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Wed054: ¹H NMR metabolite fingerprint and physicochemical analyses of commercial and genetically modified Brazilian açai berry pulp

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The pulp of açai berry (*Euterpe oleracea* Mart.) is widely consumed in the northern Brazil and its consumption has been increasing in southwest as well as abroad (USA, Canada, Australia, Japan, Chile and Europe) due to its nutritional value and also interesting medicinal properties¹. The objective of this work was to evaluate influence of different cultivars and seasonality of açai pulp using ¹H NMR metabolite fingerprint and physicochemical analysis and the correlation between these data using chemometric methods. The açai berries genetically modified (cultivated under agronomic control) were collected at different seasons in 2014, 2015 and 2016 years. Some commercial açai pulps were purchased in the same period in Belem city on 10 different stores. Methanolic extracts were obtained and the ¹H NMR spectra were acquired at 300 K in a Bruker® AVANCE III 9.4 Tesla using a 5 mm BBI probe head (ATMA®). Analyses of physicochemical properties (pH, total acidity, total soluble solids, moisture, ash content, total fiber, proteins, lipids, total phenolic, total anthocyanins e monomeric anthocyanins) were performed for each sample. AMIX® software was used for ¹H NMR data and MATLAB® for the physicochemical data. ¹H NMR spectra were collected for 50 commercial and 51 genotypes açai pulp. The chemometric study of ¹H NMR data provided insights about tendencies of grouping according to the cultivars (agronomic control/ no control), seasonality and genetic changes of açai berry pulp. The commercial samples (no control) contains higher concentration of saturated lipid compounds than genotype samples (agronomic control) and these berry pulps had typical signals of amino acid, carbohydrates and some organic acids. Regarding the seasonality the samples collected from dry season showed higher concentration of some compounds including saturated and unsaturated fatty acids, amino acids, carbohydrates and aromatics in comparison to those açai samples collected during the rainy season. From 31 genetically modified açai palm trees, only five genotypes exhibited different chemical characteristics in the pulp of its fruit. These genotypes show higher concentration of amino acids, vitamin C, unsaturated lipids and aromatics compounds. It was possible to observe that local vendors probably buy açai fruit very often and also do not keep the product stockpiled, once the samples were chemically different according to season of the year. On the other hand, the chemometric study of physical-chemical data showed great variability in the açai berry pulps. Possibly this finding is related to several factors that can influence the content of compounds including wide genetic variability, origin, ripening, way of harvesting, manipulation, washing, clean and processing²⁻³. Hence, it was not possible to observe any regular behavior as well as tendencies regarding the physical-chemical data. Although physicochemical analyses did not provide good comprehension about the seasonality and cultivars, NMR spectroscopy was extremely useful, reinforcing its potential to provide chemical information of açai berry pulp.

References.

¹Heinrich, M., et al. *Phytochem Lett.* **4** (2011) 10.

²Pacheco-Palencia, L.A et al. *Food Chem.* **115** (2009) 1199.

³Carvalho, A. V. et al. *J. Sci Food Agric.* **97** (2017) 1467.