**Phytochemical evaluation, embryotoxicity and teratogenic effects of *Curcuma longa* extract on zebrafish (*Danio rerio*)**


## ABSTRACT

*Curcuma longa* L. is a rhizome plant often used as traditional medicinal preparations in Southeast Asia. The dried powder is commonly known as cure-all herbal medicine with a wider spectrum of pharmaceutical activities. In spite of the widely reported therapeutic applications of *C. longa*, research on its safety and teratogenic effects on zebrafish embryos and larvae is still limited. Hence, this research aimed to assess the toxicity of *C. longa* extract on zebrafish. Using a reflux flask, methanol extract of *C. longa* was extracted and the identification and quantification of total flavonoids were carried out with HPLC. Twelve fertilized embryos were selected to test the embryotoxicity and teratogenicity at different concentration points. The embryos were exposed to the extract in the E3M medium while the control was only exposed to E3M and different developmental endpoints were recorded with the therapeutic index calculated using the ratio of LC50/EC50. *C. longa* extract was detected to be highly rich in flavonoids with catechin, epicatechin, and naringenin as the 3 most abundant with concentrations of 3,531.34, 688.70, and 523.83µg/mL, respectively. The toxicity effects were discovered to be dose-dependent at dosage above 62.50µg/mL, while, at 125.0µg/mL, mortality of embryos was observed and physical body deformities of larvae were recorded among the hatched embryos at higher concentrations. Teratogenic effects of the extract was severe at higher concentrations producing physical body deformities such as kink tail, bend trunk, and enlarged yolk sac edema. Finally, the therapeutic index (TI) values calculated were approximately the same for different concentration points tested. Overall, the result revealed that plants having therapeutic potential could also pose threats when consumed at higher doses especially on the embryos. Therefore, detailed toxicity analysis should be carried out on medicinal plants to ascertain their safety on the embryos and its development.