

# Need of Conservation Approach of Underutilized Fruits: A Potential of Local Resource

Anita Tomar\*, Anubha Srivastava and Kumud Dubey

\*Centre for Social Forestry and Eco-rehabilitation,  
3/1, Lajpat Rai Road, New Katra, Allahabad, U.P, India

\*Email: [anitatomar@icfre.org](mailto:anitatomar@icfre.org)

## Introduction

Since time immemorial, people have gathered plant resources to fulfill various daily requirements. Hundreds of millions of people, mostly in developing countries, derive a substantial part of their subsistence and income from wild plant products (Schippmann *et al*, 2002) Wild edible Fruits (WEF) provide staple food for indigenous people, serve as complementary food for non-indigenous people and offer an alternative source of cash income.

Wild edible fruits play a significant role in rural areas by providing nutrient supplementary diet and generating side income to the poor people. Wild fruits can be considered as rich sources of various vitamins, minerals, fibers and polyphenols which provide health benefits (Narzary *et al*, 2013). Consumption of wild fruits reduces the risk of several diseases like diabetes, cancer, coronary heart disease, neurodegenerative ailment (Rajurkar *et al* 2012). Many wild fruits notably, Amla, Harida, Bel, Elephant apple have been exploited from wild for centuries across Indian subcontinent on account of its food and medicinal properties.

During early civilization, before agriculture was practiced, man lived by hunting and fruit gathering collected from the wild. As such, most tribals still depend on wild fruit bearing plants for food, medicine and nutritional supplement. India harbours great diversity of flowering plants; among which many are fruit plants, and have great economic potential for the rural people.

Fruit plants provide huge opportunity for community development and livelihood improvement. It is felt that the abundance of such fruit plants in the wild habitat can be commercially

cultivated with ease. In such cases, nutritionally rich fruit products in the form of jam, jelly, juice, pickle can be manufactured to generate income for poor rural people and reduce their economic and livelihood burden. For such sustainable processes, suitable conservation practices and policies need to be formulated too.

There are many forest tree species which have a great potential to be commercially utilised for their fruits. Two such species are *Artocarpus lakoocha* and *Spondias mangifera*. Not much research work has been done regarding the wild fruit plants. Therefore in the present study two wild fruit trees *Artocarpus lakoocha* and *Spondias pinnata* were taken.

## *Artocarpus lakoocha* Roxb.

### Scientific Classification

Kingdom: Plantae

Order: Rosales

Family: Moraceae

Tribe: Artocarpeae

Genus: *Artocarpus*

Species: *lakoocha*

The genus *Artocarpus*, which consists of jackfruit (*Artocarpus heterophyllus*), lakoocha or monkey jack (*A. lakoocha*), chempedak (*A. integer*), breadfruit or breadnut (*A. altilis*), and marang (*A. odoratissima*), comprises over 50 distinct species of monoecious evergreen trees (Drew, 1997).

*Artocarpus lakoocha* is popularly known as "monkey jack" or "lakuchi" in India, "badahar" in Nepal, "tampang" in Malaya, and "lokhat" in Thailand.





*Artocarpus lakoocha*

A native of the humid sub-Himalayan regions of India, it grows up to 1,200 m altitude. The lakoocha trees grow 6 to 9 m tall with large, leathery and deciduous leaves. It is a tropical evergreen tree species of the moraceae family. It is distributed throughout the Indian subcontinent and southeast Asia.

Male and female flowers in separate spherical heads, Fruits 5-10cm in diameter, irregularly lobed. One of the most valued fodder trees in Nepal. *Artocarpus lakoocha* is a perennial tree found on west coast from Kokan southwards to Kerala and Tamil Nadu. *Artocarpus* species is popularly used in Ranchi district of the state of Jharkhand. *A. lakoocha* is cultivated throughout India as a shade or ornamental tree. The bark of the plant is dark brown, exfoliating in small round woody peels, reddish inside, white latex, milky juice. *Artocarpus* species display high levels of genetic variability, both between and within species. This is evident from the wide range of locally distributed *Artocarpus* genotypes. Breadfruit cultivars are triploid and seedless. *Lakoocha* seedling trees take five years to come into bearing. The orange-yellow male flowers and reddish female flowers of *lakoocha* are borne separately on the same trees.

## Uses

Reviews of the records in both, traditional and scientific literature indicate that *A. lakoocha* Roxb has many medicinal uses.



Fruits of *Artocarpus lakoocha*

It has many pharmacological activities such as anti-inflammatory, antiviral, anticancer and anti-HIV. The native of Jharkhand use many species like *Sida*, *Artocarpus* etc. for their wound healing properties. The seed and bark of the plant are reported to be effective in the treatment of stomach and liver disease.

*Artocarpus lakoocha* is a valuable tree species native to India and used for fruit, furniture, timber, and feed. The lakoocha fruits are generally eaten fresh. Each fruit contains 20-30 seeds that are fleshy with thin seed coat. The edible fruit pulp is believed to act as a tonic for the liver. Raw fruits and male flower spike (acidic and astringent) are utilized in pickles and chutney (sauce). The lakoocha tree is also valued for feed and timber. The hardwood sold as *lakuch*, is comparable to famous teak wood. Lakoocha which is durable outdoors as well as under water is used for construction, furniture, boat making, and cabinet work. Tree bark containing 8.5% tannin is chewed like betel nut, and is also used to treat skin ailments. It yields a durable fiber good for cordage. The wood and roots yield a lavish color dye. Lakoocha seeds and milky latex are purgative.

The bark in powder form is applied to sores to draw out purulent matter. The seed and bark of the plant are reported to be effective in the treatment of stomach and liver disease.





*Spondias pinnata*



Fruits of *Spondias pinnata*

## ***Spondias pinnata* (L. F.) Kurz**

### **Scientific Classification**

Kingdom: Plantae

Order: Sapindales

Family: Anacardiaceae

Subfamily: Spondioideae

Tribe: Spondiadeae

Genus: *Spondias* L.

*Spondias pinnata* (L.F.) Kurz (*S. mangifera* Willd.) belongs to family Anacardiaceae, commonly known as Amra is a small or medium sized, deciduous tree. The genus *Spondias* includes 17 described species, 7 of which are native to the neotropics and about 10 are native to tropical Asia.

They are commonly named hog plums, Spanish plums and in some cases golden apples for their brightly-colored fruit which resemble an apple or large plum at a casual glance (Tomar *et al.* 2013). They are only distantly related to apple and plum trees, however a more unequivocal common name is mombins. Its fruits are fleshy drupes with woody endocarp surrounded by fibers; unripe fruit are light green colored, which changes into yellow when ripen. The fruits ripen in December - February to March. The unripe fruits are sour, whilst ripe ones are sweet-sour with a hard stone. The fruit stone is semi-woody, fibrous outside and pitted with cavity, with 2 to 5 seeds but one is perfect. They are deciduous or semi-evergreen trees growing to 25 m

tall. The leaves are spirally arranged, pinnate, rarely bipinnate or simple. The fruit is a drupe similar to a small mango (in the related genus *Mangifera*), 4-10 cm long, ripening yellow or orange. It has a single seed. The trees grow best in fertile, well-drained soils but can be grown satisfactorily in a variety of poorer soils if they are given adequate nutrition. The *Spondias* species are best adapted to areas which have a marked dry season. Mature trees are quite tolerant of drought and do not require supplemental irrigation. Some irrigation is desirable for establishment of young trees during the first year after planting. The tree is found wild or cultivated throughout the tropical Indian subcontinent and also in the Andaman Islands and Sri Lanka, but is seldom found in western India. Wood is soft, light grey with pores.

### **Uses**

About 10 species of *Spondias* bear edible fruits and have been domesticated for fruit production. These fruits are also consumed by herbivorous mammals such as deer. In the Western Ghats of Karnataka Flower buds and tender spondias are used in pickle preparation. The fruit is eaten ripe, or pickled or made into curries when green and tender. In some areas the fruit is dried in large quantity and shipped to distant markets. It is a good source of minerals and vitamin C. The flower buds also make a very agreeable curry. The fruits are used as a vegetable when green and as a fruit when ripe and





flavouring in curry (Chadah and Patel 2007) and the leaves are aromatic and astringent fruits are very nutritious and rich in vitamin A, minerals and iron content. The bark has traditional medicinal properties (Mondal and Dash 2009; Hazra *et al.* 2008). The bark is recommended for stomach ache, dysentery, rheumatism and swollen joints. The bark is also given to prevent vomiting. Bark is used as purgative and in local applications for leprosy.

The timber is used for making interior furniture. Its wood is employed for packing cases, tea chests and match-splints. The root is considered useful in regulating menstruation. The plant is reported to have anti-tubercular properties. The leaves are used for flavoring the infusion of the leaves is used as a treatment of eye inflammation, diarrhoea and venereal diseases. The flowers are sour and used in curry as a flavoring and also eaten raw. Through value addition of this wild edible fruit tree plant the local people make chutney, jam and pickle. The tree is also used as shade and living fence posts.

*S. pinnata* is known for its common use in the treatment of infectious diseases like bronchitis, ulcer, diarrhea, dysentery and skin diseases (Melendez and Capriles, 2006; Grosvenor *et al.*, 1995; Valas Raj *et al.*, 1997; Hout *et al.*, 2008). Its roots, bark, leaves are useful and its fruits are also used in traditional medicine (Badoni and Bisht, 2009; Gardner *et al.*, 2000). Bark extract of *S. pinnata* has been reported to show antibacterial activity (Bibitha *et al.*, 2002).

Wood is utilized in temporary construction, mouldings, interior finish, drawers, turnery articles, carvings, core stock of plywood and pulp. Because of its lightness and softness, the wood is more suitable in the manufacture of matchsticks, matchboxes, boxes and crates. Leaves have a sour taste and are edible. When young leaves are used as ingredient in meat stew and filling for *fish sinanglay*, a Bicolano delicacy. Bicolanos also use dried young leaves in the preparation of "*laing*", a favorite and popular dish among the local people. Leaves are also used as feeds for cattle.

The trunk bark is used as refrigerant, tonic and for the treatment of articular and muscular

rheumatism and in dysentery and diarrhea. Dark brown coloured gum of the tree is used as a demulcent and also for fumigation. The leaves are aromatic, acidic and astringent used for flavouring while its juice is applied in ear ache. The root bark powders have been recommended for regulation of menstruation. About 10g of tender fruit juice mixed with 50g of sugar candy and 8-10 grains of black pepper powder is popular home remedy for biliousness. The ripe plant fruit has nutraceutical potentiality of a minor fruit of Assam.

## Conclusion

These neglected fruit resources can be used to combat malnutrition, hunger and to reduce burden on overexploited fruits. Adaptation of new fruit sources will bring the unexploited underutilized and neglected plants into mainstream of consumption. There is an urgent need for the conservation and protection of these plants of future. WEF are not only sources of food and nutrients to the local communities, but could also be means of income generation, if managed sustainably. Several other WEF can benefit local people not only as food, but also for their medicinal properties. These multi-valued resources are threatened by several anthropogenic and natural causes such as land-use change, habitat destruction, over-harvesting, over-grazing, and invasive species. Therefore, sustainable management of these resources for the well being of the local communities as well as to conserve biodiversity is of the utmost importance and could also contribute to preserve cultural and genetic diversity. Inclusion of WEF in community forest management plans would be the most realistic conservation and livelihood approach for the study areas as most forests are managed by community forest user groups.

A scientific investigation of wild edible fruits is urgently needed to assess the potentiality which would be cultivated and utilized as a source of food material for an ever increasing population.

## Acknowledgements

This work was financially supported by Indian Council of Forestry Research and Education (ICFRE), Dehradun, India.



## References

- Badoni A and Bisht C. Importance and problems in Natural Regeneration of *Spondias pinnata* Report opinion. 2009:1(5) 12-13.
- Bibitha B, Jisha VK, Salitha CV, Mohan S. and Valsa AK, Antibacterial activity of different plants extracts. *Ind J Microbial.* 2002:42:361-363.
- Chadah KL and Patel VB, Prospect of indigenous perennial plants as source of vegetable. *Acta Hortic.* 2007. 752:49-54.
- Grosvenor PW, Supriono A and Gray D. Medicinal plants from Riau province, Sumatra Indonesia *J Ethnopharmacol*, 1995:45:97-111
- Narzary, H., Brahma, S. and Basumatary, S. *Arch. Appl. Sci. Res.*, 2013. 5(5), 182-190.
- Hazara B, Biswas S and Mandal N. Antioxidant and free radical scavenging activity of *Spondias pinnata*. *BMC Complement* altemmed. 2008. 8:63-72.
- Hout S, Chea A, Bunn SS, Elias R., Gasquet M. Timon- David P. and Balansard G. Azas N. Screening of selected indigenous plants of combodia for antiplasmodial activity. *J ethanopharmacol* 2008:107:12-18.
- Meléndez, P.A. and Capriles, V.A, Antibacterial properties of tropical plants from Puerto Rico. *Phytomedicine.*, 2006: 13: 272-276.
- Mondal S. and Das G.K. Hypoglycemic activity of the bark of *Spondias pinnata* Linn *Kurz Pharmacogen mag.* 2009 5:42-45.
- Rajurkar, N. S. and Gaikwad, K., *J. Chem. Pharm. Res.* 2012, 4(1), 365-374.
- Schippmann U., Cunningham A.B. and Leaman D.J. Impact of cultivation and gathering of medicinal plants on biodiversity: Global trends and issues. In: *Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries.* Rome: FAO; 2002.
- Tomar A., Kumar A., and Tripathi S. A new approach of propagate *Spondias pinnata* without potting media. In *Proceeding of National seminar on tree Biotechnology.* (Eds) Madhumita Dasgupta, Rekha R. Warriar and R. Yasodha. Prdag print combatore. 2013.pp.20-22
- Valas Raj R., Pushpangadan P., Smitt U.W., Aderson, A. and Nyman, U. Anti-microbial screening of selected medicinal plants from India. *J. Ethanopharmacol* 1997:58 Suppl 2:75-83

**If we pollute the air, water and soil that keeps us alive and well, and destroy the biodiversity that allows natural systems to function, no amount of money will save us.**

**— David Suzuki**

