Systematic Botany. Lecture 28–31

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Outline

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Amaranthaceae—amaranth family

Caryophyllaceae—pink family

Polygonaceae—smartweed family

General features of Amaranthaceae

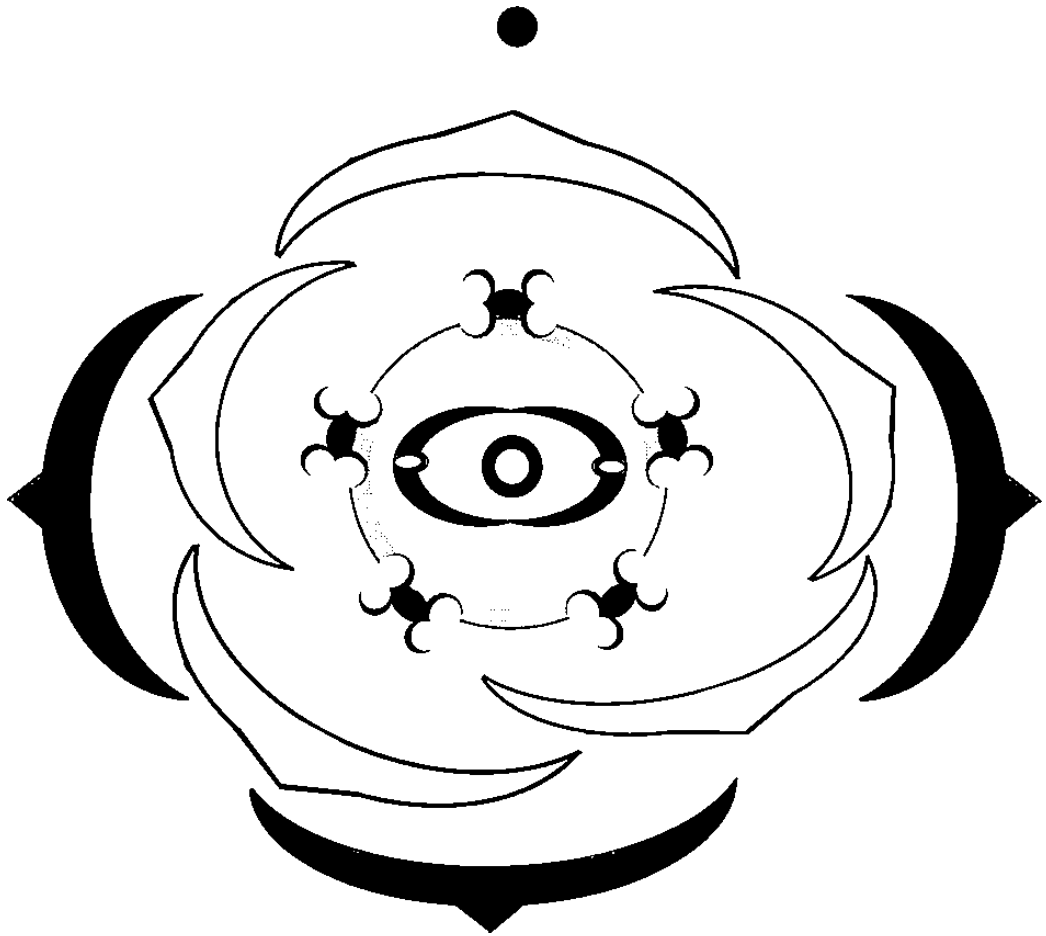
Amaranthaceae—amaranth family

- $\approx 2,500$ 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



$$\ast \mathrm{K}_{0-5}\mathrm{C}_{0}\mathrm{A}_{5}\mathrm{G}_{\underline{(2-3)}}$$

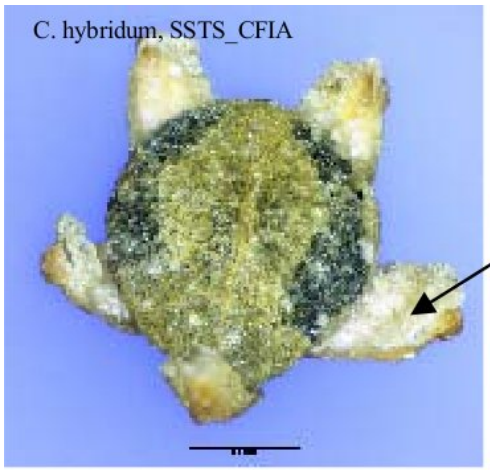
Nitrophila occidentalis frower

Economically important representatives of Amaranthaceae

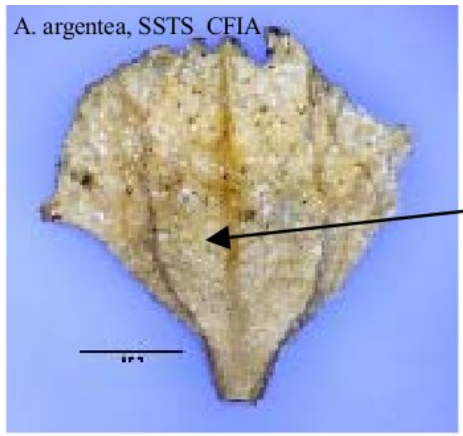
Vegetables and so-called “pseudocereals”

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

Chenopodium vs. *Atriplex*



- 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.*



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

General features of Caryophyllaceae

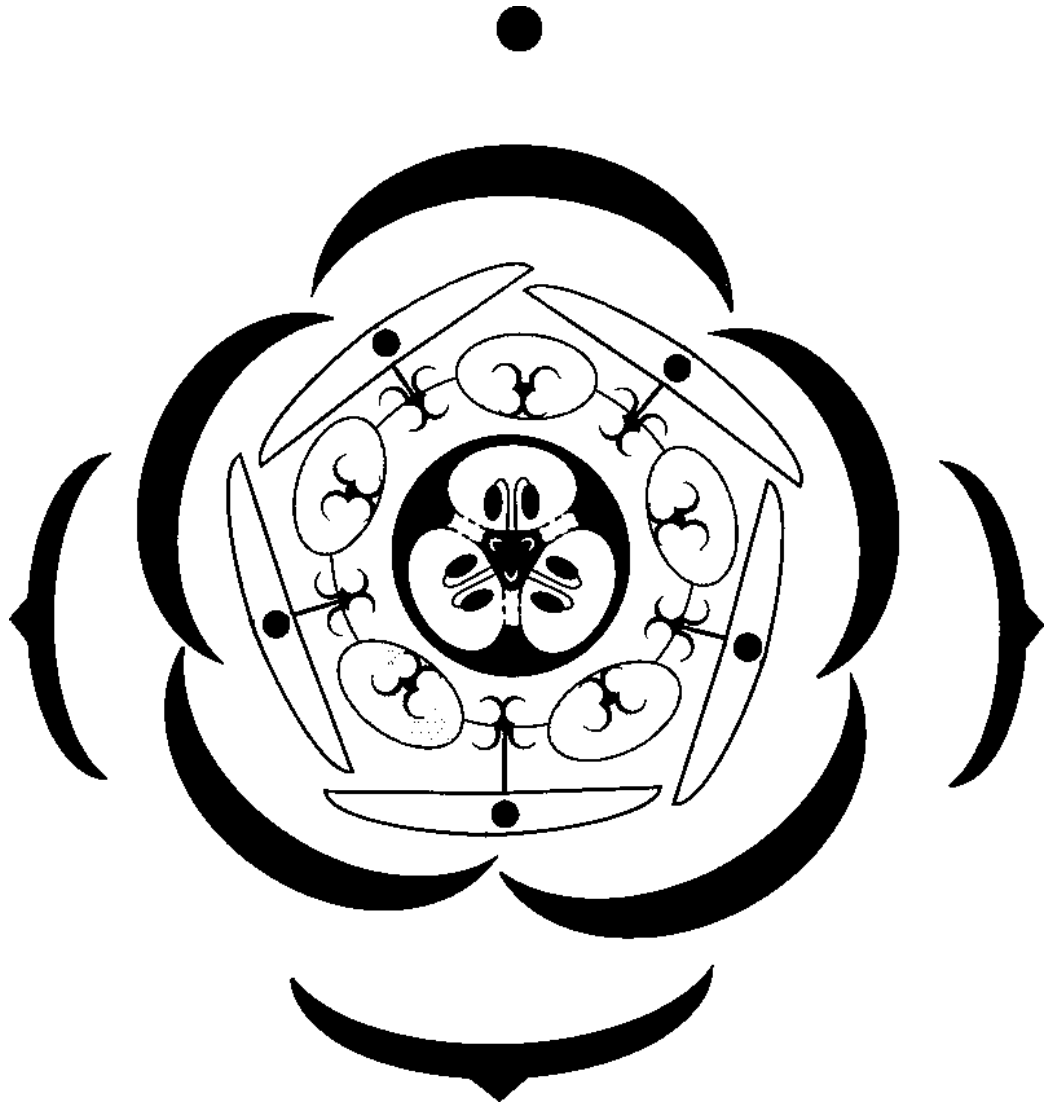
Caryophyllaceae—pink family

- $\approx 2,000$ 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 hyphodromous 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



$$\ast \mathrm{K}_5\mathrm{C}_5\mathrm{A}_{5+5}\mathrm{G}_{\underline{(3-5)}}$$

Representatives of Caryophyllaceae

Mostly ornamental and weed plants

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

Garden cultivar of *Dianthus*

Cerastium

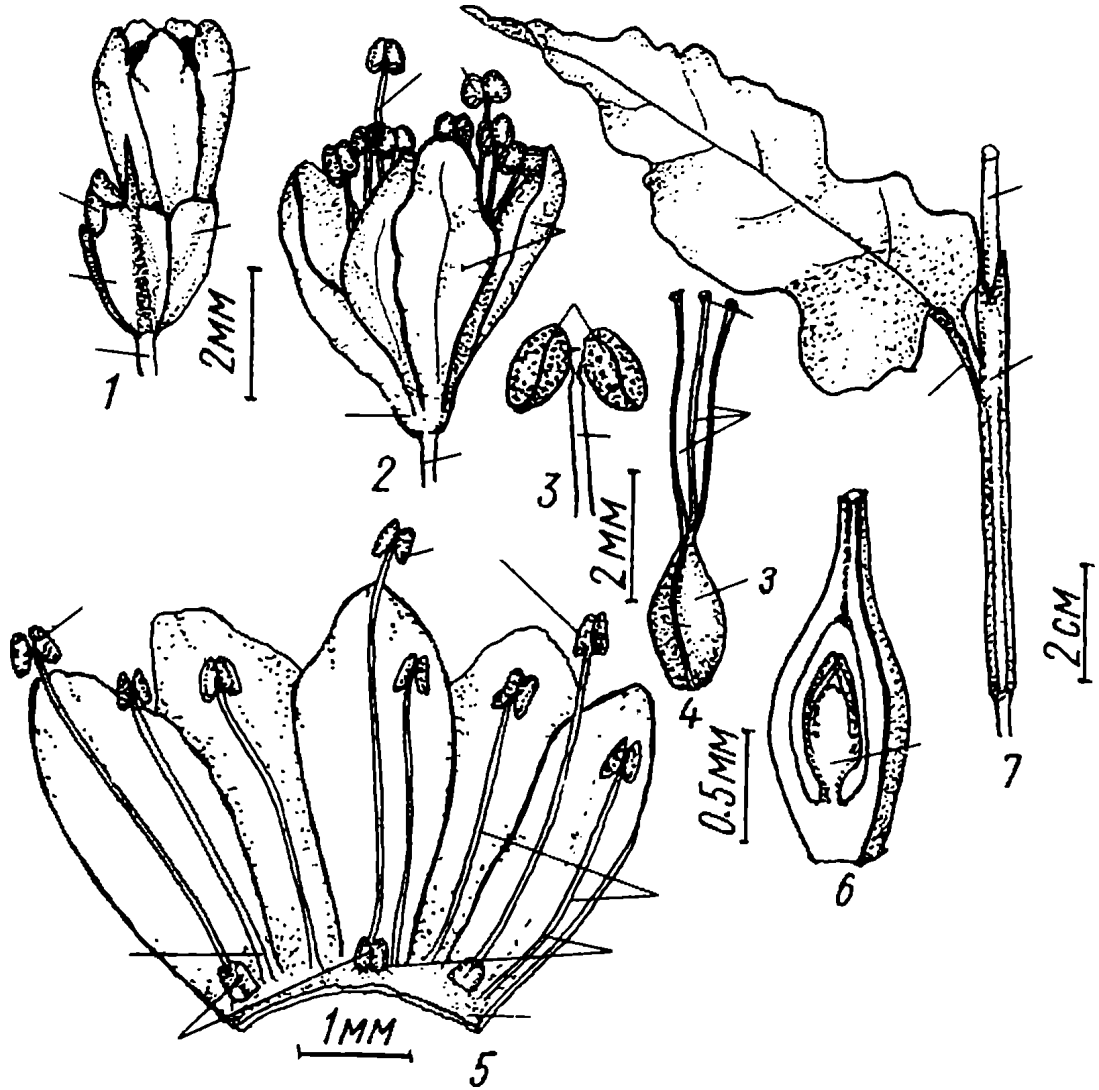
Stellaria sp.

Polygonaceae—smartweed family

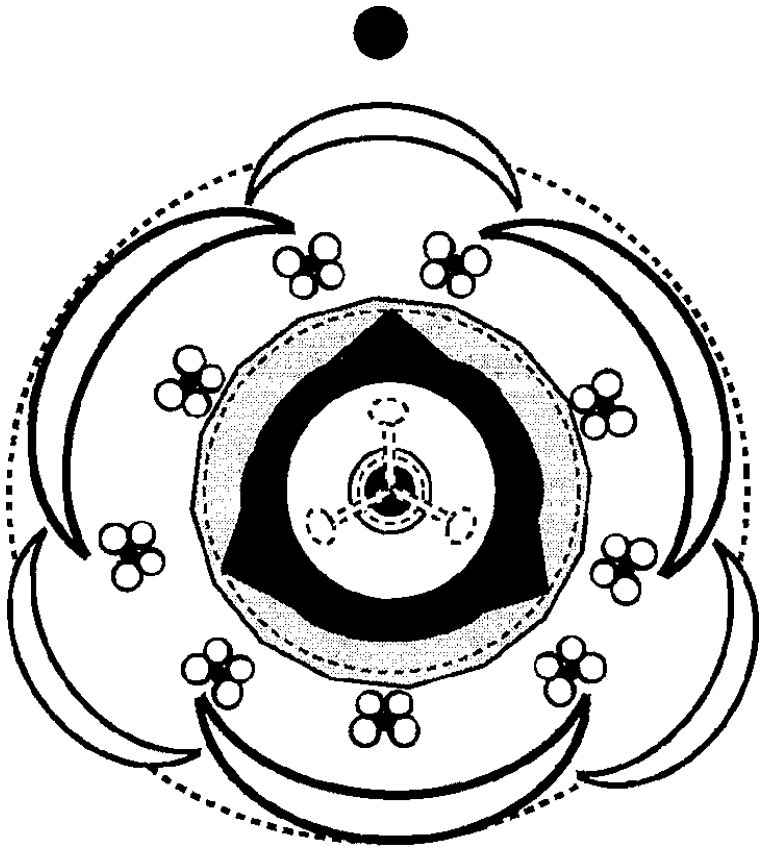
- $\approx 1,100$ species
- Distributed mostly in Northern hemisphere, prefer wetlands
- Life forms: herbs, sometimes shrubs and even trees (sea-grape, *Coccoloba*)
- Leaves alternate, simple, with ocrea—sheating membranous stipule
- Flowers actinomorphic, often 3-merous, without sepals/petals, perianth 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



$$\ast \mathrm{P}_{\{3+3\}\vee 5}\mathrm{A}_{3-9}\mathrm{G}_{\underline{(3)}}$$

Representatives of Polygonaceae

Importance: food and ornamental plants

- *Polygonum*, *Bistorta*, *Persicaria*, *Fallopia*—smartweeds
- *Rumex*—sorrel
- *Rheum*—rubarb
- *Fagopyrum*—buckwheat
- *Coccoloba*—sea-grape

For Further Reading

A. Shipunov.
Systematic Botany [Electronic resource].
2011—onwards.
Mode of access:
http://ashipunov.info/shipunov/school/biol_448

Van Bruggen, Th.
The vascular plants of South Dakota.
1996. 3rd ed.
University of South Dakota, Vermillion, SD.