National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Coconut husk smoke induces developmental and behavioural defect in Drosophila melanogaster
Speaker	: Prof. Monalisa Mishra
Supervisor	: 2787
Venue	: LS Seminar Hall
Date and Time	: 03 Jan 2025 (17:00 hr)
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 μm). 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.