

Evaluation of the Biochemical Properties of Freshly Harvested Papaya Leaves

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ABSTRACT

The biochemical characteristics of leaves are extremely important from various perspectives, such as nutrition and health, toxicology and safety, and resistance to microbiological, chemical, or physical alterations. Evaluating the biochemical properties of freshly harvested papaya leaves usually requires the analysis of several essential components that contribute to their nutritional and medicinal value. The aim of this research was to analyze freshly harvested papaya leaves. The acquired biochemical composition is valuable for subsequent investigations on drying, grinding, and milling. Dairy products, supercritical fluid extraction, and numerous other beneficial processed products are highly nutritious.

Keywords: *Papaya leaves, biochemical analysis, phytochemical constituents, antioxidant activity, nutritional composition.*

INTRODUCTION

Papaya leaves have numerous benefits for treating dengue fever, and white blood cells and platelets can be increased by using papaya leaf juice, which also helps normalize blood clotting and prevents damage from cancer, i.e., cancer cell growth inhibition. The production of key signaling molecules called Th1-type cytokines can be boosted through the papaya leaf juice and helps to regulate the immune system and its antimalarial and antiplasmodial activities. Papaya leaves are useful for the treatment of malaria and for digestion. Chemical compounds are available in the

papaya leaves of carpain, and the microorganisms that often interfere with its digestive function are killed by the carpain. Papaya leaves have additional benefits, such as providing acne medicine, increasing appetite, easing mental pain, serving as a meat tenderizer and relieving nausea (Debjit & Duraivel, 2013).

Papaya leaves contain numerous active ingredients that contribute to enhancing overall antioxidant capacity. These leaves have been shown to increase the antioxidant power in the bloodstream, thereby reducing the level of lipid peroxidation. (Noriko et al., 2010).

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Papaya leaves are commonly utilized in India for treating fever, colic, beriberi, abortion, and asthma. In various regions of Australia, papaya leaves have been traditionally used for the treatment of conditions such as jaundice, malaria, and dengue, as well as for their immunomodulatory and antiviral effects and potential cancer-fighting effects (Kavimandan et al., 2016).

Phenolic compounds possess biological properties, including antidiabetic, antioxidant, gastroprotective, anti-inflammatory, spasmolytic, antimicrobial, and anticarcinogenic activities. (Pavic et al., 2017 & Veggi et al., 2014), antiseptic, disinfectant (Magdalena et al., 2016), hepato-protective, hypotensive and cardio-protective (Rodriquez et al., 2016). It affects chronic and degenerative conditions as well as various types of cancer. (Abbasi 2008 & Liu et al., 2007). Papaya plant materials contain phenol, making them valuable for use in the pharmaceutical, cosmetic, and food industries. Plant materials from various sources contain different groups of polyphenols. (Katarzyna et al., 2018).

MATERIALS AND METHODS

Moisture Content

The moisture content was determined using the method outlined in AOAC (1990).

Ash Content

The ash content of the papaya leaves was determined by the method described by AOAC (2012) using a muffle furnace.

Fat Content

Crude fat was analyzed using a Soxhlet apparatus (Make: Pelican Equipment, Chennai).

Crude Fiber Content

Estimation of crude fiber content was performed using a fibra-plus instrument (Make: Pelican Equipment, Chennai), as shown in Plate 3.5.

Protein Content

The protein content was determined by the micro-Kjeldahl method (AOAC, 2012).

Carbohydrate Content

The carbohydrate content was computed by difference.

Flavanoid Content

One gram of the papaya leaf sample was used for the preparation of the extract by Sadasivam and Manickam (1992).

Phenol Content

Total phenol from the papaya leaf sample was estimated by the method described by Sadasivam and Manickam (1992).

Total Antioxidant Activity

Antioxidant capacity was assessed through the ferric reducing antioxidant power (FRAP) technique outlined by Sadasivam and Manickam in 1992.

RESULTS

The chemical properties of the fresh papaya leaves were analyzed following the procedures outlined in section 3.2. The results regarding the chemical composition of fresh papaya leaves, including moisture, total ash, crude fat, crude fiber, protein, carbohydrate, flavonoid, and phenol contents; antioxidant activity; and overall nutrient content, such as iron, manganese, zinc, copper, potassium, phosphorus, and sodium, can be found in Table 4.2. All measurements were conducted in triplicate, and the average values are presented. The moisture content was 74.56 ± 0.61 , the ash content was 4.73 ± 0.03 , the fat content was 2.6 ± 0.1 , the crude fiber content was 2.8 ± 0.1 , the protein content was 0.2 ± 0.03 , the carbohydrate content was 14.78 ± 0.09 , the flavonoid content was 117.94 ± 1.98 mg/100 g, the total phenol content was 354.50 ± 5.00 mg/100 g, the antioxidant activity was $422.95 \pm 1.98\%$, and The findings regarding the chemical composition of the fresh papaya leaves observed in this study align well with the reported results. by Nwamarah & Adesanmi (2019) for crude fiber, fat, and Na. Ash was good, as investigated by Raja et al. (2019) and Nobel (1015). The protein content was 0.82%, which was less than that reported by Nwamarah et al. (2019). Ca, Mn, and K were good, as reported by Ayoola et al. (2010), and the phenol content was consistent with that reported by Hossain et al. (2016). However, differences in the chemical composition of newly harvested papaya leaves can be attributed to factors such as environmental

stress, climate, geography, cultivation methods, and harvesting practices.

Table1. Biochemical composition of fresh papaya leaves

Parameters	Mean Value \pm S.D.
Moisture, %	74.57 \pm 0.61
Ash, %	4.72 \pm 0.03
Crudefat, %	2.5 \pm 0.1
Crude fiber, %	2.9 \pm 0.1
Protein, %	0.2 \pm 0.03
Carbohydrate, %	14.78 \pm 0.09
Flavanoid, mg/100 g	117.94 \pm 1.98
Phenol, mg/100 g	354.50 \pm 5.00
Antioxidant mg/100 g	422.95 \pm 1.98

CONCLUSION

This study evaluated the biochemical properties of freshly harvested papaya leaves, emphasizing the influence of moisture content. These characteristics play a vital role in different processing investigations. Nevertheless, analyzing these characteristics necessitates employing a variety of analytical methods to ascertain the nutritional and medicinal value of the leaves. Each element aids in comprehending the health advantages and possible uses of papaya leaves in traditional medicine and contemporary pharmaceuticals.

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Conflict of Interest:

There is no such evidence of conflict of interest.

Author Contribution

Both author have participated in critically revising of the entire manuscript and approval of the final manuscript.

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