

The Timru Tree: A Hidden Gem of Central India

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Introduction

The Timru (*Diospyros melanoxylon*), or Indian prickly ash, is an intermediate-sized deciduous tree thriving in semi-arid conditions prevalent in central India. Hardiness and adaptability thus render this type important for the local ecosystem. The tree ensures vital resources needed by local communities while playing an important role in the ecological balance. Timru is very essential to tribes who rely on its parts for food, medicine, and economic activities. Its cultural value can be sourced from the tradition of practices and folklores that it comprises, where the plant mostly takes part in rituals and customs and traditions of the locality. The relevance of the Timru species will be taken towards food security in several severe climate conditions were climate change questions food security.

Botanical Features

This tree attains an enormous height of 25 meters and a girth of about 1.9 meters. Good structure at its base, through the extensive tap root system, enables the quick availability of deep water to the plant, which is helpful to cope with droughty situations. The ample-sized bark appears in pelecen-color and exfoliates in rectangular scales, aiding in moisture retention along with supporting a variety of insects and birds, thereby enhancing their biodiversity.

Leaves can be opposite, alternate; the matured leaves are also leathery, and the leaf blades can reach 35 cm in length; the young leaves show hairiness on both sides, which reduces loss of water through transpiration. Mature leaves are hairless on the upper surface; it tends to optimize photosynthesis while minimizing damage brought about by environmental stressors.

Flowers and Fruits

It flowers characteristically between February and April, in step with warming warmer temperatures. At times of the period, three varieties are found: pistillate, female; staminate, male; and perfect hermaphroditic. The male flowers tend to be mauve and, at certain times, they form clusters of 3 to 4 to attract pollinators, like bees and butterflies, that are important to successful reproduction.

Female flowers are larger and mostly solitary or cauliflorous, which maximizes the chances of pollination. The fruits develop from these flowers. They turn yellowish-orange in color when ripe. In this case, ripeness is usually set between May and June. Inside every fruit are seeds that are very important for propagation and contribute to the genetic diversity of the species.

Nutritional Value

The fruit is highly nutrient-rich. The fruit varies significantly in weight 18.43 - 28.72 g and dimensions 3.15 - 3.55 cm length; 3.35 - 3.58 cm width. The analytical data reveal the variations in acidity 0.12 - 0.26% and total soluble solids 19.23 to 23.57 °Brix, hence showing its value as a fresh fruit for processing into value-added products. As to its vitamin C content, it supplies 19.90-27.40 mg/100 g, providing the antioxidant properties that help preserve a healthy immune and skin system. Furthermore, total sugars range between 28.15-30.19%, enabling it to have a sweet flavor profile that makes its fresh consumption more appealing.

Very impressive indeed is the amount of carotene at 410.05-420.08 µg/100 g for it will maintain healthy vision and support the immune system. Mineral constituents include potassium (285.17 -304.85 mg/100 g), an absolute necessity for heart health; calcium at 375.23-395.35 mg/100 g for maintaining bone density; phosphorus at 153.40-160.52 mg/100 g for metabolism energy. These nutritional attributes hint that Timru fruit could be an excellent fresh fruit and in industrial processing, such as juices, jams, etc., in upgrading dietary diversity.

Value Addition and Poverty Alleviation

Rich in carbohydrates, calcium, phosphorus, and carotene, the Timru (*Diospyros melanoxylon*) fruits are a great source, which fights malnutrition among the tribals of central India. The fruit powder because of its taste is used as a natural flavouring agent. Traditionally, dried flowers have been applied in the treatment of urinary tract infections and skin diseases. Most Timru (*Diospyros melanoxylon*) fruits, however tend to be perishable with large post-harvest losses since there are inadequate processing facilities for the fruits.

The setting up of local processing units can be very instrumental in the creation of value-added products such as nectar, jams, toffee, powder, wine, and herbal supplements out of Timru (*Diospyros melanoxylon*) fruits and its various parts. This will also go a long way in reducing waste and creating job opportunities for people within the community. Training programs based on sustainable harvesting techniques and product development can economically empower the local population while allowing them to preserve traditional knowledge about the uses of Timru.

Propagation Mode

Being cross-pollinated with a high degree of heterozygosity, the plants of Timru are mainly propagated through seeds, which allow for selection of elite plants with desirable traits such as higher yield or better nutritional quality.

Seeds should be sown during the onset of monsoon between June-July when optimum germination rate is obtained which usually takes about 70-80 days with satisfactory result under proper conditions.

Apart from seed propagation, vegetative methods like grafting may also be undertaken in order to obtain superior quality plants more rapidly without the loss of desirable characters from the parent trees.

Community-based nurseries can also aid the process of propagation while teaching the best practices involved with soil preparation, planting techniques, and strategies for pest management.

Production Technology

Timru can be grown in any variety of soils, including lateritic soils containing good irons; black soils retaining moisture; or rocky soils having a good drainage system and poor denuded soils on hot dry hill slopes composed of quartzite or shale. It has a high tolerance to mean annual temperature range of 0-48°C, and it is very suitable for cultivation in a wide range of climatic conditions prevalent in central India. Rainfall requirement varies from 500-1500 mm, and this crop adapts well to areas with fluctuating rainfall due to climate change.

Guidelines on Planting

For best planting conditions, soil test should be conducted prior to planting to detect deficiencies or pH imbalances that affect the health of the plants.

Seeds or grafts must be planted at the onset of monsoons, July-August, at spacing that is at least 6 m ×

6 m or more between plants, thus giving enough sun radiation and air flow around the plant. It is essential to dig 1 m × 1 m × 1 m depth pits before planting; these pits must be filled with topsoil and mixed with FYM along with SSP and neem cake, which can be helpful in preventing termite attack effectively. Organic farming activities like mulching with organic materials can improve soil health by retentive moisture content while suppressing weeds further.

Irrigation Requirements

While Timru has a deep-root system that is drought-resistant hence allowing access to the groundwater reserve during dry spells, more water will be available at critical growth stages, such as flowering and fruit development, through rainwater harvesting systems. This practice, aside from water conservation, encourages sustainable agriculture, with benefits to all parties associated with the ecosystem while, at the same time, ensuring higher yields during times of insufficient rainfall.

Pest Management Practices

However, they are more resistant to pests, although susceptible to defoliation of leaves by some insects such as the caterpillar in new-growth stages. This can be promoted through the IPM strategy to reduce reliance on chemical pesticides and apply instead other control methods like, for example, natural predators or organic pesticides in the form of neem oil and maybe other plant extracts. Constant observation of the plant's health would allow any problem with pest issues to be detected early and then proper interventions can be implemented on time without applying the chemical treatments.

Harvesting

Timru (*Diospyros melanoxylon*), being a non-climacteric fruit that becomes ripe while it is still on the tree, should be harvested when it turns into yellow-orange colour, and this is when it would have reached the prime ripeness state for maximum flavour and nutrient variety. Proper harvesting techniques are involved; there is also a need for using clean tools in order not to contaminate the fruits during collection processes as it will thus affect the fruit after harvest. After harvest, fruits should be left to ripen at ambient temperature for several days after which they become fully ripened; proper storage practices will ensure freshness while shelf life is long before processing or selling to a nearby local or regional market place.

Conclusion

Therefore, the Timru tree represents a very valuable resource that could hold great promise for using it in addressing food security challenges, while at the same time promoting economic development among tribal communities across central India.

By harnessing the nutritional potential of this underutilized species through innovation value-added products such as vitamin-enriched juice or herbal remedy from the bark, there is big opportunity not only in enhancing local livelihoods but also to increase community resilience against climate change effects via sustainable agricultural practices specifically designed around this currently underutilized species. It will then invest on and find the best cultivating methods while engaging the community to exploit the full potential of Timru within agroforestry systems in restoring degraded lands while promoting biodiversity efforts within such ecosystems.

Summary

The Timru tree represents an opening in which ancient wisdom can be bridged with current agricultural trends as it affects not only sustainable development respectful of culture but also environmental stewardship through high productivity agriculture under changing climatic conditions facing the world today.

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