TITLE: EVALUATION OF THE EFFECT OF GLYPHOSATE-BASED HERBICIDES ON PHOTOSYNTHETIC RESPONSE OF BENTHIC CYANOBACTERIA OF TROPICAL LOTIC ENVIRONMENTS.

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Abstract

Some scientific studies about organisms of lotic environments have shown that cyanobacteria present high abundance in rivers and streams, being even in specific cases, recognized as the most abundant primary producer in biomass terms. Some explanations for these events suggest that the massive development of cyanobacteria may be related to the contact of these organisms with pesticides present in the aquatic ecosystems, since they have phosphate compounds in their formulations. Considering this information, the present study aimed to evaluate if the species of cyanobacteria *Nostoc* sp. may have their photosynthetic responses affected when exposed to glyphosate-based herbicides, which represent the most widely used compounds of this nature in the world. To observe the effect of the Roundup® herbicide experiments were conducted, where the specimens were exposed to the following concentrations: 0.28 mg of active ingredient [ia] .L -1 (Treatment 1); 3.5 mg iaL-1 (Treatment 2); 6.0 mg ai.L-1 (Treatment 3); 35 mg ia.L-1 (Treatment 4), in addition to Control, where there was no addition of herbicide. The photosynthetic responses were evaluated using the analytical technique of Chlorophyll a Fluorescence, by which the relative electron transport rate (rETR) of each treatment and of the Control was determined. The results were compared by Analysis of Variance, ANOVA, followed by Scott-Knott's test considering the nominal value of 5% of significance. The ANOVAs showed that there were statistically significant differences only for the rETR values of Treatment 4 when compared to the other treatments and the Control. This result suggests that, in fact, these organisms maintain their photosynthetic metabolism relatively stable even under exposure to environmentally feasible concentrations of the herbicide, showing some loss of photosynthetic efficiency only under very high concentrations that simulate a *“worst case”*.

Keywords: Cyanobacteria, photosynthesis, ecotoxicology, herbicides, glyphosate, rivers and streams.

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