

REDISCOVERING NUTRITIONAL WEALTH: UNDERUTILISED HORTICULTURAL CROPS AND THEIR COMPARATIVE NUTRITIONAL VALUE

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ABSTRACT



Underutilised horticultural crops offer immense potential for enhancing nutrition, promoting biodiversity, and supporting sustainable agriculture, especially in marginal environments. This article explores six such crops—Cape Blueberry, Cape Gooseberry, Bael, Jamun, Karonda, and Kachnar—highlighting their nutritional richness, adaptability to adverse conditions, and unique bioactive compounds. These crops often surpass commercial counterparts in specific nutrients such as vitamin C, polyphenols, and proteins, yet remain neglected due to poor market integration and limited awareness. By drawing comparative nutritional insights, the article emphasises the need for renewed focus on these crops to diversify food systems, address micronutrient deficiencies, and strengthen rural livelihoods.

KEYWORDS: Climate-resilient horticulture, Indigenous fruits, Nutritional diversity, Underutilised crops,

INTRODUCTION

Horticultural production worldwide has long focused on a narrow spectrum of commercially profitable crops, often neglecting a vast diversity of indigenous and underutilised plant species. These lesser-known horticultural crops typically grow in marginal environments, exhibit high resilience to climatic variability, and require minimal agricultural inputs. Despite their adaptability and rich nutritional composition, they remain underexploited due to inadequate research, limited market integration, and low consumer awareness. Many of these crops—such as wild berries, edible flowers, and hardy fruiting trees—are excellent sources of vitamins, antioxidants, fiber, and essential minerals, often surpassing conventional produce in specific nutritional attributes. Their inclusion in mainstream agriculture could enhance dietary diversity, support ecological sustainability, and improve the livelihoods of smallholder and tribal farming communities. This article aims to highlight the nutritional value and ecological relevance of select

underutilised horticultural crops by comparing them with common fruits, thereby demonstrating their potential contribution to sustainable food and nutrition security.

CAPE BLUEBERRY

Cape Blueberry, scientifically known as *Vaccinium capense*, is an indigenous shrub of the Cape Floristic Region of South Africa. It bears small, deep blue to almost black berries similar in appearance to the well-known North American blueberries, but has not attained similar commercial success. This wild blueberry species thrives naturally in acidic, sandy soils and mountainous forests with minimal human intervention. The berries, though smaller in size, are nutritional powerhouses. They contain significant amounts of anthocyanins — bioactive pigments responsible for their rich colour and antioxidant strength. On average, 100 grams of Cape Blueberries supply about 45 kilocalories, with 9–12 grams of carbohydrates, around 2 grams of dietary fiber, and approximately 10–15 milligrams of vitamin C. Studies indicate that their anthocyanin concentration ranges from 200 to 400 milligrams per 100 grams, making them comparable or superior to some cultivated blueberry varieties. Despite this, Cape Blueberry remains largely untapped due to a lack of domestication, limited awareness, and the absence of organised supply chains.

CAPE GOOSEBERRY

Known locally as Rasbhari in India, Cape Gooseberry (*Physalis peruviana*) is a versatile fruit crop that is both hardy and productive under diverse climatic conditions. Native to the Andean region but widely naturalised in India, it grows easily on marginal soils and withstands erratic rainfall. The bright yellow-orange berries, enclosed in a papery husk, are rich in vitamins, antioxidants, and bioactive compounds. Per 100 grams, the fruit provides about 53 kilocalories, 11–14 grams of carbohydrates, nearly 2 grams of protein, and a vitamin C content ranging between 20 to 30 milligrams. It is also a fair source of provitamin A and polyphenols, which help protect cells from oxidative damage. Compared to conventional berries like strawberries and blueberries, Cape Gooseberry stands out with its higher vitamin C and provitamin A content, yet it remains underutilised outside local fresh fruit markets and small-scale processing units.

BAEL

Bael (*Aegle marmelos*), an indigenous tree of India, holds a revered place in traditional Ayurveda due to its medicinal properties. It flourishes in dry and semi-arid regions with poor soils and negligible irrigation. The round or oval fruits have a hard woody shell enclosing aromatic, sweet, and fibrous pulp.

This pulp, eaten fresh or made into sherbet, is rich in carbohydrates, mucilage, and tannins, which are soothing to the digestive tract. One hundred grams of bael pulp provides about 88 kilocalories, 31 grams of carbohydrates, nearly 2 grams of protein, and 8 to 10 milligrams of vitamin C. The pulp is especially beneficial for treating digestive disorders and dehydration during the summer. Despite its immense health benefits and adaptability to harsh climates, bael is seldom cultivated on a commercial scale and remains confined to homestead gardens and local markets.

JAMUN

Jamun (*Syzygium cumini*), commonly called black plum or Indian blackberry, is another underutilised fruit with high nutritional and medicinal relevance in India's subtropical belts. The deep purple, juicy fruits are seasonal delights during the summer and monsoon months. They are particularly valued for their richness in iron, polyphenols, and anthocyanins, which contribute to their dark hue and antioxidant capacity. A typical serving of 100 grams yields about 60 kilocalories, 14 grams of carbohydrates, around 0.7 grams of protein, and about 18–20 milligrams of vitamin C. Jamun is widely used in traditional medicine for managing blood sugar levels, yet it has not found a place in organized orchards and large-scale fruit supply chains, limiting its economic potential.

KARONDA

Karonda (*Carissa carandas*) is a drought-hardy shrub producing small, sour fruits that are traditionally used for pickles, chutneys, and preserves. It is well suited to semi-arid and rainfed conditions and often grows wild on wastelands and field boundaries. The berries are nutritious, offering roughly 42 kilocalories, 10–12 grams of carbohydrates, 2 to 3 grams of protein, and about 16–18 milligrams of vitamin C per 100 grams of fresh fruit. It is also a moderate source of iron and calcium. Despite its culinary utility and adaptability to degraded soils, karonda is neglected in scientific research and large-scale cultivation programs.

KACHNAR

Unlike typical fruit crops, Kachnar (*Bauhinia variegata*) is known for its edible flower buds rather than fruits. These tender buds are a traditional delicacy in various parts of India, cooked as vegetables or added to curries. Kachnar trees thrive in dry, rocky soils with minimal inputs and add to the agro-biodiversity of rural landscapes. Nutritionally, fresh Kachnar buds offer about 40 kilocalories, 4 to 5 grams of carbohydrates, and a relatively high protein content of 3 to 4 grams per 100 grams. The buds are also rich

in fiber, calcium, and phosphorus, making them a valuable addition to rural diets that often lack protein variety.

COMPARATIVE NUTRITIONAL SUMMARY

A comparative look at the nutritional profiles of these underutilised crops reveals their remarkable contribution to dietary diversity. For instance, Cape Blueberry rivals the commercial blueberry in antioxidant strength; Cape Gooseberry surpasses strawberries in vitamin C and provitamin A; Bael provides higher carbohydrates than most tropical fruits; Jamun is a natural source of iron and polyphenols; Karonda matches strawberries in vitamin C while adding iron and calcium; and Kachnar buds supply more protein than many leafy vegetables. Such comparative advantages highlight the potential of these crops in addressing micronutrient deficiencies and enriching local food baskets.

Table 1: Comparative analysis of nutritional quality different underutilized fruits

Crop	Energy (kcal)	Carbohydrates (g)	Protein (g)	Vitamin C (mg)	Unique Nutritional Feature
Cape Blueberry	45	9–12	0.6	10–15	High anthocyanins (200–400 mg)
Cape Gooseberry	53	11–14	1.9	20–30	Provitamin A, polyphenols
Bael	88	31	1.8	8–10	Mucilage, tannins
Jamun	60	14	0.7	18–20	Iron, polyphenols
Karonda	42	10–12	2–3	16–18	Iron, calcium
Kachnar Buds	40	4–5	3–4	Low	High protein, minerals

CONCLUSION

The comparative nutritional profiles of underutilised horticultural crops reveal their untapped potential in combating malnutrition and promoting agrobiodiversity. Their resilience and ability to thrive on marginal lands underscore their relevance in climate-resilient agriculture. However, their inclusion in mainstream horticulture necessitates targeted research, market development, and consumer education. Efforts must be made to improve agronomic practices, processing technologies, and policy support to ensure wider adoption. By integrating these crops into local and global food systems, we can create more sustainable and nutrition-sensitive agricultural landscapes that benefit both producers and consumers across diverse socio-economic settings.



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