



Title: Bioactive Compounds, Antioxidant Capacity and Cytotoxicity of African Olive (*Canarium schweinfurthii* Engl.) Fruit Pulp and Seed

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Abstract

The use of plants with therapeutic properties is an ancient form of health care, which has been part of communities for many years in all countries. African olive (*Canarium schweinfurthii* Engl.) is a multipurpose tree used for both food and in the management of various physiological disorders. This study aimed at determining the cytotoxicity, total polyphenol content (TPC) and antioxidant capacity as well as characterized polyphenols and tocopherols in the *Canarium schweinfurthii* Engl. fruit pulp. Cytotoxicity was determined using the human colon (Caco-2) cell lines and resazurin assay. Total polyphenol content was determined as mg Gallic Acid Equivalent (GAE)/g dry weight using the Folin-Ciocalteu reagent. The oxidative stress test was used to determine antioxidant capacity on human colon (Caco-2) cell lines. Total polyphenol content was determined using the Folin-Ciocalteu assay. Polyphenols were fractionated using Liquid Chromatography-tandem Mass Spectrometry technique. Tocopherols (α -, γ - and δ -) were quantified using High Performance Liquid Chromatography-Ultraviolet. *Canarium schweinfurthii* Engl. fruit pulp revealed no cytotoxicity against human Caco-2 cell lines. Total polyphenol content ranged from 73.93 to 92.43 mg GAE/g. The antioxidant capacity by Trolox Equivalent Antioxidant Capacity assay ranged from 2.74 to 5.43 while that of the Ferric Ion Reducing Antioxidant Power assay ranged from 4.36 to 6.16 $\mu\text{mol TE/g}$ dry weight. The fruit pulp contained phenolic acids (1.3-Dicaffeoylquinic acid, 4-hydroxybenzoic acid, chlorogenic acid, ferulic acid, gallic acid,

quinic acid, cinnamic acid and p-coumaric acid), flavonoids (**amentoflavone**, eriodictyol, gallic catechol, herbacetin and quercetin-3-O-glucoside) and lignans (pinoresinol). The tocopherol content of the fruit pulp ranged from 3.83 to 4.98 mg/kg. The major tocopherol isomers quantified were the alpha, gamma and delta. The fruit's antioxidant capacity may be attributable to phenolic acids, flavonoids and lignans, and tocopherols. In addition to its use as a food, the gamut of bioactives and antioxidant capacity support *Canarium schweinfurthii*'s potential therapeutic applications.

Keywords: African olive, Cytotoxicity, Polyphenols, Tocopherols, Antioxidants

Biography

Khadijah Nakyinsige holds a PhD in Food Science and Technology (specialization: Halal Products Science) from Universiti Putra Malaysia. She started her academic career from Islamic University in Uganda from where she raised from the rank of Teaching Assistant to Senior Lecturer and also served as the Dean, Faculty of Science. She joined Kyambogo University in 2017 and is currently serving as an Associate Professor and Head, Department of Food Science and Technology. Assoc. Prof. Nakyinsige also serves as the Vice Chairperson of Technical Committee 411- Halal Integrity at the Uganda National Bureau of Standards and Member of Technical Committee 49-Halal, Africa Standardization Organization. She is an editor and reviewer for several scientific journals.