

Determination the lethal concentration (LC₅₀ 96h) of herbicide Roundup Activo® on native fish (*Piaractus brachypomus*) and histopathological alterations in gills and Kidney



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Abstract

Roundup® Activo (RA) is one of the most used herbicide in Colombia to weed control in traditional and transgenic crops, although also is used in the drying of grains, maturation of sugar cane, and control of illicit crop. The objective that research was determinate the lethal concentration (LC₅₀96h) of herbicide RA on fry and fingerling on native fish *Piaractus brachypomus*. During 96h an acute static toxicity tests were performed to determine the median lethal concentration of glyphosate in the commercial product RA. Eighteen concentration was evaluated (1.0, 1.7, 2.3, 3.1, 4.2, 5.6, 7.4, 10.0, 13.3, 17.7, 23.7, 31.6, 35, 42.1, 56.2, 74.9, 100, 163.3 mg/L). Ten Fry and five fingerlings were randomly introduced in aquarium of 20L. There aquariums were marked as control (not treated with RA). The dead fishes were noted and removed instantly by histopathological studies. Finally the LC₅₀96h was determinate by the probit analysis method. Gill and kidney were dissected and fixed in formaldehyde, dehydrated in alcohol, processed in paraffin and stained in H&E. In fry and fingerlings of *P. brachypomus* the LC₅₀96h were determinate in 7.4 mg/L and 35 mg/L respectively. The histopathological alteration enhance when increasing the concentration of glyphosate in the RA. The gill showed edema, lamellar fusion, thalangeasia, and damage in pillar cells. The kidney exhibit picnotic cells, damage in the Bowman capsule and degeneration in the tubular epithelium. The LC₅₀96h in Fry and Fingerlings were lower than previous reported to *P. brachypomus* for Roundup® SL, which suggests greater toxicity of RA. INV-ING2980.

Biography:

Biologist, specialist and magister in aquaculture. Professor and researcher at the Military University Nueva Granada. Group of Ecotoxicology, Evolution, Environment and Conservation (E = mc²). Meritorious thesis in fish neuroscience, about histology and morphometry of dorsal root ganglia and their neurons in a fish of indeterminate growth the White Cachama (*Piaractus brachypomus*). Research about effect of glyphosate and Roundup in tropical fishes. Studies in the World Fish Center (Egypt) and scholarship in recirculation aquaculture systems, in the Scientific Research Center of Baja California (CICESE, Mexico). About 27 scientific publications in national and international indexed journals. INV-ING 2980.

Speaker Publications:

1. Representaciones sociales de la práctica formativa en estudiantes de fisioterapia en Colombia
2. Propiedades psicométricas de validez y fiabilidad de un instrumento para la rehabilitación de personas con discapacidad
3. Effect of glyphosate (Roundup Activo®) on liver of tadpoles of the Colombian endemic frog *Dendropsophus molitor* (Amphibia: Anura)
4. Glyphosate commercial formulation effects on preoptic area and hypothalamus of Cardinal Neon *Paracheirodon axelrodi* (Characiformes: Characidae)
5. Effect of a Roundup® on the preoptic area and the hypothalamus in *Paracheirodon axelrodi* (Cardinal Tetra)



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