ASSESSMENT ON CAROTENOIDS PROFILE EXTRACTED FROM MANGO PEEL VIA ACCELERATED SOLVENT EXTRACTION AND ULTRASOUND ASSISTED EXTRACTION

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Introduction: Mango (*Mangifera indica* Linn) is a tropical fruit associated with important nutritional and sensory properties. Phytochemical composition of mango has shown the presence of up to 25 different carotenoids with a total concentration of around 200 µg/g DW and α and β-carotene the most representative ones. The identification of technologies capable of isolation this valuable compounds is key for the valorization of natural resources in a clean, efficient and low-cost manner.

Aim: Evaluate the effect of Accelerated Solvent Extraction (ASE) and Ultrasound Assisted Extraction (UAE) on the extraction of carotenoids from three varieties of mango peel, an industrial waste presenting a potential source of interesting valuable compounds

Methodology: 1) Selection of the solvent with sonication: Five different solvent systems were screened in a two step extraction: (1) methanol, (2) hexane:ethanol (50:50; v:v), (3) hexane + ethylacetate, (4) hexane:ethylacetate (50:50; v:v) and (5) acetone:methanol (70:30; v:v) + methanol:dichloromethane (50:50; v:v); in all systems the mango:solvent ratio was 1:10 (m:v). In order to extract up to completeness, both extractions were carried out for 45 min. 2) Selection of extraction technique: Once the best solvent was identified, ASE and sonication where compared as techniques, aiming to assess the extraction yield of each one. 3) Identification of carotenoids: the solvents were evaporated and the carotenoids were re-dissolved in DCM prior to analysis. The results were obtained through Ultra Performance Liquid Chromatography-accurate mass-mass spectrometry (UPLC-am-MS), while total carotenoids were measured via spectrophotometer

Results and discussion:

Overall, acetone:methanol (70:30; *v:v*) + methanol:dichloromethane (50:50; *v:v*) allowed a better extraction of compounds, as shown in Figure 1. The higher extraction of β-carotene may be explained due polarity (Durst & Gokel, 2007).

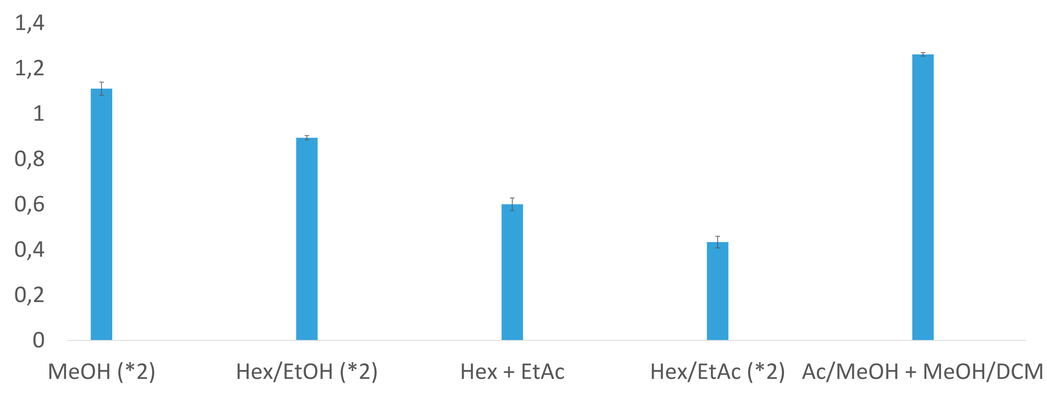

Fig. 1 *Effect of different solvents on the extraction yield of carotenoids from mango pulp*

ASE and sonication allowed the extraction of the same concentration of carotenoids. However, sonication extracted lower concentrated carotenoids (Figure 2). This results may be due that ultrasound produce the growth and collapses of microbubbles in the liquid phase (Albahari et al., 2018), which causes cell disruption, thus causing stronger and enhanced solvent entrance into the cells and intensification of the mass transfer (Marić et al., 2018).

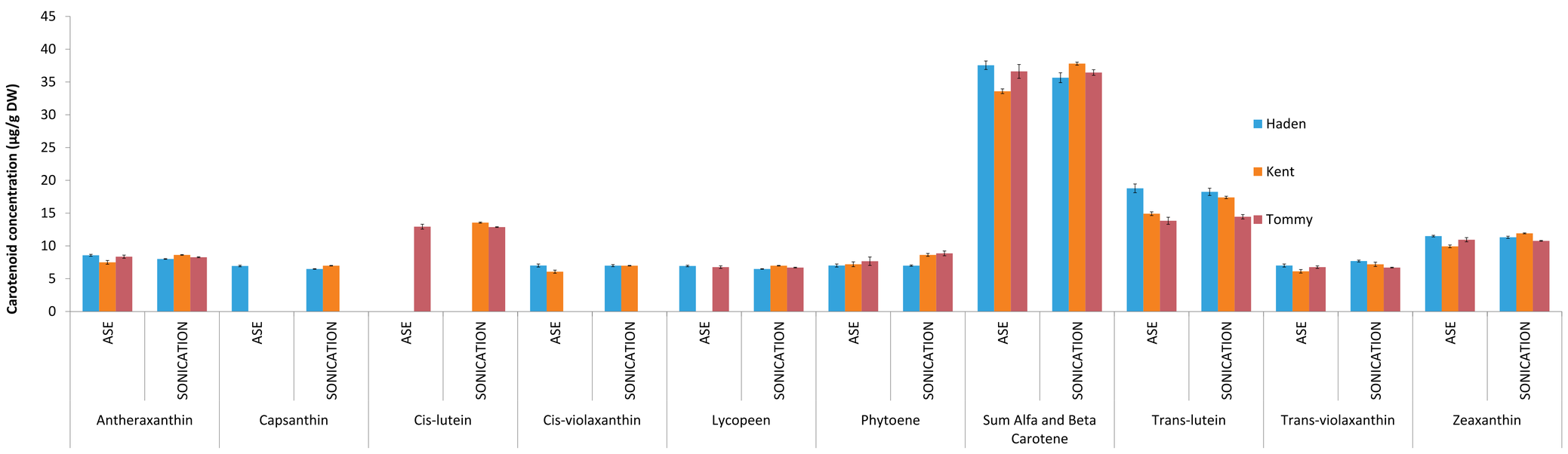

Fig.2 *Effect of sonication and ASE on carotenoid extracted from mango peel*

Conclusion: The results obtained provide a basis for the potential application of UAE as extraction technique for carotenoids, since it allows the use of a lower concentration of solvents, giving a character of "green technique" .

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Acknowledgement:
VLIR TEAM Project " Improving Ecuadorian child nutrition by using mango by-products as potential sources of bioactive compounds" for the period 2017 – 2020.
Escuela Politécnica Nacional del Ecuador Proyecto PIMI 15-05