

CYLINDROSPERMOP SIN CYANOTOXIN CAN INDUCE GENOTOXIC AND
CYTOTOXIC EFFECTS IN GUPPY (POECILIA RETICULATA) ON ACUTE
SUB-LETHAL EXPOSURE

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ABSTRACT

The toxic blooms of cyanobacteria have increased in natural environments and drinking water sources, compromising the quality of water and putting at risk the health of all biota on this environment. Cylinderpermopsin (CYN) is a cyanotoxin produced by several species of different genus of cyanobacteria. CYN is a stable, water-soluble tricyclic alkaloid able to tolerate temperature and pH variations. Studies have shown that CYN inhibits protein synthesis, changes cholesterol levels, causes degenerative glycogen processes and loss of liver structure as well as DNA damage. Thus, we aimed to investigate the genotoxicity and cytotoxicity of CYN on *P. reticulata* Erythrocyte. The experimental groups were composed of seven animals each. The animals were exposed to three concentrations (0.5, 1.0 and 1.5 $\mu\text{g.L}^{-1}$) and one negative control group. After 96 hour of exposure, the animals had the peripheral blood collected. The blood samples were homogenized in PBS (0.1 M, pH 7.2), and then smeared in glass slide and stained using fast hematological stain. It was quantify the frequency of micronuclei and nuclear abnormalities (segmented, lobed, reniform and binucleated cells) in 1000 cells per animal. The statistical analysis was performed with GraphPadPrism 5.0 software. The treatments were considered different when $p < 0.05$. The micronucleus test indicated increase in the micronuclei frequency in the treatment of 1.5 $\mu\text{g.L}^{-1}$ ($p < 0.01$). The morphonuclear abnormalities were significantly higher than control group in all treatments ($p < 0.01$), and the segmented nuclei was the most frequent morphonuclear abnormalities. Considering that the environmentally relevant concentrations is 1.0 $\mu\text{g.L}^{-1}$, these results indicate that CYN can promote genotoxic effect, and cytotoxic effect in environmental concentrations, compromising the organic functioning of fishes, and possibly other aquatic animals.

Key words: cylinderpermopsin, blood, micronucleus, fish.

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