Contribution ID: **63** Type: **Oral**

Multigenerational Toxicity Assessment of Potassium Sorbate and Sodium Benzoate in Drosophila melanogaster

Food preservatives are widely used in food industries, such as Potassium Sorbate (PS) and Sodium Benzoate (SB) are extensively used in processed food for extending shelf life. Although considered safe within regulatory limits, its chronic and multigenerational effects remain poorly understood. *Drosophila melanogaster* was employed as a model organism to examine the toxicological effects of PS and SB exposure across three generations (P0, F1, F2). Experimental groups were exposed through jaggery-semolina agar diet containing PS and SB, both individually and combined at two concentrations (0.025%, 0.1%). In this study, developmental duration, survival rate, larval crawling behavior, adult climbing performance and oxidative stress are the parameters that were systematically evaluated. Both preservatives caused dose-dependent toxicity, with higher concentration (0.1%) leading to delayed development, reduced survival, and impaired larva crawling and adult climbing ability, suggesting neuromuscular or metabolic disruption. The oxidative stress measured by the Nitro-blue tetrazolium blue (NBT) assay was elevated across all three generations, with combined treatment showing synergistic effects. The F2 generations displayed the strongest impairments, suggesting cumulative and hereditary impacts. Overall, the findings demonstrate that even within conventionally acceptable range, prolonged consumption of PS and SB can disrupt development, survival, behavior and increase oxidative stress. The study emphasizes the importance of incorporating multigenerational assessment in food additive safety evaluations and reinforces *Drosophila melanogaster* as a sensitive and reliable model for investigating long-term dietary risks of commonly used food preservatives.

Keywords: Food preservative, Multigenerational toxicity, Oxidative stress, Potassium Sorbate, Sodium Benzoate

Authors: H.N, Kavya; KAMAT, Vaishnavi Vinayak

Co-author: CHAKRABORTY, Proma

Presenters: H.N, Kavya; KAMAT, Vaishnavi Vinayak

Track Classification: Health Sciences