OCURRENCE OF GLUCOSIDASE INHIBITORS IN CYANOBACTERIA AND MICROALGAE FROM AMAZON
Gradíssimo, D. G.¹; Silva, V. C. O.¹; Mourão, M. M.¹; Schneider, M. P. C.¹; Xavier, L. P.¹;
¹Laboratório de Genômica Funcional e Biotecnologia, Centro de Genômica e Biologia de Sistemas, Universidade Federal do Pará, Belém, Pará, Brazil.

INTRODUCTION: Cyanobacteria and microalgae are an important source of products with biotechnological application in a variety of fields. There is still little knowledge described in the literature about these microorganisms in the Amazon region, which has unique characteristics regarding biological relationships and environment, with unique soil and water composition and biodiversity still largely unexplored. Glucosidases are important enzymes involved in the processing of glycosidic compounds, therefore, glucosidase inhibitors are interesting research targets for the treatment of diabetes, AIDS, cancer and diseases caused by viruses. OBJECTIVES: This study aims the screening of cyanobacteria and microalgae from the Amazon region, in search of β-glucosidase inhibitors, and the influence of nitrate deprivation in its production. MATERIALS AND METHODS: For β-glucosidase inhibitors detection, crude extracts of cyanobacteria and microalgae from 48 environmental samples from the state of Tocantins were used, for these samples the cyanobacteria were cultivated in complete medium and in medium without nitrate. The crude and methanoic extracts from two samples of Amapá were also tested. The assay consisted in observing the enzyme-substrate reaction inhibition by the cyanobacterial extract – the extracts were incubated with commercial β-glucosidase for 2 hours - using agar plates containing FeCl₃, and esculin 2%. With almond β-glucosidase (5,2 U/mg, Sigma) and conduritol β-epoxide (5mg/mL, Aldrick) as controls. RESULTS AND DISCUSSION: The extracts from 8 cyanobacteria from the Tocantins samples showed inhibitory activity for up to 30 minutes of the assay. Regarding the Amapá samples, Synechococcus sp. methanoic extract showed enzyme-substrate reaction only after 1 hour and for the Aphanocapsa extract the reaction was inhibit for more than 24 hours, similar to irreversible inhibitor β-epoxide Conduritol. CONCLUSION: The presence of β-glucosidases in 10 of 50 samples - including crude extracts - shows the importance of this organisms in biotechnology. Futures studies intend to select a suitable inhibitor for identification through LC-MS/MS and elucidation of its biosynthesis.

Keywords: cyanobacteria, β-glucosidase, inhibitor.
Suport by: FAPESPA and CNPq.