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Schmidt, Lars; Kundu, Maitreyee

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Cordia dichotoma G. Forst.

Species name: *Cordia dichotoma* G. Forst.
Family name: Boraginaceae
Synonyms: *Cordia brownii* A. DC.; *Cordia griffithii* C. B. Clarke; *Cordia indica* Lam.; *Cordia latifolia* Roxb.; *Cordia loureiroi* Roem. & Schult.; *Cordia lowriana Brandis; Cordia obliqua* Willd.; *Cordia premnifolia* Ridl.; *Cordia suaveolens* Blume; *Cordia tremula* Griseb.; *Cordia wallichii* G. Don.
Vernacular (common name): Glue berry, pink pearl, bird lime tree, Indian cherry, lasoda,

Distribution and habitat

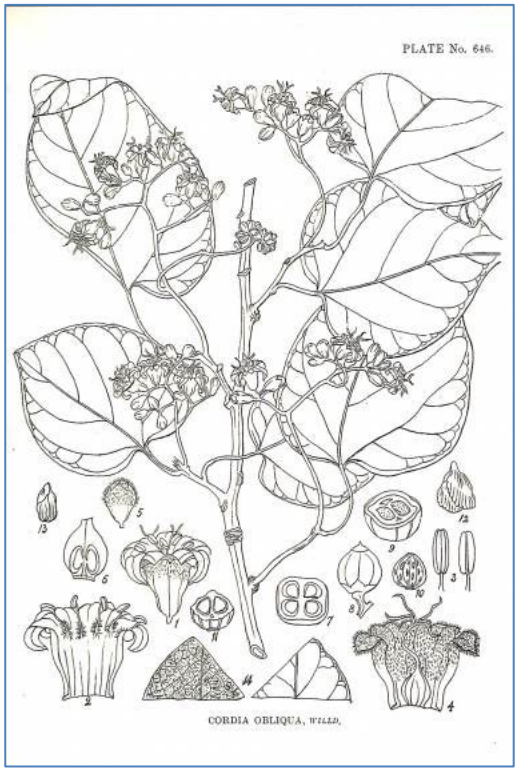
C. dichotoma is a tree of tropical and subtropical regions. It occurs in Pakistan, India to South China, and Japan, through Southeast Asia to Australia, New Caledonia, and the Pacific Islands. It is found in a variety of forests such as dry deciduous forests, moist deciduous forests, moist monsoon forests, coastal hills, inland fringes of mangroves, also in open forests, thickets, and savanna, from sea-level up to 500 m altitude. It is planted up to 1500 m altitude, sometimes as a roadside tree. The maximum shade temperature of its natural habitat varies from 35^0-49^0C and the minimum down to -1^0. It tolerates a range of soils but thrives on deep, moist, sandy loams, and does not grow well on dry, shallow, or gravelly soils. It occurs in areas where the annual rainfall ranges from approximately 250-3000 mm, but in areas with less than 500 mm of rainfall, it grows in depressions and alongside streams. *C. dichotoma* is moderately tolerant to shade. Young seedlings are frost-tender and also suffer from exposure to the hot sun. They are susceptible to browsing and fire but recover appreciably from these injuries. It coppices and pollards well.

Use

The timber of *C. dichotoma* is tough, fairly strong, seasons well, and finishes to a good surface, but is susceptible to insect attack. The wood is used for temporary and light construction, small boats, agricultural implements, tool handles, decorative veneers, and packing cases; sometimes also used for fuel. The fibers of the bark are used to make ropes. All the parts of the plant are edible. In India, the sweet, translucent fruit pulp is used in pickles. An extract of the leaves is used in cosmetic products. Mucilaginous fruit can produce glue. The fruit extract has been shown to suppress larval hatching of root-knot nematodes. *C. dichotoma* also provides high-quality fodder which is available throughout most of the year. Almost all plant parts are used for medicinal purposes. A decoction of the stem bark is taken for dyspepsia, diarrhea, dysentery, fever, headache, stomachache, and as a tonic. Externally, the moistened bark is used in boils, swellings, and tumors. It is applied to ulcers in the mouth in the form of a gargle or as a powder. The juice of the leaves is also considered cooling and is applied as a poultice to treat migraine, inflammation, and swellings. The powdered seeds or fresh fruits are applied to skin eruptions and gonorrhea. The fruit is very mucilaginous and highly esteemed for coughs and diseases of the chest, the uterus, and the urethra. In India, the fruit is considered demulcent and the bark mildly astringent and tonic. The seeds are considered a good remedy for ringworm.

Botanical description

Cordia dichotoma is a small to moderate-sized deciduous tree, 12-15m tall, and girth up to 0.6-1.8m, crown conical, cylindrical, later rounded, the branches drooping at the ends The stem bark is greyish brown, rough with shallow longitudinal cracks or fissures in old stems. Leaves alternate, variable, ovate to oblong-ovate, base acute, rounded or cordate, margin usually sub undulate to undulate dentate, rarely entire, apex



obtuse to mucronate / membranaceous to coriaceous, glabrous to sparsely hairy; petiole 1.5-4.5 cm long; stipules absent. The leaf blades of saplings are strongly toothed along the margins. Inflorescences are

corymbose cymes, 4–11 cm long, develop from lateral branches, repeatedly dividing into two branches, with many flowers found at the branch tips. Flowers sessile; calyx cup-shaped, opening irregularly at the apex, hairy, 5-lobed, corolla cylindrical-campanulate, 6-8(-10) mm long, white, yellowish-white or green, lobes 4-6, oblong, margin somewhat undulate; stamens as many as corolla lobes, inserted at corolla, filaments hairy at base, rudimentary pistil globose; ovary superior, 4-locular, 1 ovule per locule, style twice forked; stigma spatulate.

Fruit and seed description

Fruits are ovoid drupes, shining yellowish-white, orange or pinkish when ripe, supported by enlarged saucer-shaped calyx, 1-4 seeded, outer mesocarp pulpy and sticky, mucilaginous containing one hard stone. Seed is ovoid, flattened, up to 6 mm long, endosperm absent. Seedling with epigeal germination; hypocotyl elongated; cotyledons leafy; first leaves alternate.

Flowering and fruiting habit

Flowering takes place in February-May depending on the region and fruits ripen on May-August. Flowers are males or bisexual, the two types on different trees. Insects are the main pollinators. Seed dispersal is aided by birds, squirrels, and monkeys.

Seed collection

Collection of fruits from the forest floor should be avoided since fallen seeds are often damaged by insects or rodents. The best period for collection is when the color of the fruits turns reddish cream, and the pulp turns juicy. The moisture content of the seed at this stage is about 35-45%. The easiest way of the collection is to spread a tarpaulin under the tree and collect the fruits by lopping the branches or plucking the fruits.

Processing and handling

After the collection of fruits, the pericarp is removed manually and then rubbed with wood ash to remove the mucilaginous mesocarp. The healthy stones are dried in the shade.

Dormancy and pretreatment

Freshly collected seeds are dormant and need pretreatment for improvement in germination. For optimum germination, the seeds are clipped at the opposite end of the radicle and then soaked in GA_3 solution of concentration 500 ppm overnight. Dry storage for 6 months at any temperature with 4-10% seed moisture content can also remove dormancy. The germination capacity of fresh seeds is 80-90%.

Storage and viability

Seeds are desiccation-tolerant to 4-5% moisture content (orthodox) and can also tolerate freezing temperature. At ambient conditions (15-40°C) seeds can maintain their viability for about one and a half years even with moisture content up to 10%. Seed viability can be increased for at least two years by storing seeds at low temperatures (0°C to -20°C).

Sowing and germination

C. dichotoma is propagated by seed, cuttings, or by stump plants. Branches root easily and are often used as garden stakes. The number of seeds per kg ranges from 4,000-7,000. Seeds are sown directly in containers, beds, or trays. Germination starts in about 3 - 4 weeks and is complete in 6 weeks. Germination is epigeous. 1 or 2 seedlings may appear from 1 stone.

Pest and Diseases

Several fungi attack *C. dichotoma*, including *Phellinus noxius* which causes brown root rot and black bud rot, and *Phyllactinia thirumalachari* which causes powdery mildew on leaves. *Polyporus secernibilis* are known to cause white spongy rot. Insect pests include the Mango mealy bug, the whitefly *Aleuroclava afriae*, and the thrips *Austrothrips cochinchinensis*. A large number of larvae of the insect families are defoliators and larvae of Gracilariidae and Lyonetiidae feed on the leaves. Larvae of some insects belonging to families Eucosmidae, Curculionidae, and Pyralidae bore into the fruits and shoots.

Selected readings

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Author:
Maitreyee Kundu, E-mail: spalliwest@yahoo.co.in
Ed: Lars Schmidt, IGN, Copenhagen University

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