Prosopis juliflora (Sw.) DC.

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FABACEAE (BEAN FAMILY)

P. chilensis (Mol.) Stuntz; *Ceratonia chilensis* Mol.; *Mimosa juliflora* Swartz

Acacia de catarina, algarroba, amansa caballo, cambrón, carbón, catzimec, chachaca, guatapana, manca-caballo, mesquite, nacascol, plumo de oro, trupillo, yaque (Centro Agronómico Tropical de Investigación Enseñza 1984a, 1984b; Geilfus 1994; Holdridge 1970; Woodson and Schery 1950b)

Prosopis juliflora is native to the West Indies, Central America, and northern South America (Venezuela and Colombia), but it has been planted in arid zones in many parts of the World. It is the only species of the genus in Central America, where it is confined to the dryer regions of the Pacific slope (Woodson and Schery 1950). In Panama, the species grows in the remnants of forests on the Pacific slope corresponding to the life zones of the tropical dry forest and dry premontane forest. In India, it is an invader species that competes with native species (Sharma and Dakshini 1996).

Prosopis juliflora is a fast-growing, deciduous tree or shrub that is thorny and has a wide crown and deep roots. Zigzag branching, stretched out over the crown, is characteristic of the species (Drake 1993a). The tree can reach between 3 and 12 m in height and up to 45 d.b.h., depending on where it grows. It frequently grows as a shrub, with the trunk twisted and the crown broadened in the shape of a parasol. Its leaves are pinnately compound and very dark green. Characteristic thorns, produced by modified stipules, occur only in pairs in the foliar nodes. The species grows in very hot, dry climates, with temperatures up to 48 °C and annual precipitation from 150 to 750 mm. It is found from sea level to 1500 m. The roots penetrate to great depths in the soil searching for the required water. If root growth is not obstructed, the tree can grow in a variety of soils, including saline and alkaline areas and in sandy and rocky soils (Drake 1993a, Geilfus 1994). The tissue of *P. juliflora* is photosynthetically active throughout the year, presenting a superficial and widespread radicle system through which the tree fully exploits the available hydric resource. The species shows water potentials more negative than *P. tamarugo* Phil., a species native to the Atacama desert. Its low nutritional requirements and its resistance to hydric deficit give *P. juliflora* a great plasticity of response, which allows its wide distribution in arid and semiarid zones of tropical America (Alarcón and Díaz 1993).

Prosopis is considered a rather old genus, with divergence into several lineages. When these lineages were isolated, partial speciation occurred. There exists a good number of intermediate forms and hybridization with related species, which makes distinction among species in the field more difficult (Burkart and Simpson 1977, Drake 1993a).

The wood is hard, heavy (specific gravity is 0.70 or more), durable, and resistant to rotting. It finishes well and has been widely used for door and window frames and other woodwork and carpentry articles (Centro Agronómico Tropical de Investigación Enseñza 1984, 1984b). The wood is also used in rural construction and for posts and tool handles. The species has great value in agroecosystems in very dry locations where it is used for firewood and charcoal. The high caloric capacity of the alburnum produces a high quality charcoal and small-dimension wood yields between 5 and 15 tons per ha per year (Drake 1993a). The flowers are an important source of nectar for the production of high quality honey. The bark is a good source of tannin, and rubber can be obtained from the trunk (Woodson and Schery 1950). The legumes and the seeds are used as cattle feed, and the species produces 20 to 40 tons per ha per year, beginning at 2 to 3 years of age. The pods have also been ground and used as flour. Because *P. juliflora* resists drought and fixes nitrogen, it is valuable in agrosilvopastoril, mining projects, dune stabilization, and the recovery of degraded soils.

The flowers are grouped in sprigs; they are regular and the corolla is pentamerous. The pods are long, pulpy, and yellowish when ripe (Burkart and Simpson 1977).

The seeds are extracted from ripening pods that have been collected from the trees and allowed to dry. It is not nec-

essary to separate the seeds from the mesocarp. The pods are broken up into pieces by beating with a stick or trampling by cattle, and the pod pieces are sown in place of seed. Adequately stored seeds can survive for 20 to 30 years without losing viability. Seeds should be scarified with a solution of sulfuric acid at 20 percent for 1 hour. Seeds can also be soaked in concentrated sulfuric acid for 20 minutes or covered with boiling water and soaked for 24 hours. *Prosopis juliflora* reproduces well through direct sowing of the pretreated seeds or through root shoots. Germination after pretreatment is usually 75 to 95 percent. Seeds are planted by direct sowing whenever sufficient rainfall is available. Rooted cuttings in polybags also do well. For hedges, seeds are sown about 10 cm apart in two lines about 50 cm part; or polybag plants are planted 30 cm apart in two rows 50 cm apart (Drake 1993a).

In forest plantations developed to produce firewood or to control erosion, plantules should be spaced at 3 by 3 m; good yields have also been obtained with a spacing of 1 by 1 m. The trees should be protected from fire until a thick bark has formed, which occurs in the third year (Centro Agronómico Tropical de Investigación Enseñza 1984a, 1984b; Drake 1993a).

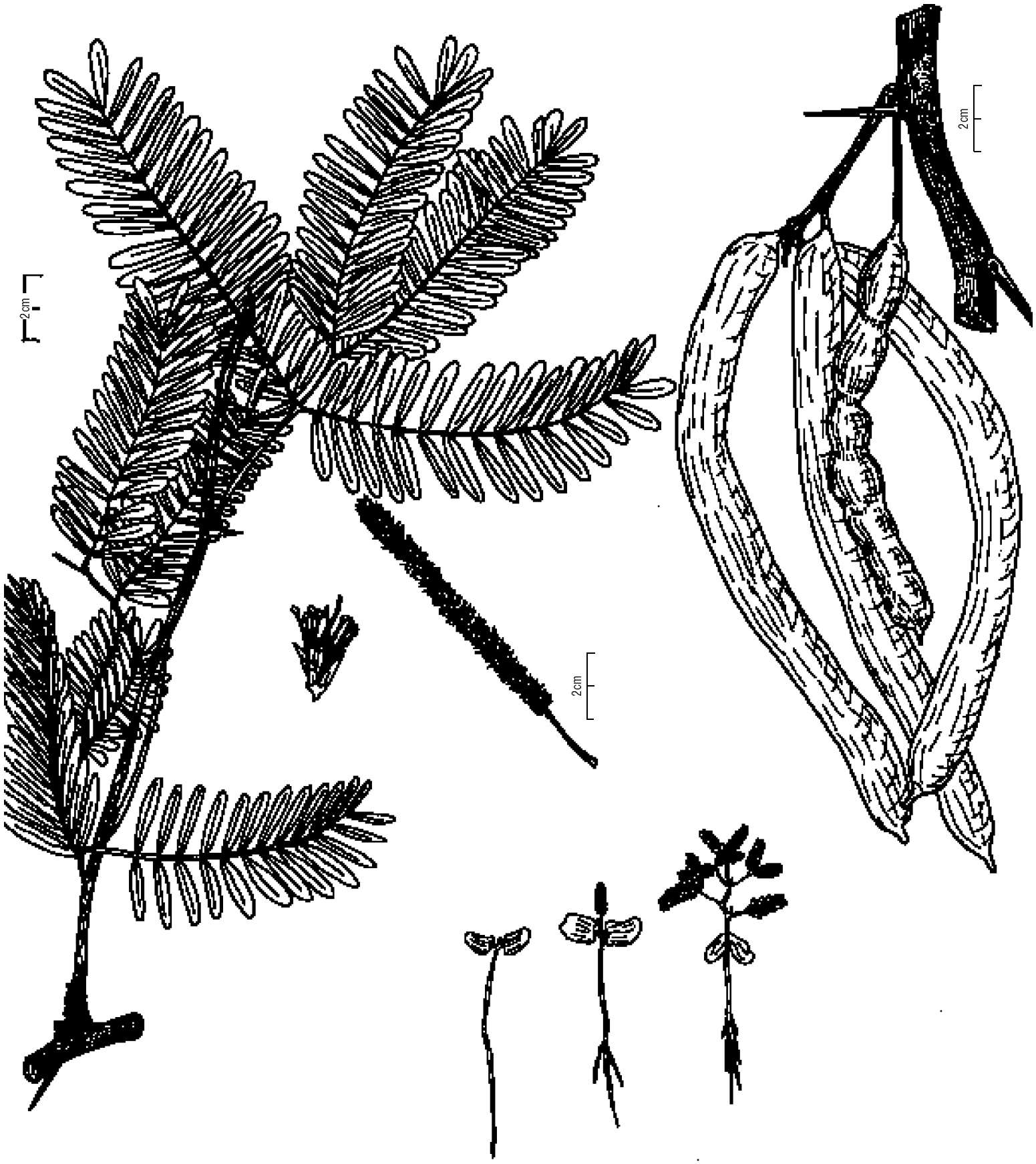
The plantules have a good capability to compete with the underbrush, but *Coleoptera* harm part of the seed crops. Generally, the species is considered a very aggressive invader that competes for the soil humidity. Because *P. juliflora* is difficult to eradicate and because it may eliminate native species, it should be sown only in arid problematic areas, where soils must be recovered or protected from erosion (Centro Agronómico Tropical de Investigación Enseñza 1984a, 1984b; Drake 1993a).

ADDITIONAL INFORMATION

The taxonomy of this genus is obscure; some species native to North America, initially classified with this name, are currently known as *P. velutina* Wooton and *P. glandulosa* (Centro Agronómico Tropical de Investigación Enseñza 1984a, 1984b). Because the diverse species of the genus in South America exhibit all the traits found in North America and in the Old World and because of the chemical composition of the species, some suggest the genus originated in South America (Burkart and Simpson 1977). In the dry areas of Central America, two varieties of the species have been reported (Burkart and Simpson, 1977). *Prosopis juliflora* (Sw.) DC. has two pairs of axial thorns on the folious nodes. The variety *inermis* (H.B.K.) Burkart has no thorns or small thorns distributed along the branches, with pubescent folioles; it apparently belongs to varieties derived from forms with thorns.

The species grows rapidly; yields of 75 to 100 tons per ha in 15-year rotations have been obtained; in 10 years, yields of between 50 and 60 tons per ha are expected. The trees sprout easily (Geilfus 1994).

In natural regeneration of *P. juliflora* the seeds are dispersed by cattle or by wild animals that eat the pods. Germination is stimulated as the seeds pass through the digestive tracts of these animals. Substances within these digestive tracts apparently stimulate dormancy, promoting germination.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