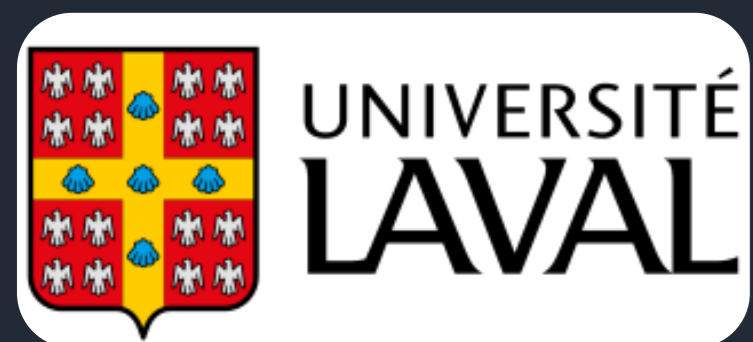


# Impact of Microbiota on Development: Rearing Axenic Black Soldier Fly (*Hermetia illucens*) Larvae

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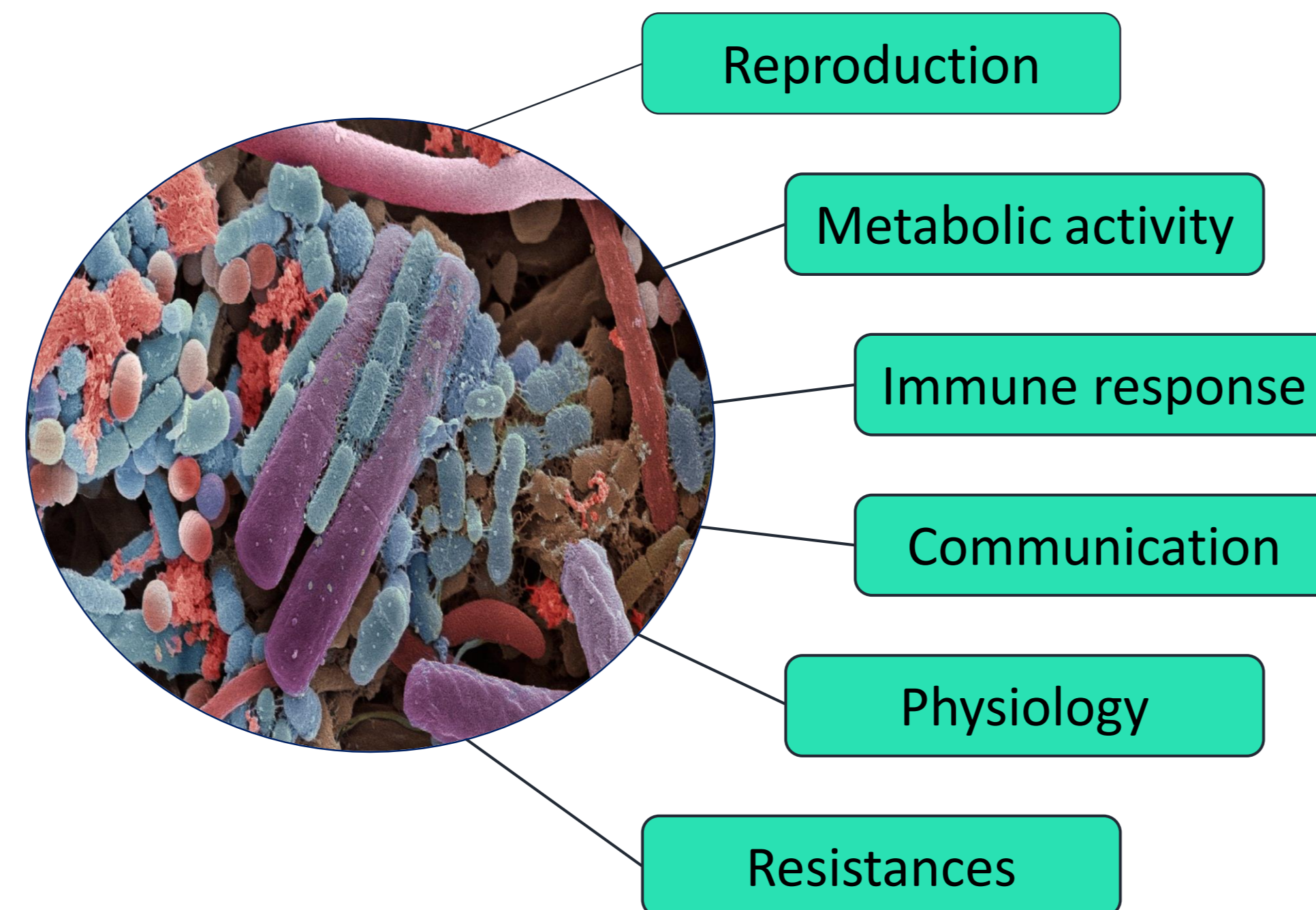
## Introduction



*Hermetia illucens* (BSF):

- The larva develop by eating animal & vegetal waste
- The larva is used as animal feed
- The larva has antimicrobial capacities
- Microbiological aspects of BSF health status, ontology and physiological performance have been neglected

## Microbiota influences the host



### Axenic BSF larva:

Larva without any other organisms (no microbiota)

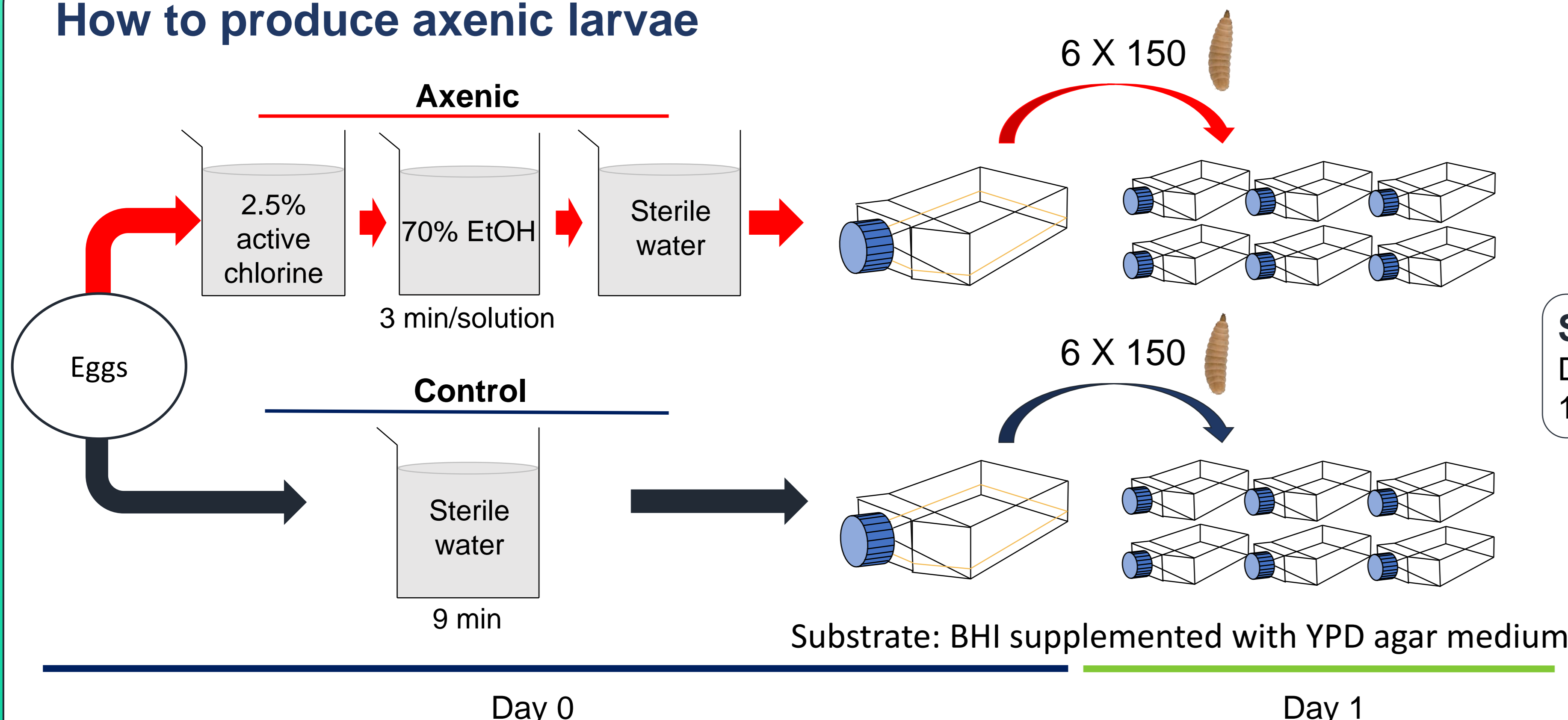
## Objectives

We aim to develop a BSF larvae rearing experimental model in which we can control factors that modulate host-microbiota functional interactions and more specifically to:

- 1) Determine if larvae can be reared in axenic conditions
- 2) Determine if axenic conditions affect BSF larvae development (body length)

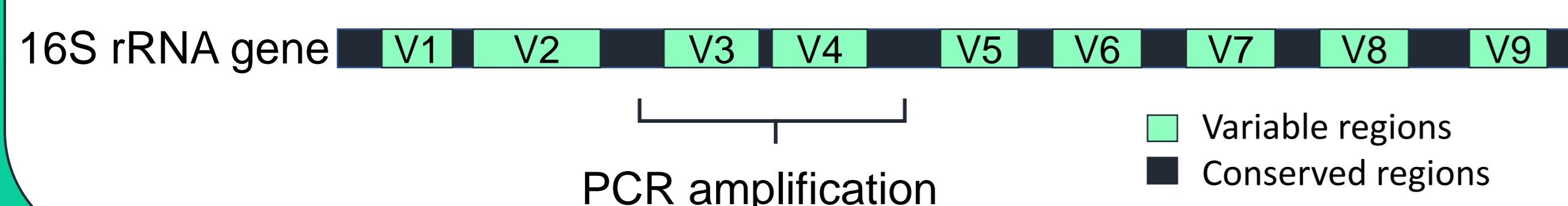
## Material and Methods

### How to produce axenic larvae



### How to verify the axenic conditions

16S rRNA: ribosome subunit specific to prokaryotes



**Agarose gel migration:**  
Band = prokaryote present  
No band = prokaryote absent

## Results

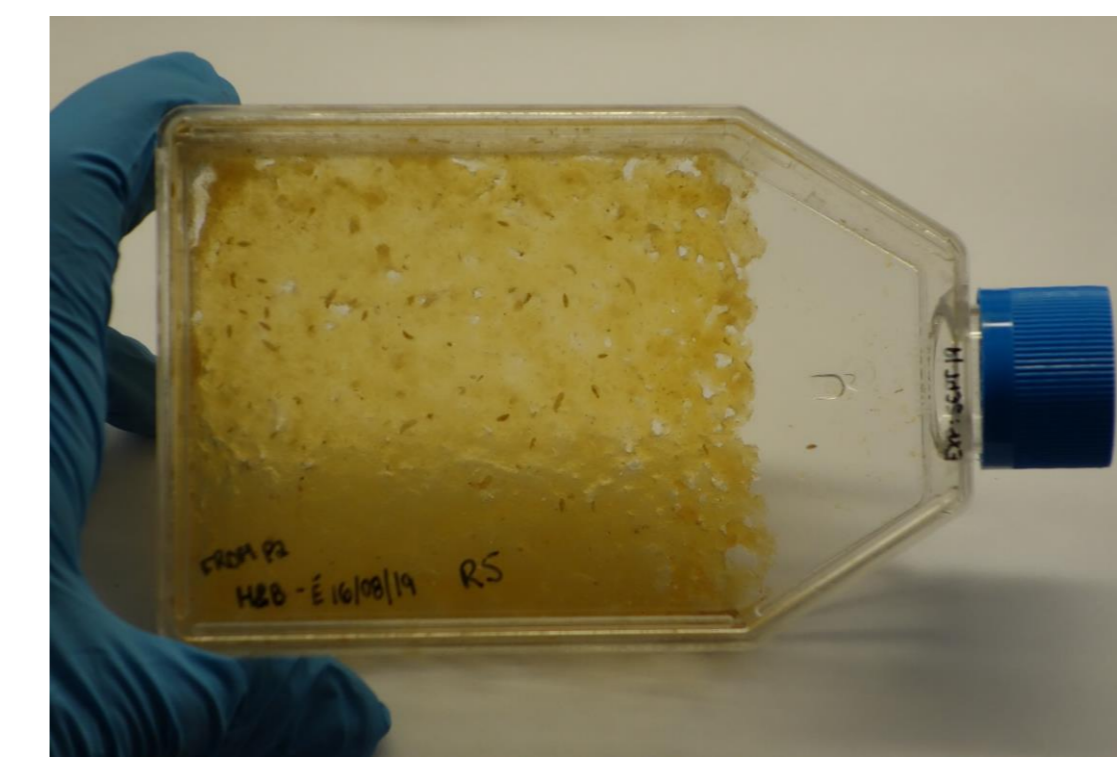


Fig 1. BHI supplemented agar medium eaten by larvae

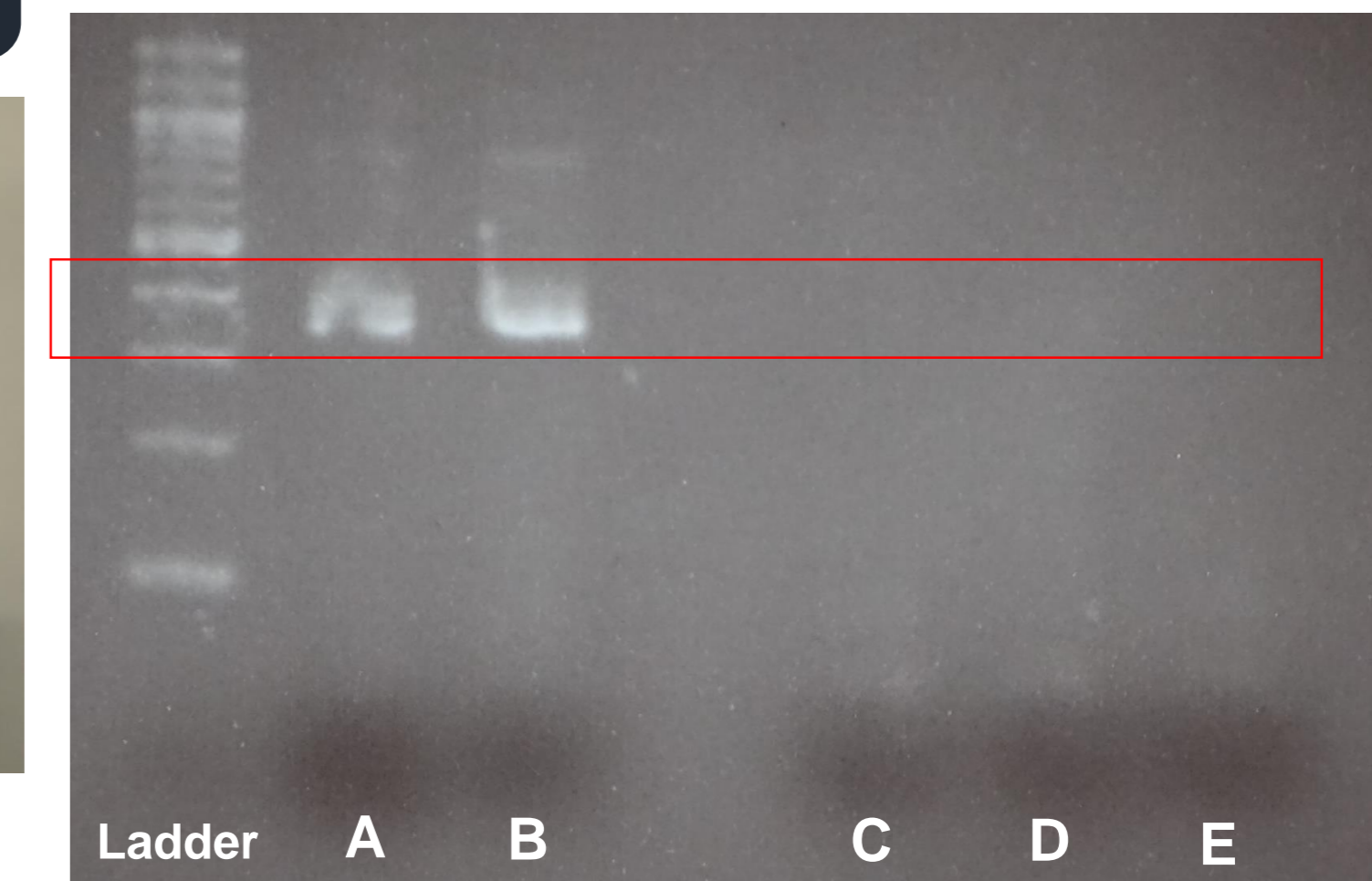


Fig 2. Agarose gel of 16S PCR shows bands for (A) control samples on day 4, (B) control samples on day 20 and absence of bands for (C) axenic samples on day 4, (D) axenic samples on day 20 and (E) negative control

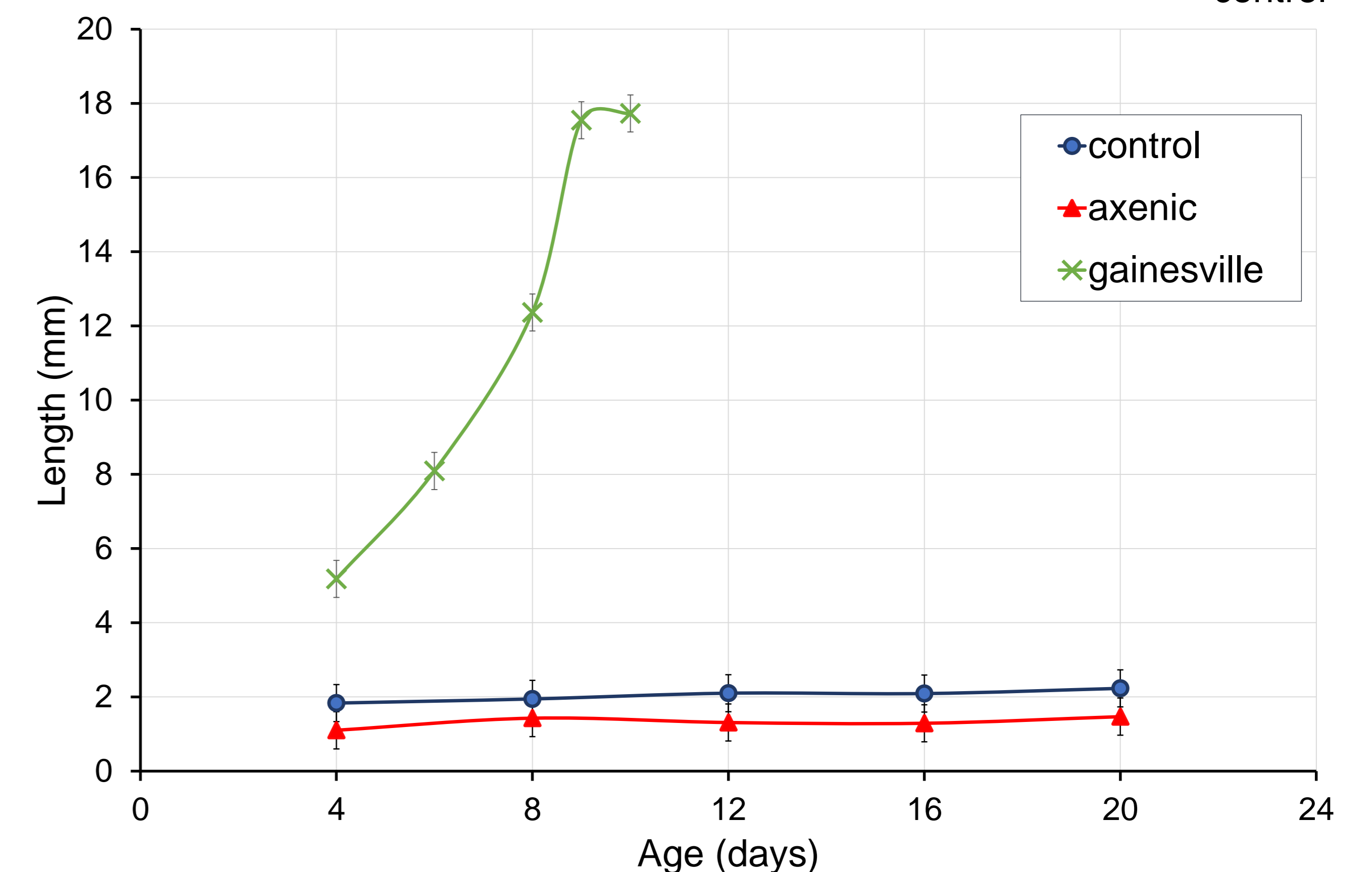


Fig 3. Total larval length variation on a period of 20 days (day 1 = hatching) when grown in axenic or control conditions on agar medium and on gainesville substrate at 27°C and RH 70% (N=10)

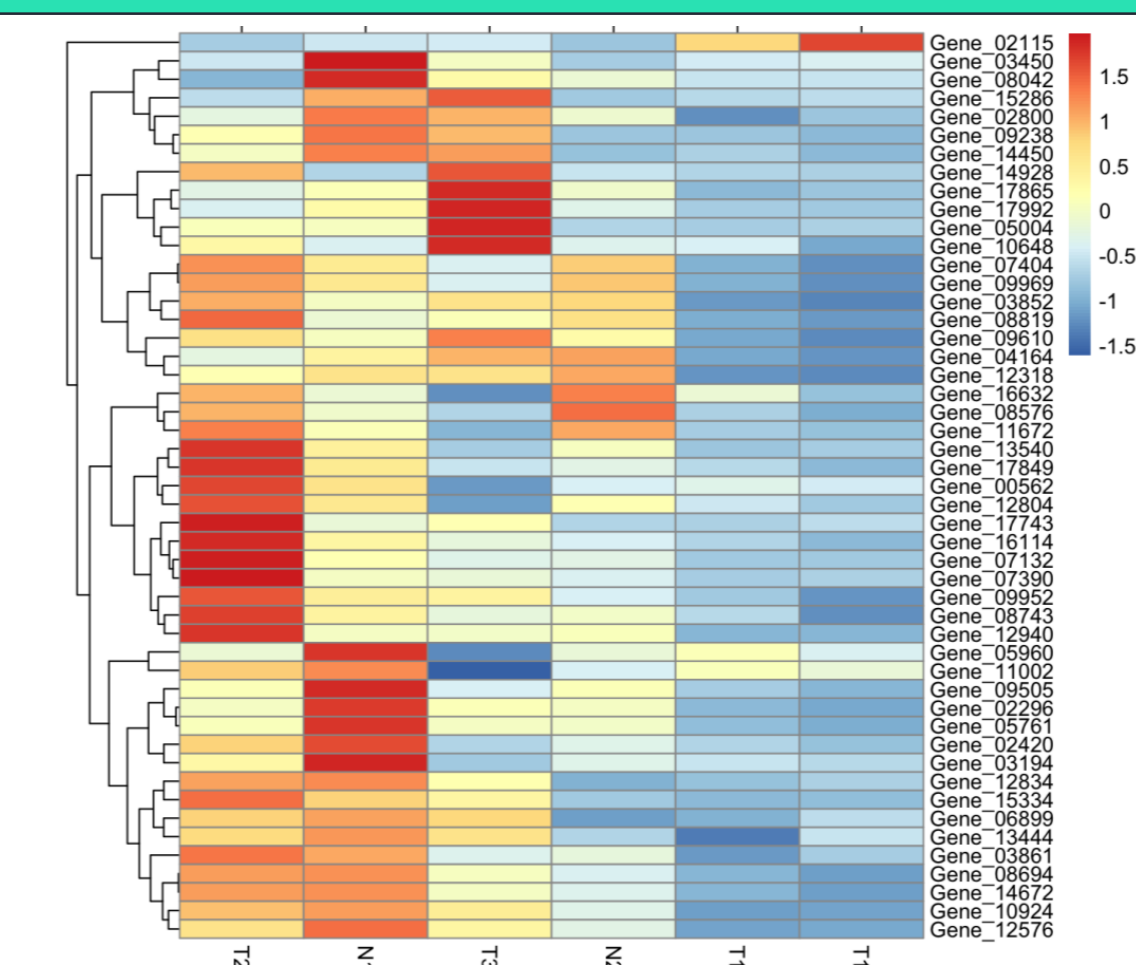
## Conclusion and perspectives

- BSF larva can grow in axenic conditions
- Larval length wasn't significantly affected by axenic conditions
- Substrate affect development ( day 50: no sign of pupation, usually on day 25)

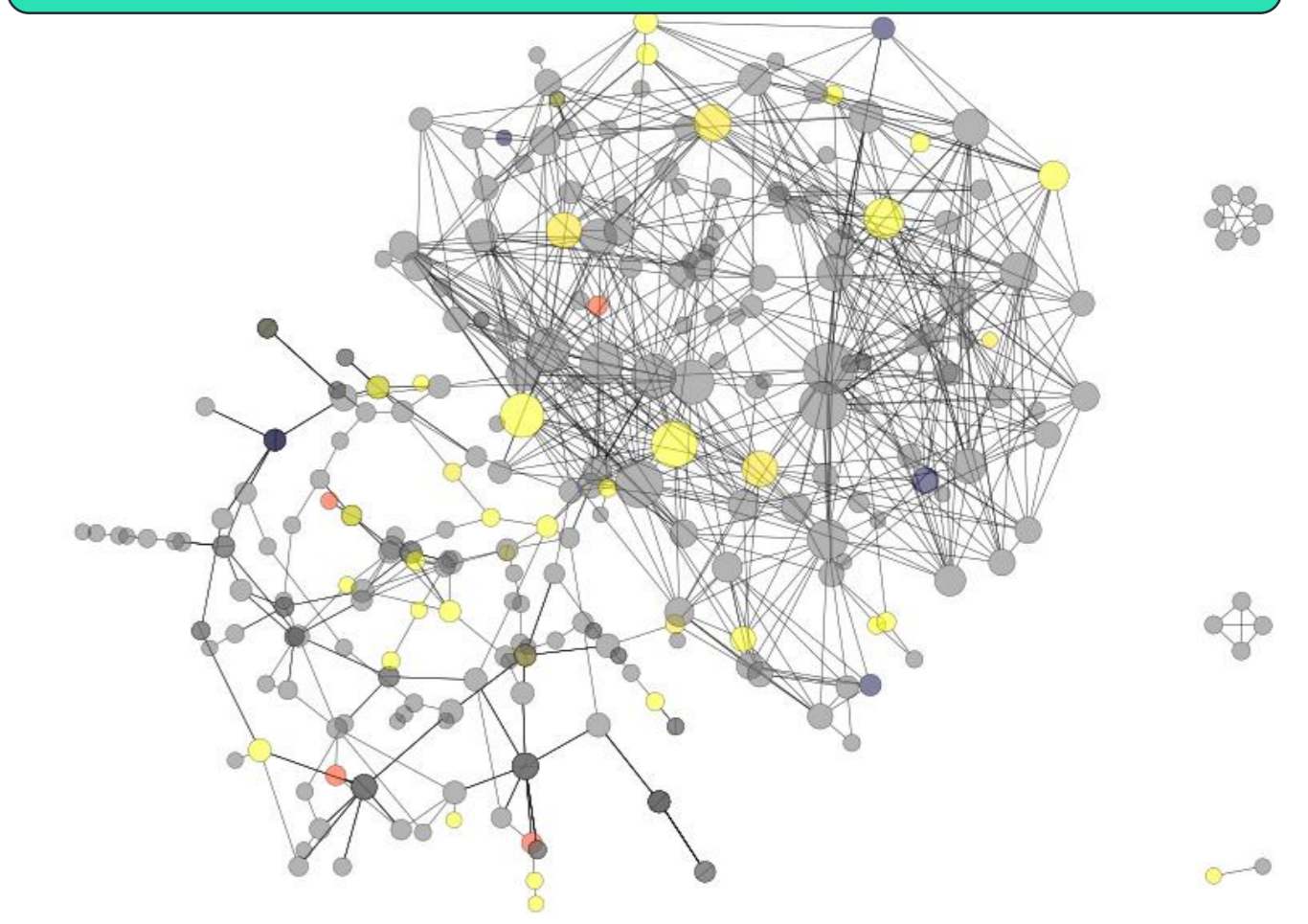
### Upcoming studies

- Investigate BSF larval growth on different media in axenic conditions
- Manipulate microbiota to optimize biomass production and antimicrobial properties

### Differential gene expression



### Network of microbial interaction



## Acknowledgments



## Bibliography

De Smet, J., Wynants, E., Cos, P., Van Campenhout, L. (2018) Microbial Community Dynamics during Rearing of Black Soldier Fly Larvae (*Hermetia illucens*) and Impact on Exploitation Potential. *Appl Environ Microbiol*, 84(9), 1-17.