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# CASHEW APPLE: COMMERCIAL EXPLOITATION FOR HEALTH AND NUTRITION

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## ABSTRACT

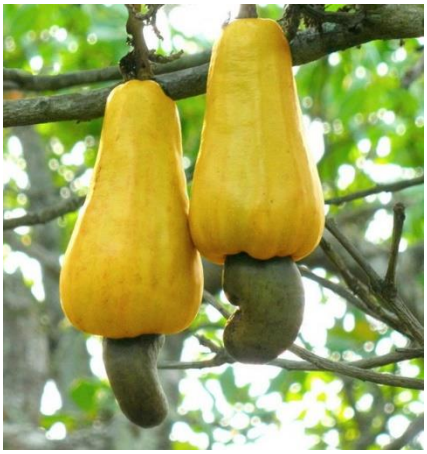
*The Cashew apple, a tropical fruit rich in vitamins and minerals, is a delicious, fibrous, and nutrient-rich fruit. The cashew apple contains 8- 11% of fermentable sugars and Vitamin C, six times that of citrus fruits and ten times more than that of pineapple. The ascorbic acid content in cashew apples is high (240 mg/100 g), about six times that of citrus fruits (40 mg/100 g), a highly rich source of Vitamin C. However, due to its short production period and high perishability, more than a lakh of cashew apples are wasted in India without commercial exploitation. The value-added products from cashew apple is a thrust area of research for food technologists, industrialists and farmers and alternate cheap solution for nutritional source.*

## INTRODUCTION

Cashew fruit (*Anacardium occidentale*), commonly called apple, belongs to the *Anacardiaceae* family, is native to tropical America, and is widely available in several countries of Asia, Africa and Central America. Extensively cashew is grown for kidney-shaped nuts in tropical climates. However, the fruit which bears the nuts is also rich in vitamins and minerals. The cashew apple is an edible false delicious, fibrous and nutrient-rich fruit attached to the externally born nut by a stem. Contains sugars, amino acids, tannin, ascorbic acid (Vitamin C) and crude fibre. The ascorbic acid content in cashew apples is extremely high (240 mg/100 g), about six times that of citrus fruits (40 mg/100 g), a highly rich source of Vitamin C (Nagaraja, 2007). The cashew apple also has free soluble sugars, the majority of which are reducing sugars in addition to vitamin C. The crude fibre content of cashew apples, measured in terms of dry weight, ranges from 15 to 18%. Phenols, tannins, and flavonols present in cashew apples may act as natural antioxidants crucial in scavenging free radicals. The cashew apple is a good source of fibre and vitamin C. Consuming cashew apples may aid in overcoming constipation and a lack of Vitamin C (Sobhana, 2019). The cashew

apple, weighing about 8-10 times that of the nut, is an equally valuable product from the crop if it is economically exploited.

In India, cashew cultivation is popular in the states of Goa, Maharashtra, Karnataka, Kerala, Andra Pradesh and some pockets of Chhattisgarh and Jharkhand. However, about 95 per cent or more of the apple crop is not eaten, as the taste is not popular. For every tone of cashewnut produced, 8-10 tons of cashew apple is produced and more than 40 lakh tones completely wasted in India, without any commercial exploitation due to its short period availability and high perishability, except in Goa where it is profitably used for the production of feni, a fermented alcoholic beverage.



## NUTRITIONAL VALUE OF FRESH CASHEW APPLE (PER 100g)

- Moisture :84.4- 88.7 g
- Protein :0.10- 0.162g
- Fat :0.05-0.50g
- Fiber :0.4-1.0g
- Carbohydrates :9.08-9.75g
- Calcium :0.9 -5.4 mg
- Phosphorous :6.1-21.4 mg
- Iron :0.19-0.71mg
- Carotene :0.03-0.742mg
- Ascorbic acid :146.6-372.0mg (Source: DCCD Kochi)

## MULTIPLE USES OF CASHEW APPLE

### 1) INDUSTRIAL USES

About 10% of cashew apple juice is reduced sugar, and 20% of the cellulose in its bagasse is cellulose. The leftover fruits are utilized as a substrate for various microorganism fermentation processes. *Saccharomyces cerevisiae* made wine and bioethanol. *Lactobacillus casei* produces lactic acid and probiotic beverages. *Pseudomonas aeruginosa, Acinetobacter calcoaceticus* and *Bacillus subtilis* produced the biosurfactants rhamnolipids, emulsan, and surfactin, respectively. *Aspergillus spp*. developed tannase and pectinase during solid-state fermentation. The *Leuconostoc spp*. enzyme dextransucrase was used to

create prebiotic oligosaccharides. Depending on the type of microorganisms utilized, cashew apple has the potential to serve as a substrate for a wide range of goods.

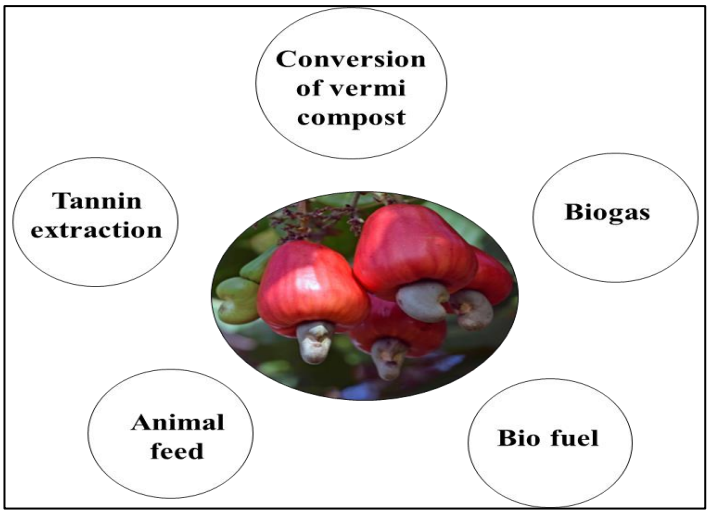
## 2) MEDICINAL USES

The fleshy cashew apple has 65-80% moisture, and its juice is rich in minerals, carbohydrates, polyphenols, and tannins. It can be used as a beverage and has potential therapeutic benefit for treating various illnesses. Fresh cashew apple juice is consumed more effectively to fight chronic diarrhoea, sore throats, and bone demineralization. Fresh or distilled cashew apple juice is believed to possess a special astringent property that relieves rheumatism and neuralgia. Cashew apples have a high caloric value, utilized as an energy booster to revive the body because the glucose in cashew apples serves as a quick source of energy, and the fructose controls insulin and stabilizes blood sugar. Copper improves blood vessel elasticity and increases oxygen-carrying capacity, while calcium promotes healthy bones and joints. It is also used as breath fresh and improves overall dental health for being a strong antioxidant (Mini *et al.*, 2005). In addition, fermented and fresh juice prevents age-related sleeplessness, macular degeneration and muscle cramps.

## 3) NEUTRACEUTICAL USES

The addition of cashew apple powder or cashew apple juice to food provides health benefits, including the prevention and treatment of disease

## 4) AGRICULTURAL USES



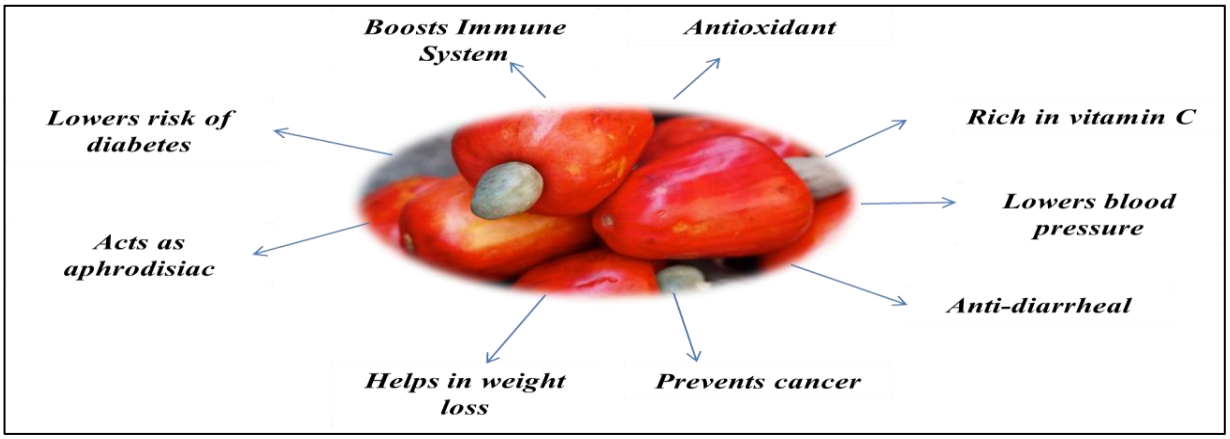

## 5) FOOD PRODUCTS

- Canned products
- Pulp products
- Confectioneries
- Culinary products
- Beverages: Fresh and Fermented

## ANTI-NUTRITIONAL FACTORS

Antinutritional compounds such as cyanoglycosides (20.65 to 26.61 mg HCN/100g) and oxalic acid (1.2-1.7%) can be present in a measurable amount in cashew apples. Therefore, excessive intake may have a negative impact on people. Women experiencing IgE-mediated anaphylaxis reactions have seen cutaneous manifestation symptoms due to cardol and anacardic acid residual effects. Overconsumption of mango fruit, an anacardic counterpart of cashew, was found to cause similar allergy reactions. It is less utilized because of its astringent and acrid principles (Runjala and Kella 2017).

## HEALTH BENEFITS




1. BOOSTS IMMUNE SYSTEM

   Cashew apple has anti-bacterial properties and is considered effective in treating stomach ulcers and gastritis, usually caused by *Helicobacter pylori* bacteria. Anarcardic acid is used in vivo to treat tooth abscesses and is efficient against gram-positive bacteria. The cashew apple is rich in natural vitamins, boosting the body's defences against infection and bacterial disorders. It strengthens our body and fights against microbial diseases because of the zinc that is present in it (Shobha *et al*., 2013).

2. ANTIOXIDANT

   Cashew apples have certain antioxidants that protect the body from damage that harmful molecules may cause. For example, anarcardic acid, an antioxidant found in cashew extract, has been proven to destroy cancer cells and decrease the effects of ageing-related pigmentation.

3. RICH IN VITAMIN C

   Cashew apples are extremely rich in vitamin C. When taken as juice or eaten as whole fruit, it supplies the body with sufficient vitamin C that has an anti-scurvy effect.

4. LOWERS BLOOD PRESSURE

   Consumption of cashew apples is beneficial in decreasing high blood pressure because of magnesium.

5. ANTI-DIARRHEAL

Cashew apple is effective in curing chronic dysentery and is also used as an anti-diarrheal remedy. In addition, it also serves as an ointment for aches of rheumatism and neuralgia.

6. PREVENTS CANCER

Moderate and regular eating of cashew fruits is highly beneficial in lowering the risk of cancer development because of compounds like flavonoids and antioxidants. These compounds can fight against tumour cells and prevent them from further dividing. In addition, Cashew fruits also help in fighting against cancerous cells due to the presence of copper.

7. HELPS IN WEIGHT LOSS

They are rich in 'heart-friendly' monounsaturated fatty acids like oleic and palmitoleic acids. These essential fatty acids help lower harmful Low-Density Lipoprotein cholesterol while increasing good High-Density Lipoprotein cholesterol in the blood. Moreover, the fibre-rich cashew apple increases the level of fat oxidation in adipose tissue and cholesterol hence recommended at a moderate level for those looking for weight reduction.

8. ACTS AS APHRODISIAC

Cashew apple is acrid, sweet, digestible, aphrodisiac, and anthelmintic. The spirit distilled from the fruit is considered rubefacient and is used as a diuretic.

9. LOWERS RISK OF DIABETES

Cashew apple helps in reducing the risk of type 2 diabetes because of their low sugar content and zero cholesterol. It is an excellent fruit for people who have diabetes as it is capable of preventing and treating other diabetes complications like obesity, cardiovascular risk and arterial hypertension

## CONCLUSION

Cashew apple pseudo fruit is rich in vitamins and minerals and filled with delicious juicy and fibrous. In India, Cashew is grown mainly for its nut; after processing the nut, the apple fruit is discarded and completely wasted worldwide. Although the fruit has higher economic and nutritional health benefits, its full potential is not tapped for commercial exploitation due to its short-period availability and high perishability. Utilizing the fruit for its minerals and nutrients could be exploited with value-added products. Value addition is a thrust area of research for food nutritionists, industrialists and farmers forming an alternate solution for nutritional sources.

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