

A Layman's Key to Native West Virginia Forest Trees

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Note: The author gratefully acknowledges suggestions made by Dr. Earl L. Core.

The following key to the native forest trees of West Virginia is designed to be used by those with no knowledge of unusual botanical terms. The more likely available and most distinguishing features of tree species are emphasized, allowing you to follow numbered steps to the probable answer. At that point, it is helpful to verify your answer using the booklet, **Forest Trees of West Virginia**, available for 50 cents from the West Virginia Department of Natural Resources, Charleston.

EXAMPLE

This key can be used only when leaves are present, and the fruit is often helpful in identification. If fruit is needed at some point in the key and none can be found, both routes from that point to the most logical identification must be tried.

To illustrate use of the key, suppose you wish to identify a specimen with the following appearance:

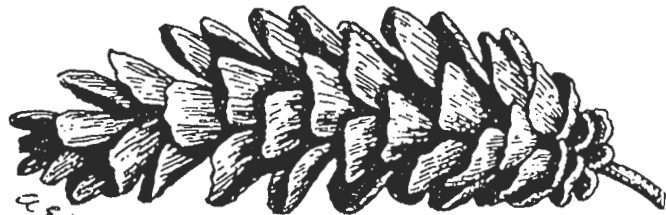


The leaves are broad, so we go from I to II. The simple leaf takes us from II to III, and the alternate arrangement from III to Group C. Working in Group C, the leaf margin is lobed, 1 to 51; margins are toothed, 51 to 64; there are no thorns, 64 to 65; the fruit is not an apple, 65 to 66; the leaf outline is not mitten-like, 66 to 67; and the star-shaped leaves take us to the correct answer—sweetgum.

- I. Tree form Christmas-tree-like; leaves needle-shaped, awl-shaped, or scale-like Group A
- I. Tree form not Christmas-tree-like; leaves broad and flat II
- II. Leaves simple (one leaf attaches to twig with bud in axis) III
- II. Leaves compound (leaf, with bud in axis, consists of more than one leaflet) IV
- III. Leaves and buds opposite on twigs Group B
- III. Leaves and buds alternate on twigs Group C
- IV. Leaves and buds opposite on twigs Group D
- IV. Leaves and buds alternate on twigs Group E

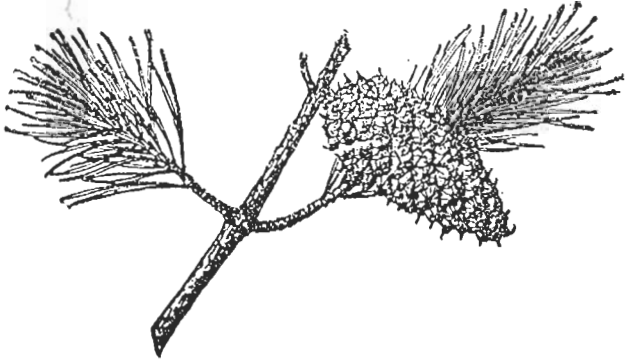
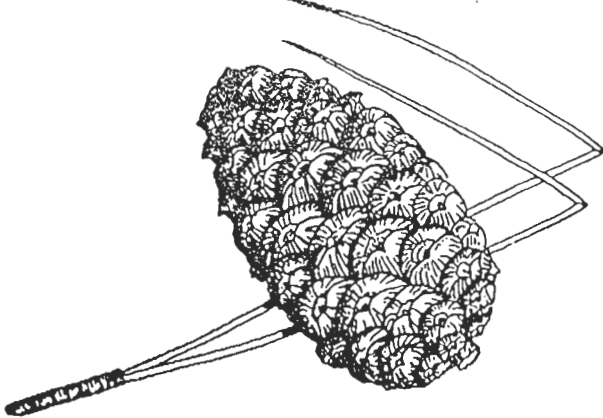
GROUP A: Tree form Christmas-tree-like; leaves needle-shaped, or scale-like.

- 1. Leaves needle-like and in clusters of 2 to 5 2
- 1. Leaves not needle-like, or if needle-like not in clusters of 2 to 5 7
- 2. Needles in clusters of 5 eastern white pine (*Pinus strobus*)



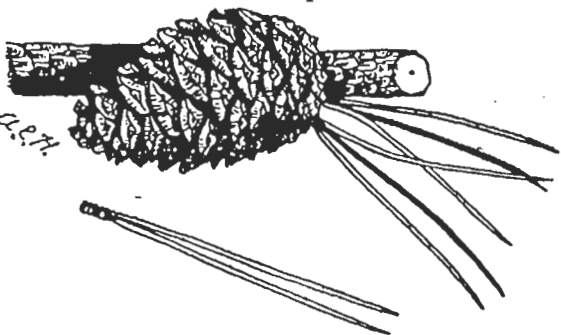
- 2. Needles in clusters of 2 or 3 3
- 3. Cone scales without prickles red pine (*Pinus resinosa*)





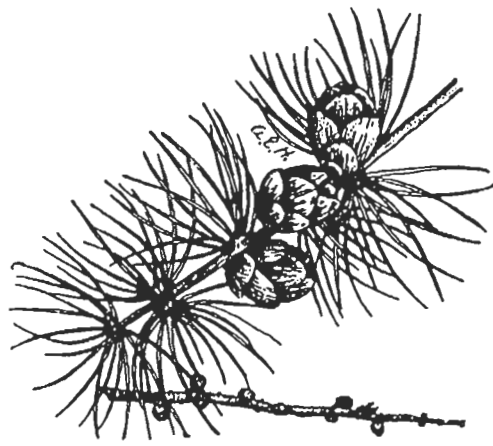
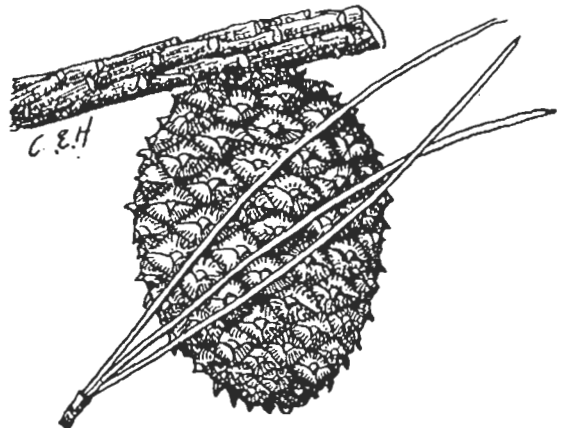
- 3. Cone scales with prickles 4
- 4. Some or all needles in clusters of 3 5
- 4. Needles in clusters of 2 6
- 5. Bark surface has pencil-point size holes often filled with resin (pitch pockets); most needles in clusters of 2 shortleaf pine (*Pinus echinata*)

- 6. Cones heavy, scales without deep purple inner lips table-mountain pine (*Pinus pungens*)



- 5. Bark surface without pitch pockets; needles in clusters of 3 pitch pine (*Pinus rigida*)

- 7. Needles in clusters of 8 or more on short lateral twigs, shed in winter tamarack (*Larix laricina*)

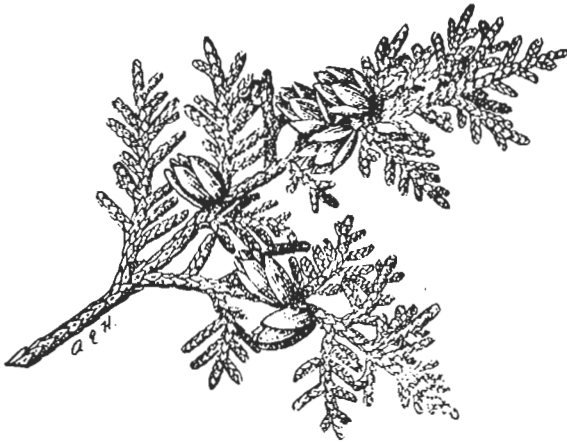


- 6. Cone scales with deep purple inner lips Virginia pine (*Pinus virginiana*)

- 7. Leaves, if needle-like, not in clusters, evergreen 8
- 8. Fruit berry-like eastern redcedar (*Juniperus virginiana*)



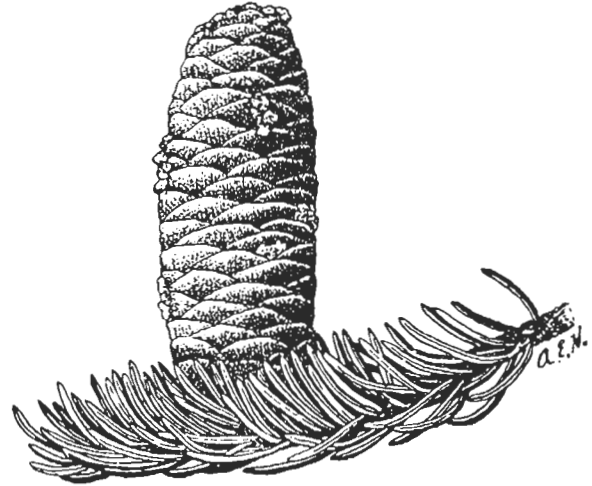
8. Fruit woody 9
 9. Leaves scale-like (as on a fish)
 northern white-cedar (*Thuja occidentalis*)



9. Leaves not scale-like 10
 10. Needles with 2 distinct white bands
 beneath, soft and flexible; top twig
 droops
 eastern hemlock (*Tsuga canadensis*)



10. Needles without distinct white bands
 beneath 11
 11. Needles with rounded tips; cones
 stand upright and fall apart when
 mature balsam fir (*Abies balsamea*)

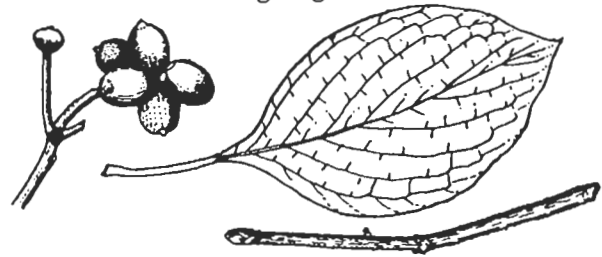


11. Needles sharp-pointed and attach to
 twig on woody peg-like projections;
 cones not upright
 red spruce (*Picea rubens*)



GROUP B: Leaves simple and opposite.

1. Leaf margins entire or slightly wavy 2
 1. Leaf margins toothed 3
 2. Leaves 3 to 5 inches long, veins
 curve and follow margin; berry-
 like fruit red and in small clusters
 flowering dogwood (*Cornus florida*)



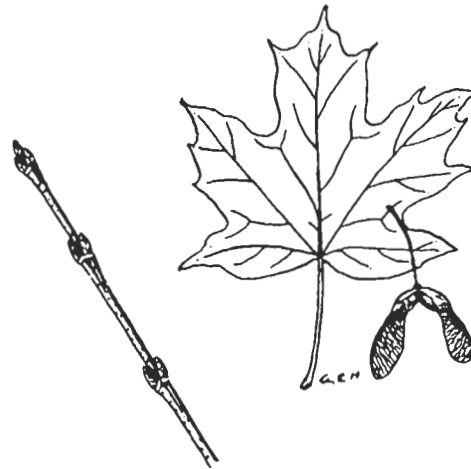
2. Leaves 4 to 8 inches long; berry-like fruit blue and in drooping clusters
 fringetree (*Chionanthus virginicus*)



Note: Northern catalpa (*Catalpa speciosa*) whose cigar-shaped fruit is $\frac{1}{2}$ to $\frac{3}{4}$ inches thick, and southern catalpa (*Catalpa bignonioides*), whose fruit is $\frac{1}{4}$ to $\frac{1}{2}$ inches thick, are not native but have naturalized.



5. Leaves mostly 3 to 5 lobed, top lobe with more than 1 tooth, usually smooth beneath
 sugar maple (*Acer saccharum*)

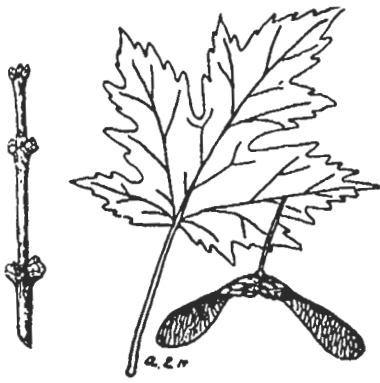


6. Bark greenish to reddish-brown with pale stripes
 striped maple (*Acer pennsylvanicum*)



3. Leaves lobed 4
 3. Leaves not lobed 9
 4. Leaves with few remote teeth 5
 4. Leaves with many teeth 6
 5. Leaves mostly 3-lobed, top lobe usually with 1 tooth, usually hairy beneath
 black maple (*Acer nigrum*)

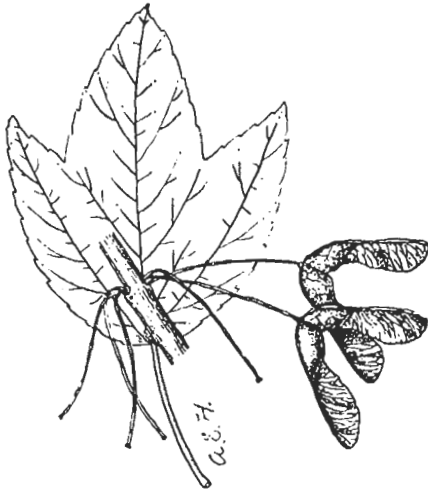
6. Bark gray to brown without pale stripes 7
 7. Leaves deeply 5-lobed, sides of middle lobe spread outward, silvery-white beneath silver maple (*Acer saccharinum*)



- 7. Leaves 3 to 5 lobed, sides of middle lobe usually taper inward 8
- 8. Leaves downy beneath mountain maple (*Acer spicatum*)



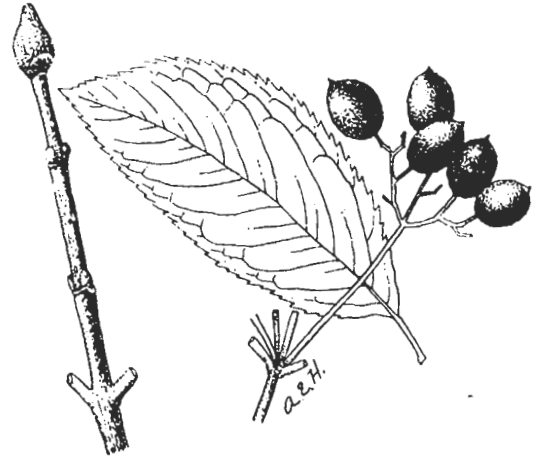
- 8. Leaves smooth beneath red maple (*Acer rubrum*)



- 9. Tip of leaf tapers into long slender point nannyberry (*Viburnum lentago*)



- 9. Tip of leaf only slightly pointed blackhaw (*Viburnum prunifolium*)



GROUP C: Leaves simple and alternate.

- 1. Leaf margins not divided (not lobed) 2
- 1. Leaf margins lobed 51
- 2. Leaf margins entire or slightly wavy 3
- 2. Leaf margins toothed 14
- 3. Leaves thick, evergreen 4
- 3. Leaves relatively thin, shed in fall 6
- 4. Leaves 4 to 11 inches long; flowers pale rose to white rhododendron (*Rhododendron maximum*)



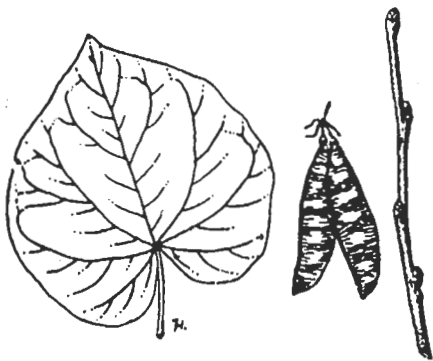
4. Leaves 3 to 5 inches long 5
 5. Leaves usually rounded at both ends;
 flowers lilac-purple moun-
 tain-rose bay (*Rhododendron catawbiense*)



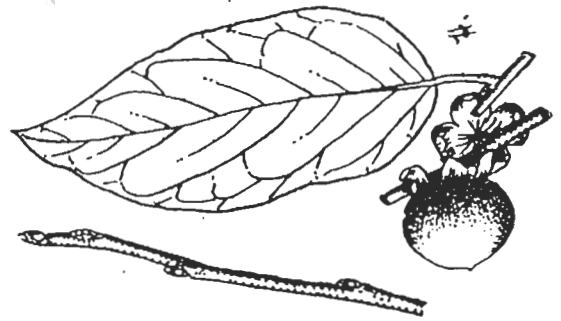
5. Leaves not rounded at both ends;
 flowers pink or white
 mountain laurel (*Kalmia latifolia*)



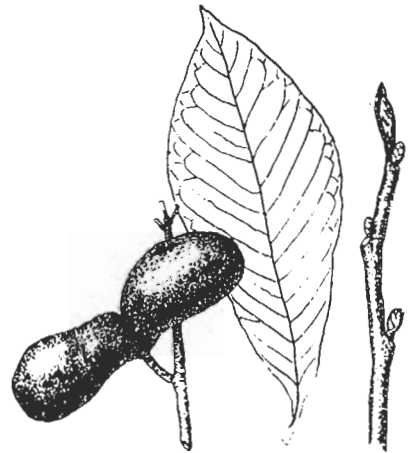
6. Fruit a bean-like pod; leaves heart-
 shaped
 eastern redbud (*Cercis canadensis*)



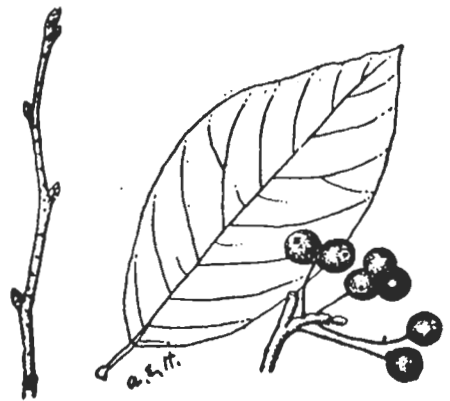
6. Fruit not a bean-like pod 7
 7. Lengthwise cut of twig reveals sections
 of pith with empty chambers; fruit
 edible berry about 1½ inches in dia-
 meter
 common persimmon (*Diospyros virginiana*)



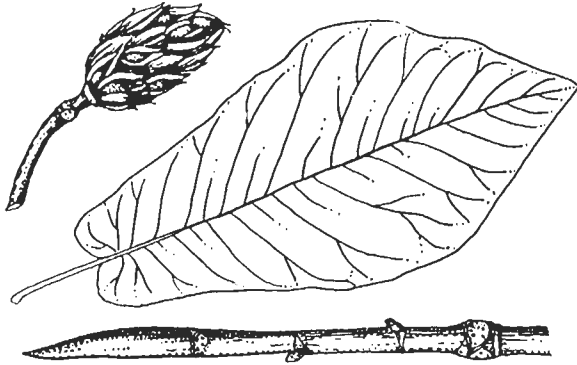
7. Twig pith not chambered 8
 8. Lengthwise cut of twig shows solid
 pith with lines crossing at regular
 intervals (diaphragmed pith) 9
 8. Twig pith not diaphragmed 13
 9. Buds fuzzy brown; leaves 4 to 12 inches
 long; fruit banana-like, 3 to 5 inches
 long pawpaw (*Asimina triloba*)



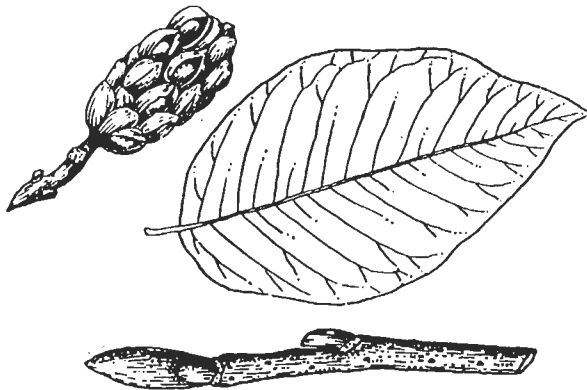
9. Buds not fuzzy brown 10
 10. Buds covered with several overlap-
 ping scales; leaves 2 to 5 inches
 long; fruit berry-like
 blackgum (*Nyssa sylvatica*)



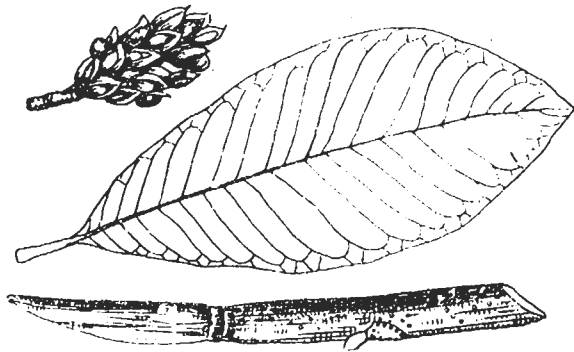
10. Buds covered with single scales; leaves 4 to 24 inches long; fruit cone-like or cucumber-like in shape .. 11
11. Base of leaf margin turns in to appear ear-like; leaves 10 to 20 inches long; flowers white, 8 to 10 inches wide mountain magnolia (*Magnolia fraseri*)



11. Base of leaf not ear-like 12
12. Leaves 4 to 12 inches long; flowers greenish or yellow, 2½ to 3 inches long, not showy cucumbertree (*Magnolia acuminata*)



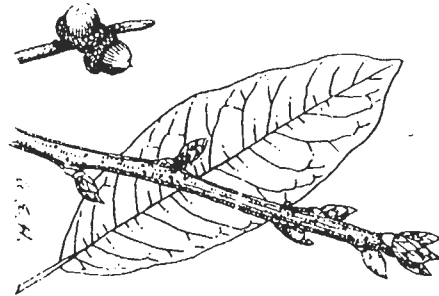
12. Leaves 12 to 24 inches long, arranged near end of branch like umbrella; flowers white umbrella magnolia (*Magnolia tripetala*)



13. Leaf veins curve and follow margin; fruit berry-like alternate-leaf dogwood (*Cornus alternifolia*)



13. Leaf veins do not curve and follow margin; fruit an acorn; buds clustered near end of twig shingle oak (*Quercus imbricaria*)

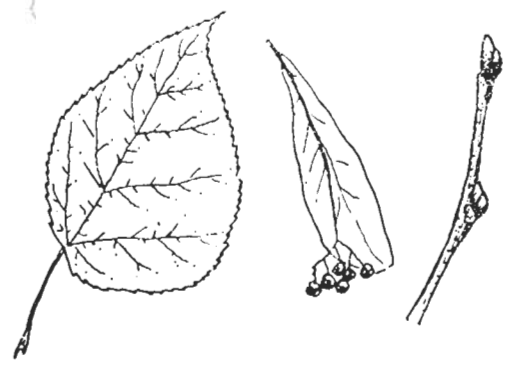


14. Branches armed with stiff, sharp thorns hawthorn (*Crataegus* species)

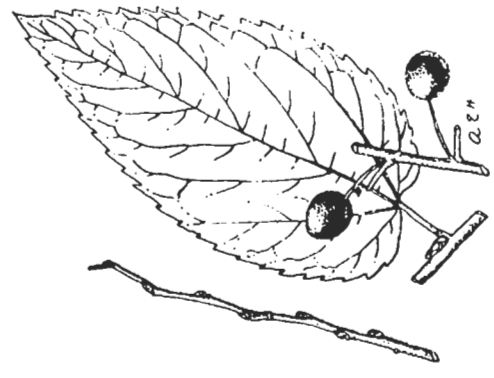


Note: Hawthorns hybridize making identification of species difficult even for the expert.

- 14. Branches unarmed 15
- 15. Base of leaf margins uneven, not symmetrical 16
- 15. Base of leaf margins nearly symmetrical 20
- 16. Bark appears warty; sweet berry-like fruit hackberry (*Celtis occidentalis*)



- 19. Leaves smooth above, downy below; margins of fruit wings hairy; cross-section of bark shows alternating brown and white layers American elm (*Ulmus americana*)



- 16. Bark not warty in appearance 17
- 17. Leaves heart-shaped; fruit berry-like and falls attached to leaf-like bract 18
- 17. Leaves not heart-shaped; fruit winged 19
- 18. Lower surface of leaf smooth American basswood (*Tilia americana*)

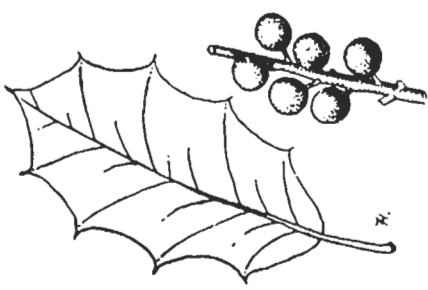


- 19. Leaves rough and hairy on both sides; margins of fruit wings smooth; cross-section of bark shows brownish layers only slippery elm (*Ulmus rubra*)

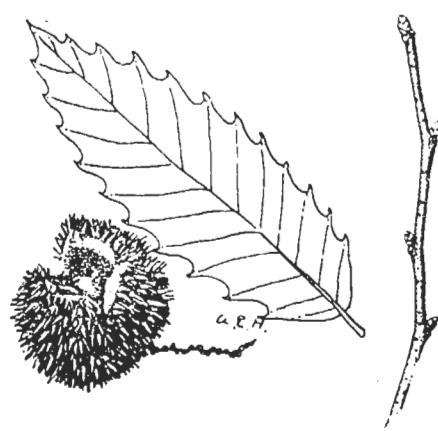


- 18. Lower surface of leaf covered with white down white basswood (*Tilia heterophylla*)

- 20. Teeth coarse, 2 to 5 to the inch 21
- 20. Teeth fine, 6 or more to the inch 30
- 21. Fruit berry-like 22
- 21. Fruit not berry-like 23
- 22. Leaves thick and leathery, ever-green, armed with spiny teeth American holly (*Ilex opaca*)



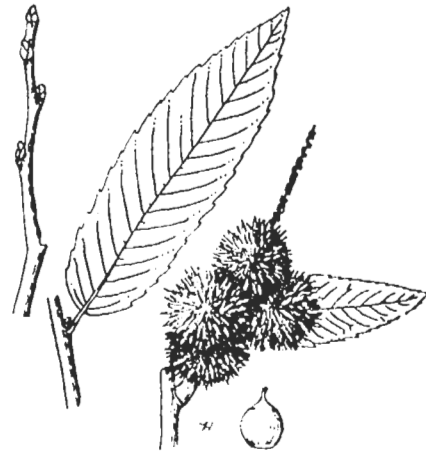
22. Leaves thin, shed in fall, margins not spiny
 mountain holly (*Ilex montana*)



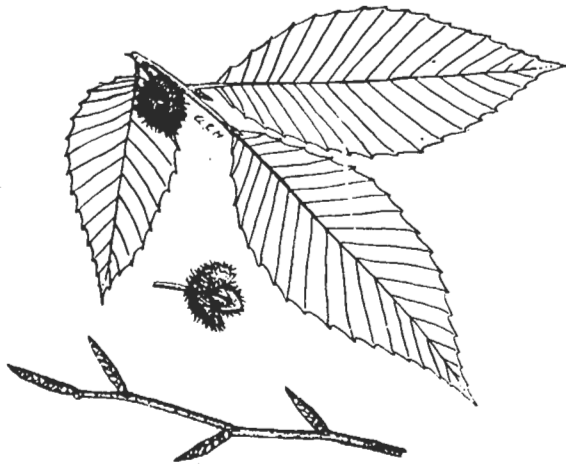
25. Lower surface of leaves woolly
 .. Allegheny chinquapin (*Castanea pumila*)



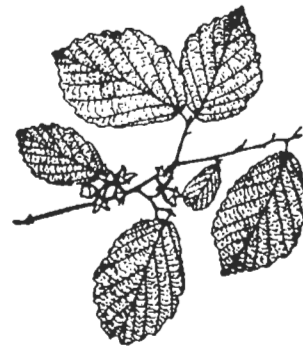
23. Fruit a nut in a bur 24
 23. Fruit not a nut in a bur 26
 24. Nuts angled, bur with weak prickles; buds sharp; bark smooth and gray
 American beech (*Fagus grandifolia*)



26. Buds without scales; leaves with rounded teeth; flowers yellow, appearing in fall
 witch-hazel (*Hamamelis virginiana*)



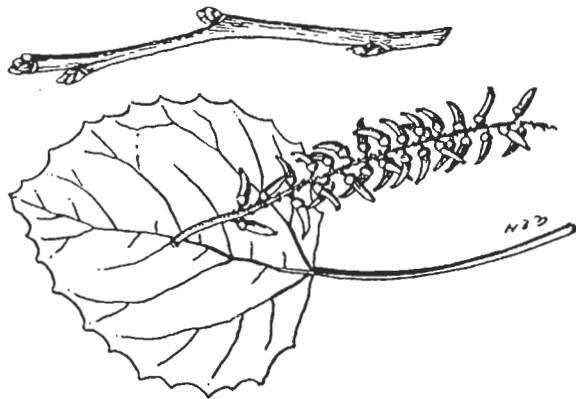
24. Nuts round, bur with stiff, sharp prickles 25
 25. Lower surface of leaves smooth
 American chestnut (*Castanea dentata*)



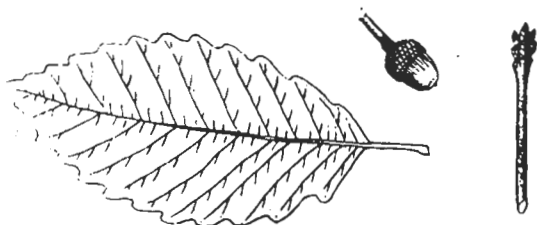
26. Buds with scales 27
 27. Fruit not an acorn, buds not clustered at end of twig 28
 27. Fruit an acorn; buds clustered at end of twig 29
 28. Tip of leaf tapers to a sharp point eastern cottonwood (*Populus deltoides*)



28. Tip of leaf does not taper to a sharp point; teeth very coarse bigtooth aspen (*Populus grandidentata*)



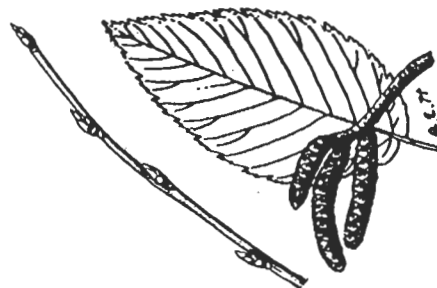
29. Teeth rounded chestnut oak (*Quercus prinus*)



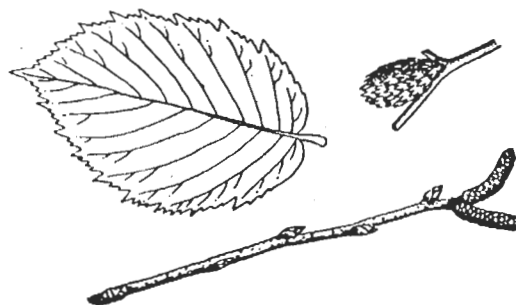
29. Teeth sharp chinquapin oak (*Quercus muehlenbergii*)



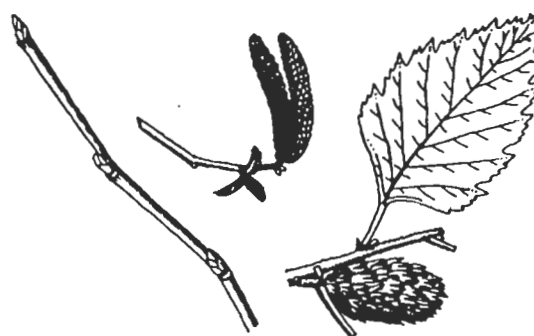
30. Little teeth found on bigger teeth on leaf margin (doubly serrate) 31
 30. Leaves not doubly serrate 39
 31. Twigs armed with stiff thorns hawthorn (*Crataegus* species)
 Note: See note at step 14.
 31. Twigs unarmed 32
 32. Fruit resembles miniature pine cone 33
 32. Fruit does not resemble miniature pine cone 36
 33. Chewed twig gives strong wintergreen taste; bark black black birch (*Betula lenta*)



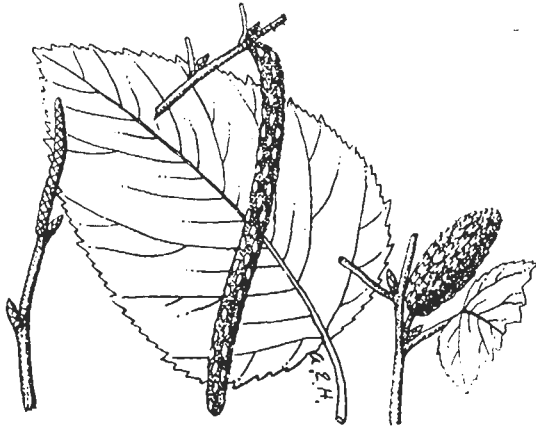
33. Chewed twig without strong or with only slight wintergreen taste 34
 34. Bark silvery or yellow-gray to golden yellow birch (*Betula alleghaniensis*)



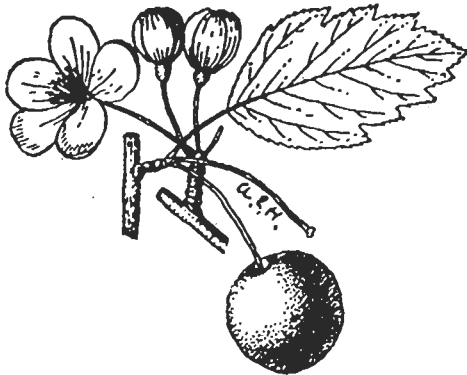
34. Bark not silvery or yellow to golden 35
 35. Bark salmon-pink to red-brown river birch (*Betula nigra*)



35. Bark white . . . paper birch
(*Betula papyrifera*)

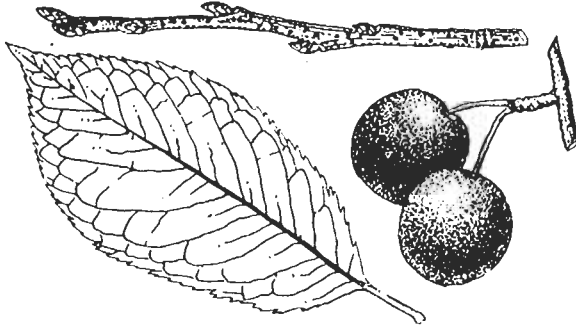


36. Fruit a sour apple about 1 inch in diameter
..... sweet crab apple (*Malus coronaria*)



36. Fruit not an apple 37

37. Leaves with pimple-like glands near base of margin or on leaf stem; fruit a plum
..... American wild plum (*Prunus americana*)

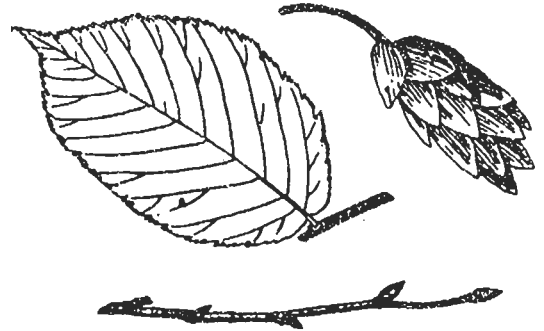


37. Leaves without pimple-like glands; fruit not a plum 38

38. Bark has muscled appearance, gray to bluish American hornbeam (*Carpinus caroliniana*)



38. Bark finely divided into thin scales, shreddy appearance, brown or reddish-brown eastern hophornbeam (*Ostrya virginiana*)



39. Chewed twig gives strong wintergreen taste black birch (*Betula lenta*)

39. Chewed twig without wintergreen taste 40

40. Fruit a sour apple about 1 inch in diameter
..... sweet crab apple (*Malus coronaria*)

40. Fruit not an apple 41

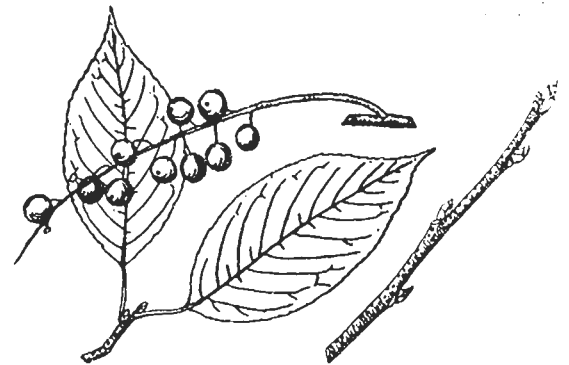
41. Fruit berry-like 42

41. Fruit not berry-like 47

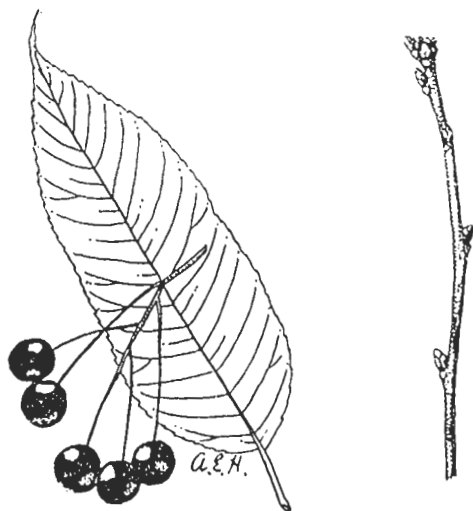
42. Pimple-like glands on leaf stem or lower leaf margin 43

42. No pimple-like glands 45

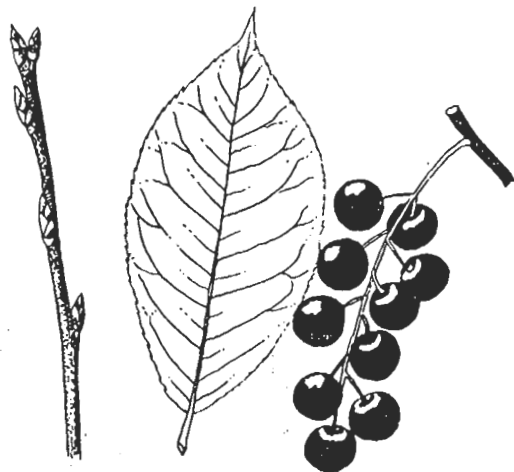
43. Leaves with incurved teeth
..... black cherry (*Prunus serotina*)



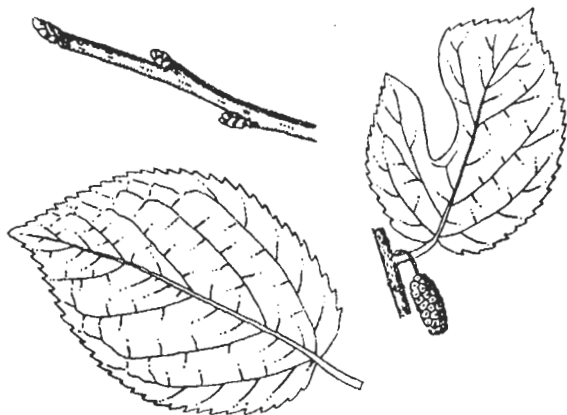
43. Teeth not incurved 44
 44. Fruit 5 or less in clusters
 fire cherry (*Prunus pennsylvanica*)



44. Fruit close to a dozen in clusters com-
 mon chokecherry (*Prunus virginiana*)



45. Silk-like strands show across break in
 twig, sap milky; fruit about 1 inch long
 red mulberry (*Morus rubra*)



45. No silk-like strands across break
 in twig 46
 46. Three dots (bundle scars) show in
 scar when leaf removed from twig.
 downy
 serviceberry (*Amelanchier arborea*)



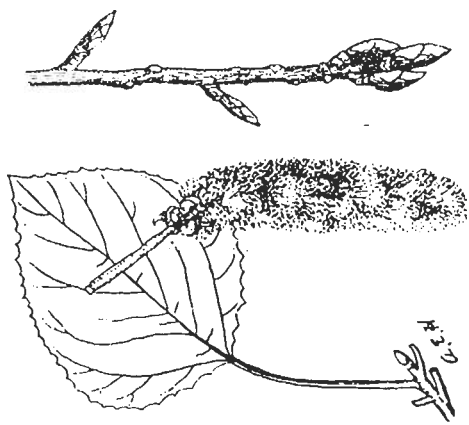
46. One bundle scar shows when leaf
 removed
 mountain holly (*Ilex montana*)
 47. Lengthwise cut of twig shows pith with
 empty chambers
 Carolina silverbell (*Halesia carolina*)



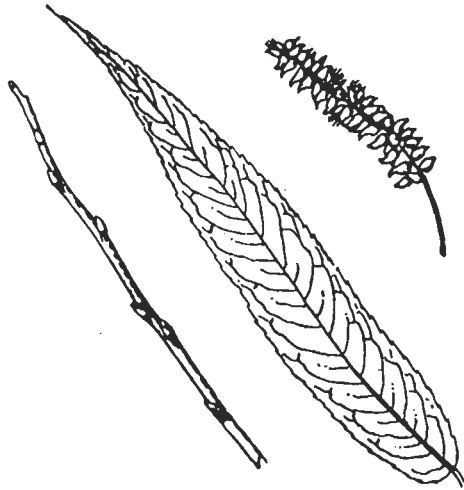
47. Pith not chambered 48
 48. Leaf stems long and flattened 49
 48 Leaf stems not unusually long 50
 49. Tip of leaf tapers to a sharp point
 eastern cottonwood (*Populus deltoides*)



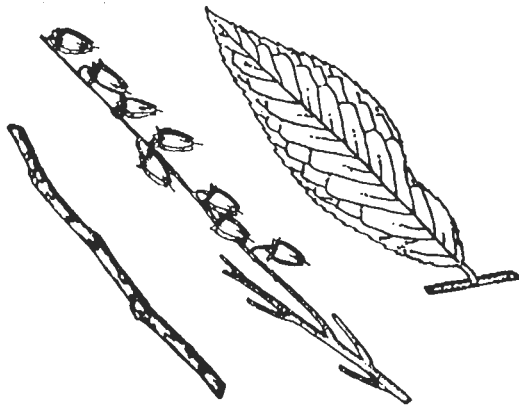
49. Tip of leaf does not taper to sharp point
 quaking aspen (*Populus tremuloides*)



50. Leaves ½ inch wide or less
 black willow (*Salix nigra*)



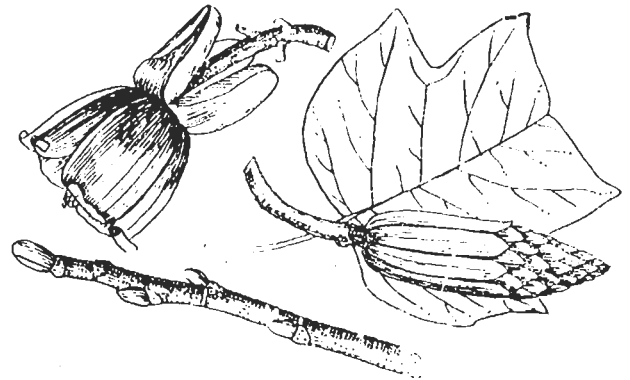
50. Leaves 1½ to 2½ inches wide
 sourwood (*Oxydendrum arboreum*)



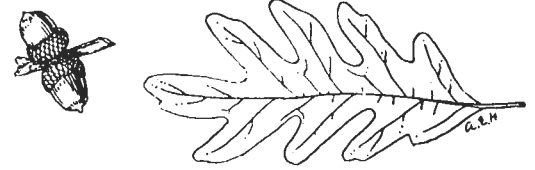
51. Margins of leaves without teeth but
 may have bristles 52
 51. Margins of leaves toothed 64
 52. Leaves often 3-lobed or with 2-lobed
 mitten-like outline; roots have
 strong, pleasing odor
 sassafras (*Sassafras albidum*)



52. Leaves without mitten-like outline;
 roots without pleasing odor 53
 53. Leaf outline resembles a tulip; fruit
 cone-like cluster of winged seeds
 yellow-poplar (*Liriodendron tulipifera*)



53. Leaf outline does not resemble a tulip;
 fruit an acorn; buds clustered at
 twig tips 54
 54. Lobes without bristle tips 55
 54. Lobes with bristle tips 58
 55. Leaves not fuzzy below
 white oak (*Quercus alba*)

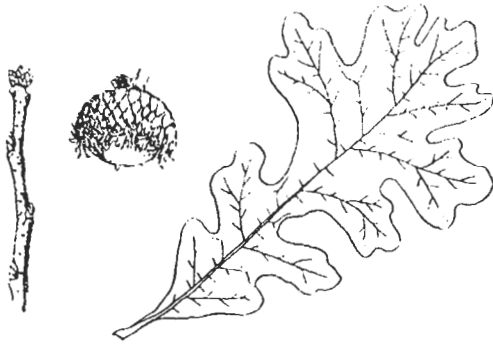


55. Leaves fuzzy below 56
 56. Leaves cross-shaped
 post oak (*Quercus stellata*)



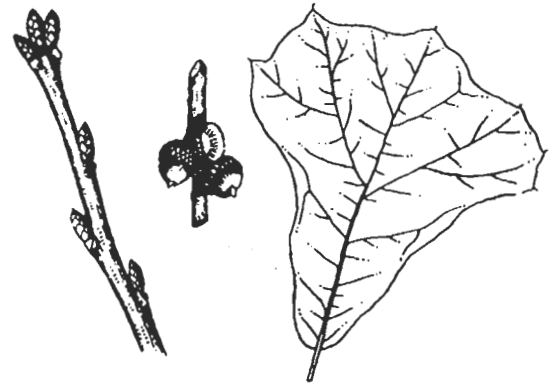
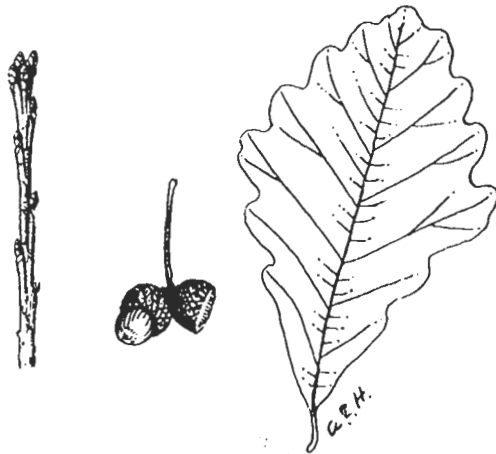
56. Leaves not cross-shaped 57

- 57. Acorn large and almost enclosed by fringed cup; deep cuts in leaf margins almost divide leaf in half bur oak (*Quercus macrocarpa*)



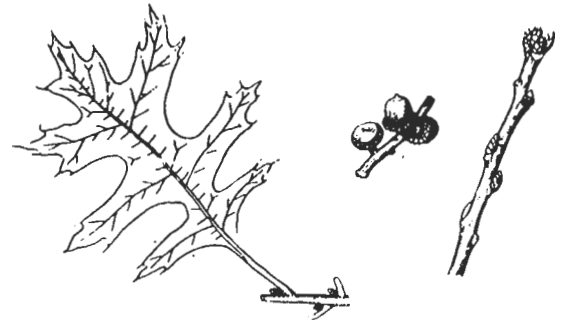
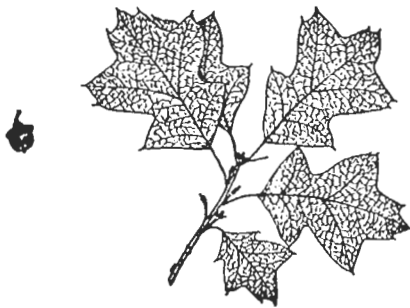
- 60. Leaves very wide toward the tip (blackjack shape) blackjack oak (*Quercus marilandica*)

- 57. Acorn cup encloses about 1/3 of nut, acorn stems 1 to 4 inches long swamp white oak (*Quercus bicolor*)



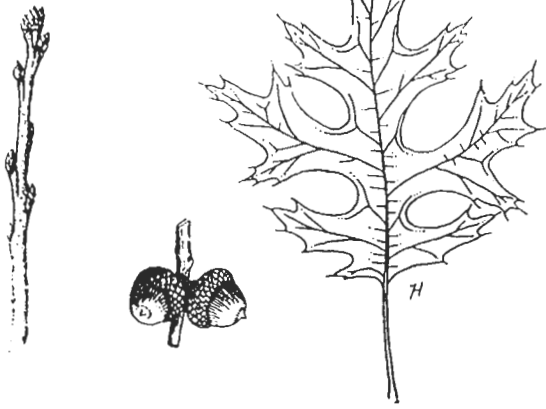
- 60. Leaves not blackjack-shaped 61
- 61. Leaf margins cut 2/3 toward middle of leaf 62
- 61. Leaf margins cut not over 1/2 toward middle of leaf 63
- 62. Lower live branches droop; acorn cup saucer-shaped pin oak (*Quercus palustris*)

- 58. Leaves white to red-woolly below 59
- 58. Leaves green below 60
- 59. Leaves leathery; usually a shrub scrub oak (*Quercus ilicifolia*)



- 59. Leaves not leathery, lobes usually come to one point, scythe-shaped southern red oak (*Quercus falcata*)

- 62. Lower live branches do not droop, but dead drooping branches usually present; acorn cup top-shaped scarlet oak (*Quercus coccinea*)



63. Inner bark yellow, bark blocky without smooth vertical streaks
 black oak (*Quercus velutina*)



63. Inner bark light red, bark with smooth vertical streaks
 northern red oak (*Quercus rubra*)



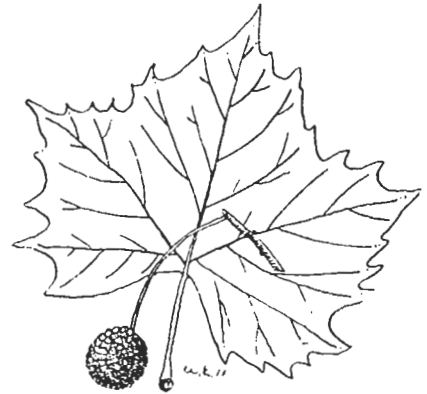
64. Twigs armed with sharp thorns
 hawthorn (*Crataegus* species)
 Note: See note at step 14.

64. Twigs unarmed 65
 65. Fruit a sour apple about 1 inch in diameter
 sweet crab apple (*Malus coronaria*)

65. Fruit not an apple 66
 66. Leaves often 3-lobed or with 2-lobed mitten-like outline; fruit berry-like, about 1 inch long; silk-like strands show across break in twig, sap milky red mulberry (*Morus rubra*)
 66. Leaf outline not mitten-like; no silk-like strands across break in twig 67
 67. Leaf star-shaped; limbs and twigs often have corky wings
 sweetgum (*Liquidambar styraciflua*)

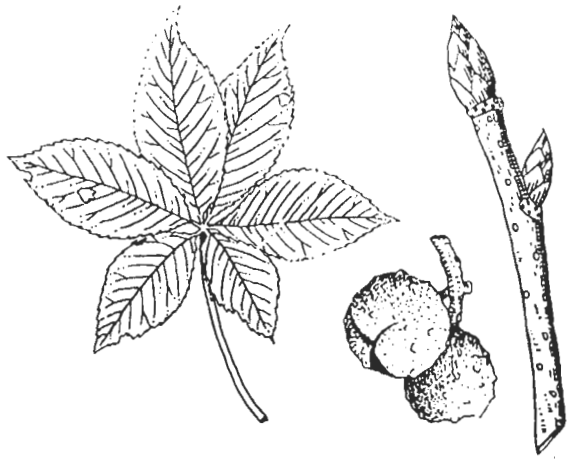


67. Base of leaf covers winter bud; bark a mixture of brown and white
 American sycamore (*Platanus occidentalis*)



GROUP D: Leaves compound and opposite.

1. Leaflets attach to one point on leaf stem (palmately compound) 2
 1. Leaflets attach at different points along the leaf stem (pinnately compound) 3
 2. Husk around nut has spines
 Ohio buckeye (*Aesculus glabra*)



2. Husk around nut without spines
 yellow buckeye (*Aesculus octandra*)



3. Paired winged fruit; 3 to 5 coarsely
 toothed leaflets; new twigs bright green
 boxelder (*Acer negundo*)



3. Winged fruit not paired; 5 or more
 entire or finely toothed leaflets 4

4. Leaflets attach directly to main leaf
 stem (sessile)
 black ash (*Fraxinus nigra*)



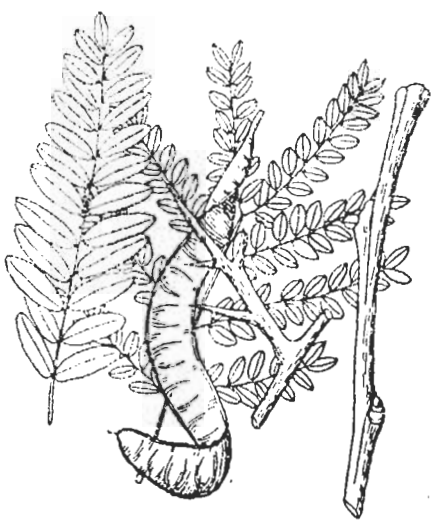
4. Each leaflet has a stem which
 attaches to main leaf stem 5
 5. Scar left when leaf removed deeply
 notched
 white ash (*Fraxinus americana*)



5. Scar left when leaf removed usually
 straight on upper edge
 green ash (*Fraxinus pennsylvanica*)

GROUP E: Leaves compound and alternate.

- 1. Thorns present 2
- 1. Thorns absent 4
- 2. Thorns generally 3-branched; fruit
 a pod 10 to 18 inches long
 honeylocust (*Gleditsia triacanthos*)



4. Leaves consist of compound leaflets attached to main leaf stem (doubly compound); fruit a pod Kentucky coffeetree (*Gymnocladus dioicus*)

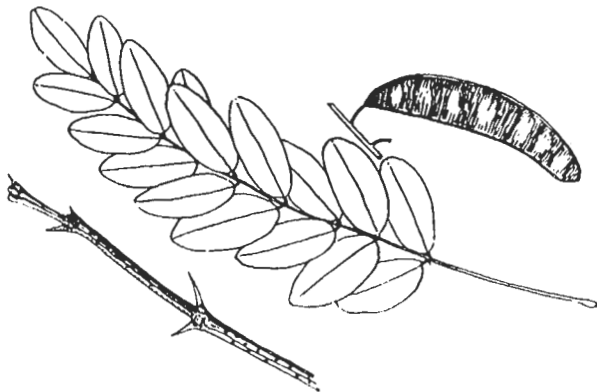


2. Thorns not branched; fruit not a large pod 3
 3. Thorns present on leaf stem; leaf consists of compound leaflets attached to main leaf stem (doubly compound) devil's walkingstick (*Aralia spinosa*)



4. Leaves not doubly compound; fruit not a pod 5
 5. Leaves consist of 3 leaflets; fruit with circular wings common hoptree (*Ptelea trifoliata*)

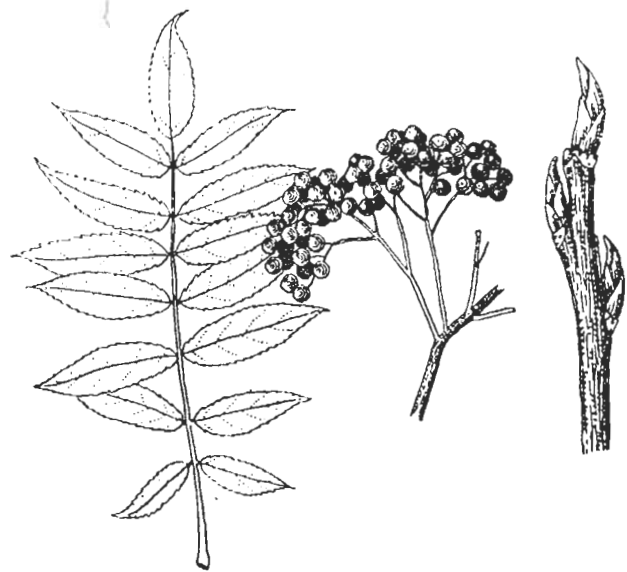
3. Thorns not present on leaf stem; leaf not doubly compound black locust (*Robinia pseudoacacia*)



5. Leaves consist of more than 3 leaflets; fruit without circular wings 6
 6. Lengthwise cut of twig reveals empty chambers 7
 6. Pith not chambered 8
 7. Nut round; twig pith light yellow black walnut (*Juglans nigra*)



7. Nut football-shaped; twig pith
chocolate brown
..... butternut (*Juglans cinerea*)



10. Fruiting heads elongated 11
11. Leaf stem winged with leaf-like material
..... shining sumac (*Rhus copallina*)
11. Leaf stem not winged; twigs covered
with velvety hair
..... staghorn sumac (*Rhus typhina*)



8. Leaf margins entire; leaf stem
winged with leaf-like material
..... shining sumac (*Rhus copallina*)



Note: Tree-of-heaven (*Ailanthus altissima*) resembles sumac, but each leaflet has a small lobe near its base. It is not native but is now naturalized.



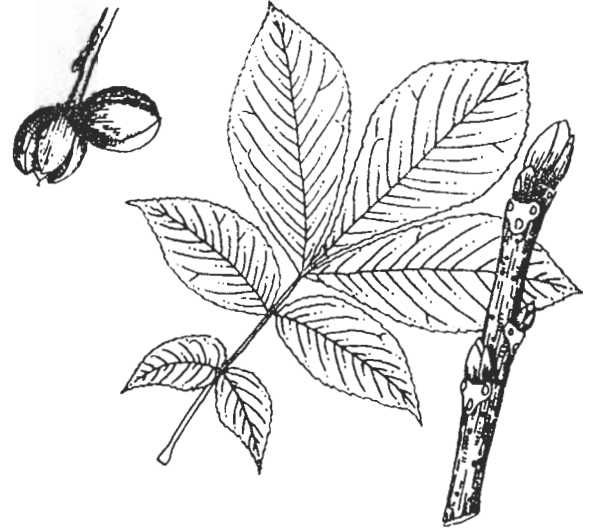
8. Leaf margins toothed 9
9. Fruit berry-like 10
9. Fruit a nut 12
10. Fruit in flat-topped clusters
..... American
mountain-ash (*Sorbus americana*)



12. Buds long and sulfur-yellow
 bitternut hickory (*Carya cordiformis*)



15. Leaflets 7 to 9, hairy beneath; nut husk
 about 1/4 inch thick
 mockernut hickory (*Carya tomentosa*)



12. Buds not sulfur-yellow 13
 13. Bark on old trunks shaggy with loose
 plates 14
 13. Bark on old trunks tight 15
 14. Leaflets usually 5, smooth or
 slightly hairy below
 shagbark hickory (*Carya ovata*)



15. Leaflets 5 to 7, almost smooth beneath;
 nut husk about 1/8 inch thick
 pignut hickory (*Carya glabra*)



14. Leaflets usually 7, hairy below
 shellbark hickory (*Carya laciniosa*)



REFERENCES

1. Brooks, A. B. 1920. *West Virginia trees*. WVU Agr. Expt. Sta. Bull. 175.
2. Core, E. L., and R. L. Guthrie. 1968. *Forest trees of West Virginia*. W. Va. Dept. Natural Resources, Charleston.
3. Harlow, W. M. 1959. *Fruit key and twig key*. Dover Pub., Inc., New York.
4. Harlow, W. M., and E. S. Harrar. 1968. *Textbook of dendrology*. 5th ed., McGraw-Hill Co., New York.
5. Preston, R. J., Jr. 1960. *North American trees*. The M.I.T. Press, Mass.