

TITLE: DIVERSITY OF CYANOBACTERIA OF AREAS SURROUNDING WATERFALLS IN CHAPADA DAS MESAS, MA

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ABSTRACT:

Cyanobacteria is a phylum that all microscopic photosynthetic prokaryotes are included. They are ubiquitous to all ecosystems and their secondary metabolites and toxins represent a source of compounds of great biotechnological interest. Ecologically, cyanobacteria can form biofilms over rocks, sediment or in plants, and they are common in humid areas next to waterfalls. Therefore, the main objective of this study was to characterize the diversity and biotechnological potential of cyanobacteria in areas near waterfalls in the Chapada das Mesas, Maranhão state. Samples from different types of moist substrates were collected in sterile plastic tubes and then inoculated in BG11 medium. Cultures were incubated in an airy and lighted place in a regime of 12h/12h light/dark for four weeks to allow bacterial growth. Microscopic slides were made and analyzed under an optical microscope, and morphological identification was carried out using the reference of Bicudo and Menezes (2006). Among the microscopic slides analyzed in this study, it was possible to identify four distinct genera of cyanobacteria. The genus *Oscillatoria* is characterized by their oscillatory movements, which lead the filaments directly into their light. These microorganisms are important because they have genes responsible for nitrogen fixation and transposons, which arouse biotechnological interest with applications in bioremediation and genetic recombination. They produce secondary metabolites such as polyketide synthase and non-ribosomal peptide synthetase, which may be related to the antifungal action of the group. The production of cyanotoxins is also observed in this genus, highlighting the anatoxins-a, hemoanatoxins-a and microcystins. The genus *Leptolyngbya* is characterized by the presence of filamentous and elongated members. These microorganisms produce powerful neurotoxins, saxitoxin and cyanopeptolin, presenting great scientific importance. The genus *Komvophoron* includes halotolerant organisms, being interesting to obtain enzymes that tolerate high concentrations of salt. Belonging to Scytonemataceae family, the genus *Scytonematopsis* presents nodularin producing organisms. Further isolation and morphological identification will be done followed by molecular biology approaches to confirm the characterization of these lineages. These preliminary results indicate that Chapada das Mesas has a high diversity of cyanobacteria with great biotechnological potential.

Keywords: Bioactive compounds, photosynthetic microorganisms, phylosphere.

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