

TITLE: BIOTRANSFORMATION OF SOLID WASTE FROM COFFEE PROCESSING USING GREEN SOLVENTS

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ABSTRACT:

Coffee seed processing generates large amounts of waste, including solid and liquid. Brazil is responsible for approximately one third of the world's coffee production, resulting in around 61 million bags of 60 kg each. Considering that main economic interest is related to coffee, and it makes up about half of the total weight of the coffee fruit, the amount of generated waste can be considered as an environmental problem for the industry. Despite presenting potential environmental impact, residues from coffee processing have compounds of high economic interest, such as lignin, cellulose, acids, phenolic compounds and flavonoids. Biotransformation is a promising technique for the recovery of these compounds, through the action of microorganisms that act as biocatalysts. The present work combines the biotransformation performed by fungi and actinomycetes, from Brazilian biomes, together with the activity of extracting green solvents, more specifically from Deep Eutectic Solvents (DES). This class of solvents is composed of unconventional solvents, which are more efficient, economical and sustainable compared to other organic solvents. Actinomycetes and fungi were inoculated in a mineral medium, applying 1% of coffee biomass. It was observed a dense growth of microorganisms with coffee biomass, as well the ones using DES to increase de straw bioavailability in the medium. All the cultures were subjected to organic and inorganic extractions, allowing HPLC (high performance liquid chromatography) and GC-MS (gas chromatography coupled to mass spectrophotometer) analysis to verify the chemical profiles of the compounds from the microbial supernatants. These chromatographic analysis are being in advance and it is expected to have organic molecules that can be used as start material for harsh synthesis of bioactive molecules, normally adopted at pharmaceutical and chemical industries.

Keywords: plant biomass; microorganisms; biotransformation; deep eutectic solvents; bioactives