Tamarindus indica L.

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FABACEAE (BEAN FAMILY)

T. occidentalis Gaertn., *T. officinalis* Hook

Indian date, Madeira mahogany, tamarin, tamarind, tamarindier, tamarindo, tamarinier

The only species in the genus (Léonard 1957), *Tamarindus indica* originated in the Old World Tropics but now grows pantropically (Parrotta 1990). It is frequently associated with baobab (von Maydell 1986, Morton 1987).

Tamarindus indica is a slow-growing, occasionally deciduous to mostly evergreen, short-trunked tree with a dome-shaped crown up to 9 m wide. It attains 30 m in height and up to 1.5 m d.b.h. (Anonymous 1982a, 1982b; von Maydell 1986; Morton 1987). This wind-resistant and long-lived tree thrives in semiarid—including alkaline, slightly saline, and poor—soils. It grows from sea level to about 1,500 m, with a preference for riparian, well-drained sites in woodlands, alluvial flats, scarp slopes, and deciduous thickets and around termite mounds.

Tamarindus indica is genetically broad, as reflected primarily in the variability of its fruits; these range from small to large and sweet to acidic. Interesting genetic types are reported in Southeast Asia and a red-fruited variety, known as *T. indica rhodocarpa*, grows in India (Anonymous 1979, Morton 1987, Parrotta 1990).

Tamarindus indica is a multipurpose tree (Anonymous 1979, von Maydell 1986, Parrotta 1990). Because it has a wide, dense crown and attractive shape, tamarind is an excellent shade and ornamental tree (Schubert 1979), even as a potted indoor plant. Due to heavy shading and supposedly allelopathic properties, *T. indica* suppresses understory vegetation and is used as a firebreak species in Indian forest plantations (Troup 1921). The sapwood is bright yellow and the dark brown to purple, heavy heartwood (specific gravity of 0.8 to 1.22 g/cm^3) is hard to work but easy to polish and bend. It is generally borer and termite-proof and suitable for furniture, pestles, mortars, carts, boats, wheels, hubs, utensils, turnery, tools, toys, and panels (Troup 1921). It also makes excellent fuelwood and charcoal for both fuel and gunpowder. The ashes and bark are used for tanning; the bark also provides extractives for making ink or fixing dyes. The flowers yield good honey and a yellow dye, while leaves make a red dye. Flowers, foliage, and immature pods can be added to soups, curries, stews, and salads and are browsed by livestock (Anonymous 1982a, 1982b). Seeds can be peeled, roasted, or boiled but are considered famine food (Storrs 1979). They also contain a pectin used for jelling fruits; stabilizing ice cream, mayonnaise, and cheese; and sizing textiles, paper, and jute products. Seed oil is suitable for food, varnish, and lamp fuel, while the seed husk yields a fish poison. The tree's best known use, however, relates to the pulp of the pod, which is eaten fresh or as an ingredient in fruit drinks, jams, chewing gum, confections, chutney, curries, preserves, ice cream, syrups, and condiments such as barbecue and Worchestershire sauces. The fruit is particularly rich in vitamins B and C and calcium (Lefèvre 1971). Overripe fruit pulp is used to clean silver, copper, and brass. Medicinally, *T. indica* is used as a cure for fevers, intestinal ailments, and biliary disorders (von Maydell 1986, Storrs 1979).

Flowers usually appear with new leaves in spring and summer. In Sri Lanka and India, two flowering periods—one in the spring and the other in the fall—have been reported (Troup 1921). The flowers are carried in small, terminal, glabrous, 5-cm-long racemes. They are pale yellow with pink, red, or brown stripes, 3 to 5 cm long, and about 2.5 cm wide (Noad and Birnie 1994). Fruits ripen about 10 months later in trees as young as 4 years (Lefèvre 1971). Mature seed pods range from 6 to 20 cm long, 1.9 to 2.5 cm wide, and 1 to 3 cm thick, are straight to curved, scaly, gray to rusty brown, and oval in cross section. They are irregularly constricted between the 1 to 10 seeds contained within (von Maydell 1986). Seeds are hard, shiny brown to blackish, with a large patch of a dif-

ferent color shade on each face. They are obovate-orbicular, compressed, about 1.6 cm long, and embedded in a sticky, fibrous, yellow to red-brown pulp.

Fruits are collected only when they are fresh and ripe as indicated by a buff, brittle epicarp (Cowen 1965). Pods are shaken from the tree or if reachable fruit pedicels are clipped (Morton 1987). Average annual fruit yields from an adult tree are 150 to 200 kg (Anonymous 1979). Immediately after fruit harvest, seeds can be separated easily from the shell and fibrous pulp under water. Seeds average 600 to 3,000 per kg (Anonymous 1992, Food and Agriculture Organization 1975, von Maydell 1986, Teel 1984). Seeds store well in dry sand, remaining viable for at least 2 years if kept in closed vessels for protection from insects, including *Calandra (Sitophilus) linearis, Caryedon cerratus, Corcyra cephalonia, Pachymerus (Coryoborus) gonogra, Paralipsa gularis,* and *Rhyzopertha dominica* (Lefèvrre 1971, Morton 1987, Parrotta 1990, Teel 1984).

Seeds often germinate at 90 percent success (Teel 1984). Germination can be accelerated by nicking seed coats, by soaking seeds for 24 hours in water (Food and Agriculture Organization 1975), or by boiling seeds for 7 minutes and cooling them slowly (von Maydell 1986).

Seeds, covered with about 1.5 cm of loose, sandy loam or loam/sand mix, are germinated in porous soil in bags or raised seedbeds, but direct sowing is also acceptable (Szolnoki 1985). Within 5 to 15 days (Marrero 1949, Troup 1921), they germinate epigeously into Sloanea subtype seedlings (Burger 1972, de Vogel 1980). As soon as cotyledons show, seedlings require light shading until they reach about 35 cm. The dirty yellow taproots grow more than 30 cm within 2 months, and seedling growth is often equally rapid for the first 2.5 to 3 m (Szolnoki 1985). As a result, nursery time can be limited to 3 to 6 months (Anonymous 1992, Teel 1984). To allow lifting with a sufficiently large rootball, seedlings should be spaced at a minimum of 30 cm (von Maydell 1986). With the beginning of rains, when seedlings are more than 80 cm in height, they can be transplanted at 10 to 20 m spacings (Morton 1987).

Tamarindus indica can also be successfully reproduced by rootsuckers, air- and stem-layering, grafting, and cuttings (Anonymous 1979, von Maydell 1986, Morton 1987, Troup 1921). Trees with exceptionally good fruit should be propagated vegetatively (von Maydell 1986).


1cm
1cm
1cm