
Vochysiaceae

Vochysiaceae A. St.-Hil., Mém. Mus. Natl Hist. Nat. 6, 4:253–270 (1820) (Vochisieae).

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Tall trees to shrubs, Al-accumulating; hairs, when present, simple or stellate. Leaves opposite or verticillate, simple, entire; venation brochidodromous or eucamptodromous; stipules usually present, often modified into glands or associated with extrafloral nectaries. Inflorescences thyrses (panicles of cincinni), cincinni, or racemes, terminal or axillary. Flowers with prophylls, bisexual, strongly zygomorphic, hypogynous or epigynous; calyx 5-merous, connate at base, often unequal, the largest one usually spurred; petals 1, 3, or 5, rarely 0, free, clawed, white, yellow, pink, or purple, caducous; stamen 1, anther dorsifixed or basifixed, commonly sagittate, longitudinally dehiscent; staminodes 0–4; ovary 1- or 3-locular; style simple; stigma terminal or lateral; ovules 1–many per locule; placentation axile or apical. Fruit a loculicidal capsule or samaroid, 4–5-winged by the unequally enlarged and persistent calyx-lobes. Seeds 1–several, exalbuminous, often winged and hairy; testa chartaceous; embryo straight.

A family comprising about 200 species in seven genera, five of which are neotropical; two genera in West Africa.

VEGETATIVE MORPHOLOGY. Vochysiaceae are shrubs or trees, often very large. Species of *Qualea*, *Vochysia*, and especially *Erisma* are some of the tallest trees of the Amazon basin, reaching c. 50 m high; many have well-developed buttresses. The indumentum, when present, is usually composed of simple hairs. Stellate hairs are observed only in *Erisma*. Leaves of Vochysiaceae are always simple and entire, opposite and secondarily distichous in *Callisthene*, opposite in *Erismadelphus*, *Korupodendron*, and *Qualea*, opposite or verticillate in *Vochysia*, or usually opposite in *Erisma*. The venation is brochidodromous or eucamptodromous. Stipules are usually present (e.g., Fig. 166A); in *Qualea*, they are often modified into glands or associated with extrafloral nectaries (Fig. 167A). Cataphylls are commonly observed at the base

of branchlets and inflorescences in *Callisthene* (Fig. 168A), and less often in *Qualea*.

VEGETATIVE ANATOMY. The epidermis commonly has mucilaginous cells; crystals of calcium oxalate are solitary or in clusters. The leaves are usually dorsiventral; the stomates are anomocytic (*Erisma*, *Salvertia*, and *Vochysia*) or paracytic (*Callisthene* and *Qualea*) (Metcalf and Chalk 1950; Sajo and Rundall 2002).

Cork is pericyclic. The wood is characterized by the presence of vested vessel pitting, only libriform fibers, banded axial parenchyma (apotracheal in *Callisthene*, *Erisma*, *Erismadelphus*; paratracheal in *Qualea*, *Salvertia*, *Vochysia*), and intercellular canals. Rays are homocellular (*Qualea* and *Salvertia*) or heterocellular (*Callisthene*, *Erisma*, *Erismadelphus*, *Vochysia*); they are all uniseriate in *Erismadelphus*, predominantly multiseriate in *Callisthene* and *Qualea*, and often predominantly uniseriate in *Salvertia*, *Vochysia*, and *Erisma* (Quirk 1980). Included phloem is present only in *Erisma* and *Erismadelphus*.

FLOWER STRUCTURE AND ANATOMY. In Vochysiaceae, the basic element of the inflorescence is a one- to several-flowered cincinnus that is usually arranged in racemes, panicles, or thyrses. The flowers are bisexual and strongly zygomorphic, hypogynous (tribe Vochysieae), or epigynous (tribe Erismeae). The calyx is formed by 5 subequal or unequal lobes connate at the base; the largest one is commonly spurred, deciduous in *Erisma*. The spur develops from the floral axis (Kopka and Weberling 1984), and its morphology is taxonomically useful at the species level.

There are five white petals in *Erismadelphus*, *Korupodendron*, and *Salvertia*, usually three yellow petals (rarely absent) in *Vochysia*, or one white, yellow, pink, or purple petal in *Callisthene*, *Erisma*, and *Qualea*. The stamen is characteristically solitary, standing in the plane of symmetry, in front of

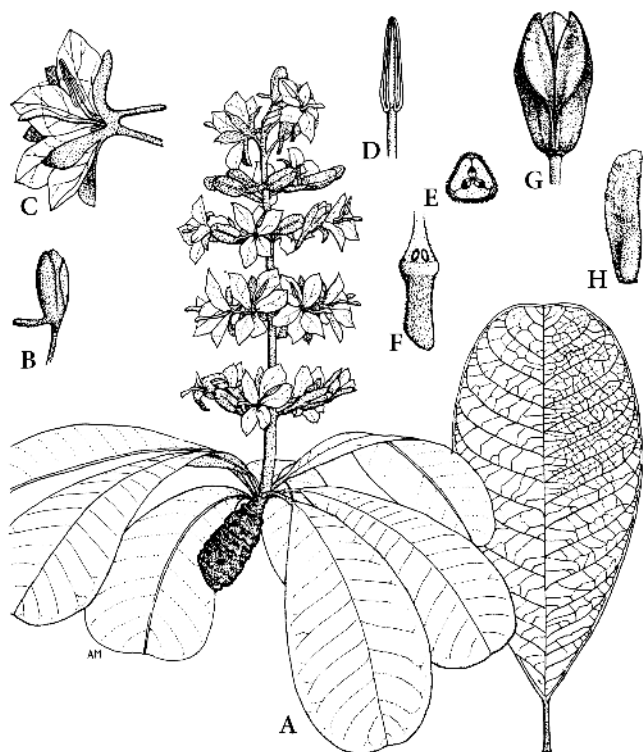


Fig. 165. Vochysiaceae. *Salvertia convallariodora*. A Habit. B Flower bud. C Anthetic flower. D Stamen. E Transverse section of ovary. F Longitudinal section of ovary. G Fruit. H Seed. (Orig.)

the spurred calyx-lobe in *Erismadelphus*, *Salvertia*, and *Vochysia*, or outside the plane of symmetry in *Callisthene*, *Erisma*, and *Qualea*. The usually sagittate anther is dorsifixed or basifixed; in the species of *Qualea* sect. *Trichanthera* (recognized at generic rank as *Ruizterania* by Marciano-Berti 1969), the anther is conspicuously barbate. Two staminodes are commonly present.

In tribe Vochysieae, the ovary is trilocular, with two (*Salvertia* and *Vochysia*) to several (*Callisthene* and *Qualea*) axile ovules per locule. Erismeeae have unilocular ovaries with one (*Erismadelphus* and *Korupodendron*) or two (*Erisma*) ovules.

EMBRYOLOGY. Information on the embryology of Vochysiaceae is incomplete. In species of *Qualea* and *Vochysia* (Davis 1966; Boesewinkel and Venturelli 1987), the ovules are hemitropous, crassinucellate, and bitegmic. The ovule primordium is trizonate. The inner and outer integuments are initiated from dermal cells; both integuments form the micropyle.

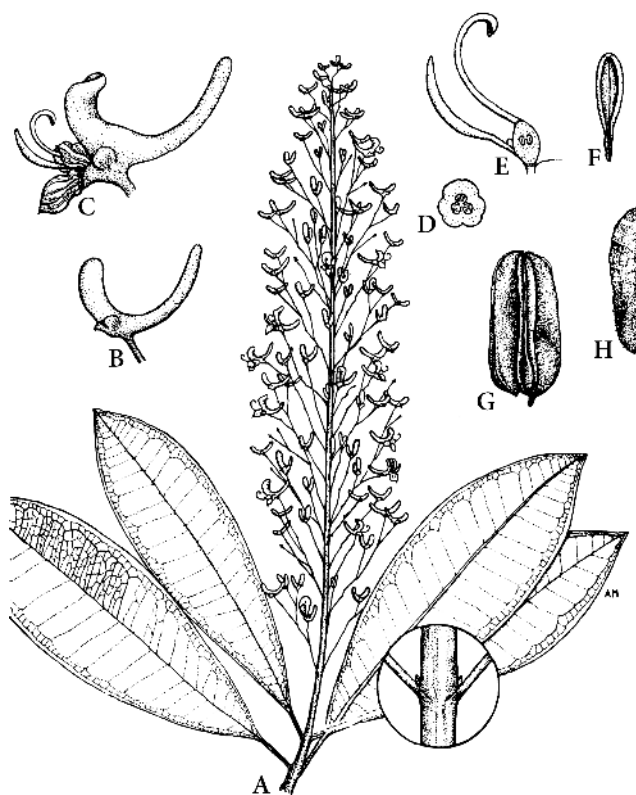


Fig. 166. Vochysiaceae. *Vochysia guianensis*. A Habit, a node enlarged to show stipules. B Flower bud. C Anthetic flower. D Transverse section of ovary. E Longitudinal section of ovary. F Stamen. G Fruit. H Seed. (Orig.)

The nuclear endosperm is absent in the mature seed. The embryo is straight with two convolute (*Vochysieae*) or planoconvex (*Erismeeae*) cotyledons.

POLLEN MORPHOLOGY. Pollen grains are tricolporate, angulaperturate, with equatorially elongate endoapertures and columellate, reticulate or striate exine (Erdtman 1952; Makino-Watanabe 1995). The pollen of the northernmost species, *Vochysia guatemalensis*, is quite variable and is sometimes syncolpate (Ludlow-Wiechers 1980).

KARYOLOGY. The few chromosome number counts reported for the family have indicated $x = 11$ or 12 (Cronquist 1981; Berry 1987).

POLLINATION AND REPRODUCTIVE SYSTEMS. The numerous but ephemeral flowers with a single stamen often appear in the dry season, or at the transition between the dry and rainy season. This flowering pattern is common in neotropical plants,