Andira inermis (W.Wright) Kunth ex DC.

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FABACEAE (BEAN FAMILY)

Andira jamaicensis (W. Wright) Urb. (Symbolae Antillarum 4(2): 298; 1905); *Geoffraea inermis* (W. Wright) W. Wright (London Medical Journal 8: 256; 1787); *Geoffroea jamaicensis* W. Wright (Philosophical Transactions of the Royal Society of London 62: 512; 1777); *Geoffroea jamaicensis* var. *inermis* W. Wright (Philosophical Transactions of the Royal Society of London 67: 512; 1778)

Acapúrana, acatrus, akoelie kiererie, akoelie tjerere, almendro de montaña, almendro del río, almendro macho, almendro montés, almendro real, andirá jareua, andirá uchy, angelica, angelim, angelim do igapo, angelim morcegueira, angelim rana, angelin, angelino, aracuhy, arenillo, avineira, barbosquillo, bastard cabbage, bat seed, black blossom berry, bois palmiste, cabbage-bark, carbón, carne asada, chaperno, chigo, chirai, cocú, congo, cornwood, cuartololoti, cuilimbuca, cujía, cumaru-rana, gallina, iximche, jacarandá morcega, kabbes, koeraroe, koeraroe talaboe, koraro, kuraru, lombricero, lombrigueira, maats, macallo, macayo, majagua, moca, moca colorada, morcegueira, pacay, palo de seca, partridge wood, peloto, pheasant wood, pilón, purga, quinillo dorado, quira, red cabbage tree, redietjabesi, rere erepare, rode kabbes, Saint Martin, Saint Martin rouge, Sapupira da varzea, uchy-rana, vreemoesoehoedoe, wild olive, wormwood, yaba, yaba amarilla, yaba colorada, yabo, yava, zwarte kabbes (Record and Hess 1949)

Andira inermis is found in the lowland forests of southern Mexico, Belize, Central America, the West Indies, northern South America, and Brazil. The species was introduced and cultivated in West Africa (Adams 1972, Brako and Zarucchi 1993, Croat 1978, Howard 1988, Whitmore and Hartshorn 1969).

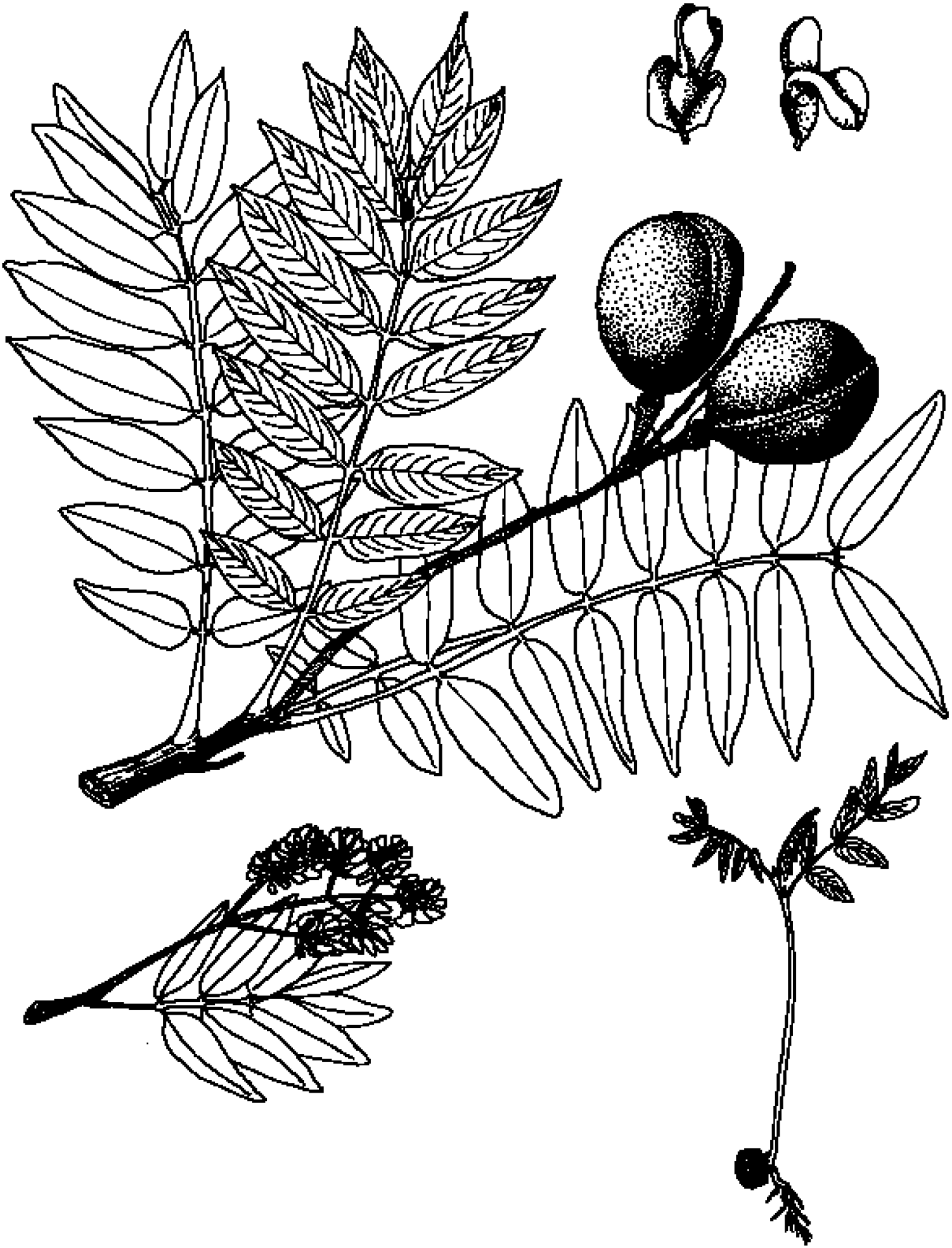
Andira inermis is a fast-growing, evergreen, medium-to-large tree that reaches 10 to 35 m in height and 1.70 m d.b.h. It has a straight bole, mostly unbuttressed (Salas 1993). The tree has a spreading or rounded dense crown; branchlets are sparsely pilose or glabrate. Young twigs are round, brownish, and puberulous. The outer bark is ragged and dark gray or medium brown, while the inner bark is light pinkish-brown; it has a coarse texture with longitudinally deep fissures. The bark exfoliates in large plates and has an unpleasant odor (Croat 1978, Whitmore and Hartshorn 1969). Leaves are alternate, imparipinnate, and generally glabrate; with 7 to 17 pairs of opposite leaflets with oblong or rounded base; leaflets are subcoriaceous with petiolules 5 mm long and dark veins. The leaflet blade is shiny green adaxially and dull green abaxially; midvein is swollen, and protuberant abaxially. Stipules are free, prominent, slender, linear-subulate, 1 to 2 cm long, and caducous (Whitmore and Hartshorn 1969). The species is riparian and grows best in lowlands that are periodically inundated. It grows at elevations ranging from 0 to 400 m where temperature varies from 28 to 35 °C and annual rainfall from 2500 to 6500 mm. It may be found in primary and secondary forests with alluvial, acid-clayey, or sandy soils.

The timber is strong, hard, and heavy. The narrow sapwood is pale brown to grayish yellow and usually clearly demarcated from the yellowish-brown to dark reddish-brown heartwood (Chudnoff 1984). The average specific gravity (green volume/dry weight) is 0.64. The green weight is 1140 kg per m^3 (76 percent moisture content) (Llach 1971b). Wood texture is coarse, with a moderately irregular grain and a rather low luster and without distinctive odor or taste when dry. Bands of light-colored parenchyma tissue give this wood a distinctive figure. The sapwood is susceptible to discoloration by sap-stain fungi during the early stages of drying. Radial shrinkage (green to oven-dry) is 4.6 percent and tangential shrinkage is 9.8 percent; volumetric shrinkage is 12.5 percent. *Andira inermis* has superior values in the rupture module (1470 kg per cm^2), elasticity module (186 kg per cm^2 by 1000), maximum

load (13.4 m kg per cm^3), and hardness (655 to 822 kg) (Llach 1971b). It is easy to work, saw, and cut; but it is difficult to obtain a smooth surface because of the alternating bands of hard and soft parenchyma. The wood polishes and varnishes well after filling. Heartwood is resistant to decay fungi and moderately resistant to dry-wood termites. The wood is used for heavy construction, house framing, exterior siding, turnery, furniture, cabinetwork, parquet flooring, and decorative veneer (Chudnoff 1984). The seeds and bark are rich in the alkaloid andirin (García 1974). The bark is used in the Brazilian Amazon as a purgative and vermifuge; it is poisonous in large doses (Schultes and Raffauf 1990). Fresh seeds are toxic and cannot be eaten. They are used as an antihelmintic to induce vomiting (Schultes and Raffauf 1990). The tree has a good shape and beautiful flowers and has been used as an ornamental.

Flowers and fruits may be seen throughout the year. Flowering occurs from February to May, with most fruits maturing in September and October. A second flush of blooms may occur in October, with fruits maturing in January and February (Croat 1978). The flowers are grouped in terminal panicles 15 to 30 cm long, each with numerous pink or purple flowers. The calyx is campanulate, shortly five-toothed, and 3 mm long. The corolla is long and has a suborbicular standard; wings are almost straight, oblong, obtuse, and free; the keel is similar to the wings. The vexillar stamen is free or rarely connate with the others to form a sheath; the anthers are versatile. The ovary is stipitate or rarely subsessile with one ovule. The style is short and curved, and the stigma is small. The species is an obligate outcrosser because it is self-incompatible (Croat 1978). The fruit is a green, short-stipitate camara that is oval or subglobose, 2 to 4 cm long, with one seed. The fruit has a leathery exocarp, fleshy mesocarp, and a ligneous endocarp (Polak 1992). The seed is approximately 2 cm in diameter. Fruit and seed dispersal is synzoochorous. Bats and scatter-hoarding rodents have been reported as dispersers (Mabberley 1997, Van Roosmalen 1985).

Fruits are collected from the ground under the trees. The seeds are separated from the fleshy mesocarp. Tissue separation is done with a sharp knife as soon as the fruit is collected to avoid damage by Curculionids (*Cleogonus* sp.) and fungi. Surrounded by the woody endocarp, the seeds are soaked in running water for 24 hours and sown in greenhouse beds. The seeds show recalcitrant behavior and cannot be stored.

Germination is hypogeal and the seedling is cryptocotylar. Seeds germinate in 20 to 25 days. Germination is approximately 60 to 70 percent.

The seeds are sown directly in the soil or in plastic bags filled with soil and sand. Once established, seedlings grow vigorously. They are not susceptible to insect attacks. Bare-root seedlings can be transferred to the field 3 to 5 months after seed sowing. *Andira inermis* has been planted in experimental plots with a planting distance of 3 by 3 m. Outplanted saplings grow slowly during the first year; their leaves do not wither.