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Nutritional Composition and Health-Promoting Properties of Sapota (*Manilkara zapota*)

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Sapota (*Manilkara zapota*), commonly known as chikoo, sapodilla, or naseberry, is a tropical fruit belonging to the family Sapotaceae. It is native to Central America and widely cultivated in India, Mexico, Sri Lanka, Thailand, and Southeast Asia. The fruit is round to oval, brown-skinned, with sweet, grainy pulp and black, shiny seeds. It is highly appreciated for its pleasant taste and nutritional and medicinal properties. Traditionally, different parts of the plant, such as the fruit, leaves, bark, and seeds, have been used in folk medicine for treating diarrhoea, cough, fever, ulcers, inflammation, and metabolic disorders (Rivas-Gastelum *et al*., 2023). Recent scientific studies indicate that sapota is rich in nutrients and bioactive phytochemicals that contribute to its antioxidant, anti-inflammatory, antimicrobial, and cardioprotective properties (Tulloch *et al*., 2020).

Nutritional Composition of Sapota

Sapota is an energy-dense fruit due to its high carbohydrate content. According to USDA data reported in the reviewed literature (Padmavathi, 2018), 100 g of fresh sapota provides approximately the amounts shown in Table 1.

Table 1. Nutritional quality of sapota fruit (per 100 g fresh weight)

Nutrient	Amount per 100 g fresh fruit
Energy	83 kcal
Carbohydrates	~20 g
Protein	0.4 g
Fat	1.1 g
Dietary fibre	5.3 g
Vitamin C	14.7 mg
Vitamin A	60 IU
Potassium	193 mg
Calcium	21 mg
Iron	0.8 mg

The fruit is also a source of folate, niacin, pantothenic acid, magnesium, phosphorus, copper, and zinc (Miranda, 2022). Its dietary fibre content (5.3 g/100 g) may be beneficial for digestive health (Padmavathi, 2018). In addition to basic nutrients, sapota contains polyphenols, flavonoids, tannins, and other phytochemicals. Compounds identified in fruit extracts include methyl-4-O-galloylchlorogenate, 4-O-galloylchlorogenic acid, catechin, epicatechin, gallocatechin, gallic acid, quercetin, and chlorogenic acid (Tulloch et al., 2020). These compounds are associated with many of the biological activities reported for the fruit.

Figure 1. Sapota (*Manilkara zapota*) fruits on the plant

Antioxidant Properties

Oxidative stress plays a central role in ageing and chronic diseases such as cancer, cardiovascular disease, and diabetes. Sapota exhibits antioxidant activity due to its content of vitamin C, phenolic acids, flavonoids, and tannins. Studies have shown that sapota fruit extracts demonstrate free-radical-scavenging activity in assays such as DPPH, ABTS, and FRAP. Antioxidants such as methyl-4-O-galloylchlorogenate and 4-O-galloylchlorogenic acid, isolated from methanolic extracts, showed antioxidant potential (Tulloch et al., 2020). A study in elderly individuals reported that regular consumption of ripe sapota increased total antioxidant capacity (TAC) and vitamin C levels while reducing nitric oxide levels, indicating an improvement in oxidative balance (Leelarungrayub *et al*., 2019). Thus, sapota consumption may help neutralise free radicals, reduce oxidative damage, and protect cellular integrity.

Anti-inflammatory Activity

Chronic inflammation is associated with metabolic disorders, cardiovascular diseases, and immune dysfunction. Sapota contains tannins and polyphenols, which possess anti-inflammatory properties (Padmavathi, 2018). Research has demonstrated that sapota extracts inhibit pro-inflammatory cytokines such as tumour necrosis factor-alpha (TNF-α). In vitro studies have shown dose-dependent inhibition of inflammatory markers, indicating possible immunomodulatory effects (Leelarungrayub *et al*., 2019). Leaf ethanolic extracts have also been reported to exhibit anti-inflammatory and antihyperglycaemic properties. These findings suggest that sapota-derived compounds may have potential in the management of inflammatory conditions.

Digestive Health Benefits

Sapota is rich in dietary fibre and tannins. Fibre aids bowel movement, helps prevent constipation, and may reduce the risk of colon-related disorders. Tannins present in sapota act as natural astringents and have traditionally been used in managing diarrhoea and intestinal inflammation. Traditionally, sapota fruit and bark have been used to manage digestive disorders such as enteritis and gastritis (Padmavathi, 2018). Thus, consumption of the fruit may support gastrointestinal health.

Cardiovascular and Metabolic Benefits

Sapota contains potassium, which helps regulate blood pressure and maintain electrolyte balance (Padmavathi, 2018). Its antioxidants may help prevent the oxidation of LDL cholesterol, thereby potentially reducing the risk of atherosclerosis. A clinical study reported a decrease in total cholesterol levels after four weeks of sapota consumption among elderly participants. Although glucose levels showed some variation, the reported changes in lipid profile suggest possible cardioprotective effects. Leaf extracts have also demonstrated hypocholesterolaemic and antihyperglycaemic activities, indicating potential relevance to metabolic health (Tulloch *et al*., 2020).

Antimicrobial and Immune-Boosting Effects

Sapota fruit contains bioactive compounds reported to have antiviral, antibacterial, and other antimicrobial activities (Padmavathi, 2018). Tannins extracted from leaves and fruit may inhibit microbial growth and could have applications in food preservation. Vitamin C present in sapota supports immune function and helps reduce oxidative stress (Leelarungrayub *et al*., 2019). These properties may contribute to overall health.

Other Therapeutic Applications

Traditionally, sapota has been used for the following purposes (Rivas-Gastelum *et al*., 2023):
Treating cough and cold
Acting as a diuretic
Managing diarrhoea
Reducing fever
Promoting wound healing
Studies have also indicated cytotoxic, anti-arthritic, hepatoprotective, and neuroprotective potential, which warrants further investigation.

Conclusion

Sapota (*Manilkara zapota*) is not only a popular tropical fruit but also a food source of essential nutrients and bioactive phytochemicals. It provides carbohydrates, dietary fibre, vitamins A and C, potassium, and phenolic compounds. The literature reports antioxidant, anti-inflammatory, antimicrobial, cardioprotective, and digestive-health properties. A clinical study has also reported improvements in antioxidant status and lipid profile in elderly individuals. Therefore, sapota has potential for further investigation in nutraceutical development and dietary approaches to health. Incorporating sapota as part of a balanced diet can contribute nutrients and bioactive compounds to the daily diet.

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