Chemical and Physical Characterization of Macaúba Pulp and Nut Lipids Obtained by Dry Crystallization between 15 and 25^{o}C.

Renata Gomes de Brito Mariano, Bruno Ferreira Primo, Regina Isabel Nogueira, Sonia Couri, Suely Pereira Freitas, Federal University of Rio de Janeiro, Embrapa Food Technology
Rio de Janeiro, Brazil

Acrocomia aculeata (macaúba) is a tropical palm fruit widely distributed in the Brazilian cerrado. On a dry basis, the macaúba pulps and nuts are mainly constituted of lipids (35 to 40) and (45 to 55), respectively. Lipids are one of the main ingredients used to manufacture of foods, soaps, cosmetics and pharmaceutical products. Macaúba pulp and nut oils contain saturated and unsaturated fatty acids but differ greatly in their proportions. The macaúba pulp is rich in oleic (above 50%) and palmitic acids (above 20%) but them in the nut the major fatty acids are lauric (above 40%), palmitic (above 15%) and miristic (above 10%). The oleic acid (C18:1) a long-chain monounsaturated fatty acids, due to their functional properties, is interesting in the context of food industry. The lauric acid (C12:0) a short-chain fatty acid, due to its stability, is applied in the cosmetic and chemical sectors. The macaúba oils were supplied by Paradigma oil mill, locate at Minas Gerais State, Brazil. The pulp and nut oils were fractionated at different temperatures between 15 and 25^{o}C, during 24 h, in a high-melting fraction and a low-melting fraction. Thermal analysis were carried out by means of a differential scanning calorimeter-DSC (TA Instruments, model Q 200). About 10 mg of oil sample was placed in hermetically sealed aluminum pans. For each oil phase, DSC runs were performed from -40 to 70^{o}C at a scan rate of 5^{o}C/min. The fatty acids composition was evaluated by high-resolution gas chromatography (Varian, model CP 3800) using high purity methyl esters as external standard. Regarding the pulp oil fractions separated at 20 ± 2^{o}C, the palmitic acid content was increased in the saturated fraction (about 20%) promoting a elevation of 7^{o}C in the melting point as compared with integral oil. For the nut oil, in the saturated fraction obtained at 20 ± 2^{o}C, the lauric acid was increased 43% promoting an elevation of 5^{o}C in the melting point. Further step to increase short-chain content in the saturated phase and long-chain content in the unsaturated phase could be carried out to concentrate specific fatty acids and improved macaúba oil potential to industrial applications.