

**ACUTE TOXIC EFFECTS OF DIAZINON AND
ETOFPENPROX ON ZEBRAFISH (*Danio rerio*)**

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by

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Abstract

Pesticides severely affect the balance in biodiversity, but are used worldwide for agriculture to control pests. The effect of this on the life in water bodies has been poorly investigated. The present study investigated the acute toxicity of two widely used pesticides; Diazinon ($C_{12}H_{21}N_2O_3PS$) and Etofenprox ($C_{25}H_{28}O_3$) on zebrafish (*Danio rerio*) embryos, since the sensitivity of toxicology testing of zebrafish reveals the permissible limits in toxicants to the ecosystem. Fertilized zebrafish embryos were exposed to a series of concentrations of pesticides (below 100 mg L^{-1} for Etofenprox and below 10 mg L^{-1} for Diazinon) which was prepared according to the results of the range finding test. Deionized water was used as an internal plate control and negative control whilst 15% ethanol was used as positive control. Four apical observations of coagulation of fertilized eggs, lack of somite formation, lack of detachment of the tail bud from the yolk sac and lack of heartbeat at 24, 48, 72 and 96 hours were recorded as an indicator for lethality according to OECD / OCED 236; guideline for the test of chemicals, Fish Embryo Acute Toxicity (FET) test. Results indicated that the median lethal concentration (LC50) of Diazinon and Etofenprox at 96 hours for zebrafish embryos were 1.975 mg L^{-1} and 4.800 mg L^{-1} respectively. Shrinkage of chorion, growth retardation, lack of tail formation, yolk sac edema, hemorrhages, pericardial edema, lack of pigmentation were most potential sub lethal and teratogenic deformities in treated embryos with Diazinon and Etofenprox. An increasing trend of mortality rate with the pesticide concentration and the decreasing trend of LC50 with the exposure time were observed in the present study. Results revealed that exposing zebrafish embryos to minor concentrations of Diazinon (1.975 mg L^{-1}) and of Etofenprox (4.800 mg L^{-1}) can directly affect the survival and embryonic development of zebrafish, it can be used as a cost effective method to assess the hazard potential of pesticides in aquatic bodies.

Keywords: LC50, Toxicology, Sub lethal, Deformities