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Tree bean: A miracle vegetable of Arunachal Pradesh

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Abstract

Tree bean, *Parkia roxburghii*, (G. Don) is a very important multipurpose tree species distributed in the north-eastern hill region of India. This bean have significant economic uses but are under severe neglect. It grows abundantly in the North Eastern region of India, especially in Arunachal Pradesh, Manipur, Mizoram and Nagaland. It has significant economic values as vegetable, medicinal, Industrial and fire wood in this region. It is a fast growing, easier to grow and hardy in nature. It produces a crop even under adverse soil and climatic conditions. This tree is suitable for reclamation of abandoned *Jhum* lands and also as agro-forestry plantations. Right from flowers and tender pods to the mature seeds of this plant is edible and it is a good source of nutrients. It is a multipurpose tree species having variety of uses.

Keywords: Tree bean, miracle vegetable

Introduction

It belongs to the family Leguminaceae is an important tree vegetable of South East Asia, especially North Eastern India. Arunachal Pradesh is a region where the soil and climatic conditions are suitable for growth and survival of numerous plants, shrubs and trees. Many of these flora have been stabilised by natural propagation and growth while others are cultivated. Over the ages the local communities in the region have developed indigenous uses of many wild plants within their environment as food sources. Among the numerous less familiar foods used by the local communities in Arunachal Pradesh is a tree legume, commonly known as tree beans is most popular food. The tree bean being a fast-growing leguminous species with multiple uses is considered suitable for reclamation of abandoned jhum land. It is distributed in India, Bangladesh, Myanmar, Java, Thailand, Egypt and the Malaysian region. In Northeast India, tree bean is found in Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. It is also known as yongchak in Manipuri and Zongtan in Mizoram with other local names such as sapota, long-chak and kukitetai.

Botany

It is a large tree (up to 25 m height) with spreading branches, generally found in lowland rainforests and often along streams (Firake *et al.*, 2013)^[1]. It is a much-branched legume with bipinnate leaves. The inflorescence head or capitulum's arise terminally with clusters of yellowish white tiny flowers, hanging at the top of long stalks from the branches. The fruits in early stages are soft, tender and bright green in colour. leaves are 30-80 cm long. The pinnate are 40-60 in number, and 8-20 cm long. The leaflets are 60-140, linear-oblong, 6-12 mm long, close-set, shining above, and pointed at the tip. Flower-heads are dense, ovoid or perform, up to 6 cm long, hanging from leaf axils like old-fashioned electric bulbs, on long cable-like stalks. The flowers are white and yellow, about 1 cm long. The fruits in early stages are soft, tender and bright green in colour. On maturation the pods turn black and contain yellow dry powdery pulp in which are embedded several black seeds^[2]. The pods are 25-30 cm long, about 3.5 cm wide, rather thick, pendulous, and black and shinning when mature, and contain from 15-20 seeds. The pods are edible, and are considered a delicacy in Manipur. Their pulp is golden yellow, with a sweetish taste and an odour like that of violets. The roasted seeds are used in certain parts of Africa to make an infusion like coffee, for which reason they have been called soudan Coffee tip of a long thick stalk - the reason for its common name. The fruits that are flat are in clusters at the tip of long thick stalks. Known to grow quite fast. The entire inflorescence has a very soft appearance. However, once the flower is dry the core is pretty hard. Please do not even for fun try flinging it at any one.

Nutritional importance

Right from flowers and tender pods to the mature seeds of this plant are edible and it is a good source of ascorbic acid(26.0mg/100g), fat (20.28%), proteins (32.82%), minerals (4.45%), Na (51.0), Mg (34.7) and P (160 mg/100g), Ca (97.47), K (2400), Cu (2.3) and Zn (2.77 mg/100g), Fe (57.1 mg/100g)and Mn (35.0 mg/100g) at par with other legumes [3]. Bark and the leaves are employed in making lotion for skin diseases and ulcer. The bark is reported to be suitable for tanning; it is used for dyeing nets in the Philippines. The various plant parts - pods, seeds, flowers, young shoots - are consumed by the people of Arunachal Pradesh, Mizoram, Manipur and Nagaland, raw or in various preparations such as salads and curries. It is a valued diet supplement and different edible parts of the plant are used medicinally. The pods are known to cure stomach disorders and regulate liver functions. The oil extract of the plant possesses insecticidal properties and the woods can be used as a source of paper pulp [4].

Uses

The long tender pods of tree bean are most popular and delicious vegetable in Arunachal Pradesh, Manipur, Assam, Nagaland, Tripura and Mizoram. Based on local preference, the pods are consumed at different stages of maturity, either fresh or processed. The tender and matured beans are used in various dishes. The beans, after scraping the out skin, are sliced into pieces for use indifferent chutney (Iromba) preparations. Matured flowers and young shoots are also used in curries and salad. The leaves are good source of fodder and green manure. The tree is also of immense use in local medicines. Decoction of bark, fruit skin and leaf is being used to control diarrhoea and dysentery. Bark and leaves of the tree bean are used as lotion for sores, skin diseases, eczema and ulcer [5] and seed oil of tree bean has insecticidal properties against aphids [6].

Cultivation

Tree been is a leguminous crop and is often considered as agro-forestry species; but to ensure better yield and for rejuvenation of declining plantation, it equally requires all sorts of management practices like other commercial crops. However, very few experiments have been undertaken to standardize the production package for tree bean. ICAR Research Complex for NEH Region, Manipur Centre has standardized some cultural aspects for tree bean and it has been approved and recommended by the Department of Horticulture and Soil Conservation, Govt. of Manipur in 2014. The optimum sowing time of tree bean is during the month of May to June (rainy season). For direct sowing of seeds in the field the seeds are dibbled with a spacing of about 10 m x 10 m (30 ft x 30 ft) to maintain an optimum plant population of 100 -110 plants/Ha. Light watering has to be done immediately after seed sowing. For intercultural operations, a minimum of two weddings per year have to be done till the 4th year. Harvesting starts from the 5th year onwards. The beans are usually harvested during the month of December to April and a single tree bears about 10,000-15,000 pods approximately.

Value Addition

Value addition refers to the Process of changing or transforming a product from its original state to a more valuable state. The seeds of the tree bean are usually sun dried and stored for future consumption during off season. Pickling

of tree bean is also another option, which is gaining popularity amongst the consumers. The tree bean is washed thoroughly and its skin scrapped off, they are then cut into tiny pieces and pickled in oil along with spices of one's choice.

Economics

In Arunachal Pradesh, it is considered as the most costly vegetable fetching a market value of Rs 50-80/kg. Ethno botanically, this tree species is highly important. The fruits in early stages are soft, tender and bright green in colour. They turn blackish when fully mature in March–April.

Future Prospects

In Arunachal Pradesh and most of the hilly states of North East India, the forest lands are becoming barren due to the practice of Jhum cultivation. The rotation cycle is now even coming down to 2-3 yrs. Hence, it causes serious ecological problem. Now it is time to think of fast growing plant having economic potentiality, which may help in maintaining ecological balance as well as to uplift the socio-economic status of the Jhumiers. The *Parkia roxburghii*, a fast growing leguminous species bearing economic fruits will be one of the suitable species for reclamation of abandoned Jhum land and also for Agro-forestry system of cultivation. The maintenance is not required because being a legume it will also enrich soil through nitrogen fixation. Thus, like Arunachal Pradesh other North East state may take up large scale plantation of this species on priority basis and efforts should be made for characterization, documentation and genetic cataloguing of available germplasm across the country for identification and registration of promising genotypes with agriculturally important traits; followed by systematic crop improvement programme for development of improved varieties with desirable traits like earliness, dwarfness, resistance/tolerance to biotic and abiotic factors etc.

Conclusion

Arunachal Pradesh is bestowed with the most congenial climatic conditions for the production of tree bean. This bean having good potential to contribute to the income of farmers. The crop is now popular among Arunachal Pradesh farmers due to its nutritional value and its shelf life. Therefore, in Arunachal Pradesh more attention and priority should be given on cultivation of tree-bean in larger area, Priorities should be given to future exploration and collection based on gaps in areas and diversity required and Inventory and database for information documentation and dissemination and to help better monitoring and management.

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