GREEN AND BUOY COFFEE WASTE AS AN IMPORTANT SOURCE OF ANTIOXIDANT COMPOUNDS FOR INDUSTRY

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Introduction: The coffee production chain generates waste that can cause significant social and environmental impacts. This work aimed to evaluate the presence of antioxidant phenolic compounds in extracts of green and buoy arabica coffee, considered waste for special and good quality coffee production.

Materials/Methods: The chemical profile of the different extracts and bioactive fractions were obtained using different solvents (ethanol, hexane, ethyl acetate and N-butanol). We analyze the antioxidant and antimicrobial activity, cytotoxicity and stability of the hydroethanolic extracts.

Results/Discussion: Liquid chromatography analysis and mass spectroscopy showed that the different extracts and fractions have similar chemical profiles, with the presence of chlorogenic acids, caffeine and sucrose. Thus, extraction with ethanol proved to be more appropriate for obtaining antioxidant compounds from fruits. The hydroethanolic extracts did not show antimicrobial activity. However, analysis of total phenolic content indicated potential antioxidant activity, which was confirmed by the DPPH· and ABTS·+ assays (Fig. 1).

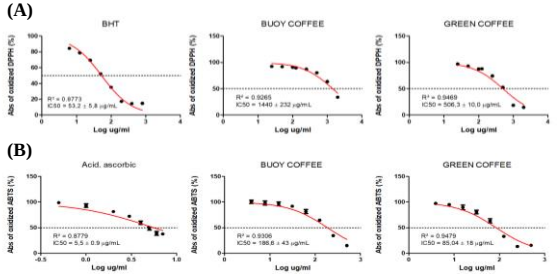

Figure 1: IC50 values of antioxidant activity for optimized extracts of buoyant and green coffee using the (A) DPPH and (B) ABTS assay.

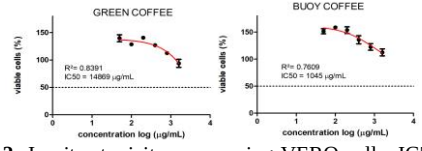

Figure 2: In vitro toxicity assay using VERO cells. IC50 charts of buoy and green coffee extracts.

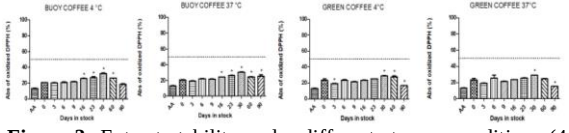

Figure 3: Extract stability under different storage conditions (4 and 37 C). AA: Ascorbic acid used as a positive control. *Significant difference in relation to the control sample (0 day), by Dunnety's test.

The in vitro toxicity test with VERO cells using MTT reagent, carried out to evaluate the safety and toxicity of the extracts, indicated that no evaluated concentration of extracts (50 – 1600 µg/ml) reduced cell viability by 50%. This data indicated that the extracts are not directly toxic to cells (Fig. 2). In contrast, an increase in proliferation and/or mitochondrial activity was detected in some evaluated concentrations. This work suggest the potential healing effect of the evaluated extracts. Accelerated stability test showed that the antioxidant capacity of the bioactive compounds in the buoy and green coffee extract exposed at different temperatures (4 and 37 °C) remains high (above 50%) for at least 90 days in storage (Fig. 3).

Conclusion/Perspectives: The extracts have the potential to be used as a source of antioxidant compounds, and can be incorporated in the production of active and biodegradable packaging for food preservation, adding value to the coffee crop.

References: Castro, A. C. C. M., Oda, F. B., et al (2018). Green coffee seed residue: A sustainable source of antioxidant compounds. *Food Chemistry*, *246*, 48–57.

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