**Asterids — Ericaceae, Cornaceae, Caprifoliaceae**

Today we will begin looking at asterid families. Asterids (like rosids) is an unranked name that refers to a monophyletic clade. The clade is composed of two basal orders (Ericales and Cornales) and two major clades, euasterids I and euasterids II. There are a number of familiar groups in this clade, such as *Cornus* (dogwoods), *Helianthus* (sunflowers), *Solanum* (tomatoes), etc., and we will be exploring these families over the next two weeks.

**Cornaceae – the dogwood family**

Cornaceae is a composed of 10 genera and approximately 115 species that are found globally. The family is solely comprised of woody species (trees and shrubs). The primary economically important species from the family are from the genera *Cornus* and *Nyssa* (for wood and ornamentals), *Davidia* (ornamentals), and *Camptotheca* (ornamentals). There are two genera found in the United States: *Cornus* (14 spp.) and *Nyssa* (3 spp.).

Answer the following questions using the specimens provided.

1. *Cornus florida* L. (USA native, cultivated)
   1. Describe the phyllotaxy and leaf complexity. Take a leaf and rip it in two. Describe what happens when you pull it apart. What do you think this is?
   2. Inflorescence: Determine the inflorescence type. How many bracts & nectariferous discs are there per inflorescence?
   3. Are the flowers perfect/imperfect? Complete/incomplete?

* 1. Perianth: How many sepals/petals are there? Are they distinct/connate?
  2. Androecium: How many stamens?
  3. Gynoecium: How many carpels? What is the ovary position?

1. *Cornus* sp. (Asian, cultivated)
   1. Inflorescence: What is the inflorescence type? How many bracts are there per inflorescence?
   2. What is the major difference in the inflorescence of this species from *C. florida*, other than color?

**Caprifoliaceae—the honeysuckle family**

Caprifoliaceae is composed of ~50 genera and ~655 species (found in the euasterids II clade) and are found in the Northern Hemisphere with the highest diversity in eastern North America and eastern Asia. The family is comprised of shrubs and woody vines. The species *Lonicera japonica* (Japanese honeysuckle) is naturalized in the USA and is an invasive in many areas. Many of the genera are sold as ornamentals including *Lonicera* (honeysuckle), *Abelia*, *Diervilla* (bush-honeysuckle), *Kolkwitzia* (beautybush), *Linnaea* (twinflower) and *Syhmphoricarpos* (coral-berry). There are a number of genera represented in the United States: *Lonicera* (29 spp.), *Symphoricarpos* (13 spp.), *Diervilla* (3 spp.), *Triosteum* (3 spp.), *Linnaea* (1 sp.) and *Weigelia* (1 sp.).

Answer the following questions using the specimens provided.

1. *Lonicera maackii* (Rupr.) Maxim.
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the inflorescence type? What is the floral symmetry?
   3. Perianth: How many sepals are there? How many petals are there? Are they symsepalous/sympetalous? Describe the corolla shape.
   4. Androecium. How many stamens? Are the anthers adnate to anything? If so, what? Are the anthers dorsifixed/basifixed?
   5. Gynoecium: How many carpels? What is the ovary position?

**Adoxaceae—the moschatel family**

Adoxaceae is a family of 5 genera and ~156 species found in the euasterids II clade. Members are found primarily in the Northern Hemisphere, though there are representatives in South America and Australia. This family has been historically allied with Caprifoliaceae and you will notice a number of similarities between the two. You should also take note that this family shares some similarity to the more distantly related Cornaceae. The family’s largest genus, *Vibrunum*, has ~141 species(though this number may be more) with the genera *Adoxa* (2 spp.), *Sambucus* (11 spp.), *Sinadoxa* (1 sp.) and *Tetradoxa* (1 sp.) are much smaller.

Answer the following questions using the specimens provided.

1. *Viburnum sp.*
   1. Describe the phyllotaxy and leaf complexity. Take a leaf and rip it in two. Describe what happens when you pull it apart. What do you think this is?
   2. What is the inflorescence type? What is the floral symmetry? How many sterile flowers are there per inflorescence?
   3. Perianth: How many sepals are there? How many petals are there? Are they symsepalous/sympetalous? Describe the corolla shape.
   4. Androecium. How many stamens? Are they epipetalous? Are the anthers dorsifixed/basifixed?
   5. Gynoecium: How many carpels? What is the ovary position?

**Ericaceae—the heather family**

Ericaceae is a family of ~145 genera and ~3,343 species found throughout temperate zones on acidic soils. Species are also found in the Arctic and in the montane tropics. The genus *Vaccinium* produces blueberries and cranberries, while there are also a number of ornamentals from the family, included *Rhododendron* (azalea, rhododendron). There are ~44 genera found in the United States (~219 spp.) with the largest genera being *Arctostaphylos*, *Vaccinium* and *Rhodoendron*.

Answer the following questions using the specimens provided.

1. *Vaccinium sp.*
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the inflorescence type? What is the floral symmetry?
   3. Perianth: How many sepals are there? How many petals are there? Are they symsepalous/sympetalous? Describe the corolla shape.
   4. Androecium: How many stamens? Are they epipetalous? Are the anthers dorsifixed/basifixed? Describe the dehiscence.
   5. Gynoecium: How many carpels? What is the ovary position?
2. *Rhododendron canescens*
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the inflorescence type? What is the floral symmetry?
   3. Perianth: How many sepals are there? How many petals are there? Are they symsepalous/sympetalous? Describe the corolla shape. What is the structure on the outside of the corolla? Ask your TA for help.
   4. Androecium: How many stamens? Are they epipetalous? Are the anthers dorsifixed/basifixed? Describe the dehiscence.
   5. Gynoecium: How many carpels? What is the ovary position?

Now let us attempt to synthesize the above information into an overall description for each family.

**Cornaceae**

Phyllotaxy and leaf complexity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calyx: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corolla: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Androecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Gynoecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Any other special identifying features: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Caprifoliaceae**

Phyllotaxy and leaf complexity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calyx: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corolla: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Androecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Gynoecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Any other special identifying features: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Adoxaceae**

Phyllotaxy and leaf complexity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calyx: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corolla: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Androecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Gynoecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Any other special identifying features: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ericaceae**

Phyllotaxy and leaf complexity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Calyx: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Corolla: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Androecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Gynoecium: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Any other special identifying features: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**References:**

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