

Identification lethal and sub lethal concentrations (LC₅₀) of Organophosphate (OP) pesticide Diazinon using an endemic species (Yucatan Molly, *Poecilia velifera* Regan 1914) as a potential biomonitor for the intensive agricultural activities of Southeastern Mexico.

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ABSTRACT:

Organophosphate (OP) pesticides are commonly used in agriculture; this group of compounds includes very toxic chemicals. Diazinon (IUPAC name: O,O-Diethyl O-[4-methyl-6-(propan-2-yl)pyrimidin-2-yl] phosphorothioate, INN-Dimpylate) is used often in the Yucatan Peninsula, Mexico. Regular tropical rain-floods and the Yucatan's karstic topography allow Diazinon to be incorporated quickly into the freshwater watersheds and other aquatic ecosystems surrounding agricultural areas. This dispersion process has various negative consequences for the aquatic ecosystems. In the present study we used the Yucatan Molly (*Poecilia velifera*) a native and endemic fish of Southeastern Mexico as a biomonitor for the first time to assess some of the basic gaps in the Diazinon toxicity data. 96 juvenile fish (fry) were exposed to two time exposure-observations; for acute (24 hours) and chronic exposures (10 weeks). Three Diazinon doses were added as follows: 0.01, 0.02 and 0.04 mg/l (and a duplicated control group). The results showed that the acute dosed group has 100% mortality. Fish exposed to a 0.01 mg/l did not have any observable effects. The LC₅₀ value calculated during this experiment for Yucatan Mollies exposed to dissolve Diazinon is extremely toxic at 0.02 mg/L. These results confirm, that the sensibility of *Poecilia velifera* as a native bioindicator for pesticides; and compared with other published LC₅₀ data appears to be the most sensitive. Further studies are recommended to continue the study on the Yucatán Molly physiology; this fish has the potential to become a reliable sentinel for the aquatic ecosystems in the Yucatan Area, Mexico.

Keywords:

Agriculture, Diazinon, LD₅₀, Yucatan Molly, Biomonitor, Yucatan Mexico, Ecotoxicology