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The Effects of Selected Carbonated Drinks On Embryonic Development And Deformities Of Zebrafish (*Danio Rerio*)

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Structured Abstract

Background: In recent years, carbonated drink sales have increased in malaysia. concerns have been raised about the safety of carbonated drinks, especially for pregnant women who enjoy their fizz and sweetness. Carbonated drinks can cause diabetes, cardiovascular disease, and weight gain. however, little is known about how they impact embryonic survival, morphology, and developmental defects. This study examined how carbonated drinks (aw and cc) affected embryonic development and deformities in zebrafish embryos.

Methods: The zebrafish embryo acute toxicity test (zfet) was used to determine embryotoxicity. The embryos were exposed to different concentrations of cc and aw (25 to 400 g/l). Observations were taken every 24 hours for 120 hours of exposure. The embryos' heartbeats, morphologies, developmental defects, survival, and hatchability were monitored and analysed. ANOVA and post-hoc Tukey tests were used to compare the average heart rate per minute of control, AW, and CC groups.

Results: The embryotoxicity test revealed a concentration-dependent relationship, with higher concentrations causing greater toxicity to zebrafish embryos treated with both AW And CC. A higher cumulative mortality rate was observed in CC compared to AW. The calculated LC_{50} values for CC and AW were 230.56 G/L And >400 G/L, respectively, indicating higher toxicity in CC. Embryos hatched earlier than expected in both AW and CC. Both Samples result in developmental defects like non-detachment of the tail, pericardial edema, and scoliosis.

Conclusion: Pregnant women should avoid carbonated drinks as they may contain harmful ingredients for zebrafish embryos. This study offers new insights that can be used as a baseline for prenatal toxicity studies on carbonated drinks.

Keywords: Carbonated Drinks, Zebrafish Embryo Acute Toxicity Test

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