

Effects of dental bacterial strain *Enterobacter ludwigii* on *Drosophila*: A model organism to study host-microbes interaction

Monalisa Mishra* Subhashree Priyadarsini

Neural Developmental Biology Lab, Department of Life Science, National Institute of Technology, Rourkela, 769008, Odisha



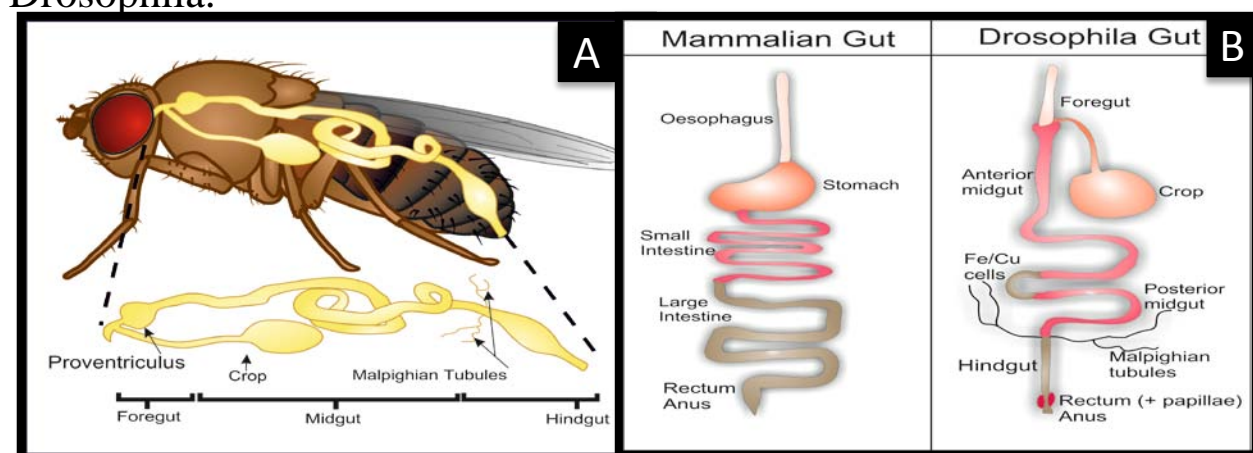
*E-mail: mishramo@nitrkl.ac.in

Abstract

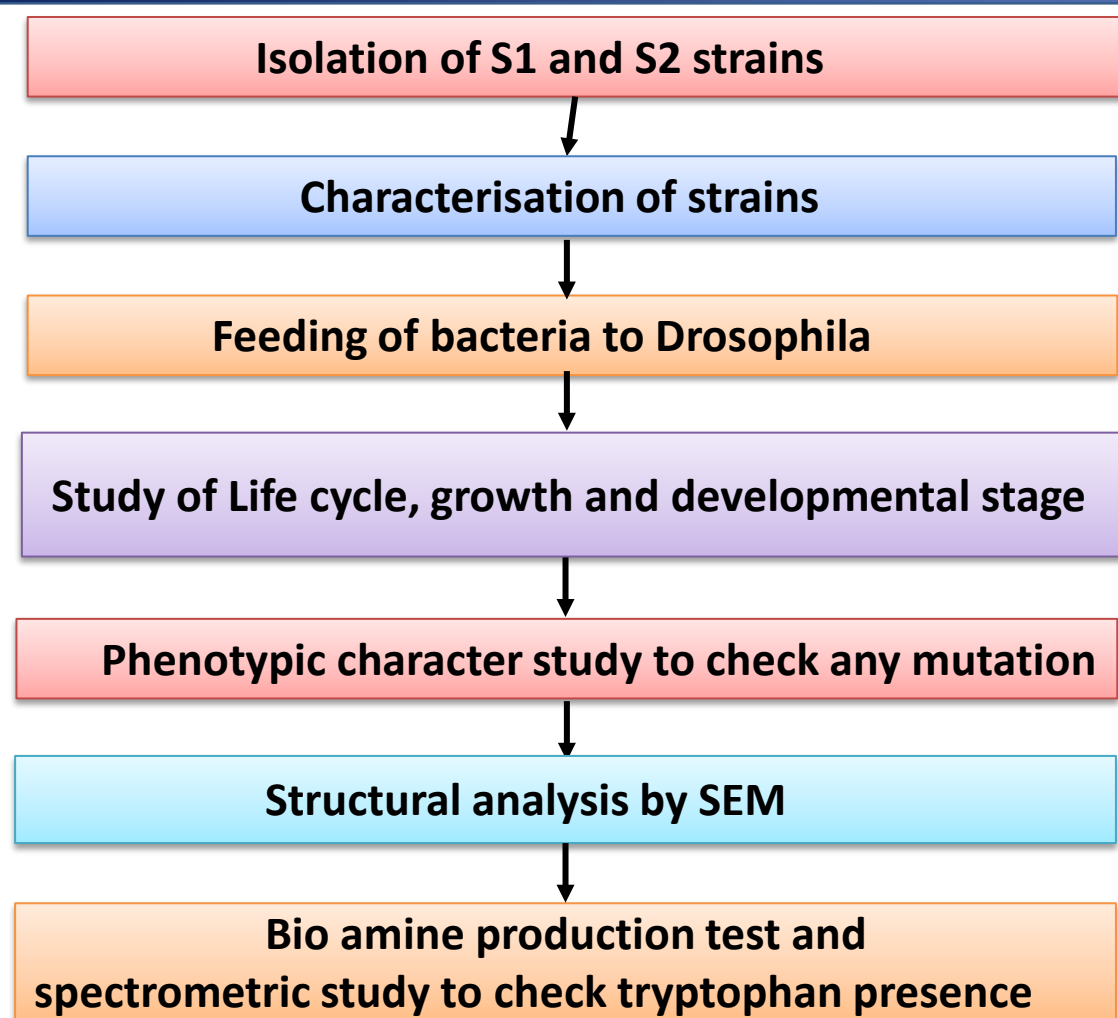
Mouth is the first part of digestive system through which food gets introduced to the digestive tract. An infected oral cavity may result a substandard digestive system and an unhealthy animal. The current study focuses on the effect of 2 mouth bacteria involved in teeth blackening on the growth and development of *Drosophila*. Various labs are using *Drosophila* as a model organism to study host-microbes interaction. Once the microbes entered into the gut it secretes various neurosecretory products which can alter the functionality and thus the behaviour of the animal. Taking this idea into consideration, oral bacteria were added to the fly food individually. Flies were allowed to feed on it separately and their entire life cycle, growth and development were monitored. Larvae reared on bacteria containing food showed changes in larvae crawling behaviour, and adults hatched from those larvae showed changes in phototoxic and geotrophic behaviour without showing much changes in their phenotypic characters (structural changes in wing and numerical changes in bristles). Although the flies appear normal in terms structure they undergo time dependent neuronal degeneration. How the microbes can change the neuronal behaviour is an open question at this moment and needs further investigation.

Introduction

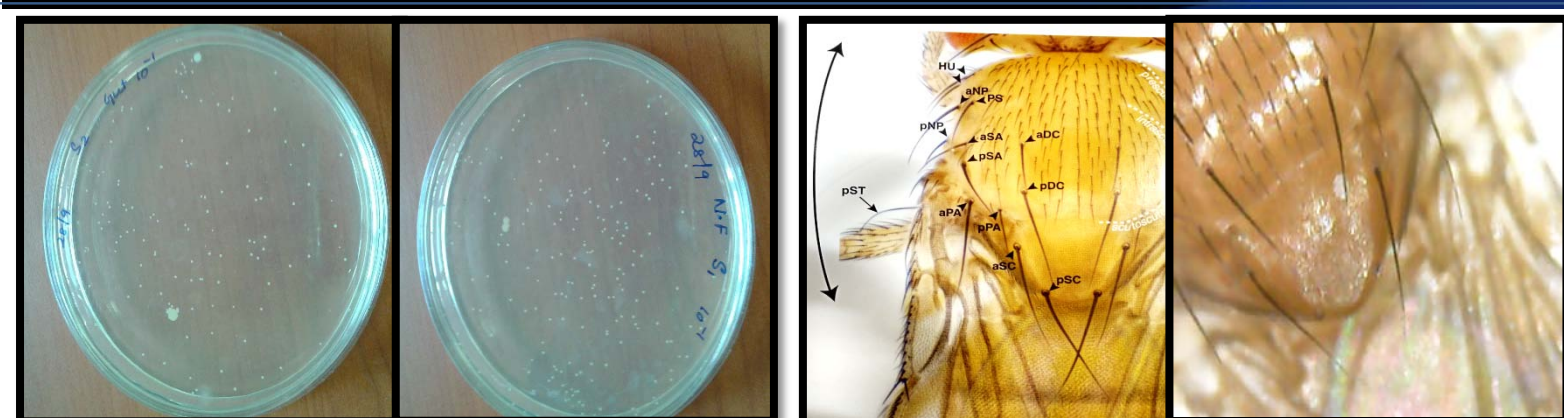
Drosophila gut share similarity with human gut in terms of development, structure and functional point of view. Thus various human gut infection can be studied using *Drosophila* as a model system. The current study aims to check the effect of two bacteria associated with teeth blackening on the various physiological system of *Drosophila*.



Methodology



Major Findings

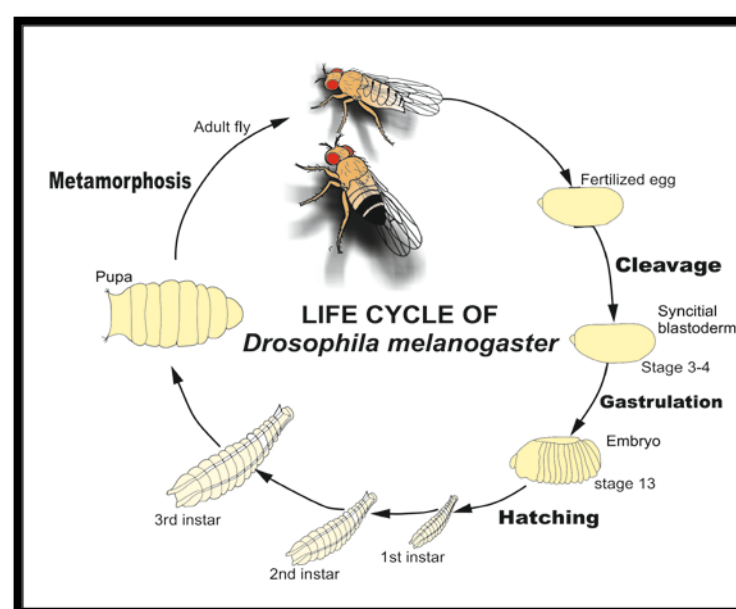


Bacteria can pass to the adult stage

Wild type bristle

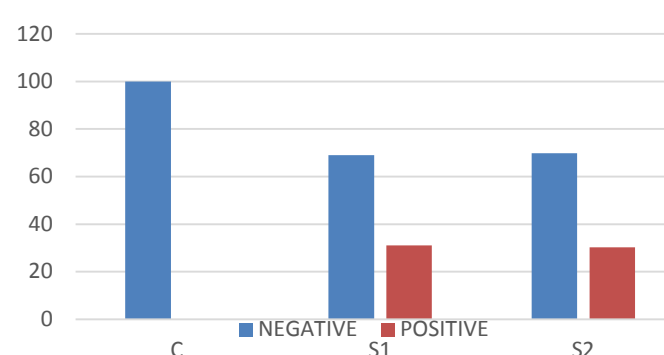
Mutant bristle

Results

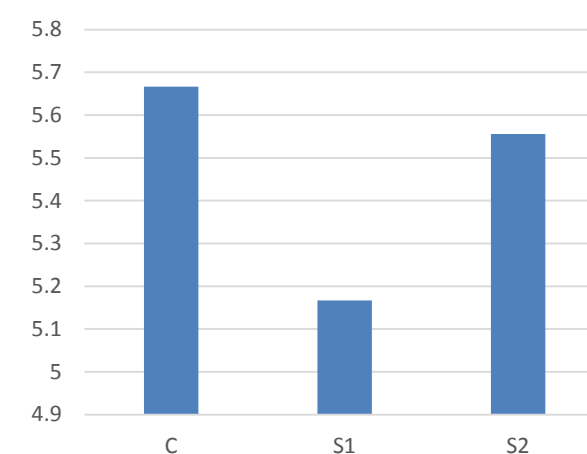


Write daly on right side if u have...make a table....

GEOTAXIS (C.F)



LARVAL CRAWLING



Write the developmental delay if any? Larva crawling first the adult geotaxis. Then add the time dependent degeneration plot which is via walking behavior. Then the cause of degeneration.....

Future work...

As we found the bacteria can pass to the adult gut, we may say that the bacteria is breaking the gut barrier and pass to the next generation. Since the bacteria can induce the age dependent neurodegeneration may be the bacteria is secreting some neurotransmitter which is involved in degeneration process. Further study will answer the mechanism behind this degeneration process.

Acknowledgement

This work is supported by National Institute of Technology, Rourkela, Orissa, India, 769008.