

Rubiaceae A.L.de Jussieu
(Coffee or Madder Family)

Trees, shrubs, lianas, or herbs; lacking internal phloem; usually with iridoids, various alkaloids; raphide crystals common. Hairs various. *Leaves opposite or whorled, usually entire, with pinnate venation; stipules present, interpetiolar and usually connate, occasionally leaflike, with colleters on adaxial surface.* Inflorescences determinate, occasionally reduced to a single flower, terminal or axillary. *Flowers usually bisexual and radial, often heterostylous, frequently aggregated.* Sepals usually 4 or 5, connate, sometimes with colleters on adaxial surface. *Petals usually 4 or 5, connate, forming a usually wheel-shaped to funnel-shaped corolla, adaxial surface often pubescent, the lobes valvate, imbricate, or contorted.* *Stamens usually 4 or 5; filaments usually adnate to corolla and positioned within corolla tube or at its mouth, sometimes basally connate; anthers 2-locular, opening by longitudinal slits; pollen grains usually tricolporate.* *Carpels usually 2 (-5), connate; ovary inferior, with usually axile placentation; stigma(s) 1 or 2, linear, capitate, or lobed. Ovules 1 to numerous in each locule, with 1 integument and a thin-walled megasporangium. Nectar disk usually present above ovary. Fruit a loculicidal to septicidal capsule, berry, drupe, schizocarp, or indehiscent pod; seeds sometimes winged; embryo straight to curved; endosperm present or lacking (Figure 8.112).*

Floral formula: * $\overline{4-5}, \overline{4-5}, \overline{4-5}, \overline{2-5}$; capsule, berry, drupe, schizocarp, indehiscent pod

Distribution: Cosmopolitan, but most diverse in tropical and subtropical regions.

Genera/species: 550/9000. **Major genera:** *Psychotria* (1500 spp.), *Galium* (400), *Ixora* (400), *Pavetta* (400), *Hedyotis* (400), *Tarenna* (370), *Randia* (250), *Gardenia* (250), *Palicourea* (250), *Mussaenda* (200), *Borreria* (150), and *Rondeletia* (125). Some of the numerous genera in the continental United States and/or Canada are *Casasia*, *Catesbaea*, *Cephalanthus*, *Chiococca*, *Diodia*, *Ernodia*, *Erithalis*, *Exostema*, *Galium*, *Guettarda*, *Hamelia*, *Hedyotis*, *Mitchella*, *Morinda*, *Pentodon*, *Pinckneya*, *Psychotria*, *Randia*, *Richardia*, and *Spermacoce*.

Economic plants and products: Coffee, a stimulating beverage containing caffeine, is made from the brewed seeds of *Coffea arabica* and *C. robusta*. Quinine, a drug used in treating malaria, comes from the bark of species of *Cinchona*, and ipecac, a drug used to induce vomiting, is derived from *Psychotria*. *Gardenia*, *Hamelia*, *Pentas*, *Randia*, *Rondeletia*, *Serissa*, *Hedyotis*, and *Ixora* provide ornamentals.

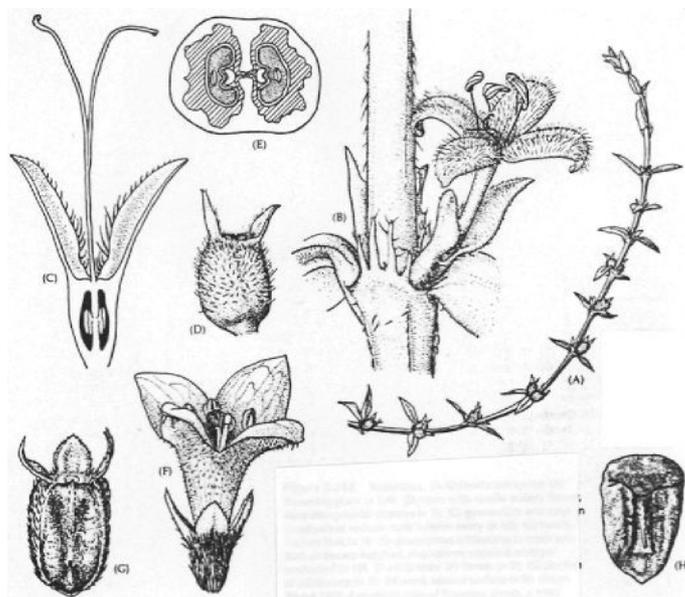


Figure 8.112 Rubiaceae. (A-E) *Diodia tetragona*: (A) flowering plant (x 0.4); (B) node with sessile axillary flower, note interpetiolar stipules (x 5); (C) gynoecium and calyx in longitudinal section, note inferior ovary (x 10); (D) nearly mature fruit (x 5); (E) drupaceous schizocarp in cross-section, endocarp hatched, endosperm stippled, embryo unshaded (x 10). (F-H) *D. teres*: (F) flower (x 5); (G) portion of schizocarp (x 5); (H) seed, adaxial surface (x8). (From Wood 1974, *A student's atlas of flowering plants*, p. 106.)