

# Introduction to Botany. Lecture 36

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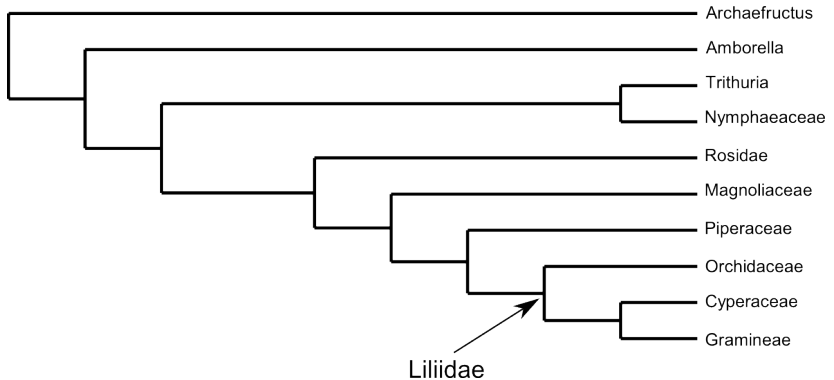
Minot State University

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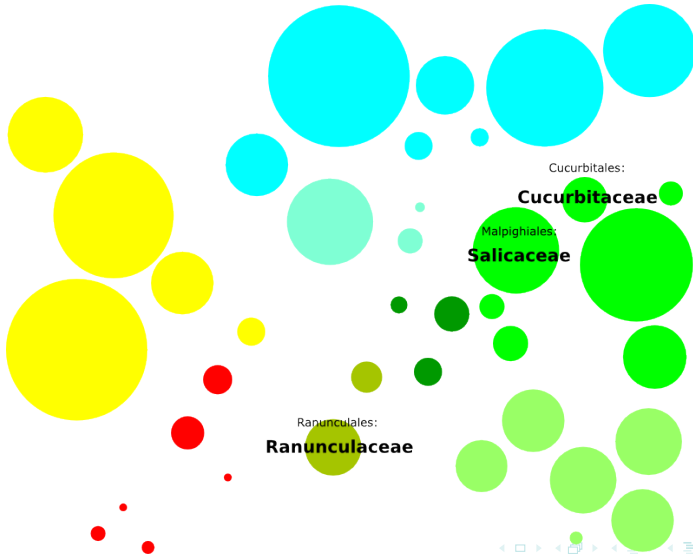
# Outline

- 1 Rosidae, or rosids (Part I)
  - Ranunculaceae—buttercup family
  - Salicaceae—willow family
  - Cucurbitaceae—melon family

# Phylogeny of angiosperms so far



# Overview of rosids



# Main features of rosids

- Pentamerous flowers
- Often diplostemony (two cycles of stamens)
- Often hypanthium (cup-like receptacle)
- Free petals
- Most are trees

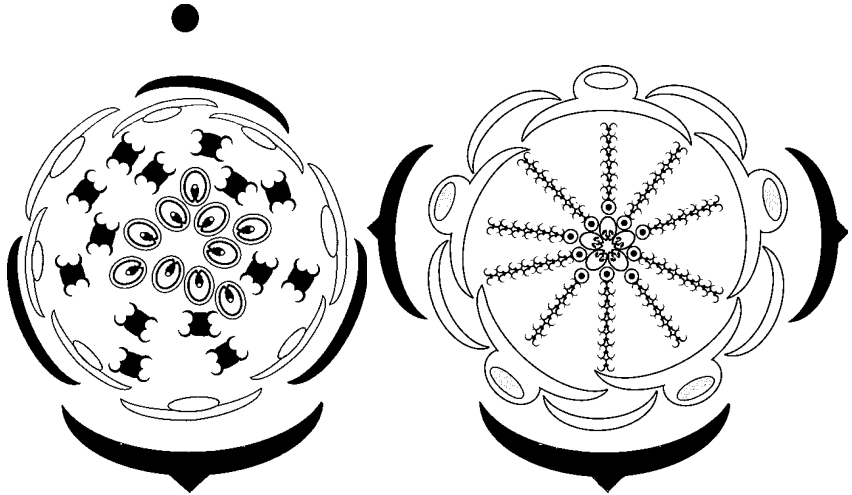
# General features of Ranunculaceae

- $\approx 2,000$  species
- Distributed mostly in temperate regions of both Northern and Southern Hemispheres
- Generally, forest or meadow plants

# Morphology of Ranunculaceae

- Mostly herbs
- Vascular bundles sometimes scattered (as in monocots)
- Leaves are complicatedly dissected or compound, alternate, without stipules
- Flowers solitary or in different raceme-like inflorescences; bisexual, mostly with infinite ( $> 12$ , irregular) number of stamens and pistils
- Petals originate from stamens, sometimes absent
- Carpels free, form multiple pistils
- Fruit is multiple follicle or multiple nut
- Embryo very small, sometimes has one cotyledon

# Ranunculaceae: *Ranunculus* and *Aquilegia*



\*K<sub>3-5</sub>C<sub>0-5-8</sub>A<sub>∞</sub>G<sub>1-∞</sub>



# Representatives of Ranunculaceae

- Many ornamental plants, e.g., *Ranunculus* (buttercup), *Aquilegia* (columbine), *Anemone*
- *Ranunculus* and other genera are important component of wet grasslands

# *Ranunculus ficaria*



# Blue anemones, *Anemone*



# Columbine, *Aquilegia vulgaris*



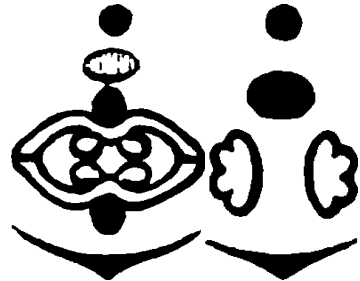
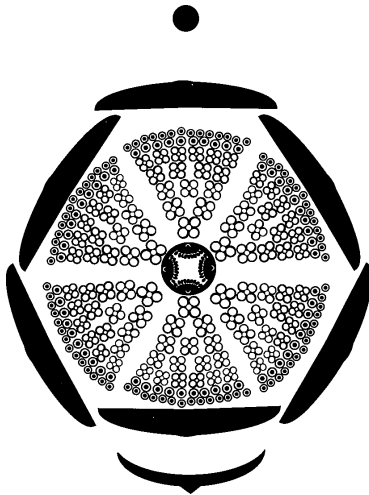
# General features of Salicaceae

- $\approx 1010$  species
- Distributed across all climatic zones, most genera are in tropics, most species in temperate regions
- Poplar (*Populus*) and willow (*Salix*) are important component of temperate riparian forests

# Morphology of Salicaceae

- Trees, usually with alternate simple leaves with stipules and salicoid teeth
- In many genera, flowers are more and more reduced—from flowers with numerous stamens and both sepals and petals to apetalous flowers with several stamens
- Flowers often have disk—flattened nectariferous structure
- Pistil of two carpels
- Fruit is a capsule
- Seeds often with hairs

# Salicaceae: *Azara* and *Salix* (female, male)



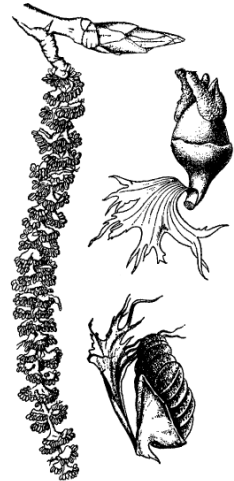
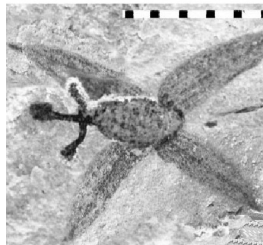
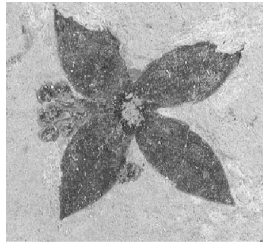
$$*K_{0-6}C_{0-8}A_{2-\infty}\underline{G_{(2-4)}}$$

# Representatives of Salicaceae

- Willow (*Salix*), almost 300 species of trees and shrubs, important component of Northern flora
- Poplar, or cottonwood (*Populus*) has  $\approx 40$  species. Cultivated as a wood source. Aspen (*Populus tremuloides*) is a main component of North Dakota forests.



# Salicaceae: salicoid teeth; fossil *Pseudosalix* and recent *Populus*



# *Salix hastata*, female and male plants



# Aspen, *Populus tremuloides*



# Azara flowers



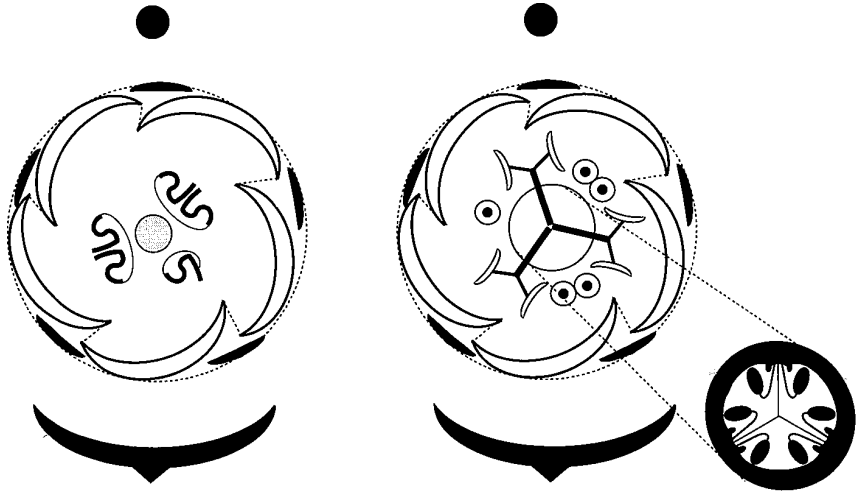
# General features of Cucurbitaceae

- $\approx$  900 species, mostly tropical and subtropical plants
- Prefer dry regions, important component of different deserts

# Morphology of Cucurbitaceae

- Hairy herbs or vines with tendrils (modified shoots)
- Vascular bundles bicollateral: phloem located between both sides of xylem
- Leaves alternate, without stipules, sometimes palmately dissected, with actinodromous venation
- Flowers unisexual, in raceme-like inflorescences
- Petals fused, form a tube
- Stamens usually fused
- Pistil with 3 carpels, ovary inferior (flower epigynous)
- Fruit is a berry

## Cucurbitaceae flower diagram



$$*K_{(5)}C_{(5)}A_{(3-5)}; *K_{(5)}C_{(5)}\overline{G_{(3)}}$$

# Representatives of Cucurbitaceae

- Many famous crops:
  - Pumpkin, squash—*Cucurbita*
  - Melon—*Melo*
  - Watermelon—*Citrullus*
  - Cucumber—*Cucumis*
  - Gourd—*Lagenaria*
- In North Dakota, invasive wild cucumber (*Echinocystis*) is a common plant now
- Exploding cucumber—*Ecballium* is a famous example of mechanical seed distribution
- *Hodgsonia* is one of the most attractive Cucurbitaceae



# Wild watermelon, *Citrullus colocynthis*



# Wild cucumber, *Excinocystis lobata* (near Minot)



## *Hodgsonia heteroclita*, female plant



# Summary

- Ranunculaceae is an example of flower stabilization
- Salicaceae is an example of flower reduction
- Cucurbitaceae is an example of sympetaly

# For Further Reading



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.  
*Plant Biology*. 2nd edition.  
Thomson Brooks/Cole, 2006.  
**Chapter 25.**