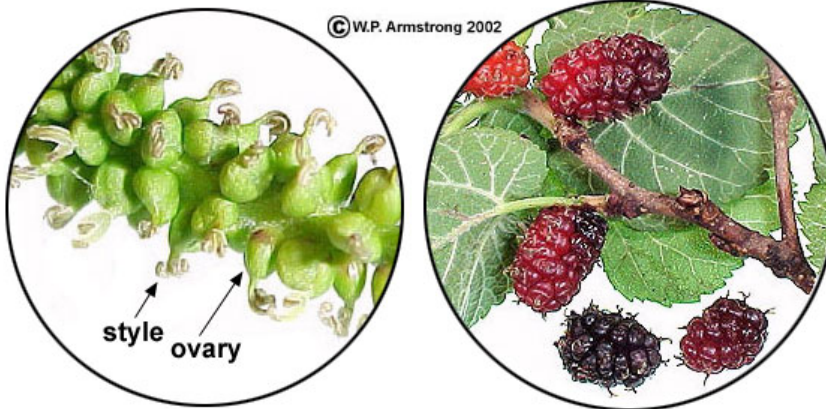




Tomato (Potato Family)

Simple, Aggregate, or Multiple Fruit?

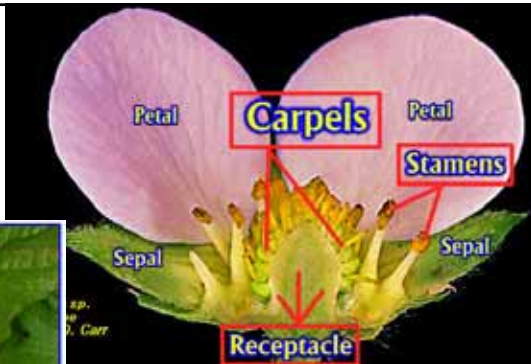
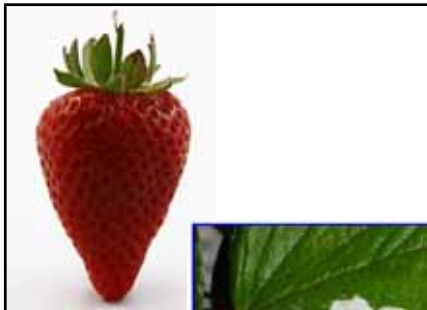


Black Mulberry (Fig Family)

Simple, Aggregate, or Multiple Fruit?



Raspberry (Rose Family)
Simple, Aggregate, or Multiple Fruit?



Strawberry (Rose Family)
Simple, Aggregate, or Multiple Fruit?

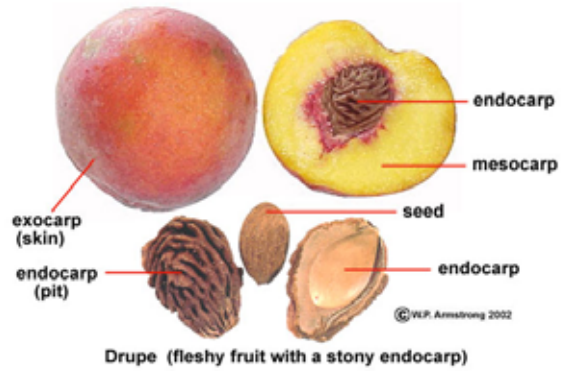


Morinda or Noni (Coffee Family)
Simple, Aggregate, or Multiple Fruit?

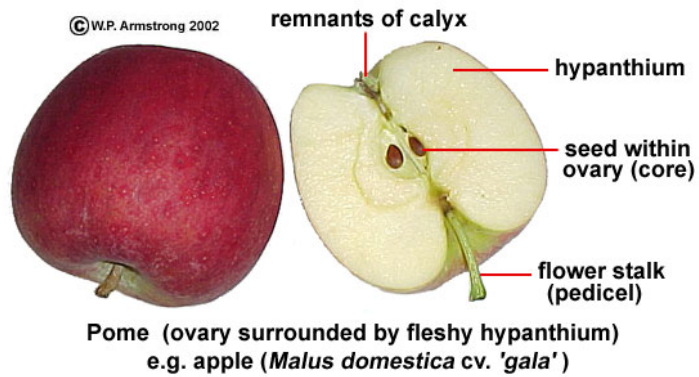


Pineapple (Bromeliad Family)
Simple, Aggregate, or Multiple Fruit?

4. Drupe: Seed enclosed within a stony endocarp (pit).



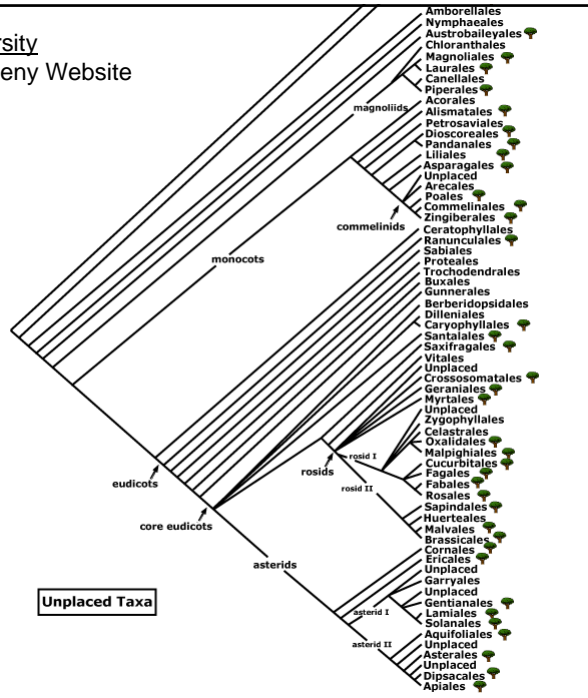
5. Pome: Accessory fruit with thick hypanthium.



Angiosperm Phylogeny & Diversity
 2. The Angiosperms Phylogeny Website



<http://www.mobot.org/MOBOT/research/APweb/>



Angiosperm Phylogeny & Diversity
 3. The Classic Distinction: the Dicots vs. Monocots

3a. Primitive Dicotyledons

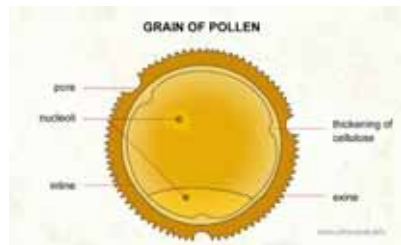
- 2 cotyledons.
- Mostly woody, with eustele and vascular cambium.
- Pinnate or palmate venation.
- Many with ethereal oils (many of our spices).
- Monoaperturate pollen.
- Flowers of many strobiloid in form (elongate, many spiraled parts).
- Flowers 3-merous when fewer parts.
- Perianth members free.
- Poor differentiation between floral whorls (tepals).
- Laminar stamens.

3b. Monocotyledons

- 1 cotyledon.
- Mostly herbaceous, all with atactostele & no vascular cambium.
- Parallel venation.
- Monoaperturate pollen.
- Flowers 3-merous and whorlar.
- Tepals.
- Tepals free or fused.
- Stamens well differentiated into filament and anther.

3c. Eudicotyledons

- 2 cotyledons.
- Woody or herbaceous, all with with eustele.
- Pinnate or Palmate venation.
- Triaperturate pollen.
- Flowers 4-5-merous and whorlar.
- Calyx and corolla well differentiated.
- Perianth of free or fused parts.
- Stamens well differentiated into filament and anther.



Mono- vs. Tri-aperturate Pollen



Primitive Dicot Examples

Magnolia family

Star Anise Family

Water-lily family

Laurel family

Star Anise Family

Star anise (*Illicium*; SW China)



Magnolia Family

Magnolia
(Magnoliopsida)



Liriodendron



Liriodendron



Liriodendron



Liriodendron



Water Lily Family

Nymphaea

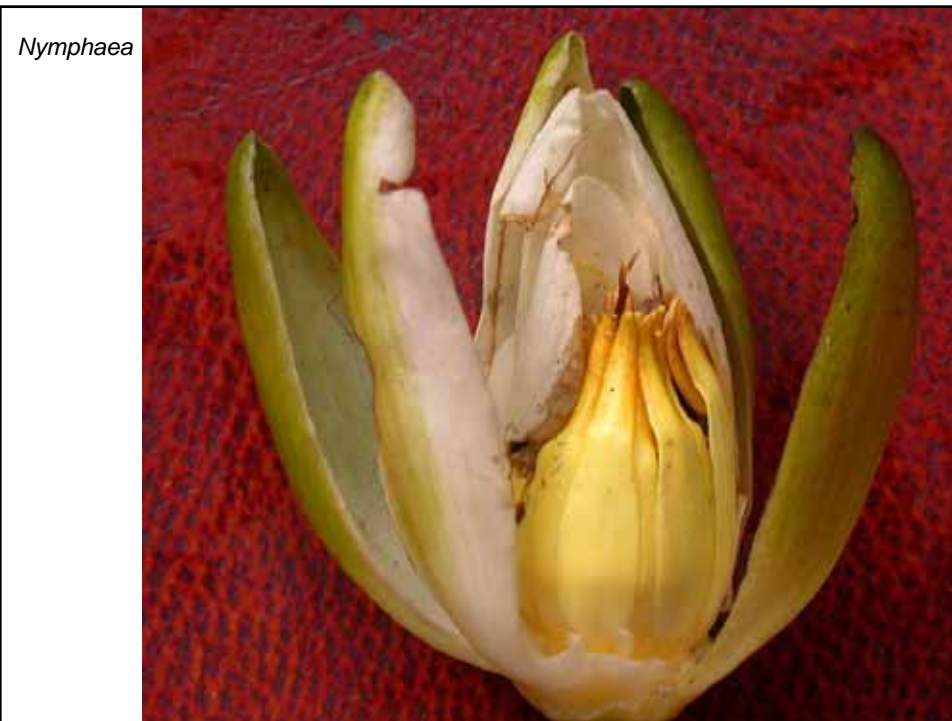




Nymphaea



Nymphaea



Nymphaea



Nymphaea



Nymphaea



Nymphaea



Victoria



Victoria



Victoria



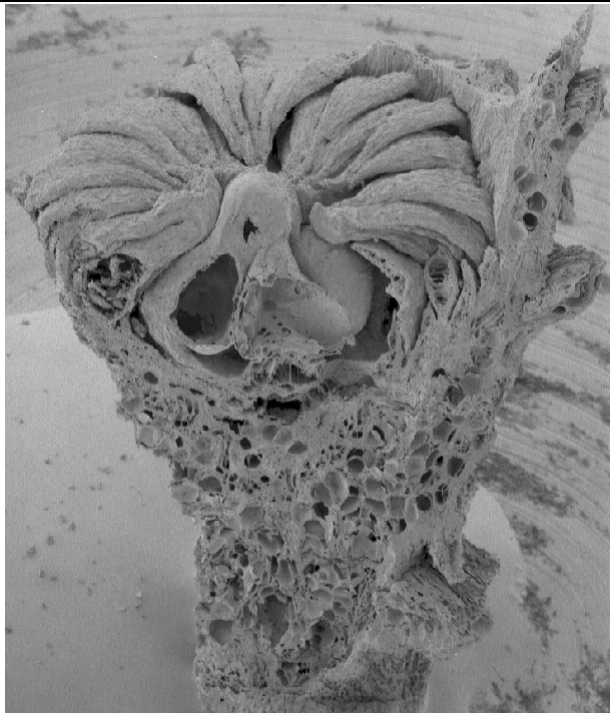
Victoria



Victoria



Microvictoria
90 mya, NJ



Nuphar



Nuphar



Nuphar



Nuphar



Nuphar



Nuphar



Nuphar



Nuphar



Cabomba or Fanwort family

Brasenia

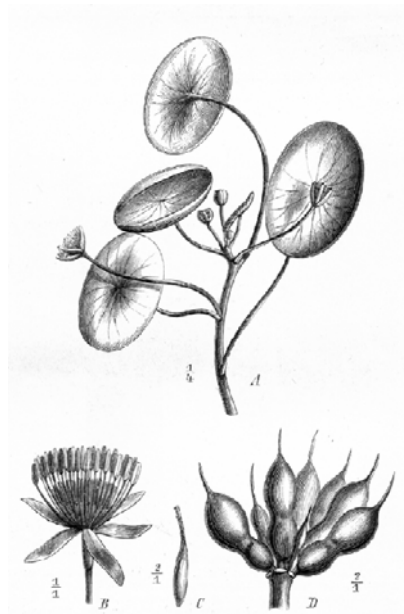


Fig. 6. *Brasenia purpurea* (Michx.) Casp. A blühender Zweig; B Blüte; C ein Fruchtbl.; D Fr. einer Bl.

Brasenia



Brasenia



Brasenia



Cabomba



Cabomba



Laurel family

Lindera



Sassafras





Persea
(Magnoliopsida)



Laurus



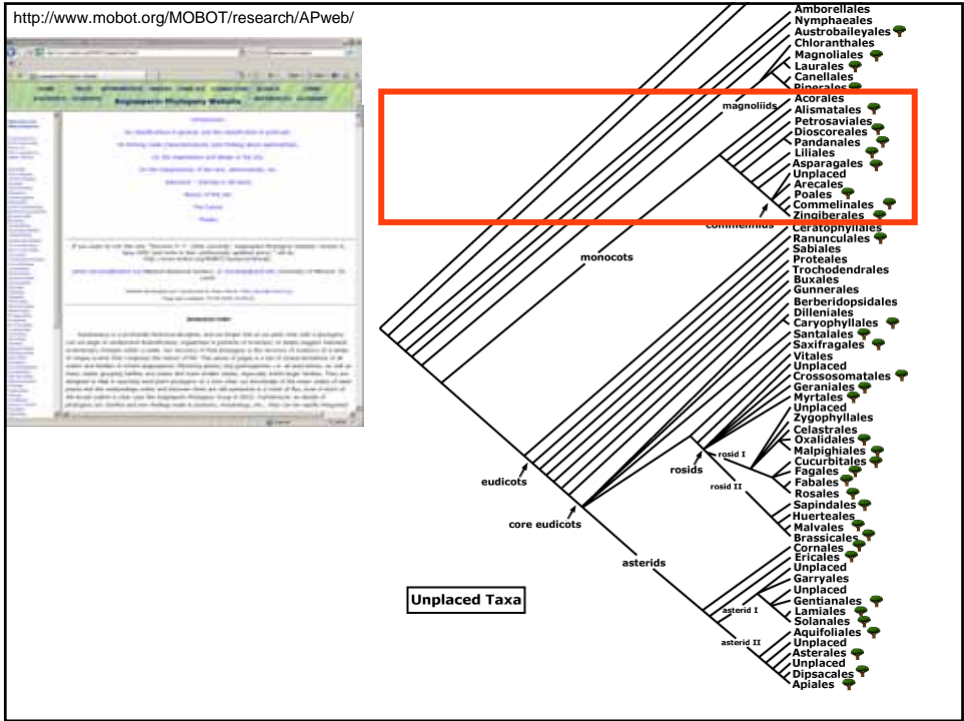
Laurus



Lindera







Monocot Examples

- *****
- Water-plantain family
 - Lily family (sensu lato)
 - Ginger family and relatives

Alisma



Lilium



Asparagus



Agave (related to Asparagus)



Agave (related to *Asparagus*)



Allium



Zingiber



Zingiber



Musa



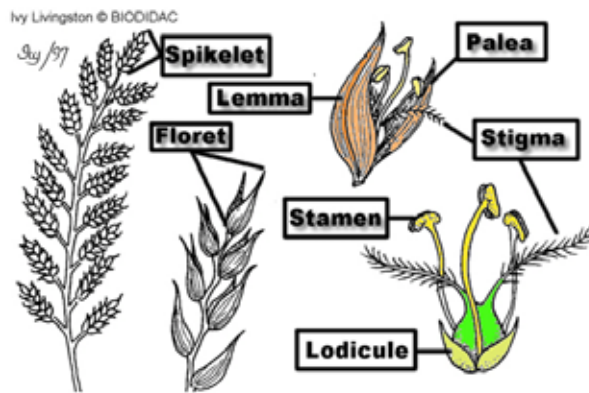
Strelitzia





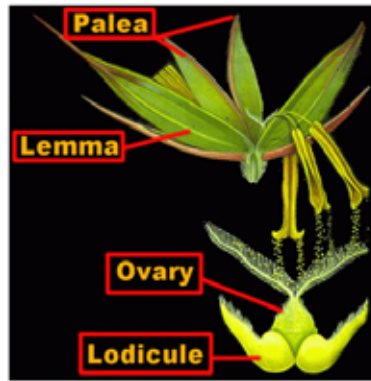
Pennisetum

Poaceae

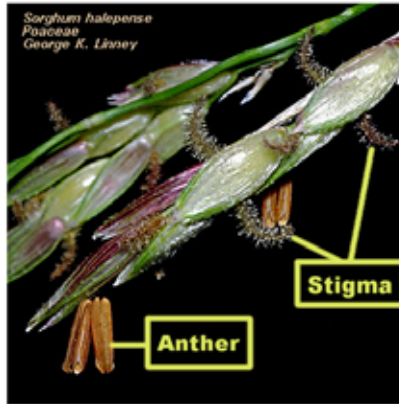


Grass spikelets and flowers

Grass family



Grass spikelets and flowers



Eudicot examples

Buttercup family

Tea family

Rose family

Blueberry & Rhododendron family

Sunflower family

Buttercup (*Ranunculus*)



Blackberries (*Rubus*)



Roses (*Rosa*)



Roses (*Rosa*)



Tea (*Camelia*)



Blueberry family (e.g., *Vaccinium*)



Sunflower family (e.g., *Helianthus*)

