




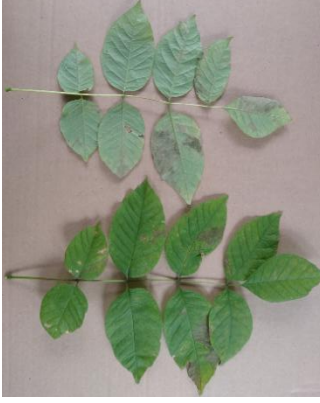



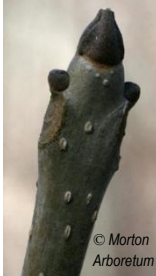


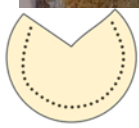

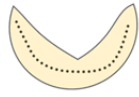



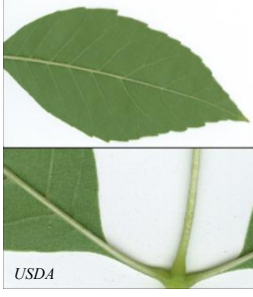

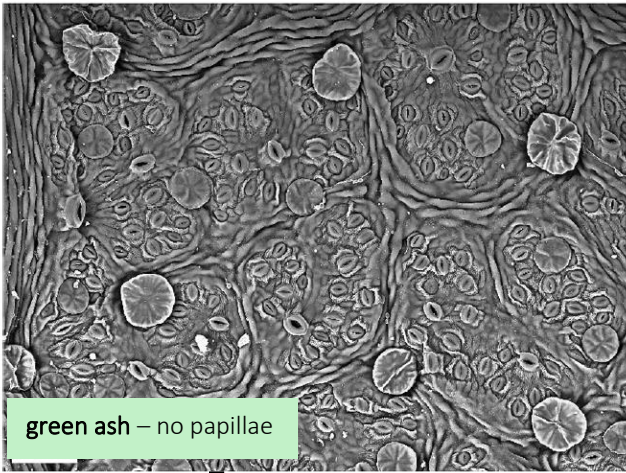


# How to identify white, green and black ash species

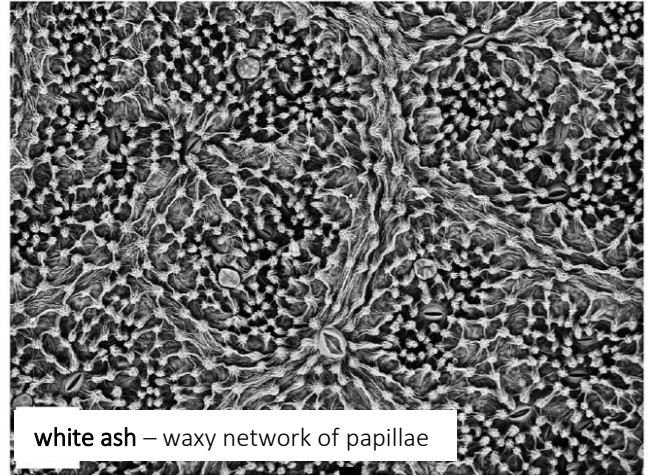
<b>Black ash, also called brown ash</b> <i>(Fraxinus nigra)</i>	<b>Green and red ash are considered one species:</b> <b>green ash</b> <i>(Fraxinus pennsylvanica)</i>	<b>White ash</b> <i>(Fraxinus americana)</i>
<p>Light brown to gray bark, appears almost whitish, with corky texture. Bark scales are easily rubbed off and reveal a pale orange/tan underside.</p>  <p><small>© Vince</small> <small>K. Kanoti, Maine Forest Service</small></p>	<p>Gray to brown bark gets darker when wet. Very slightly corky texture. Loose diamond pattern.</p>  <p><small>Young tree bark</small></p>	<p>Grey bark with strong diamond pattern. Bark feels hard.</p>  <p><small>Young tree bark</small> <small>K. Kanoti, Maine Forest Service</small></p>
<ul style="list-style-type: none"> <li>- Compound leaves with 7-11 leaflets</li> <li>- Leaflets attached directly to stem and are always serrated</li> <li>- Leaves turn yellow in the fall</li> </ul>  <p><small>photo: Bob D'Arcy</small></p>	<ul style="list-style-type: none"> <li>-Compound leaves with 5-9 leaflets</li> <li>- Leaflets attached by short petiolules.</li> <li>- Underside is pale green</li> <li>- Leaves turn yellow in the fall</li> </ul> 	<ul style="list-style-type: none"> <li>-Compound leaves with 5-9 leaflets (usually 7)</li> <li>- Leaflets attached by longer petiolules.</li> <li>- Underside whitish</li> <li>- Leaves turn reddish /purple in the fall</li> </ul> 
<p>Samaras (fruit) canoe-shaped. Very subtle transition between wing and seed.</p> 	<p>Samaras are teardrop/pin shaped. Clear margin between the wing and the seed.</p>  <p><small>USDA</small></p>	<p>Samaras are funnel shaped. Clear margin between the wing and the seed.</p>  <p><small>USDA</small></p>
<p>Dark brown terminal winter bud (Hershey's kiss-like) separated from uppermost lateral buds. Shallowly notched leaf scar with a nearly full circle bundle sheath.</p>  <p><small>© Morton Arboretum</small></p>  <p><small>photo: P.M. Dziuk</small> <small>Drawing by Tyler Everett, APCAW</small></p>	<p>Light brown, cone-shaped, terminal winter bud often with red hair. Twigs often hairy as well. V-shaped notch on leaf scar; bundle sheaths "U"-shaped.</p>  <p><small>photo: P.M. Dziuk</small> <small>USDA</small></p>  <p><small>Drawing by Tyler Everett, APCAW</small></p>	<p>Brown terminal winter buds blunt. Leaf scars deeply notched, with crescent-shaped bundle sheath.</p>  <p><small>photo: P.M. Dziuk</small> <small>© Morton Arboretum</small></p>  <p><small>Drawing by Tyler Everett, APCAW</small></p> <p>Green and white ash hybridize; characteristics can be in between the two species.</p>
<p>Tufts of tan to reddish hairs at the base of each leaflet.</p>  <p><small>USDA</small></p>  <p><small>underside</small></p>	<p>Toothed leaflets gradually narrow at base forming a winged petiolule.</p>  <p><small>© Derek</small></p>  <p><small>USDA</small></p>	<p>Leaflets entire or with very shallow teeth. Leaflets don't gradually narrow at base.</p> 

## Using a hand microscope to distinguish between green and white ash

Genomic analysis (*Smith et al., U. of Tennessee*) has confirmed that the most reliable physical trait to distinguish white ash from green ash is the presence of a network of microscopic papillae (bumps) on the underside of mature leaves of white ash, as noted previously by botanists (Wright, 1945; Hardin et al, 1982). This network can be observed in the field using an inexpensive LED-lit hand microscope (e.g., 60x-120x LED Lighted Pocket Microscope, [Amazon](#)).

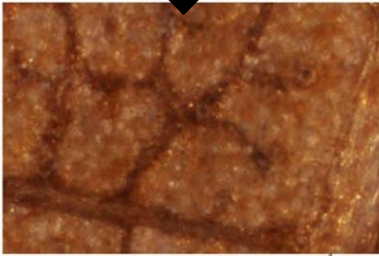


Lower leaf surface at 400× magnification (from *Williams & Nesom, 2010*).



green ash – no papillae

white ash – waxy network of papillae



These images show lower-magnification view of the leaf surface, similar to what can be observed with a hand microscope. *Photos: J. Campbell*



### Growth habits of the three ash species also differ



Black ash

Branches and especially twigs are stout even on small trees; opposite twigs typically form wide angles.



Green ash

Compared to white ash, the tree habit appears messy, with opposite twigs forming variable angles and often bending, which gives the tree a disorganized look.



White ash

The habit of white ash is highly organized; opposite twigs form acute angles and bend in a consistent pattern, giving the twigs at the ends of branches a trident-like appearance.