



***Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud-An ideal timber crop of commercial importance**

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Abstract

Assam is bestowed with varied agro-climatic zones and mean annual rainfall varying from 1500 mm to 3750 mm and its favourable temperature offers diversified agro-climatic habitats for the growth of various economically important plants. There are a very few economically important crops, which can be cultivated without disturbing the native flora and have the prospective to establish as cash crops under the suitable climatic condition of Assam. Princess tree (*Paulownia tomentosa*) is one such timber yielding plant which is identified to yield good quality timber and very well adapted to the climatic pattern in Assam. To study the regionalization possibilities of this species in the Assam climatic conditions seedlings of *P. tomentosa* were planted in 2014 in the University campus of Assam down Town University in a distance of 1 x 1 m. The plant has been grown on an experimental basis and the seedlings were obtained from Australia. This study mainly enlighten on the ecophysiological and floristic study of this plant under Assam climatic conditions. *Paulownia tomentosa* is capable of growing, adapting and developing in less fertile soils and it is proved to be an ideal tree for improving and reclaiming polluted and degraded soils. This article deals with the preliminary data of the regionalization performance of this high energetic value crop.

Keywords: *Paulownia tomentosa*, timber, introduced, climatic conditions, Assam

Introduction

Paulownia tomentosa is a deciduous fast growing exotic plant and introduced to Assam by Dr. N. N. Dutta, Chancellor of Assam down Town University around 7 years back to see the growth cycle and capability to adjust in the climatic conditions of Assam. The detailed floristic study was carried out under the aegis of Botany department. *Paulownia tomentosa* is native to western and central China where historical records describe its ornamental, medicinal and timber uses. *Paulownia tomentosa* is known with several names like Empress Tree, Princess Tree, Royal tree, Phoenix tree etc. (Innes 2009; Bikfalvi 2013). *Paulownia* genus includes 17 species and is member of monogenetic family of Paulowniaceae of the order Lamiales. The important species of this genus are *P. catalpifolia*, *P. albiphloea*, *P. fargesii*, *P. australis*, *P. elongata*, *P. kawakamii*, *P. tomentosa* and *P. fortunei*, etc. Cultivation of *Paulownia* genus for their hard wood originated from China since 3000 years ago.

They are widely distributed in China, Laos, Vietnam and south to northern and are cultivated in Eastern Asian countries like Japan, Korea as a native plant. *Paulownia tomentosa* is a deciduous plant and can reach upto a height of 20 – 30 m under natural climatic conditions and in China up to 50 m height is recorded. Its diameter can reach up to 2 m. *Paulownia tomentosa* plant usually forms many branches in open space but in the forest area it normally forms a straight trunk. *Paulownia tomentosa* bark

is dark brown to black in colour, smooth with visible lenticels in the young tree and develops vertical cracks in maturity. Most of the parts of the plant are covered with glandular mucigel hair, thick and branched hairs. The leaves are cylindrical at the matured tree. The new plants have big spirally arranged leaves and long stem. They are produced in the axes of the decreasing or small leaves in the month of March- April in climatic conditions of Assam. Flowers are large, showy, fragrant blossoms are borne in upright clusters. The calyx of the flower is flashy and bell shape with five lobes uneven triangular. The upper main lobe is bigger and hairy in appearance. The flowers are formed on 10-35 cm long panicles with a purple white tube like corolla of 4-6 cm long.

The capsulated fruit is oval shaped in structure and it contains numerous small seeds.

Paulownia tomentosa enters soon in the reproduction phases, usually after 4 – 5 years but it can reach also 6-7 years under normal conditions of Assam. The fruits have capsules of 3– 4 cm high and 2-3 cm in diameter. The capsule contains numerous small seeds with wings. The number of seeds can be up to 2000 in the fruits. The roots of *Paulownia tomentosa* is well developed and relatively shallow. Roots of the upper surface are having high density, dichotomously branched. The roots for suction are long and are expanded up to 60 cm. The timber of *Paulownia tomentosa* is well known in the global market and it is also known as Chinese teak.



Fig 1: Photographs showing growth of the matured plant of *Paulownia tomentosa*



Fig 2: *Paulownia tomentosa* tree in full blooming stage at Assam down Town University

Result and Discussion

Within the natural conditions of Assam *Paulownia tomentosa* developed around 30 – 40 cm diameter tree trunk in 7 years. Our study revealed that each *Paulownia tomentosa* tree of aged between 6 – 7 years can generate approximately 1 m³ timber in a surface with density of 2000 plants/ha. *Paulownia tomentosa* trunk is strong, pleasant and suitable for carvings without junctions and it has a soft surface having specific mass of 0, 32 g/cm³ (Ates *et al.*, 2008) [2]. *Paulownia tomentosa* timber has low thermal conductivity (0,063 – 0,085 kcal/m hr C) and naturally resistant against fire and damages (El-Showk *et al.*, 2010) [4]. Presence of high tannins content makes the plant body resistant against wood worms and termites. Leaves and flowers of *Paulownia tomentosa* can be a good source of proteins, sugars and fats for the nourishment of cattle's. The presence of high nitrogen contents in the leaves of *Paulownia tomentosa* can be utilize as green fertilizer or compost in the organic cultivation.

Conclusion

As an introduced plant in Assam condition *Paulownia tomentosa* has a high adaptability and consumes around 1500- 2000 liters of water per tree. The adequate conditions for the *Paulownia tomentosa* cultivation are attained in a height of 250 – 1300 m above the sea level with an average of the annual temperature of 15 – 35 degree Centigrade (and annual rainfalls 1400 – 2800 mm). The plant is a good source in the production of high quality honey and it is light yellow in colour. The Plants represent an enormous bioactive compound which can be useful to prevent various diseases. Strong acting substances of *Paulownia* were used in folklore Chinese medicine and there are many reports on the analysis and isolation of various bioactive compounds. The plant is used in the treatment of lung problems,

respiratory disorders, and digestive system in Chinese medicine system. The syrup and tea is also prepared from the flowers of *Paulownia tomentosa* which affect positively in bronchitis, spleen and liver disorders. *Paulownia tomentosa* is a very flexible plant and nominal infection of root rot, virus disease and pests were observed in the climatic conditions of Assam during the study period.

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Conflict of Interest

The author declares no conflict of interest.

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