
Departmental Seminar

Seminar Title : Cocos nucifera's husk smoke as a hypoxia inducer and developmental limiter in *Drosophila melanogaster*

Speaker : Prof. Monalisa Mishra

Supervisor : Santosh Kumar #2787

Venue : LS Seminar Hall

Date and Time : 07 Mar 2025 (16:00 hrs)

Abstract : Smoke that includes Particulate matter (PM), Carbon monoxide (CO), Sulfur dioxide (SO₂), and nitrogen dioxide (NO₂), have a substantial negative impact on human health. PM, which can vary from tiny dust to coarse particles, enters the respiratory system and reduces the amount of oxygen taken in by the lungs, leading to hypoxia. Transcription factors called HIFs stimulate genes that help the cells to adjust to hypoxia. Despite its evolutionary separation from mammals, *Drosophila melanogaster* retains important components of the HIF-mediated hypoxia response. There is just one HIF- α homolog in *Drosophila*, Sima, and one HIF- β homolog, Tango. In this study, *Drosophila* eggs were exposed to 0.1g of coconut husk smoke which upon burning generate different size fractions of PM (10, 2.5, and 1.0 μ m). Concentrations of CO, SO₂, and NO₂ were monitored from the smoke to correlate the inference of PM and gases on behavioral and morphological changes in *Drosophila*. Upon exposure, infusible CO and PM in smoke are introduced into the thoracic and alveolar region of *Drosophila* causing hypoxia by altering the expression level of Sima and Tango. Further, the hypoxic condition also causes morphological, developmental, and behavioral abnormalities in *Drosophila*. This is the first report that successfully determines a compromised larva trajectory path and speed in *Drosophila* upon exposure to coconut smoke that could create a hypoxic condition.