

Fatty Acids, Tocopherols, Phenolics and the Antimicrobial Effect of *Sclerocarya birrea* Kernels with Different Harvesting Dates

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Abstract Oil extracted from the kernel of *Sclerocarya birrea* with different harvesting dates was studied in terms of the oil content, fatty acids, tocopherols, phenolic compounds and antimicrobial activity. A quantitative increase in the oil content was observed to reach 63.0% at the end of the last harvesting date. The percentage of total fatty acids had altered and palmitic acid content was found to be 16.8% at the first date of harvesting and dropping for the rest of the dates to reach 14.6% by the end of the harvesting process. In the same manner, stearic acid was found to be 15.2% at the first date and this dropped dramatically to reach 8.8% by the end of the harvesting, while oleic and linoleic acids increased from 58.9 and 4.3% to 67.3 and 5.9%, respectively. Alpha and gamma tocopherols decreased rapidly, whereas the δ -tocopherol and δ -tocotrienol were 4.8 and 4.9 mg/100 g, respectively at the beginning and had disappeared completely by the last harvesting date. Total phenolic and flavonoid content increased continuously through the different harvesting dates. *Sclerocarya birrea* kernel oil was effective in inhibiting the growth of three out of four bacterial strains

tested. This inhibitory effect was less than that of the control.

Keywords Antibacterial activity · Fatty acids · *Sclerocarya birrea* · Tocopherols · Total flavonoid · Total phenolic

Introduction

Sclerocarya birrea subsp. *caffera* is a Savannah tree, belonging to the Anacardiaceae family. The common English name is Marula, the tree is commonly known in Sudan as Homeid, where it is widely distributed in western and southern areas [1]. Humans have used the marula tree as a source of nutrition for at least 10,000 years; the tree produces more than 600 kg of fruits per year with an average yield of 550–1000 kg with a current value of US\$1 per kg of fruit [2]. The kernels contained 53.0, 28.0 and 8.0% of oil, protein and carbohydrate, respectively [3]. The oil contains 67.2, 5.9 and 14.1% oleic, linoleic and palmitic acid, respectively and 13.7 mg/100 g tocopherols