



Winter Twigs as Clues

A Visual Key to Deciduous Trees Native to Illinois

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[Begin](#)

Special Acknowledgements

The key used in this program is modified from "A Key to Deciduous Tree Genera of Ohio in Winter Condition" written by E. Lucy Braun in 1937.

Many of the illustrations are from "Forest Trees of Illinois" written by Robert H. Mohlenbrock in 1990. Thanks to the illustrators: Miriam Wysong Meyer and Fredda J. Burton from SIU and Mark Mohlenbrock.

Permission to use this resource was granted by the Illinois Department of Conservation.

Additional illustrations have been generously provided by Joseph Armstrong and Micah Stanley.

[Next](#)

Winter Twigs As Clues

The screenshot shows a dark interface with a central image of a twig. Below the image is a button that says "Click on the button of your choice →". To the right is a vertical list of menu options: Acknowledgements, Introduction, Parts of a twig, Identify a twig, and Quit.



This interactive key has been designed to help you identify deciduous trees that are native to Illinois. Each tree may be identified to its genus, the scientific name for closely related species. The common names of these trees are also given.

You can use this visual key:

- to identify unknown trees that are leafless during winter
- to familiarize yourself with features found in winter twigs.

[Menu](#)

[Next](#)



Using a key to identify an unknown tree is a step by step process. Two contrasting features are described. You select the one that best fits the specimen, go to the next set of descriptions specified by the key, and repeat the process until an identification is reached.

This interactive key also includes:

- twig images with field marks
- instant forwarding as you make choices
- view of your last choice
- automatic backtracking to retrace choices
- instant definitions of special terms

[Menu](#)

[Next](#)



Side by side images with descriptions of contrasting features of winter twigs are presented. Field marks emphasize those features you should examine more closely.

Clicking on the image that has the general feature most like the twig you are trying to identify will send you to a new page. More choices or an identification of your twig will be displayed.

At the top of each page, your last choice is displayed to make rechecking easier if neither of the new descriptions seem to fit.

[Menu](#)

[Next](#)



Sometimes an incorrect choice is made and you have to look more closely at your earlier decisions. This interactive key allows you to move easily to prior choices.

Going back to earlier pages

If you make an incorrect choice, use the

[Back](#)

button at the bottom of each page to retrace your steps.

[Menu](#)

[Back](#) [Next](#)



Terms used to describe a twig may be unclear even with an illustration. Hypertext definitions provide more information when you find it necessary.

Defining special terms

Selected terms are highlighted in green.

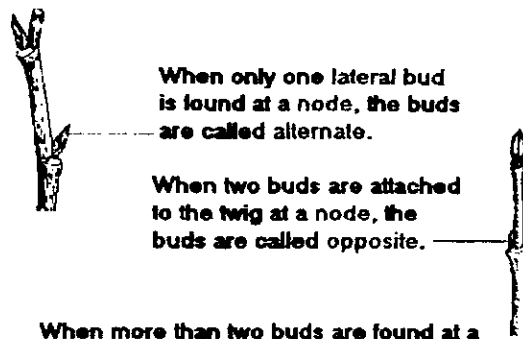
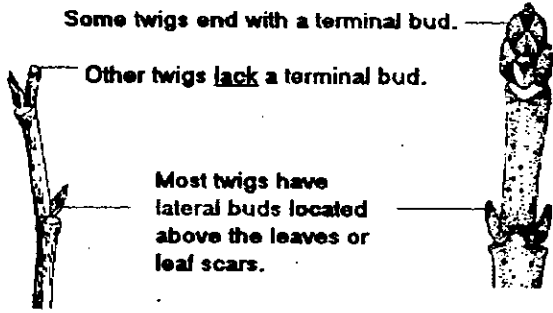
You can click on these words for an instant definition. Try it!

Dichotomous key

[Menu](#)

[Back](#) [Return](#)

Parts of a twig



When more than two buds are found at a node, the buds are referred to as whorled.

Menu

Parts of a twig

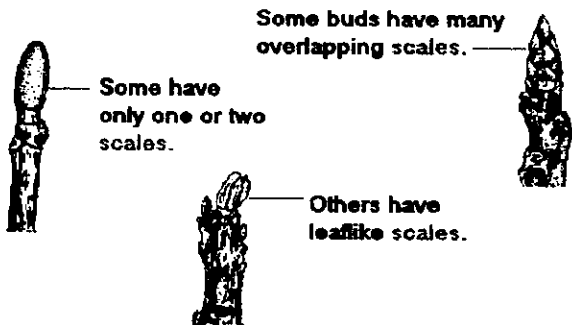
Back Next

Menu

Parts of a twig

Back Next

It is helpful to look at the type of bud covering present.



Leaf scars are left by fallen leaves and are often used to identify a twig.

Bundle scars showing where the old leaf's vascular system attached to the stem may be helpful as well.



Menu

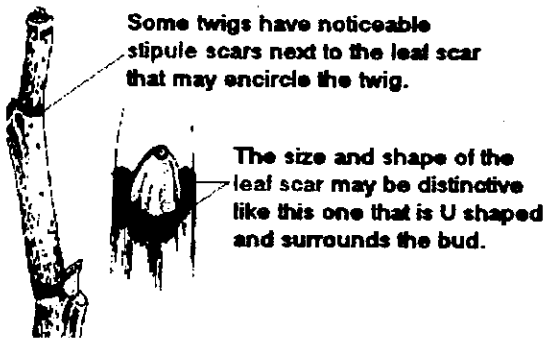
Parts of a twig

Back Next

Menu

Parts of a twig

Back Next



Some twigs have noticeable lenticels, eruptions in the bark, to allow the tree to exchange gases.

Some twigs are covered with hairs.



Menu

Parts of a twig

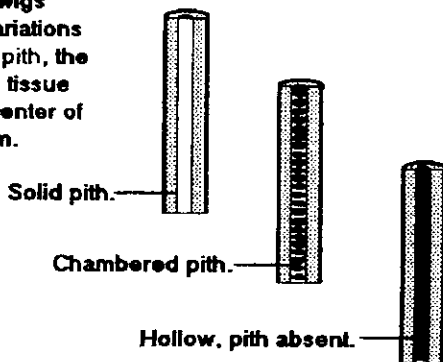
Back Next

Menu

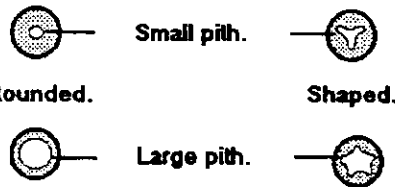
Parts of a twig

Back Next

Some twigs have variations in their pith, the storage tissue in the center of the stem.



Pith variations as seen in cross sections are also used to identify certain twigs. The size, shape, and color of pith may be important.



Menu

Parts of a twig

Back Next

Menu

Parts of a twig

Back Next

Twigs may have spines, thorns, or prickles.



Twigs may have short lateral shoots called spurs.

Some winter twigs have cone-like clusters of flower buds called catkins.



Familiarity with these features should help in the identification of winter twigs.

Menu

Back Next

Menu

Back Next

When you are in the field:

- Always choose living twigs for examination.
- Look at more than one twig from each tree.



Twigs from the same tree may show considerable variation depending on their age, location on the tree, and other factors.

Trees are individual organisms (just like animals) with many differences due to genetic and environmental interactions.

Menu

Back Return

1 Begin twig

Click on the picture that best describes your twig.



Are the buds or leaf scars opposite or whorled?

59



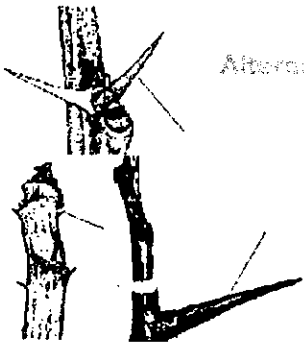
Are the buds or leaf scars alternate?

Menu

Back

2

Alternate buds



Twigs with spines, thorns or prickles?

60



Twigs without spines, thorns or prickles?

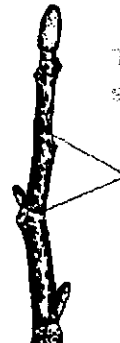
61

Menu

Back

3

Twigs without spines, thorns or prickles



Do stipule scars encircle twigs or nearly so?

62



Stipule scars absent or not encircling twigs?

63

Menu

Back

4

Terminal bud present or absent?



Terminal bud present?

64



Terminal bud absent?

65

Menu

Back

5

Terminal bud absent



Lateral buds buried or partially buried?

66



Lateral buds not buried?

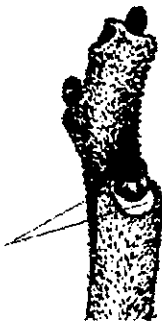
67

Menu

Back

6

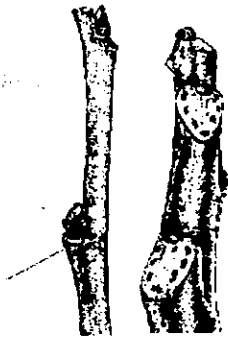
Buds not flattened



Leaf scar surrounding bud or nearly so?

Menu

20



Leaf scar not surrounding bud?

Back

7

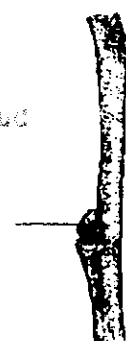
Leaf scar not surrounding bud



Buds flattened?

Menu

23

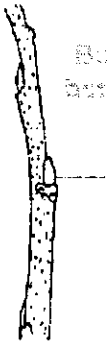


Buds not flattened, but may be close to twig?

Back

8

Buds not depressed but may be close to twig



One bud scale visible; bud not round?

Menu



Two or more bud scales; if buds round only part of second scale visible?

Back



One bud scale visible; bud not

Menu

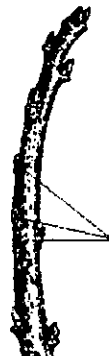
Back

Your twig is most likely from the Willow Tree.

Salix

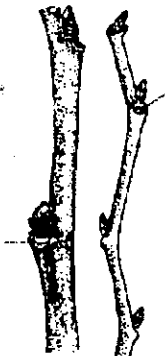
9

Two or more bud scales



One bundle scar; leaf scars spiral?

Menu



Bundle scars more than one?

Back



One bundle scar; leaf scars spiral

Menu

Back

Your twig is most likely from the Persimmon Tree.

Diospyros

10

Bundle scars not in three groups



Three bundle scars or three groups of scars?

Menu

13



Bundle scars more than three and not in three groups?

Back

11

Bundle scars spiral and not in groups of three



Pith small and light colored?

Menu

12



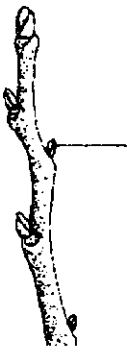
Pith large and dark colored?

Back



12

Buds with two or three scales?



Buds with two or three scales?

Menu



Buds with more than three scales?

Back



Buds with more than three scales

Menu

Your twig is most likely a Mulberry.

Morus

Back

13

Buds with two or three scales?



Buds symmetrical with brown or rusty hairs?

Menu



Buds lopsided and hairless?

Back



Buds symmetrical with brown or rusty hairs

Menu

Your twig is most likely a Chestnut.

Castanea

Back

14

Pith large and dark colored?



Buds lopsided with no hairs

Menu

Your twig is most likely a Basswood.

Tilia

Back



Leaf scars U shaped; lenticels prominent?

Menu



Leaf scars broad heart shaped; lenticels inconspicuous?

Back

Your twig is most likely one of the Sumacs.

Rhus



Leaf scars U-shaped

Menu

Back

Your twig is most likely from the Tree of Heaven.

Ailanthus



Leaf scars broad heart shaped

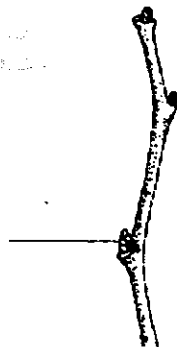
Menu

Back



15

Two bud scales showing?

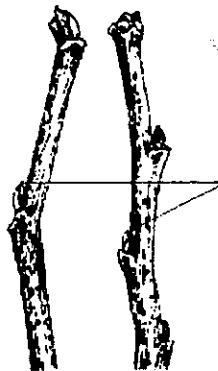


More than two bud scales showing?

Two bud scales showing?

Menu

Back



16

Your lateral bud tip is close to twig?



Tip of lateral bud close to twig?

Tip of lateral bud not next to twig?

Menu

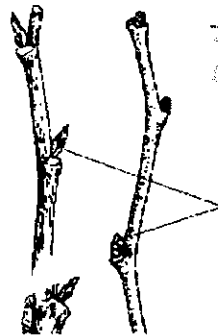
Back



Your twig is most likely from the Hackberry Tree.

Celtis

Tip of lateral bud close to twig



17

Tip of lateral bud tipped left or right?

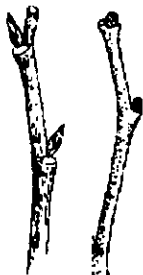


Buds tipped left or right of leaf scars?

Buds straight above leaf scars?

Menu

Back



Your twig is most likely from one of the Elm Trees.

Ulmus

Buds tipped left or right of leaf scars



18

Buds straight above leaf scars



Twigs hairy with oval buds; three bundle scars; catkins may be present?

Twigs hairless or with thin, fine hairs?

Menu

Back



Your twig is most likely from one of the Hazelnuts.

Corylus

Twigs hairy with oval buds; three bundle scars; catkins may be present



19

Short lateral shoots (spurs); thin horizontal lenticels?

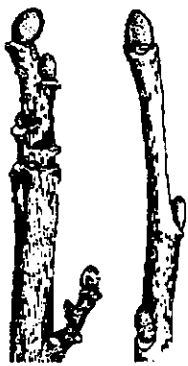


Short lateral shoots (spurs); thin horizontal lenticels?

No spurs; no thin horizontal lenticels?

Menu

Back



Your twig is most likely a Basswood.

Tilia

Buds lopsided; small half round leaf scars

Menu

Back

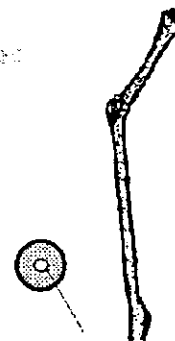
23



Buds flattened

Stout twigs with large heart-shaped leaf scars?

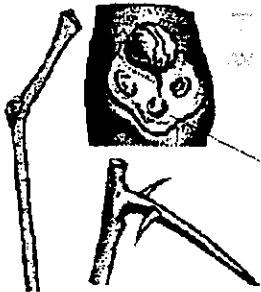
Menu



Twigs slender with small pith?

Back

24



Twigs slender with small pith

Leaf scars broad U to V shape; branched thorns?

Menu



Leaf scars oval; simple thorns above some leaf scars?

Back

25



Leaf scars with large heart-shaped leaf scars?

Pith salmon pink?

Menu



Pith brownish; hairy, light brown buds?

Back



Your twig is most likely from the Tree of Heaven.

Ailanthus

Pith brownish; hairy light brown buds

Menu

Back



Your twig is most likely from the Kentucky Coffee Tree.

Gymnocladus

Pith salmon pink

Menu

Back

26



Leaf scars with large heart-shaped leaf scars?

Pith whitish?

Menu



Pith brownish?

Back



Your twig is most likely from one of the Sumacs.

Rhus

Pith brownish

Menu

Back



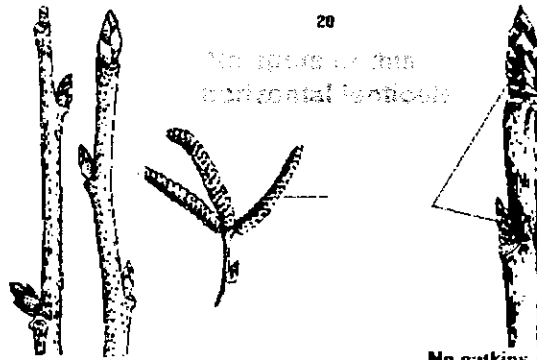
Your twig is most likely from one of the Cherry Trees.

Prunus

Short lateral spurs; thin horizontal lenticels

Menu

Back



20
No spurs or thin horizontal lenticels

Catkins usually present?

No catkins present; buds in two sizes?

Menu

Back



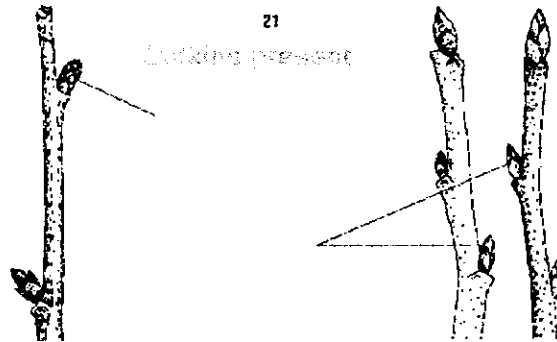
Your twig is most likely from the Blue Beech Tree also known as Ironwood.

Carpinus

No catkins present; buds in two sizes

Menu

Back



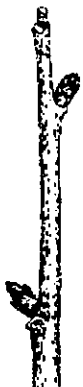
21
Catkins present

Small oval buds; mature bark in scaly strips?

Long oval buds, pointed tips; mature papery bark?

Menu

Back



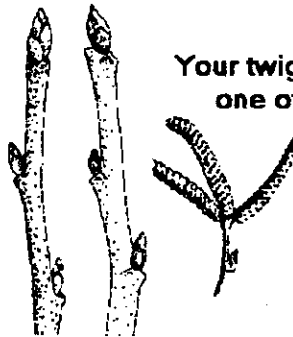
Your twig is most likely from the Hop Hornbeam Tree also referred to as Ironwood.

Ostrya

Small oval buds; scaly strip bark

Menu

Back



Your twig is most likely from one of the Birch Trees.

Betula

Long oval buds with pointed tips; papery bark

Menu

Back



22
Thin bud on a... drawing

Buds very small, less than half of twig diameter; oval flower buds may be prominent?

Buds not small, more than half twig diameter; lopsided buds with small half round leaf scars?

Menu

Back



Your twig is most likely from the Redbud Tree.

Cercis

Buds very small; flower buds may be large

Menu

Back

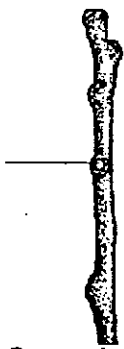
27

Buds whitish



Red brown twigs with high, conical buds; possibly silky hair?

Menu



Brown twigs with pale, nearly flat buds?

Back



Pale brown twigs with flat, round buds

Menu

Your twig is most likely from the Hop-Tree.

Ptelea

Back



Your twig is most likely from the Yellow-Wood Tree.

Cladrastis

Red brown twigs; high conical buds; silky hairs

Menu

Back

28

Buds buried or partially buried



Buds in leaf scar?

Menu



Buds above leaf scar?

Back

29

Buds above leaf scar



Stout twigs with buds in hairy covered depressions; pinkish pith?

Menu



Twigs slender; pith not large or pinkish?

Back

Your twig is most likely from the Kentucky Coffee Tree.

Gymnocladus

Menu

Pinkish buds in hairy depressions; pinkish pith

Back

30

Buds partially hidden



Buds partially hidden in bark with depressed globular shape?

Menu



Buds entirely hidden in fold above leaf scars?

Back

Your twig is most likely from the Sumacs.

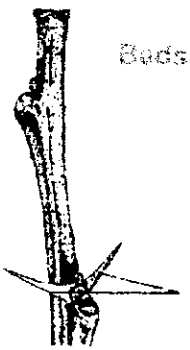
Rhus

Menu

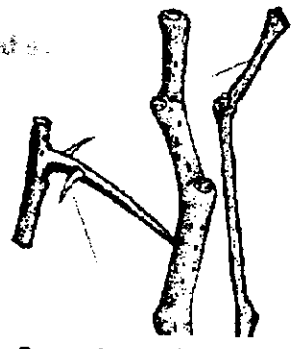


Buds entirely hidden in folds above leaf scars

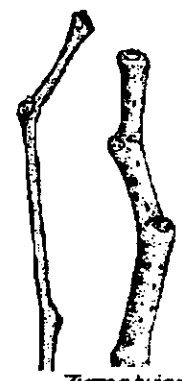
Back



31
Buds in leaf axils



Brown zigzag twigs; some with branched thorns?



Zigzag twigs; some with branched thorns



Gleditsia

Your twig is most likely from the Honey Locust or Water Locust Tree.

Menu

Back

Menu

Back

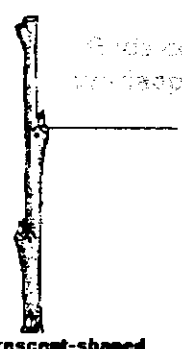


Buds without scales or leaf-like?

32
Terminal bud only

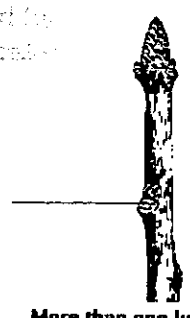


Buds covered by definite overlapping scales?



One crescent-shaped bundle scar per leaf scar?

33
Buds covered by overlapping scales



More than one bundle scar per leaf scar?

Menu

Back

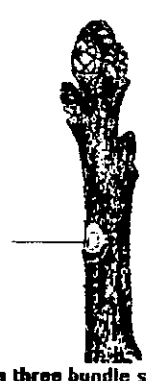
Menu

Back



Three bundle scars per leaf scar or in three groups?

34
More than one bundle scar per leaf scar



More than three bundle scars per leaf scar; not in three groups?



Pair of stipule scars next to leaf scars?

35
More than three bundle scars; not in three groups



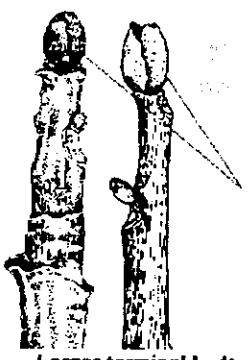
No stipule scars next to leaf scars?

Menu

Back

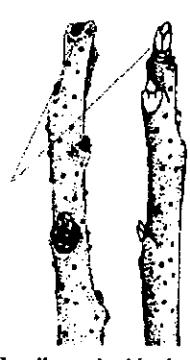
Menu

Back

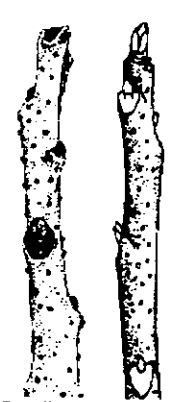


Larger terminal bud; numerous bundle scars?

36
Larger terminal bud; numerous bundle scars



Small terminal bud; numerous bundle scars?



Small terminal bud; numerous bundle scars

Your twig is most likely from one of the Sumacs.

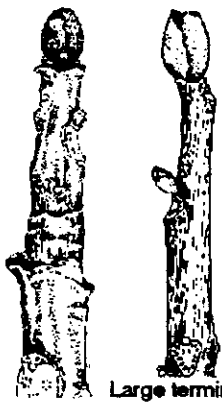
Rhus

Menu

Back

Menu

Back



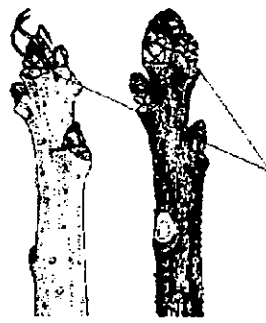
Large terminal bud; numerous bundle scars

Your twig is most likely from one of the Hickory Trees.

Carya

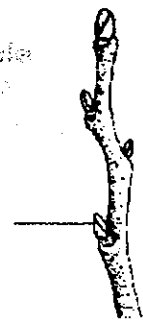
Menu

Back



Cluster of lateral buds near terminal bud; numerous overlapping scales?

37
Close of stipule scars near leaf scars



Terminal bud frequently absent; no clusters of lateral buds; few scales?

Menu

Back



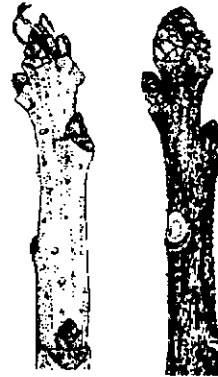
Terminal bud often missing; no clusters; few scales

Your twig is most likely from the Chestnut Tree.

Castanea

Menu

Back



Cluster of buds near terminal bud; overlapping scales

Your twig is most likely from one of the Oak Trees.

Quercus

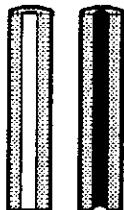
Menu

Back



Pith chambered with thin plates?

38
Three bundle scars or in three groups



Pith solid or hollow?



Back

Menu



Pith chambered with thin plates

Your twig is most likely from the Black Walnut Tree.

Juglans

Menu

Back



First scale of lateral bud directly above leaf scar; young twig with ridges?

39
First scale of lateral bud directly above leaf scar?



First scale of lateral bud not directly above leaf scar?

Back

Menu



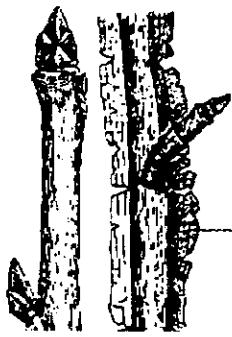
First scale of lateral bud above leaf scar

Your twig is most likely from the Cottonwood Tree.

Populus

Menu

Back



40
First scale
lateral bud
directly above
leaf scar

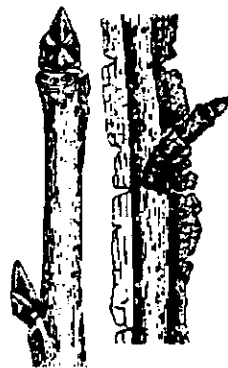


Buds not covered,
but may be shiny?

Buds covered by resinous coating;
older twigs have corky ridges?

Menu

Back



Buds with resinous coating; older twigs corky

Your twig is most
likely from the
Sweet Gum Tree.

Liquidambar

Menu

Back



41
Buds not covered
by resinous coating



Buds not stalked?

Buds distinctly long stalked?

Menu

Back



Buds distinctly long stalked

Your twig is most
likely from the
Alder Tree.

Alnus

Menu

Back



42
Buds not stalked



Bundle scars more than
three and in three groups?

Three bundle scars?

Menu

Back



Bundle scars more than three and in three groups

Your twig is most
likely from one of the
Hickory Trees.

Carya

Menu

Back



43
Twigs greenish or greenish
brown; broad crescent
leaf scars?



Twigs brownish, reddish
brown or grayish; leaf
scars not broad crescents?

Twigs greenish or greenish
brown; broad crescent
leaf scars?

Menu

Back



Twigs greenish brown; broad crescent leaf scars

Your twig is most
likely from the
Alternate-leaved
Dogwood Tree.

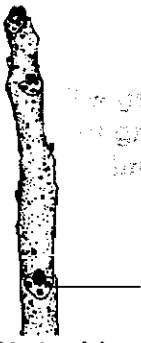
Cornus

Menu

Back

44

Buds brown, red or black
or gray; leaf scars
broad, crescentic



Lateral buds stick out from stem;
three prominent bundle scars?

Menu

Lateral buds lie along stem
or point to tip; leaf scars
narrow and inconspicuous?

Back

45

Lateral buds pointing away from
or point to tip; leaf scars
narrow and inconspicuous



Long slender brownish
buds with silky hairs;
lenticels not prominent?

Menu



Buds not as described;
lenticels prominent on
smooth shiny bark?

Back

Your twig is most
likely from the
Shadbush or
Serviceberry Tree.

Amelanchier



Long brownish buds with silky hair

Menu

Back

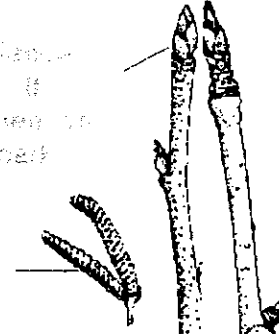
46

Buds not very slender
with silky hair; if
lenticels prominent on
smooth shiny bark



No catkins present; some lateral
branches short and stubby?

Menu

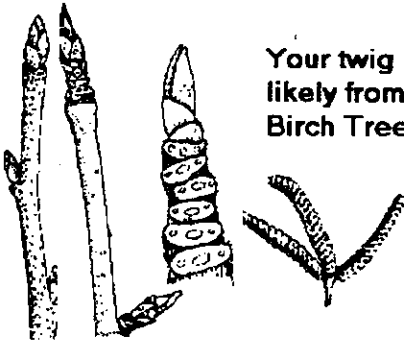


Catkins may be present; long
buds on slender twigs?

Back

Your twig is most
likely from one of the
Birch Trees.

Betula



Catkins may be present; long buds on slender twigs

Menu

Back

Your twig is most
likely from one of the
Hawthorn Trees.

Crataegus



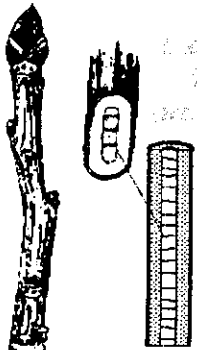
No catkins present; some short lateral branches

Menu

Back

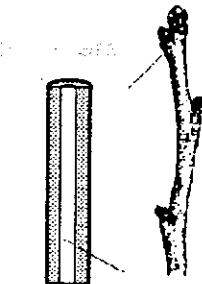
47

Stipule scars absent;
irregular chambered pith?



Stipule scars absent;
irregular chambered pith?

Menu



Stipule scars present;
solid pith?

Back

Your twig is most
likely from one of the
Hawthorn Trees.

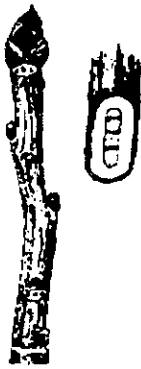
Crataegus



Stipule scars present; solid pith

Menu

Back



Your twig is most likely from the Sour Gum or Tupelo Tree.

Nyssa

Stipule scars absent; irregular chambered pith

Menu

Back



Green buds on green twig with spicy odor when crushed?

Menu



Gray buds on gray to brown twig with no odor?

Back



Your twig is most likely from the Sassafras Tree.

Sassafras

Greenish bud on green twig; spicy odor

Menu

Back



Your twig is most likely from the Swamp Holly Tree.

Ilex

Gray buds on gray to brown twigs; no odor

Menu

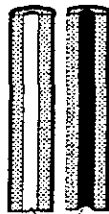
Back

Buds without scales or leaf-like



Pith chambered with thin plates?

Menu



Pith solid or hollow?

Back



Your twig is most likely from the Walnut Tree.

Juglans

Pith chambered with thin plates

Menu

Back

Buds yellow with knobby surface; outer scales leaflike?



Buds hairy or fuzzy?

Menu



Buds yellow with knobby surface; outer scales leaflike?

Back



Your twig is most likely from the Bitternut Hickory Tree.

Carya

Buds yellow with knobby surface; scales leaflike

Menu

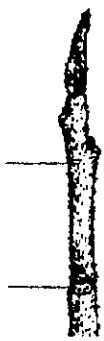
Back

51
Buds horseshoe-shaped; 5-7 bundle traces?



Horseshoe-shaped leaf scars with 5-7 bundle traces?

Menu



Leaf scars with 3 bundle traces and stipule scars?

Back



Buds horseshoe-shaped; 5-7 bundle traces

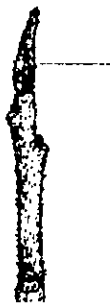
Menu

Back

Your twig is most likely from the PawPaw Tree.

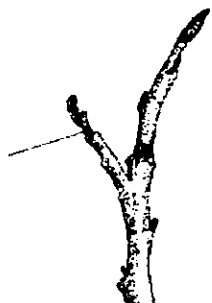
Asimina

52
Hairy elongated terminal buds on grayish twigs?



Hairy elongated terminal buds on grayish twigs?

Menu



Stalked brownish buds with fine hairs?

Back



Stalked brownish bud with fine hairs

Menu

Back

Your twig is most likely from the Witch Hazel Tree.

Hamamelis

Your twig is most likely from the Carolina Buckthorn Tree.

Rhamnus

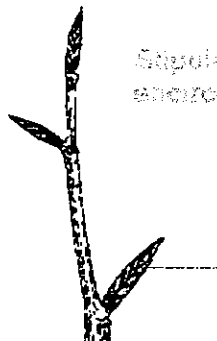


Hairy elongated terminal bud; grayish twig

Menu

Back

53
Stipule scars encircle twigs



Buds long and slender with several overlapping scales?

Menu



Buds not long and slender with several overlapping scales?

Back

Your twig is most likely from the Beech Tree.

Fagus

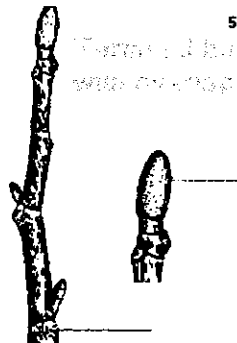


Long slender buds with many overlapping scales

Menu

Back

54
Terminal bud not longer with overlapping scales



Flat terminal buds with one pair of scales and round leaf scars?

Menu



Leaf scars U shaped surrounding buds?

Back



Your twig is most likely from the Tulip Tree.

Liriodendron

Flat terminal bud with one pair of scales; round leaf scars

Menu

Back



Stout, straight twigs with large oval to long terminal bud?

Menu



Somewhat zigzag twig with tiny terminal bud?

Back



Your twig is most likely from the Cucumber Magnolia Tree.

Magnolia

Stout twigs with large oval terminal buds

Menu

Back



Zigzag twigs with tiny terminal buds

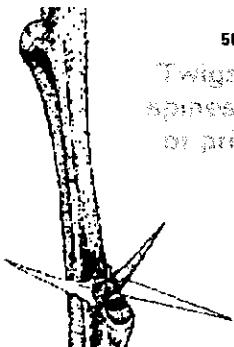
Menu

Back

Your twig is most likely from the Sycamore Tree.

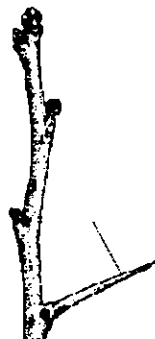
Platanus

Twigs with spines, thorns or prickles



Pairs of short spines or thorns at each node?

Menu



One spine per node or scattered spines?

Back



Pairs of short spines or thorns at each node

Menu

Back

Robinia

Your twig is most likely from the Black Locust tree.

Your twig is most likely from the Black Locust tree.

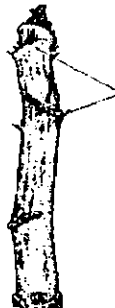
Robinia



Pairs of short spines or thorns at each node

Menu

Back



Scattered prickles of varying sizes on stout twigs?

Menu



No more than one spine per node?

Back



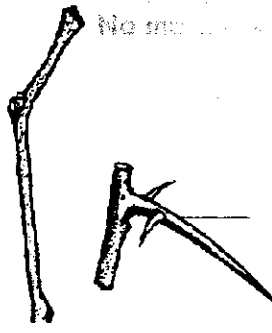
Your twig is most likely from the Devils Walking Stick.

Aralia

Scattered prickles of varying sizes on stout twigs

Menu

Back



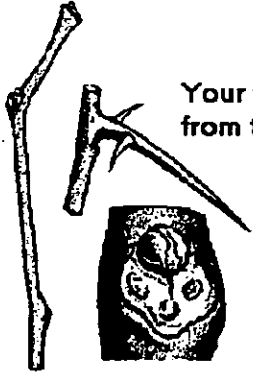
Large branched spines on slender smooth twigs?

Menu



Unbranched spines?

Back



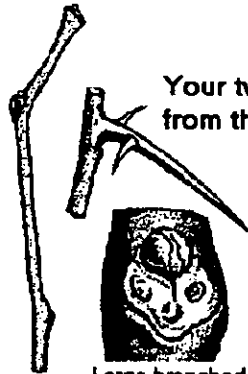
Your twig is most likely from the Honey Locust tree.

Gleditsia

Large branched spines on smooth twigs

Menu

Back



Your twig is most likely from the Honey Locust tree.

Gleditsia

Large branched spines on smooth twigs

Menu

Back



Unbranched spines

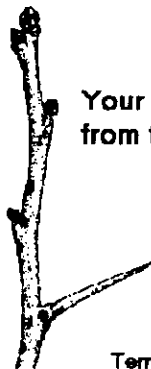
Terminal bud present?



Terminal bud absent?

Menu

Back



Your twig is most likely from the Hawthorn tree.

Crataegus

Terminal bud present

Menu

Back



Your twig is most likely from the Osage Orange tree.

Maclura

Terminal bud absent

Menu

Back



Your twig is most likely from the Osage Orange tree.

Maclura

Terminal bud absent

Menu

Back



Your twig is most likely from the Osage Orange tree.

Maclura

Buds partially hidden; depressed globular shape

Menu

Back

60



Is a terminal bud or fruit scar present?

Menu



Is a terminal bud or fruit scar absent?

Back

61



Terminal bud with only one pair of scales visible?

Menu



Terminal bud with more than one pair of scales visible?

Back

62



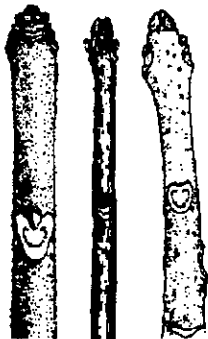
Bundle scars numerous, closely spaced in C or U shaped line?

Menu



Bundle scars fewer, more widely spaced?

Back



Your twig is most likely from an ash tree.

Fraxinus

Bundle scars numerous in a closely spaced C or U shape?

Menu

Back

63



One crescent-shaped bundle scar; twigs greenish or reddish and slightly four angled?

Menu



Bundle scars 3 or more?

Back



Your twig is most likely from a wahoo tree.

Euonymus

One crescent shaped bundle on greenish or reddish four angled twigs?

Menu

Back

64



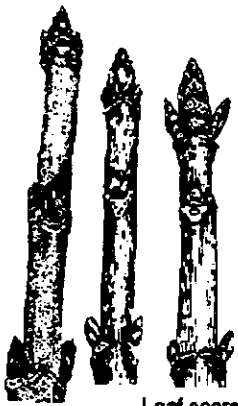
Leaf scars narrow, U to V shaped?

Menu



Leaf scars broad, not U or V shaped?

Back



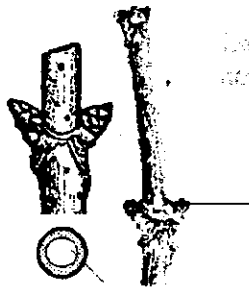
Your twig is most likely from one of the maples including the boxelder.

Acer

Leaf scars narrow, U to V shaped

Menu

Back



Small buds; twigs weak with large pith; prominent lenticels?

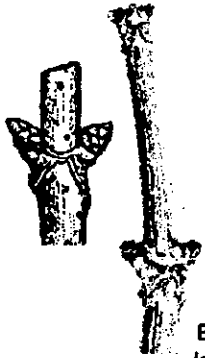
Buds small; twigs weak with large pith; prominent lenticels?

Menu



Large buds; twigs stout; large triangular leaf scars.

Back



Your twig is most likely from the Elderberry.

Sambucus

Buds small; twigs weak with large pith; lenticels prominent

Menu

Back



Your twig is most likely from the Ohio or Red Buckeye.

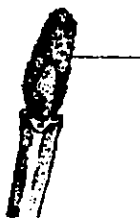
Aesculus

Large buds; twigs stout; large triangular leaf scars

Menu

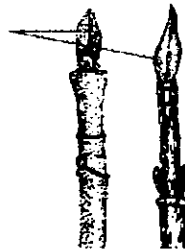
Back

Terminal bud with one pair of scales



Buds rough with scaly hairs?

Menu



Buds smooth or with fine hairs?

Back



Your twig is most likely from the Rusty Nannyberry.

Viburnum

Buds with scaly hairs

Menu

Back

Lateral buds hidden and leaf scars commonly raised?



Lateral buds hidden and leaf scars commonly raised?

Menu



Terminal bud and lateral buds are both similar in size and usually large?

Back



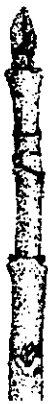
Your twig is most likely to be a Sweet Viburnum or Black Haw.

Viburnum

Similar lateral and terminal buds

Menu

Back



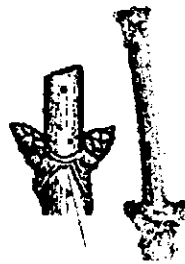
Your twig is most likely from the Rough-Leaved Dogwood tree.

Cornus

Lateral buds hidden, leaf scars raised

Menu

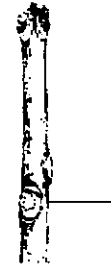
Back



Leaf scars fan-shaped, meeting around stem?

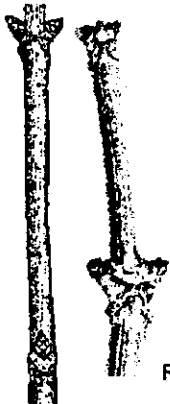
Menu

Back



Leaf scars do not meet?

70



Your twig is most likely from the Elderberry.

Sambucus

Fan shaped leaf scars meet

Menu

Back



Leaf scars connected by stipules or stipule scars?

Menu

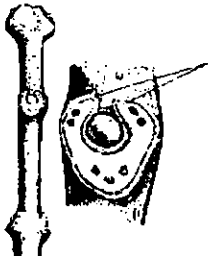


Leaf scars not connected by slender lines?

71

Back

Leaf scars not connected by lines



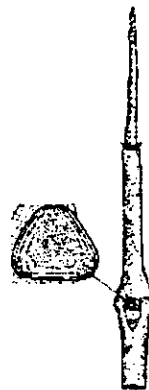
Leaf scars almost encircle the buds; bundle scars in three groups of three?

Menu



Leaf scars beneath the buds; they do not encircle the buds?

Back



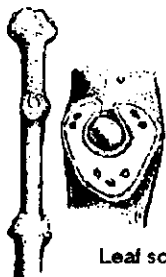
Your twig is most likely from the Button Bush.

Cephalanthus

Leaf scars connected by stipules or stipule scars

Menu

Back



Your twig is most likely from the Amur Cork Tree.

Phellodendron

Leaf scars almost encircle buds

Menu

Back



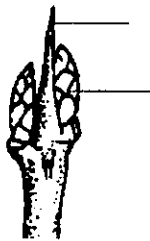
Leaf scars large and roundish on stout twigs with small buds?

Menu



Leaf scars small, half-round to oval, on slender to medium twigs?

Back



Twig ends in spine; minute or no stipule scars; 4 or more bud scales?

Menu



Twigs not spine tipped; distinct stipule scars; usually three bud scales?

Back



Leaf scars dark; bundle scars arranged in a C shape?

Menu



Leaf scars light, usually 3 per node; bundle scars arranged in an ellipse?

Back



Your twig is most likely from the Buckthorn tree.

Rhamnus

Twigs end in spine

Menu

Back



Your twig is most likely from the Bladdernut.

Staphylea

Twigs lack spines; distinct stipule scars

Menu

Back



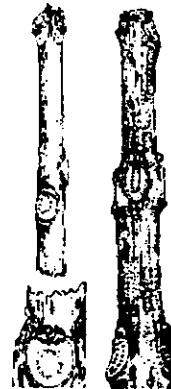
Your twig is most likely from the Princess Tree.

Paulownia

Leaf scars dark; C-shaped bundle scars

Menu

Back



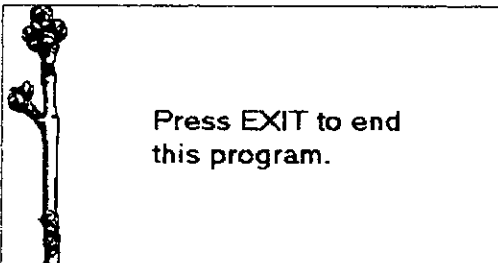
Your twig is most likely from the Common or Western Catalpa (Indian Bean) tree.

Catalpa

Leaf scars light; bundle scars in ellipse

Menu

Back



Press EXIT to end this program.

Menu

EXIT

INSTALLING AND RUNNING THE TWIG KEY

What's on the disks?

There are three disks with the twig program as TWIG.ZIP, ToolBook runtime files and DLLs , and PKunzip for you to inflate the twig program which was 1.8 MB.

TWIG.ZIP : the program deflated to fit on disk

PKUNZIP.EXE : inflates twig program

MTB30RUN. EXE : runs the program

**MTB30NET.EXE, MTB30BMP.DLL, MTB30CMP.DLL, MTB30LNL.DLL,
MTB30MM.DLL, MTB30MM.SBK, MTB30UTL.DLL, MTB30BAS.DLL**
: needed when program is used

Your computer should have WINDOWS and 4 MB of memory to store the program files.

How do I get started?

To copy in DOS:

Insert Disk #1 into Drive (A: or B:)

NOTE: If B:, use B: in place of A:

Type the commands shown in **bold**:

C:\Copy A:TWIG.ZIP C:

C:\Copy A:PKUNZIP.EXE C:

C:\MD MTB30

C:\PKUNZIP TWIG.ZIP C:MTB30

Insert Disk #2 into Drive (A: or B:)

C:\Copy A:*.* C:MTB30

Insert Disk #3 into Drive (A: or B:)

C:\Copy A:*.* C:MTB30

To RUN this program after copying in the files:

Start Windows by typing C:\WIN

Double click **MAIN**

Double click **File Manager**

Double click TWIG.EXE in C:MTB30

or

Select **RUN** in the **Program Manager**.

Type the command line: C:MTB30TWIG

Note: If a message states that start up books will not be available, click OK.