

## Winter Twig Key to Common Leafless Dicot Trees of the Williamsburg Area

[Jan. 2023 Version]

**Sources, Explanation, and Comments:** This key to the genera of local deciduous dicot trees in winter was first put together by S. Ware for the 2018-2019 Tree Stewards class for them to use in a keying exercise, and has been repeatedly revised by him since then. It applies only to this local area, so it won't necessarily work in other parts of Virginia, where other genera and species are present. Features used in the key may not apply to a genus overall, but refer to features of the species *in this area* to which that key choice leads you.

This key is intended as a teaching tool, not as a comprehensive key; it omits all conifers, evergreen dicots, shrubs (both tall and short), rare or uncommon understory trees in our area, and introduced trees that are not widely naturalized in the Williamsburg area. It keys only to genus. A key that does not provide for identification to individual species of a genus as large as *Quercus* may strike you as not very helpful, but many of our local oaks cannot be reliably distinguished in leafless condition unless you have mature acorns, which are often not present. Most of the references listed at the end of this introduction have acorn-dependent keys to oaks, but only the Kirkman et al. reference covers all our local oak species.

This key is not original; it relies heavily on three sources: (a) the winter key to eastern North American trees by the famous professor of forestry of the State University of New York at Syracuse, Dr. William Harlow (first published in 1941, before S. Ware was born), (b) the book by May and Tom Watts on identifying winter trees published in 1970, and (c) a guide to trees (with and without leaves) by Dr. Kay Kirkman (a Wm. & Mary alumna) and two co-authors. Full references are given below. The key also draws from a photocopied winter tree guide for the southeastern U.S. used by the late Dr. Sam Jones of the University of Georgia, and a published key to winter trees of Missouri by Jerry Cliburn and Ginny Wallace (revised edition 2003). Both these last two are keys are also clearly based overwhelmingly on Dr. Harlow's key, and Dr. Harlow's key also strongly influenced the keys in Kirkman *et al.* Also consulted was a 1958 book on winter identification of woody plants by Dr. Earl Core and Nellie P. Ammons of West Virginia University that takes a very different approach from the Harlow book.

That in the 21<sup>st</sup> century you should be relying overwhelmingly on information from mid-20<sup>th</sup> century books may seem odd to you, but while everything else has been changing, the characteristics of the twigs of trees have not changed in the last 100 years. After all, many individual trees alive today were already producing twigs when Dr. Harlow was composing his original key!

### References:

*Twig Key to the Deciduous Woody Plants of Eastern North America.* 4<sup>th</sup> ed. Harlow, William M. 1954. Reprinted 1959 by Dover Publications in "Fruit Key and Twig Key to Trees and Shrubs".

*Winter Tree Finder.* Watts, May Theilgaard, and Tom Watts. 1970. Nature Study Guild.

*Native Trees of the Southeast.* Kirkman, L. Katherine, Claud L. Brown, and Donald J. Leopold. 2007. Timber Press.

*A Key to Missouri Trees in Winter.* Cliburn, Jerry, and Ginny Wallace. 2003. Missouri Conservation Commission.

*Woody Plants in Winter.* Core, Earl L., and Nellie P. Ammons. 1958. West Virginia University Press.

**See page 7 for illustration of terms used in the key.**

## Winter Twig Key to Common Leafless Dicot Trees of the Williamsburg Area

(see p. 7 for illustrations of terms)

- 1a.** Leaf scars opposite or whorled (2 or 3 leaf scars per node) 2 (*bottom of p. 5*)
- 1b.** Leaf scars alternate on twig 3
- 3a.** Twig  $\geq \frac{1}{2}$  in. in diameter, without terminal bud;  
many small bundle scars in curved row along edges  
of large leaf scar; cross-sect. of twig mostly pith *Ailanthus* (tree-of-heaven)
- 3b.** Twigs, buds, and leaf scars not in this combination 4
- 4a.** Leaf scars large, 3-lobed, pale on darker,  
stout, tough twigs with end buds much  
larger than side buds; bundle traces in three groups 5
- 4b.** Leaf scars, twigs, buds not in above  
combination. 6
- 5a.** Pith chambered; lenticels round; bundle scars in 3 tight clusters *Juglans* (walnuts)
- 5b.** Pith not chambered; lenticels elongated vertically; bundle scars  
more scattered, in 3 loose rings or clusters *Carya* (hickories)
- 6a.** Buds clustered at end of twigs (usually >3); pith 5-sided *Quercus* (oaks)
- 6b.** Buds not clustered at twig ends 7
- 7a.** Twigs armed with thorns or prickles 8
- 7b.** Twigs without thorns or prickles 11
- 8a.** Thorns in pairs, one on each side of a leaf scar; buds apparently  
lacking (but actually submerged beneath leaf scar) *Robinia* (black locust)
- 8b.** Thorns not paired at leaf scar; buds not as above 9
- 9a.** Thorns at the tip of side twigs (axillary bud near,  
but not at, end of thorn) *Malus* (crabapple)
- 9b.** Thorns or prickles on surface of twigs and branches 10
- 10a.** Unbranched prickles along twig surface,  
especially near nodes (twigs stout, leaf scars large) *Aralia* (devil's walking-stick)
- 10b.** Thorns with 2 or 3 branches, often  
on older twigs & branches *Gleditsia* (honey locust)

<b>11a.</b> End bud without scales (can see veins in folded naked leaf); both end and side buds covered with dense short brown fuzz	<i>Asimina</i> (pawpaw)
<b>11b.</b> Buds not as above	12
<b>12a.</b> End buds long and slender, 4 or more times as long as wide	13
<b>12b.</b> Buds not as above	14
<b>13a.</b> Side buds tan, leaning away from twig, with at least 8 scales; stipule scars joined in circle around twig; bark very smooth, gray; lower twigs may retain some dead leaves	<i>Fagus</i> (beech)
<b>13b.</b> Side buds greenish or reddish, close to twig, with about 6 scales; stipule scars not forming circle around twig; bark gray, but often with darker vertical streaks; fully leafless	<i>Amelanchier</i> (serviceberry)
<b>14a.</b> Stipule scars forming ring around twig at each node	15
<b>14b.</b> Stipule scars not encircling the twig	17
<b>15a.</b> Leaf scar completely surrounding the bud; one cap-like bud scale; snowy-white under-bark exposed on limbs near upper trunk	<i>Platanus</i> (sycamore)
<b>15b.</b> Leaf scar not completely surrounding bud; bark not as above	16
<b>16a.</b> End bud slightly flattened, with two smooth scales meeting like a duck's beak	<i>Liriodendron</i> (tulip poplar)
<b>16b.</b> End bud not flattened, enclosed in a single scale	<i>Magnolia</i> (sweet bay)
<b>17a.</b> Buds enclosed in a single cap-like bud scale [twigs slender]	<i>Salix</i> (willows)
<b>17b.</b> Axillary buds with at least two scales	18
<b>18a.</b> Axillary buds apparently with only two (rarely 3) scales	19
<b>18b.</b> All buds with 4 or more scales	22
<b>19a.</b> End bud stalked, with 2 scales like duck's beak; (may have catkins, cone-like fruit)	<i>Alnus</i> (alder)
<b>19b.</b> End bud not stalked	20

<b>20a.</b> Bundle scars numerous	<i>Castanea</i> (chinkapin)
<b>20b.</b> Bundle scars 3 or fewer	21
<b>21a.</b> All buds with 2 blackish scales; one bundle scar; twig not zig-zag [pith chambered]	<i>Diospyros</i> (persimmon)
<b>21b.</b> Zigzag twigs with very small leaf buds with 2 scales; three bundle scars; (may have larger, superposed flower buds with many scales)	<i>Cercis</i> (redbud)
<b>22a.</b> Side buds two-ranked; twigs often zig-zag	28
<b>22b.</b> Side buds spiraled around twig, not two ranked	23
<b>23a.</b> Second year twigs green, glaucous; one bundle scar; scratched twig bark pleasantly aromatic	<i>Sassafras</i> (sassafras)
<b>23b.</b> Twigs not green, three or more bundle scars	24
<b>24a.</b> Lenticels on older twigs elongated horizontally, light-colored on smooth dark twig bark; scratched twigs have bitter-almond smell	<i>Prunus</i> (wild black cherry)
<b>24b.</b> Twigs not as above	25
<b>25a.</b> Buds with 4—5 brownish scales with downy edges & tips; pith diaphragmed, not 5-sided	<i>Nyssa</i> (black gum)
<b>25b.</b> Buds not as above; pith 5-sided, not diaphragmed	26
<b>26a.</b> End buds slightly gummy; lateral (side) buds with about four exposed scales; large lowest scale on side buds centered above leaf scar	<i>Populus</i> (cottonwood)
<b>26b.</b> End buds not gummy; more than 5 exposed bud scales; lowest scale on side buds not obviously centered over leaf scar	27
<b>27a.</b> End bud smooth, shiny; 3 bundle scars that are dark rings with a central depression (some twigs may have corky outgrowths; prickly, ball-like fruits may hang on tree)	<i>Liquidambar</i> (sweetgum)
<b>27b.</b> Twigs not as above [bud hairy, especially the inner scales at its tip]	<i>Pyrus</i> (Bradford pear).

- 28a.** Tree bark “warty”: smooth beneath but with scattered to frequent warty ridges (but twigs usually smooth); pith diaphragmed at nodes; buds pressed against twigs; fruit = one-seeded drupe *Celtis* (hackberries)
- 28b.** Tree bark not warty; twigs & fruit not in above combination 29
- 29a.** Buds very small, partially sunken into the twig; one bundle scar; (bark deeply furrowed; tree often leaning; fruit = small woody capsules) *Oxydendron* (sourwood)
- 29b.** Buds not sunken into twig, bundle scars 3 or more 30
- 30a.** Buds not centered over middle of leaf scar, but placed toward to one side of it; leaf scar with corky layer *Ulmus* (elms)
- 30b.** Buds centered over middle of leaf scars 31
- 31a.** Side buds definitely wider than slender twigs; juice never milky; bundle scars 3 or in three groups; (catkins may be present) 32
- 31b.** Side buds about as wide as the twig; bundle scars more than 3; twigs with milky juice (if not too cold); no catkins *Morus* (mulberries)
- 32a.** Bark strongly peeling horizontally, twigs often hairy (may have catkins) *Betula* (river birch)
- 32b.** Bark not peeling horizontally 33
- 33a.** Buds with about 6 scales with fine vertical lines (use hand lens); bark with vertical shreds (may have catkins) *Ostrya* (hop hornbeam)
- 33b.** Buds with at least 8 scales, lacking fine vertical lines; bark smooth, gray, sinewy (no catkins) *Carpinus* (American hornbeam)
- 2a.** Leaf scars whorled (= three leaf scars per node); leaf scar circular, bundle scars many; terminal bud lacking; pith not chambered *Catalpa* (catawba trees)
- 2b.** Leaf scars opposite (two scars per node) 34
- 34a.** Twigs slender, green to red, notched line around each node connects leaf scars; very small leaf buds with two scales, but may have large stalked globose-shaped flower buds *Cornus* (flowering dogwood)
- 34b.** Twigs and buds not as above 35

- 35a.** Terminal bud absent, twigs thick, leaf scars large 36
- 35b.** Terminal bud present; twigs variable 37
- 36a.** Leaf scar circular but with notch; many bundle scars; pith chambered or hollow *Paulownia* (empress tree)
- 36b.** Leaf scars broad, 4-sided to crescent shaped; bundle scars 3, 5, or 7; pith not chambered *Sambucus* (elderberry)
- 37a.** Bundle scar one 38
- 37b.** Bundle scars 3 or more 39
- 38a.** Twigs slender, green, flexible, with four raised lines along stem (usually a shrub) *Euonymus* (hearts-a-bustin')
- 38b.** Twigs not green & flexible *Chionanthus* (fringe tree)
- 39a.** Large oval terminal bud ( $\geq \frac{1}{2}$  inch long) with many large overlapping scales; on stout twig; leaf scars wide, triangular to round, with 6-7 bundle scars *Aesculus* (red buckeye)
- 39b.** Twigs without above combination 40
- 40a.** End buds with 6 or more smooth bud scales, red, green, or dark tan, on slender twigs; may also have globose flower buds; bundle scars three, lenticels many *Acer* (maples)
- 40b.** End buds with 3 or 4 velvety chocolate brown to gray-brown bud scales; on stout twigs; bundle scars many in a crescent, or not easily seen; lenticels not conspicuous *Fraxinus* (ashes)

Illustrations of Terms used in Key

