Albizia niopoides (Spruce ex Benth.) Burkart

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FABACEAE (BEAN FAMILY)

Feuilleea niopoides (Spruce ex Benth.) Kuntze (Revisio Generum Plantarum 1: 188; 1891); *Pithecellobium caribaeum* Urb. (Symbolae Antillanum 2[2]: 260; 1900); *Pithecolobium hassleri* Chodat (Bulletin de l'Herbier Boissier, sér. 2, 4: 483; 1904); *Albizzia caribaea* (Urb.) Britton & Rose (North American Flora 23[1]: 44; 1928); *Acacia guacamayo* (Britton & Killip) Standl. (Tropical Woods 52: 26; 1937); *Albizia hassleri* (Chodat) Burkart (Darwiniana 7: 517; 1947); *Albizia richardiana* King & Prain (Annals of the Royal Botanic Garden, Calcutta 9: 32; 1940); *Pithecellobium niopoides* Spruce ex Benth. (Transactions of the Linnean Society of London 30[3]: 591; 1875); *Senegalia guacamayo* Britton & Killip (Annals of the New York Academy of Sciences 35[3]: 142; 1936); *Senegalia liebrmannii* Britton & Rose (North American Flora 23[2]: 116; 1928)

Gallinazo, gavilana, guanacaste blanco, silk tree (Barneby and Grimes 1996, Brako and Zarucchi 1993 Burkart 1979)

The genus *Albizia* has about 150 species of unarmed, small to large trees widely spread in the tropical and subtropical zones of Asia, Africa, Australia, Mascarene islands, and America (Nilsen 1981, Zamora 1991). It reaches the greatest diversity in Africa, Madagascar, and Central and South America (Nilsen 1981). The species extends from southern Mexico throughout Central America to eastern Peru and the Amazon region to the Brazilian coast. It is also found in the Antilles (Barneby and Grimes 1996, Brako and Zarucchi 1993, Burkart 1979).

Albizia niopoides is a medium-to-tall tree, 10 to 30 m in height and 35 to 100 cm d.b.h.(Laboratorio de Productos Forestales 1981). The tree has a straight bole and glabrous young twigs which are greenish or yellowish with scarce lenticels (Zamora 1991). The crown is wide, round, extended, resembling that of *Enterolobium cyclocarpum* (Jacq.) Griseb. The bark is light gray or yellowish with exfoliating, thick scales in a concentric pattern; the scales leave crateriform scars which seem excavated with a chisel (Holdridge and Poveda 1975, Salas Estrada 1993, Zamora 1991). Leaves are alternate, bipinnate, paripinnate; with 5 to 10 pairs of opposite pinnae, each with 30 to 55 pairs of pinnules (foliolules). The tree grows well in the dry tropical forests of the lowlands in Central and South America at elevations from 0 to 500 m, temperatures of 24 to 32 °C, and annual rainfall of 1000 to 2500 mm. The soils are alluvial, floodable but with good drainage, on plateaus and flatlands with slopes of 5 percent and moderate drainage (Hartshorn and Poveda 1983). The species can reach higher elevations (up to 1200 m) and can be found in humid forests (Holdridge and Poveda 1975, Salas Estrada 1993). Frequently, the tree is emergent in the canopy of primary dry forests (Hartshorn and Poveda 1983).

The tree's attractive form makes it suitable for shade and as an ornamental. The heartwood is light reddish-brown and the sapwood is yellow; the wood is heavy (green weight = 1000 kg per m^3, with 58 to 60 percent moisture and specific gravity of 0.60 to 0.65), with a medium texture, homogeneous, straight or interlocked grain, and medium luster and has a golden glare in the radial surface. It exudes a light, rancid, vanilla odor, and the taste is not characteristic (Creemers and Lemckert 1981, Herrera and Morales 1993). Volumetric contraction is low (9.8). The mechanical properties are medium (Herrera and Morales 1993). The air-dried wood shows small splits on the sides and ends. It is moderately easy to work and saw and it polishes well. Natural durability is low but the wood can be preserved and impregnates well. It can be used in heavy construction (treated wood), general interior and exterior construction, mine posts, railroad foundations (treated wood), fences (treated wood), sticks, carts, floors, furniture, match boxes, and handles. It is also used as firewood (Herrera and Morales 1993, Salas Estrada 1993) and in papermaking (Runkel Factor = 0.44 to 0.46; Peteri's Coefficient = 78 to 80) (Laboratorio de Productos Forestales 1981). The species has been

used in the native pharmacopoeia. South American natives used the saponin-rich roots to heal contusions and anginas, and the boiled bark is used to heal scorpion bites. The species has been planted primarily in grasslands and areas undergoing early natural regeneration because its nitrogen-fixing capacity improves the soil.

Albizia niopoides flowers in March and April. The fragrant, white flowers are grouped in pedunculate heads and are pentamerous, synsepalous and synpetalous. The calyx is tubular, distally toothed, and 1 mm long. The corolla is funnelform, valvate, and 2 to 3 mm long. The numerous stamens are basally united forming a tube. The anthers are small (Woodson and Schery 1950b). Fruits are found mainly in August and September. The pod is laterally compressed (6 to 14 by 1 to 2.5 cm), straight, glabrous, thin, chartaceous, and longitudinally dehiscent (Zamora 1991). The pericarp is brown or yellowish brown and dull with an inconspicuous mesocarp. The endocarp is dull, whitish, and slightly septate, with many seeds, transverse, not overlapping, in one series (Gunn 1984, Holdrige and Poveda 1975). The seeds are ovate or oblong, laterally compressed, and without aril; the testa is thick, glossy, creamy or light brown, monochrome, hard, and osseous, with pleurogram, linea fissura open at the hilar end, and fracture lines. The funiculus is long, filiform, and whitish or light brown.

Pods must be collected before dehiscence by shaking the tree's branches or by gathering those on the ground. Seeds average about 22,500 per kg. The seeds are hard and have orthodox behavior. They have acceptable germination after storage for 1 to 2 years. Seeds should be soaked in hot water (80 ^{o}C) for 1 minute followed by a bath in lukewarm water (30 to 40 ^{o}C) for 24 hours. This pretreatment contributes to uniform germination, and floating seeds can and must be removed. After imbibition the seeds must be sown in greenhouse beds filled with potting mix or sand at ambient temperature (24 to 32 ^{o}C). The percentage of germination is 85 percent if damaged seeds are discarded.

Germination is epigeal, and the seedling is phanerocotylar. The root protrudes in 2 to 4 days. The taproot may or may not have nitrogen-fixing nodules. The first eophyll is pinnate. The seedling must be transplanted to plastic bags before the first eophyll completes its extension. In some experiments, the seeds have been sown directly in the soil, and outplanted as pseudosticks. If seedlings develop in plastic bags they can be transferred to the field in 4 months. Four-month-old seedlings are 35 to 40 cm tall.

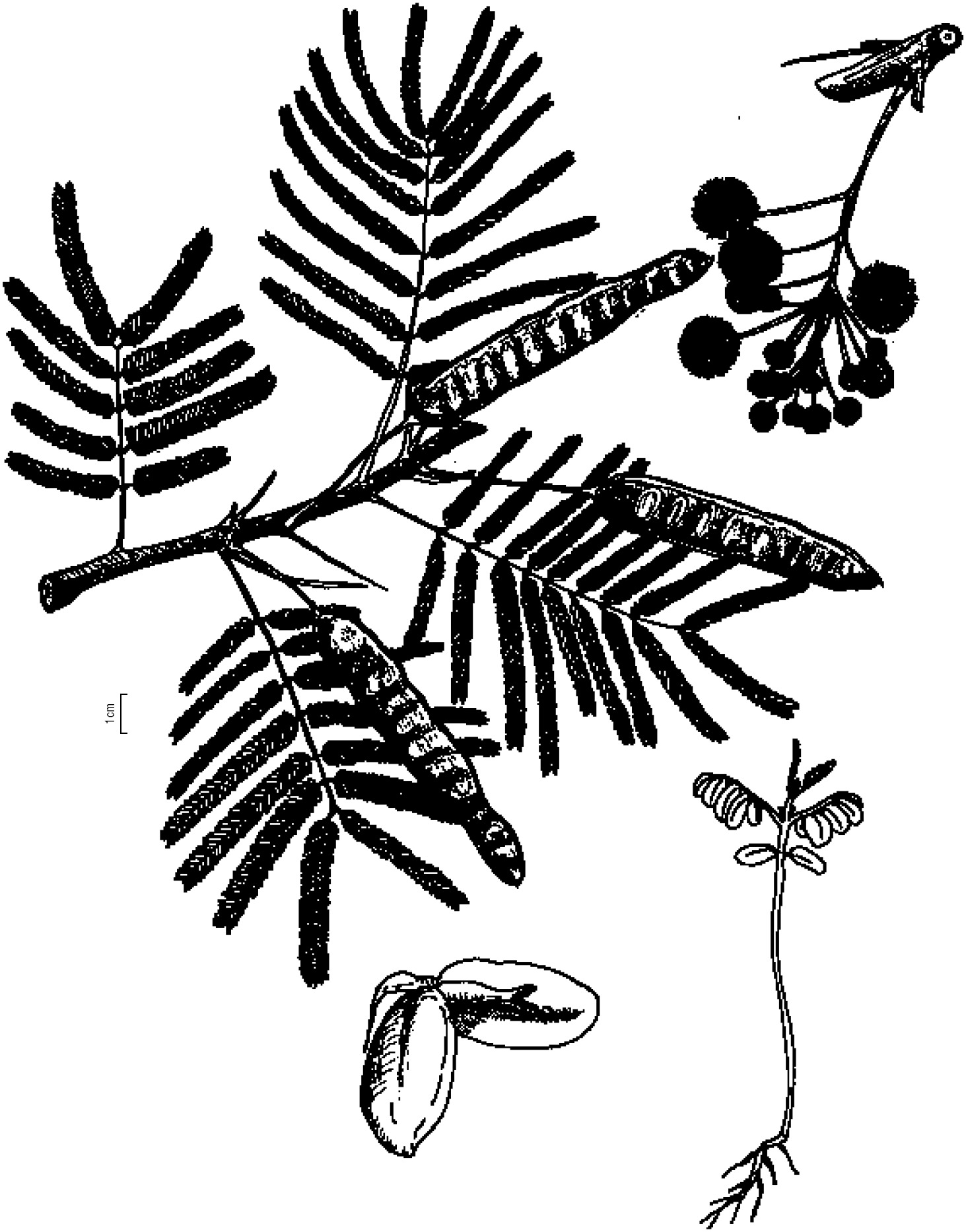
ADDITIONAL INFORMATION

The leaf pinnules are (5-) 7-9 (-11) by 1 (-2) mm, linear, apex obtuse or acute, and glabrous. The petiole has a short pubescence and is pulvinate. The pulvinus is adaxial, basal, concave, and longitudinally oblong. The rachis is adaxially channeled, bearing an extrafloral nectary toward the distal end. The petiolules bear basal and adaxial pulvinuli. Stipules are 6 to 7 mm long, setiform, and deciduous (Zamora 1991). The flowers are sometimes heteromorphic in the same head, and the central flowers have thicker staminal tubes and dimensions different than those in the marginal (Nilsen 1981). The gynoecium is monocarpellar, and placentation is laminar. The numerous ovules are anatropous, bitegmic, and crassinucellate.

Primarily pollinated by moths, the flowers are also visited by other insects, hummingbirds, and passerine birds; whether birds are visitors or pollinators is unknown. Pollen is partially heteromorphic, with internal pores, occurrence of two supplementary sets of pores, nonequatorial apertures of the simple porate type, exine areolate, and tectum sometimes perforate (Guinet 1981).

The hilum of the seed is small, exposed, and sometimes concealed by funicular remnants. The vascular bundle extends around the seed from the hilum to the micropyle in the raphe-antiraphe line. The endosperm and perisperm are absent. The embryo is large and investing; the embryo axis is straight and the radicle is short and thick. The plumule is well developed with several foliar primordia and the cotyledons are large, thick, and ovate, enclosing the embryo axis.

Many seeds are damaged by bruchids and weevils while inside the pod.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