Dye-sophila: The Effect of a Natural and Artificial Yellow Dye on Drosophila Populations and Preference

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There have been calls for replacing synthetic food dyes, including Yellow 5 (tartrazine), with natural dyes, including beta-carotene extract from the microalgae Dunaliella salina. The project used Drosophila melanogaster to test for offspring population size and dye preference. In a population assay, a generation of D. melanogaster was laid and raised in a dye-containing food source, with appropriate controls and two dye concentration levels. Once the flies matured, the populations were sorted by sex and counted. It was hypothesized that flies exposed to tartrazine would decrease in population, and those exposed to D. salina beta-carotene would increase or remain the same. This was partially supported as the flies exposed to tartrazine had a decrease in offspring population. However, the same was true for flies exposed to beta-carotene, raising concern that the natural dye is no safer. In a preference assay, it was hypothesized that flies pre-exposed to a specific dye would prefer that dye over the other options in their food. However, in general the flies had an equal tendency to avoid or choose the dyed food regardless of pre-exposure. In the future, I could use other sources of beta-carotene or compare other synthetic dyes to their natural counterparts. I would also expand the dye concentration range and include the pattern of effect on future populations. The impact of the experiment is to advocate for caution as the food industry replaces harmful synthetic dyes with allegedly safer natural alternatives.

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