Virginia Woody Plant Diversity •300 tree species •300 shrub species

There might be 100 species in this photo.

We're going to need some ID tools.

### **Virginia Woody Plant Diversity**

- 5 physiographic provinces (geology and soils)
- elevation range from 0 to 5729 feet
- varied land use
- disturbance
- mild climate
- introduced species



## Taxonomy

Kingdom

Division

Class

Order

Family

Genus

**Species** 

<u>Plantae</u> – Plants

<u>Magnoliophyta</u> – Flowering plants

<u>Magnoliopsida</u> – Dicotyledons

<u>Sapindales</u> –

<u>Aceraceae</u> – Maple family

<u>Acer L.</u> – maple

<u>Acer rubrum L.</u> – red maple <u>Plantae</u> – Plants

<u>Coniferophyta</u> – Conifers

<u>Pinopsida</u> –

<u>Pinales</u> –

<u>Pinaceae</u> – Pine family

**<u>Pinus L.</u> – pine** 

<u>Pinus strobus L.</u> – eastern white pine Functionally, we try to identify trees to Family, Genus and Species.

Genus and species together make up the binomial, or scientific name. "L." indicates Linnaeus, the person who first described these trees.

PLANTS A CAR CAR CAR SALE AND A CAR AND A CAR

## Several Types of Tools •Higher Education Classes / Software •Dichotomous Keys

Woody Plants in Winter

- •Online Databases
- •Apps
- •Flora
- •Other Clues
- •Dr. Dendro











VT Dendrology Leaf and Twig Keys



#### Our unknown:



George A. Petrides



Common Native Trees of Virginia is free online / very inexpensive for paper copies.

The key is in the front of the book: Question 1 a. Leaves are needle or scalelike, go to 2. b. Leaves are broad and flat, go to 14.

## What the "wrong choice" looks like:



### Our unknown:





### All the opposites: MAD Cap Horse



a Leaves opposite, go to 15. b. Leaves alternate, go to 25.

The "wrong choice":



Maple Ash Dogwood

Caprifoliaceae family

Horsechestnut (buckeye) Notice the buds are opposite too.





More explanation coming right up...

15 a. Leaves compound, go to 16 b. Leaves simple, go to 19.





This whole structure is a leaf.

Buds grow where the leaf is attached to the twig. It will shed as a unit in fall.

This leaf has 5 leaflets.



Pinnate means feather-like. Think of palmate as shaped like your open palm.

a. Leaves are pinnately compound, go to 17.
b. Leaves are palmately compound – Yellow Buckeye pg. 91.





16



17
a. Leaflets with large teeth, twig covered with whitish wax, bud covered with soft
white hairs – Boxelder pg. 86.
b. Leaflets with small teeth, twig not covered with soft with wax, bud not covered with hairs, go to 18.





Boxelder is common along rivers and in abandoned lots.

![](_page_11_Picture_1.jpeg)

### Our new unknown:

a. Leaves are needle or scalelike, go to 2.b. Leaves are broad and flat, go to 14.

![](_page_11_Picture_4.jpeg)

![](_page_11_Picture_5.jpeg)

![](_page_11_Picture_6.jpeg)

![](_page_12_Picture_1.jpeg)

a. Needles at least 1 inchlong, go to 3.b. Needles less than 1 inchlong or scale-like, go to 10.

![](_page_12_Picture_3.jpeg)

2

![](_page_12_Picture_4.jpeg)

![](_page_12_Picture_5.jpeg)

![](_page_13_Picture_1.jpeg)

a. Needles in groups of 5, and 3 to 5 inches long – Eastern White Pine, pg. 22

b. Needles in groups of 2 or 3, go to 4.

![](_page_13_Picture_4.jpeg)

3

![](_page_13_Picture_5.jpeg)

Needles naturally grow in groups called fascicles. To distinguish the pines you need to count the needles. Fascicles stay together even after they fall from the tree.

![](_page_14_Picture_1.jpeg)

4
a. Needles mostly in groups of 3, go to 5.
b. Needles mostly in groups of 2, go to 8.

![](_page_14_Picture_3.jpeg)

![](_page_14_Picture_4.jpeg)

![](_page_14_Picture_5.jpeg)

![](_page_15_Picture_1.jpeg)

### 8

a. Needles 3 to 5 inches, dark yellow green, cones 1½ to 2½ inches long –
Shortleaf Pine, pg. 23.
b. Needles less than 3 inches, go to 9.

![](_page_15_Picture_4.jpeg)

![](_page_15_Picture_5.jpeg)

![](_page_15_Picture_6.jpeg)

a. Needles 1½ to 3 inches, yellow-green and twisted, cones 1½ to 3 inches long.
Scaly bark on older trees, may be orange-brown on upper trunk and large
limbs – Virginia Pine, pg. 27.
b. Needles 1½ to 2½ inches, dark green, and somewhat twisted, cones 2 to 3½ inches – Table Mountain Pine, pg. 29.

9

![](_page_16_Picture_2.jpeg)

![](_page_16_Picture_3.jpeg)

![](_page_16_Picture_4.jpeg)

Virginia pine is a common invader of old fields.

![](_page_17_Picture_1.jpeg)

### One more unknown:

a. Leaves are needle or scalelike, go to 2.b. Leaves are broad and flat, go to 14.

![](_page_17_Picture_4.jpeg)

![](_page_17_Picture_5.jpeg)

1

![](_page_17_Picture_6.jpeg)

![](_page_18_Picture_1.jpeg)

![](_page_18_Picture_2.jpeg)

![](_page_18_Picture_3.jpeg)

![](_page_18_Picture_4.jpeg)

![](_page_18_Picture_5.jpeg)

![](_page_18_Picture_6.jpeg)

![](_page_19_Picture_1.jpeg)

![](_page_19_Picture_2.jpeg)

![](_page_19_Picture_3.jpeg)

![](_page_19_Picture_4.jpeg)

![](_page_19_Picture_5.jpeg)

![](_page_19_Picture_6.jpeg)

### 36

a. Leaves have lobes with or without teeth, or large rounded teeth appearing like a wavy margin, go to 37.
b. Leaves do not have lobes or margins as above, and may or may not be toothed or spined, go to 53.

![](_page_20_Picture_3.jpeg)

Lobes are the parts that stick out. The parts that stick in are called sinuses.

![](_page_20_Picture_5.jpeg)

![](_page_20_Picture_6.jpeg)

![](_page_20_Picture_7.jpeg)

![](_page_20_Picture_8.jpeg)

![](_page_21_Picture_1.jpeg)

![](_page_21_Picture_2.jpeg)

It's a hackberry (Celtis occidentalis)

![](_page_21_Picture_4.jpeg)

![](_page_21_Picture_5.jpeg)

![](_page_21_Picture_6.jpeg)

## **Twig Keys**

![](_page_22_Picture_1.jpeg)

### http://dendro.cnre.vt.edu/ dendrology/idit.htm

### Twigs can be more distinctive than leaves.

![](_page_22_Picture_4.jpeg)

These two leaves came from the same black oak!

# Twig Keysphyllotaxy

Phyllotaxy (or arrangement) is a very useful identification characteristic and is usually the first question asked in twig keys.

![](_page_23_Picture_2.jpeg)

Alternate The majority of woody plants are alternately arranged Opposite MAD Cap Horse Whorled Catalpa has 3 buds at each node

## Twig Keys terminal buds

![](_page_24_Picture_1.jpeg)

Oaks have multiple terminal (many end) buds that are imbricate (scaly).

Willows have false terminal buds (the twigs actually die back a little). Each bud is covered by one cap-like scale.

Bitternut hickory has naked buds. You can clearly see the tiny folded leaves wrapping the end bud.

## Twig Keys leaf scars

![](_page_25_Picture_1.jpeg)

![](_page_25_Picture_2.jpeg)

Leaf scars are where the leaves were attached to the twigs.

They are distinguished by their size, shape, and by the number and pattern of vascular bundle scars (the scar left behind by the old bundles of xylem and phloem).

# Twig Keys • pith

![](_page_26_Picture_1.jpeg)

Pith is the spongy material in the center of a twig.

![](_page_26_Picture_3.jpeg)

Oaks have a starshaped pith.

Black gum has a solid but diaphragmed pith.

Walnut has a chambered pith.

## **Twig Keys**

### miscellaneous

Flowering dogwood has very different flower buds (left) and vegetative buds (right). Vegetative buds will be shoots next growing season. Tulip-poplar twigs have valvate (two scales) buds and stipule scars that surround the twig (look just below the buds).

Ginkgo and most fruit trees make spur shoots. Spur shoots grow just a few millimeters each year.

![](_page_27_Picture_5.jpeg)

![](_page_28_Picture_1.jpeg)

![](_page_28_Picture_2.jpeg)

### http://dendro.cnre.vt.edu/ dendrology/idit.htm

![](_page_28_Picture_4.jpeg)

Databases are powerful tools. Enter everything you know about your unknown tree, query the database, and look at the possible matches.

![](_page_29_Picture_1.jpeg)

![](_page_29_Picture_2.jpeg)

The vTree App works on your Android or iPhone.

![](_page_30_Picture_1.jpeg)

**Location from GPS** 

**Location from Network** 

Location from Address or Destination

> Ignore Location Display All Species

![](_page_30_Picture_6.jpeg)

The App narrows possible species by sensing your location or using an entered location.

239 species normally found at Lat: 35.896 Lng: -84.254 Elevation: 865.

Show me only... e.g. oak or quercus

Press to narrow species list

Acer negundo boxelder Acer nigrum black maple Acer platanoides Norway maple \*\*Exotic\*\* Acer pseudoplatanus sycamore maple \*\*Exotic\*\* Acer rubrum red maple Acer saccharinum

![](_page_31_Picture_5.jpeg)

The trees of Culpeper, VA.

![](_page_32_Picture_1.jpeg)

![](_page_32_Picture_2.jpeg)

needles or scaly leaves

![](_page_32_Picture_4.jpeg)

#### broadleaves

Previous	Next	Clear Questions
----------	------	--------------------

![](_page_32_Picture_7.jpeg)

The resultant list can be further narrowed by answering interview questions.

![](_page_33_Picture_1.jpeg)

**3G 4**:50

#### Information and images

**VTree** Florida maple (Acer barbatum Michx.) Aceraceae family

Leaf: Opposite, simple, orbicular in shape, 1 1/2 to 3 1/2 inches in length and width, entire margin with 3 or 5 somewhat rounded lobes, green above, paler and often fuzzy below. Flower: Yellow-green, small, hanging from a long (1 to 2 inches) stalk in clusters of a few flowers, appearing with the leaves. Fruit: Samara, about 3/4 inch long, spreading at

about 65 degrees (wider than sugar maple), mature in the mid-summer.

**Twig:** Slender and shiny, reddish brown, terminal buds sharp pointed, brown and fuzzy. **Bark:** Light gray, with thick irregular curling ridges, becoming plated.

Form: Medium sized tree to 60 feet, elliptical crown.

![](_page_33_Picture_9.jpeg)

**Previous Species** 

![](_page_33_Picture_11.jpeg)

![](_page_33_Picture_12.jpeg)

A tree... broadleaf... opposite... samara fruits... Lobed leaves... It could be Florida maple.

![](_page_34_Picture_1.jpeg)

![](_page_34_Picture_2.jpeg)

Still can't figure it out? Send an email to Dr. Dendro.

![](_page_34_Picture_4.jpeg)

This same functionality is now built in to the VT Dendrology website.

![](_page_35_Picture_2.jpeg)

### http://dendro.cnre.vt.edu/dendrology/factsheets.cfm

Urry Urry Construct the Future Department of Forest Resources and Environmental Conservation	Department of Forest Resources and Environmental Conservation
Class - Fact Sheets - Features - Tools - VTree	Class - Fact Sheets - Features - Tools - VTree
Factsheets	Possible Matches
Search the database:         • You can search for all or part of a name.         • No fields are required.         • If you return no matches, try a more general search (ie. "maple" instead of "ashleaf maple").         Family:       Select a Family         State:       None Selected 🗸         Genus:       Hardiness Zone: Any Zone ✓         species:       Floristic Region (Biome):         common:       Any Region ✓         Display Matching Species       more info on Plant Hardiness Zones and Floristic Regions	Date to Search         There are 7 ID Fact Sheet matches at Latitude: 38.473030, Longitude: -77.998123, Elevation: 392.         You can narrow the list of possibilities with additional information: Growth Habit         Fruit Type         Flower Color         Leaf Type         Broadleaves (Hardwoods)         Arrangement         Leaf         - simple or compound         isimple
View trees at any North American location:	- lobes I'm not sure - deges i serrated - shape i round (in outline) - thickness i I'm not sure - thickness i I'm not sure - thickness i I'm not sure - thickness I'm not s
(Click the map to select your location)	Iwig       - bundle scars         - leaf scars       Im not sure         - leaf scars       Im not sure         - end buds       Scaly         - special features       Im not sure         Resubmit       Im not sure <ul> <li>= a North American native, may naturalize outside its native range</li> <li>Celastrus scandens American bittersweet</li> <li>Celastrus is fortungi wintersevent</li> <li>Evanymus fortungi wintersevent</li> </ul>

### Identification Tools and Vocabulary •Flower – color, shape, number of petals

![](_page_36_Picture_1.jpeg)

![](_page_36_Picture_2.jpeg)

![](_page_36_Picture_3.jpeg)

![](_page_36_Picture_4.jpeg)

![](_page_36_Picture_5.jpeg)

panicle

![](_page_36_Picture_6.jpeg)

umbel

![](_page_36_Picture_7.jpeg)

cyme

Cherry drupes, maple samaras, cottonwood capsules...

![](_page_37_Picture_2.jpeg)

![](_page_37_Picture_3.jpeg)

There are a lot of vocabulary words associated with fruit identification.

All three of these images are from the yellow birch.

![](_page_38_Picture_2.jpeg)

![](_page_38_Picture_3.jpeg)

![](_page_38_Picture_4.jpeg)

Bark can change dramatically with age. To see what young bark looks like, look up to branches high in the tree.

Trees have distinctive forms that can be excellent ID clues.

Yellow-poplar has a very straight and clear bole.

![](_page_39_Picture_3.jpeg)

![](_page_39_Picture_4.jpeg)

Sugar maple has a round crown.

![](_page_39_Picture_6.jpeg)

American elm has a broad, umbrella-shaped crown.

### Identification Tools and Vocabulary •Location (locally, topography is biggest influence)

![](_page_40_Picture_1.jpeg)

![](_page_40_Picture_2.jpeg)

Some common trees of local landforms...

•Location •Rivers •<u>sycamore</u> •<u>silver maple</u> •<u>willows</u> •<u>boxelder</u> •<u>hackberry</u> •<u>green ash</u> •<u>red maple</u>

![](_page_41_Picture_2.jpeg)

- Location
  - •Coves
    - dead hemlock
      yellow-poplar
      sugar maple
      white oak
      northern red oak
      basswood
      beech
      white ash
      blackgum
      red maple

![](_page_42_Picture_4.jpeg)

- Location
  - •Hillsides
    - pignut hickory mockernut hickory white oak black oak chestnut oak scarlet oak blackgum sassafras sourwood •white pine Virginia pine •red maple

(aspect dependent)

![](_page_43_Picture_5.jpeg)

- •Location
  - •Dry Ridges
    - Virginia pine
    - pitch pine
    - •table mtn pine
    - •scarlet oak
    - blackgum
    - •<u>sourwood</u>
    - •red maple

![](_page_44_Picture_10.jpeg)

### Species composition is a function of: •Soils •History •burning •wildlife •seed source •former agriculture

![](_page_45_Picture_1.jpeg)

![](_page_45_Picture_2.jpeg)

![](_page_45_Picture_3.jpeg)

Species Composition is a function of: •Forest management... steering composition, competition and growth to meet objectives

![](_page_46_Picture_1.jpeg)

## **Doctor Dendro**

![](_page_47_Picture_1.jpeg)

Dr. Dendro will entertain any of your tree-related questions.

Dr. Dendro checking for flowers in a subalpine larch in northern Idaho

![](_page_47_Picture_4.jpeg)

Dr. Dendro (on right) with former graduate students John Butnor (left, now with USDA Forest Service) and Dr. Chris Gough (center, now a Professor at Virginia Commonwealth University).

#### Ask Dr. Dendro a question.

For tree identification questions please feel free to attach digital photos. Be sure and indicate what region of the country the plant is from, whether it is wild or in a yard, and any other information you noticed about the plant.

Last Updated: April 2011

Contact Us

Photo Use

You may need to ask for help.

### http://dendro.cnre.vt.edu/dendro logy/doctor/doctor.cfm