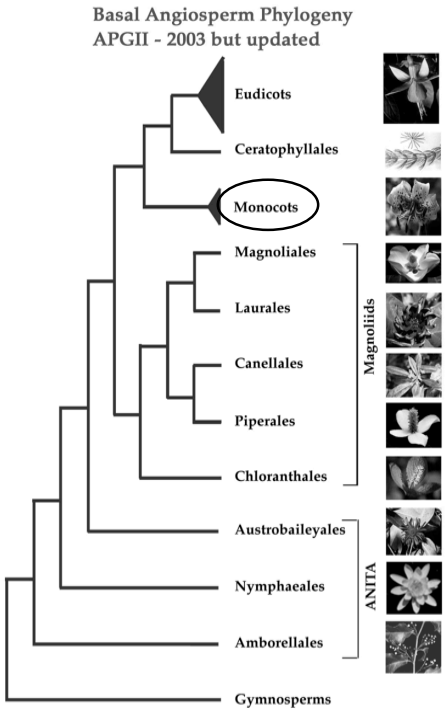
The Monocots



Monocotyledons - those plants possessing one seed leaf.

The other main features of the monocots separating them from all other flowering plants are:

1. 3 merous flowers
2. Parallel-veined leaves
3. Absence of woody tissue

Araceae - jack-in-the-pulpit family

Large family primarily of the tropics
Mainly epiphytic, others terrestrial, a few aquatic

Vegetative parts often containing **raphides** in the vacuoles with mucilage; raphides often **calcium oxalate** - an irritant

Inflorescence a fleshy **spadix**, surrounded by bract called the **spathe**

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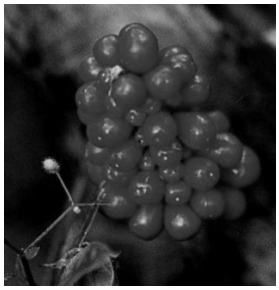
Flowers unisexual or perfect
Fruits berries clustered on spadix

Symplocarpus foetidus - skunk cabbage

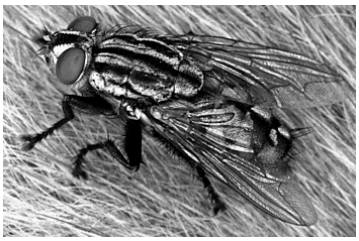


Arisaema triphyllum - jack-in-the pulpit

Araceae - jack-in-the-pulpit family

Rotting flesh odor, mottled purple and yellow-green coloration indicate specialized pollination syndrome

Symplocarpus foetidus - skunk cabbage



flesh flies - *Sarcophagidae*

carrion flies - *Calliphoridae*

gnats - *Mycetophilidae*

Lemnaceae - duckweed family

Lemna minor - small duckweed

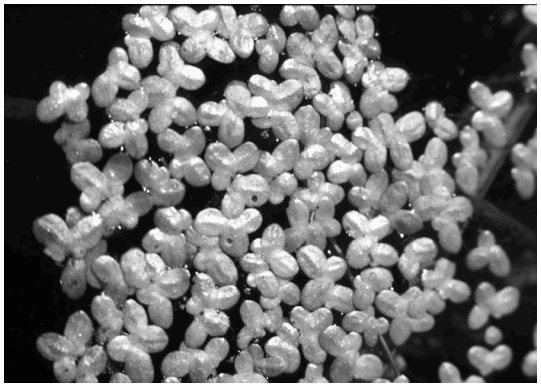
Floating or submersed aquatic family almost cosmopolitan in distribution; Vegetative reproduction primarily

Now known to be derived from within the Araceae

Includes the smallest angiosperm, and the smallest flower

Inflorescence reduced to 1 female and 1-2 male flowers

Lemna turionifera - perennial duckweed



Lilioids - petaloid monocots

The lilioid monocots represent five orders and contain most of the showy monocots such as lilies, tulips, blue flags, and orchids

Majority are defined by 6 features:

1. Terrestrial/epiphytes: plants typically not aquatic

Lilioids - petaloid monocots

The lilioid monocots represent five orders and contain most of the showy monocots such as lilies, tulips, blue flags, and orchids

Majority are defined by 6 features:

2. Geophytes: herbaceous above ground with below ground modified perennial stems: bulbs, corms, rhizomes, tubers

Lilioids - petaloid monocots

. . . thus common in two biomes

- temperate forest understory (low light, over-winter)
- Mediterranean (arid summer, cool wet winter)

Lilioids - petaloid monocots

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Majority are defined by 6 features:

3. Leaves without petiole: leaf blade typically broader and attached directly to stem without petiole

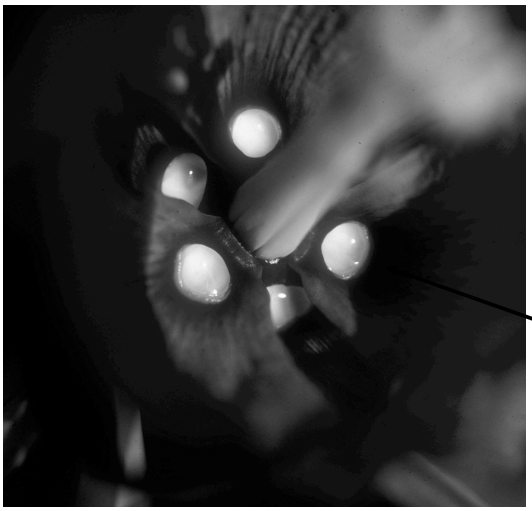
Lilioids - petaloid monocots

The lilioid monocots represent five orders and contain most of the showy monocots such as lilies, tulips, blue flags, and orchids

Majority are defined by 6 features:

4. Tepals: showy perianth in 2 series of 3 each; usually all petaloid, or outer series not green and sepal-like & with no bracts

Lilioids - petaloid monocots



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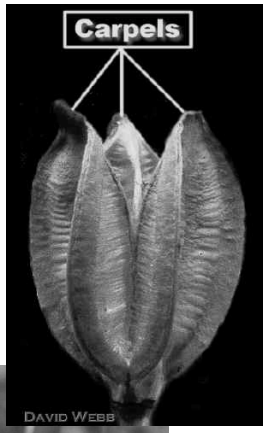
Majority are defined by 6 features:

5. Nectaries: usually well -developed nectar tissue at the base of ovary or stamens; insect or bird-pollinated

Lilioids - petaloid monocots



The lilioid monocots represent five orders and contain most of the showy monocots such as lilies, tulips, blue flags, and orchids

Majority are defined by 6 features:

6. Capsule/berry: fruit a 3-parted capsule or berry

Liliaceae s.l. - lily family

The orders of Liliales and Asparagales contain 15 families in the new classification system, but these are not well demarcated based on morphological features.

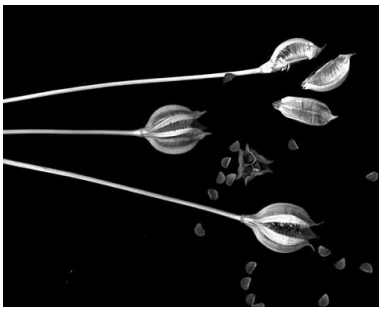
Liliaceae s.l. (sensu lato or "in the broad sense") = many of these families

"Liliaceae" of the two floras used in lab reflects this old usage which we will use

The family comprises herbaceous perennials common in the north temperate forests

Leaves usually do not have a well-developed petioles and leaves are either sessile or basal

Liliaceae s.l. - lily family



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Flowers are showy and 3 merous with 6 tepals

3 fused carpels (either superior or inferior) form capsule or berry with numerous seeds

Iridaceae – Iris Family

A family primarily of Mediterranean climate geophytes.
Leaves are basal and equitant - folded and overlapping.

Iris virginica - Blue flag iris

Iridaceae – Iris Family

CA 3 CO 3 A 3 $\underline{\overline{G}}$ (3)

Tepals 6, the 3 inner (petals) forming the "flags or standards"

The 3 outer (sepals) forming the "falls" with nectar guides

The 3 stamens are positioned under the 3 petal-like styles

The gynoecium is inferior and forms a 3-parted capsule

Iris virginica - Blue flag, iris

Orchidaceae - orchids

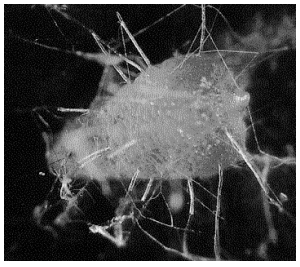
About 880 genera and over 22,000 species, mainly tropical; ranging from 0-5,000 m in nearly all environments except open water and true desert; more than half of species are epiphytic

Cypripedium acaule
Stemless lady-slipper

Corallorhiza striata
Striped coral root

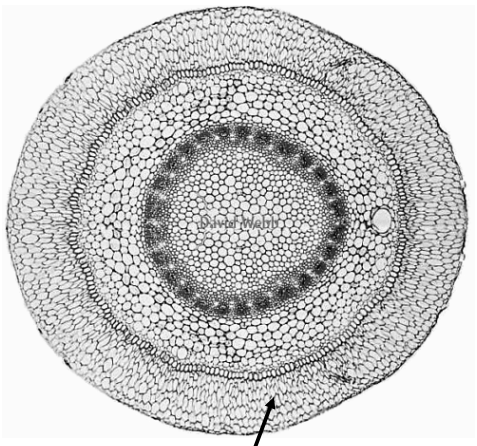
Orchids are mycotrophic (= fungi dependent); some are obligate mycotrophs

All orchids have a protocorm – restricted to this family



Orchidaceae - orchids

Survive in these epiphytic and other harsh environments via CAM photosynthesis, velamen, and leaf tubers, in addition to mycorrhizal association



Orchid root velamen (water storage)

leaf tubers (water storage)

Orchidaceae - orchids

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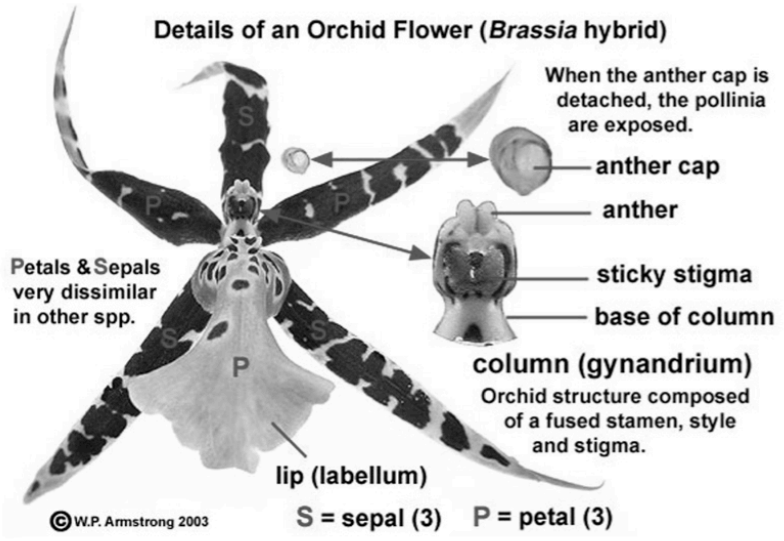

- 6 tepals with labellum (flower resupinate or upside down)
- 3 or fewer stamens
- inferior gynoecium fused at top with stamens to form column
- capsule