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Supercritical ethanolic transesterification of residual oil of palm pressed-fibers (*Elaeis guineensis Jacq.*)

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The present study aimed the utilization of the resulting fibers from the industrial pressing of palm oil. The palm-pressed fibers (PPF) were physico-chemically characterized and were determined the overall yields of CO2 supercritical extraction at temperatures of 40 and 60°C and pressures of 150, 300 and 450 bar. The oily extracts of palm-pressed fibers were analyzed by gas chromatography and carotenoids content; the oily extract obtained in the best condition was characterized by acid, peroxide, saponification, refractive indexes and relative density. Afterwards, transesterification reactions were carried out using ethanol and supercritical CO2 as cosolvent and the following conditions: molar ratios of 20:1 and 40:1 (ethanol:oil); CO2 mass of $5.31 \times 10-7$ g; temperatures of 150, 250, and 350°C; periods of 10, 20, 30, 40, and 60 minutes; pressure of 200 bar and stirring at 600 rpm. The product obtained in the transesterification was analyzed for its content of fatty acid esters. The operational condition of the highest overall yield of the oily extract (6.09%) was obtained at 40°C and 450 bar. The oily extracts of palm-pressed fibers presented low carotenoids content (5.32–26.11 µg/g oil). They also presented more than 80% of saturated fatty acids and their physico-chemical characteristics met or were close to those determined by the "Codex Alimentarius". Supercritical transesterification showed maximum yield of esters of 99.33%, in the operational condition with molar ratio of 40:1, 150°C and 60 minutes.

Biography

Fernanda Wariss Figueiredo Bezerra holds a degree in Food Engineering from the Federal University of Pará-UFPA (2012). She has completed her Master in Food Science and Technology by the Graduate Program in Food Science and Technology of UFPA (2017). She is pursuing her PhD in Food Science and Technology by the Graduate Program in Food Science and Technology of UFPA. She acted as Instructor in the "Project of Socioproductive Inclusion in the State of Pará" and has experience in the area of food quality control in performing physical-chemical, enzymatic and antioxidant analyzes; and extraction with supercritical fluid.

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