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Nutritional and phytochemical characteristics of *Garcinia afzelii* fruit

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ABSTRACT

Wild edible plants are increasingly recognized for their nutritional and bioactive potential, particularly in regions where food biodiversity remains underexploited. *Garcinia afzelii*, a traditionally consumed wild species, has received limited scientific attention despite its potential nutritional interest. This study aimed to characterize the nutritional and phytochemical properties of *G. afzelii* fruit pulp in fresh and dried forms. Bromatological analyses revealed a marked increase in dry matter content from 23.3% in fresh pulp to 86.69% after drying. Drying also resulted in higher concentrations of proteins (1.82% to 6.77%), ash (0.76% to 3.50%), and dietary fiber (1.10% to 6.80%). The fruit exhibited an acidic pH, which remained relatively stable after drying, while titratable acidity increased moderately. Phytochemical analyses showed that fresh pulp contained high levels of polyphenols (776.46 mg GAE/g), flavonoids (75.19 mg QE/g), and tannins (129.36 mg CE/g), with a significant reduction of these compounds following drying. Vitamins B9, C, K and β-carotene were more abundant in fresh pulp, with decreased levels in dried samples. Overall, *Garcinia afzelii* fruit pulp exhibits noteworthy nutritional and phytochemical characteristics, particularly in its fresh form. These findings highlight its potential interest as an underutilized local food resource and provide a scientific basis for its further valorization.

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INTRODUCTION

Globally, a wide diversity of edible plant species exists (Rowe *et al.*, 1999), of which only a limited proportion is currently exploited for human consumption, thereby maintaining food and nutrition security as a major global challenge (Berry *et al.*, 1995). In this context, wild edible plants, traditionally consumed by rural populations, are increasingly recognized for their high nutritional value and richness in bioactive compounds, thus representing a potential lever for improving food security and overall dietary quality (Duguma, 2020). Fruits derived from these wild plant species are of particular interest due to their significant contribution to essential nutrients, dietary fiber, vitamins, and antioxidant compounds. Numerous studies have demonstrated that fruits rich in polyphenols, flavonoids, and organic acids exhibit strong antioxidant capacity, which may support nutritional prevention by limiting oxidative stress (Scalbert *et al.*, 2005; Manach *et al.*, 2004). Nevertheless, despite their traditional consumption, the nutritional and phytochemical composition of many wild edible fruits remains insufficiently documented, thereby limiting their valorization and integration into local and agro-industrial food systems (Stadlmayr *et al.*, 2012).

The genus *Garcinia* (Clusiaceae), widely distributed across tropical regions of Asia, Africa, New Caledonia, Polynesia, and Brazil, is known to contain a wide range of biologically active metabolites and constitutes a rich natural source of bioactive compounds with notable therapeutic potential (Santo *et al.*, 2020). However, available scientific data remain uneven across species, and several *Garcinia* fruits from West Africa are still insufficiently characterized from a nutritional perspective. Among these species, *Garcinia afzelii* is a wild edible plant native to West Africa, traditionally exploited by local populations mainly for its roots (Doumbia *et al.*, 2025). The fruit pulp of this species, although consumed in certain areas, remains largely underutilized and poorly studied. To date, available information on its nutritional composition, phytochemical profile, and vitamin content remains limited, particularly with regard to the impact of processing methods such as drying on its nutritional quality.

Therefore, the present study aims to characterize the nutritional composition, phytochemical profile, and vitamin content of *Garcinia afzelii* fruit pulp in both fresh and dried forms. These data will contribute to a better understanding of the nutritional potential of *G. afzelii*, thereby supporting its valorization as an underutilized wild edible fruit.

MATERIALS AND METHODS

Plant material

The plant material consisted of mature fruits of *Garcinia afzelii* (Fig. 1), harvested in May 2021 from forests in Bonoufla, Bahoulifla, Gnanmienkro, Gatifla, and Sehitifla, located in the Vavoua Department, Côte d'Ivoire. Fruits were collected at full maturity and transported on the same day to the Laboratory of Biocatalysis and Bioprocesses at Nangui ABROGOUA University in Abidjan, Côte d'Ivoire, for subsequent analyses.

Fig. 1. Mature fruits (a) and cross-section of *G. afzelii* fruits (b)

Determination of pH and titratable acidity

Total titratable acidity was determined according to AOAC method (2000). Ten grams of crushed pulp were homogenized in 50 mL of distilled water. After thorough mixing, 5 mL of the homogenate was titrated with 0.1 N sodium hydroxide using phenolphthalein as an indicator until a persistent pink coloration appeared. Acidity was expressed in mEq/100 g of fresh weight.

pH was measured according to AOAC (1995) using a calibrated pH meter (C861, Consort).

The electrode was immersed in 5 mL of pulp juice, and measurements were repeated five times for each sample.

Moisture and dry matter content

Moisture content was determined according to AOAC method (2000). Five grams of fresh pulp were dried at 105 °C until a constant weight was achieved. Dry matter content was calculated from the weight loss.

Total sugars extraction and determination

The total sugars were extracted according to Martinez-Herrera *et al.* (2006). One gram of sample underwent two successive extractions with 80% ethanol (v/v) under agitation and centrifugation (6,000 rpm, 10 min). The pooled supernatants were combined and used for total sugar determination using the phenol-sulfuric acid method described by Dubois *et al.* (1956), with absorbance measured at 490 nm, while reducing sugars were quantified using Bernfeld's dinitrosalicylic acid (DNS) method (1955), with absorbance measured at 540 nm.

Protein content

Protein content was determined according to the method of Lowry *et al.* (1951). After reaction with alkaline reagents and Folin-Ciocalteu reagent, absorbance was measured at 660 nm. Protein content was calculated using a bovine serum albumin calibration curve and expressed as a percentage of dry weight.

Lipid content

Total lipids were extracted using a Soxhlet apparatus according to AOAC method (2000), with hexane as the solvent for 8 hours. Lipid content was determined by weight difference after solvent evaporation and expressed as a percentage of dry weight.

Crude fiber content

Crude fiber content was measured according to the AOAC method (2000) by sequential digestion, first with dilute acid (0.25 N H_2SO_4) and then with alkali (0.31 N NaOH), followed by calcination of the residue at 550 °C for 3 h.

Ash content

Ash content was determined according to the AOAC method (2000) by incinerating 5 g of sample in a muffle furnace at 550 °C for 6 hours and expressed as a percentage of dry weight.

Polyphenol extraction

Total phenolic compounds were extracted according to the method of Rhaman and Punja (2005).

One gram of sample was extracted twice with 10 mL of 80% acetone (v/v). After homogenization, incubation at 37 °C for 30 min, and centrifugation (6,000 rpm, 10 min), the supernatants were combined for subsequent total phenolic compound determination.

Total polyphenol content

Total phenolic compounds were quantified using the Folin-Ciocalteu method described by Singleton *et al.* (1999). Absorbance was measured at 725 nm and results were expressed as mg of GAE/100 g of dry matter (DM).

Total flavonoid content

Total flavonoids were determined according to the method of Meda *et al.* (2005) using aluminum chloride complexation. Absorbance was measured at 415 nm, and results were expressed as mg of QE/100 g DM.

Vitamin B9 content

Vitamin B9 was extracted according to AOAC method (2000). Briefly, two grams of *G. afzelii* pulp were incubated in 25 mL of 0.1 N H_2SO_4 at 121 °C for 30 min. After cooling, the pH was adjusted to 4.5 using 2.5 M sodium acetate, and 50 mg of Takadiastase was added for enzymatic hydrolysis at 35 °C for 24 h. The hydrolysate was filtered (Whatman No. 4), diluted with 50 mL of purified water, and filtered through a 0.45 µm membrane. A 20 µL aliquot was injected into the HPLC system. Separation was performed on a C18 reverse-phase column (Agilent ZORBAX Eclipse Plus C18; 250 × 4.6 mm, 5 µm) in isocratic mode with methanol (A) and 0.023 M H_3PO_4 (B, pH 3.54) in a 33/67 ratio at a flow

rate of 0.5 mL/min. UV detection was performed at 270 nm. Quantification was achieved by comparison with a five-point standard curve prepared from a folic acid stock solution.

Vitamin C content

Vitamin C was determined according to the method of Pongracz *et al.* (1971) by reduction of 2,6-dichlorophenol-indophenol. The titration equivalence was used to calculate ascorbic acid content (expressed as mg/100 g of fresh weight).

β-Carotene content

β-Carotene content was determined according to the method of Biswas *et al.* (2011). For each sample, 1 g of material was homogenized with 5 mL of hexane, 2.5 mL of ethanol (96%), and 0.1 mL of alcoholic hydroquinone (20 g/100 mL ethanol 95%). The mixture was vortexed, centrifuged at 3,000 rpm for 20 min, and the supernatant collected under low light conditions. A 4 mL aliquot was analyzed by UV-visible spectrophotometry at 450 nm (T80 UV/VIS spectrometer), using a solvent blank. β-Carotene concentration was calculated from a calibration curve (absorbance$_{450}$= 0.0163 × concentration, R^2= 0.9988). All manipulations were performed under light protection to prevent carotenoid oxidation.

Vitamin K

Vitamin K was analyzed by high-performance liquid chromatography (HPLC) according to the method of Sami *et al.* (2014). After saponification, extraction with diethyl ether, and purification, compounds were separated on a C18 column in isocratic mode, with UV detection at 248 nm and quantification using external standards.

RESULTS

Proximate composition of *G. afzelii* fruit pulp

The fruit pulp of *Garcinia afzelii* exhibited notable compositional changes between fresh and dried forms (Table 1). Dehydration increased dry matter content from 23.3% to 86.69%. On a dry weight basis, protein content rose from 1.82% to 6.77%, while ash content increased from 0.76% to 3.50%. The pH remained relatively stable (2.98–2.99). However, titratable acidity increased markedly from 41.96 mEq/100 g to 152.75 mEq/100 g.

Table 1. Proximate composition of *G. afzelii* fruit pulp (expressed on a dry weight basis)

Parameter	Values	
	Fresh	Dry
Ash (%)	0.76 ± 0.03^a	3.50 ± 0.1^b
Protein (%)	1.82 ± 0.02^a	6.77 ± 0.04^b
Dry matter (%)	23.3 ± 0.04^a	86.69 ± 0.18^b
pH	2.98 ± 0.01^a	2.99 ± 0.01^b
Titratable acidity (meq/100 g)	141.96 ± 0.04^a	152.75 ± 0.2^a
Fiber (%)	1.1 ± 0.01^a	6.80 ± 0.05^b
Total lipids (%)	1.02 ± 0.01^a	4.05 ± 0.04^b

n = 5; values expressed as mean ± standard deviation; means sharing the same letter within a row are not significantly different ($p > 0.05$) according to Student's t-test; meq: Milliequivalent.

Phytochemical composition of *G. afzelii* fruit pulp

Phytochemical analysis (Table 2) of *G. afzelii* fruit pulp revealed the presence of various phenolic and antioxidant compounds. Total polyphenols, expressed as gallic acid equivalents (GAE) was 776.45 mg/g in fresh pulp but decreased significantly to 69.34 mg/g in dried pulp. Flavonoid content decreased from 75.19 mg/g (fresh) to 65.54 mg/g (dry), and tannins declined from 129.36 mg/g to 80.04 mg/g. The levels of tannic and gallic acids were modest in fresh pulp (0.09 mg/g and 0.9 mg/g, respectively), while tannic acid became undetectable in dried pulp, along with several other compounds, including caffeic acid, catechin, rutin, and vanillic acid.

Regarding antinutritional factors, oxalate content increased moderately from 19.26 mg/100 g (fresh) to 21.41 mg/100 g (dry).

Table 2. Polyphenolic composition of *G. afzelii* fruit pulp

	Compounds	Values	
		Fresh	Dry
Total phenolic compounds	Polyphenols (mg GAE/g)	776.46 ± 0.11^a	69.34 ± 0.01^b
	Flavonoids (mg QE/g)	75.19 ± 0.02^a	65.54 ± 0.02^b
	Tannins (mg CE/g)	129.36 ± 0.03^a	80.04 ± 0.06^b
	Tannic acid	0.09 ± 0.01	Nd
	Gallic acid	0.9 ± 0.03^a	0.27 ± 0.02^b
Individual phenolic compounds	Caffeic acid	0.04 ± 0.01	Nd
	Catechin	1.08 ± 0.02	Nd
	Rutin	0.45 ± 0.03	Nd
	Vanillic acid	0.86 ± 0.01	Nd
Antinutritional factor	Oxalate (mg/100 g)	19.26 ± 0.01^a	21.41 ± 0.01^b

n =5; values expressed as mean ± standard deviation; Nd = Not detected; means sharing the same letter within a row are not significantly different ($p > 0.05$) according to Student's t-test; GAE: Gallic Acid Equivalents; QE: Quercetin Equivalents; CE: Catechin Equivalents.

Table 3. Vitamin composition of *G. afzelii* fruit pulp

Compound	Values	
	Fresh	Dry
Vitamin B9 (µg/100 g)	72.03 ± 0.02^a	29.33 ± 0.02^b
Vitamin C (mg/100 g)	5.03 ± 0.02^a	0.42 ± 0.01^b
β-Carotene (mg/100 g)	8.64 ± 0.01^a	1.28 ± 0.01^b
Vitamin K (µg/100 g)	5.1 ± 0.04^a	1.02 ± 0.01^b

n = 5; values expressed as mean ± standard deviation; Nd = Not detected; means sharing the same letter within a row are not significantly different ($p > 0.05$) according to Student's t-test.

Vitamin composition of *G. afzelii* fruit pulp

Vitamin analysis (Table 3) of *G. afzelii* fruit pulp showed richness in vitamins, especially in the fresh form, with marked reductions after drying. Vitamin B9 was 72.03 µg/100 g in fresh pulp, decreasing to 29.33 µg/100 g in dry pulp. Vitamin C content was 5.03 mg/100 g in fresh pulp but dropped sharply to 0.42 mg/100 g in dry pulp. β-Carotene content in fresh pulp was 8.64 mg/100 g, whereas in dry pulp it decreased to 1.28 ± 0.01 mg/100 g. Finally, vitamin K decreased from 5.1 µg/100 g (fresh) to 1.02 µg/100 g (dry).

DISCUSSION

The ash content of *Garcinia afzelii* fruit pulp is 0.76% in the fresh state and 3.50% in the dried state. Morabandza *et al.* (2013), working on the mesocarp of fresh *Garcinia kola* fruits (Clusiaceae), recorded a significantly higher ash content than in the present study, at 7.90%.

Similarly, Peroumal (2014), in his work on the pulp of *Mammea americana*, reported lower ash contents than those observed in this study, ranging from 0.11% to 0.22%. Additionally, Cissé (2012), analyzing fresh baobab pulp (*Adansonia digitata*) collected in Côte d'Ivoire, reported an ash content of 5.21%, considerably higher than the value observed for fresh *G. afzelii* pulp in this study. Koné *et al.* (2018) also reported higher contents in the pulp of black plums (*Vitex doniana*) from three regions of Côte d'Ivoire (Bagoué, Poro, and Tchologo), with values ranging from 3.43% to 3.64%.

Regarding protein content, it increases from 1.82% in the fresh sample to 6.77% in the dried sample. In the fresh state, this content remains lower than that reported for other species of the same genus. Morabandza *et al.* (2013) observed 5.17% in the mesocarp of fresh *Garcinia kola* fruits. By comparison, baobab pulp (*Adansonia digitata*) collected in Côte d'Ivoire also has a higher content of 3.03% (Cissé, 2012). For pomegranate (*Punica granatum*), Ejjilani (2022) reported protein contents ranging from 0.47% ("Khik") to 0.83% ("Chiou, Chel") for local genotypes, and from 0.45% ('Ruby') to 1.13% ("Wond").

Nevertheless, the protein content of fresh *G. afzelii* fruit pulp remains higher than that of some tropical fruits; Peroumal (2014) reported values between 0.40% and 0.47% for *Mammea americana* pulp. Furthermore, according to Rhodes *et al.* (2018), mango cultivars such as "Tommy Atkins", "Keitt", "Kent", and "Haden" contain on average 0.82% protein in the pulp. Hassen *et al.* (2021) also observed, in Algerian pomegranates (*Punica granatum* L.) from different regions, much lower protein contents than *G. afzelii*, ranging from 0.0062% to 0.590%, depending on fruit peel coloration.

The dry matter content of *G. afzelii* pulp ranges from 23.3% in the fresh state to 86.69% in the dried state. The fresh pulp (23.3%) exceeds the value reported by Morabandza *et al.* (2013) for *Garcinia kola* mesocarps, which was 15.6%. It also surpasses values for other tropical fruits, such as *Mammea americana* pulp (11.69 ± 1.72 g/100 g to 16.33 ± 2.48 g/100 g) (Peroumal, 2014) and ripe *Sclerocarya birrea* fruits, which averaged 7.80 ± 1.49% (Halidou *et al.*, 2022).

However, the 23.3% value for fresh *G. afzelii* is lower than that of fresh baobab pulp in Côte d'Ivoire (88.33%) (Cissé, 2012). Ekué *et al.* (2008) highlighted that fleshy fruits generally have very high-water content.

The pH of *G. afzelii* pulp remains nearly stable between fresh (2.98) and dried (2.99), indicating minimal variation in free acidity during drying. In contrast, titratable acidity, indicative of total organic acids, slightly increases from 141.96 to 152.75 meq/100 g, likely due to concentration from water loss. The fresh pulp values (pH 2.98; titratable acidity 141.96 meq/100 g) exceed those reported for *Garcinia kola* mesocarps (pH 2.91; 64.48 meq H_2SO_4/g/l) (Morabandza *et al.,* 2013). Compared to other fruits, *G. afzelii* shows markedly higher acidity. For instance, pomegranate pulp (genotype "Bzou") has a pH of 3.69 and titratable acidity of only 0.91 g citric acid/100 mL (Ejjilani, 2022). Similarly, in 17 pomegranate genotypes, pH ranges from 3.3 to 4.0 (Cicek *et al.*, 2019) and titratable acidity varies from 0.18 to 3.84 mg/ml in Algerian varieties (Hassen *et al.*, 2021), significantly lower than *G. afzelii*. *Mammea americana* pulp has a higher pH (3.41-3.86) and lower titratable acidity (2.62 ± 1.00 to 5.16 ± 1.41 meq/100 ml) (Peroumal, 2014). Baobab pulp collected in Côte d'Ivoire remains lower (pH 3.3; titratable acidity 102.6 meq/100 g) (Cissé, 2012), and black plum pulps (*Vitex doniana*) from Koné *et al.* (2018) show much higher pH values (4.50 ± 0.01 to 5.11 ± 0.01) depending on the region.

Dietary fiber content increases after drying, from 1.1% (fresh) to 6.80% (dry). Compared to other tropical fruits, *G. afzelii's* fiber content is moderate; baobab pulp in Côte d'Ivoire reaches 25.25% (Cissé, 2012), while ripe mango pulp contains only 1.6% ("Tommy Atkins", "Keitt", "Kent", "Haden") (Rhodes *et al.*, 2015). Though lower than baobab, *G. afzelii* pulp is richer than most tropical fruits, particularly when dried. Increased fiber intake is associated with reduced risk of colorectal cancer, type 2 diabetes, obesity (Alahmari, 2024), and cardiovascular diseases (Zhang *et al.*, 2025).

Total lipid content rises after drying, from 1.02% (fresh) to 4.05% (dry). Despite this increase, it remains lower than fresh *Garcinia kola* mesocarp (19.53%) (Morabandza *et al.*, 2013).

Pomegranate fruits have even lower lipid contents (0.054–0.950%) (Hassen *et al.*, 2021), while African baobab pulp contains 0.94% (Cissé, 2012). Lipid content of *G. afzelii* pulp, though higher than many tropical fruits, is lower than *Parkia biglobosa* (23.25 ± 0.01%) and *Tamarindus indica* (17.02 ± 0.01%) (Ahodegnon *et al.*, 2018). *Sclerocarya birrea* (marula) pulp averages 2.78 ± 0.74% (1.90–3.84%), similar to dried *G. afzelii*.

Total polyphenol content decreases after drying, from 776.45 ± 0.11 mg GAE/g (fresh) to 69.34 ± 0.01 mg GAE/g (dry). The initial high content surpasses levels in *Vitis vinifera*, *Punica granatum*, *Citrus aurantium*, and *Opuntia ficus-indica* (Zeghad *et al.,* 2019) and in

Mammea americana pulp (90 ± 20 to 143 ± 8 mg/100 g) (Peroumal, 2014). It also exceeds that in passion fruit (72 mg/100 g), mango (68 mg/100 g), banana (51 mg/100 g), pineapple (47 mg/100 g), and temperate fruits like pear (69 mg/100 g), nectarine (73 mg/100 g), yellow peach (59 mg/100 g), and citrus (30–45 mg/100 g) (Brat *et al.*, 2006). Compared to baobab pulp in Côte d'Ivoire (1084 mg/100 g) (Cissé, 2012), it is lower, yet higher than black plum pulps (*Vitex doniana*) (193.33–196.67 mg GAE/100 g) (Koné *et al.*, 2018). Polyphenols contribute to cardiovascular disease prevention (Iqbal *et al.*, 2023), blood pressure reduction, lipid profile improvement, and glucose metabolism enhancement (Wan *et al.*, 2024), with antioxidant, anti-inflammatory, and genetic/epigenetic modulation effects (Gál *et al.*, 2023).

Flavonoid content slightly decreases after drying, from 79.19 ± 0.02 mg QE/g (fresh) to 70.33 ± 0.02 mg QE/g (dry), higher than in *Garcinia kola* (14.67 mg/100 g) (Morabandza *et al.,* 2013) and other fruits studied by Zeghad *et al.* (2019). It also exceeds Algerian pomegranate levels (42.36–240.73 mEq GAE/100 g) (Hassen *et al.*, 2021) and *Mammea americana* pulp (2.60 ± 1.15 to 9.90 ± 2.86 mg/100 g) (Peroumal, 2014). High flavonoid content explains the plant's biological activities, including antioxidant, anti-inflammatory, anti-apoptotic, analgesic, antifungal, antimicrobial, hemostatic, aphrodisiac, and astringent effects (Verma *et al.*, 2024; Li *et al.*, 2023; Hasnat *et al.*, 2024), and vascular protective roles (Li and Zhang, 2023).

Total tannins decrease from 129.45 ± 0.03 mg CE/g (fresh) to 80.04 ± 0.06 mg CE/g (dry), higher than *Garcinia kola* seeds (4.74–29.11 mg CE/g) (Yété *et al.*, 2015), due to factors like plant material, post-harvest treatment, and extraction method. Tannins bind proteins, conferring protective layers (Yété *et al.*, 2015). Phenolic acids such as gallic acid, caffeic acid, catechin, and vanillic acid decrease significantly after drying. Gallic acid drops from 0.9 ± 0.03 mg/100 g to 0.27 ± 0.02 mg/100 g; caffeic acid and catechin become undetectable. Rutin, a flavonoid, decreases from 0.45 ± 0.03 mg/100 g to undetectable.

Vitamin B9 (folates) is higher in fresh pulp (72.03 ± 0.02 µg/100 g) and decreases after drying (29.33 ± 0.02 µg/100 g). This is lower than "Ataulfo" mango pulp (74.5 ± 2.09 µg/100 g) and fresh papaya (90.8 ± 1.91 µg/100 g) but higher than fresh guava (64.4 ± 2.57 µg/100 g), lemon (44.58 ± 0.62 µg/100 g), and mandarin (3.78 ± 0.91 µg/100 g) (Striegel *et al.*, 2019; Islam *et al.*, 2020). B vitamins are crucial for health, particularly in chronic kidney disease, and higher natural folate intake is linked to reduced all-cause mortality and lower risk of end-stage renal disease (Liu *et al.*, 2024) and osteoporosis (Zhou *et al.*, 2024).

Vitamin C content is relatively high in fresh pulp (13.25 ± 0.03 mg/100 g) but decreases after drying (5.12 ± 0.01 mg/100 g). Compared to other fruits, it is lower than black plum pulp in Côte d'Ivoire (14.34–15.05 mg/100 g) (Koné *et al.*, 2018) but higher than *Parkia biglobosa* and *Tamarindus indica* (0.32 ± 0.01 mg/g and 0.21 ± 0.01 mg/g) (Ahodegnon *et al.,* 2018). Vitamin C is important for antioxidant protection, iron absorption, tissue repair, and blood vessel formation via collagen synthesis.

β-Carotene content is 8.64 ± 0.01 mg/100 g in fresh pulp, lower than Indonesian pineapple (12.336 mg/100 g) but higher than other Indonesian fruits: papaya (7.232 mg/100 g), guava (7.052 mg/100 g), melon (0.844 mg/100 g), mango (0.524 mg/100 g), banana (0.445 mg/100 g) (Sari and Sari, 2022). High dietary β-carotene intake is associated with reduced depression risk (Zhang *et al.*, 2022).

Vitamin K values are very low: 5.1 ± 0.04 µg/100 g (fresh) and 1.02 ± 0.01 µg/100 g (dry), as vitamin K is mainly found in leafy vegetables (Dunlop *et al.*, 2024). In 90 Australian horticultural products, fruits, cereals, and nuts had very low K1 (<5 µg/100 g), while leafy vegetables often exceeded 200-300 µg/100 g. Higher dietary vitamin K intake is linked to better physical function, lower fall injury risk in elderly women (Smith *et al.*, 2023), and greater muscle mass in adults (Wang *et al.*, 2024).

CONCLUSION

The study of *Garcinia afzelii* pulp reveals a rich biochemical profile, confirming its nutritional and agro-food potential. Proximate analyses show high water content in fresh pulp and increased macronutrient concentration after drying, highlighting the value of dried pulp where fruit preservation is limited. Organoleptically, its high acidity, due to organic acids, provides a tangy flavor and potential as a natural acidifying agent, though these compounds decrease during drying. Fresh pulp is rich in phenols, flavonoids, and tannins, reflecting notable antioxidant capacity, which is reduced upon processing. However, increased oxalates in dried pulp present a nutritional constraint, requiring appropriate processing. *G. afzelii* appears as a promising resource, whose optimal use depends on processing techniques that preserve functional and nutritional qualities. These results provide a strong scientific basis for exploring its potential, notably as an appetite-suppressing fruit.

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