

ABSTRACT

Is Astyanax bimaculatus, Pisces Characidae, a suitable toxicological test species for freshwater environments in Trinidad?

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The pollution and degradation of our invaluable freshwater systems due to domestic and industrial activities is one of Trinidad's most critical environmental problems. Thus far however, suitable freshwater test organisms have not been designated to facilitate Acute and Chronic Toxicity Tests, or Toxicity Identification Evaluation Tests in Trinidad.

The purpose of this study is to perform a preliminary evaluation of Astyanax bimaculatus, as a suitable freshwater vertebrate toxicity test species for Trinidad. Field collected test organisms were subjected to acute, static, non-renewable toxicity tests using copper and cadmium as the toxicants. Dose Response Curves were plotted and median lethal concentrations for the toxicants were derived for *A. bimaculatus*. The toxic response of *A. bimaculatus* to copper and cadmium was compared to that of other typical temperate, freshwater fish test species, as well as tropical freshwater fish test species. Comparisons were both qualitative and statistical.

The mean 24 and 96 h LC50 values for copper fell between 2.0 and 2.5 ppm (mg/L). Conversely, when the copper 96 h LC50 for the Definitive Test only was considered, this provided a much lower LC50 value of 0.30 ppm. A single 24 h LC50 value of 13.00 ppm and a mean 96 h LC50 of 2.480 ppm were obtained for cadmium. However, the 96 h LC50 for the Definitive Test for cadmium provided a markedly lower LC50 value of 0.96 ppm.

The preliminary evaluation suggests that *Astyanax bimaculatus* is as sensitive in its toxic response to copper and cadmium as other typical temperate toxicological fish test species, and is comparable in sensitivity to that of other tropical fish test species. *A. bimaculatus* also has numerous toxicological test species characteristics. Thus, it is recommended that *A. bimaculatus* be used as the local freshwater toxicity vertebrate test species, in the absence of an official species.

Keywords –

Astyanax bimaculatus

Pimephales promelas

Acute Toxicity Test

Copper

Cadmium

Freshwater