

VARIABILITY AND ETHNOBOTANY OF JACKFRUIT IN WESTERN GHATS OF KERALA, INDIA

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Jackfruit is an important component of tree based homestead farming in humid south west India. Diversity for fruit characters, named types, socio-cultural importance, medicinal uses, food and fodder uses, seed preservation methods for off season use, folklore surrounding jack tree, miscellaneous uses, etc., are dealt in detail and the need for on-farm conservation is stressed.

Key words : Jackfruit, diversity, ethnobotany, on-farm conservation

Jackfruit, *Artocarpus heterophyllus* is an important component of the subsistence homestead farming in Kerala. Being a native of Western Ghats, the diversity of genetic material available in jackfruit is very high and the present problem is rather one aiming at preserving the genetic entity of superior chance seedlings of this highly heterogenous cross-pollinated crop. Jackfruit is an important fruit crop in Malaysia, Sri Lanka, Bangladesh, Brazil and in some African countries. In India, it is cultivated in Kerala, Assam, humid parts of Tamil Nadu, Karnataka, coastal parts of Maharashtra, and parts of Bihar, West Bengal, U.P., and Orissa. Jackfruit trees in truly wild conditions seen in Western Ghat forests, along with are related wild species, like *A. lakoocha* and *A. hirsutus* (Wlth. India, 1948). It is an important component of subsistence farming system of Western Ghat tribals, like 'Kurichyas' and 'Muduvass'. In addition to delicious table purposes types i.e., "Thaenvarikka" (in Malayalam) spotted rarely in homesteads as chance seedlings, jackfruit trees with ideal cooking quality fruits are selected and retained in homesteads. Till

recently, jackfruit used to be the third important staple food for the people of Kerala after rice and cassava. Jackfruit being highly heterogenous, the palatability, taste and cooking quality of fruits cannot be predicted unless the tree comes to bearing (Purseglove, 1974). Though a few selected clones like "Muttam Varikka", "Singapore Jack" and "Thankavarikka" have been popularised as grafts by private nurseries, not much improvement work has been done in this crop. Prospects for mass clonal multiplication of selected chance seedlings exist (Purseglove, 1974). Considering its vast potential for food production and least attention paid in the past (Simmonds, 1979) and threat of genetic erosion in the native tract, efforts were made since 1986 at NBPGR Regional Station, Thrissur to collect the existing diversity in the region alongwith the ethnobotanical information/Indigenous Technical Knowledge. An exploration tour was undertaken in May-June 1987 in parts of north Kerala and adjoining areas of Karnataka and Tamil Nadu and a total of 95 accessions were collected (Muralidharan *et al*, 1997).

1. Diversity for fruit characters

In cultivated Jackfruit, basically two types the soft flaked 'Koozha' and firm fleshed 'Varikka' exist. In Southern districts of Kerala, 'Koozha' type is predominant whereas 'Varikka' is more common towards Northern Kerala. An intermediate type 'Navarikka' is also spotted in homesteads. 'Vallaran' is a form of 'Navarikka' with white coloured flakes. 'Rudraksha chakka' synonymous to 'Undachakka', 'Thengachakka' or 'Thamarachakka' is a miniature round fruited type in jack. 'Varikka' types are characterised by firm flakes with golden yellow or light pink colour, good aroma and better shelf life and are used as table fruit. 'Koozha' type having soft, loose flakes are preferred as cooked delicacies. Mature but unripe fruits in both types are used for culinary purposes. 'Thaenvarikka' ('Thaen' means honey) is exclusively used as dessert fruit. 'Chemparathichakka' is another rare type similar to 'Gulabi' of Bihar with red flakes. Trees with individual fruit weight ranging from 600 g to 40 kg have been spotted in this belt. Trees bearing fruits with mammiform projections, seedless fruits and 99 per cent sterile fruits have also been observed by the authors.

2. Socio-cultural importance and ITK

Jackfruit tree has an important place in Hindu life and social culture of inhabitants and is venerated since time immemorial. It is considered as the favourite fruit of Lord 'Ganesha'. Urns containing ashes of forefathers are kept beneath jackfruit trees and oil lamp lighted daily at twilight for an year in Kerala Hindu funeral rites. Likewise jackfruit wood is an important item of fuel for ritual fires in 'Homa' and 'Havana'. Offering cow milk of the first lactation at the jackfruit tree basin is a common practice among all religions/castes in Kerala. Jack timber used to hold a key position in traditional Kerala architecture and was used for 'Ara', 'Nira' (wooden wall), 'Pathayam'

(storage), etc. A grand old tree named 'Ammachiplavu' ('Ammachi' means mother and 'plavu' means jack tree) which is believed to have given asylum to the legendary king Marthanda Varma of Travancore in its trunk cavities is revered even now in a temple in Thiruvananthapuram district.

3. Medicinal uses and folk beliefs

The petiole of fallen ripe leaves fried with 'Jeera' and boiled to a decoction is orally administered with 'Dhanwantharam gulika' (an ayurvedic pill) for treatment of stomach disorders. Cooked mature fruits contain high amount of roughage and is said to help bowel movement for elderly people suffering from constipation. Boiled water with fallen ripe leaves and tamarind leaves is used to apply 'Kizhi' (heat treatment) in affected parts to relieve body pains and arthematic complaints. Taking rice gruel which folded ripe leaves as spoon was a common practice in Kerala homes. This is believed to have anti-rheumatic properties. 'Koozha' fruits are said to create gastric problems if eaten in excess. Eating one crystal of common salt is believed to cure this. Another practice is to take a glass of buttermilk mixed with a pinch of dried ginger powder. Cooking seeds with ginger roots which is available in plenty in January-February was a common practice and is said to correct the flatulence properties of the seed. Washing the hands after eating jackfruit is believed to adversely affect the yield and quality of fruits. Hence smearing coconut oil is practiced to remove the sticky latex from hands and mouth. Plucking the last fruit of the season in a tree is done by selected people only as the process called 'Kadalattal', if done by bad characters, is believed to adversely affect the future yield. Another interesting feature is smearing hands with kerosene while preparing mature fruits for cooking purpose. Interestingly the food so prepared does not smell

kerosene. Aroma of turmeric is believed to inhibit flowering and fruiting in jack and hence people delay turmeric curing till the end of January.

Appeasement and threatening strategies are believed to encourage bearing in non-bearing trees. Cutting a few branches, bursting fire crackers tied to branches and in some cases scraping a little bit of bark and placing gold are all practised.

Christening each tree in the homestead based on some specific character of the tree, habit or site is common in Kerala. For example, 'Parakkattiplavu' means jack growing in rocky site or 'Mundan plavu' means dwarf tree. It may not be an exaggeration to say that for the people of Kerala, Jackfruit has been like dates to Arabs or figs to Jews.

4. Food and Fodder uses

Jackfruit leaf, both green and ripe, is an excellent fodder for goat. Green leaves in bundles are sold in market as fodder. Collection of fallen leaves with a sharp pointed stick is a common sight in fodder scarce areas. A large twig is used as soother food to lead goats to distant places. The inedible part of jack fruit forms an excellent feed for milch animals. Jack seeds after removing the outer skin is an important part of cattle feed.

Jackfruit, at varying stages of development, is used as a vegetable and cooked staple. Very tender fruits after removing the outer spines are finely chopped and cooked with grated coconut and condiments as 'Kothachakka'. It is cooked with pulses like cowpea and horse gram to make it more nutritious and tasty and is an item of menu in many Kerala temples. Six weeks old fruits which have just started segregation into pericarp and seeds are cooked to 'Idichakka' which is a type of vegetable where the whole fruit after removing the spines is sliced, steamed and minced on stone mortar and seasoned with coconut and condiments. Mature flakes are used in vegetable curries like 'Erissery' and 'Avial'. Fresh seeds are

cooked into many dishes like 'Mezhukkupuratty', 'Theeyal' and 'Thoran'. Fresh seeds along with mango and drumstick is made into a curry. Placenta is fried into chips or cooked into curry. The core (mid axis) is made into 'Thoran' and masala curry. Mature jack fruit is cooked into staple called 'Chakkavevichathu'. Pickling of mature flakes as practised in northern India is not common in the West Coast.

Ripe fruits mixed with rice or wheat flour and sweet spices are cooked into various delicacies like 'Kumbli' in cinnamon leaves, 'Ada' in banana leaves, etc., 'Varikka' fruits are made into preservers like 'Chakkavarattiyathu' and 'Halwa' and is an important ingredient of sweet meat called 'Chakkapradhaman'. Rarely jack figs are prepared by sun drying pericarp of ripe 'Varikka' fruits before the onset of monsoon. Used along with coconut, jeera and dried ginger powder, it forms a pastime snacks in peak rainy days. In the hilly tracts of travancore, parboiling and sun drying of mature flakes for off season use is also rarely observed. Fruits with thin flakes are ideal for chips making. Fried in coconut oil, it is one of the rare delicacies comparable with banana chips and is often sold in the market and fetches a premium price. Whole nuts, fried in oil or roasted in fire or pan fried, were used to be a pastime snack for the poor class during peak monsoon season. 'Moodayideel' or preserving the seeds for off season. Preserving seeds for off season for vegetable purpose was a very common practice in Kerala till recently. In fact jack seeds and salted mango in varying degrees of permutation combinations used to be a common side dish during the South West monsoon season. Mature fruits after removing placenta and washing are shade dried and stored indoor. Earthen pots or urns are filled with dry soil or sand and nuts in alternate layers. In another method common Travancore, 'Pullanji' (*Calycopteris floribunda*)

leaves are substituted for sand or soil to retain moisture. Yet another modification is packing the seeds in *Clerodendron infortunatum* leaves and keeping the heaps covering with a banana pseudostem. Burying the seeds in urns containing paddy husk is practised in South Kerala. A more laborious process of removing the cotyledon and smearing with a paste of fine clay and shade drying and immersing in sand is said to extend the shelf life to four-five months. Parboiling the seeds and sun drying is also practised in North Kerala.

5. Miscellaneous uses

Folded jackfruit leaves are used as funnels for pouring oil in kitchen. Jack leaf litter is used as seed bed for tuber crops like cocoyam, taro, greater yam and elephant foot yam. Jack tree is retained as a support for black pepper and shade and wind break in coffee and cardamom plantations. Incidentally coffee is the only companion crop grown in homesteads under jack tree shade. It is added as green manure also. Dumping surplus jack fruits at elephant foot yam basis is said to enhance the yield manifold.

Many toy articles like police uniform, belt and cap are made with jack leaf by rural children. Latex from jack fruit is collected, stored and used as an adhesive for mending broken earthen ware and plastic.

CONCLUSION

Jackfruit which is an inseparable component tree crop in Kerala homestead cropping system

is a very valuable multipurpose tree. Immense genetic variability extant in the homestead is under severe threat of genetic erosion due to manifold reasons of social and economic nature. The varied uses of the tree which originated, domesticated and nurtured in the distant past tribal life pattern that existed in Kerala tend to gradually diminish due to overall economic development and changes in food habits and cultural metamorphosis that are taking place. In the fast changing lifestyle Jack has lost its place as staple. Hundreds of old trees, still exist on roadsides, railway platforms and other public lands in a semi wild condition besides truly wild trees in Western Ghat forests. Many of these roadside trees planted by former rulers as shade trees for the pedestrians have lost relevance in the traffic crowd of present day. They are the repository of valuable genes and incidentally regeneration is not observed due to human factors. Intentional planting of grafted seedlings from these mother trees on public lands is the only viable strategy to check genetic erosion.

REFERENCES

- Muralidharan, V.K., M.M. Ganapathy, K.C. Velayudhan and V.A. Amalraj. 1997. Collecting Jackfruit germplasm in Western Ghats. *Indian J. Pl. Genet. Resources* 10: 227-231.
- Purseglove, J.W. 1974. *Tropical Crops - Dicotyledons*. Longman Group Ltd., London. p. 377-386.
- Simmonds, N.W. 1979. *Evolution of Crop Plants*. Longman Group Ltd., London, p. 201-202.
- Wlth India. 1948. *The Wealth of India Raw Materials*. Vol. I, PID, CSIR, New Delhi p. 125-126.