I INTEGRATIVE INTERNACIONAL CONGRESS
ON ANIMAL AND ENVIRONMENTAL HEALTH

ENZYMATIC POTENTIAL OF BACTERIAL ISOLATES FROM ANTHROPOGENIC DARK EARTH (TPA) FROM THE ORIXIMINÁ REGION – PARÁ

I Integrative International Congress on Animal and Environmental Health, 1ª edição, de 25/06/2024 a 28/06/2024
ISBN dos Anais: 978-65-5465-100-4

PEREIRA; Gabriel Martins Pereira [1], SILVA; Eliane Gomes da Silva [2], GUSMÃO; Jandria Gabriela Vieira Gusmão [3], OLIVEIRA; Thais Farina de Oliveira [4], NEVES; Suellen Caroline Barbosa Neves [5], TERCETI; Mateus de Sousa Terceti [6], FERNANDES; Graciene do Socorro Taveira [7]

RESUMO

Enzymes produced by microorganisms play a fundamental role in biotechnology, with special emphasis on cellulases, tannases, amylases and proteases. In this sense, Anthropogenic Black Earth (TPA) is a type of dark and highly fertile soil found in some regions of the Amazon and has been studied as a source of bioprospecting for enzymes with biotechnological importance and the discovery of new species of microorganisms. The objective of this study was to analyze for the first time the production capacity of the enzymes cellulase, tannase, amylase, protease of isolated strains of TPA from the region of Oriximiná – Pará, Eastern Amazon. The TPA soil samples collected in Oriximiná were refrigerated (0-4 °C) and taken to the Bacteriology Laboratory (LaBac) at UFOPA, where serial dilution was carried out (1:9) and subsequent plating on Plate Count Agar (PCA) medium. After incubation in a bacteriological oven (30° ± 2°C/24 hours), the colonies were isolated, purified and cultured in tubes containing Tryptone Soy Agar (TSA). A total of 20 isolates were obtained and their enzymatic activity was evaluated in culture media containing the substrates: Amylase Agar (AA) – starch; Agar Protease (AP) - protein; Cellulase Agar (AC) - carboxymethylcellulase (CBM); Tannase Agar (AT) – tannins. The results observed showed that of the strains tested in AA, 3/20 (15%) showed enzymatic activity against starch. For protein degradation testing, 13/20 (65%) of the strains showed this ability. Protease is used in the detergent industry, in the production of food and medicines. A total of 50% of the strains tested in the AC degraded cellulase, while 7/20 (35%) of the bacteria tested in the AT degraded tannins. Cellulase is essential in the paper industry, degrading cellulose and making it more biodegradable, and tannase is applied in the food industry, improving the flavor and clarification of teas and wines. Interestingly, 2/20 (10%) of the strains tested showed enzymatic activity towards starch, protein and cellulose, while only 1/20 (5%) of the strains degraded all substrates tested. The results of this study highlighted the enzymatic potential of TPA isolates with promising characteristics for various biotechnological, agricultural and environmental applications, reinforcing the relevance of prospecting in unique environments, such as TPA. Enzyme quantification and bacterial identification studies are already being carried out. Our initial results point to the discovery of strains with biotechnological potential. Source of funding: process 2022/1437972 FAPESPA/CNPq and Ufopa

PALAVRAS-CHAVE: enzymatic potential, anthropogenic terra preta,

[1] Universidade Federal do Oeste do Pará, gabrielmarttins28bio@gmail.com
[2] Universidade Federal do Oeste do Pará, elianegsbio@gmail.com
[3] Universidade Federal do Oeste do Pará, jandriagabriela@outlook.com
[4] Universidade Federal do Oeste do Pará, farinathais@gmail.com
[5] Universidade Federal do Oeste do Pará, scambiental@hotmail.com
[6] Universidade Federal do Oeste do Pará, mateusterceti@gmail.com
[7] Universidade Federal do Oeste do Pará, gracienefernandes@hotmail.com

bacterial diversity, environmental microbiology

[1] Universidade Federal do Oeste do Pará, gabrielmarttins28bio@gmail.com
[2] Universidade Federal do Oeste do Pará, elianegsbio@gmail.com
[3] Universidade Federal do Oeste do Pará, jandriagabriela@outlook.com
[4] Universidade Federal do Oeste do Pará, farinathais@gmail.com
[5] Universidade Federal do Oeste do Pará, scambiental@hotmail.com
[6] Universidade Federal do Oeste do Pará, mateusterceti@gmail.com
[7] Universidade Federal do Oeste do Pará, gracienefernandes@hotmail.com