

# INCREASED OXIDATIVE STRESS AND BEHAVIORAL CHANGES INDUCED BY THE CONSUMPTION OF BRILLIANT BLUE FCF DYE IN *Drosophila melanogaster*

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**INTRODUCTION:** Synthetic dyes are used to restore color to foods that have lost it and to intensify color to make the product more appealing. Brilliant Blue FCF is one of the most widely used food dyes today; however, it may cause adverse health effects. **OBJECTIVE:** Therefore, the aim of this study was to evaluate the effect of adding Brilliant Blue FCF food dye to the diet of *Drosophila melanogaster* on behavioral changes and oxidative stress. **MATERIALS AND METHODS:** Flies aged 3 to 4 days, of both sexes, were used and divided into four groups: control (standard diet), 0.015 µg/mL, 0.05 µg/mL, and 0.15 µg/mL of Brilliant Blue FCF dye. After 10 days of exposure, the flies were subjected to behavioral tests (open field and aggressive test) and biochemical analyses, including measurements of reactive oxygen species (ROS) levels, catalase (CAT) activity, and superoxide dismutase (SOD) activity. **RESULTS:** The results showed that consumption of Brilliant Blue FCF dye led to an increase in ROS levels as well as in the activities of the antioxidant enzymes SOD and CAT. It also reduced the number of crossings in the open field test at the 0.05 µg/mL concentration and increased aggression at both 0.05 µg/mL and 0.15 µg/mL. **CONCLUSION:** The intake of a diet containing Brilliant Blue FCF was capable of inducing oxidative stress, as evidenced by increased ROS levels in the flies. This effect may be related to the metabolic transformation of the dye, since these additives belong to the azo dye group, which are metabolized into aromatic amines by the gut microbiota. This contributes to increased ROS levels, requiring an adaptive response from the organism to counteract the resulting oxidative stress, as demonstrated by the elevated activity of antioxidant enzymes. Furthermore, dye consumption contributed to behavioral alterations, suggesting that the oxidative stress generated may be negatively influencing the flies' behavior. Therefore, consumption of Brilliant Blue FCF by *Drosophila melanogaster* promotes both oxidative and behavioral damage. However, further studies are necessary to determine the true impact of synthetic dyes on public health.

**Keywords:** Toxicity; Artificial Dyes; Behavior; Reactive Oxygen Species.

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