

Extended Abstract

Apoptosis and cell proliferation
sites in the brain of *P.
brachycomus* exposed to
sublethal concentrations of
Roundup Active

Edwin Gomez Ramirez

Universidad Militar Nueva Granada

E-mail: edwin.gomez@unimilitar.edu.co

Abstract

In Colombia, glyphosate is widely used for weed control, grain ripening and eradication of illicit crops. The Roundup Active® is the most used presentation of glyphosate. This situation has generated environmental, social, ecological and public health problems. For this reason, the objective was to determine apoptosis and cell proliferation sites in the brain of *P. brachycomus* exposed to sublethal concentrations of Roundup Active®. The fishes were exposed to two concentrations of glyphosate 1 y 3 mg acid equivalent (a.e.)/L and the control with 0 mg a.e./L, prepared from commercial product Roundup Active®. The individuals were maintained in a density of 20 fish/aquarium (20L) for 96h. The fishes were fed twice a day (8:00 y 16:00 h). Five fish per treatments were sacrificed, dissected and the brain was fixed in formaldehyde 4% for three days to 4°C. The samples were sectioned to 5 µm in a microtome CUT SLEE 4020. Immune histochemical analysis was carried out to identify Caspase-3 to apoptosis y PCNA to cellular proliferation in tissue embedded in paraffin. Apparently, there are a slightly higher marking of cells Caspase-3 positive in the treatments exposed to Roundup Active®. On the other hand, the number of cells PCNA positive appears similar in all treatments evaluated. These findings suggest that Roundup Active® promotes apoptosis as an adaptive response to a xenobiotic. Acknowledgement CIAS 3146 and PIC- CIAS 3283.

Roundup is that the leading fine liked marketable glyphosate formulation practical within the farming of genetically adapted glyphosate-resistant crops. The goal of this study was to gauge the histological cuts of the neotropical innate fish, *Jenynsia multidentata*, in answer to severe and sub long-lasting exposure to Roundup and to exertion out if sub chronic interaction to the herbicide reasons changes in male sexual communication of persons exposed to a sublethal concentration (0.5 mg/l) for 7 and 28 days. The projected 96-h LC50 remained 19.02 mg/l for equally male and female fish. Gill and liver histological lesions were assessed through histopathological directories permitting quantification of the histological damages in fish unprotected to dissimilar concentrations of the herbicide. Roundup induced different histological changes in

an exceptionally very concentration-dependent manner. In sub chronic-exposure tests, Roundup also altered standard histology of the studied organs and produced a thoughtful decrease within the amount of copulations and mating success in male fish exposed to the herbicide. It's expected that in natural environments contaminated with Roundup, together general health condition and reproductive success of *J. multi dentate* is seriously affected.

The emerging nervous scheme is extremely susceptible to ecological toxicants particularly insecticides. Glyphosate insecticide encourages neurotoxicity both in humans and rodents, but so far only when unprotected to advanced attentions. A few studies, though, must also state the danger of overall toxicity of glyphosate at attentions similar to permissible bounds customary up by conservational protection establishments. In vitro data concerning glyphosate neurotoxicity at attentions similar to supreme permissible attentions in drinking water is missing. In the current study, we recognized an in vitro examine founded upon neural stem cells (NSCs) from the sub ventricular region of the postpartum mouse to decipher the effects of two maximum permissible concentrations of glyphosate in drinking water on the basic neurogenesis procedures. Our results established that supreme allowable attentions of glyphosate documented by ecological defence specialists meaningfully summary the cell relocation and difference of NSCs as established by the down regulation of the look heights of the neuronal β -tubulin III and the astrocytic S100B genes. The look of the cytoprotective gene CYP1A1 was down regulated at the same time as the look of oxidative pressures indicator gene SOD1 was upregulated. The attentiveness similar to non-toxic humanoid plasma attentiveness meaningfully persuaded cytotoxicity and triggered Ca^{2+} gesturing in the distinguished philosophy. Our answers established that the allowable attentions of glyphosate in drinking water familiar by ecological defence establishments are accomplished of encouraging neurotoxicity in the emerging anxious system.

The morphological alterations in the liver, which was related with augmented look of Hsp70, comprised atomic and cytoplasmic vacuolization, cytoplasmic hyaline presences, and necrosis. The kidney accessible edema and tubular cell degeneration with cytoplasmic hyaline inclusion. The semi-quantitative histopathological examines designated that the liver was more delicate than kidney to ATZ-induced damage. Ultrastructural analysis presented that ATZ produced skin changes in numerous organelles and augmented the number of lysosomes in hepatocytes and kidney proximal tubular cells. Yet, no significant change was observed in MN incidence in erythrocytes likening preserved and switch collections.

The aim of this effort was to assess the sympathy of Pacu fingerlings (*Piaractus mesopotamicus*) by judging the properties of middle

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deadly attention (LC50) of atrazine (ATZ - 28.58 mg/L) after serious involvement (up to 96 h).

The fish were unprotected to the LC50 of ATZ for 96 h (28.58 mg/L) in a standing system. Throughout the trial, the fingerlings were arbitrarily dispersed in four glass tanks (50 L) covering dechlorinated water. Four glass cisterns were for the switch group, and four were for the ATZ-exposed group (n=4 per glass tank), given a total number of 16 animals tested per group. The genotoxicity was evaluated by micro nucleus (MN) test in erythrocytes from outlying blood. Qualitative and semi-quantitative histopathological analyses, and also ultrastructural study, were applied in liver and kidney examples. Finally, the content of heat tremor protein (Hsp70) in the liver was assessed by the cowboy movie staining technique.

These penalties chosen that ATZ-induced damage to the kidney and liver function, ATZ at the concentration tested did not induce a important change in MN incidence in Pacu erythrocytes likening preserved and control collections, and also that Pacu fingerlings may be a good bio indicator for challenging fresh water pollution.

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