

Effects of processing on the quality and stability of three unconventional Sudanese oils

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In a refining experiment, on a laboratory scale, crude oils from *Sclerocarya birrea* (SCO), sorghum bugs (SBO), water-extracted melon bugs (MBO H₂O) and solvent-extracted melon bugs (MBO SOL) were processed by alkali refining. Quality changes were characterized by the determination of free fatty acids (FFA), peroxide value, tocopherols, sterols, phosphatides and stability against oxidation (Rancimat test). In addition, the fatty acid composition was determined. It is clear that the contents of phosphatides, peroxides, tocopherols, sterols as well as oxidative stability were reduced during processing, while FFA were nearly totally removed. The content of phosphorus was reduced in SCO, SBO, MBO H₂O and MBO SOL by 26, 19, 12, and 78%, respectively, while complete oil processing removed 95, 99, 96 and 99% of the FFA in crude oils, respectively. The level of total tocopherols decreased during processing by 38.7, 83.8, 100, and 33.3%, respectively. The color decreased through the processing steps up to bleaching; then, in the deodorization step, it darkened sharply in all samples. No change in the fatty acid composition was observed. The order of oxidation stability was crude . degummed . deodorized . neutralized . bleached, in SCO; and crude . degummed . neutralized . bleached = deodorized, in MBO H₂O; and crude . degummed . deodorized . neutralized . bleached in MBO SOL; while in SBO, the order of oxidative stability was deodorized . crude . degummed . neutralized = bleached. Total sterols decreased by 42–92% in the processed oils, compared with crude oils. Keywords: *Sclerocarya birrea* oil, sorghum bug oil, melon bug oil, refining, quality, stability.