**Rosids I**

Today you will be looking at two families within the rosids I clade. The rosids are an unranked group of eudicots that include *Vitis* (grapes), *Cucumis* (pumpkins), *Malus* (apples), *Lagerstroemia* (crapemyrtle), *Brassica* (broccoli, etc.), and many more. This group is one of the most economically important groups in the angiosperms.

**Rosaceae—the rose family**

The rose family consists of ~100 genera and over 2000 species. The family is cosmopolitan with the greatest number of species in the temperate regions of North American, East Asia and Europe. A number of fruit crops come from this family, including *Prunus* sp. (almonds, apricots, cherries, nectarines/peaches, plums), *Pyrus* (pears), *Fragaria* (strawberry), and *Rubus* (blackberry). The largest genera in the United States (by number of species) are *Rubus, Crataegus* (Hawthorne), and *Potentilla*.

We will be looking at the four subfamilies as described in your Zomlefer text. Recent phylogenetic studies have regrouped these into three subfamilies, but we are going to use the Zomlefer version for the sake of morphological characteristics. The subfamilies that we will be concerned with are: Rosoideae, Spiraeoideae, Amygdaloideae, and Maloideae.

Answer the following questions using the specimens provided.

**Rosoideae**

1. *Agrimonia pubescens* (herbarium specimen)
   1. Describe the phyllotaxy and leaf complexity.
2. *Duchesnea indica* (syn. *Potentilla indica, Fragaria indica*)
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry? Are the flowers perfect/imperfect? Complete/incomplete?
   3. Perianth: How many sepals are there (Do not confuse with leafy bracts.)? How many petals are there?
   4. Androecium: Note adnation to hypanthium.
   5. Gynoecium: How many carpels? Are they syncarpous or apocarpous? What is the ovary position?
3. *Rosa* sp.
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry? Are the flowers perfect/imperfect? Complete/incomplete?
   3. Perianth: How many sepals are there? How many petals are there? **Note**: There should be five petals but this is a hybrid species where there has been homeotic mutations that convert stamens to petals.
   4. Androecium: Note adnation to hypanthium.
   5. Gynoecium: How many carpels? Are they syncarpous or apocarpous? What is the ovary position?

**Spiraeoideae**

1. *Spiraea × vanhouttei*
2. Describe the phyllotaxy and leaf complexity.
3. What is the floral symmetry? Are the flowers perfect/imperfect? Complete/incomplete?
4. Perianth: How many sepals are there? How many petals are there?
5. Androecium. Note numerous stamens borne on hypanthium.
6. Gynoecium. How many carpels? Are they syncarpous or apocarpous? What is the ovary position?
7. Where are the nectaries borne in relation to the other flower whorls?

**Amygdaloideae**

1. *Prunus caroliniana* or *Prunus serotina*
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry? Are the flowers perfect/imperfect? Complete/incomplete?
   3. Perianth: How many sepals are there? How many petals are there?
   4. Androecium: Note adnation to hypanthium.
   5. Gynoecium: How many carpels? Are they syncarpous or apocarpous? What is the ovary position?

f. What is the fruit type?

**Maloideae**

1. *Amelanchier*
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry? Are the flowers perfect/imperfect? Complete/incomplete?
   3. Perianth: How many sepals are there? How many petals are there?
   4. Androecium: Note adnation to hypanthium.
   5. Gynoecium. How many carpels? Are they syncarpous or apocarpous? What is the ovary position?
   6. What is the fruit type?

2*. Pyracantha coccinea*

* 1. Make a longitudinal cross section of the fruit. Try to identify the remnants of the hypanthium. Which ones can you identify?

**Fabaceae—the legume or pea family**

The legume family consists of ~ 630 genera and over 18,000 species. It has the third highest number of species (after Orchidaceae and Asteraceae) in the angiosperms. There are a number of crops from this family, including *Glycine* (soybean), *Cicer* (chick peas), *Pisum* (peas) and *Arachis* (peanuts). The largest genera in the United States (by number of species) are *Astragalus, Lupinus, Trifolium, Dalea* and *Desmodium*.

We will be looking at the three subfamilies as described in your Zomlefer text. Recent phylogenetic studies have regrouped these into more than three subfamilies, but we are going to use the Zomlefer version for the sake of morphological characteristics. The subfamilies that we will be concerned with are: Mimosoideae, Caesalpinioideae, and Faboideae.

Answer the following questions using the specimens provided.

**Mimosoideae**

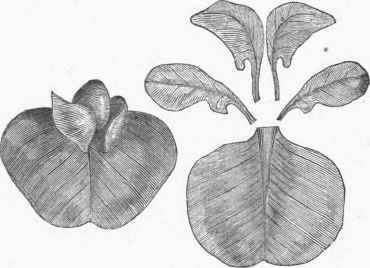
1. *Albizia julibrissin*
   1. Describe the phyllotaxy and leaf complexity. Have your TA point out the pulvini (plural). What is the function of the pulvinus (singular)?
   2. What is the floral symmetry?
   3. Perianth: How many sepals are there? How many petals are there? Note the connate calyx and corolla.
   4. Androecium. **Note:** Showy portion of these flowers are the filaments.
   5. Gynoecium: How many carpels? What is the ovary position? Identify fruit type.

**Caesalpinioideae**

1*. Gleditsia triacanthos* or *Senna* sp.

* 1. Describe the phyllotaxy and leaf complexity. **Note:** Pulvini.
  2. What is the floral symmetry?
  3. Perianth: **Note:** Five free petals. Four are the same size with the fifth being different.
  4. Androecium: **Note:** stamens ten or fewer.
  5. Gynoecium: How many carpels? What is the ovary position?

**Faboideae**

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In the Faboideae, the corolla is divided into three distinct sections: banner, wings and keel. Label these parts above as you will need to find them in your specimens. Use Your Zomlefer book if you need help.

1. *Wisteria sinensis* (non-native)
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry?
   3. Perianth: How many sepals? How many petals?
   4. Androecium: How many stamens? Monadelphous or diadelphous?
   5. Gynoecium. How many carpels? What is the ovary position?
2. *Trifolium* sp.
   1. Describe the phyllotaxy and leaf complexity.
   2. What is the floral symmetry?
   3. Perianth: How many sepals? How many petals?
   4. Androecium: How many stamens? Monadelphous or diadelphous?
   5. Gynoecium: How many carpels? What is the ovary position?

Now that we’ve had the opportunity to observe several species in both the Rosaceae and Fabaceae, and their respective subfamilies, let us now attempt to synthesize this information into an overall description for both families.

**Rosaceae**

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

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

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

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

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

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

**Fabaceae**

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

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

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

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

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

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