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Holoptelea integrifolia Planch

Kundu, Maitreyee; Schmidt, Lars Holger; Jørgensen, Melita Joan

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Holoptelea integrifolia Planch

Taxonomy and nomenclature

Species name: *Holoptelea integrifolia* Planch.
Family: Ulmaceae
Synonym
Ulmus integrifolia
Vernacular/Common name Indian Elm (English), Kanju, chirol (India)

Distribution and habitat

The species is distributed in India up to an altitude of 600 m from the sub-Himalayan tract and Central and southern regions, where it grows in monsoon and rain forests. The tree thrives from sub-tropical to dry tropical climate where the rainfall ranges from 800 to 2500 mm per annum. Rainfall is mainly received during the monsoon season with some winter showers. The temperature during summer is 27° C to 48° C and -1° C to 14° C in winter. It grows best in deep porous sandy or loam soil, gravelly subsoil with good drainage but becomes stunted and crooked on poor shallow soil. The tree is also found in rocky areas where water is at a great depth below the surface. It is an excellent species for reclamation of rocks, stream banks, skeletal soils, brackish lands, gullied and ravine lands. It is a moderate light demander and not frost-hardy.

Uses

The wood is light yellow, moderately hard and used for low-cost furniture and in the plywood and paper industry. The pulp of bark is used for making hardboards and insulation boards. The species provides good firewood; calorific value of sapwood is 5250 kcal (22,000kJ)/kg. Leaves are lopped for fodder, containing 14% crude protein. Bark, leaves and seeds are used in local medicines. The bark is used in rheumatism. Both bark and leaves are used for treating edema, diabetes, intestinal disorders, leprosy, and other skin diseases. Seed and bark is used in treating ringworm.

Botanical description

It is a large deciduous tree with strong ascending or spreading branches marked with tubercles. Under favourable conditions the tree grows up to a height of 30-35 m and 3 m girth with a clear bole of 10 m or more and a broad crown. Bark is grey, fairly smooth, pustular, exfoliating in somewhat corky scales. Leaves alternate, elliptic-ovate, 5-13 cm long, acuminate, entire, sub-coriaceous, nerves 5-8 pairs, rarely cordate or oblique. The bark when cut and the leaves and twigs when crushed emit an unpleasant odour. Flowers are polygamous, greenish-yellow, in short racemes, or fascicles. No of stamens are 8 in male flowers, 5 in bisexual flowers; anthers are hairy. Ovary is unilocular and stalked.

Branch of *Holoptelea integrifolia*

Fruit and seed description

Fruit: Fruit is an oval or suborbicular samara, with membranous reticulately veined wings, 2.5 cm in diameter on a long slender stalk, single seeded. 25000 to 29000 fruits weigh one kg. Each samara contains one seed.
Seed: The seed may in practice be equal to the flat samara or the de-winged samara. It may also refer to the morphological seed after extraction, which is very small, whitish and kidney-shaped.

Flowering and fruiting habit

The old leaves chiefly fall in January-February, the new leaves appear in April-May. The flowers appear on the leafless tree from February to March and fruits mature April to May. The fruits fall soon after ripening that is followed by leaf fall of other species, which protect the seeds from direct sunlight. Direct sunlight may cause the death of the seed.

Fruits of *Holoptelea integrifolia*

Seed extracted from *Holoptelea integrifolia*

Seed collection

Regular monitoring is needed during maturation time for collection of seed, as maturation period is short and fruits fall soon after ripening and are dispersed over a long distance during summer months due to their light weight and wing. Seeds collected from the ground also have low germination capacity. The best collection time is when the fruits turn brownish green and seeds are brownish white in colour (seed moisture content 12-16 %). Collection can be done by shaking the trees or lopping the branches or plucking the fruits. A tarpaulin sheet may be spread under the tree. Brownish green pods are after-ripened by drying in shade with proper aeration by spreading in one layer on cement floor or table-top till the moisture content reach 3-5%. In humid areas seeds can be sundried.

Processing and handling

Seeds are indehiscent samaras and extraction of seeds is not done, but wings may be removed to reduce bulk. The papery wings can be removed by rubbing between hands and then cleaning can be done either by winnowing or by a seed blower.

Dormancy and pretreatment

Fresh seeds (not extracted) have 80-90% germination, whereas extracted seeds have 100% germination. Seeds have no dormancy and do not need any pretreatment.

Storage and viability

Seeds of *Holoptelea integrifolia* are of orthodox type which can tolerate 3-5% moisture content, and freezing temperature. Viability can be maintained for up to one year if stored at 3-5% moisture content at ambient temperature and can be extended up to more than five years if stored at low temperatures (15 °C to -20°C) and 3-5 % moisture content. But increase of moisture content above this level is the main cause of death of seed at any temperature. Extraction of seeds from fruits before storage prolongs storability, as moisture content of stored seeds is increased due to hygroscopic nature of the fruit coat/wing.

Sowing and germination

The species can be raised by direct sowing or transplanting of nursery-raised seedling. In direct sowing, fresh seeds are sown at the rate of two seeds per stake in lines 3 m apart. Seedling can be raised in nursery by sowing seeds in lines about 12-20 cm apart. Transplanting is done when the seedlings are 10 cm high at a spacing of 22.5 x 22.5 cm. The seedlings are kept in the transplant bed for two years and planted in the monsoon. Germination starts after 4-5 days. Germination is epigeous. Regular watering, weeding, mulching and lateral shades are important for establishment of seedlings.

Phytosanitary problems

The major pests of the tree are the woodborers of *Bostrychidae, Buprestidae, Cerambycidae*, and *Plalypodidae*.

Selected readings

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Author: Maitreyee Kundu E-mail: *spalliwest@yahoo.co.in*

Editor: Lars Schmidt, Melita Jørgensen

For further information: Director, Tropical Forest Research Institute, P.O. R.F.R.C., Mandla Road, Jabalpur 482021, India.

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