OIL/FATS

NPARR, 7(1), 2016-80 Extraction of Albizia julibrissin seed oil and the analysis of fatty acid

The main nutritional components and physicochemical parameter of Albizia julibrissin seed have been analyzed. Its oil was obtained by ultra-critical CO\textsubscript{2} extraction method. After methyl esterifying the extraction, the fatty acid composition in the Albizia julibrissin seed oil was determined and analyzed by the GC. Based on the results of analysis, the thousand seeds weight, rate of kernel contents and bulk density of Albizia julibrissin seed were 42 g, 560 g/kg, and 785 g/L, respectively. Main components consisted of 18.2% crude fiber, 32.2% protein, 4.6% ash, 10.9% fat, etc. The Albizia julibrissin seed oil proper extracted technology condition through the test were as follows: the extracting temperature 40\degree C, the pressure 35 MPa, and the extracting time 120 min. The major components of fatty acid comprised 6.5% palmitic acid, 2.6% stearic acid, 17.1% oleic acid, 71.89% linoleic acid etc. of which contained unsaturated fatty acid accounted for 90%. The results indicated that there were rich nutritional ingredients in Albizia julibrissin seed with wide applying prospect in food field [Jiang, L., Jiang, C., Sun, X., Wei, D. and Hu, Y. (College of Food Science and Engineering, Northwest A & F University, Yangling, China), Journal of the Chinese Cereals and Oils Association, 2015, 30 (12), 76-79].

NPARR, 7(1), 2016-81 Changes in oil content and fatty acid composition in Jatropha curcas during seed development

Seed development in Jatropha curcas L. was studied with respect to morphology, oil content and lipid profiles. Seeds were collected at 8 different stages of development starting from 6 days after pollination till maturity. Seed oil content increased from 6.15% to 35.86%. Palmitic acid (16:0) decreased from 34.27-15.62, whereas linolenic acid (18:3) reduced from 26.32 to 0.65%. A sharp increase in oleic acid (18:1) content from 8.05 to 29.56% was observed at stage 5 which increased further to 44.38% at maturity. Linoleic acid (18:2) increased steadily from 33.38 to 47.19 % till stage 7 but reduced to 33.02% at maturity with a simultaneous increase in oleic acid. Remarkable changes in fatty acid composition were observed after stage 4 (27 DAP). The biodiesel quality of oil at stage 8 was better than at stage 7 as indicated by lower iodine number and higher cetane number [Sinha, P., Islam, M.A., Negi, M.S. and Tripathi, S.B. (The Energy and Resources Institute, IHC Complex, Lodhi Road, New Delhi, India), Industrial Crops and Products, 2015, 77, 508-510].

NPARR, 7(1), 2016-82 Fatty acid profile of intact plants of two different sites and callus cultures derived from seed and leaf explants of Calophyllum brasiliense Cambess: A new resource of non-edible oil

In Mexico, the oil seed from Calophyllum brasiliense is traditionally used for lighting, but the oil seeds and leaves have not yet been evaluated. In this work, two sites of C. brasiliense were studied: San Andres Tuxtla and Pajapan. The aim of this study was to characterize the fatty acid profile of the seed oil, leaves, and callus cultures from leaves or seed explants. Fatty acids of the leaves, seeds, and callus culture samples were extracted with hexane, esterified, and then analyzed in a Gas chromatography-mass spectrometry. The San Andrés Tuxtla seeds had a significantly higher (P≤ 0.05) oil content: 58.2% versus 47.6% in Pajapan seeds. The seed oil recovered from the San Andrés Tuxtla samples showed higher amounts of linoleic acid (41.3%), while the oil recovered from the Pajapan seeds had remarkable oleic acid content (39.3%). The physicochemical parameters of San Andrés Tuxtla and Pajapan oils such as the density, viscosity, iodine, acid, and saponification values were measured and met the industrial standards for oil feedstock for
biodiesel. The biomass growth of callus cultures was enhanced, and callus could produce fatty acids. These were mainly total saturated acids such as palmitic acid (31.32-39.18%) followed by stearic acid (19.52-21.18%). The main unsaturated fatty acid was oleic acid with values ranging from 23.14 to 31.63%. This is the first report on the fatty acid composition of seeds, leaves, and callus cultures from *C. brasiliense*. Therefore, this study can help to promote the importance of this agricultural product and can lead to biotechnological tools for the sustainable production of fatty acids or secondary metabolites [Bernabé-Antonio, A.*, Álvarez, L., Salcedo-Pérez, E., Toral, F.A.L.-D., Anzaldo-Hernández, J., and Cruz-Sosa, F. (Departamento de Madera, Celulosa y Papel. Centro Universitario de Ciencias Exactas e Ingenierías, Universidad de Guadalajara, Km. 15.5, Carretera Guadalajara-Nogales, Colonia Las Agujas, Zapopan, Jalisco, Mexico), *Industrial Crops and Products*, 2015, 77, 1014-1019].

NPARR, 7(1), 2016-83 Effect of microwave roasting on the quality and volatile compounds of sunflower oil

How microwave roasting affects the quality and volatile compounds of pressed sunflower oil was investigated here. The results showed that with an increase in microwave power and duration of treatment, the color of pressed sunflower oil gradually became deeper, while acid value did not change significantly. Peroxide value increased initially and then decreased under moderate and low microwave power, showing a decreasing trend under high microwave power. The induction time did not have a significant effect at middle and low microwave power, but showed an increasing trend at high power. Finally, vitamin E content decreased gradually. By referring to various indexes, seven sunflower oil samples (700 W 5 min, 700 W 4 min, 700 W 3 min, 560 W 4 min, 560 W 5 min, 420 W 5 min, and 420 W 6 min) with high total sensory scores were selected and their volatile compounds were analyzed using headspace solid-phase microextraction-gas chromatography-mass spectrometry (HS-SPME-GC-MS). A total of 65 kinds of volatile compounds were detected, including 16 aldehyde compounds, 6 ketone compounds, 15 heterocyclic compounds, 12 terpenes, 4 alcohols, 9 alkanes, 2 esters, and 1 acid. Additionally, the oil samples shared 14 volatile compounds in common. It can be seen from the results above that microwave roasting has a significant effect on the quality of sunflower oil. The characteristic flavor of sunflower oil is produced by the combination of the inherent natural fragrance of the sunflower seeds, lipid oxidation products, and Maillard reaction products during the roasting process [Chen, J.*, Hong, Z.-T., Liu, G.-Q. and Wang, Y.-H. (School of Food Science and Technology, Henan University of Technology, Zhengzhou, China), *Modern Food Science and Technology*, 2015, 31 (8), 211-218].