GYMNOSPERMS

GNETACEAE

P. Acevedo-Rodríguez

A pantropical family with a single genus, i.e., *Gnetum*, with ~43 species of trees or twining lianas. *Gnetum* is represented in the Americas by seven species all of which are twining lianas that are found in South America with one species extending north to Costa Rica, in lowland wet or rain forests.

Diagnostics: Broad-leaved gymnosperm twining lianas with cylindrical woody stems, reaching 5–10 cm in diameter; branches with conspicuous swollen nodes; exudate cream or light yellow resinous; leaves opposite, simple, entire and petiolate. General appearance similar to Malpighiaceae but distinguished by the lack of stipules or glands, and stems with successive cambia.

General Characters

1. STEMS. Woody cylindrical or nearly so; branches with enlarged nodes, smooth; old stems reaching 20–30 m in length and in some species up to 15 cm in diam. All neotropical species have successive cambia that produce continuous concentric rings of xylem and phloem with wide rays (Figure 9A, B). Vessel elements may be very wide and visible to the naked eye (Figure 9A, B).
2. EXUDATES. Abundant whitish, cream or light yellow exudate produced within the conjunctive tissue, rays, medulla and cortex (Figure 9B; Carlquist 1996).
3. CLIMBING MECHANISMS. In all species, the main shoot and those of the opposite, short, lateral branches are twiners**.**

4. LEAVES. Broad, opposite, simple, coriaceous, with pinnate venation and entire or undulate margins; tertiary venation reticulate, without free veinlets (Figure 10A). Petioles commonly short and stocky. Stipules absent but interpetiolar ochrea-like ridge present (Figure 9C).
5. INFLORESCENCE. Strobili are inflorescence-like, axillary, paniculate with whorled spike-like units (cones) bearing whorls of naked “flowers” subtended by cupular or annular involucral collars; staminate “spikes” with collars closely together, each bearing 20 or more staminate “flowers”; pistillate “spikes” with widely spaced flower whorls, each bearing 4–12 pistillate flowers (Figures 10B; 11A).
6. FLOWERS. “Flowers” unisexual, actinomorphic, enclosed by a false perianth; staminate “flowers” with 2 connate stamens; “pistillate” flowers with a single ovule.
7. SEED. Seeds ellipsoid, with red, yellow, orange or light green fleshy coat which resemble a fruit (Figure 11B).

USES

The seeds of several species are roasted and eaten by people in the Amazon basin.

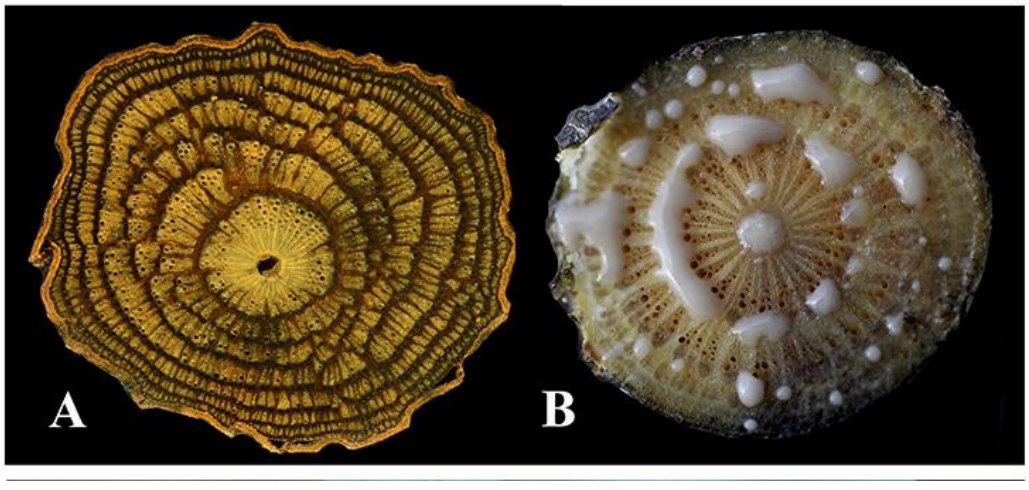

Figure 9. **A**. Stem cross sections of *G. nodiflorum* showing successive concentric rings of xylem and phloem, wide rays and vessel with large lumens. B. Cross sections of a fresh stem of *G. leyboldii*

showing abundant exudate produced in the conjunctive tissue between the successive layers of vascular tissue. Photos by P. Acevedo.

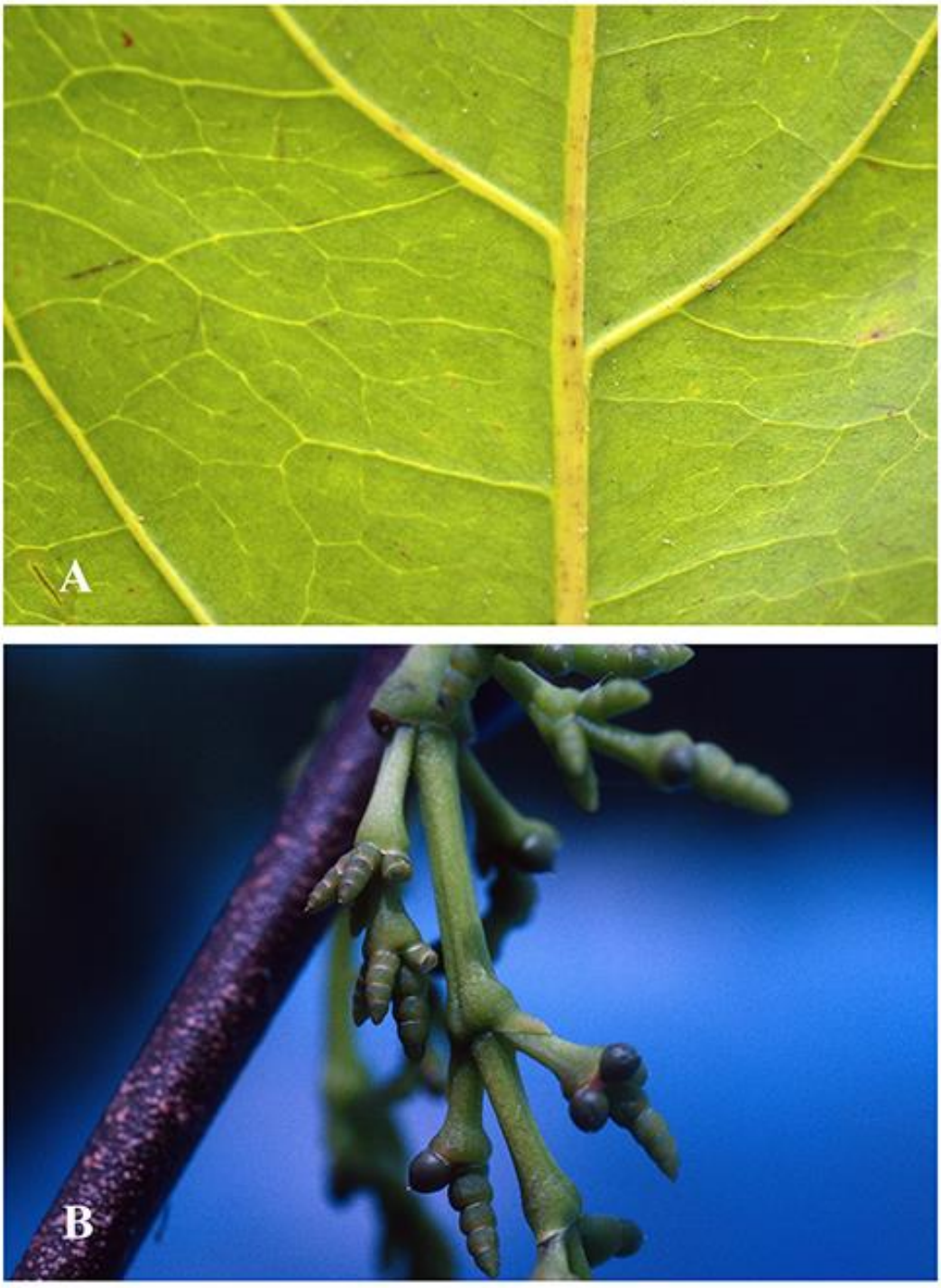

Figure 10. **A**. Leaf venation pattern of *G. leyboldii* showing reticulum of tertiary veins lacking free veinlets. **B**. Pistillate inflorescence-like strobili of *G. schwackeanum.* Photos by P. Acevedo.

Figure 11. A. Pistillate "inflorescence" of *Gnetum nodiflorum*. **B.** Seed in *Gnetum leyboldii*. Photos by P. Acevedo.

GNETUM Linnaeus, Mant. 18. 1767.

Dioecious, twining lianas or less often trees or shrubs (outside the Neotropics). Branches cylindrical, smooth, with enlarged nodes; stems 5–30 m long and up to 15 cm in diam., producing abundant whitish, cream or light yellow exudate (Figure 9B); bark moderately rough (e.g., *G. nodiflorum* Brongn.); cross section with successive cambia producing concentric rings of xylem and phloem with wide rays and abundant conjunctive tissue between rings (Figure 9A, B), vessel elements conspicuously wide (Figure 9A, B). Leaves opposite, simple, coriaceous, ovate, elliptic or oval up to 20 cm long, with pinnate venation and entire or undulate margins; tertiary venation reticulate, without free veinlets (Figure 10A); petioles short, adaxially canaliculate; stipules absent but interpetiolar ochrea-like ridge present. Inflorescences axillary, paniculate with whorled spike-like units (cones) bearing whorls of naked flowers subtended by cupular or annular involucral collars; staminate "spikes" with collars closely together, each bearing 20 or more staminate flowers; pistillate "spikes" with widely spaced flower whorls, each bearing 4–12 pistillate flowers. Flowers unisexual, actinomorphic, enclosed by a false perianth; staminate flowers with 2 connate stamens; pistillate flowers with a single ovule, enclosed by a false perianth that persists as a fleshy seed coat. Seeds ellipsoid, fleshy coat red, yellow, orange or light green.

Distinctive features: Twining lianas with smooth grayish branches swollen at the nodes and interpetiolar ochrea-like rim; often producing a whitish or cream latex; leaves simple, commonly coriaceous, tertiary venation lacking free veinlets.

Distribution: A pantropical genus with ~43 species of lianas or less often trees, represented in the Neotropics by seven species of lianas found throughout the Amazon Basin, with one species

(*G. leyboldii* Tul.) extending north to Costa Rica; in flooded and non-flooded moist and wet forests.