

Nutritive Value and Health Benefits of Yongchak (*Parkia Timoriana*)

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Yongchak (*Parkia timoriana* (DC.) Merr.) of leguminosae family (sub family momosoideae) is a little known nutritious important tree vegetable of Southeast Asia, especially for North-eastern parts of India. *P. timoriana* can be found growing frequently in the yards of households, jhums, and forests in the northeast regions of India, including Mizoram, Nagaland, Manipur, Meghalaya, and Assam. One of the most common *Parkia* species in the Indo-Pacific region is *P. timoriana*. The trees are commonly cultivated in semi-natural conditions or in gardens situated in residential areas. The forested areas are home to several tree bean plants that produce pods, which are a vital part of the diet of the local people living in those regions. The tree has a remarkable ability to thrive in a range of agro-climatic regions, spanning from chilly hills to sweltering plains, and from low to high altitude areas, all without requiring any extra attention. Due to its pungent scent and acrid flavor, it is commonly referred to as stink bean. Although yongchak may not seem appealing, its remarkable nutritional value has drawn the interest of the scientific community for its potential health advantages.

Nutritive value

Tree beans possess a diverse range of nutrients and supplements that can be beneficial for health. Compared to other legumes, the flowers, delicate pods, and seeds of this plant are a rich source of proteins, fats, carbohydrates, vitamins, and minerals and can be consumed for their nutritional benefits. The nutritional composition of *P. timoriana* is comparable to that of apples (Chandrabalan 2011). The kernel of *P. timoriana* has an essential amino acid composition that is similar to the essential amino acid requirement pattern for preschool children given by FAO/WHO/UNU in 1985.

This plant offers a variety of edible parts including flowers, tender pods, and mature seeds. It is rich in essential nutrients such as ascorbic acid (26.0mg/100g), fat (20.28%), proteins (32.82%), and minerals (4.45%). It also contains significant amounts of sodium (51.0mg/100g), magnesium (34.7mg/100g), phosphorus (160 mg/100g), calcium (97.47mg/100g), potassium (2400mg/100g), copper (2.3mg/100g), and zinc (2.77 mg/100g). Additionally, it is a good source of iron (57.1 mg/100g) and manganese (35.0 mg/100g)(Singh et al. 2009).According to Mohan and Janardhanan's research in 1993, *P. timoriana* seeds are abundant in protein content like albumins and globulins, vital amino acids namely isoleucine, leucine, phenylalanine, and tyrosine, and fatty acids such as oleic and linoleic acids.The seeds contained lower levels of fat during the tender stage, but as the pods matured, the fat content increased(Salam 2011).Compared to other legumes, the mineral composition of yongchak's seeds and pods is superior(Gopalan et al. 1989).In their study, Devi et al. (2007) analyzed the nutritional quality of *P. timoriana* in terms of its leaf, seed, and pods. They found that crude protein levels were notably higher in the seeds (22.9%) compared to the leaf and pods. Conversely, total carbohydrate content was found to be higher in the pods (23.2%).The seeds contain a maximum fat content of 29.6%, while the leaf has a significantly higher crude fiber content of 5.5%. As for ascorbic acid and calcium, the leaf has the highest amount, followed by the seed and pod in descending order. According to Salam's 2011 study, *P. timoriana* had varying carbohydrate levels ranging from 59.26% to 67.82% across different pod stages. Additionally, Geervani and Devi in 2006 observed that carbohydrate content in *P. timoriana* increased as the pods matured.According to Salam's (2011) report, the crude fiber content ranged from 10.16% in tender pods to 19.28% in matured pods, while seeds contained 9.03% of fiber.The presence of thiazolidine 4-carboxylic acid (TCA) causes the strong odor emitted by Yongchak.

For ages, the inhabitants of Manipur have savored the distinct aroma, flavor, and taste of Yongchak.The flower and pod are both used as a vegetable in the traditional Manipuri salad called Singju. Occasionally, they are also combined with fish to make the local delicacy, Iromba.It can be consumed either raw with condiments or cooked alongside other vegetables or meat. Sold in bunches, it is a highly sought-after food item in Southern Thailand, Myanmar, Malaysia and Indonesia. The optimal way to enjoy its taste is by incorporating it with other flavourful ingredients like shrimp or by adding it to dishes such as

Green Curry of Duck (Charmaine1998). If seeds are appropriately heated or cooked, the existence of anti-nutritional elements such as tannins, total free phenols, and lectins can be removed since they are sensitive to high temperature.

Health Benefits

- ✚ **Boosts Immune System** - Yongchak is a rich source of ascorbic acid (26.0 mg 100 g-1), which is a potent antioxidant that can boost the immune system. Vitamin C helps to improve the production of white blood cells, which are responsible for fighting off infections and diseases.
- ✚ **Improves Digestion** - Yongchak is high in fiber, which can facilitate digestion and prevent constipation. Fiber-rich foods can also improve gut health by promoting the growth of healthy bacteria in the intestine.
- ✚ **Aids in Weight Loss** - Yongchak is low in calories/ fats and high in fiber, making it an ideal vegetable for weight loss diets. Foods high in fiber keep you full for longer, thus reducing the desire to overeat.
- ✚ **Lowers Blood Pressure** - Yongchak is a good source of potassium, which is an essential mineral that can help regulate blood pressure. Potassium helps to reduce the negative effects of sodium on blood pressure, thus reducing the risk of cardiovascular diseases.
- ✚ **Prevents Anemia** - Yongchak is high in iron, which is an essential mineral that plays a vital role in the production of red blood cells. Including Yongchak in the diet can prevent anemia and improve hemoglobin levels.

Table 1: Amino acid composition of tree bean (mg g⁻¹ protein)

| Amino acid | Tenderpod | Immature pod | Mature pod | Mature kernel |
|---------------|-----------|--------------|------------|---------------|
| Threonine | 38 | 37 | 36 | 34 |
| Valine | 36 | 43 | 47 | 44 |
| Cysteine | 06 | 07 | 07 | 10 |
| Methionine | 10 | 14 | 16 | 18 |
| Isoleucine | 34 | 35 | 38 | 42 |
| Leucine | 53 | 56 | 70 | 80 |
| Tyrosine | 36 | 43 | 47 | 46 |
| Phenylalanine | 35 | 40 | 46 | 565 |
| Lysine | 44 | 52 | 63 | 65 |
| Histidine | 22 | 28 | 29 | 26 |

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|----------------------------|------|------|------|------|
| Aspartate | 257 | 150 | 97 | 82 |
| Serine | 49 | 50 | 48 | 48 |
| Glutamate | 89 | 139 | 177 | 162 |
| Proline | 52 | 60 | 65 | 48 |
| Glycine | 31 | 34 | 35 | 42 |
| Alanine | 45 | 52 | 53 | 56 |
| Arginine | 44 | 65 | 78 | 86 |
| Total essential amino acid | 292 | 327 | 370 | 394 |
| Total amino acid | 881 | 905 | 952 | 944 |
| % essential amino acid | 33.2 | 36.1 | 38.8 | 41.7 |
| Amino acid score | 64 | 84 | 92 | 100 |

Source : Longvah and Deosthale (1998)

Table 2: Fatty acid composition of tree bean(values are per cent of total oil)

| Fatty acids | Tender pod | Immature pod | Mature pod | Mature kernel |
|------------------------------|------------|--------------|------------|---------------|
| C _{16:0} Palmitic | 29.5 | 22.4 | 19.2 | 19.0 |
| C _{18:0} Stearic | 3.9 | 2.8 | 7.4 | 6.9 |
| C _{22:0} Behenic | 2.1 | 4.6 | 4.2 | 5.3 |
| C _{24:0} Ligniceric | 1.7 | 2.4 | 3.8 | 3.8 |
| C _{18:1} Oleic | 13.1 | 18.0 | 17.3 | 16.2 |
| C _{18:2} Lenoleic | 41.0 | 46.0 | 47.5 | 47.5 |
| C _{18:3} Lenolenic | 8.7 | 3.8 | 1.6 | 1.3 |
| Total Saturates | 37.2 | 32.2 | 32.6 | 35.0 |
| Total Unsatulates | 62.8 | 67.8 | 66.4 | 65.0 |

Source : Longvah and Deosthale (1998)

Conclusions

Overall, Yongchak or *P.timoriana* is a highly nutritious legume vegetable that has a variety of health benefits. It is a good source of macronutrients, vitamins, minerals, and phytonutrients. Its nutritional value makes it an excellent choice for those looking for a nutrient-dense food that can help prevent various health problems. Additionally, its medicinal properties make it a great herbal remedy for various conditions.

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