Morus alba

L.

Moraceae

white mulberry, tut, mulberry

LOCAL NAMES
Amharic (yeferenji injori); Arabic (tuth); Bengali (tut); Burmese (posa); English (white mulberry,mulberry,Indian mulberry,Russian mulberry); Filipino (amoras,amingit); French (mûrier blanc); German (Weiße Maulbeere); Gujarati (shetun); Hindi (hipnerle,reshms chattu,shahtut,chinni,tut,tutri,siah tut); Indonesian (bebesaran lampung,bebesaran,murbei); Italian (morera blanco,moral blanco,gelso bianco); Javanese (bebesaran lampung); Luganda (nkenene); Nepali (kimbu); Sanskrit (tula); Spanish (morera); Swahili (mfurusadi,mforsadi); Tamil (kambli chedi,musukette,mussuketi); Thai (mon,posa); Trade name (mulberry,tut,white mulberry); Vietnamese (dâu-tàm,d[awf]m tang,d[aa]u,t[awf]m tang)

BOTANIC DESCRIPTION
Morus alba is a fast-growing shrub or moderate-sized tree with a fairly cylindrical, straight bole, up to 35 m high and 1.8 m in girth, without buttresses; bark dark greyish-brown, rough with vertical fissures; exuding white or yellowish-white latex.

Leaves very variable, ovate or broadly ovate, distichous, simple to 3-lobed, dentate, palmately 3-veined at base; stipules lateral, caducous, coriaceous.

Inflorescence axillary, pendulous. Flowers greenish, inconspicuous, with 4 free imbricate petals. Male flowers in a catkinlike raceme, with lax flowers; stamens 4, pistillode top-shaped. Female flowers in a long or short spike; ovary enclosed, 1-(2-) locular with a single ovule, style bipartite.

Fruit a syncarp, consisting of many drupes enclosed in a fleshy perianth up to 5 cm long; white, pinkish-white, purple or black.

It has been suggested that the generic name of the mulberry, Morus, was derived from the Latin word ‘mora’ (delay), from the tardy expansion of the buds. An alternative explanation is that it comes from the Celtic word ‘mor’ (black), referring to the colour of the fruit.

BIOLOGY
Flowers are normally bisexual but can be unisexual on different branches of the same plant. Both types appear in stalked, axillary, pendulous catkins in April and May. Fruit ripens and drops off the tree from June to August; water, birds, jackals and human beings often disperse it.

Leaves and fruits. (Arnoldo Mondadori Editore SpA)

Silkworm larvae feeding on mulberry leaves. (Boner A.)

Pakistan Forest Institute mulberry plantation. (Boner A.)

ECOLOGY
M. alba grows in areas with a subtropical or mild temperate climate. The shade-tolerant trees are highly susceptible to drought and inhabit ravines, valleys and coastal areas.

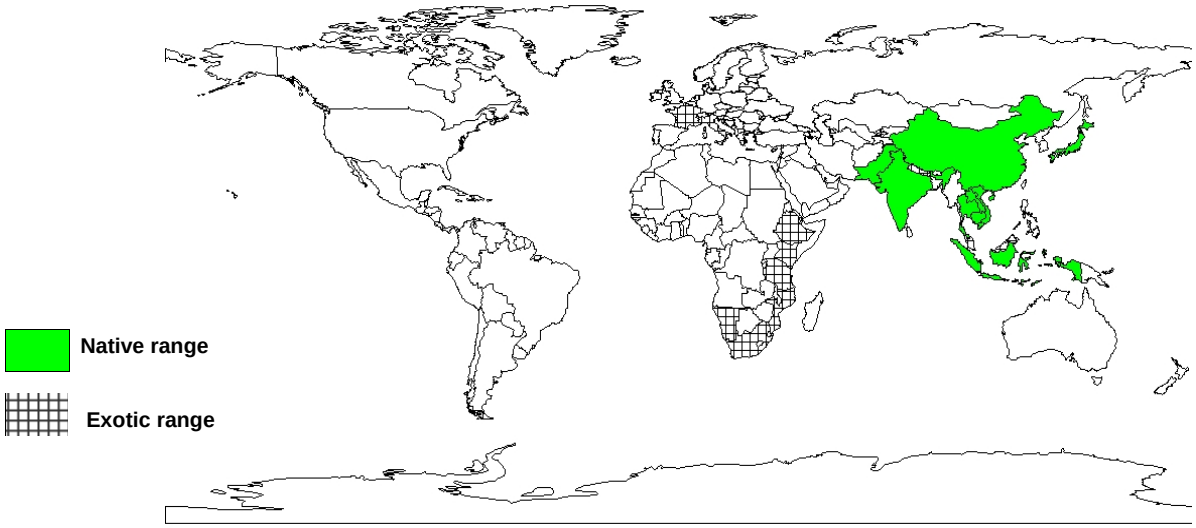
BIOPHYSICAL LIMITS
Altitude: 0-3300 m, Mean annual temperature: 0-43 deg. C, Mean annual rainfall: 1500-2500 mm

Soil type: The plant grows on a variety of soils ranging from sandy loam to clayey loam, but prefers deep, alluvial, loamy soil with sufficient moisture and pH 6.0-7.5.

DOCUMENTED SPECIES DISTRIBUTION

Native: Cambodia, China, India, Indonesia, Japan, Laos, Myanmar, Pakistan, Thailand, Vietnam, Zanzibar

Exotic: Ethiopia, France, Italy, Kenya, Korea, Republic of, Malaysia, Mozambique, Namibia, Nepal, South Africa, Tanzania, Uganda, United Kingdom



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: Leaves are highly nutritious and contain vitamins B complex (except B12), C (200-300 mg/100 g), D and flavonols. They are sometimes eaten as a vegetable; fruit is eaten fresh or made into juice and stews.

Fodder: Leaves are used as fodder for livestock; up to 6 kg of leaves a day can be fed to dairy cows to improve milk yield. Shade-dried leaves incorporated into feed enhance health and egg production in poultry.

Fuel: Makes medium-quality fuelwood with a calorific value of 4370-4770 kcal/kg.

Fibre: Wood yields sulphate pulp with satisfactory strength for white writing and printing paper; bark is worked in to paper pulp and fibre is suitable for the textile industry.

Timber: M. alba yields a medium-weight hardwood with a density of 670-850 kg/cubic m. Heartwood yellow or yellowish-brown, darkening to golden or red-brown upon exposure, sharply demarcated from up to 4 cm wide; white or pale yellow sapwood; grain straight, texture moderately coarse and even in the semi-ring porous material, uneven in ring porous material; wood lustrous at first, becoming dull with age, with attractive silver grain. In seasoning, the wood has a tendency to warp. It is easy to saw, work, turn, bend and finish, and it seasons well. It is suitable for house building, boats, beams, posts, flooring, bridge building, agricultural implements, cabinet work, furniture and turnery, especially picker arms, bobbins and tool handles; useful for spokes, poles, shafts and bent parts of carriages and carts; also much valued for sports equipment such as hockey sticks, tennis and badminton rackets, and cricket bats.

Alcohol: Fruit juice may be fermented and used to make liquor.

Tannin or dyestuff: Contains about 32% tannin, suitable for tanning and colouring purposes.

Essential oil: Fruit contains cineole, geraniol, linalyl acetate, alpha-pinene and limone as major components of the essential oils.

Medicine: Bark is said to be good in the treatment of stomach-ache, neuralgic pains and dropsy; leaves and young branchlets used for treating heavy colds, cough, red eye, insect bites and wounds; fruit used in the treatment of sore throat, dyspepsia and melancholia.

Other products: Grown extensively for its leaves, used in rearing silkworms; its cultivation is integral to the sericulture industry.

SERVICES
Erosion control: A useful species for stabilizing physical soil-conservation structures.

Shade or shelter: Recommended for shelter planting such as protecting orchards from wind.

Reclamation: Grown on wastelands.

Soil improver: The species helps in maintaining soil fertility through litter fall; lowers soil surface temperature.

Ornamental: Grown on roadsides and avenues as an ornamental tree.

TREE MANAGEMENT
To minimize competition, the plants must occasionally be weeded. Once in several years, the plant should be pruned down to regularize its shape and allow the growth of new shoots. The form depends on the height of the plant and the height at which the old branches are cut. M. alba requires protection against fire and browsing, to which it is susceptible. Plantations are managed by coppicing; in India, 20-year-old coppice shoots of M. alba showed a mean annual diameter increment of 1.5 cm and a mean annual height increment of 1 m. Early growth was very fast: 4.5 m in the 1st 2 years.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox, with viability being maintained for several years in hermetic storage at room temperature; more than 3 years of hermetic storage at room temperature with 13-2% mc. There are about 1.1 million seeds/kg.

PESTS AND DISEASES
Larvae of Ascotis selenaria, Cacoecia micaceana, Diacrisia indica, D. obliqua, Metanstria hyrtaca defoliate the tree; larvae of Dichocrosis punctiferalis damage the fruit; mealybugs breed on the plant. Porcupines also damage young plants.

Several fungal diseases attack the plant: heart rot, spongy rot, leaf spot, stem rot, powdery mildew, rust and stem canker.

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SUGGESTED CITATION

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