

**A POTENTIAL USE OF BIOACTIVE
COMPOUNDS FROM SOME FRUITS AND ITS BY-
PRODUCTS**

BY

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ABSTRACT

The present study aimed to compare between physico-chemical properties of two papaya and avocado varieties (Summer and Winter). Also, extraction with two solvents (80% methanol and 0.5N acidified methanol) was applied in order to determine the bioactive compounds (total polyphenols and flavonoids) as well as the antioxidant activity by DPPH assay. Polyphenols and flavonoids were fractionated and identified by using HPLC in their by-products. Fatty acid methyl esters of papaya seeds oil and avocado pulps oil were fractionated and identified using GC as well as vitamins contents in papaya pulps, papaya seeds and avocado pulps.

Results ascertained that both varieties are different in all measured parameters. Solvent type strongly affected both active constituents and its antioxidant activities. The highest phenolic recovery, by methanol 80% revealed greater efficiency as antioxidant potency for papaya seeds of Winter variety and avocado seeds of Summer variety, compared to ascorbic acid (200 ppm). However, peels of the Winter variety in papaya and avocado contained higher carotenoids content. The major polyphenols in papaya peels and seeds were pyrogallol and catechin. The major polyphenols in avocado peels included catechin and 3-hydroxy tyrosol, while avocado seeds had catechin and pyrogallol. The major flavonoids; hesperdin, and naringin in papaya and avocado peels were significantly higher than those in seeds. Obvious relations were found among the extractable total phenolic components and DPPH scavenging potentials of extracts. In papaya seeds oil and avocado pulps oil; oleic acid was the major fatty acid, followed by palmitic acid and Linoleic acid. Data also revealed that ascorbic acid and vitamin B₁₂ were the major water soluble vitamins in both papaya and avocado pulps. On the contrary, vitamin K was the major vitamin in papaya seeds and avocado pulps. The content of crude powder yield in peels was significantly higher than those in seeds for two varieties. Furthermore, *in vitro* anticancer cytotoxicity in clinical setting for the management of breast (MCF7) and lung (H1299) cancers by Sulforhodamine B assay (SRB) proved chemotherapeutic potential involvement of oxidative stress, in a dose-dependent manner with the *IC₅₀ value accounted 45-477 and 85-250 µg/ml for peel and seed crude powder extracts, respectively. The major polyphenols in papaya peels crude powder included pyrogallol, benzoic acid and catechin, while papaya seeds crude powder had pyrogallol, benzoic acid and chlorogenic acid. The major polyphenols in avocado peels crude powder included pyrogallol and catechin, however, avocado seeds crude powder had catechin and benzoic acid.

Moreover, papaya and avocado were utilized in the processing of jam as an application. Sensory evaluation findings of papaya and avocado jams were accepted, where, no significant differences were recorded for avocado jam, however, significant differences ($p \geq 0.05$) were recorded for papaya jam.

Keywords: Papaya, Avocado, Antioxidant activity, Polyphenols, Flavonoids, Vitamins, Anticancer, Jam.

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