

JAK FRUIT THE UNDER EXPLOITED MIRACLE

By Nirmala M. Pieris

Jak fruit (*Artocarpus heterophyllus*) also known as jack tree or simply jack or jak (Sinhalese - kos or herali, Tamil – Pelaka) is a species of tree in the Artocarpus genus of the mulberry family (Moraceae) and is closely related to figs, mulberry and breadfruit. The jak fruit tree is believed to be indigenous to the Southwestern rain forests of India. There are several varieties in Sri Lanka with exotic names such as kuru kos, del kos, rosa kos, batu kos and rajasinghe pani waraka. The tree is evergreen, 10 to 15m tall with dark green oval shaped leaves. Almost all the parts of the tree secrete white sticky latex like milk (juice) when injured. The latex makes excellent cement for cracked pots especially those used for carrying water. The jak fruit tree is a very long-lived tree and generally has a life span of 60 to 70 years.

The tree grows best under tropical humid and rainy climates but rarely survives cold and frosty conditions. The jak fruit tree grows throughout the wet zone from sea level to 2,000 feet or even 3,000 feet, although it thrives best at the lower elevations. The tree prefers a rich, deep and moist soil, but will also grow well in poor soil. Once established, all it needs is ample moisture. In Sri Lanka the tree is naturally grown in scattered cultivations and in home gardens. The tree is also widely cultivated in tropical regions of India, Bangladesh, Nepal, Cambodia, Vietnam, Thailand, Malaysia, Indonesia, the Philippines and Australia. Jak fruit is also found across Africa (e.g. in Cameroon, Kenya, Uganda, Tanzania, Madagascar and Mauritius), as well as throughout Brazil, Jamaica, the Bahamas, South Florida and Hawaii. Jak fruit is the national fruit of Bangladesh.

The jak fruit tree is a multipurpose species. It provides food, fuel, timber and medicinal extracts, and also plays a significant role in the preservation of the environment. The starchy fruit is a good substitute for rice, for which reason the tree is referred to as 'rice tree - buth gasa' in Sri Lanka and is a potential source of income for both the rural and urban people of the tropics and subtropics.

The tree comes into bearing in 3 to 4 years. Arthur V. Dias a pioneer in promoting jak fruit cultivation in Sri Lanka brought across an 18 month variety from Johore Malaysia in the 1940's. During the season, each tree bears as many as 250 large fruits. The fruits are reported to be the largest tree-borne fruits in the world. Even a small jak fruit weighs 5 to 7kg, and farmers have recorded specimens of more than 45kg. While the jak fruit crop is seasonal in many countries, with the fruiting season varying from country to country it is available



year round in Malaysia, Indonesia, Thailand and Australia. A jak fruit tree in one's garden is a mini granary. With food shortages and food prices escalating worldwide, every jak fruit tree strengthens the sense of food security. Even in the worst of times, a mature tree will yield 300 to 700 kg per year. If the produce of a tree can be sold prudently, it can bring a tidy income. This needs careful harvesting, collection, transport, processing and marketing.



The outer surface of the jak fruit is covered with blunt thorn like projections, which becomes soft as the fruit ripens. The unripe fruits are green with the interior consisting of cream colored edible bulbs. There may be as many as 100 to 500 edible bulbs embedded in a single fruit interspersed between thin bands of fibers. Mature jak fruits will ripen within 3 to 4 days and will turn to a light brown color and spread a strong sweet, fruity smell. The ripe fruits known in Sinhalese as 'waraka' (hard variety) or 'wela' (softer variety) comprising of orange-yellow bulbs are highly perishable and can only be stored for 3 to 4 days. The bulbs enclose a smooth, oval, light-brown color seed.



The fruit is eaten in various forms. Before the arils ripen, they are boiled with the seeds and eaten with scraped coconut as a meal or cooked with coconut milk and made into a delicious curry commonly eaten with rice. It can be dried or fried to produce something similar to potato chips and also pickled. It is also used as a filling for cutlets.



When ripe, the rich yellow flesh (aril) surrounding the seed is sweet and aromatic. It can be eaten fresh, preserved in sugar syrup, made into a juice, smoothie and ice cream or made into



jams, jellies, cookies and muffins. For making the traditional Southern Indian breakfast dish, idli, the fruit is used along with rice as an ingredient and jak fruit leaves are used as a wrapping for steaming.

The young (immature) fruit is called 'polos' in Sri Lanka and is curried or prepared into 'mallun' (a preparation with grated coconut) or made into a pickle. It is remarkably similar in texture to chicken, making jak fruit an excellent vegetarian substitute for meat. In fact, canned jak fruit (in brine) is sometimes referred to as "vegetable meat".

Jak fruit seed is 2 to 4 cm long and 1 to 3 cm thick and is white and crisp within. The seeds are edible with a milky sweet taste and can be eaten, boiled, roasted, fried or curried. When roasted, they have a taste and texture similar to chestnuts. Roasted seeds are made into sweetmeats and desserts and also used in confectionery. The seeds can be preserved by brining, soaking in syrup or freezing.

The heartwood is an excellent timber and a dye extracted from it is used for dyeing robes of Buddhist forest monastic's in Southeast Asia, giving the robes of the monks in those traditions their distinctive light-brown color. Jak fruit wood is widely used in the manufacture of furniture, doors and windows, and in roof construction. The wood is also used for



the production of musical instruments and in the manufacture of beads for jewelry due to its warm yellow brown or golden brown color with its loose wood grain.

Aroma Constituents

Jak fruit is well known for its distinct aroma. In a study using five jak fruit cultivars, the main volatile compounds that were detected are: ethyl isovalerate, 3-methylbutyl acetate, 1-butanol, propylisovalerate, isobutyl isovalerate, 2-methylbutanol, and butyl isovalerate. These compounds were consistently present in all the five cultivars studied, suggesting that these esters and alcohols contributed to the sweet and fruity aroma of the fruit. An artificial jak fruit flavoring essence is presently marketed in Thailand.



Nutritional Facts

Jak fruit is a miracle providing so many nutrients and calories. 100g of edible jak fruit bulbs provide about 95 calories. It contains a high amount of carbohydrate and a good amount of simple sugars such as fructose and sucrose, thus providing a quick boost of energy and revitalizes the body instantly. The fruit is low in sodium, cholesterol, and saturated fats and is a rich source of vitamins A, C, riboflavin, niacin, thiamine, and folate. It contains important minerals like magnesium,



calcium, iron, potassium, phosphorous, copper, zinc, manganese, and selenium. The fruit is also a rich source of dietary fiber and provides almost 11% of the daily fiber requirement. The seeds are a good source of starch and dietary fiber and contain lignans, isoflavones, saponins and all phytonutrients.

Health benefits

The high dietary fiber content of the fruit makes it a good bulk laxative. The fiber content helps to protect the colon mucous membrane by decreasing exposure time and as well as binding to cancer-causing chemicals in the colon. The vitamin-A and flavonoid pigments such as carotene-β, xanthin, lutein and cryptoxanthin-β that are present play vital roles in antioxidant and vision functions. Vitamin A is also required for maintaining integrity of mucus membranes and skin. Consumption of natural fruits rich in vitamin-A, and carotenes has been found to protect from lung and oral cavity cancers.

Jak fruit is also a good source of antioxidant vitamin-C and provides about 14 mg or 23% of RDA. Consumption of foods rich in vitamin C helps the body develop resistance against infectious agents and scavenge harmful free radicals. Jak fruit is one of the rare fruits that is rich in B-complex group of vitamins. It contains good amounts of vitamin B-6



(pyridoxine), niacin, riboflavin, and folic acid. The fresh fruit is a good source of potassium, magnesium, manganese, and iron. Potassium is an important component of cell and body fluids that helps in controlling heart rate and blood pressure.

Experts believe that the root and extracts of jak fruit are effective in controlling asthma and alleviating the symptoms associated with this condition. Jak fruit contains strong anti-ulcerative properties that not only help cure ulcers but also prevents a number of other digestive system disorders. Chinese medicine uses jak fruit as a treatment for fighting the effects of alcohol in the body.



The starch from the seeds is given in bilious colic and the roasted seeds have an aphrodisiacal action.

The finely minced tender leaves roasted with scraped coconut are a specific antidote for insomnia, while the juice of the tender fruit with coconut milk and jaggery is a miraculous antidote for narcotic poisoning. The leaves are also used in skin diseases. An infusion of the mature leaves and bark is given for stones in the bladder and for diabetes. The roots are used for skin diseases for diarrhoea and fever and as an anti-asthmatic.

Jak fruit for Pregnant Women

As jak fruit, is loaded with nutrients it is actually beneficial during pregnancy and breastfeeding. Being a rich source of



vitamin A that is crucial for proper cell production, eyesight, and fetal development is one of the advantages. As a rich source of niacin (vitamin B3) the fruit helps regulate hormones, boost immunity, and controls stress levels in pregnant and breastfeeding women. However over consumption must be avoided as it can lead to stomach upsets due to its high fiber content.

Jak fruit in Cosmetics

A skin whitening cream with jak fruit seed extract has been developed with a combination of botanical essential oils and extracts, as a natural alternative to lighten dark spots and increase skin luminosity without aggressive treatments. This highly anti-oxidant jak fruit cream enriched with sun filters and vitamin E has an innovative combination of lightening ingredients that do not irritate the skin.

In Brazil, jak fruit has also been used for the manufacture of body lotions, body balms, body scrubs, body butter and various other cosmetic products.

Side Effects of Jak fruit

Although jak fruit has a number of health benefits, it is also important to consider some of its side effects on health. Jak fruits may cause an allergic reaction in people suffering from birch pollen allergies. It may increase coagulation in people suffering from blood disorders and may alter the tolerance levels of glucose in diabetes patients. The seeds of jak fruit may have an immunostimulative effect in patients undergoing immunosuppression therapy or patients with tissue transplants. Jak fruit should not be taken by those taking steroid medicines. It is believed that the consumption of jak fruit should be avoided by those trying to get pregnant as it may inhibit sexual arousal, libido, performance, and vigour in men.

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