

Public Abstract

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Title:IDENTIFYING BIOACTIVE PHYTOCHEMICALS IN SPENT COFFEE GROUNDS FOR COSMETIC APPLICATION THROUGH GLOBAL METABOLITE ANALYSIS

Annually, more than 6 million tons of spent coffee grounds (SCG) are generated worldwide. The present study explores the possible use of spent coffee grounds as the raw materials for cosmetics industry. The main objective of this project are to investigate the chemical profiles and identify the bioactive compounds for cosmetics application through global metabolite analysis. The compounds extracted from SCG of Ethiopia coffee (Yirgacheffe), Costa Rican coffee (Tarrazu) and Hawaiian coffee (Kona) were analyzed by ultra-high pressure liquid chromatography coupled with mass spectrometry (UPLC-MS). The ion chromatograms were submitted to XCMS platform operated by Center for Metabolomics at the Scripps Research Institute. The peak detection, peak grouping, spectra extraction, and retention alignment were processed by XCMS. The spectra were annotated and the compounds were identified and categorized by integration with METLIN, the world's largest metabolite database. Multivariate and univariate statistical analysis including PCA and cloud-plot were performed by XCMS to compare the chemical profiles between the three coffee cultivars. These analyses indicated that each cultivar showed a specific cluster. Over 200 compounds related to anti-oxidant, anti-inflammatory, anti-tyrosinase and anti-tumor for skin care application were identified by XCMS. Therefore, the presence of bioactive compounds in SCG makes it a potential source of raw material for cosmetic application (e.g., anti-oxidant, anti-inflammatory, skin-whitening, and anti-aging).