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Toxicity and teratogenicity evaluation of ethanolic extract from Momordica charantia fruit using zebrafish (Danio rerio) embryo model

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Abstract
Zebrafish (Danio rerio), a freshwater fish, has become a favoured animal model to assess the teratogenicity effects of various compounds. Momordica charantia is a fruit traditionally used as a functional food to treat various ailments. In the present work, 80% ethanolic extract of M. charantia fruit was investigated for its teratogenicity effects on the zebrafish embryos. The embryos of 12 h post-fertilisation were immersed in the ethanolic extract at various concentrations of 250, 500, 750, 1,000, and 1,250 mg/L prepared in 2% DMSO. Microscopic observation was carried out every 24 h. Results showed an increased mortality rate, and a delayed hatching rate with increasing concentration. Some of the deformities observed included hyperactivity, crooked backbone, reduced pigmentation, awkward positioning, and coagulation at the highest concentration. Probit analysis resulted in 725.90 mg/L as the median lethal concentration (LC50). Chromatographic analysis revealed the presence of propanedioic acid, malic acid, contrunculin-A, glutamine, D-fructose, sorbopyranose, xylitol, galactonic acid, D-mannitol, and mannose. These compounds may contribute to the deformities observed in a concentration-dependent manner. Therefore, M. charantia fruit must be consumed with caution and within the recommended amount.

Author Keywords
Danio rerio; Danioscope; Median lethal concentration; Momordica charantia; Teratogenicity

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