

**A STUDY ON TOXICITY EFFECT OF TRACE  
METALS ON ZEBRA FISH (*Danio rerio*) EMBRYO**

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by

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## Abstract

The present study investigated the acute toxicity effect of trace metal Arsenic (As), Cadmium (Cd), Mercury (Hg), Lead (Pb), Copper (Cu) and Zinc (Zn) on Zebra fish (*Danio rerio*) embryo concerning their eco-toxicological impact on a wide range of biological endpoints. In recent years, fish embryos have gained interest in risk assessment procedures because of their high sensitivity to pollutants and their ecological relevance. Zebra fish (*Danio rerio*) embryos were exposed to ten different concentrations of each trace metals and lethality rate was recorded at 24, 48, 72 and 96 hours based on the four apical observations of coagulation of fertilized egg, lack of somite formation, lack of detachment of the tail and lack of heart beat as described in OECD/ OCDE 236, 2013; guideline for the test of chemical, Fish Embryo Acute Toxicity (FET) test. The results indicate that median lethal concentration ( $LC_{50}$ ) of Pb, As, Zn, Cd, Cu and Hg at 96 hour for zebra fish (*Danio rerio*) embryo were 41.697  $mgL^{-1}$ , 34.840  $mgL^{-1}$ , 14.021  $mgL^{-1}$ , 0.407  $mgL^{-1}$ , 0.099  $mgL^{-1}$  and 0.0217  $mgL^{-1}$  respectively. And also there is a significant difference between the control and trace metal treated embryo ( $P < 0.05$ ). There was an increasing trend of mortality rate with the trace metal concentration and there is a decreasing trend of  $LC_{50}$  with the exposure time. Sub-lethal and teratogenic deformities such as growth retardation, lack of tail development, lack of eye lens (placode), yolk sac edema, pericardial edema, hemorrhages, shrinkage of chorion and scoliosis were observed in most of the trace metal treated embryos. The results confirm that zebra fish (*Danio rerio*) embryo can be a useful model for integrated biological hazard assessment and toxicity effects of trace metals.

Key words: acute toxicity, trace metal, zebra fish embryo, sub-lethal, teratogenic