

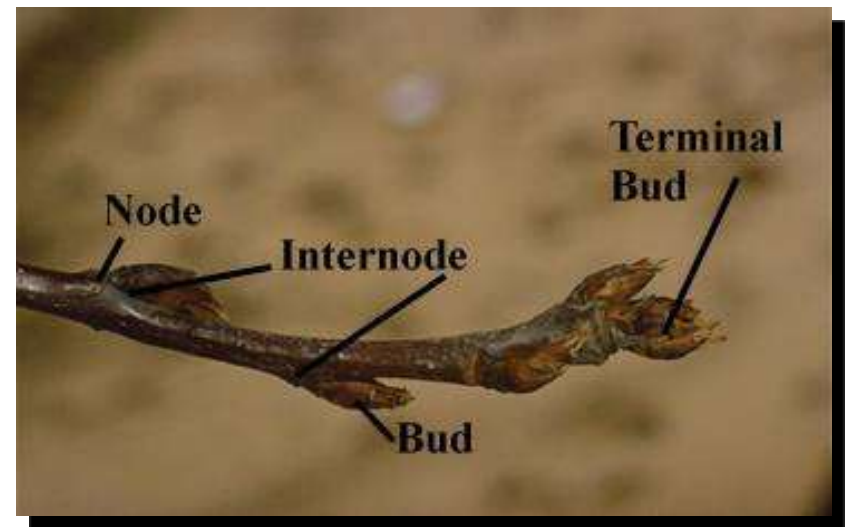
Tree and Leaf Identification

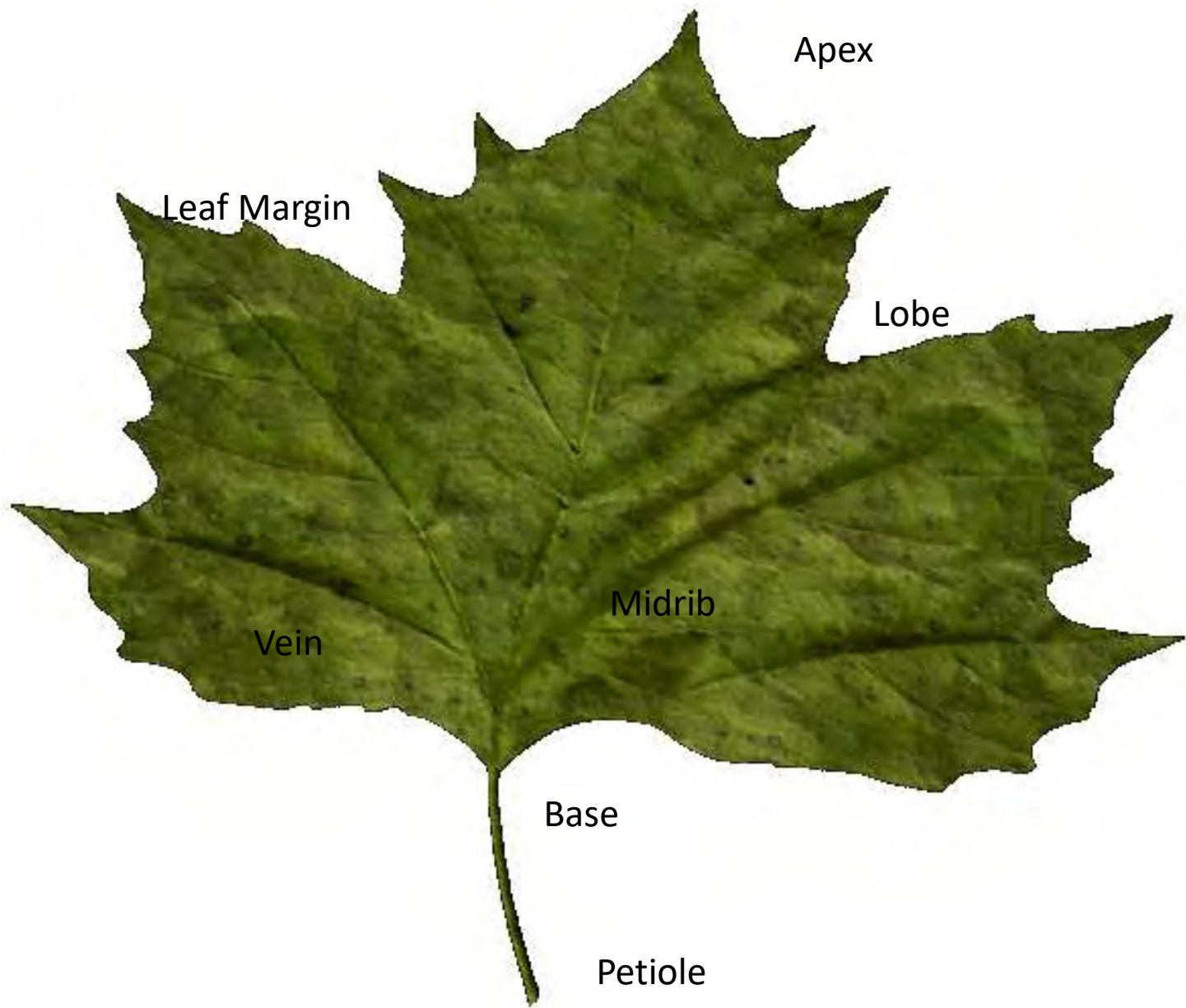
Leaves

- Leaves are the best and often the easiest way to identify a tree.
- Needles and scale of evergreens are also considered leaves.
- Questions to consider when identifying leaves:
 - Are the leaves:
 - simple or compound?
 - margins smooth or margins rough?
 - any sinuses or lobes?
 - What is the size, shape, texture, and color variation of the leaves?

Plant Identification

- **Bud** - A compressed, undeveloped shoot. Buds may be lateral or terminal.
- **Node** - point on the stem where leaf or bud is borne. The space between two nodes is an **internode**





Apex

Leaf Margin

Lobe

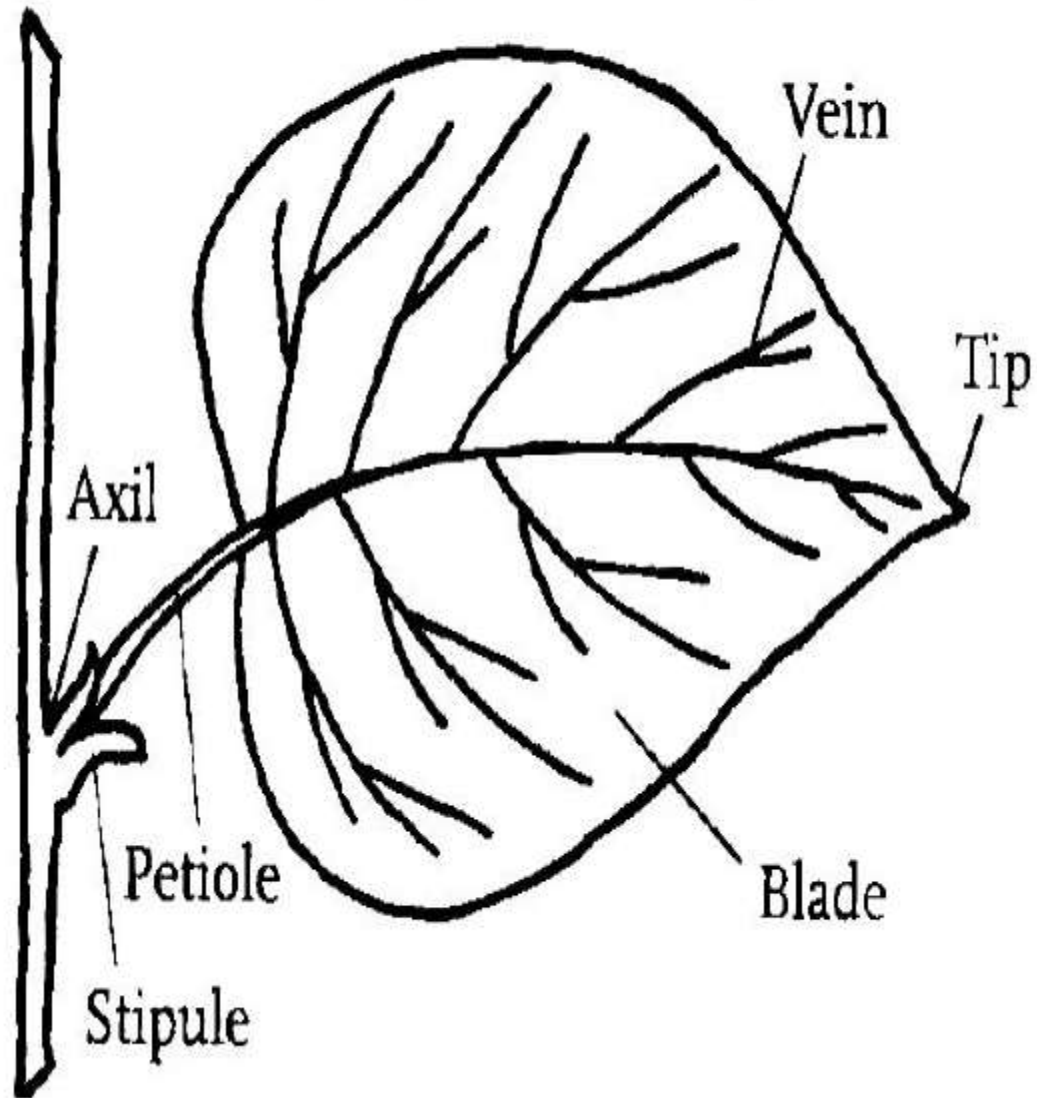
Vein

Midrib

Base

Petiole

LEAF PART NAMES



Plant Identification

- Simple Leaf
 - **Petiole** - the stalk of a leaf. A leaf without a petiole is sessile
 - **Blade** - the flat, expanded portion of the leaf



Plant Identification

- Leaf arrangement
 - **Alternate** - leaves arranged one per node



Plant Identification

- Leaf arrangement
 - Opposite - leaves arranged two per node



Plant Identification

- Leaf arrangement
 - Whorled - arranged two or more per node



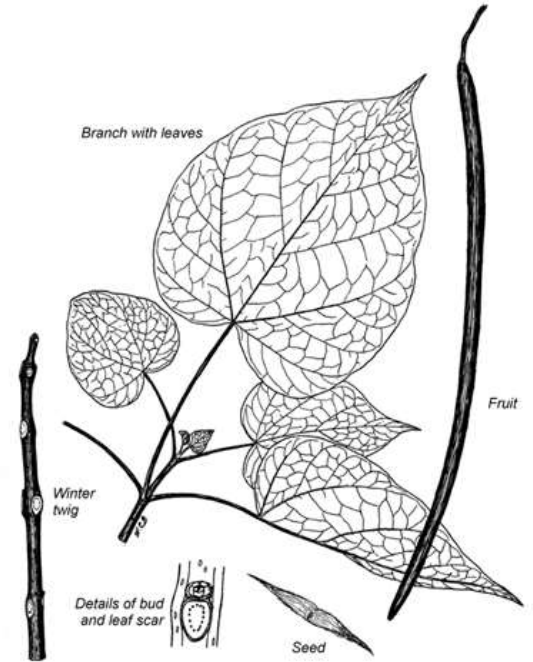
Leaf Arrangement



alternate



opposite



whorled

Simple

- Only one leaf blade
- Joined by its stalk to the woody stem
- Examples: maple, oak, aspen, beech

Compound

- Made up of several leaflets
- Leaflets are joined to a midrib that is not woody
- Examples: ash, walnut, sumac

Simple vs. Compound Leaves

- Simple - the blade is all in one piece, though it may be lobed, toothed, etc.



Simple vs. Compound Leaves

- Compound - the blade is divided all the way to the midrib (rachis) into two or more pieces.



**Palmately
Compound**

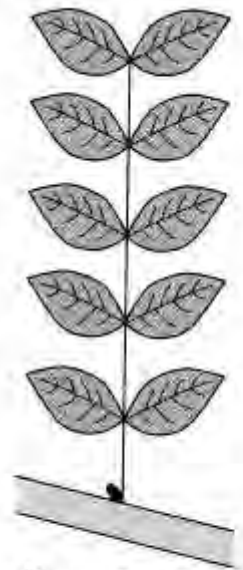


**Pinnately
Compound**

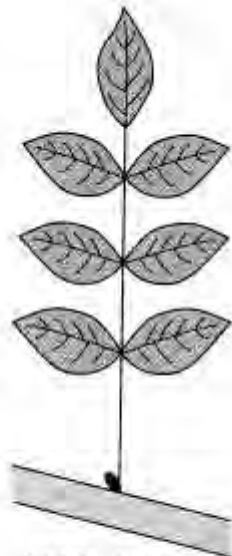


**Twice
Pinnately
Compound**

Compound Leaves



Even-pinnate



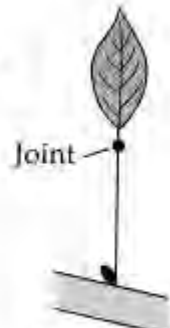
Odd-pinnate



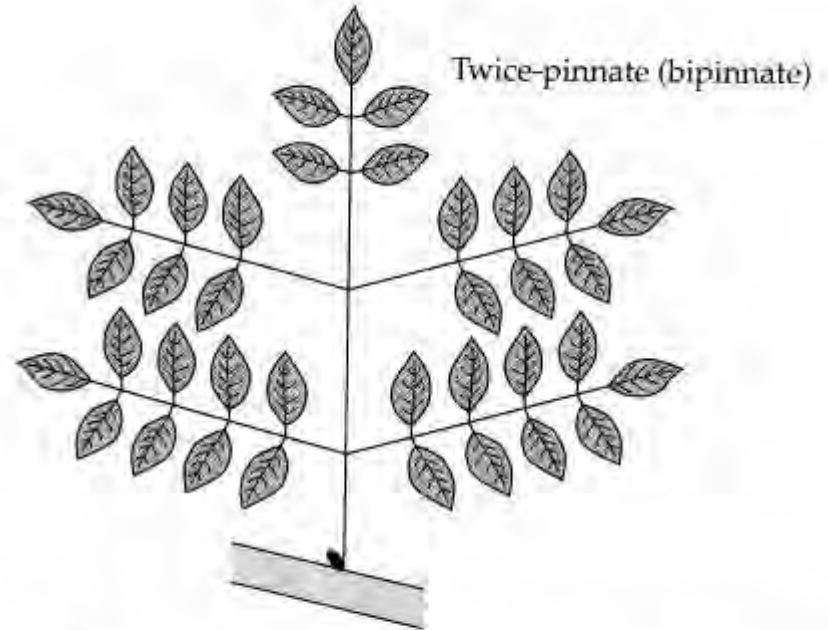
Palmate



Trifoliolate



Unifoliolate



Twice-pinnate (bipinnate)

Figure 4.5 Arrangements of leaflets in compound leaves.

Simple vs. Compound

Axillary bud - the bud in the axil
- the angle between the leaf
and stem.



Compound leaves

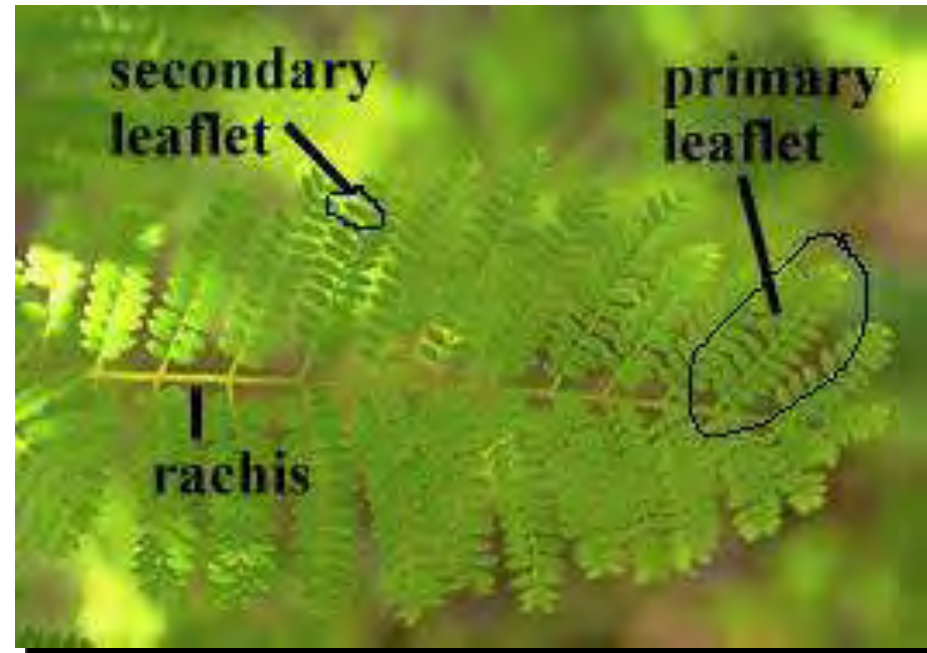
- Once pinnately compound - leaflets arranged along one undivided main axis. (odd or even number of leaflets)



This is one leaf

Compound leaves

- **Twice pinnately compound** - main axis (rachis) with two or more branches and the leaflets arranged along the branches. The branch divisions are primary leaflets and the ultimate divisions are secondary leaflets. There can also be **thrice-pinnately compound** leaves, etc.



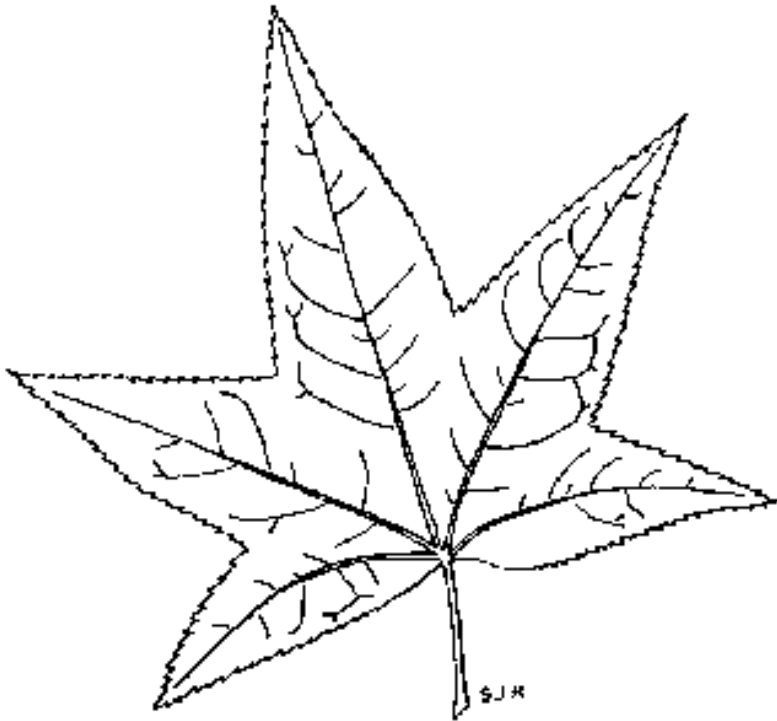
Compound leaves

- Palmately compound -leaflets all arising from one point at the base of the leaf.



Leaf Type

Simple vs. Compound



Simple or Compound?



What is the leaf type?



Leaf Characteristics

- Deciduous



- Evergreen



Which is which?



Deciduous

Evergreen

Characteristics of Evergreens

- Needle shaped leaves
- Seeds that develop inside cones
- Evergreen – green year round
- Examples: pine, spruce, hemlock, fir



Evergreen leaves

- Needle like



- Scale like



Evergreen needles

- Clusters



- Singles



CONIFERS



scale-like



awl-like



linear



needle-like

Deciduous Tree Characteristics



- Broad flat leaves
- Lose all leaves each year in the fall
- Angiosperm (flowering plants), broadleaf, hardwood
- Examples: oak, maple, beech, aspen, ash

Deciduous examples



Red oak



Elm



Honey locust



Red maple



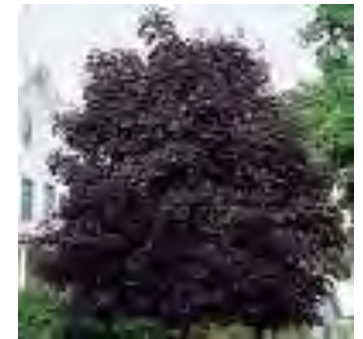
Black locust



White
birch



beech



Crimson king

Leaf characteristics-deciduous

- Leaf arrangement: whorl, alternate, opposite
- Leaf type: simple or compound
- Leaf edge: entire (smooth), lobed (projection), toothed (serrated)
- Leaf texture: hairy, waxy, rough, smooth, thick, thin, etc.
- Leaf shape: various



Leaf Observations

Deciduous	Evergreen
Leaf arrangement: Alternate, opposite, whorl	Leaves, needles or scales
Leaf type: Simple, compound	Needle attachment: Single, clusters
Leaf edge: Entire, lobed, toothed	

Leaf Edge

Lobed , smooth, toothed?



Leaf Venation, Lobing, Shape, & Margins

- Leaf venation
 - Pinnate - with a main midvein and secondary veins arising from it at intervals



Leaf Venation, Lobing, Shape, & Margins

- Leaf venation
 - Palmate - with the main veins all arising from one point at the base of the leaf.



Leaf Venation, Lobing, Shape, & Margins

- Leaf venation
 - Parallel - with all the main veins parallel (usually also parallel to the sides of the leaf.)



Leaf Venation, Lobing, Shape, & Margins

- Leaf venation
 - Dichotomous - with each vein branching in two again and again (e.g. Ginkgo)



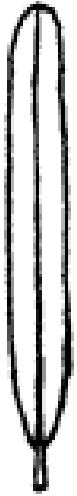
Leaf Venation, Lobing, Shape, & Margins

- Leaf lobing
 - Pinnately lobed - with the lobes arising along the length of the mid-line of the leaf.

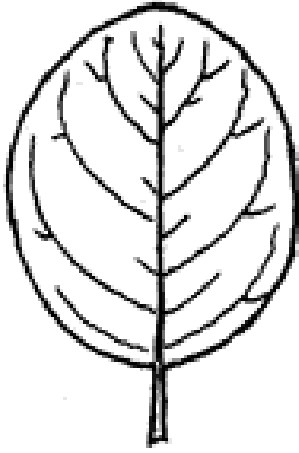


- » Palmately lobed - with the lobes all arising from one point at the base of the leaf.

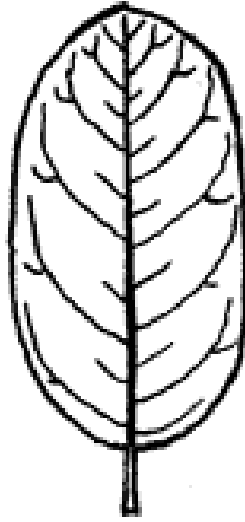




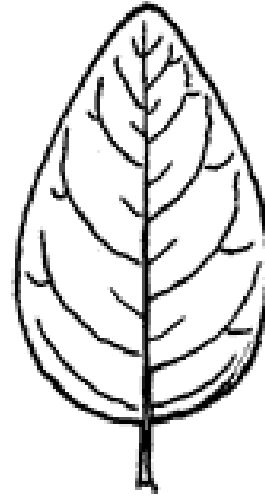
linear



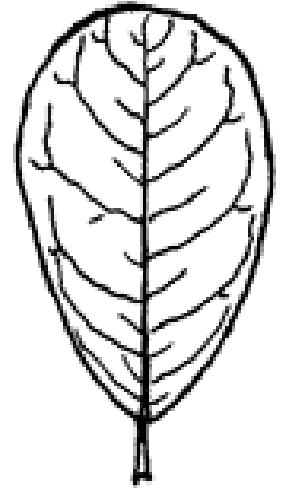
oval



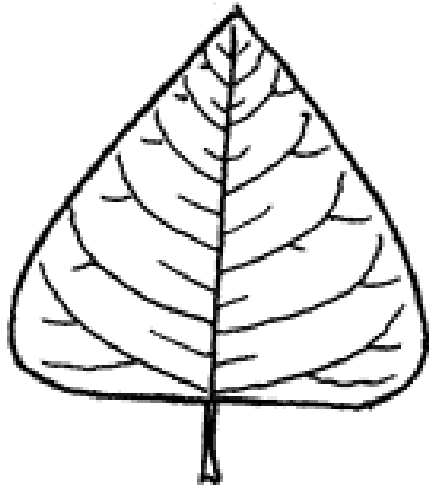
oblong



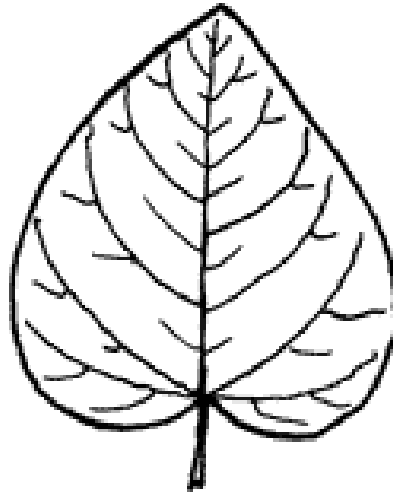
ovate



obovate



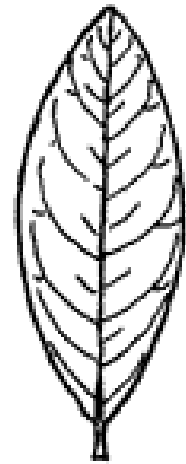
deltoid



cordate



elliptical



lanceolate

Leaf Venation, Lobing, Shape, & Margins

- Leaf shapes

- Ovate - egg-shaped with the larger end at the bottom.



- » Elliptic - shaped like an ellipse, tapered at both ends and with curved sides.

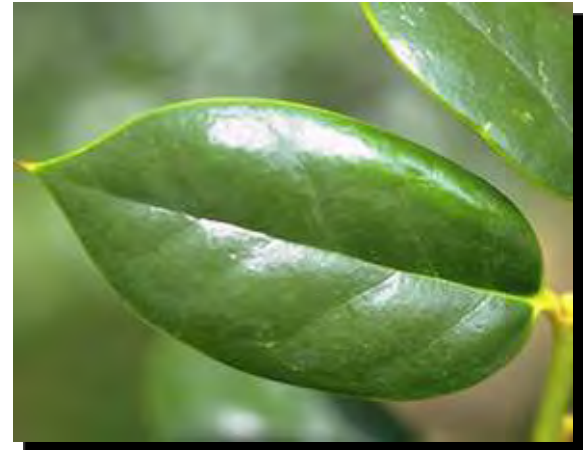


Leaf Venation, Lobing, Shape, & Margins

- Leaf shapes
 - Oblong - tapered to both ends, but with the sides more or less parallel.



- » Lanceolate - shaped like the tip of a lance, broadest at the base and tapered to a long point.



Leaf Venation, Lobing, Shape, & Margins

- Leaf shapes
 - Linear - very long and thin, with the sides parallel



- » Cordate - heart-shaped with the wide part at the bottom



Leaf Margins



entire



undulate



finely
serrate



coarsely
serrate



doubly
serrate



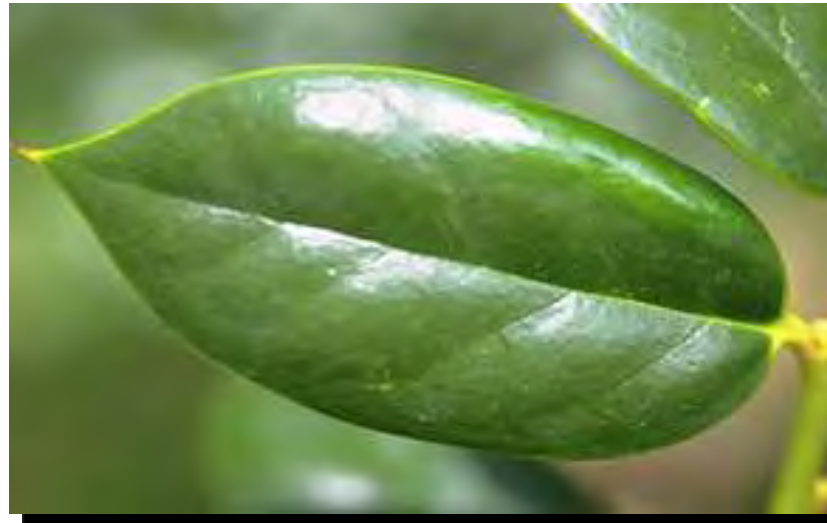
crenate



lobed

Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Entire - smooth, with no teeth or lobes



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Serrate - with sharp, forward-pointing teeth



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Doubly serrate - with teeth which have smaller teeth on them



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Serrulate - with very tiny sharp teeth



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Dentate - with teeth which point outwards



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Crenate - with low, rounded scallop-like teeth



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Undulate - waving up and down



Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Revolute - turned under

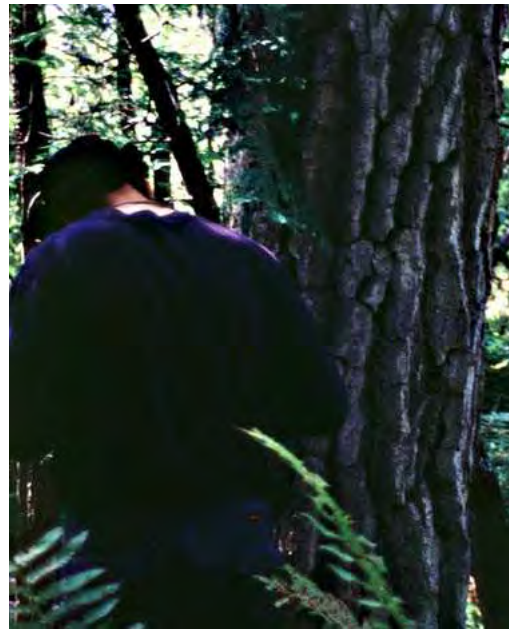
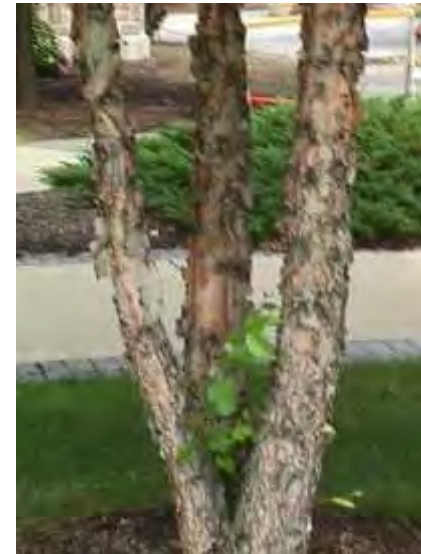


Leaf Venation, Lobing, Shape, & Margins

- Leaf margins
 - Lobed, parted, divided, cut, etc. - A number of terms describe the various degrees of lobing.

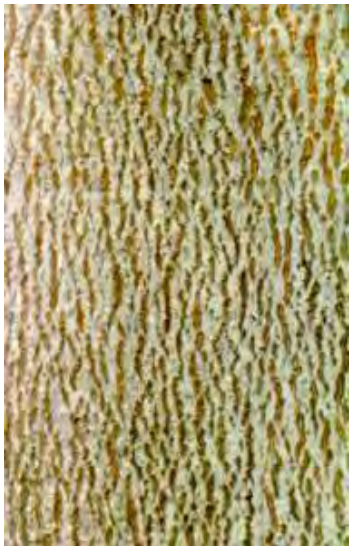


Bark Color and Texture



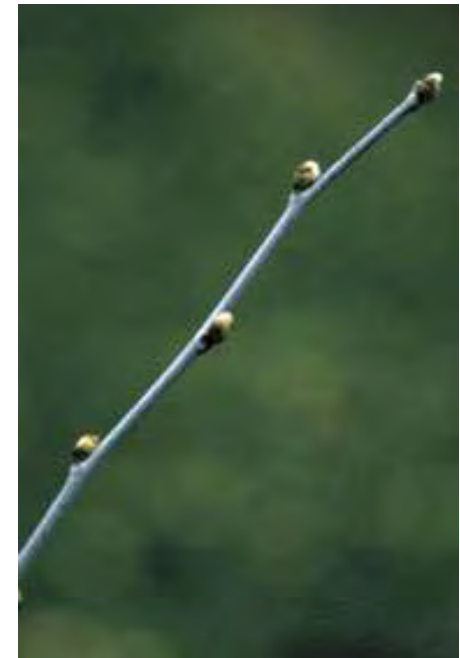
Bark

- Color
- Texture
- Furrows
- Age
- Thorns



Twig clues

- Leaf scars aka buds are the places where the leaves used to be attached
- Size color and shape of buds also useful to ID trees

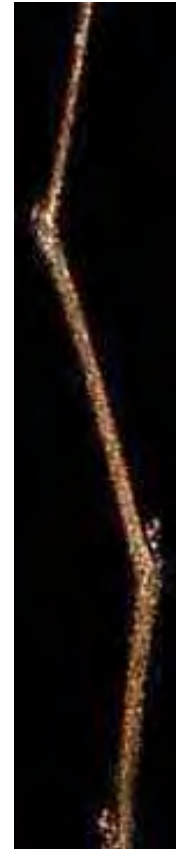


Bark and Twigs

- **Lenticel** - a "breathing pore" in the skin or bark of a stem.



Twigs & Buds



Flower clues

- Shape
- Color
- Texture
- Size



Fruits & Seeds



Common Ash
Tree Leaf



Sugar Maple
Leaf

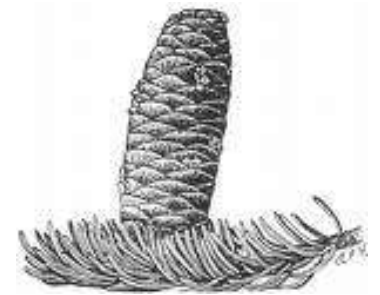


European Olive
Tree



Common Oak
Leaf

Cones



Describe these leaves



Describe these leaves



Describe these leaves



Describe these leaves



Describe the leaves

