

In set A

the BSF flies were left free in the garden area and some organic waste material were kept around the area. The BSF flies flew from one point to another while laying there eggs randomly.

In set B

10 BSF flies were captured using a sweep net and were carefully placed inside the nylon net to prevent them from escaping and keeping them away from predators. Monitoring process started to obtain the laid eggs initially which will then provide us with the larva after hatching process has taken place.

The BSF flies were all provided with water containing glucouse to energies them during the process of laying eggs, also around the constructed set one big container containing mixture of organic manure and the animal manure so as to produce a strong odor which will stimulate the BSF flies in laying of eggs, the lay their eggs in a wooden sheet. this process takes place from 1 to 4 days and after each BSF has laid the eggs it dies out for a new cycle to start.

Results

A particular concern with BSFL organic waste treatment is its varying reliability and efficiency. In our project we have used various types of organic waste as a substrate in BSF treatment, including kitchen waste, poultry waste, dairy manure, and human feces. Tinder contended that the macronutrients in organic wastes, such as protein, carbohydrates, fibers, and lipids, have a considerable influence on the process performance. Protein is an essential nutrient in larval feeding substrates because of its significant positive effect on larval development. The different nutrient contents of the organic wastes determine the BSFL's performance. The efficiency of BSFL treatment is dependent on the type, quantity, and quality of feed, and also various environmental factors.

The containers were all refilled with the organic wastes every after 3 days and the process continued for 30 days when the larvae developed to pupa a stage in which they no longer feed but remains dormant to wait for the transformation back to adult flies.

Students collecting **eggs from the wooden sheet laid** by the BSF flies

Several experiments were conducted while varying the amount of waste and BSF flies in which the amount of both were increased every month from May to November.

Since the containers with larvae were refilled every after 3 days, it was observed that the larva was rapidly increasing in size and they increased the amount of waste which they were decomposing.

Below is the table which summarizes the feeding process.

No/ of days	Waste in kg's	Type of waste	Size larva	nature
Day 1	2	Rotten avocados, vegetables	0.08cm	Egg to larvae
Day 3	4	Rotten avocados, vegetables, banana peels and pumba	0.12cm	larvae
Day6	10	Food remain,rotten vegetables, cabages	0.25cm	Larvae
Day 10	18	Vegetables, banana peels,rotten tomatoes.	0.45cm	larvae
Day 15	25	Vegetables, banana peels,rotten tomatoes.	0.80cm	larvae
Day 18	32	Vegetables, banana peels,rotten tomatoes.	1.00cm	larvae
Day 25	45	Vegetables, banana peels,rotten tomatoes.	1.5cm	larvae
Day 29	55	Vegetables, banana peels,	2.00cm	Larvae to pupa

Conclusion

People at kivinje community should consider using the Black soldier flies as a mean of controlling waste in the environment which may lead to disease and make the appropriate use of the recycled nutrients produced by the flies to increase production of poultry and other organisms like fish.

References

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