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"*Paulownia tomentosa* (Thunb.) Sieb. & Zucc. ex Steud- a newly introduced plant to Assam"

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Abstract

Paulownia tomentosa is a fast growing exotic plant and introduced to Assam by Dr. N. N. Dutta, Chancellor of Assam down town University around 6 years back to see the growth cycle and capability to adjust in the climatic conditions of Assam. The plant has been grown on an experimental basis and the seedlings were obtained from Australia. The detailed floristic study was carried out under the aegis of Botany department. *Paulownia tomentosa* is capable of growing, adapting and developing in less fertile soils and it is a ideal tree for improving and reclaiming polluted and degraded soils with heavy metals and harmful substances. *Paulownia tomentosa* is native to western and central China where historical records describe its ornamental, medicinal and timber uses.

Keywords: *Paulownia tomentosa*, Climatic conditions, Introduced, Assam

Taxonomy

Paulownia tomentosa is recognized with many names like Princess Tree, Empress Tree, Royal tree, Kiri Tree, Phoenix tree etc. (Innes 2009; Bikfalvi 2013). Paulownia genus is nominated according the Swiss botanist Thunberg (ZhaoHua et al., 1986) nominated in honour of the queen Anna Pavlovna of Netherlands (1795 - 1865), the daughter of Car Paul I of Russia (Woods 2008). Paulownia genus includes 7 – 17 species and is member of monogenetic family of Paulowniaceae in the order Lamiales. The most important species of this genus are *P. albiphloea*, P. *australis*, *P. catalpifolia, P. elongata, P. fargesii, P. fortunei, P. kawakamii*, and *P. tomentosa* etc. The hard wood trees of the Paulownia genus originated from China are cultivated since at least 3000 years ago. They are naturally distributed in China, south to northern Laos and Vietnam and are long cultivated elsewhere in eastern Asia, notably in Japan

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and Korea where they are native. It has a natural distribution from the tropical zones till the ones with moderated climate.

Botanic description

Paulownia tomentosa is a deciduous tree and can reach a height of 20 – 30 m (Innes 2009) under natural conditions and up to 50 m (Navroodi 2013) recorded in China, its origin land. Its diameter can reach 2 m (Innes 2009; Navroodi 2013). *Paulownia tomentosa* plant usually forms many branches in open space, whereas 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 maturated tree. The new plants have big spirally arranged leaves and long stem. The flowers of *Paulownia tomentosa* are pendicellate with two or five flowers with stems.

Figure: *Paulownia tomentosa* tree in full blooming stage at Assam down town University

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 flowers are placed at the apical basis. The calyx is flashy, in bell shape with five lobs uneven triangular. These triangular shaped lobs have the upper main lob bigger and mainly hairy. *Paulownia tomentosa* enters soon in the reproduction phases, usually after 4

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– 5 years but it can reach also 6-7 years under normal conditions of Assam. The corolla is big, purple to white, two lips and two lobs to the upper lip and tree elongated lobs to the lower lobs. The bell tube is usually 5 mm from the basis and later is gradually or immediately prolonged. The fruits have capsules of 3– 4 cm high and 2-3 cm in diameter. The capsule contains many small seeds with wings. The number of seeds in the fruit can be up to 2000. The root system at *Paulownia tomentosa* is relatively shallow, well developed. Upper roots are thin, dichotomously branched and having high density. Suction roots 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.

Utilization of the Plant

Within natural conditions in 10 years *Paulownia tomentosa* develops a trunk with diameter of 30 – 40 cm, measured 1,2 m from the earth, producing a volume of 0,3 – 0,5 m3 in some studies. According to some botanist each *Paulownia tomentosa* tree aged 5 – 7 years old can generate 1 m3 timber in a surface with density of 2000 plants/ha, offering a total production of 330 t/ha. In the areas planted with a smaller number of plants per surface unit can reach a production of 150 t/ha. *Paulownia tomentosa* trunk is light dries quickly,strong, aesthetically pleasant and easily workable and suitable for carvings without junctions and a soft surface, with a specific mass of 0,35 g/cm3 (Ates et al., 2008; Akyildiz et al., 2010). *Paulownia tomentosa* timber has low thermo conductivity (0,063 – 0,086 kcal/m hr C) and natural resistance against fire and damages (El-Showk et al., 2010), because of high tannins content it is resistant against the termites and wood worms. Flowers and leaves of *Paulownia tomentosa* are a good source of sugars, proteins and fats for the cattle nourishment. The nitrogen compound to the *Paulownia tomentosa* leaves can be compared with that of several leguminous family plants, the leaves are utilized as green fertilizer as compost.

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 200 – 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

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light yellow in colour. The plant is used in the treatment of lung problems respiratory disorders, and digestive system in Chinese medicine system. The tea and syrup is also extracted from the flowers of *Paulownia tomentosa* which affect positively in bronchitis and in the liver and spleen 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

Authors declare that they do not have any conflicts of interest.

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