BACTERIAL PROFILE PRESENT IN EFFLUENTS RECEIVING RESIDUES FROM THE PROCESSING OF MANIHOT ESCULENTA IN THE AMAZON REGION AND ITS RELATIONSHIP WITH CYANIDE BIOREMEDIATION

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In the Legal Amazon region of Pará state, it is common for traditional communities to cultivate and artisanally process cassava roots (*Manihot esculenta* Crantz) to produce flour, tapioca, tarubá, and tucupi. During this processing, residues are often discharged into effluents, can bring risks to health and contamination of environmental compartments, due to the release of free cyanide (CN?) and/or hydrocyanic acid (HCN) contents from cassava processing. Microorganisms that metabolize *M. esculenta* residues are likely crucial in cyanide degradation. Metaproteomics plays a critical role in contaminated environments for socio-environmental reasons, enabling the identification of microorganisms with high metabolic and kinetic capabilities that transform or degrade chemical contaminants into less hazardous or non-hazardous products. Therefore, this study aimed to perform metaproteomics to identify bacteria present in effluents receiving cassava processing residues. To achieve the objectives of this study, the following methodology was used: Liquid residues from cassava processing were collected in natural areas of a private site located in Bragança municipality (1°02\'06.6\"S; 46°49\'42.8\"W), Pará, Brazil. The liquid residues were collected (March 2023) in the fermentation tank. Samples were stored in inert polyethylene bottles without preservatives and transported to the laboratory within 6 hours of collection. The samples of effluents from the cassava were obtained and subjected to protein digestion followed by mass spectrometry analysis. For protein digestion, proteins were reduced with Dithiothreitol (DTT, 5 mM) and alkylated with Iodoacetamide (IAA, 14 mM). Calcium chloride (CaCl, 1 mM) was added, followed by treatment with trypsin (50 ng/?L) for 20 hours at 37°C, 200 rpm. Subsequently, trifluoroacetic acid was added to a final concentration of 0.4% to stop the enzymatic reaction. Sample supernatants were transferred to vials, and the solution pH was adjusted to 10 with 1 M ammonium hydroxide for effective trapping in the first dimension column of Ultra-Performance Liquid Chromatography (HPLC). This was directly coupled to the ESI-Q-ToF Synapt G2S mass spectrometer (Waters). Many bacteria were identified in the effluents during the processing of *M. esculenta: Bacillus subtilis, Bacillus pumilus, Levilactobacillus brevis* were identified in this study. However, many identified microorganisms not being typically described in the literature for this role. Therefore, this study not only provides insights into the bacterial profile present in effluents receiving residues from *M. esculenta* processing but also underscores the need for further research to uncover bacterial species potentially involved in cyanide degradation.

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