Plant Identification: Helpful Things to Look For

Variations in Flower Structure

- Flowers may be bisexual or unisexual
  - **perfect** flowers – have both stamens & carpels (bisexual)
  - **imperfect** flowers – bear either stamens OR carpels depending on the flower (unisexual)
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**Monoecious** – staminate (male) and carpellate (female) flowers on same individual

**Dioecious** – male & female flowers are on DIFFERENT individuals

**Hermaphroditic** – plants with perfect flowers

- **Spicebush (Lindera benzoin)** is dioecious

Variations in Flower Structure: Fusion of Parts

- Members of floral whorls (sepals, petals, stamens, carpels) may be variously fused with each other or with other whorls
  - One of the most important features to look for in family-level ID

Flowers of the **mallow family (Malvaceae)** (like Hibiscus) typically have fused filaments

Petal may be fused together to form a tube, as may sepals
Variations in Flower Structure: Ovary Position

• very important in identifying families of flowering plants!

superior ovary

Hypanthium
(“floral cup”)

inferior ovary

Characteristic of the rose family
(Rosaceae), among others

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Variations in Flower Structure: Symmetry

Actinomorphic flowers are radially symmetrical
(‘Regular’ in Newcombs)

Zygomorphic flowers are bilaterally symmetrical
(‘Irregular’ in Newcombs)
Flower Structure: How many Parts?

One of the first things to look for if your plant is flowering

Members of the coffee (Rubiaceae) and mustard (Brassicaceae) families have four petals

Members of the lily family (Liliaceae) and related groups have six tepals

Flower Structure: How many Parts?

• Tips and tricks:
  – Look at several flowers and make sure consistent
  – If some petals might be missing, can count sepals
  – When in doubt, five petals is most common for dicots
The Inflorescence: How are the Flowers Grouped?

- Panicle
- Spike
- Raceme
- Corymb
- Simple umbel

G. Fleming
The Inflorescence: How are the Flowers Grouped?

The carrot family (Apiaceae) has distinctive compound umbels.

The aster/daisy family (Asteraceae) has flowers arranged uniquely in heads.
Leaf Characteristics Useful for Plant ID

- Leaf arrangement: alternate, opposite, or whorled?

Leaf Structure: The Margin

- Leaf margins may be:
  - entire (smooth)
  - serrate or toothed
  - lobed
Leaf Structure: Simple or Compound?

- A **simple** leaf has a blade of just one part

- A **compound** leaf has a blade **divided** into several individual parts

Note: Referred to as ‘divided’ in Newcomb’s
**Compound Leaves**

- **Palmately compound** – leaflets attached at the same point (like fingers from the palm)

- **Pinnately compound** – leaflets attached individually along the rachis (like rungs of a ladder)

**Compound Leaves**

- Pinnately compound leaves may be once-compound (*pinnate*) or twice-compound (*bipinnate*)
  - or even further divided to be *tripinnate* or more.
Simple Versus Compound Leaves: How do we tell the difference?

- Leaflets **never have buds at the base**
- The tip of the rachis **never has a terminal bud**
- Leaflets are always arranged in **two rows** on either side of the rachis
  - I.e., Leaflets are never in a spiral, whorled, etc. around the rachis
**Leaf Structure: Are Stipules Present?**

- In many plant spp., the petiole bears two small leaf-like **stipules** at its base
  - The presence & structure of stipules can be useful clues for ID

**Other Leaf Characteristics**

- Does it smell?
  - several families are always characterized by pungent odor

E.g. the **laurel family** (Lauraceae), wax-myrtle family (Myricaceae), and others

Members of the **St Johnswort family** (Hypericaceae) all have pellucid dots if held to light
Identifying with Newcomb’s: Tips & Tricks

• Shrub or vine? If yes, ignore other options in ‘plant type’

• Leaves divided? If yes, ignore other options in ‘leaf type’

• When does a small flower become ‘indistinguishable’?
  – May need to try both options

• Get stuck?
  – Look at multiple plants, flowers, etc. if possible when making choices
  – Keep in mind other possible options as you go through the key; go back and try those first
  – Good coverage, esp. to genus, but your species may not be included