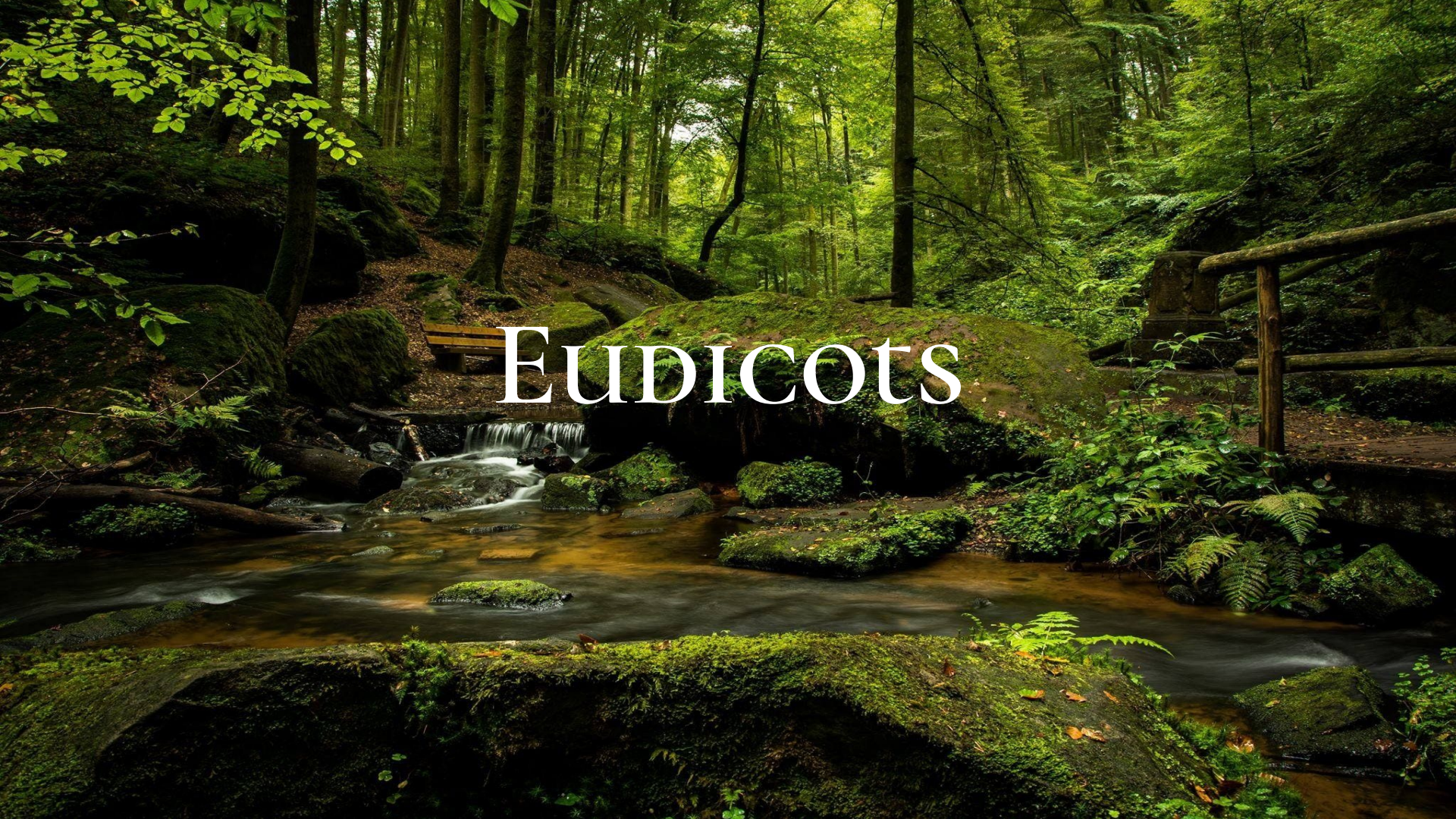

Eudicots

QOTD: Question of the Day

What is your favorite nut? What are some characteristics about them that are cool?







Catkins: a Crash Course

Catkins: aka aments; cylindrical flower cluster

- inconspicuous/no petals
- usually wind-pollinated (anemophilous) but sometimes insect-pollinated (ex. Salix)
- many, usually unisexual flowers, along a central stem
- usually only male (female flowers are single) but can be both male and female in some







Willows - Salicaceae

- Willows, Poplars, Aspens, Cottonwoods
- Simple leaves, alternate arrangement
- serrate/dentate leaf margins most of the time
- Salicoid teeth: vein enters tooth, expands, terminates near apex at setae: tip of tooth
- Are dioecious or bisexual









Populus

- Appearance:
  - Height: 15-50m
  - Bark: smooth, white to greenish to dark gray, has diamond-shaped lenticels: pores that allow gas exchange
  - Leaves: spirally arranged, can be circular or triangular or lobed
  - Petioles (stalk that attaches leaf to stem) are flattened so that the leaves shake easily in the win
  - Flowers: dioecious, long catkins



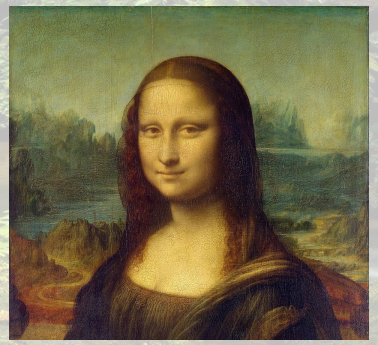




POPULUS

- Ecology:
  - Live in wetlands/riparian zones (riverbanks)
  - Food for butterflies and Aspen Oyster mushroom
- Uses:
  - Wood, paper pulp
  - Sap is eaten
  - Snowboards, electric guitars, drums
  - Used as energy crop for biomass/fuel
  - Used in Italy for panel paintings
    - The Mona Lisa is painted on poplar wood!

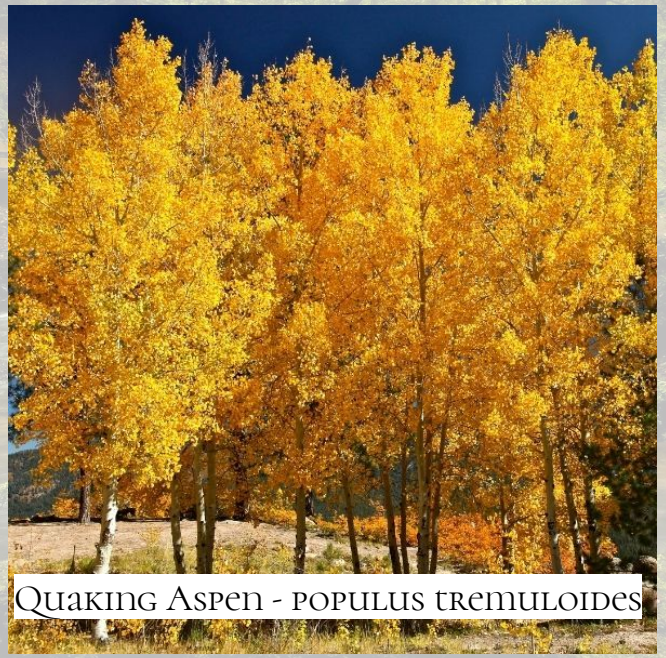




POPULUS



Narrowleaf Cottonwood - Populus angustifolia



Quaking Aspen - populus tremuloides



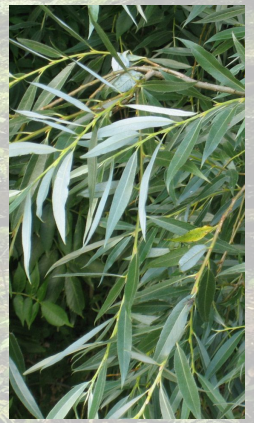
Bigtooth Aspen - populus grandidentata



Salix

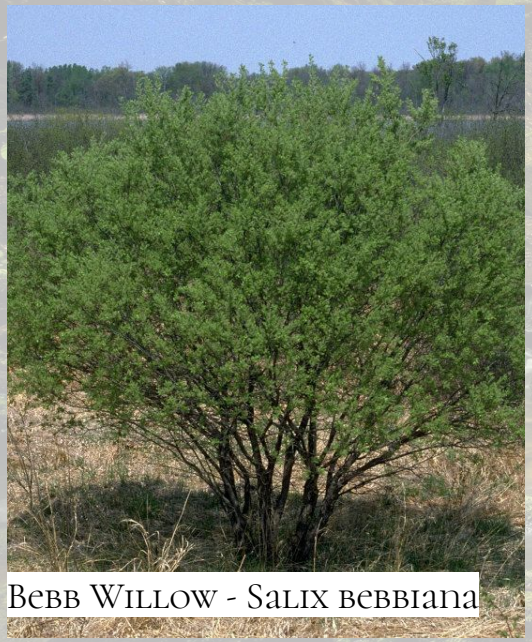
- Appearance:
  - Leaves: linear-lanceolate, can be oval, serrated edges, short petioles
  - Flowers: dioecious, catkins
  - Roots: stoloniferous: connect other trees
- Ecology:
  - Shade tolerant, do not live long
  - Eaten by butterflies and ants
- Uses:
  - Native Americans used for twine, fires, baskets
  - medicine



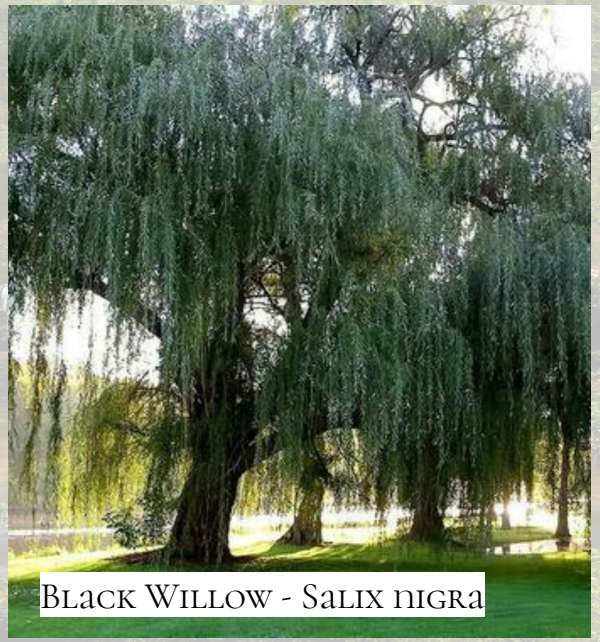




Salix



Bebb Willow - Salix bebbiana



Black Willow - Salix nigra



Scouler Willow - Salix scouleriana

Walnut Family - Juglandaceae

- walnut, hickory, pecan, wingnut, butternut
- can be shrubs or trees
- Leaves: usually alternate, but opposite in *Alfaroa* and *Oreomunnea*
- pinnately or ternately compound, exstipulate
- can be monoecious or dioecious
- flowers are catkins and are wind-pollinated









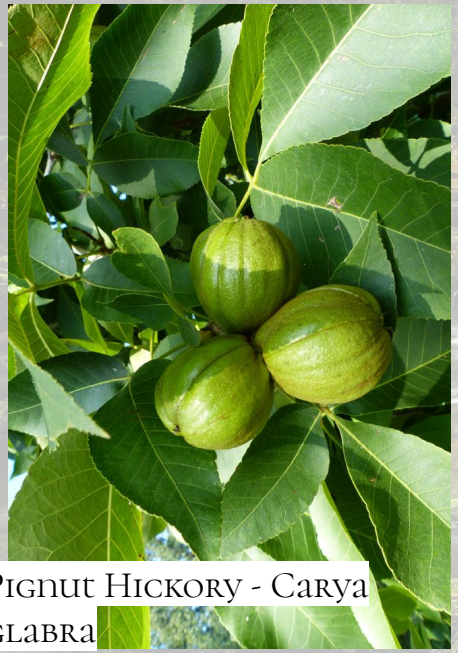
Carya - pecan and Hickory

- Appearance:
  - Leaves: pinnately compound
  - Flowers: small, yellow green catkins, wind pollinated and self-incompatible
  - Fruit: nut, enclosed in a husk which splits
    - Sometimes categorized as drupes: fruit with a pit in the center, like a peach





Carya - pecan and Hickory



Pignut Hickory - Carya glabra



Pecan - Carya illinoinensis



Juglans

- Includes butternut & black walnut
- 21 species in this genus, 2 on the tree list :)
- Leaves: pinnately compound
- Flowers: appear in spring
  - male cylindrical catkins developed from leafless shoots from the past year (~10 cm in length, large number of little flowers)
  - female flowers appear in a cluster at the peak of the current year's leafy shoots
- Fruit: type of accessory fruit known as a pseudodrupe (or drupe-like nut)
- Wood:
  - Cherokee produced black dye from bark
  - important for timber
- Ecology:
  - used as food plants by the larvae of some Lepidoptera species (moths)
  - nuts and fruit eaten by mice & squirrels

Juglans

Black walnut (J. nigra):

- riparian zones, native to N. America, monoecious flowers
- most parts of the tree have a characteristic pungent or spicy odor (not in the nut)
- bark: gray-brown, diamond-shaped pattern
- leaves: pinnately compound, alternately arranged; 30-60 cm, 15-23 leaflets, acuminate tip, serrated margin, dark green, hairy on underside

Butternut (J. cinerea)

- aka white walnut, native to E. US + SE Canada
- ~20m tall, slow growing, rarely lives longer than 75 years
- light gray bark, 40-80 cm stem diameter
- leaves: alternate, pinnate, 40-70 cm long, 11-17 leaflets
- leafout tied to **photoperiod** rather than air temp, when daylight = 14 hrs; leaffall when daylight = 11 hrs

Juglans







J. cinerea



J. nigra



Red Alder - Alnus rubra

Spot the difference: what do you notice?





How closely related do you think these trees are?

Birch - Betulaceae

- Monoecious
  Birch (Betula), Alder (Alnus), Hazel (Corylus), Hornbeam (Carpinus), Hop-hornbeam (Ostrya), hazel-hornbeam (Ostryopsis)
- 167 species, but we only have to learn 7
- Appearance:
  - Flowers: catkins, large feathery stamen that make a lot of pollen, rely on wind pollination
  - Leaves: simple, alternate, margins are doubly serrate





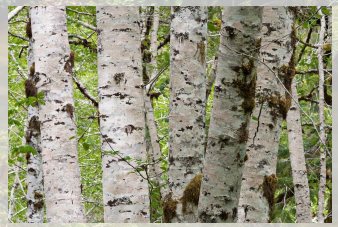


Red Alder - Alnus rubra

- 35 species in the Alnus genus, but we only have to learn about one
- Largest Alder species in North America
- Appearance:
  - Height: 20-30m
  - Trunk: 25-50cm
  - Bark: mottled, ashy-gray, smooth
  - Leaves: ovabe, 7-15cm long, bluntly serrated edges and point at apex, margin is revolute: rolled downwards to underside of leaf, which is different from all other alders
  - Flowers: reddish catkins 10-15cm long, woody
- Distribution:
  - Coastline from Alaska to California









Birch - Betula

- monoecious
- Appearance:
  - Small to medium sized trees/shrubs
  - Leaves: simple, alternate, singly or doubly serrate, feather-veined
  - Fruit: samara: has two wings, catkins are not woody like alders
  - Bark: long, horizontal lenticels: porous spots, papery plates
- Ecology:
  - pioneer species, especially after fires
  - Light, well-drained, acidic soils
- Uses:
  - Wood, plywood, soap, tar, inner bark is edible, paper, bark is used for skin wounds









Birch - Betula

Yellow Birch - Betula alleghaniensis





Sweet Birch - Betula lenta

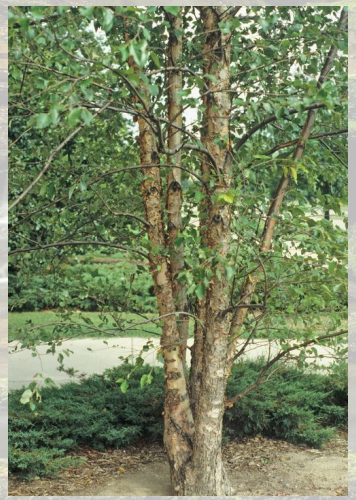




Birch - Betula

Water Birch - Betula occidentalis





Paper Birch Betula papyrifera





Birch - Betula

Gray Birch - Betula populifolia







American Hornbeam - Carpinus caroliniana

- hardwood, aka blue-beech, ironwood, musclewood, muscle beech
- native to Eastern N. America, shaded areas w/moist soil
- monoecious
- small, 10-15m, fluted/crooked trunk
- smooth, greenish-gray bark
- leaves: alternate, 3-12 cm long, prominent veins, ovate-oblong, rounded, or wedge-shaped
- male/female catkins
- fruit: small, 7-8 mm long nut, matures in fall
- uses: handles of tools, levers, walking canes, golf clubs
- ecology: shade-loving, moderate soil fertility & moisture
    - shallow, wide-spreading root system
    - leaves eaten by caterpillars of Lepidoptera





Eastern Hophornbeam Ostrya virginiana

- Aka. American Hophornbeam, hardhack, ironwood
- Appearance:
  - Height: up to 18m
  - Bark: grayish brown, flaky plates, small lenticels
  - Young twigs are fuzzy
  - Leaves: ovoid-acute, 5-13cm long, pinnately veined, double serrate margin, fuzzy underside
- Distribution:
  - Mid-eastern US
- Ecology:
  - Buds and catkins are food for birds







Tree joke time

What do you get when you cross a four-leaf clover with poison oak?



…A rash of good luck



Speaking of oaks, let’s learn about Family: Fagaceae!

Fagaceae (Beech)

- Chestnuts, Beeches, Oaks
- flowering plants, mostly deciduous (evergreen in the tropics)
- alternate simple leaves, pinnate venation, often lobed
    - petioles and stipules both present
- unisexual flowers (in the form of catkins)
- fruits lack endosperm (instead they lie in a scaly/spiny husk; may/may not enclose entire nut
- one of the most ecologically important woody plant families in N. Hemisphere; Oaks form backbone of temperate forest in N. America, Europe, Asia
- Uses: timber for floors, furniture, cabinets, and wine barrels





American Chestnut - Castanea dentata



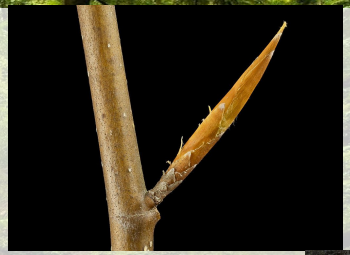


- Widely considered most important chestnut tree
- monoecious
- Appearance:
  - Height: up to 30m
  - Flowers: small, greenish male flowers on long catkins, not self-compatible
  - Bark: smooth, reddish when young, grey and deeply furrowed when old
  - Fruit: burs
  - Leaves: simple, 14-20cm long, 7-10cm broad, saw like teeth
- Distribution:
  - Eastern US, from Maine to Missisippi



American Beech - Fagus grandifolia

- native to E. US & extreme SE Canada
- 16-35m, monoecious
- smooth, silver-gray bark
- leaves: dark green, small teeth terminating each vein, 6-12 cm long, short petiole
- winter twigs (distinctive among N. American trees): long, slender, 2 rows of overlapping scales on buds
- Beech buds: long, resemble cigars
- dispersal of seedlings AND root sprouts (n trees sprout from roots
- shade tolerant





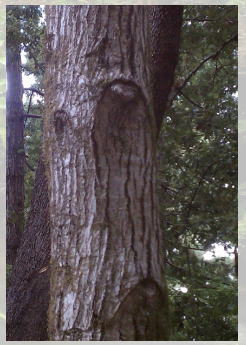


Tanoak - Lithocarpus densiflorus

- Appearance:
  - Height: up to 40m, 15-25m on average
  - Trunk: 60-190cm
  - Bark: fissured, gray to brown
  - Leaves: alternate, 8-13cm, toothed margins, leathery texture, young leaves are covered in orangish hairs
  - Acorns: 2-3cm long, hard woody shell unlike other acorns
- Distribution:
  - Coast of Oregon to California
  - Sea level to 1,200m
- Ecology:
  - Shade tolerant, vulnerable to wildfires and sudden oak death











Quercus - Oaks!

- ~500 extant species
- native to Northern Hemisphere
- leaves: spirally arranged, lobate margins (mostly), some with serrated/completely smooth margins
- male catkins + female flowers (monoecious)
- nuts: acorn/oak nut in a cupule (1 seed)
- Ecology:
- keystone species: wide range of habitats from Mediterranean semi-desert to subtropical rainforest; important components of hardwood forests







Your Homework

Using what you have learned, make a tree-related meme! Your meme will be entered in a competition with other people's memes and will be scored on the following criteria:

- Depth of information
- How creative and original your meme is
- How funny it is to us
- How funny it is to some of our friends who don't know very much about trees
- How funny it is to our brothers
- How much effort was invested in the creation of your meme

Your Homework

For example, here is my meme:



Depth of information: 5/10. You don't need that much info to understand it

Originality: 4/10. Eh.

It's very funny to me of course so 10/10

My brothers think it's an 8.5/10

I made this meme in 30 seconds so effort was not made. 2/10

Your Homework

Happy meme-making!