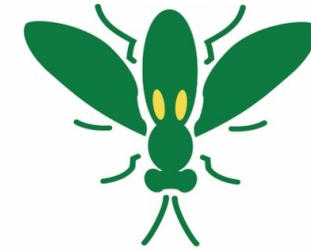


Behavioral Responses of Black Soldier Fly,
Hermetia Illucens,(L.)(Diptera:
Stratiomyidae) to Olfactory Stimuli:
Evaluation using an Olfactometer.

Aline Spindola, PhD

Entomologist – R&D/Innovation Team



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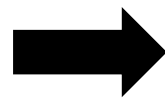
Breaking down organic matter...



OZANKUTSALY/iStock via Getty Images

- Bacteria communities
- Protozoa
- Fungi
- Invertebrate and Vertebrate scavengers

Microbial interkingdom interactions



Volatile organic compounds (VOCs)

Brundage, A. et al., 2017



Ecology

- Secondary colonizers
- Generalists

Li et al, 2016

Some of the challenges when breeding BSF flies at industrial scale:

- Eggs being laid outside of egg collectors
- Large variability on egg/neonate collection within the same batch

Male harassment towards mated/gravid females due to mating arena and oviposition site usually confined in the same spot

Helinski & Harrington, 2012

Optimal mating cage internal arrangement



<https://proteinproducts11c.com>

- Egg attractant + Collector placed far from mating arena
- Breeding lights pointed towards to mating arena and avoiding oviposition site

Project research goals

Determine olfactory behavior response of BSF adults to VOCs depending on sex and physiological state

Identify VOCs and respective concentrations that will lure gravid females

Research question addressed – Phase I

- Would BSF females, depending on their physiological state, respond differently to EF In-house attractant?

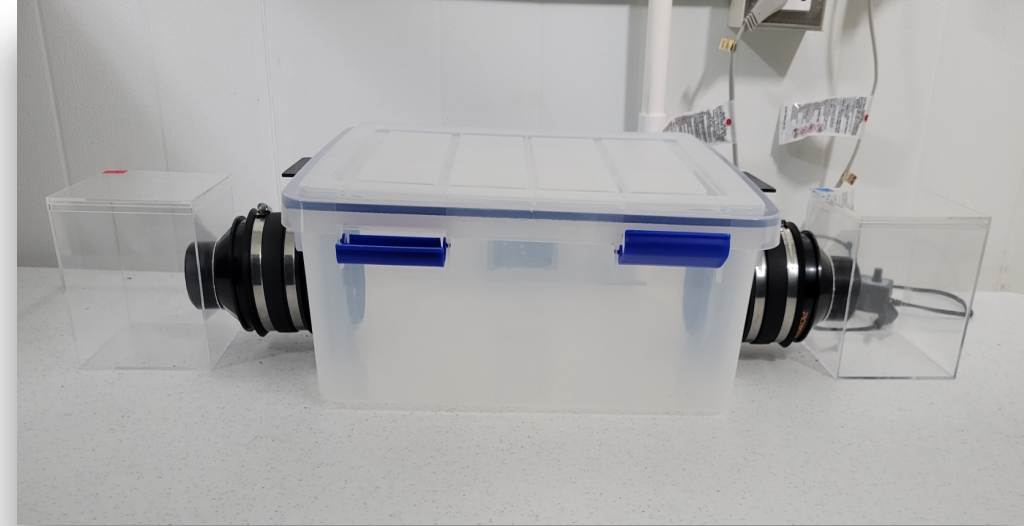
Experiment design



Pupae were selected for same ind. wt [180mg]



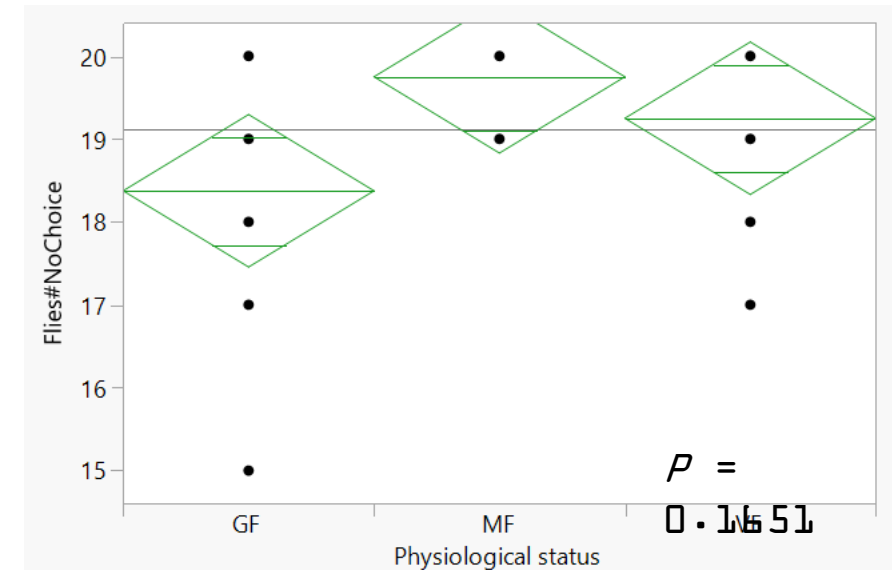
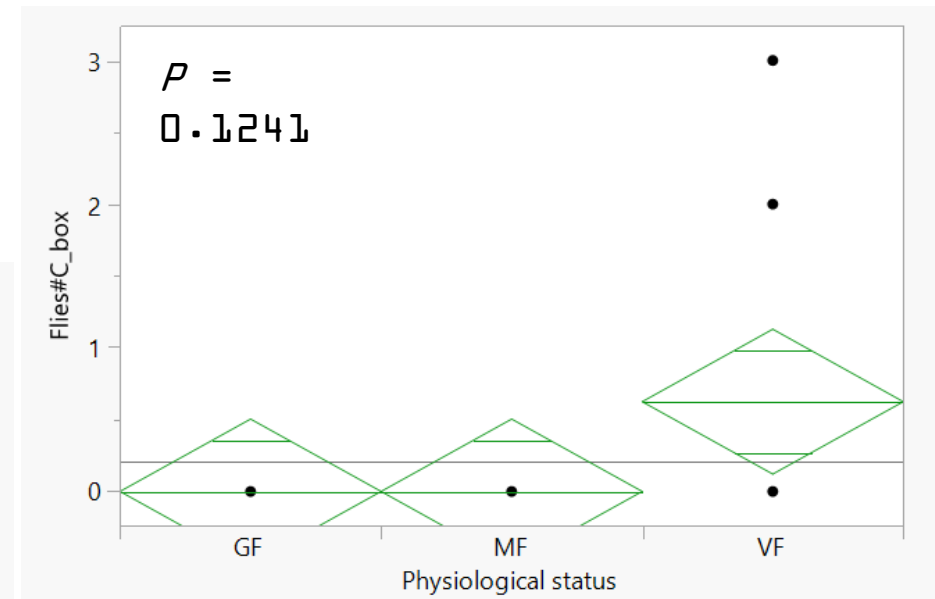
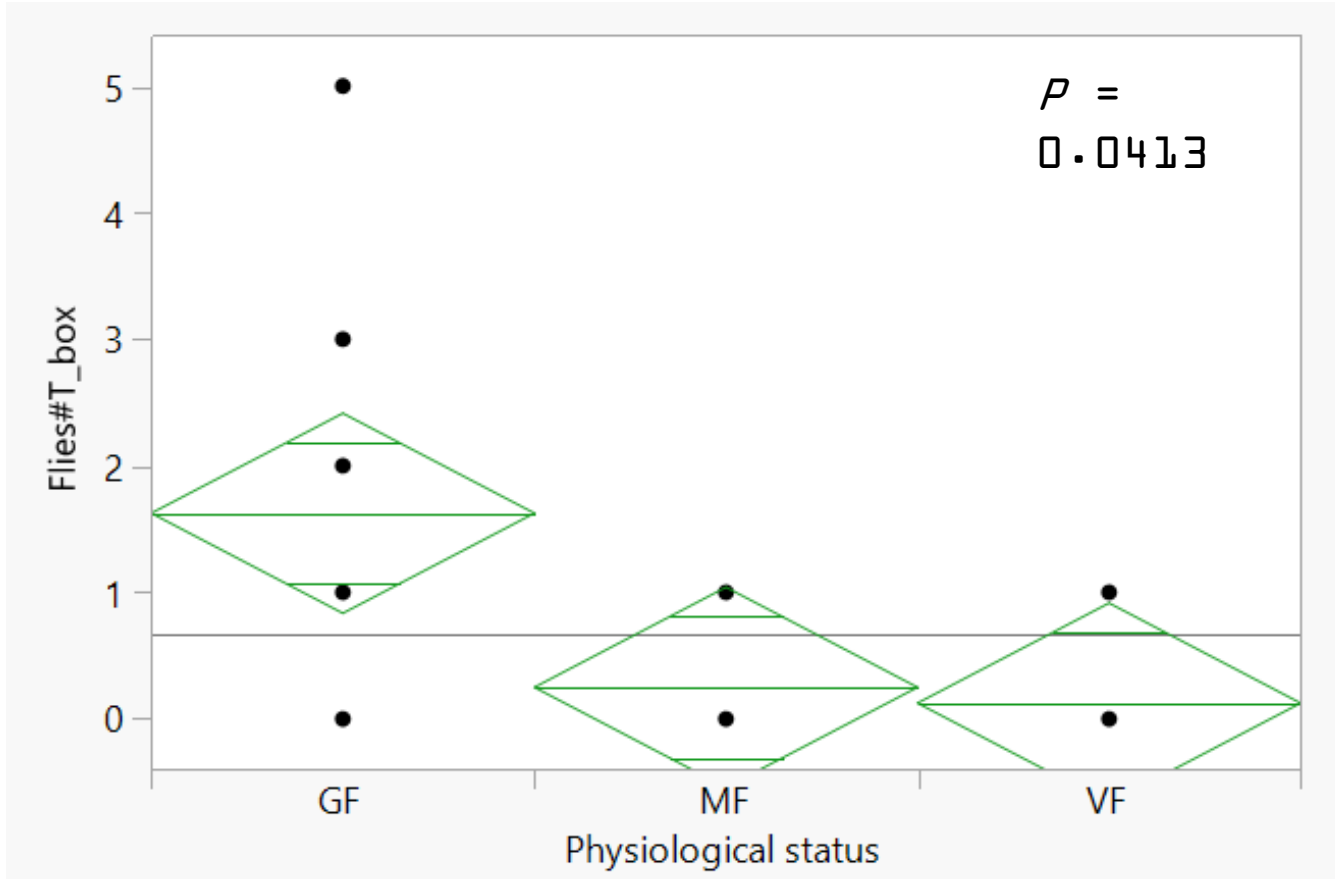
Females were mated and couples held into mating chambers until copula was finished.



Olfactometer design
Speed air flow: 0.10m/s

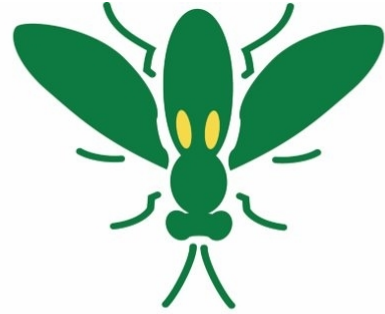
- A total of 16 flies/groups were tested
- 20 per round

Results



Preliminary discussion

- Behavior response were low:
 - Olfactometer designer may not be ideal
 - Test response using different amounts of attractant and isolated volatiles



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