Biological impact of the sweetener sucralose – an in *vivo* study in *Drosophila melanogaster*

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Sucralose is one of the most widely used sugar substitutes in the world, being almost sweeter than sugar. Sucralose is often used in beverages together with sugar to increase their sweetness. However, being a chlororganic compound, sucralose is potentially genotoxic and spermotoxic. For this reason, the investigation of the impact of both substances on the genome is truly up to date, being *Drosophila melanogaster (D. melanogaster)* a suitable model for the study of the sucralose-sugar diet impact. The objectives of this study were to analyse the effects of a diet with the addition of sucralose-sugar mixtures, including behavioural alterations and DNA damage in *D. melanogaster*. The effects on longevity (average and maximum), negative geotaxis, spatial exploration, and genotoxicity (basal DNA damage) were evaluated. Young males (0 to 2 days old) were divided into 2 groups; group one, with sucrose concentrations of 0, 5, 10, 15 and 20%, and group two with sugar concentrations at 10% (control) and additionally sucralose at concentrations of 0.25, 0.5, 1 and 2%, placed on this diet for 72 h. The results were analysed in the F_1, where, compared to the control group, diets with 15% and 20% sucrose showed a 17% decline in average longevity (114 *vs* 95 days), impact on locomotion with an 8% increase in displacement, a 9% decline in exploration (43 *vs* 39 cm^2) and a 47% decrease in the number of descendants (277 *vs* 146 descendants). Concentrations of 15% and 20% sucrose showed a significant increase in DNA damage with percentages of DNA in tail of 39.5% (±3.29) and 42.5% (±2.35), respectively, compared to the control group value of 6.5% (± 0.47).

The data suggest significant influence of increased sucralose-sugar consumption on *D. melanogaster*, affecting fertility, survival and genetic damage.

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