Prosopis cineraria

(L.) Druce

Fabaceae - Mimosoideae

khejri, kandi, jand

LOCAL NAMES

Arabic (ghaf); Bengali (shami); Gujarati (khijado,sumri,semru,sami,kamra); Hindi (janti,banni,jand,chonksa,sangri,shami,chaunkra,khejiri); Sanskrit (jhind,jhand); Tamil (perumbay,vanni,jambu); Trade name (jand,kandi,khejri); Urdu (jandi,thand,kandi)

BOTANIC DESCRIPTION

Prosopis cineraria is a tree to 6.5 m high; cortex cinereous; prickles internodal, scattered, straight, somewhat macroscopic, conical with broad bases. Taproot to more than 3 m long.

Leaves 1-3-jugate, glabrous or puberulous; petiole and rachis 0.5-4 cm long, the pinnae 2-7 cm long; leaflets 7-14-jugate, ovate, straight to sub-falcate, without nerves (or 2-4-nerved at base, the midrib excentric), mucronate, 4-15 mm long x 2-4.5 mm broad, greyish when dry; stipules foliaceous, deciduous.

Racemes spiciform, 5-13 cm long, several together, subpaniculate; peduncle with amplexicaul bract (or 2 bracts united), this caducous and leaving an oblique scar, 1.5-2 mm long; bractlets ovate, sessile, 0.5-0.8 mm long, caducous; pedicels 0.5 mm, to 1.5 mm long when mature; flowers yellow, glabrous; calyx truncate, 0.8-1.2 mm long; corolla 3.5 mm long, glabrous, the petals rolled back in age; anthers 0.8-1 mm long; pistil glabrous.

Fruit slender, elongate, 8-19 cm long (including the stipe 0.8-2 cm), subcylindric-torulose, 4-7 mm in diameter, glabrous; pericarp thin, brittle; endocarp segments thin, longitudinal, little developed; seeds distant, longitudinal, ovate, 6 mm long, the tegument with open horse-shoe fissural line on faces, 10-15 in a pod, brown.

BIOLOGY

It is evergreen or nearly so. The trees start flowering and fruiting at an early age; five years old coppice shoots produce as fertile seed as the older trees. New leaves appear before or simultaneously with the fall of the old leaves in summer. The small, yellow flowers appear from March to May after the new flush of leaves. The pods are formed soon thereafter and grow rapidly in size. The pods ripen from June to August.

Growth of new foliage, flowering and fruiting occurs during the driest months (March-June) when other plants become leafless and dormant. The flowers of P. cineraria are entomophilous and depend on pollinating insects for seed setting.

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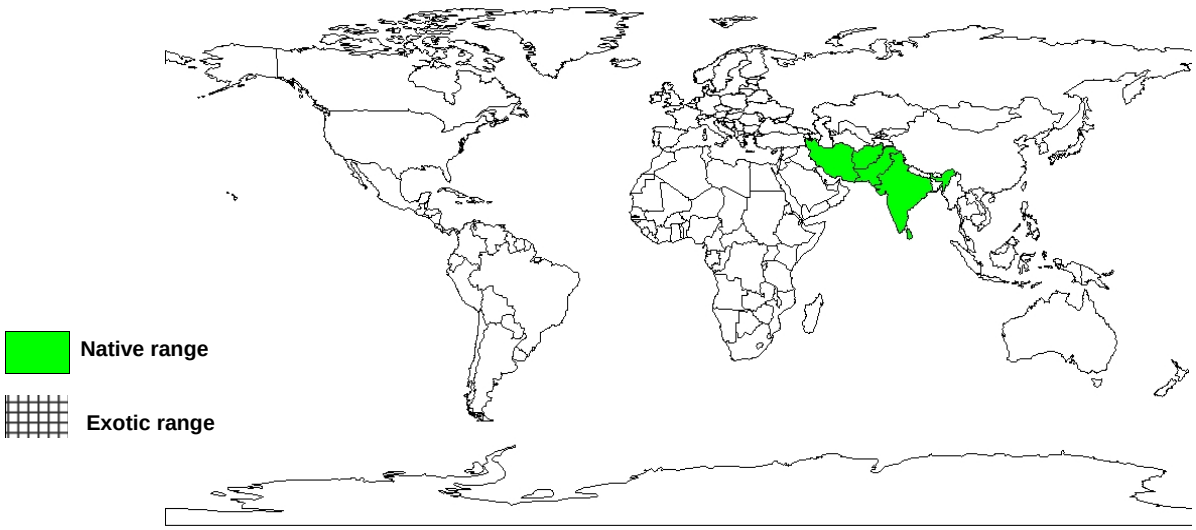
ECOLOGY
In the areas of its natural distribution, the climate is dry to arid characterized by extremes of temperature. The maximum shade temperatures varies from 48 deg C to 52 deg C. The annual rainfall varies from about 120 mm to 250 mm. Where rainfall is more, the tree is found scattered in open dry forests and in some areas on black cotton soil. It is a characteristic tree of secondary dry deciduous forest, desert thorn forest, ravine thorn forest, Zizyphus scrub, and desert dune scrub.

BIOPHYSICAL LIMITS
Altitude:
Mean annual temperature: -6-50 deg C.
Mean annual rainfall:120-250 mm.
Soil type: In its natural range, it grows on coarse sandy soils. It can however grow on a variety of soils. Good growth is obtained on deep sandy loam soil with adequate availability of moisture in lower layers. Shallow dry soils with hard layer beneath, which restricts root penetration, results in poor growth. In arid areas, the growth is better in dune lows than in sandy plains, which in turn offer better site than the dune tops. Good drainage is very essential and poorly drained soils are not suitable. Along rivers, it grows above the flood level on alluvial deposits consisting of varying mixtures of sand and clay. It does not survive long on pure sandy soils. On saline soils also it quickly dies out, but it can grow on slightly alkaline soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Afghanistan, India, Iran, Pakistan, Sri Lanka
Exotic: United Arab Emirates



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Food: P. cineraria pods are used as vegetable in the dried and green form in many parts of the Thar desert in India. During India's Rajputana famine (1868–69), many lives were spared, using the sweetish bark as a food. It was ground into flour and made into cakes.

Fodder: The leafy portion, known locally in India as “loong’ is available for 4-5 months (June-October), during which it is used as dry fodder for animals and is sometimes mixed with animal feed.

Fuel: In the Punjab, its rather scanty, purplish brown heartwood is preferred to other kinds for firewood. It is an excellent fuel, also giving high-quality charcoal (5,000 kcal/kg).

Timber: Wood used for boat frames, houses, posts, and tool handles; the poor form of unimproved trees limits use as timber.

Gum or resin: The tree yields a pale to amber coloured gum with properties similar of gum acacias.

Tannin or dyestuff: Bark and leaf galls used for tanning.

Medicine: Reported to be astringent, demulcent, and pectoral, it is a folk remedy for various ailments. In India, the flowers are mixed with sugar and administered to prevent miscarriage. In Las Bela, India, the ashes are rubbed over the skin to remove hair. The bark, considered anthelmintic, refrigerant, and tonic, is used for asthma, bronchitis, dysentery, leucoderma, leprosy, muscle tremors, piles, and wandering of the mind. Smoke from the leaves is suggested for eye troubles, but the fruit is said to be indigestible, inducing biliousness, and destroying nails and hair. Punjabis consider the pod astringent. Central Province Indians use bark for rheumatism. Although recommended for scorpion sting and snakebite, the plant has not proved out.Reclamation: The trees are planted for sand dune stabilization and reclamation.

SERVICES
Reclamation: The trees are planted for sand dune stabilization and reclamation.

Nitrogen fixing: It fixes atmospheric nitrogen.

Soil improver: Pakistanis and Indians believe, quite properly, that it increases fertility under its canopy.

Intercropping: Owing to the deep root system, a mono-layered canopy and the ability to fix atmospheric nitrogen, P.cineraria is compatible with agri-horticultural crops. The tree boosts the growth and productivity of the companion plants. Besides, it does not compete for moisture with crop plants, which may be grown close to its trunk.

TREE MANAGEMENT
Initial spacing of 2 x 2 m is recommended. Should be weeded until well established. Standing crops yield 7-70 cu m fuel/ha, averaging 21 cu m stacked. Annual yields of stacked firewood approach 3 cu m/ha. The heartwood is very hard and heavy (769-945 kg cu m). Tree coppices readily.
In India, a special type of lopping which inflicts minimum damage is used on the trees. The method, locally known as "changni", is acquired through traditional wisdom in farm families. It is a common belief that such lopped trees bear lush green leafy fodder in the subsequent year.

GERMPLASM MANAGEMENT
Ripe pods are collected by lopping or shaking the branches. The pods are dried in the sun, beaten and winnowed to separate clean seed. Seeds weigh 25 000-27 000/kg. When stored properly seeds can keep well for several years.

PESTS AND DISEASES
One fungus and five insect species are known to attack the tree. Species of Chrysobothris and Sinoxylon bore into the dead wood, causing wood rot. Other pests include Cuscuta reflexes; Caryedon gonagra, Celosterna scabrator, Drosicha stebbingi, Laccifer lacca, Oxyrhachia tarandus, Perisopneumon tamarinda; and Schistocerca gregaria. P. cineraria plants are severely damaged by browsers. Protection of young plants against goats and other browsers is essential.

FURTHER READNG

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Singh RV. 1982. Fodder trees of India. Oxford & IBH Co. New Delhi, India.

Tewari JC et al. (eds.). 1993. Prosopis species in the Arid and Semi-Arid zone of India. Proceedings of a conference held at the Central Arid Zone Research Institute, India. The Prosopis Society of India and the Henry Doubleday Research Association.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)