

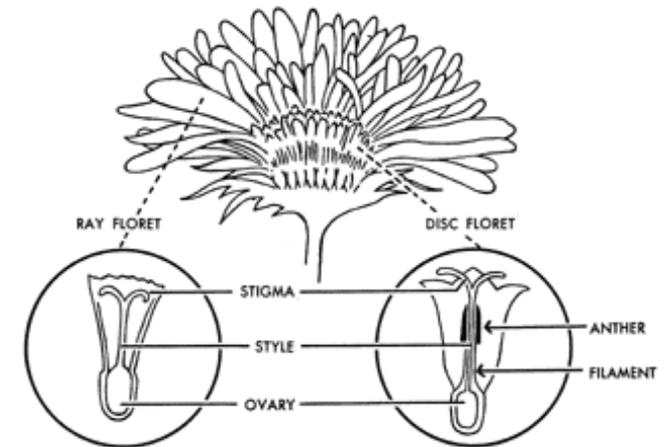
IMPORTANT TROPICAL PLANT FAMILIES

Araceae - Philodendrons, Dieffenbachia, Taro Root, Elephant Ears, Jack-in-the-Pulpit

- Dist: Pantropical, a few temperate. ~2500 spp.
- Habit: Terrestrial, epiphytic or climbing herbs (some large and treelike *Xanthosoma*)
- Leaves: often large and cordate (heart or spade shaped), sometimes lobed, palmate or lanceolate;
- Contain **calcium oxylate crystals!** Some poisonous.
- Petiole sheaths stem
- Sometimes produce adventitious roots
- Flower: unique - a hood-like **spathe** and a spike-like **spadix** (w/ tiny flowers crammed along it.)
- Fruit: berry

Asteraceae - Sunflower and daisy family

- Dist: Worldwide. #1 angiosperm family >23,000 spp.
- Habit: mostly herbs and shrubs, some trees
- Leaves: usually simple, often lobed or deeply dissected, alternate or in basal rosettes
- Flowers: *Composite flowers in heads* made up of few to many ray and/or disk flowers
- Heads surrounded by small bracts
- Fruit: an *achene*, often crowned by a *pappus* – often wind dispersed
- Uses: sunflower oil/seeds, safflower, lettuce, artichoke, pyrethrins, dandelions, chamomile, marigolds, etc.
- Representative genera: *Culcitium*, *Werneria*, *Espeletia*, *Gynoxys*, *Helianthus* (sunflower), *Chrysanthemum* (mums), *Taraxacum* (dandelion)



Bignoniaceae – Calabash, trumpet vine and catalpa family

- Dist.: Mostly tropical with a few temperate members. ~750 spp.
- Habit: trees, shrubs or vines
- Leaves: **opposite and compound**, rarely simple; in vines, terminal leaflet sometimes modified into a tendril
- Flowers: tubular, zygomorphic, 2 upper and 3 lower petal lobes, with four didynamous **T-shaped stamens**
- Fruit: a dry 2-valved capsule or long indehiscent pod; seeds often flattened, winged
- Representative genera: *Tabebuia*, *Crescentia*, *Jacaranda*

Bromeliaceae - "Spanish moss", pineapple

- Dist: **New World endemic**, 1500 spp.
- Habit: Epiphytic or terrestrial herbs with spirally arranged leaves (forming a **rosette**).
- Some have dense bulbous base, some have open base, some form tanks that hold water.
- **Leaves: strap-like**, often with umbrella-shaped hairs and/or spiny margins, sometimes variegated.
- Flowers: borne on branched structure; 3 sepals and 3 petals; hummingbird pollinated
- Fruits: berries (bird disp.) or dry capsules (wind disp.) or multiple (like pineapple)

Costaceae – Spiral "gingers"

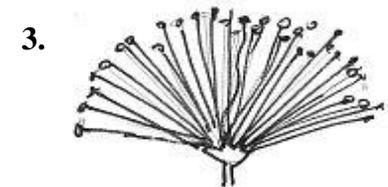
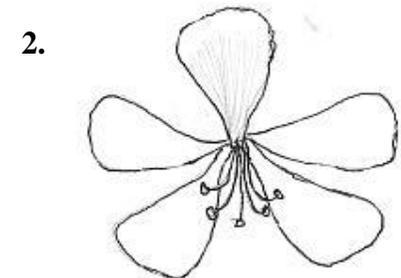
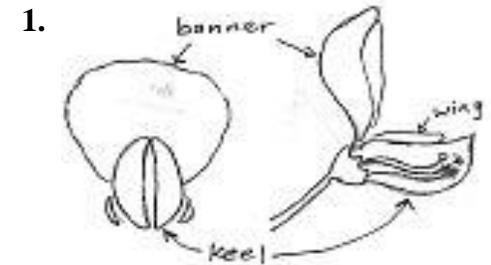
- Dist.: Pantropical. ~150 spp.
- Habit: **Understory herbs**
- Leaves: Simple, entire, **arranged spiral-staircase like**. Petioles short. Sheath closed.
- Flowers: Zygomorphic. Each subtended by a bract in upright spiral structure.
- Fruit: Capsule

Cyclanthaceae – panama hat plant

- Dist.: Neotropics. 180 spp.
- Habit: Palm-like **understory herbs**, or epiphytic, or climbing using roots.
- Leaves: Simple, alternate or in basal clump. Often **bifid** or palmate, sometimes bifoliate or palmately compound.
- Leaves have one vein or many parallel veins that converge at tip.
- Flowers/Fruits: Plants monoecious. Flowers and fruits in upright **cone-like structure** arising from base.
- Representative genera: *Cyclanthus*, *Carludovica*, *Asplundia*

Fabaceae = Leguminosae - Bean and pea family

- Distribution: Worldwide, except the arctic. 3rd largest family & **most important tropical tree family**, esp. in moist lowlands. ~19,400 spp.
- Habit: herbs, shrubs, trees or vines
- Leaves: **Alternate compound**, may be trifoliate or unifoliate (see subfamilies), with stipules and **swollen pulvini**.
- Flowers vary by subfamily:
 - 1. Subfamily Faboideae:** zygomorphic, 5 petals: Upper "banner" petal is outermost, inner "keel". Keel encloses stamens, often in a 9+1 arrangement. Leaves pinnately compound, trifoliate or unifoliate. Examples: *Erythrina*, *Glycine*, *Lupinus*, clover
 - 2. Subfamily Caesalpinoideae:** ± zygomorphic, 5 spreading petals, upper petal innermost. 5-10 stamens. Leaves pinnately or bipinnately compound. Example: *Bauhinia*, *Brownea*, *Cassia*, *Senna*, *Parkinsonia*
 - 3. Subfamily Mimosoideae:** actinomorphic "puffball" flowers with 10 to many showy stamens, petals reduced. Leaves usu. bi- or tri- pinnately compound. Occasionally pinnately compound or reduced to phyllodes. Examples: *Parkia*, *Zygia*, *Mimosa*, *Acacia*
- Fruit: Usu. a one-chambered pod with two seams (legume) and one to many seeds. The legume may be fleshy, dry, inflated, winged or constricted between the seeds. Sometimes the pod opens to reveal brightly colored seeds.
- Roots of many species have nodules that contain nitrogen fixing bacteria (*Rhizobium*).
- Uses: Economically important family for food (soybeans, beans, peanuts, peas, lentils), forage (clover, alfalfa), dyes (yellow, indigo), timber, insecticides (rotenone), drugs, food additives (gum arabic), ornamentals.



Gesneriaceae - Gloxinia family

- Dist.: Old and New World tropics, esp. montane. ~ 3,000 spp.
- Habit: Mostly understory herbs, some sub-shrubs, and epiphytic climbers
- Leaves: Opposite, often hairy, sometimes variegated, sometimes **anisophyllous** (of two different sizes at a single node)
- **Flowers: zygomorphic, 5 fused petals**, often bilabiate, sometimes with inflated sac; **often hairy; stamens 4 with filaments free but anthers stuck together.**
- Fruit: capsule or berry

Heliconiaceae – Lobster claw family

- Dist.: Neotropics. ~250 spp.
- Habit: **Understory herbs** in forest and edge habitats
- Leaves: Large, simple, and entire. Alternate and 2-ranked or basal on long petioles. **Hairless.**
- Leaves lack cross-veins and are **easily torn.**
- Flowers: zygomorphic, with 5+1 tepals. Subtended by **showy boat-like bracts.**
- Fruit blue and drupe-like; no aril on seeds.

Malvaceae (including Bombacaceae) – Baobab, Hibiscus and *Ceiba* family

- Dist.: mostly S. America rainforest, a few in African forests and savannas, Madagascar and S.E. Asia. ~ 180 spp.
- Habit: Usually large trees with unusually swollen, smooth, columnar or water-storing trunks. Spines sometimes present on trunks.
- Leaves: Alternate, simple, palmately lobed or palmately compound. Dry season deciduous.
- Flowers: White or bright colored and usually large, cauliflory common. 5 sepals, 5 petals, with **5 to many stamens fused into a tube** at least at the base (like a shaving brush).
- Fruits: A large pod or capsule with many smooth seeds often surrounded by fluffy fibers (kapok).
- Uses: Kapok fiber used to stuff life preservers, Balsa - light wood for making models.
- Representative genera: *Ceiba*, *Ochroma* (balsa), *Pseudobombax*, *Hibiscus*, *Sida*

Marantaceae – Arrow-root, prayer plant

- Dist.: Pantropical. ~450 spp.
- Habit: **Understory herbs** of moist forest, swamps and edge habitats.
- Leaves: Simple, entire. Alternate and 2-ranked or basal. Often **velvety-hairy; articulation at top of petiole** (pulvinus; often a different color); open sheath at base of petiole.
- Leaves with **fine secondary cross-veins** visible when leaf is torn.
- Flowers: asymmetrical, showy, often subtended by 1-2 bracts; 3 sepals, 3 petals. sometimes on spike-like or cymose inflorescence
- Fruit: capsule, or fleshy or dry berry; seeds arillate
- Uses: edible arrow-root, many ornamentals (*Calathea*)

Melastomataceae – Melastomes, or "Black-mouth Fruits"

- Dist.: Mainly tropical, some temperate genera. 8th largest plant family! ~ 5,005 spp.
- Habit: mostly trees or shrubs, some herbs and vines.
- Leaves: opposite and decussate, most with characteristic **ladder-like venation**.
- Flowers: simple or in a raceme, usually pink or purple. Floral parts in multiples of 4-5. **Elbow-shaped stamens; anthers open by terminal pore. Ovary usually inferior.**
- Fruit: berry or capsule
- Uses: a few ornamentals. Important food for birds.

Moraceae - figs, mulberries, breadfruit, jackfruit

- Dist.: mainly tropical with some temperate members; 40 genera, ~ 1000 spp.
- Habit: Trees and shrubs with clear to **milky sap**
- Leaves: Usually alternate, simple, entire, toothed or lobed, with stipules. Some have **terminal conical stipule** and stipular scars encircling stems (e.g. *Ficus*)
- Flowers: Unisexual, **minute, in compound structures** (heads, catkins, or syconium of *Ficus*)
- Fruits: compound and variable - fleshy and edible fig, long fleshy spikes, or large aggregates (breadfruit, jackfruit).
- Uses: Important fruit and fiber crops, rubber (*Castilla elastica*), timber
- This family used to include *Cecropia* and relatives but those are now placed in Urticaceae

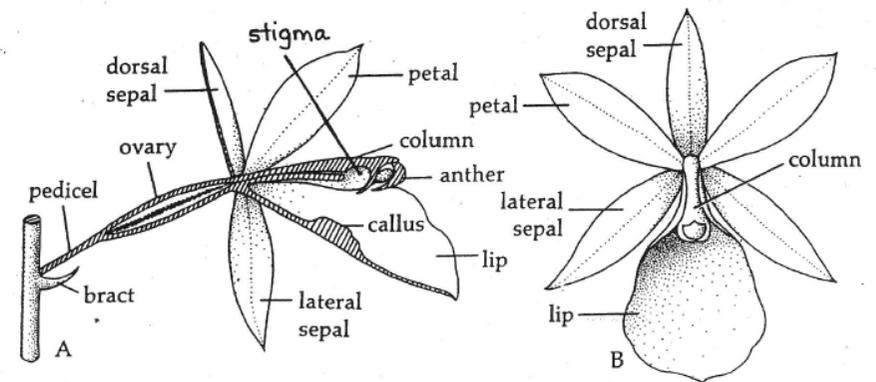
Orchidaceae - Orchids, vanilla

- Dist.: Worldwide. The 2nd largest flowering plant family with >30,000 spp.
- Habit: Epiphytic or terrestrial **herbs**.
- Stems: Stems long w/ 2-ranked leaves, or short with leaves emerging from base, or rhizomes
- Leaves: Usually strap-like w/ parallel veins, many have **pseudobulbs**
- Roots: Adventitious, often arise from stem, often with **velamen**
- Flowers: **Zygomorphic**; highly specialized: 3 sepals and 3 petals, the lowermost modified into a **lip**.
- Reproductive organs (female and male) fused into a **column**, sometimes attached to lip.
- Specialized insect or hummingbird pollination
- **Fruit: a capsule** with many dust-like seeds (no endosperm, wind-dispersed)
- Sometimes reproduce asexually – "keikis"

Palmae = Arecaceae – palm family

- Dist.: Pantropical. ~2,750 spp.
- Habit: monocot trees, shrubs or lianas; stems erect, usually unbranched
- Leaves: Large, alternate or spirally arranged, often in a terminal cluster.
- Leaves simple, palmately or pinnately compound, with basal sheaths
- Flowers small and numerous, parts in 3's, usually on a branched inflorescence
- Inflorescence usually subtended by a large, sometimes woody bract

THE ORCHID FLOWER



- Fruit usually a drupe
- Uses: extremely economically important for fiber, fruit, oil, building material and wildlife food
- Representative genera: *Iriarteia*, *Socratea*, *Geonoma*, *Astrocaryum*, *Phytelephas*, *Attalea*, *Elaeis*, *Cocos*

Piperaceae - Black pepper family

- Distribution: Pantropical. ~3600 spp. (only 5 genera, the biggest is *Piper*)
- Habit: herbs, shrubs, small trees or epiphytes
- **Leaves:** simple, entire leaves, usually alternate, with **swollen nodes**
- **often with spicy or licorice odor**
- Flowers: tiny on a **spike**-like inflorescence arising opposite the leaves
- Fruits: small drupes, sometimes embedded in the spike.
- Uses: Black pepper (*Piper nigrum*), Kava

Poaceae - grass family

- Dist.: Worldwide. 5th largest plant family. 10,035 spp.
- Habit: Annual or perennial **herbs**, sometimes woody; often form dense mats or tufts
- **Stems round**, often with hollow internodes and swollen nodes
- Leaves: simple, entire, alternate, **2-ranked, parallel-veined**
- Leaves sheath the stem, and have an appendage (**ligule**) at the blade/sheath junction
- Flowers: in terminal panicles or clusters; small, apetalous, subtended by 2 bracts
- Fruit an **achene** or grain
- Representative genera: *Chusquea*, *Bambusa* (bamboos), *Gynerium* (caña brava), *Cortaderia*, *Stipa*, *Oryza* (rice), *Saccharum* sugar)

Rubiaceae - Coffee family, gardenias, quinine, bedstraw

- Dist.: Worldwide. The 4th largest plant family. ~13,150 spp.
- Habit: herbs, shrubs, trees and vines
- **Leaves: opposite** (or whorled), simple, usu. entire, with **interpetiolar stipules**
- Flowers: actinomorphic, solitary, sympetalous flowers with 4-5 fused petals, 4-5 stamens attached to corolla, corolla tube often filled with flattened hairs. **Ovary inferior w/ 2 carpels.**
- Fruit a drupe, berry, or capsule; usually with one or two seeds
- Uses: Coffee (*Coffea*), and drugs like quinine (*Cinchona*) and epacac, ornamentals, dyes (madder).

Solanaceae - Potato, tomato, peppers, chiles, tobacco, nightshade

- Dist.: Worldwide, with centers of diversity in C. and S. America and Australia. ~ 2000 spp.
- Habit: Erect or climbing herbs, shrubs or trees.
- Leaves: Alternate, variable - often pinnately lobed or dissected, sometimes hairy, hoary or prickly, **no stipules.**
- Flowers: Actinomorphic. Prominent calyx. Always have **5 petals with a fold line** down the center, often fused.
- 5 stamens, epipetalous; **anthers often yellow or pink and hug the style.** Ovary superior w/ 2 carpels.
- Fruit: A juicy (e.g. tomato) or hollow (e.g., peppers) berry with many **flattened seeds.** Calyx sometimes expands into inflated sac (e.g., ground cherry)

- Uses: Very economically important family! Tobacco, potato, eggplant, all peppers and chiles, tomatillo, tree tomato, naranjilla, and ornamental plants, belladonna, nightshade, Datura (zombie poison). Lots of **alkaloids**, many toxic members.

Zingiberaceae – Ginger family

- Dist.: Pantropical
- Habit: **Understory herbs** in moist forest with tuberous rhizomes (e.g., ginger root)
- Leaves: Simple, entire, alternate and **2-ranked**; **aromatic** when crushed; sheaths open with ligule
- Flowers: Zygomorphic, tubular, showy and subtended by bracts; often in spiral cone-like structure, from ground or at ends of stems.
- Fruit: Capsule or berry with arillate seeds
- Uses: many aromatic spices including ginger, galanga, turmeric, cardamom. Perfumes and ornamentals.

DIVISION Pteridophyta (lots of families) – The Ferns

- Dist: Worldwide, both temperate and tropical
- primitive vascular plants, mostly small to medium size herbs (except tree ferns *Cyatheaceae*), epiphytic or terrestrial.
- leaves usually thin and either frond like (feathers) or simple or lobed
- rhizomes present
- spores produced on the leaf underside (clumped in spots, lines or areas of “sori”).
- depend on water for fertilization, so restricted to moist sites.

DIVISION Bryophyta (lots of families) – The Mosses

- Dist: Worldwide, both temperate and tropical
- diminutive non-vascular plants growing in carpet-like clumps, “leaves” tiny.
- spores produced in capsules on end of thin stalks
- depend on water for fertilization, so restricted to moist sites.