DIOSCOREACEAE

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A primarily tropical family extending to warm temperate regions with three genera and ~800 species of twining, rhizomatous vines or lianas, most of which belong to the genus *Dioscorea*. Dioscoreaceae is represented in the New World only by *Dioscorea* with a total of ~400 species, 278 of which are found in the Neotropics. For the most part, they are found in moist, wet or seasonal lowland forests.

Diagnostics: Twining lianas or vines, commonly with large tubers; most species with cylindrical stems, < 2 cm in diameter; cross section with a distinctive atactostele; leaves simple to deeply lobed, alternate to opposite, with long petioles. General appearance like some Menispermaceae but distinguished by the herbaceous to slightly woody stems with an atactostele, presence of pseudo-stipules, and the capsular fruits or samaras. *Dioscorea* species with alternate leaves are sometimes confused with *Smilax*, but the latter climbs by means of tendrils, not by twining.

General Characters

1. STEMS. Herbaceous to slightly woody, cylindrical, trigonous, quadrangular, winged (Figure 25A–D), smooth or armed with prickles or spines (indurate petioles), known to reach up to 10–15 m in length and in some species up to 3 cm in diam. All species have an atactostele with collateral vascular bundles scattered in the ground tissue, irregularly so in some species (Figure 25A, B). Vessel elements may be very wide and visible to the naked eye (Figure 25A, B).
2. EXUDATES. Watery or no visible exudate.
3. CLIMBING MECHANISMS. All species are twiners, stems either twine clockwise or counterclockwise.

4. LEAVES. Alternate, subopposite or opposite, membranaceous or chartaceous, simple, commonly cordiform, less often trilobed or linear, palmately lobed or palmately compound, commonly with 3–7(14) main arcuate, veins from base (acrodromous) or palmately veined, margins entire (Figure 26A–C). Petioles commonly long and pulvinate on both ends; sometimes persistent as a spine after shedding of the blade (Figure 26D). Pseudo-stipules often present as an auricle or spine at the petiole base.
5. TUBERS and BULBILS. Most species produce subterranean, small to large tubers and axillary, starchy bulbils (Figure 25D, E).
6. INFLORESCENCE. Axillary (Figure 27A, B) or sometimes the staminate inflorescences terminal and paniculate thyrses; axillary inflorescences spreading to pendent, spikes, racemes or thyrses; flowers subtended by a bract and a bracteole.
7. PEDICELS. Absent or short.
8. FLOWERS. Unisexual (the plant often dioecious), actinomorphic or rarely zygomorphic, commonly up to 4 mm long; perianth of 6 distinct or connate tepals in two whorls. Staminate flowers with 6 stamens or sometimes 3 stamens and 3 staminodia, the filaments free, or connate to various degrees, the anthers opening through longitudinal slits; pistillode sometimes present. Pistillate flowers with hypanthium; staminodia sometimes present; ovary inferior, tricarpellate with 1–4 axial ovules per locule, the styles 3, free or connate at base, the stigma 3 or 6.
9. FRUIT. Trilocular loculicidal, marginicidal, dry or less often fleshy capsules with 2–4 seeds per locule, or a samara with a single seed (Figure 27C, D).

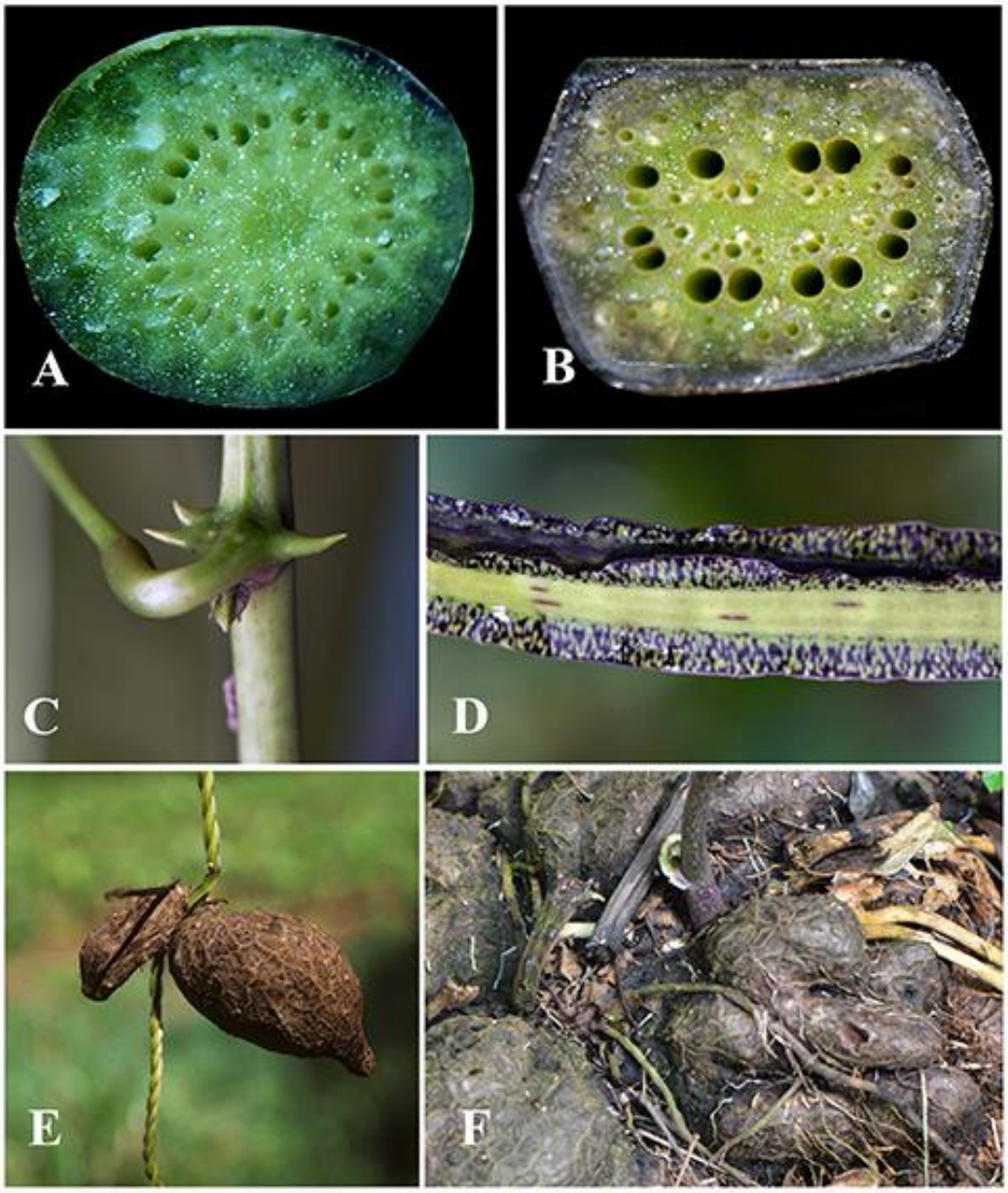

Figure 25. **A & B**. Cross sections of stems in 2 species of *Dioscorea*, showing collateral vascular bundles, some of which have xylem with wide vessels. **C.** Petiole with geniculate base and 'stipular' thorns of *Dioscorea* sp. **D.** Square, 4-winged stem of *Dioscorea* sp. **E**. Aerial starchy bulbil of *Dioscorea alata*. **F**. Tuberous base of *Dioscorea alata.* Photos by P. Acevedo.

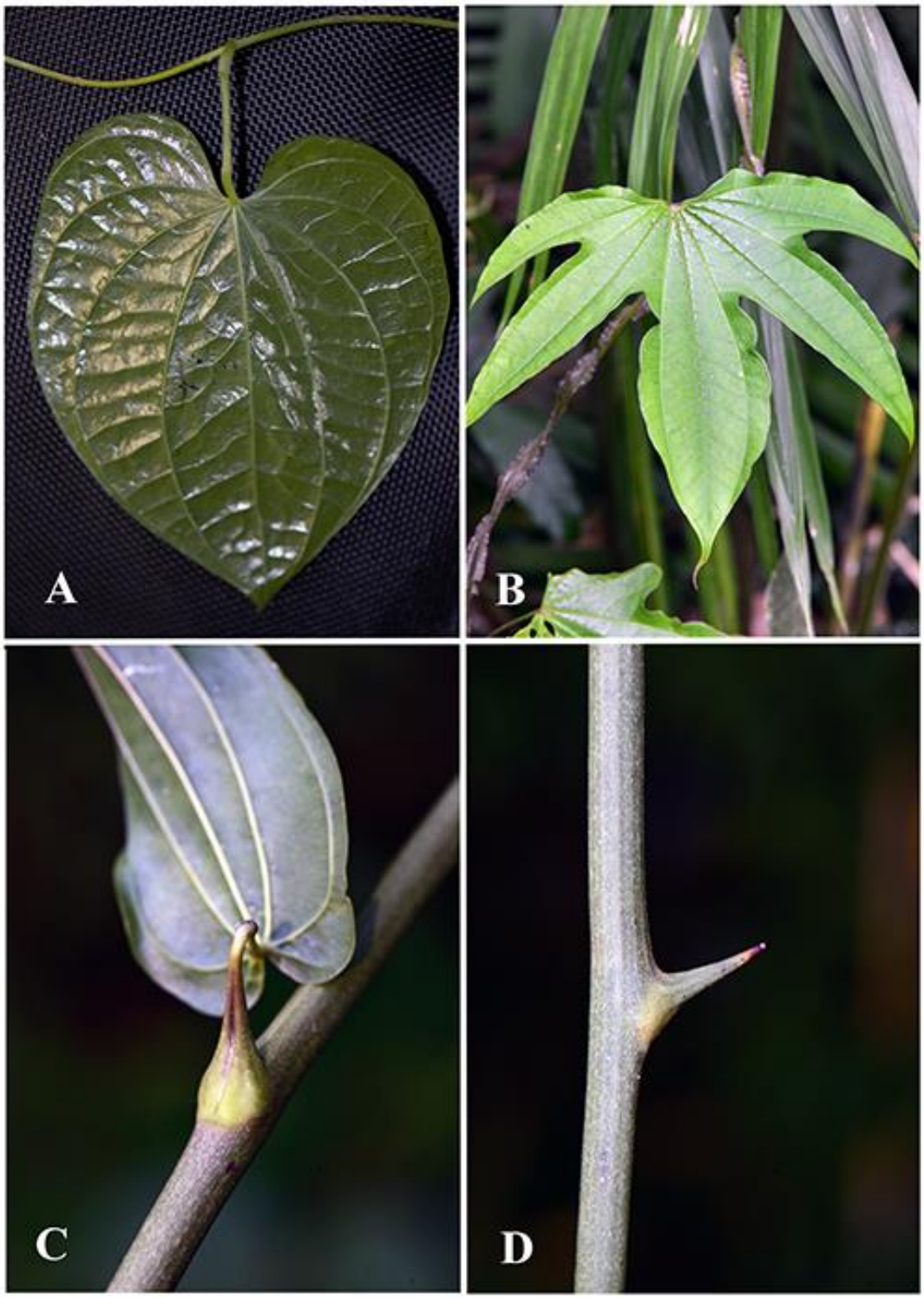

Figure 26. Leaf features in *Dioscorea*. **A**. Cordate blade with 9 main, arcuate veins of *Dioscorea sp.* **B**. Palmately lobed blade with 9 main, arcuate veins of *Dioscorea* sp. **C, D.** *Dioscorea* sp. with persistent indurate (spine-like) petiole, before and after shedding of blade. Photos by P. Acevedo.

Figure 27. A. Pendent axillary, staminate thyrses of *Dioscorea cordata*. **B.** Spreading staminate spikes of *Dioscorea cayenensis*. **C.** Trilocular capsule of *Dioscorea* sp. **D**. Samara of *Dioscorea cordata*. Photos by P. Acevedo.

USES

Several species of *Dioscorea* are commercially cultivated for their large edible tubers, a main source of carbohydrates in the tropics. The rhizomes of several species have medicinal value, some of which are the source of steroid compounds used in the manufacture of hormonal medicines such as birth-control pills and the treatments or various ailments. Most species, at one time or another, produce aerial bulbils that are rich in starch (commonly known as air potatoes), some of which are consumed by humans or fed to livestock. Throughout the tropics, several species of *Dioscorea* are commonly used in the tropics as fish stupefactants (Acevedo 1990).

DIOSCOREA Linnaeus, Sp. Pl. 1032. 1753.

Rajania L. (1753).

Dioecious, twining vines, herbaceous or slightly woody. Stems cylindrical, angular or winged, sometimes provided with prickles or spines of petiolar origin; cross sections in subwoody species with visible wide vessel element lumens (Figure 25A, B). Leaves alternate or opposite, simple or palmately lobed, acrodromous with 3–7(–14) main arcuate, parallel veins, the margins entire; petioles usually long, pulvinate on both ends, sometimes geniculate; petiolar sheath often prolonged as auricular (or sometimes spiny) pseudostipules; axillary bulbils often present, fleshy, of various shapes, size and textures. Inflorescences axillary, spikes, racemes, racemiform or paniculate thyrses, pendulous or ascendant produced in axillary spikes, racemes, or panicles. Flowers unisexual, actinomorphic, 6-merous; perianth minute; staminate flowers with 6 stamens or sometimes with 3 stamens and 3 staminodia; pistillate flowers with 6 staminodia, the ovary inferior; styles 3, free or connate at base, with 3–6 stigmas. Fruit a trilocular capsule, chartaceous, coriaceous or fleshy or a distally winged samara; seeds 6–12 per fruit, flattened and winged or only one in samaroid fruits.

Distinctive features: Herbaceous to subwoody twiners with alternate or opposite, cordiform, trilobed to palmately lobed leaves with 3–9(14) main, arcuate, parallel veins; cross sections of stems with scattered conspicuous large vessels.

Distribution: A tropical and subtropical genus of ~800 species, 289 of which are found in the Neotropics, in moist, wet or seasonal forests.