

# Systematic Botany. Lectures 23–26

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# Outline

## Pink order: Caryophyllales

Amaranthaceae—amaranth family

Caryophyllaceae—pink family

Polygonaceae—smartweed family



# Pink order: Caryophyllales

## Amaranthaceae—amaranth family



# General features of Amaranthaceae

## Amaranthaceae—amaranth family

- ▶  $\approx$  2,500 species
- ▶ Worldwide distribution
- ▶ Desert, semi-desert and dryland plants
- ▶ Often split in Amaranthaceae s.str. and Chenopodiaceae (beet family)

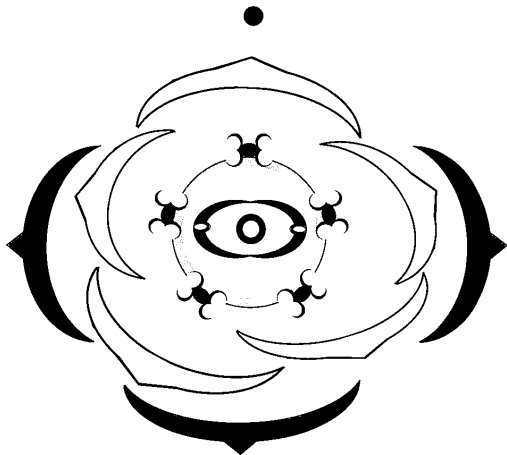


# Morphology of Amaranthaceae

- ▶ Herbs and shrubs, contain red pigments **betalains**
- ▶ Stems with unusual tissue structure (“abnormal secondary growth”), leaves often succulent, sometimes with salt glands
- ▶ Flowers reduced, mono- or bisexual, in dense glomerules
- ▶ Pistil has 2 (or 3) carpels and one ovule
- ▶ Fruit is a nutlet
- ▶ Embryo curved around **perisperm**



# Amaranthaceae flower



\* $K_{0-5}C_0A_5G_{(2-3)}$

## *Nitrophila occidentalis* flower



# Economically important representatives of Amaranthaceae

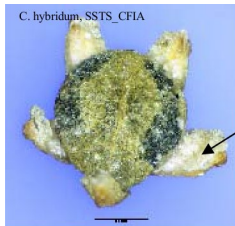
## Vegetables and so-called “pseudocereals”

- ▶ *Beta*—beet
- ▶ *Chenopodium quinoa*—quinoa
- ▶ *Amaranth*—amaranth, both ornamental and pseudocereal
- ▶ *Spinacia oleracea*—spinach



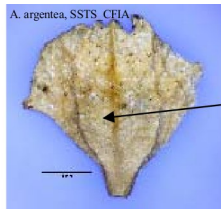


## *Chenopodium* vs. *Atriplex*



Fruiting  
bract

- Five fruiting bracts, meeting in the middle of the flat side.
- \* Meets on the thin edge in *C. bonus-henricus*, *C. capitatum* and *C. rubrum*.



Fruiting  
bract

- Two fruiting bracts, meeting along the thin edge.
- Note that the pericarp (seed covering) follows the alignment of the bracts.

# Pink order: Caryophyllales

## Caryophyllaceae—pink family



# General features of Caryophyllaceae

## Caryophyllaceae—pink family

- ▶  $\approx$  2,000 species
- ▶ Distributed in temperate and warm temperate regions of Northern Hemisphere
- ▶ Forest, meadow and prairie plants

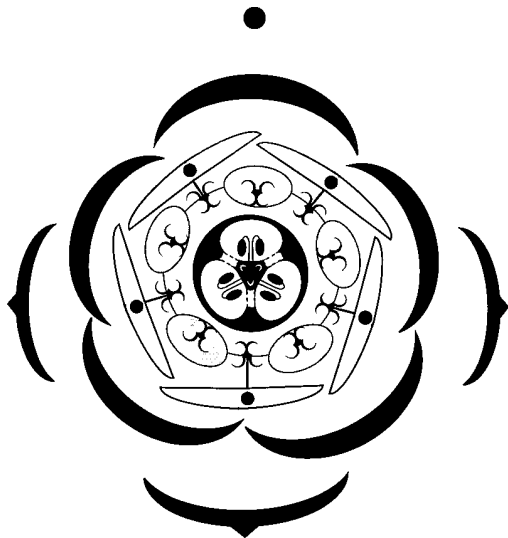


# Morphology of Caryophyllaceae

- ▶ Mostly herbs
- ▶ Stems are usually swollen at nodes, leaves narrow, opposite, with hypodromous venation, usually without stipules
- ▶ Flower bisexual, pentamerous, in cymes; with free petals and sepals (sometimes sepals fuse), stamens 5 or 5+5,
- ▶ Pistil has 3 or 5 carpels, ovules in one camera, attached to the central placenta
- ▶ Fruit dehiscent, dry capsule
- ▶ Embryo curved around perisperm



# Caryophyllaceae flower



\* $K_5 C_5 A_{5+5} \underline{G_{(3-5)}}$



# Representatives of Caryophyllaceae

Mostly ornamental and weed plants

- ▶ *Dianthus*—pink
- ▶ *Stellaria*—chickweed
- ▶ *Cerastium*—mouse-ear chickweed



## Garden cultivar of *Dianthus*



# *Cerastium*





# *Stellaria* sp.



# Pink order: Caryophyllales

## Polygonaceae—smartweed family



## Polygonaceae—smartweed family

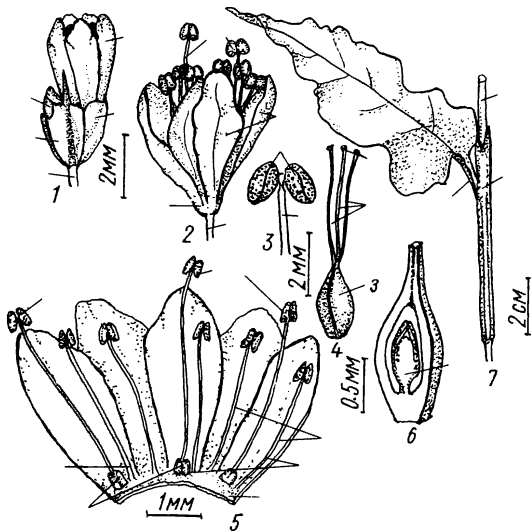
- ▶  $\approx 1,100$  species
- ▶ Distributed mostly in Northern hemisphere, prefer wetlands
- ▶ Life forms: herbs, sometimes shrubs and even trees (sea-grape, *Coccoloba*)
- ▶ Leaves alternate, simple, with ocrea—sheathing membranous stipule
- ▶ Flowers actinomorphic, often 3-merous, without sepals/petals, perianth calyx-like or corolla-like, androecium of 6–9 stamens
- ▶ Pistil with three carpels, one camera and one terminal ovule
- ▶ Fruit is a nut (1-seeded dry fruit), seed with perisperm



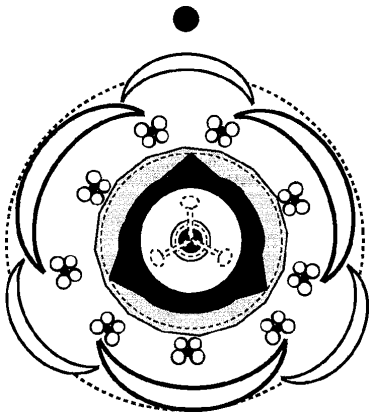
# Ocrea



# *Persicaria*, smartweed



# Polygonaceae flower



$$*P_{\{3+3\}} \vee 5 A_{3-9} \underline{G(3)}$$

# Representatives of Polygonaceae

Importance: food and ornamental plants

- ▶ *Polygonum*, *Bistorta*, *Persicaria*, *Fallopia*—smartweeds  
Understood differently in “Flora of North America” and USDA PLANTS database
- ▶ *Rumex*—sorrel  
Many inconstent keys in the past
- ▶ *Rheum*—rubarb
- ▶ *Fagopyrum*—buckwheat
- ▶ *Coccoloba*—sea-grape
- ▶ *Eriogonum*—wild buckwheat  
No ocrea!




## Other Caryophyllales

- ▶ Nyctaginaceae (3 genera): small flowers with monomerous pistil and big showy bracts, like *Mirabilis* (four-o'clock)
- ▶ Cactaceae (cacti and leafy *Portulaca*)  
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- ▶ Aizoaceae (mostly South African 1 genus in ND)
- ▶ Droseraceae (sundew)
- ▶ Molluginaceae (*Mollugo*)
- ▶ Montiaceae (*Phemeranthus*)
- ▶ Nepenthaceae (Asian pitcher plants)
- ▶ Phytolaccaceae (*Sarcobatus* in ND)
- ▶ Tamaricaceae (*Tamarix*)






## For Further Reading

 A. Shipunov.  
*Systematic Botany* [Electronic resource].  
2011—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_448](http://ashipunov.info/shipunov/school/biol_448)

 A. Shipunov.  
Flora of North Dakota: Checklist  
2012—onwards.

Mode of access: <http://ashipunov.info/shipunov/fnddb>

