NAME OF THE DEPARTMENT: Dept. of Biotechnology

SL NO.	**4**
TITLE OF THE SEMINAR	**ROSALIND FRANKLIN SEMINAR SERIES on "Evolution, Development, Body size and Reproductive Isolation : An Integrative Biology Approach using Drosophila"**
DATE & TIME	11 AM to 1 PM; Date: 12.03.2022 (Saturday)
DETAILS OF EXPERT SPEAKERS	Dr. Shampa M. Ghosh , KIIT school of Biotechnology, Bhubaneswar
NO. OF PARTICIPANTS	69
MEETING VENUE	University Auditorium
BRIEF REPORT ON THE WEBINAR	Dr. Ghosh discussed about the evolutionary biology of Drosophila and experimental observations regarding the effect of temperature and body length on the evolution of Drosophila. A set of four laboratory populations of *D. melanogaster* for rapid development for over 300 generations (FEJ1) and their four matched ancestral control populations (JB1) were studied. By the process of evolution, the selected populations have reduced lifespan and fecundity, preadult larval competitive ability, changes in larval behavioural traits, and decreased resistance to biotic and abiotic stresses during both larval and adult stages. The reproductive isolation was tested between the selected populations and their ancestral controls, and evidence was found for the presence of two complementary asymmetric pre and post mating barriers to prevent effective reproduction between selected and control population. Selection has led to great reduction in body size in the fast-developing lines. Small males belonging to fast developing lines obtain few matings with large control females, both in presence and absence of large control line males, giving rise to unidirectional, premating isolation caused by sexual selection. On the other hand, a small number of selected line females suffer greatly increased mortality following mating with large control males, which results in unidirectional postcopulatory prezygotic isolation. Dr. Ghosh also discussed the experimental findings about the phenomenon of temperature size rule which implies that a reduction in developmental temperature leads to an increase in body size. In Drosophila melanogaster, temperature affects body size primarily by affecting critical size ; at this point of development the larvae initiate the hormonal cascade that stops growth and starts metamorphosis. The thermal plasticity of critical size explains the effect of temperature on overall body size, but it cannot be entirely accountable for the effect of temperature on the size of individual traits, as they vary in their thermal sensitivity. Specifically, the legs and male genitalia showed reduced thermal plasticity for size, while the wings show elevated thermal plasticity, relative to overall body size. The traits reflected varying degrees of thermal plasticity and the effects of temperature on the cell proliferation rate during trait growth was different. The elevated thermal plasticity of the wings is due to canalization in the rate of cell proliferation across temperatures. The opposite is true for the legs. These data reveal that environmental canalization at one level of organization may help to explain the plasticity at another level and vice versa. Dr. Ghosh and our faculties discussed about the integration of molecular biology and developmental biology, which would help in understanding the genes and developmental mechanisms that generate variation in body and trait size with temperature in general.

Dr. Shampa Ghosh, KIIT School of Biotechnology, KIIT University, Bhubaneswar speaking at Rama Devi Women's University on 12.03.2022