

Determining the oxidative stability and quality of tiger nut (*Cyperus esculentus*) oil and its antioxidant activity during microwave heating

ABSTRACT

Introduction: The emphasis on vegetable oils high in oleic acid is prominent in human communities around the world. That said, the high level of this monounsaturated fatty acid (oleic acid) in tiger nut oil (*Cyperus esculentus*) shows that it is resistant to oxidative stability. The purpose of this study was to see if tiger nut oil can be exploited for use as an alternative or supplemental source of high-quality and nutritious cooking oil. **Materials and methods:** Color, RI, viscosity, PV, p-AV, FFA, TPC, at 233 and 269 nm, thermal behavior, TAG and FAC were used in this study to evaluate the oil after microwave heating. **Results:** PV, p-AV, FFA, TPC, and specific extinction increased during microwave heating. Significant differences ($p < 0.05$) were detected for peroxide, anisidine, acid value, polar compounds, and specific extinction. During microwave heating, the amounts of the peroxide, anisidine, and TOTOX values increased from the initial value of 3.06, 0.72, and 6.84 for the unheated oil to 4.11, 10.02, and 18.25 after 15 minutes of heating respectively. Free fatty acid changed from 0.10 to 0.12% during microwave heating. The amount of unsaturated fatty acids decreased significantly during heating. During microwave heating, antioxidant activity decreased significantly ($p < 0.05$) from 68.60 to 19. **Conclusions :** This may indicate that tiger nut oil can withstand heat treatments in culinary methods such as frying and it can be concluded that tiger nut oil is stable in heating processes, especially frying.

Keyword: Cyperus; Oxidation-reduction; Microwave; Antioxidants