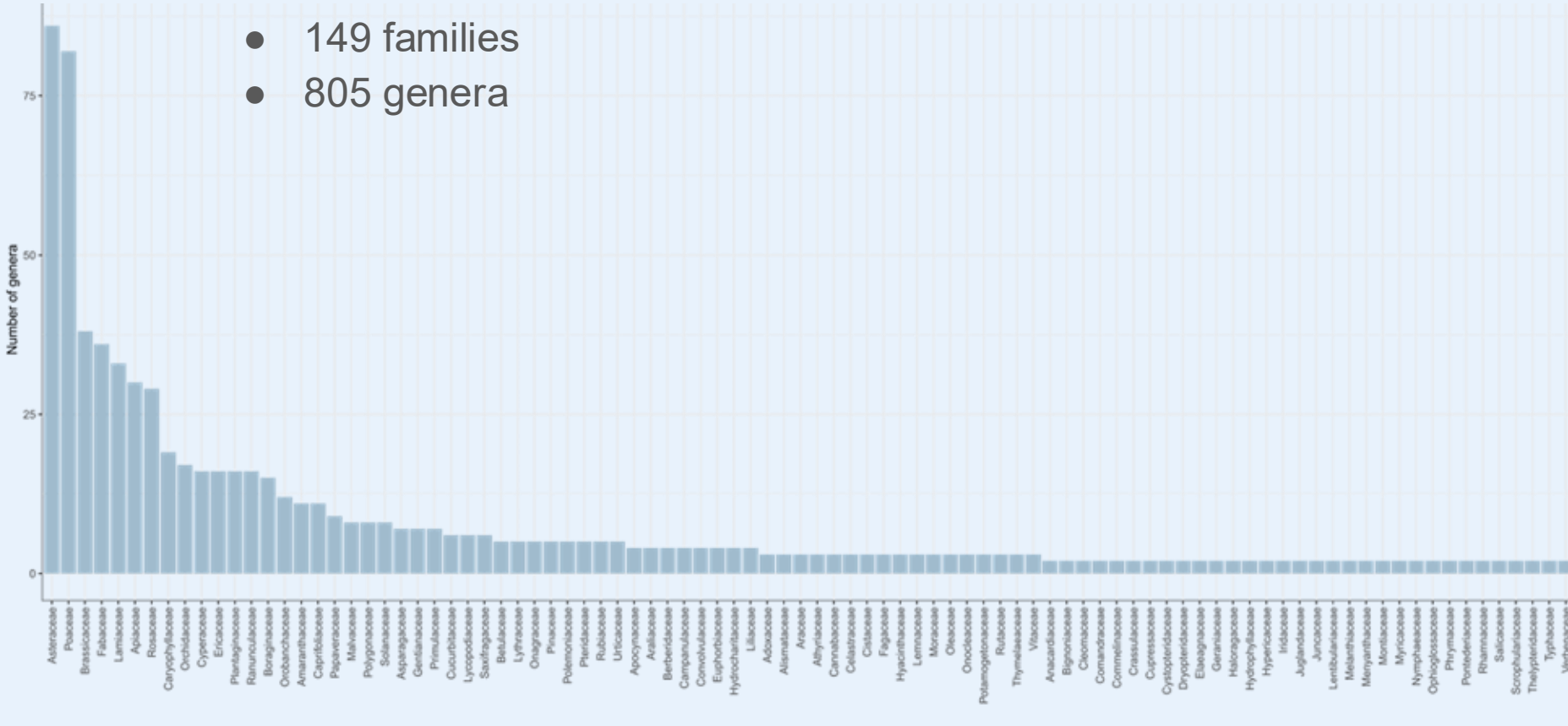

Plant Taxonomy
Flower Morphology

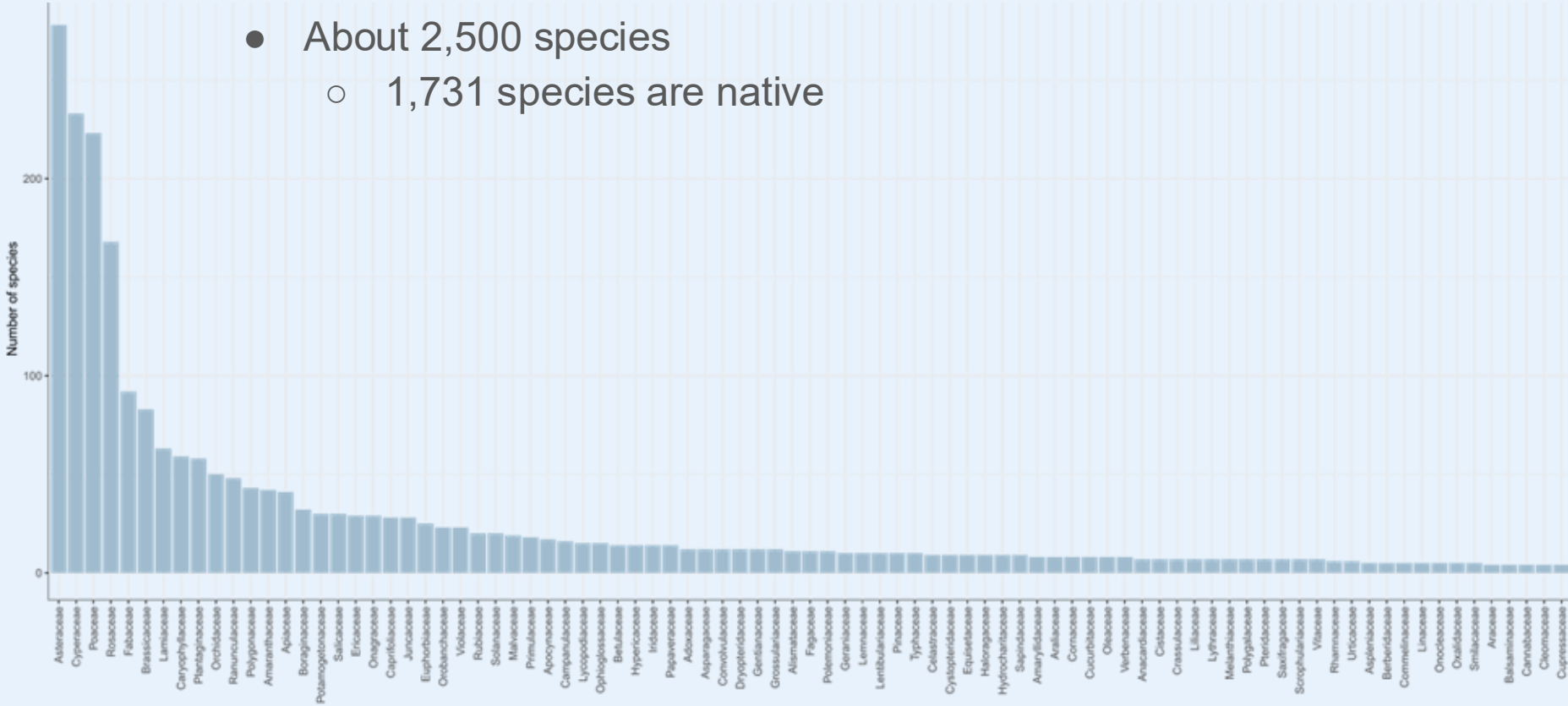
Plant families in Wisconsin

- 149 families
- 805 genera



Plant families in Wisconsin

- About 2,500 species
  - 1,731 species are native



Aquatic Plant Biology (BIOLOGY 359)

- Fall semesters

General plant form

- Terminology reference: http://tinyurl.com/7bwy3uw
- Vegetative
- Reproductive


Prunus


Pyrola


Spiraea


Linaria (butter-and-eggs)

How plants grow

- Plant growth is *indeterminate* and *modular*
  - Indeterminate?
  - Modular?

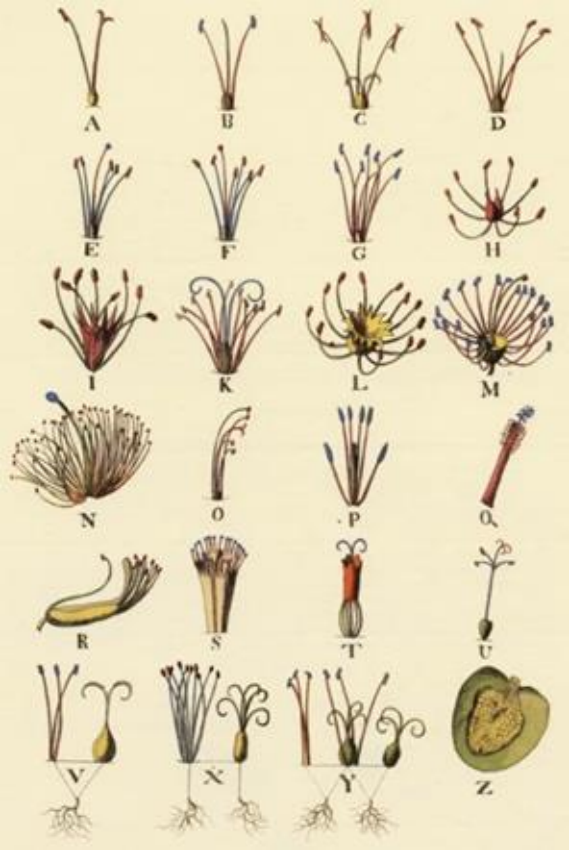
The importance of flowers

- Function?
- Often conspicuous

Flowers for classification

- Often consistent within a taxonomic group
  - Numbers of organs
  - Positions/fusion of organs

‘Sexual system’ of classification



A. Monandria (1 stamen)
B. Diandria (2 stamens)
C. Triandria (3 stamens)
D. Tetrandria (4 stamens)
E. Pentandria (5 stamens)
F. Hexandria (6 stamens)
G. Heptandria (7 stamens)
H. Octandria (8 stamens)
I. Enneandria (9 stamens)
K. Decandria (10 stamens)
L. Dodecandria (12 stamens)
M. Icosandria (20 stamens)
N. Polyandria (many stamens)
O. Didynamia (2 stamens longer than the rest)
P. Tetradinamia (4 stamens longer than the rest)
Q. Monadelphia (all stamens fused together)
R. Diadelphia (stamens fused into two sets)
S. Polyadelphia (stamens fused into many sets)
T. Syngenesia (filaments separate but anthers fused)
U. Gynandria (stamens fused to pistil)
V. Monoecia (unisexual flowers on the same plant)
W. Dioecia (unisexual flowers on different plants)
X. Polygamia (unisexual and hermaphroditic combinations)
Y. Cryptogamia (flowers hidden from view)

- The original classifications by Linnaeus used flower features to group plants
- Reproductive organs: number and fusion of stamens / pistils

Just to clarify...

This is a flower

This is a plant
(roots included)

“Is it a flower or a weed?”

How flowers grow

- Flowers are *determinate* shoots with condensed internodes

Whorls

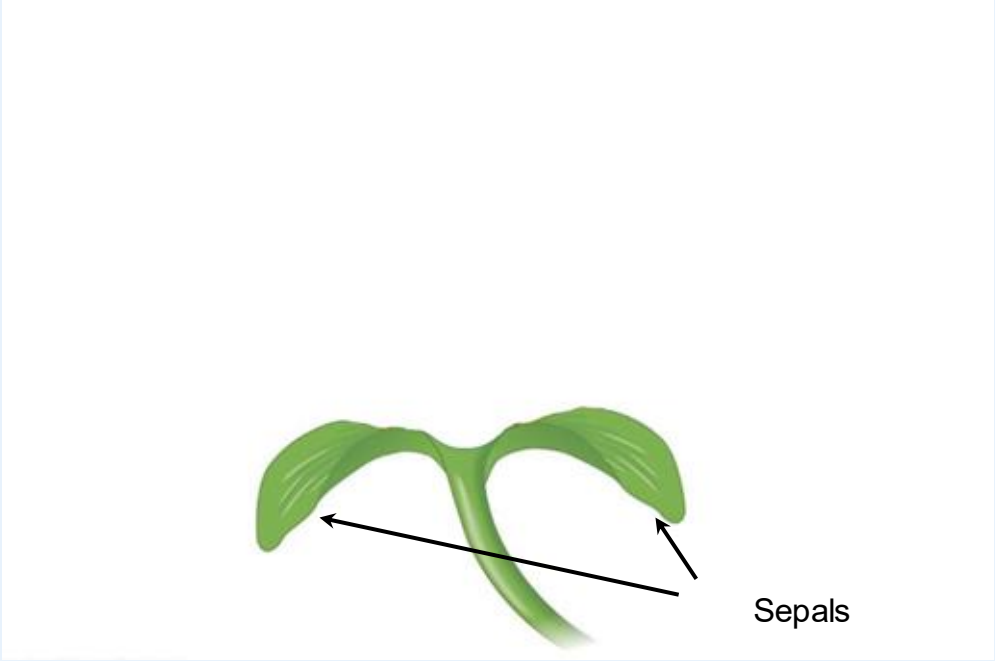
- Often organs are arranged at the same level
- Most common arrangement for floral organs

A ‘whorl-wind’ tour of the flower

- Up to four types of organs, in the same order from outside to inside

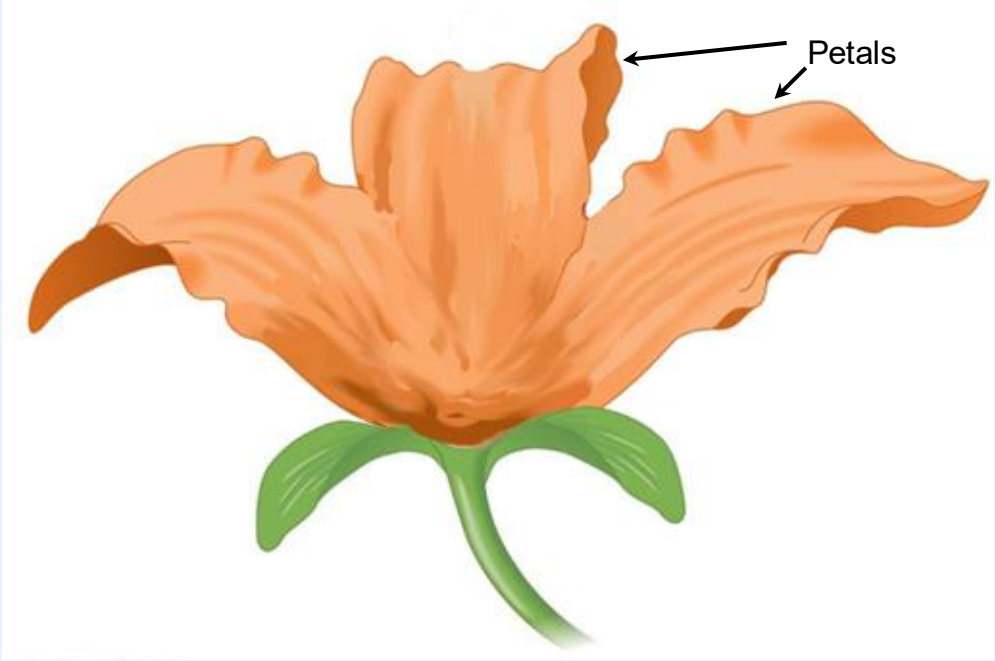
Calyx

- …made up of *sepals*



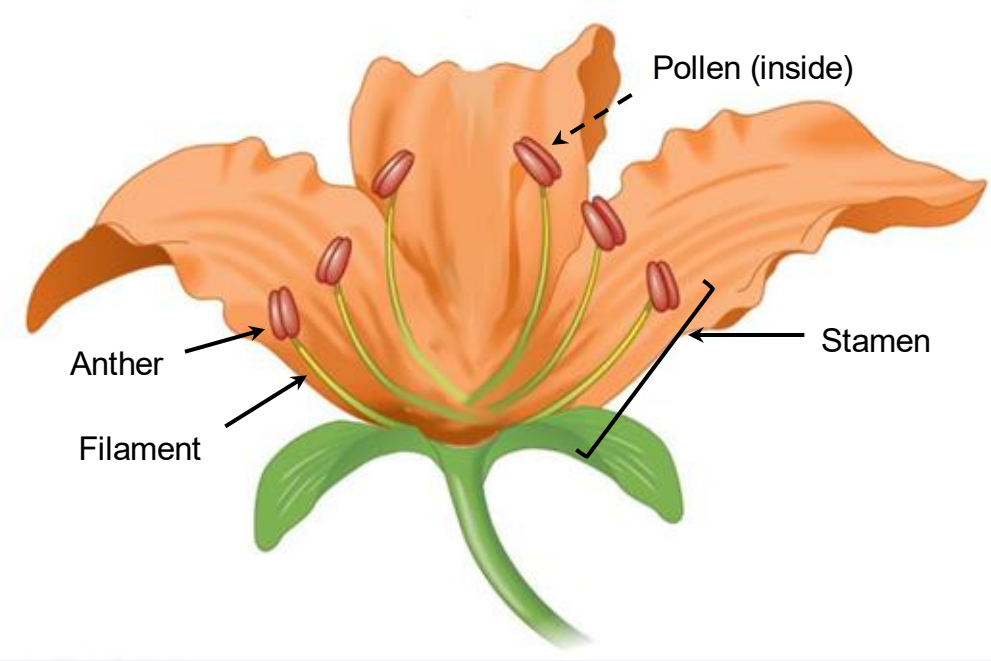
Corolla

- …made up of *petals*



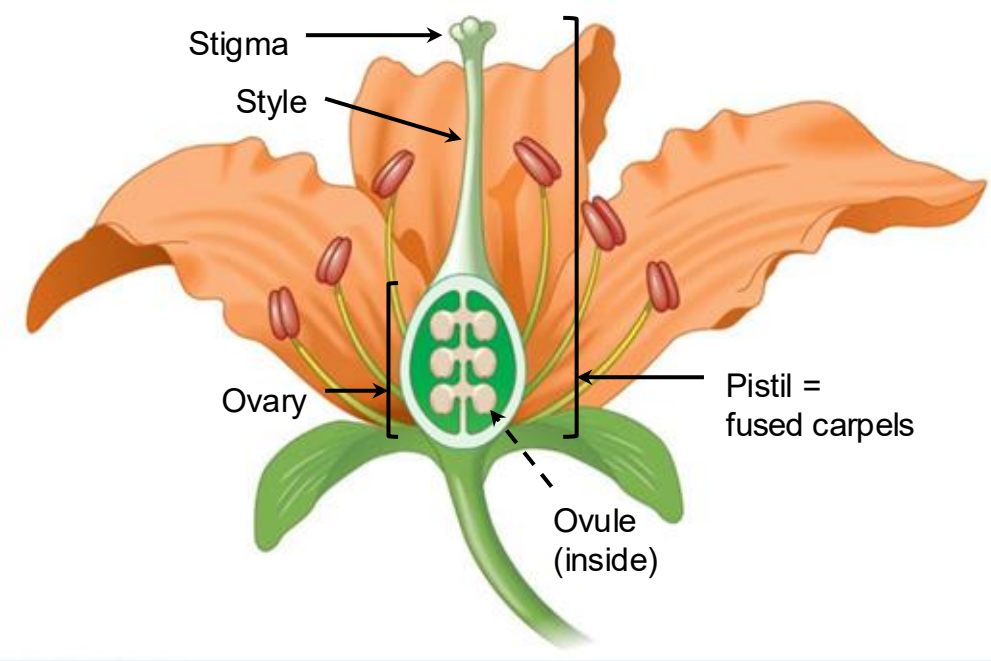
Androecium

- …made up of *stamens*



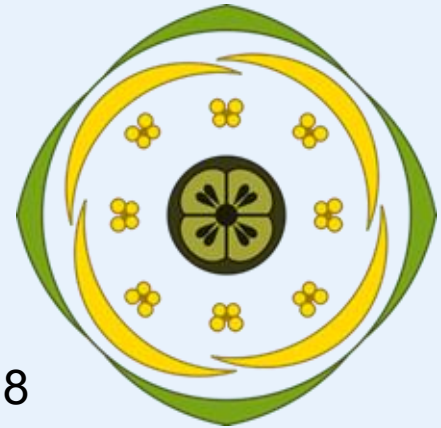
Gynoecium

- …made up of carpels
- Several carpels often fused into pistil



Floral diagrams and formulas

K = calyx
C = corolla
A = androecium
G = gynoecium



K 4 C 4 A 4 G 8

Evening-primrose
Oenothera
Onagraceae

Tepals

- If the distinction between petals and sepals is unclear, we call them '*tepals*'

Bellwort
Uvularia
Colchicaceae

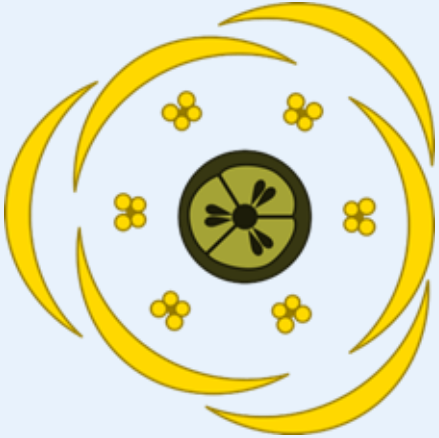
Smartweed
Persicaria
Polygonaceae

Perianth

- *Perianth*: collective term for petals/sepals/tepals

Undifferentiated perianth

P = perianth (tepals)
K = calyx (sepals)
C = corolla (petals)
A = androecium (stamens)
G = gynoecium (carpels)



P 6 A 6 G 3

To infinity and beyond!

- Perianth and androecium often have common denominator
- Ranges given for family; species often constant organ number
- Organs numbering more than ~15 are not counted (‘numerous’)
  - ∞ (infinity symbol) used instead

K 5 C 5 A 5 G 5

K 5 C 5 A ∞ G 5

Some flowers are spiral instead of whorled

- Spiral arrangement usually coincides with large number of organs
- Organs still in the same order as whorled flowers

Whorled or spiral?

Spirals are a common pattern in plants

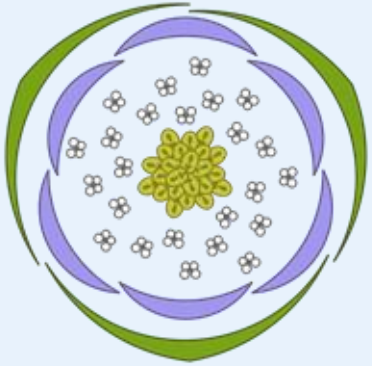
Spirals are less common in flowers

Cultivated spirals

- Many cultivated flowers are mutants with unnaturally numerous petals

Mixed spiral and whorled arrangements

- Organs with > 10 units tend to be spiral

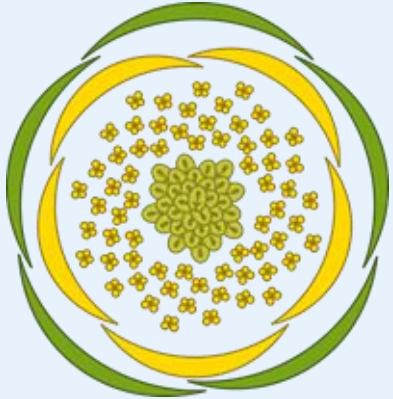


K 3 C 6 A ∞ G ∞

Hepatica
Ranunculaceae

Rosaceae (rose family) with spiral gynoecia

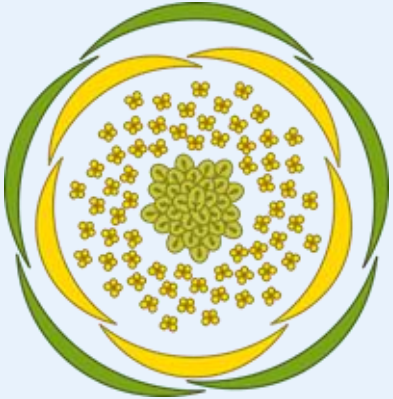
Geum
Rosaceae



K 5 C 5 A ∞ G ∞

Ranunculaceae (buttercup) with spiral gynoecia

Ranunculus
Ranunculaceae



K 5 C 5 A ∞ G ∞