TITLE: INFLUENCE OF MIXOTROPHIC CULTURES OF *Arthrospira platensis* IN THE PRODUCTION OF FIBRINOLYTIC ENZYMES.

AUTHORS: BARROS, P.D.S.[1]; JÚNIOR, J.N.S.[1]; SILVA, E.C.[2]; MARQUES, D.A.V.[3]; HERCULANO, P.N.[2]; PORTO, A.L.F.[4]; BEZERRA, R.P.[4]

INSTITUTION: [1]Laboratório de Imunopatologia Keizo Asami/LIKA, Universidade Federal de Pernambuco; [2]Laboratório de Tecnologia de Bioativos/LABTECBIO, Universidade Federal Rural de Pernambuco; [3]Universidade de Pernambuco - Campus Serra Talhada; [4] Departamento de Morfologia e Fisiologia Animal/DMFA, Universidade Federal Rural de Pernambuco.

ABSTRACT:

Thrombolytic agents by microorganisms has been the target of research to used for treatment of cardiovascular diseases (CVDs). Photosynthetic microorganisms, such as *Arthrospira platensis,* are increasingly important to the research of bioactive due to its biochemical and physiological diversity. This cyanobacteria has been extensively exploited as a source of food human health and pharmaceuticals. The aim of this study was increase the production of fibrinolytic proteases using corn steep liquor (CSL) in mixotrophic cultures of *Arthrospira platensis*. Cyanobacteria was grown in standard medium Schlösser (SMS) for autotrophic growth, SMS supplemented with 0.2% CSL (SMSC) and SMS without Inorganic nitrogen ($NaNO_3$) supplemented with 0.2% CSL for mixotrophic cultures (SMSS). All cultivation was with an initial concentration of 50 mg/L, 30 ± 2 ºC and with illumination at 45 ± 5 µmol photons m^{-2} s^{-1}. The extraction of the fibrinolytic enzyme was carried by homogenization using 0.1 M Phosphate buffer pH 7.0, 50 mg/mL of lyophilized biomass was homogenized for 30 minutes at room temperature. The homogenate was centrifuged and the supernatant was used for evaluation of total protein concentrations and fibrinolytic activity. All extracts showed catalytic activity on fibrin. The autotrophic culture obtained enzymatic activity of 43.64 ± 9.43 U/mg, SMSC of 35.54 ± 4.12 U/mg, and, the highest value was 389,2 ± 24,8 U/mg in SMSS. *A. platensis* used CSL for the production of fibrinolytic enzyme and this process was highest by removal of inorganic nitrogen from the standard medium. This approach proved to be a powerful tool for the optimization of fibrinolytic enzyme production. This condition showed nine fold enzyme production compared to the autotrophic culture. These results demonstrate the biotechnological potential of *A. Platensis* for the production of a promising protease for the pharmaceutical industry.

Keywords: Protease, Cyanobacteria, Corn steep liquor, Cardiovascular diseases.

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