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Jackfruit (*Artocarpus heterophyllus* Lam.), a potential fruit crop of Tripura and exploring its nutritional benefits

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Abstract

Jackfruit is a tropical climacteric fruit, belonging to Moraceae family, is native to south and Southeast Asia. Tripura is considered to be the home of jackfruit and it is reservoir of many year-round producing genotypes. Tripura have many underutilized fruits that are popular among people due to their diversified use and have remained wild or semi domesticated due to lack of research support. Tripura shares 16.84 % highest production of jackfruit in India followed by Orissa, Assam and West Bengal (NHB, 2015-2016). *Artocarpus* species are rich in phenolic compounds. It is now widely accepted that the beneficial effects of fruits and vegetables of jackfruit for the prevention of certain diseases (like cure ulcers, indigestion and cancer-fighting properties) are due to this bioactive phenolic compounds they contain.

Keywords: jackfruit, underutilized fruit, nutritional property, Tripura

Introduction

Jackfruit (*Artocarpus heterophyllus* Lam.) is native to parts of South and Southeast Asia and is believed to have originated in the rainforests of Western Ghats of India and is cultivated throughout the low lands in South and Southeast Asia. In India, it has wide distribution in states of Assam, Tripura, West Bengal, Bihar, Uttar Pradesh, foothills of the Himalayas and South Indian States of Kerala, Tamil Nadu and Karnataka. Tripura, Assam and West Bengal produces major share of jackfruit in India (APAARI, 2012). The area under jackfruit cultivation in Tripura is 8,645.00 ha and the production is 291.59 MT. Tripura shares 16.84 % highest production of jackfruit in India followed by Orissa, Assam and West Bengal (NHB, 2015-2016).

Tripura offers jackfruits round the year. The peak season starts from March – April and ends in June – July. Based on the season of yield, jackfruit trees can be broadly classified into (1) Normal bearing, (2) Early bearing, (3) Late bearing, (4) Twice bearing and (5) All season types. Early bearing is one that yields before March and can start anywhere from November. Late bearing is one that would yield fruits till, say August to September. All season types will have jackfruits almost twelve months (baramasi) and would give fruits at least 8 to 9 months. Twice bearing class of trees will bear two times a year – one in normal and another in off-season. Farmers of Tripura can sale tender jackfruit for vegetable purpose as double price to the market during off-season. Most of the baramasi jackfruits are available in South Tripura.

Jacktree is a medium-sized evergreen tree, and typically reaches 8-25 m in height. The tree grows rapidly in early years, up to 1.5 m/year (5 ft/year) in height, slowing to about 0.5 m/year (20 in/year) as the tree reaches maturity. It has a straight rough stem and a green or black bark which has a thickness of around 1.25cm, exuding milky latex. The leaves are broad, elliptic, dark green in colour and alternate. They are often deeply lobed when juvenile on young shoots. Male heads are usually sessile or on short peduncles receptacles and sometimes born on the ultimate twing, while female heads are oblong ovoid receptacle. Jackfruit has a relatively high productivity, about 25.71 t/ha. The fruits are borne in the main and side branches of the tree. A mature jacktree can yield from ten to two hundred fruits. They are dicotyledonous compound fruits, which are oblong cylindrical in shape and the length of the fruits ranges from 22 to 90 centimeters with the diameter 13-50 centimeters. The weight of individual fruits may vary between 2 and 20 kilo grams, and larger fruits of

about 50 kilograms have been recorded. Jackfruit has a green to yellow brown exterior rind that is composed of hexagonal, bluntly conical carpel apices that cover a thick, rubbery, and whitish to yellowish wall. It is a multiple aggregate fruit which is formed by the fusion of multiple flowers in an inflorescence. About 30% of the fruit weight is occupied by the flesh. There are large numbers of bulbs inside the fruit, which have high nutritional value.

Nutritional and health benefits of jackfruit

Jackfruit plays a significant role in Indian agriculture with increasing their nutritional value in human diet and these fruit are gaining commercial importance. Jackfruit is a cross pollinated crop and it is propagated by seeds. Jackfruit is a multipurpose tree and all parts of the plant are equally important. It is a good source of vitamins like A, C,

thiamine, riboflavin, niacin and minerals like calcium, potassium, iron, sodium and zinc.

It is a multipurpose tree and all parts of the plant are equally important. The tree is also known for its durable timber, which ages to an orange or reddish brown colour with anti-termite properties. Jackfruit is one of the most important underutilized fruit crops, suitable for growing in wide agro-climatic regions owing to its versatile adaptability, hardy nature, low maintenance cost and high yield. The trees have a significant role in the preservation of the environment they can be very effective in the amelioration of soils and prevention of the soil erosion. The leaves and fruit waste provide valuable fodder for cattle, pigs and goats. Jackfruit wood chips yield a dye which is used to give the famous orange-red colour to the robes of Buddhist priests.

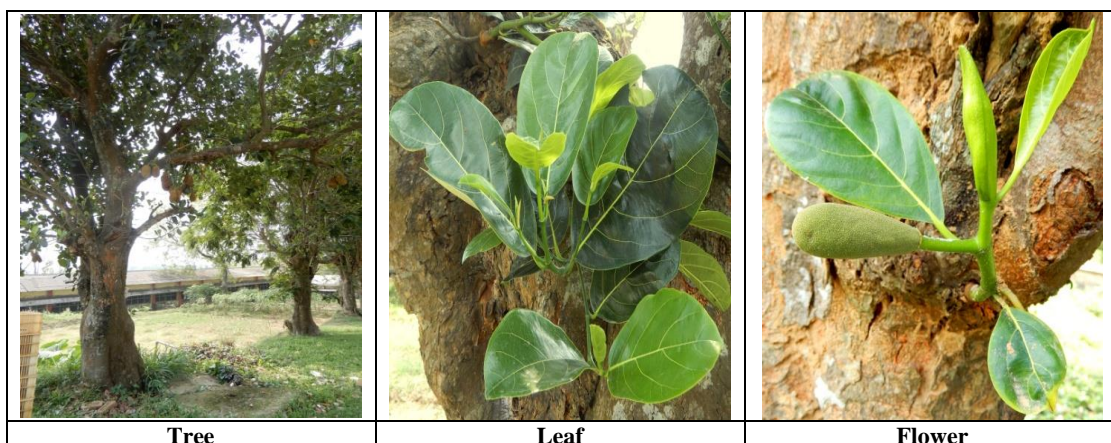
Table 1: Nutritional value of Jackfruit

Food Value (100g of edible portion)	Pulp (ripe-fresh)	Seeds (Fresh)	Seeds (Dried)
Carbohydrates	11-19 g	-	-
Moisture	72.0-77.2 g	51.6-57.77 g	-
Protein	1.3-1.9 g	6.6 g	-
Fat	0.1-0.3 g	0.4 g	-
Carbohydrates	18.9-25.4 g	38.4 g	-
Fiber	1.0-1.1 g	1.5 g	-
Ash	0.8-1.0 g	1.25-1.50 g	2.96%
Calcium	22 mg	0.05-0.55 mg	0.13%
Phosphorus	38 mg	0.13-0.23 mg	0.54%
Iron	0.5 mg	0.002-1.2 mg	0.005%
Sodium	2 mg	-	-
Potassium	407 mg	-	-
Vitamin A	540 I.U.	-	-
Thiamine	0.03 mg	-	-
Niacin	4 mg	-	-
Ascorbic Acid	8-10 mg	-	-

(Source: Tiwari *et al*, 2015)

Flakes of ripe fruits are high in nutritive value; every 100 g of ripe flakes contains 323-323 mg potassium, 22-30.2 mg calcium, 11-19 g carbohydrates Vitamin A (540 IU) and minerals (K, P, Fe and Ca). Unripe (green) remarkably similar in texture to chicken, making jackfruit an excellent vegetarian substitute for meat. In fact, canned jackfruit (in brine) is sometimes referred to as "vegetable meat". The nutritious seeds are boiled or roasted and eaten like chestnuts, added to flour for baking, or cooked in dishes. It is now widely accepted that the beneficial effects of fruits and vegetables of jackfruit for the prevention of certain

diseases (like cure ulcers, indigestion and cancer-fighting properties) are due to the bioactive compounds they contain. *Artocarpus* species are rich in phenolic compounds. The extracts and metabolites of *Artocarpus* particularly those from leaves, bark, stem and fruit possess several useful bioactive compounds and recently additional data are available on exploitation of these compounds in the various biological activities including antibacterial, antitubercular antiviral, antifungal, antiplatelet, antiarthritic, tyrosinase inhibitory and cytotoxicity. Inedible parts such as peel are used as animal feed.



Tree

Leaf

Flower

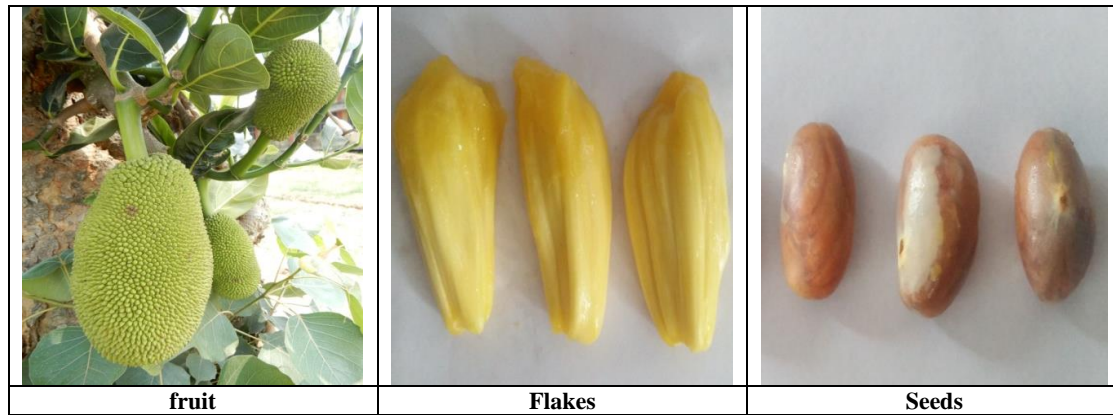


Fig 1: Morphological characteristics of Jackfruit found in Tripura region

Conclusion:

An analysis of different aspects of medicinal importance of jackfruit have been highlighted which reflects the importance of this non-conventional fruit crop that inspire of having immense importance is yet to gain popularity as a major fruit crop tree in Tripura. Despite all these benefits, unfortunately, the fruit is underutilized in commercial scale processing in regions where it is grown. The aim of this article is to disseminate the knowledge on nutritional and health benefits of jackfruit, in order to promote utilization of jackfruit for commercial scale food production in Tripura region.

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