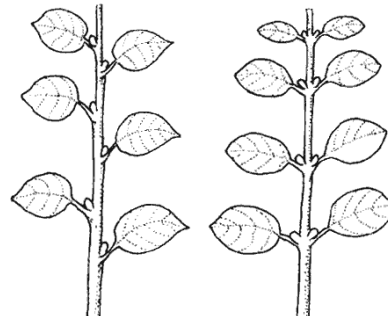


Key to Trees of the Rutgers Ecological Preserve
prepared by Elizabeth Garvey and Richard Lathrop 2011,
based on General Ecology (1979) key

1. Scale-like evergreen leaves ... *Juniperus* see page 4

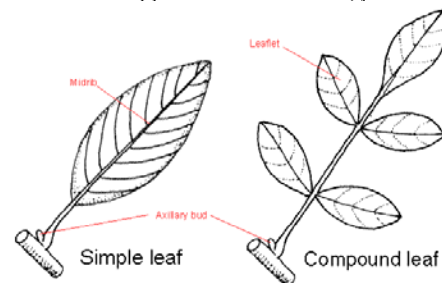
2. a) Leaves opposite on twigs..... go to 3

b) leaves alternate on twigs.....go to 5



3. a) Leaves compound.... *Fraxinus* see page 4

b) leaves simple.....go to 4



4. a) leaves entire, heart shaped... *Cornus* see page 4

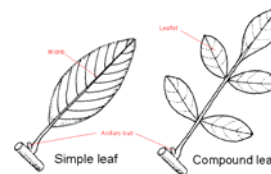


b) leaves palmately lobed... *Acer* see page 5



5. a) Leaves compound.....go to 6

b) leaves simple.....go to 8



6. a) Leaflets all nearly same size ... go to 7



b) terminal leaflets largest... *Carya* see page 6



7. a) leaflets toothed at base ... *Ailanthus* see page 7



b) leaflets toothed along entire margin... *Juglans* see page 7



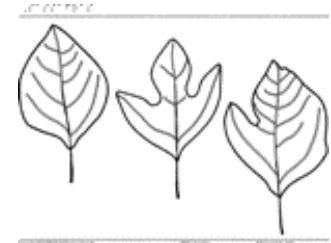
8. a) leaves lobed go to 8



b) leaves not lobed (entire)..... go to 10



c) leaves lobed and/or unlobed on same tree..... go to 13



9. a) leaves many lobed, lobes shallow to deep... *Quercus* see page 8



10. a) bark light-medium grey, smooth....*Fagus* see page 10



b) bark not so..... go to 11

11. a) bark warty or furrowed, leaves lopsided at base..... go to 12

b) bark scaly (esp. on older trees) or with marked horizontal lines (lenticels), leaves not lopsided.....go to 14

12. a) leaves single toothed go to 13

b) leaves double toothed, rough *Ulmus* see page 10



13. a) bark warty, leaves single toothed or smooth with veins twice pinnate...*Celtis* see page 10



b) bark furrowed with flat ridges, leaves large, nearly heartshaped but often asymmetrical at base ... *Tilia* see page 10



14. a) bark scaly, leaves double toothed, light green above, lighter below*Ostrya* see page 11



b) leaves with fine single marginal teeth..... go to 12

15. a) bark (young) with marked lenticels, (old) scaly leaves relatively narrow.....*Prunus* see page 12



b) leaves broader than cherry above; bark (young) with raised dots or horizontal lenticels, (mature) grey, scaly, vertically cracked *Malus* see page 12



16. a) leaves mostly entire or two lobed, scaly bark, leaves hairy below... *Morus* see page 13

b) bark aromatic, furrowed, leaves entire or 2-3 lobed, twigs green... *Sassafras* see page 13



Juniperus (juniper)

A) *Juniperus Virginia* (eastern red cedar)



- Leaves: evergreen, scale-like to prickly
- Bark: reddish-brown, thin, fibrous and shreddy

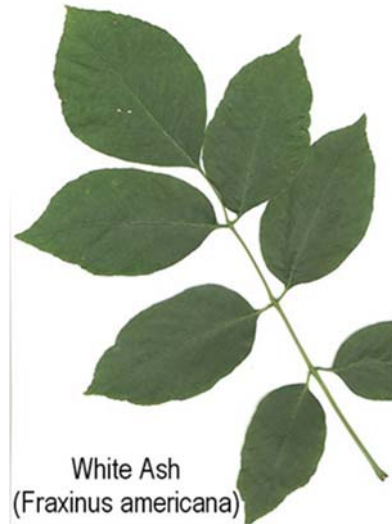
Fraxinus (ash)

A) *Fraxinus americana* (American ash, white ash)

-leaves: 8-12 inches long, 7 (5-13) oval to oblong-lancelet leaflets.

Leaflets glabrous (not hairy) below, margins smooth or finely toothed

-bark: grey, with diagonal shaped ridges



B) *Fraxinus pennsylvanica* (green ash)

-leaves: smaller than white ash, 6-9 inches long, leaflets smooth, hairy on underside, margins toothed above the middle

-bark: like white ash, grey, with diagonal shaped ridges



Cornus (dogwood)

A) *Cornus florida* (flowering dogwood)

-leaves: 3-6 inches long, primary leaves curve up

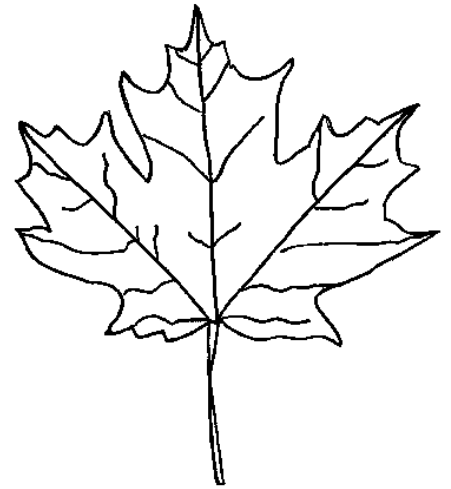
-bark: (young) smooth, (older) small scaly blocks



Acer (maple)

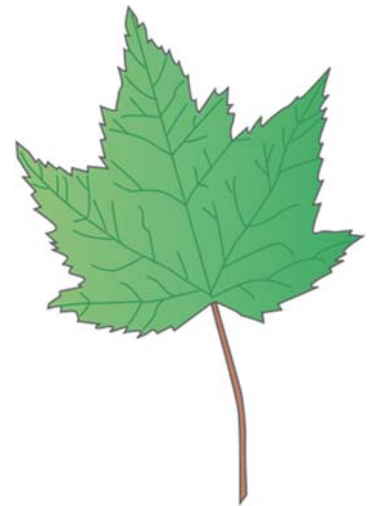
A) *Acer saccharum* (sugar maple)

- leaves: usually five lobed, margins with several large pointed teeth, and sides of the center lobe roughly parallel
- bark: (young) smooth and grey-brown, (mature) scaly and furrowed



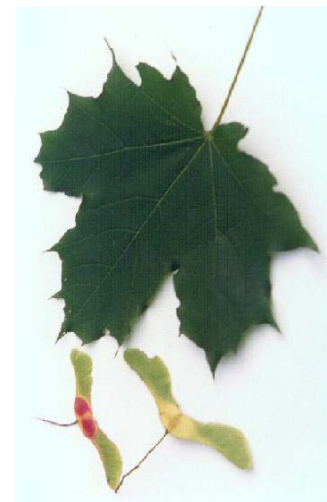
B) *Acer rubrum* (red maple)

- leaves: 3 (occasionally) triangular, coarsely toothed lobes
- bark: smooth, light gray (young). (mature) with narrow scaly plates



C) *Acer platanoides* (Norway maple)

- leaves: similar to sugar maple but broader in relation to their length; samaras are two-winged and flat
- bark: smooth (young), (mature) grey with tight ridges and furrows



Carya (hickory)

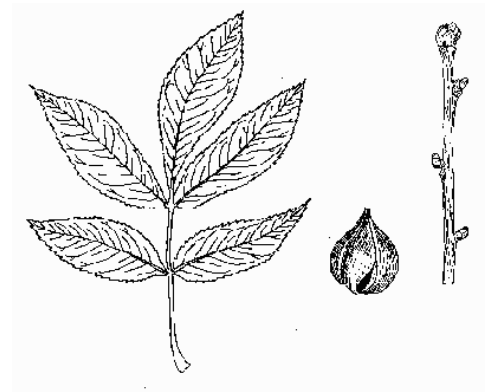
A) *Carya ovata* (shagbark hickory)

- leaves: 8-4 inches long with 5 (occasionally 9) smooth, broadly lancelet leaflets
- bark: (young) smooth grey. (mature) distinctly shaggy, thin narrow scales curved outward at the ends



B) *Carya glabra* (pignut hickory)

- leaves: 6-12 inches long, (5 occasionally 7) leaflets, and leaflets lanceolate
- bark: (mature) with scaly ridges which form a rough diamond shaped pattern, ridges broken horizontally



C) *Carya tomentosa* (mockernut)

- leaves: 6-13 inches long, 7-9 leaflets, leafstalk stout and hairy
- bark: rounded, wavy intersecting ridges; ridge sides are smoothed
- fruit large oval to pear-shaped



**MOCKERNUT
HICKORY**

D) *Carya cordiformis* (bitternut)



- leaves: 6-12 inches long, 7-11 leaflets
- bark: intersecting vertical strips giving the appearance of a woven basket
- fruit thin-shelled, pear-shaped
- bright sulfur-yellow winter bud

Juglans nigra (black walnut)

- leaves: 12 or more inches long, (7 to 12) leaflets, toothed
- bark: tightly furrowed in crisscrossing pattern



Ailanthus althissima (tree of heaven)

- leaves: odd-pinnately compound, 1-3 feet long, 11-41 leaflets, leaves toothed at base and with a disagreeable odor when crushed
- bark: thin, dark grey, somewhat roughened



Quercus (oak)

A) *Quercus rubra* (Northern red oak)

- leaves: 5-8 inches long, 5-4 inches wide, with 7-11 pointed toothed lobes separated by regular sinuses which extend halfway to the midrib
- bark: dark brown to black, with ridges and furrows which look like ski tracks



B) *Quercus velutina* (black oak)

- leaves: resemble red oak, with 5-7 lobes separated by variable sinuses, coppery with tufts of hair in the axils on the underside
- bark: thick, nearly black, with heavy vertical furrows, many horizontal checks
- acorns: deep cup and fringed



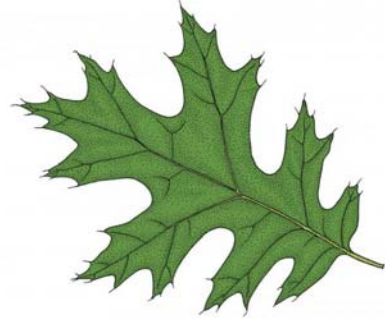
C) *Quercus palustris* (pin oak)

- leaves: resemble red oak but with deep sinuses and smaller in size
- bark: smooth when young; (mature) shallowly ridged and broken by longitudinal fissures



D) *Quercus coccinea* (scarlet oak)

- leaves: resemble red oak but with deep, regular sinuses
- acorns deep cup and fringed



E) *Quercus alba* (white oak)

- leaves: 5-9 inches long, 7-9 rounded lobes divided by narrow variable sinuses which often extend nearly to the mid rib, smooth above and below
- bark: light ashy grey, texture variable, scaly or divided into small rectangular blocks



F) *Quercus bicolor* (swamp white oak)

- leaves: 6.5 inches long, relatively few irregular teeth or sharp shallow lobes
- bark: light ashy grey, in strips to furrowed and blocky



Fagus grandifolia (American beech)

- leaves: 2-6 inches long, 1-2.5 inches wide, each prominent vein ends in a small incurved marginal tooth, smooth above and below except air in veins axils on underside
- bark: smooth, blue grey, sometimes (rarely) mottled or warty

*Celtis occidentalis* (hackberry)

- Leaves: ovate to ovate-lanceolate, sharply singly toothed, narrow curved tip, unequally heart shaped base, smooth or slightly rough above, smooth or somewhat hairy below
- bark: greyish brown with characteristic corky warts or ridges, on old trees somewhat scaly

*Tilia Americana* (basswood)

- Leaves: leaves large and almost heart-shape asymmetrical at base, single toothed with veins twice pinnate...
- bark: bark furrowed with flat ridges

*Ulmus Americana* (American elm)

- leaves: 2.5-5 inches long, leaf base uneven, coarsely double toothed, rough above, paler below
- bark: grey, furrowed in narrow, untidy, interlacing ridges
- cross-section of bark reveals alternating cream and brown layers



Ulmus rubra (slippery elm, red elm)

- leaves: 2.5-4.5 inches long, 1.25-2.25 inches wide, wide often broadest above the middle, coarsely double toothed, rough above, hairy below
- bark: red brown, furrowed, non-interlacing platy ridges



SLIPPERY ELM (Leaf and fruit, one-third natural size; twig, one-half natural size)

Ostrya virginiana (hophornbeam)

- leaves: 2.5-5 inches long, 1.5-2 inches wide, elliptical to ovate, doubly toothed margins, smooth above, below smooth except for auxiliary tufts of hair, dull yellow green above, lighter below
- bark: brownish, shed off in narrow scaly plates which curl at the free ends

*Carpinus caroliniana* (American hornbeam)

- leaves: 2.5-5" long, elliptical to ovate, doubly toothed margins
- gray trunk fluted into musclelike ridges
- bark: smooth, tight, thin, bluish gray, sometimes blotched



Prunus (cherry)A) *Prunus serotina* (black cherry)

-leaves: leaves 2-6 inches long, 1-1.5 inches wide, fine marginal teeth, teeth callous incurved, shiny dark green above, paler below and usually densely hairy alongside midrib at the base of the leaf
 -bark : (young) smooth, red brown to nearly black, horizontal line like lenticels, (mature) breaking into scaly plates, (old) eventually entirely scaly

B) *Prunus avium* (sweet cherry)

-leaves: around 4 inches long, broadly oblong or broadest above the middle, coarse or somewhat rounded teeth, rounded or heart shaped
 bark: smooth, reddish brown, with lens shaped lenticels



Malus spp. (crab apple – often hybridizes)

- leaves: alternate, edge finely serrated; leaf tip often pointed
- bark: smooth (young) with raised dots or horizontal lenticels, (mature) grey, scaly, vertically cracked



Malus spp. (Apple)

- Leaves: Alternate, simple, elliptical to ovate, 1 1/2 to 3 inches, pinnately veined, finely serrated, sometimes borne on spur shoots, green above and paler, white pubescent below and on the petiole.
- Bark: Variable, generally smooth when young, later thin and scaly.



Morus rubrum (mulberry)

- leaves: 3-5 inches long, 2-4 inches wide, coarsely toothed, rough above, hairy below, exude milky sap when broken along stem, lobed or unlobed
- bark: dark reddish brown, with somewhat long platy ridges

*Sassafras albidum* (sassafras)

- leaves: 4-6 inches long, 2-4 inches wide, entire, 2 or 3 lobed on some tree, smooth above, smooth or sparsely hairy below
- bark: aromatic, deeply furrowed into blocky ridges with frequent horizontal cracks ('axe marks')

*Populus glauca*

- Leaves: ovate, 3 to 4 inches long, pinnately veined, large blunt teeth, petiole flattened vertically, green above and paler below.
- Bark: Thin, gray, olive-green to milky green and smooth on young stems; later gray-brown, ridged with diamond shaped lenticels and splits forming.



Betula populifolia (Gray birch)

-Leaves: Alternate, simple, pinnately-veined, triangular with a very elongated acuminate tip, 2 to 3 inches long, doubly serrate margin, green above and paler below.

-Bark: Reddish brown with numerous lighter lenticels on very young stems, later turning gray to white and very chalky; remains smooth and generally does not peel.



Rhamnus cathartica. (European buck thorn.)

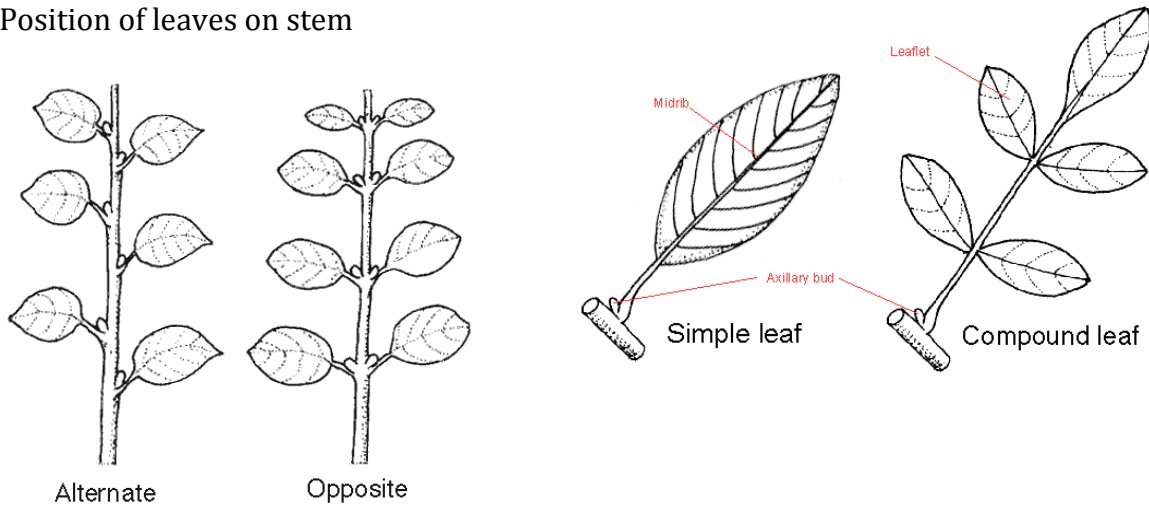
-Leaves: Opposite or sub-opposite (partially alternate), simple, elliptical to nearly oval, 2 to 3 inches long, finely serrated, dark shiny green above, much lighter below.

-Bark: Smooth, shiny gray to reddish brown with numerous lenticels, later becoming dark gray and scaly; large specimens become rectangular blocky; inner bark is yellow.



Key to Terms

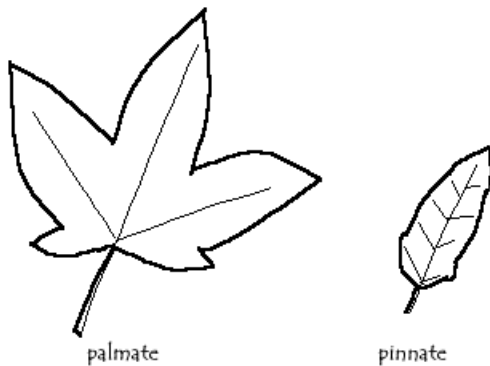
Position of leaves on stem



The auxiliary buds are always found at the junction of the leaf stem and the twig. It is not found at the junction of a leaflet and a leaf stem.

Simple leaf: note auxiliary bud

Leaflet or leaf vein pattern. Note auxiliary bud
Or leaf lobe pattern



Resources used:

http://dendro.cnre.vt.edu/dendrology/data_results_with_common.cfm?state=unknown
http://www.hubbardbrook.org/w6_tour/tree-stop/
<http://www.depauw.edu/univ/naturepark/natural%20history/>
<http://www.ipfw.edu/phyplt/assets/NativeTreesOfIndianaRiverWalk/>
<http://www.duke.edu/~cwcook/trees/>
<http://www.cas.vanderbilt.edu/bioimages/>
<http://www.aces.edu/forestry/dendrology/leaves.php>
<http://uptreeid.com/KeyLeafOnly/Collection6.htm>
http://www.uwgb.edu/biodiversity/herbarium/trees/alternate_opposite_leaves01.htm
<http://www.forestwander.com/articles/2010/10/07/forestwanders-beautiful-autumn-leaves-identification-guide/>
<http://www.extension.umn.edu/yardandgarden/>
<http://www.aces.edu/forestry/dendrology/leaves.php>
http://diglibrarian.tripod.com/trees_of_indiana/
<http://www.discoverscience.rutgers.edu/extras/trees/treephotos.html>
<http://www.bio.brandeis.edu/fieldbio/>
<http://www.uwgb.edu/biodiversity/herbarium/trees/acepla01.htm>
<https://plants.usda.gov/core/profile?>
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