



American Chestnut Tree

Identification Resources

For the Appalachian Trail Mega-Transect

Chestnut Project

May 2008

Pilot Project Partners:

The Appalachian Trail Conservancy

Potomac Appalachian Trail Club

How to identify American chestnut trees

Excerpt from:

Field Guide for locating, pollinating, and harvesting nuts from flowering American Chestnut Trees (Castanea dentata)

The American Chestnut Foundation
Revised First Edition, May 2000

Chestnut trees are most easily located while they are in full bloom, from early June, in the southern part of the range, to the weeks around the Fourth of July in the North. The great mass of conspicuous white **catkins** on larger trees is visible at great distances. The **odor** of the blooms is also quite distinctive, especially on still mornings and evenings. Later in summer, **bur-laden** trees are fairly obvious. In early fall, chestnut leaves turn **yellow** sooner than the leaves of many other deciduous trees with yellow leaves. In late fall, the brown leaves tend to stay on the trees. In fall and winter, to locate trees that had female flowers the previous summer look on the ground for fallen **burs**.

American chestnut leaves are **long** in comparison to their width, the **teeth** on the edges of the leaf **curve inward**, and the stems usually have a **reddish** color

Chinese chestnut leaves are more **oval** in shape, thicker and more leathery than American chestnut leaves. Chinese chestnut leaves grown in the sun have a **whitish** cast on the back of the leaf, and the stems are **gray** with large white "bumps" or lenticels on them.

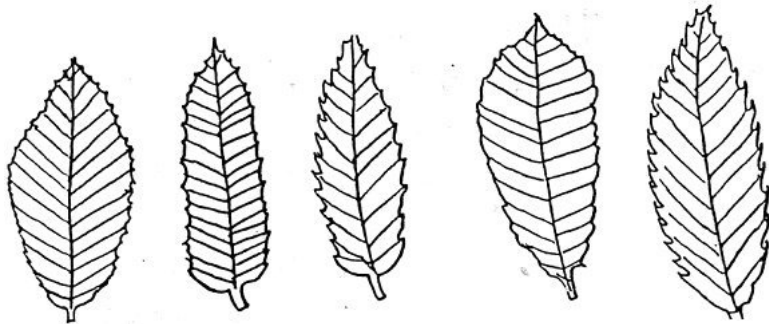
European chestnut leaves look much like American chestnut leaves, but their teeth tend to be **triangular** in shape rather than curved inward.

Japanese chestnut leaves are often dark, **shiny green** on top and the sides of leaves are somewhat **parallel**.

LEAF TRAIT ANALYSIS FIELD LIST*

| Trait Type | POSSIBLE OPTIONS | | | | |
|---|------------------|-----------------|---------------|-----------------------------------|----------|
| leaf thickness | THICK | THIN | | indeterminate | |
| leaf shape | OVAL | CANOE | | indeterminate | |
| leaf shininess | SHINY | DULL | | indeterminate | |
| dentation | WEDGE | OCEAN-WAVE | | indeterminate | |
| bud shape | OVAL | CYLINDRICAL | | indeterminate | |
| bud color | RED | YELLOW | | GREEN indeterminate | |
| bud hairiness | YES | NO | | indeterminate | |
| stipules | FLARED | THIN | | NOT PRESENT indeterminate | |
| twig color | RED | GREEN | | BROWN indeterminate | |
| twig hairiness | YES | NO | | indeterminate | |
| petiole angle | ACUTE | OBTUSE | | indeterminate | |
| relative stem size | THICK | THIN | | MODERATE indeterminate | |
| lenticel size | SMALL | MEDIUM | | LARGE indeterminate | |
| Simple hairs on veins | YES | NO | | indeterminate | |
| simple hairs in interveinal areas | YES | NO | | indeterminate | |
| presence and abundance of stellate hairs | YES | NO | | indeterminate | |
| shape and abundance of trichomes | 4-CELLED | CHINESE STALKED | | EUROPEAN-STALKED indeterminate | |
| Depending on the combination, the final analysis will be one of these candidates: | | | | | |
| SPECIES ATTRIBUTED | | American | Chinese | European | Japanese |
| | | Chinquapin | indeterminate | | |

*This is not an exhaustive list



Other trees that might confuse you



The Horse Chestnut

- fat twigs and buds
- very few spines on the husk of the burr
- glossy dark brown nuts without a pointed tip like a chestnut
- 7 leaflets to a leaf rather than one

| Chinkapin | Japanese | European | Chinese | American |
|--|---|---|---|--|
| Nut | | | | |
| 1 nut ½ " tip pointed with a round cross section | 2-3 nuts, 1-2 in. No sunburst pattern at base, moderate brown | 2-3 nuts, 1-2 in. No sunburst pattern, dark brown black stripes | 2-3 nuts, ¾ - 2 in, rounded hairy tip, sunburst pattern uncommon, often lt. brown | 2-3 nuts, ½ - 1 in., pointed tip, top 1/3 to 2/3 downy, sunburst at base |
| Taste | | | | |
| Sweet | Not sweet | Starchy | Sweet | Sweet |
| Resistance to blight | | | | |
| None | Moderate | Slight | High | Low to None |

- leaf teeth may be pointed, but never have a bristle at the tip
- Chestnut oak leaves are thinly haired underneath
- acorns rather than chestnuts
- leaf stalk longer than a chestnut's
- long droopy flower catkins that are less fragrant and not as creamy white compared to a chestnut catkin
- 3 buds with many scales at twig tip rather than one bud with few scales
- the chinkapin oak has very hairy undersides of leaves whereas the chestnut has smooth leaf undersides



Chestnut Oak & Chinkapin Oak

Checklist for Data Collection:

- ___ Chestnut Count Forms
- ___ Large Tree Report Forms
- ___ Large Ziplock Bag
- ___ Pencils
- ___ Clipboard
- ___ Measuring Tape
- ___ Trail Section # and Start and End Points

Optional But Helpful:

- ___ Trail Maps
- ___ Hand lense or microscope
- ___ GPS
- ___ Digital Camera



Beech

- very long thin buds
- the husk of the burr is tiny, and the beechnut even smaller
- leaves are broad and fat, only 3-5 inches long
- The male flowers are not in a catkin form

The Beech is know as the "initial tree" and is often carved.
The chestnut does not have the smooth silvery bark that the beech has.

Reproductive life-cycle of the American chestnut

Flowering American chestnut trees will either have only male flowers (catkins) or both male and female flowers (small burs). Female flowers usually have male flowers on the same branch. Chestnut trees bloom from mid-June to early July, depending on latitude and elevation. A chestnut tree rarely self-pollinates. Therefore at least two chestnut trees need to be near each other for viable nut production.

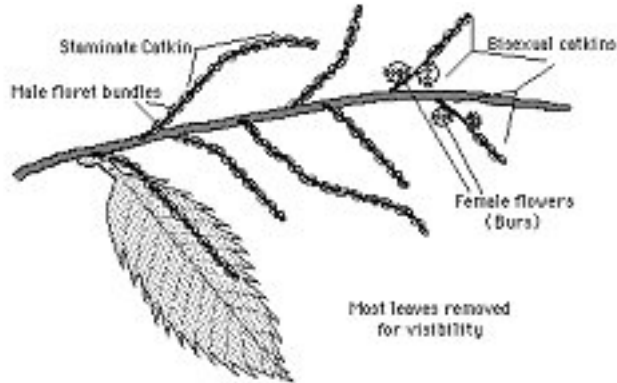
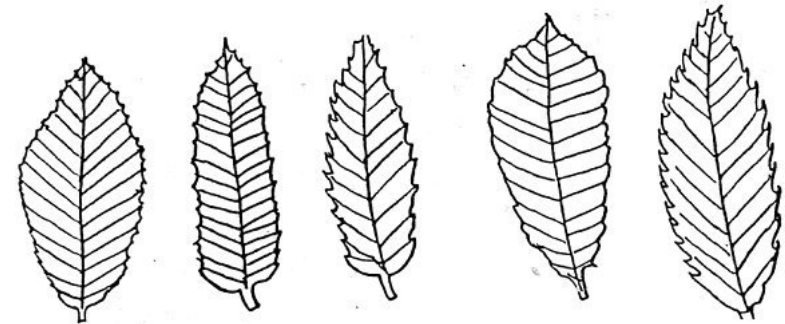


Fig. 3. Male and female chestnut flowers

Female chestnut flowers develop into burs that contain up to three nuts at maturity. The nuts are ready for harvest when the burs begin to open up.



| Chinkapin | Japanese | European | Chinese | American |
|---|---|--|---|--|
| Leaf Taper to Stem | | | | |
| Straight | Curved | Curved | Curved | Straight |
| Taper to Tip | | | | |
| Straight | Curved | Curved | Curved | Straight |
| Teeth | | | | |
| 1-3 mm, small, sharp, no hook | Tiny, often only bristles, no hook | Big, sharp or rounded, no hook | Large or small, not pronounced or hooked | 6 mm, big, sharp, and often curved (hooked) |
| Underside of Leaf | | | | |
| Sun leaves hairy | Many large dots (glands), sun leaves hairy | Many small dots. Sun leaves hairy on some specimens but not others | Sparse dots. Sun leaves hairy. | Many small dots. Sun leaves <i>not</i> hairy, long sparse hairs only on midrib. |
| Twig | | | | |
| Hairy tips, purple or brownish grey | Pink to light red, large white lenticels | Stout, dark, brown, small white lenticels | Hairy tips, tan to pea green. Large elliptical yellow lenticels | Slender, smooth, hairless reddish brown, small white lenticels |
| Bud | | | | |
| Up to 3mm, downy dark red, pointed longer than wide, sticks out from stem | Glossy brown, as long as it is wide (rounded) | Dark red, fat and globular | Hairy, tan, dull brown to black rounded and flat against stem | Up to 6mm, smooth, reddish brown to yellow, pointed, or longer than it is wide, sticks out from stem |

The following pages are from the web page of **Paul Sisco, TACF Regional Science Coordinator:**

<http://www.mindspring.com/%7Epsisco/www/overview.html>

Burs and Nuts

American vs. Chinese



American Chestnuts:

Nuts are relatively small, 1/2 to 1 inch in diameter

Tips of American chestnuts are pointed

Nuts are hairy over 1/3 to 2/3 of length from pointed end

Vascular bundles in a sunburst pattern on hilum end

2 to 3 nuts in each bur

Chinese Chestnuts:

Nuts are relatively large, 3/4 to 2 inches in diameter

Tips of Chinese chestnuts are rounded

Only the tips of the nuts are hairy

Vascular bundles in a diffuse pattern on hilum end

2 to 3 nuts in each bur

Chestnut and Chinkapin Leaves

Top of leaves



Bottom of leaves



Top Row: Allegheny chinkapin leaf

Bottom row (from left): American, Chinese, European and Japanese Chestnut leaves

Chestnut Stems and Buds



From Left: American, Chinese, European, and Japanese twigs

American twig: pointed bud at 45 degree angle from stem; smooth, reddish stem

Chinese twig: rounded, hairy buds, large stipules (leaf-like coverings over the buds), large lenticels (white "bumps" on stem)

European twig: thick stem, large buds

Japanese twig: pale, pinkish stem

Burs and Nuts American vs. Chinese



American Chestnut Burs:

A dense mass of long, slender spines

Spines are 2 to 3 cm long, 0.5 mm thick

Up to 3 nuts per bur

Chinese Chestnut Burs:

A sparse mass of short, thick spines

Spines are 1 to 2 cm long, 1 mm thick

Up to 3 nuts per bur

Stipules



Chinese Stipules

Broad

Cover the buds

**Remain on the stem
through September**

Chestnut and Chinkapin Burs



Clockwise from top:

Allegheny chinkapin,
European chestnut,
Japanese chestnut,
Chinese chestnut, and
American chestnut burs
Note that the Chinese
bur looks small, even
though the nuts inside
are large. This is
because of their short,
stubby spines.



Chestnuts

Chestnut burs have two sutures and
open into four valves (sections)

There are up to three nuts per bur.



Chinkapins

Chinkapin burs have one suture and
open into two valves (sections).

There is only a single nut per bur.

Chestnut and Chinkapin Nuts



Top and Side Views of Chestnuts

From Left: American, Chinese, Japanese, and European chestnuts

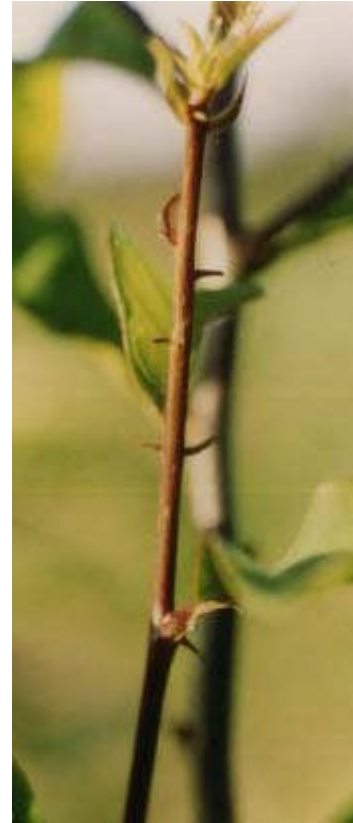


Top: Chinkapin nuts: note the pointed end

Middle: American chestnuts: note the hairy surface

Bottom: Chinese chestnuts: note the rounded end

Stipules



American Stipules

Slender

Angle sharply out from stem

Usually fall off in June

Buds and Stems



Chinese Buds and Lenticels

Rounded buds that hug the stem

Hairy stems and hairy leaf veins

Stem color tan to pea-green

Large lenticels (bumps) on stem

Chinese vs. American Chestnut

(Castanea mollissima vs. Castanea dentata)



Top View

American Leaf (left):

Leaf is long in relation to its width

Large, prominent teeth on edge; bristle at the end of each tooth curves inward

Base of leaf blade tapers sharply

Leaf is very thin and papery

Chinese Leaf (right):

Leaf is oval-shaped

Teeth are smaller

Base of leaf blade is rounded

Leaf is thick and waxy-feeling

Bottom View



American Leaf (left):

Elongated leaf

Large, prominent teeth on edge; bristle on teeth curves inward

Blade tapers sharply to meet stem at base of leaf blade

Light green underside on leaves exposed to the sun

Chinese Leaf (right):

Oval-shaped leaf

Small teeth on edge

Base of leaf blade rounded

Underside of sun leaves look whitish because of many hairs

Buds and Stems



American Buds and Lenticels

Pointed buds that angle away from the stem

Stems smooth and hairless

Stem color reddish brown to dark green

Small but numerous lenticels on stem