

TITLE: DETECTION OF ANAMMOX BACTERIA IN PAMPULHA LAGOON, BELO HORIZONTE - MG

AUTHORS: DE MARCO, T.; LEMOS, C.; ARAÚJO, J.C.; LEAL, C.D.; COSTA, M. C.;

INSTITUTION: CENTRO FEDERAL DE EDUCAÇÃO TECNOLÓGICA DE MINAS GERAIS (CEFET-MG), BELO HORIZONTE, MG (AVENIDA AMAZONAS, 5253, CEP 30421-056, BELO HORIZONTE-MG, BRASIL)

ABSTRACT:

High concentrations of ammonia in effluents can result in the eutrophication of aquatic environments, and a withdrawal of ammoniacal nitrogen is an important safety goal in your treatment. The ANAMMOX (Anaerobic Ammonia Oxidation) process, when compared to conventional nitrogen removal technologies, shows advantages and promises, presenting lower demand area, reduction in operating costs and emission of greenhouse gases. The objective of this work was to investigate different environmental samples in relation to the presence of Anammox bacteria for the selection of a biomass environment, such as the inoculum of an Anammox bioreactor. Meanwhile, since Anammox has low replication rate and use of a void, it is necessary to install the process. ANAMMOX non-bench scale reactor for effluent treatment. The Anammox detection site was the Pampulha Lagoon, which is in the process of being treated but continues to receive domestic and clandestine sewage from the municipalities of Belo Horizonte and Contagem and has characteristics compatible with the existence of Anammox anaerobic bacteria. In addition, the Pampulha Lagoon Complex, a tourist attraction in the city of Belo Horizonte, was recognized in 2016 as a UNESCO World Heritage Site, therefore, studies that contribute to its recovery are being encouraged. The samples were taken at three points of different depths, at each point, three samples in the 0-3 cm, 3-6 cm and 6-10 cm profiles. DNA extraction followed the protocol of the MoBio-Power lyser Power Soil DNA kit and its efficiency to confirmed in 1% agarose gel electrophoresis. The polymerase chain reaction was carried out using the Pla46f primers, specific for the group of Planctomycetes, and Am820r, for the genera *Ca. Brocadia* and *Ca. Kuenenia*. The result was positive for the presence of the Anammox bacteria in 89% of the samples, which is feasible, using samples from the Pampulha Lagoon as inoculum of a bioreactor. The close step of the work is to enrich the Anammox bacteria in a bioreactor inoculated with this sludge and to evaluate the efficiency of the ammoniacal nitrogen removal process.

Keywords: Anammox, wastewater, PCR, source of inoculum

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