

A key to discerning American beech, Hop Hornbeam (*Ostrya*), Hornbeam (*Carpinus*) and Birch. P.M. Eckel, 2013. Guide and illustrations.

Key to four trees in the Arnot Forest common near the field camp all with similar leaves.

Characteristics of the four species chosen:

All are broad-leafed (not needle-leafed) deciduous (not evergreen);

All are hardwoods (not softwoods);

All have leaves simple (not compound), alternate (not opposite):

Summary: hardwoods, broad-leafed, deciduous, simple, alternate:

| | | |
|--|---------------------|--------------|
| <i>Fagus grandifolia</i> Ehrh., | Beech | [Fagaceae] |
| <i>Betula alleghaniensis</i> Britt., | Yellow Birch | [Betulaceae] |
| <i>Carpinus caroliniana</i> Walt., | Musclewood | [Betulaceae] |
| <i>Ostrya virginiana</i> (Mill.) K.Koch, | Hop-hornbeam | [Betulaceae] |

Note: The Latin names are given first in the keys due to the confusion of common, or English names. For example Musclewood (*Carpinus caroliniana*) is also called the American Hornbeam, Blue-beech and Ironwood. The name American Hornbeam can be easily confused by name with the Hop-hornbeam. Its other name, Blue Beech, makes it

easily confused with Beech. The name “Musclewood” is used here because of the striking muscle-like ropiness of the shape of the trunk.

Mnemonics (memory helps):

[the -cle- in Musclewood reflects the C- in *Carpinus*]

[the -o- in Hop-Hornbeam reflects the C- in *Ostrya*; the “Hop-“ reminds one of the fruits in little, unlobed sac-clusters]]

Leaves

Note: All four species have hairy petioles; only *Ostrya* may have conspicuous stalked glands, sometimes so strongly that a taxonomic ‘form’ has been named for it, *Ostrya virginiana* forma *glandulosa*.

1. Leaves usually paired on woody spurs and buds on the twigs; leaf blades with lateral veins usually branched beyond the middle of the vein *Betula alleghaniensis* (Yellow Birch)

The leaves grow on very short lateral shoots (like an apple tree) or the bases of buds, and are usually paired; crushed twigs with the taste and odor of wintergreen; petioles at first softly hairy, then grow to be nearly hairless.

1. Leaves single on the twigs; leaf blades (lacking woody spurs like an apple);
2. With lateral veins straight unbranched;
3. margins of leaves doubly serrate *Carpinus caroliniana* (Musclewood):

Blades with lateral veins only very rarely forked; actually a small tree often with shrubby growth with multiple stems.

3. margins of leaves singly serrate *Fagus grandifolia* (Birch)

Note that leaves often in loose clusters of 3 leaves; extensive, shallow root systems often promote thickets of young trees around old trees or old harvested trees; Beech, Sugar Maple and Yellow Birch are the dominant trees of the Beech-Maple eastern deciduous forest in North America.

2. Leaf blades with lateral veins usually branched beyond the middle of the vein

Ostrya virginiana (Hop Hornbeam),

The petioles are usually densely hairy and often have conspicuous stalked glands.

Bark

1. Gray-silver, somewhat satiny, resembling smoothness of Beech
but ropey or fluted, muscular *Carpinus caroliniana* (Musclewood).
1. Gray-silver, somewhat satiny, trunk smooth, cylindrical,
not ropey or muscular *Fagus grandifolia* (Beech)
1. Gray, dull, vertically loose or peeling in narrow strips
Ostrya virginiana (Hop-hornbeam)
1. Yellowish, satiny, horizontally peeling, peels in curls
Betula alleghaniensis (Yellow Birch)

Fruits

1. Fruit in large, lobed bracts *Carpinus caroliniana*

(Muscle-wood; also called the American Hornbeam, Blue-beech and Ironwood)

Nuts develop in pairs subtended by a leafy bract.

Although the other three plants are trees with a single stem, this one is actually a rather tall to medium shrub with several stems.

1. Fruit in unlobed (entire) bags or sacks closely resembling fruit of Hops

Ostrya virginiana (Hop-hornbeam)

The nut is enclosed in a sac-like bract (like the sac-like perigynium of a sedge (*Carex*). A vine with the same kind of fruit is *Humulus lupulus*, the common name is “Hops,” a major ingredient in beer-making. The word “hornbeam” refers to the hardness of the wood.

1. Fruit a small [1/2 to 3/4 inch], hard nut enclosed in a small spiny bur ...

Fagus grandifolia

(Beech) fruit containing 2 sharply 3-angled nuts

1. Fruit an ovoid to short-cylindric catkin 2-3 cm long

Betula alleghaniensis

(= *B. lutea*) (Yellow Birch)

A Personal Reference Herbarium

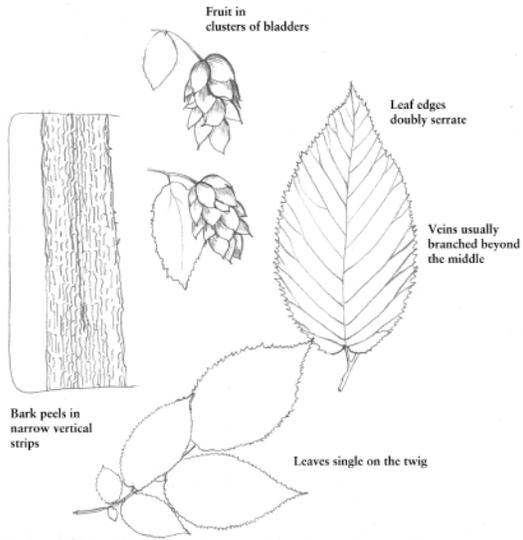
A mini personal herbarium that will help with tree identification recall may be created using:

1. A small notebook (ring-bound, composition book, grocery list, anything with a ring or other binding and of any size.
 2. Tape (cellophane or other clear tape),
 3. A pen, such as a ball-point pen with ink that doesn't run (most Bic pens are like this). The removable tops of pens are often lost during a field hike, the pen tip that dispenses ink is often clogged because of dirt. It is better to use a click-retractable pen.
 4. A tool for taking a twig and fruit, bark, etc. from the tree without injuring it (Willows are very difficult to remove without cutting or clipping) such as garden clippers, pruning shears (secateurs), sharp knives, etc.
-
- A. Write down the date (this tablet is usually a souvenir of the trip) and the location (State; County; City, street corner, person's house - as detailed as you wish).
 - B. Remove a fruiting twig to fit the size of the notebook and tape it in. Squash the pages down in the end, usually by sitting on the tablet.
 - C. Notes may be written on the page, such as the name of the tree or plant, arrows drawn to highlight a certain character such as the number of teeth on the leaf margin, branching of leaf veins and other information.
 - D. Try to dry the notebook, such as placing it near a blowing fan, as soon as possible as the moist specimens may mold or dry in lumpy, brittle shapes.

This is also a great way to teach children to help them recall the identification of street trees after they are taught how to identify them.

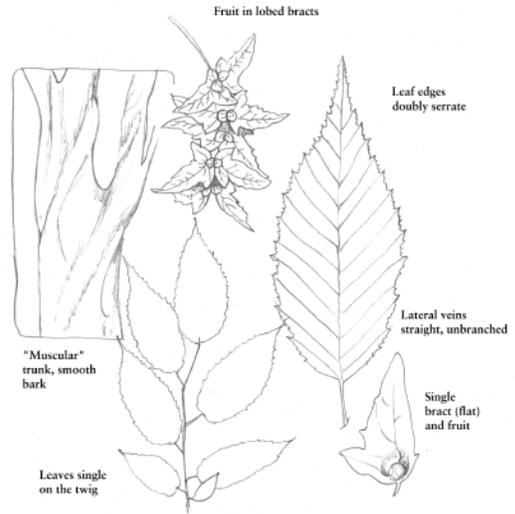
HOP HORNBEAM

(*Ostrya virginiana*)



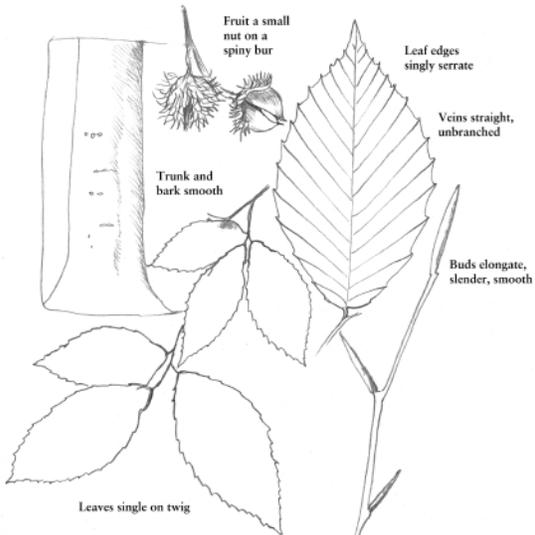
MUSCLEWOOD

(*Carpinus caroliniana*)



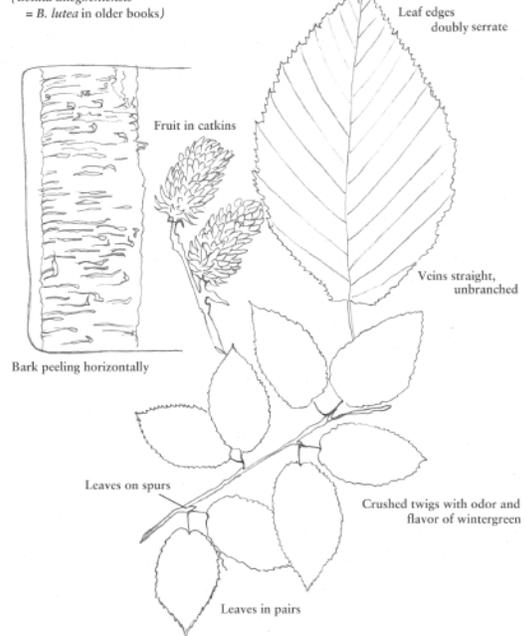
BEECH

(*Fagus grandifolia*)



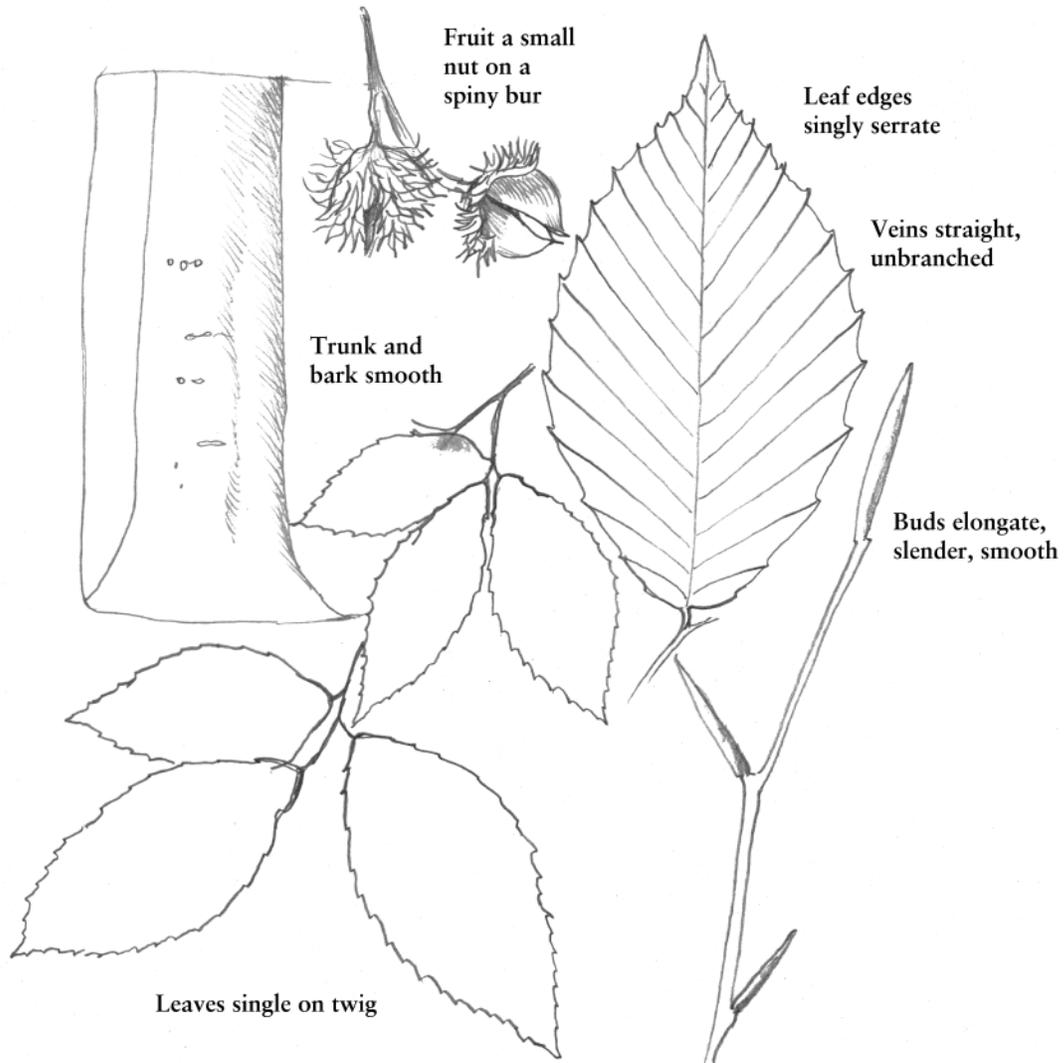
YELLOW BIRCH

(*Betula alleghaniensis*
= *B. lutea* in older books)



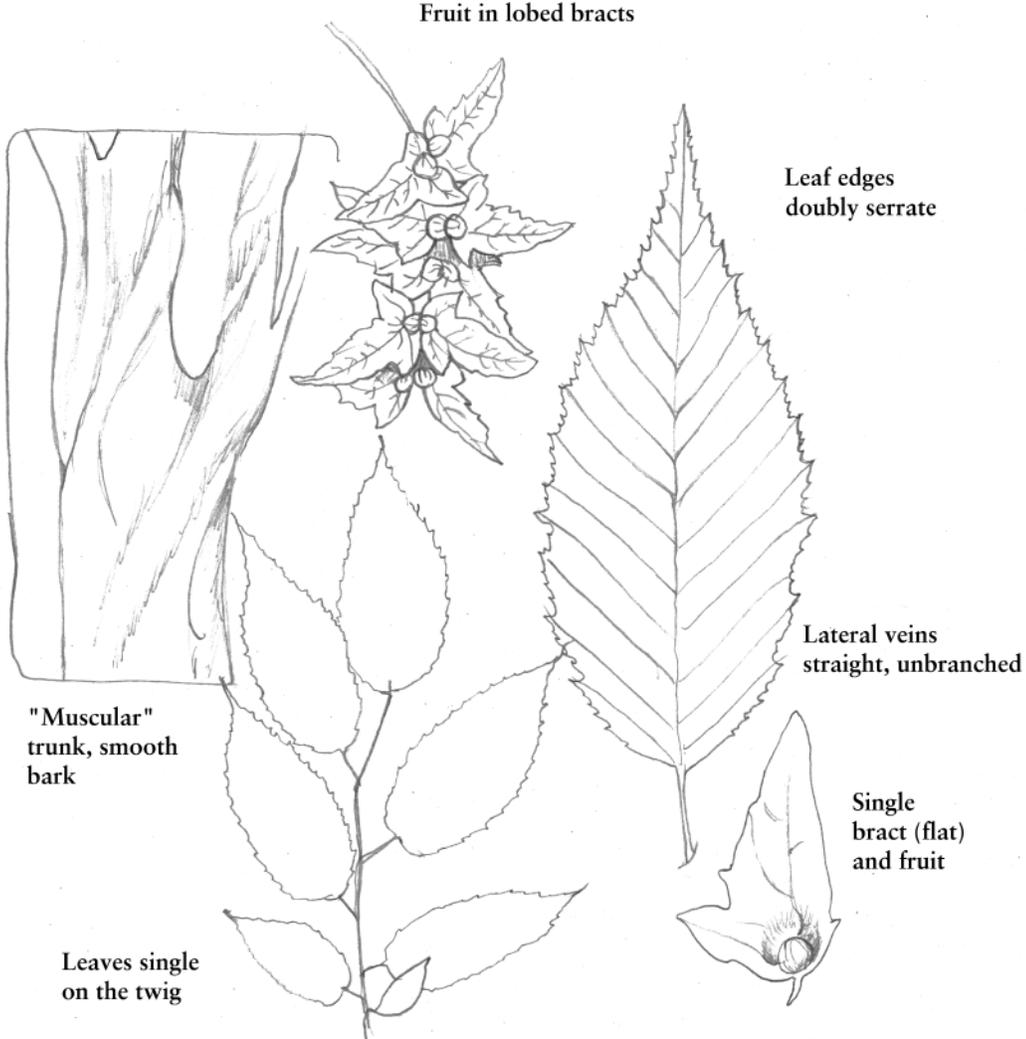
BEECH

(Fagus grandifolia)



MUSCLEWOOD

(Carpinus caroliniana)



Fruit in lobed bracts

Leaf edges doubly serrate

Lateral veins straight, unbranched

"Muscular" trunk, smooth bark

Single bract (flat) and fruit

Leaves single on the twig

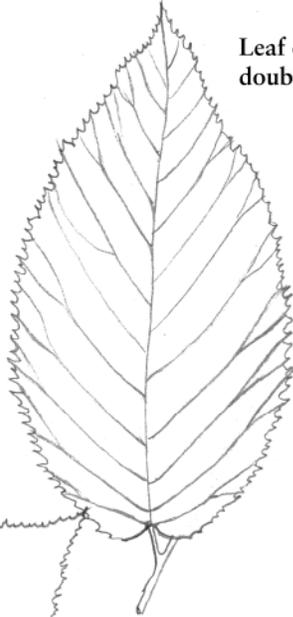
HOP HORNBEAM

(*Ostrya virginiana*)

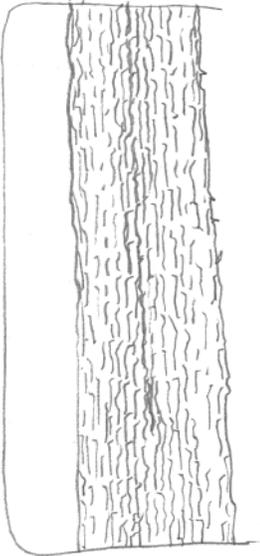
Fruit in clusters of bladders



Leaf edges doubly serrate

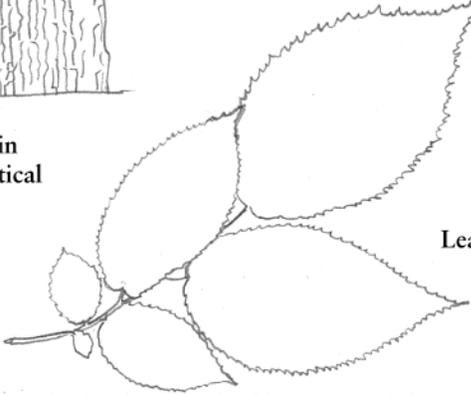


Veins usually branched beyond the middle



Bark peels in narrow vertical strips

Leaves single on the twig



YELLOW BIRCH

(*Betula allegheniensis*
= *B. lutea* in older books)

