Cassia fistula

L.

Fabaceae - Caesalpinioideae

rajbrikh, Indian laburnum

LOCAL NAMES
Bengali (amultash,sondal,sonali); Cantonese (kakke); English (golden shower,Indian laburnum,pudding pipe tree,purging cassia,purging fistula); French (Bâton casse,casse doux,casse espagnole); Gujarati (Girmala); Hindi (bandarlathi,bharva,suvarnaka,amaltas,rajataru,girimalah); Malay (tengguli,rajah kayu,bereksa); Sanskrit (saraphala,survanaka,argwadha,rajtaru); Spanish (Canâfístula mansa,chácara,Guayaba cimarrona); Tamil (kavani,konnai,tiru kontai,sarak-konne); Thai (chaiyaphruek,khuun); Trade name (Indian laburnum,rajbrikh); Vietnamese (bò-cap nuóc)

BOTANIC DESCRIPTION
Cassia fistula is a medium sized deciduous tree, 10 m tall with a straight trunk to 5 m, 1 m diameter and spreading branches. Stem bark pale grey, smooth and slender when young and dark brown and rough when old.

Leaves alternate, pinnate, 30-40 cm long, with 4-8 pairs of ovate leaflets, 7.5-15 cm long, 2-5 cm broad, entire, the petiolules 2-6 mm long.

Flowers bright yellow in terminal, drooping racemes, 30-60 cm long; calyx oblong, obtuse, pubescent; corolla with five subequal, obovate, shortly clawed petals, to 3.5 cm across; stamens 10, upper three with erect filaments to 0.7 cm long and with basifixed anthers; lower three curved and filaments with dorsifixed anthers and the median four stamens with erect filaments, to 1 cm long and with versatile, curved anthers; pistil sessile or stalked, ovary pubescent, style to 0.5 cm long and with terminal stigma.

Fruit an indehiscent pod, 40-60 cm long by 1-2 cm diameter, cylindrical, pendulous and terete, containing 25-100 seeds. The pod develops numerous transverse septa between the seeds. When fresh the pods contain a black pulp which on drying adheres to the septa.

Seeds lenticular, light brown and lustrous.

The generic name is from the Greek name 'kassia'.

BIOLOGY
The new leaves normally appear during March-July in India. The flowers appear mainly from April to July, although some trees flower as late as October, especially during dry years. The long cylindrical pods develop rapidly and reach their full length by October and they ripen during December-March. The ripe pods start falling during May.

Flowers (Trade winds fruit)

Seeds in pods at Kahului
Maui, Hawaii (Forest & Kim Starr)

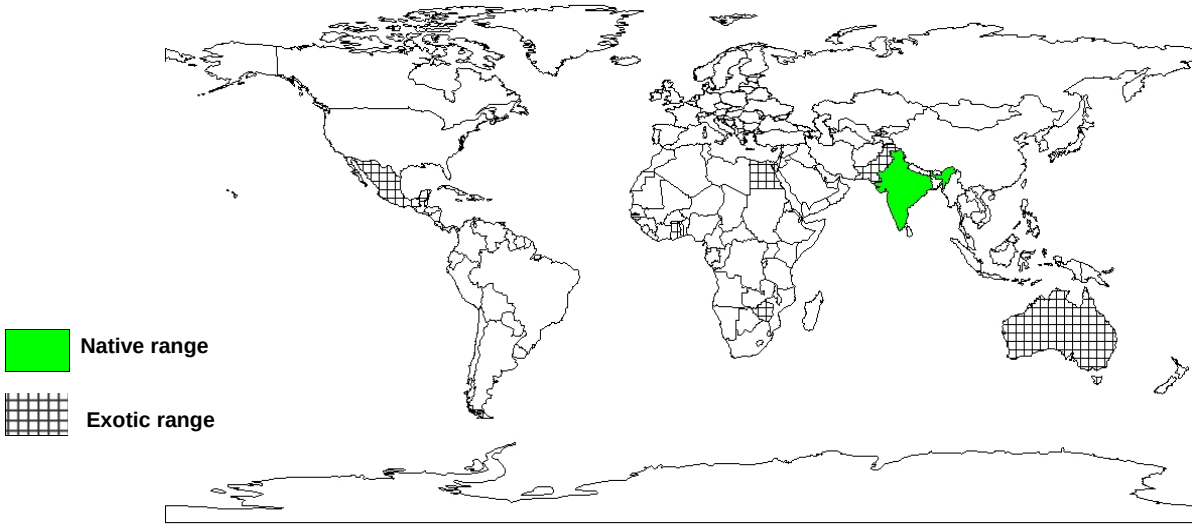
Seed pods at Kahului
Maui, Hawaii (Forest & Kim Starr)

ECOLOGY
This is a tree of deciduous forests ranging from tropical thorn to moist through subtropical thorn to moist forest zones. Indian laburnum is reported to tolerate precipitation of 480-2 720 mm, annual temperature of 18-28.5 deg C, and pH of 5.5-8.7. The tree can withstand moderate amount of shade, is drought resistant, but not frost hardy.

BIOPHYSICAL LIMITS
Altitude:
Mean annual temperature: 18-29 deg C
Mean annual rainfall: 480-2 720 mm
Soil type: The tree prefers soils of pH 5.5-8.7

DOCUMENTED SPECIES DISTRIBUTION

Native: India
Exotic: Australia, Egypt, Ghana, Mexico, Pakistan, Zimbabwe



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: Flowers are consumed by Santal people of India.

Apiculture: Produces yellow flowers in drooping racemes. It yields pollen at this time and bees collect nectar from the extra-floral nectaries located at the base of the leaf-stalk.

Fuel: The plant has been considered as a fuelwood in Mexico.

Timber: The reddish wood, hard and heavy, weighing around 800 kg/cu. m is strong and durable, it is suited for cabinetwork, farm implements, inlay work, posts, wheels and mortars.

Tannin or dyestuff: The bark has been employed in tanning.

Medicine: The drug "C. fistula", a mild laxative, is obtained from the sweetish pulp around the seed. Reported to be aperient, astringent, laxative, purgative, and vermifuge, Indian laburnum is a folk remedy for burns, cancer, constipation, convulsions, delirium, diarrhoea, dysuria, epilepsy, gravel, hematuria, pimples, and glandular tumors. Ayurvedic medicine recognizes the seed as antibilious, aperitif, carminative, and laxative, the root is used for adenopathy, burning sensations, leprosy, skin diseases, syphilis, and tubercular glands, the leaves for erysipelas, malaria, rheumatism, and ulcers, the buds for biliousness, constipation, fever, leprosy, and skin disease, the fruit for abdominal pain, constipation, fever, heart disease, and leprosy. Yunani use the leaves for inflammation, the flowers for a purgative, the fruit as anti-inflammatory, antipyretic, abortifacient, demulcent, purgative, refrigerant, good for chest complaints, eye ailments, flu, heart and liver ailments, and rheumatism, though suspected of inducing asthma. Seeds are considered emetic. Konkanese use the juice to alleviate ringworm and blisters caused by the marking nut, a relative of poison ivy. Leaf poultices are applied to the chilblains so common in the upper Sind; also used in facial massage for brain afflictions, and applied externally for paralysis and rheumatism, also for gout. Zimbabweans use the pulp for anthrax, blood poisoning, blackwater fever, dysentery, and malaria. Ghana natives use the pulp from around the seed as a safe and useful purgative. Throughout the Far East, the uncooked pulp of the pods is a popular remedy for constipation. A decoction of the root bark is recommended for cleaning wounds. In the West Indies, the pulp and/or leaves are poulticed onto inflamed viscera, e.g. the liver. The bark and leaves are used for skin diseases, flowers used for fever, root as a diuretic, febrifuge, for gout and rheumatism.

Other products: Seeds contain 24% crude protein, 4% crude fat, 7% crude fiber, and 50% carbohydrates with a 81% in vitro digestibility. The foliage contains 16% crude protein, 40% carbohydrates with a 88% in vitro digestibility. FAO (Gohl, 1981) reports the leaves to contain, on a zero moisture basis, 17.6 g protein, 66.8 g total carbohydrate, 30.2 g fiber, 7.8 g ash, 3 270 mg Ca, and 330 mg P per 100 g. Flowers contain ceryl alcohol, kaempferol, rhein, and a bianthroquinone glycoside, which on hydrolysis, yields fistulin and rhamnose. Leaves contain rhein, rheinglucoside, and sennosides A and B. The rootbark contains tannin, phlobaphenes, and oxyanthraquinone substances, which probably consist of emodin and chrysophanic acid; also contains (bark and heartwood) fistuacacidin, barbaloin, and rhein. Stembark contains lupeol, beta-sitosterol, and hexacosanol.

SERVICES
Ornamental: Produces yellow flowers in drooping racemes, making it an extremely showy tree in bloom (being at this time all flowers and no leaves). It is hence widely planted as an ornamental tree.

TREE MANAGEMENT
The tree coppices vigorously and produces root suckers freely.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox. Seeds survive for at least 13 years in open storage at room temperature. Viability maintained for more than 3 years in hermitic storage at room temperature with 13±2 % moisture content. C. fistula germplasm is under long term storage at IITA Genebank.

PESTS AND DISEASES
Very susceptible to attack by scale insects and the numerous fungi.

FURTHER READNG

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SUGGESTED CITATION

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