PLANT IDENTIFICATION FOR NON-BOTANISTS

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WHO AM I?

My name is Rebecca Lexa. I grew up in Rolla, MO on the northern end of the Ozarks. After I got my Bachelor's degree from UMR (now MST) I moved away, and ended up settling in the Pacific Northwest.

I now teach community education classes on a variety of natural history topics, from foraging to birdwatching to geology. While a lot of my classes are taught in the PNW, the Ozarks are still dear to me, and I try to get back to visit as often as possible!

This class is applicable to a wide range of ecosystems and regions.

OUR AGENDA

- Casual identification vs. scientific identification
- Observing a new-to-you plant
- Identification tools (books, apps, and more!)
- Q&A and wrap-up

CASUAL IDENTIFICATION VS. SCIENTIFIC IDENTIFICATION

- Casual identification is done for one's own personal curiosity and exploration of nature. Anyone can engage in casual identification regardless of experience and background.
- Scientific identification is much more rigorous, often done for research purposes, and is generally rooted in botany or other natural sciences.
- These two types of identification are NOT mutually exclusive, and often rely on each other for improvement of our understanding of the natural world.

CASUAL IDENTIFICATION VS. SCIENTIFIC IDENTIFICATION

For example, many of the resources that are available for casual identification, like books and apps, are based in years of botany and other scientific research and observation. However, many important species discoveries and other scientific breakthroughs were aided greatly by casual observers and everyday naturalists. One recent example is the small whorled pogonia (*Isotria medioloides*); once believed extinct, a small population was found by an iNaturalist user in 2022.

WHAT DO I NEED FOR CASUAL PLANT IDENTIFICATION?

- Field guides (take the best ones with you out in the field, use the rest at home)
- Smart phone (can access websites if there's signal, or carry ebooks, or ID apps)
- Hand lens/magnifying glass
- Camera (if desired)
- Gloves
- Weather and terrain-appropriate clothing and footwear
- Something to take notes in
- Something to carry specimens home in—more info on the next slide!

WHEN AND HOW TO COLLECT SPECIMENS FOR CASUAL IDENTIFICATION

As a general rule I am a "take only pictures, leave only footprints" kind of person. Any plants or other natural materials that I remove from an ecosystem are resources that ecosystem no longer has access to, so I am very mindful of my impact, no matter how small. I use iNaturalist (more on that later) as my personal herbarium/record of observations rather than taking physical specimens.

When possible, take ample photos as references, and make notes in your notebook and/or upload your find to an app to record the location, date/time, and other pertinent information.

If you positively identify a plant as being a common native species and wish to take a sample for a personal herbarium, art reference, etc., make sure you do so from a location where collection is legal, and where the population is abundant. Be aware some species that may seem to grow in large patches may have sparsely scattered populations (for example, ghost pipe/*Monotropa uniflora*.) Only take what you need for your records.

On the other hand, if you've identified it as a non-native/invasive species, take as much as you want, please and thank you!

OBSERVING A NEW-TO-YOU PLANT

The next several slides will be exploring some things to look out for when you are trying to identify an unknown plant. I am basically breaking down my process into bite-sized chunks, teasing out the features and traits I look for when identifying a new-to-me plant.

This class is meant for citizen-level naturalists rather than professionals, so terms and concepts will be kept simple, and my methods may differ from how a trained botanist may approach the same unknown plant. However, our basic goal is the same: try to get a positive identification down to species level (or at least genus or family!)

COLORS

Color will likely be one of the most obvious features of a plant to many people. At a distance most plants are going to be simply "green", but upon closer inspection you may notice not only multiple shades of green, but a host of other colors as well. It's very important to notice even the tiniest details when it comes to color. Here's a good example…

POISON HEMLOCK VS. QUEEN ANNE'S LACE

TEXTURES

There are two types of texture to notice when you are trying to identify a plant:

Visual texture: This plant *looks* velvety; that one *looks* leathery

Tactile texture: This plant *feels* fuzzy; that one *feels* prickly

Visual and tactile textures don't always match; some cacti, for example, look very fuzzy but will give you a nasty sting if you touch them. This is why gloves are important! Always be cautious when handling an unknown plant, even with gloves, long sleeves, and other protective layers. **When in doubt, look but don't touch!** You can generally identify plants without the tactile texture, but it's good information to have if you can safely get it.

A FEW EXAMPLES OF VISUAL TEXTURES

SIZE

When considering a plant's size, you want to look at a few things:

- The overall size of the individual plant
- The size (length, width, diameter, etc.) of various components (leaves, flowers, stems, etc.)
- Compare the size of your chosen specimen to other plants of the same species if possible
- When you are looking up potential species that this plant may be, pay attention to the size range offered by field guides and other resources—is your unknown plant in that range?

BRAZILIAN VS. CANADIAN ELODEA

SHAPES

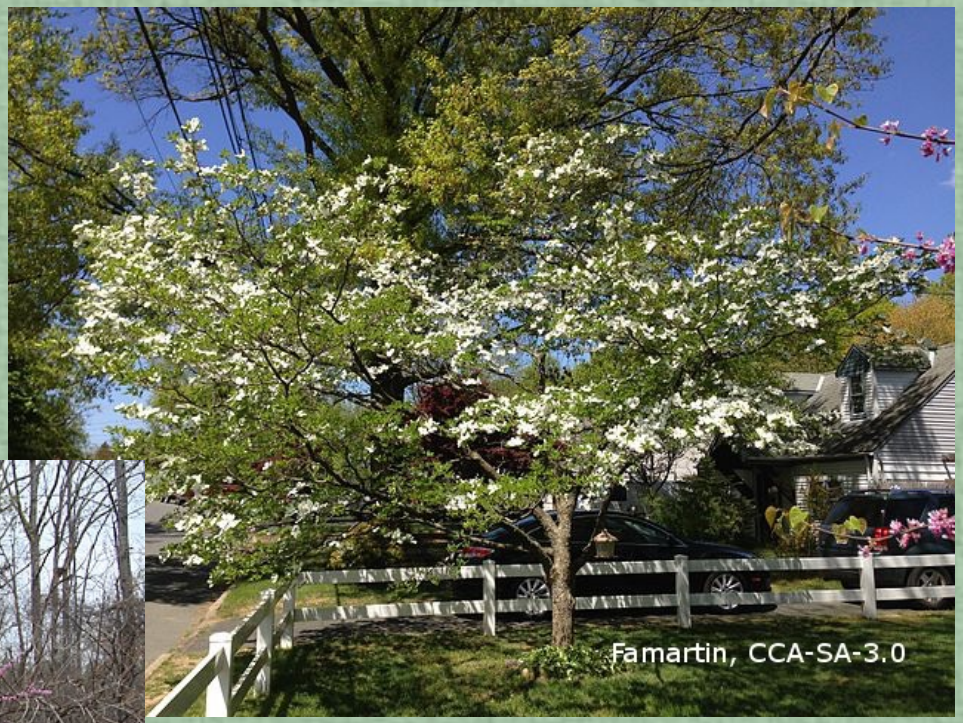
When observing a plant's shape, you want to look on multiple levels:

- The overall shape of the plant (what's your impression when you take a few (or many) steps back to look at it)
- The shapes of individual pieces and parts

Both can be important diagnostic criteria when trying to figure out what species you're looking at.

OVERALL SHAPE

Compare and contrast the overall shape of the eastern redbud tree on the left, and the flowering dogwood on the right.



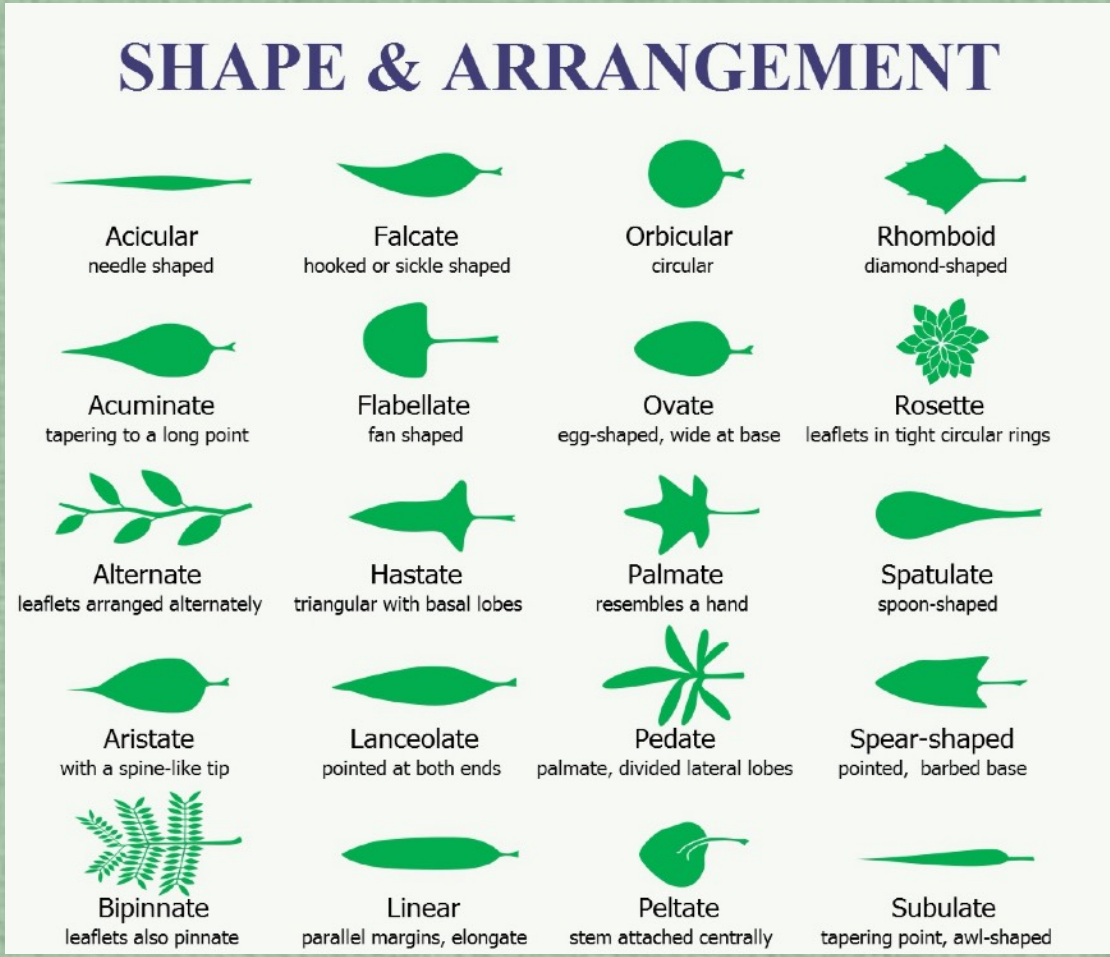
For details, compare the shape of the trunk and branches of the two trees. How are they similar, and how are they different? Individual variation within species is common, but there are general patterns.

DETAIL SHAPES

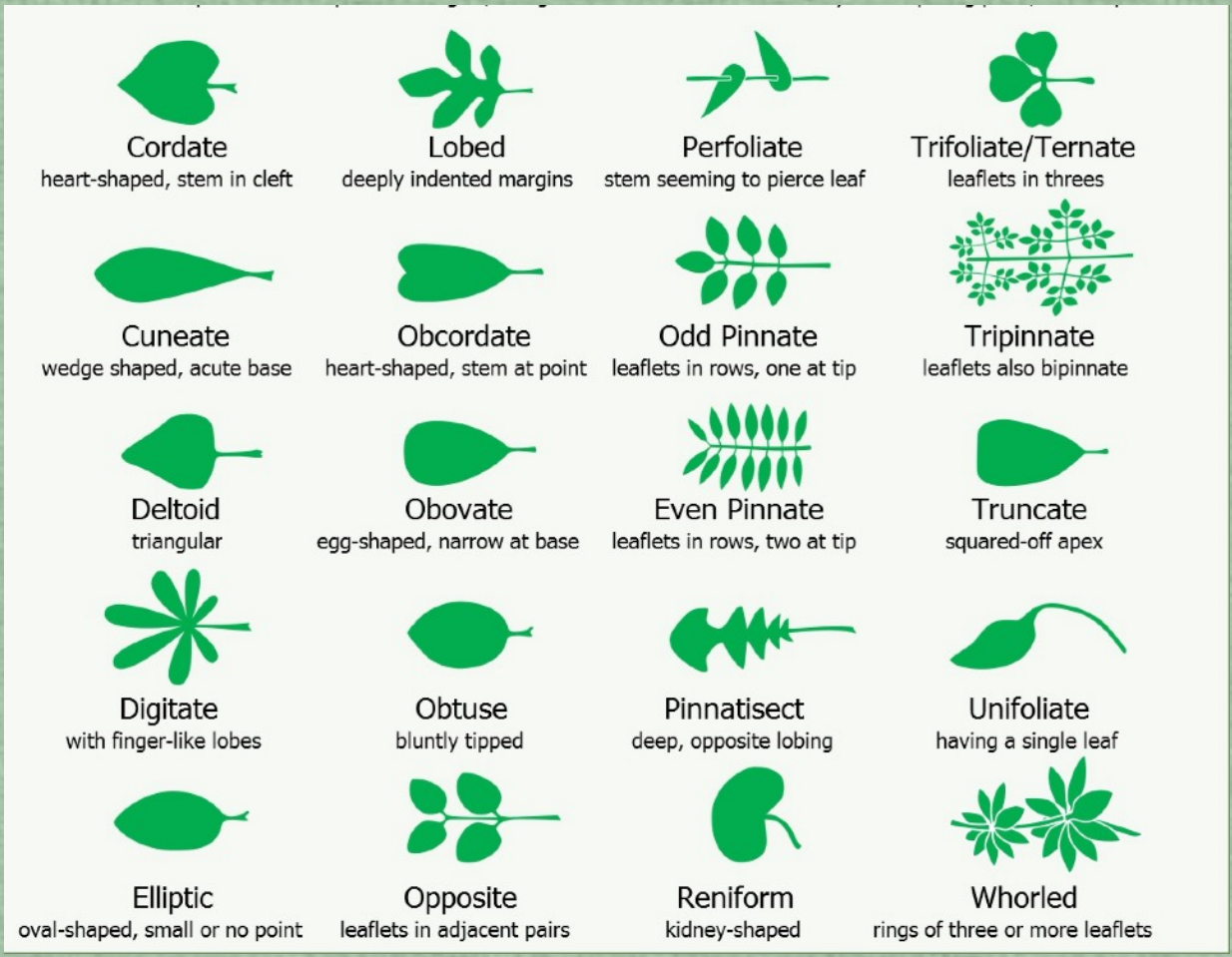
In the previous slide we got to look at some of the details of trunk and branch shapes. Now, let's get a little closer. We're going to look not just at the shape of some of the individual bits and parts of a plant, but also arrangement in relation to each other.

BRANCHES/TRUNKS/STEMS (AND IN THIS CASE, THORNS!)

LEAVES! AND MORE LEAVES!



LEAVES! AND MORE LEAVES!



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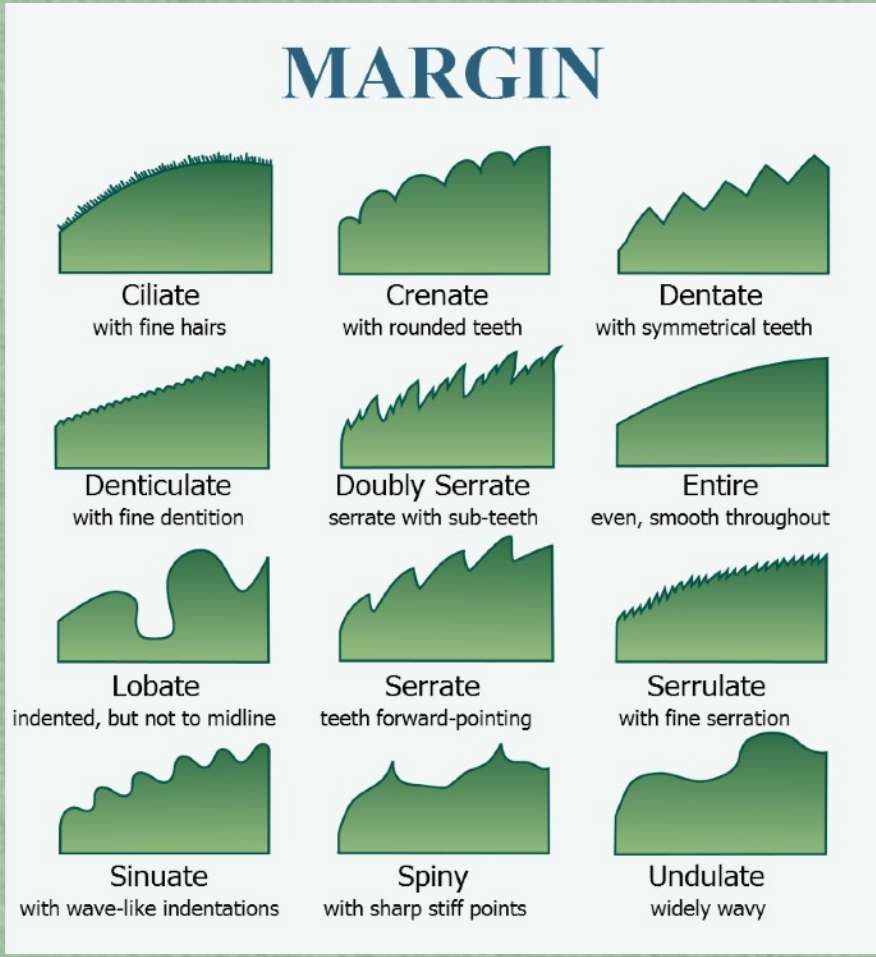

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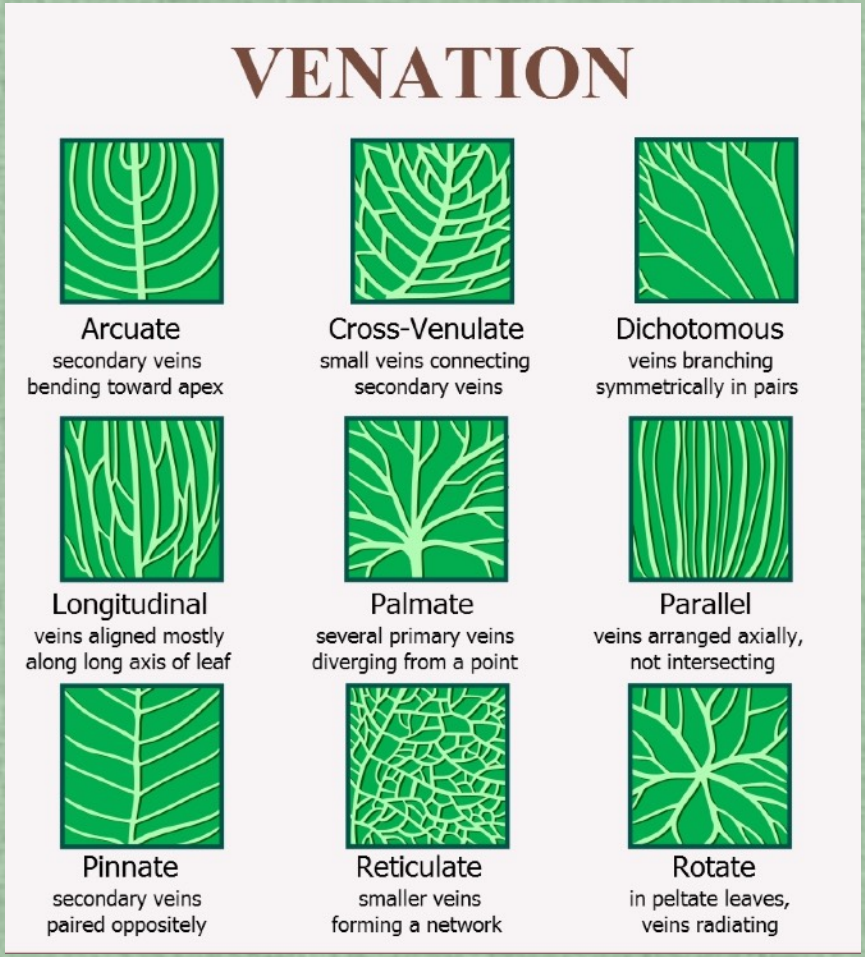

CONIFER NEEDLES

Needles are a unique sort of leaf found on conifers (pines, firs, etc.) Here are a few things to keep in mind when examining them:

- Needle length and diameter
- Overall needle shape
- How many needles grow out of one node on the branch

CONIFER NEEDLES

SHAPES/ARRANGEMENTS - FLOWERS, FRUIT, CONES, ETC.

AROMA

Use your sense of smell! Some plants have very notable scents. Various sage species (*Artemisia* spp.) have a pungent odor in the oils in their foliage, for example; the flowers of both eastern skunk cabbage (*Symplocarpus foetidus*) and western skunk cabbage (*Lysichiton americanum*) have pungent odors produced by their flowers. If you note a particular aroma with a particular plant, make note of it—your field guides and other sources might mention it!

LOCATION

Consider where you are finding this plant. What sort of habitat is it in? Is it close to water? Does it seem to prefer sun or shade or both? What sort of soil is it growing on—dry or wet, thin or deep, etc.? Does it seem to consistently grow in the vicinity of another species? Do you find this plant alone, or in groups?

LOCATION

When you are researching potential identifications for your unknown plant, pay attention to the range maps and other location information offered by your sources. If you are trying to decide between two candidate species for your ID, and Species A commonly grows in the area where you found the plant but Species B isn't found there, it's likely to be Species A. (With the caveat that if the plant you are trying to identify is obviously cultivated, range maps may not apply!)

SEASON

Similarly to location, pay attention to what time of year you're observing this plant. If it has flowers, fruit, cones, etc., take especial note as these only show up for a short time each year in most species. Deciduous plants will lose their leaves in winter, so if your mystery plant has leaves in January, that narrows your options a lot!

If you are deciding between two species when trying to identify a plant that is flowering in mid-May, for example, and Species A flowers April to June while Species B flowers July to September, it's probably not Species B. (However, climate change has been affecting plant phenomenology—when plants grow, flower, go dormant, etc.—in recent decades!)

SO WHAT DO WE DO WITH ALL THIS INFORMATION?

Again, I've just spent the past twenty-ish slides breaking down the things I look for when identifying a plant I've not met before. It seems like a lot of information—and it is!—but I process most of this in a matter of a few seconds. With practice, noticing these details will become second nature to you as well.

And all of it becomes really important when you're using the following resources to try to figure out what you've got.

FIELD GUIDES

These are always the books I reach for first. Field guides are basically collections of species profiles, including both common and scientific names, pictures, range maps, and other identifying information. Some are general (like plants of North America); others get more specific (conifers of the midwest, North American orchids, etc.) Most book stores have a few of these, and often the gift shops at parks and other public lands have them as well.

HOW TO USE FIELD GUIDES

If I suspect what plant I've found, I'll look it up in my field guides. If I'm not sure, I may check the table of contents or index to see if I can at least narrow down where in the book I want to look. Very often I find myself just paging through the books until I see pictures that look like my mystery plant and then start comparing from there.

I collect field guides so I usually have several to compare; not all authors may agree on everything, so it's good to have a basis of comparison.

A FEW FIELD GUIDES TO START WITH

- *Trees of Missouri* by Stan Tekiela
- *Shrubs and Woody Vines of Missouri* by Don Kurz
- *Wild Berries & Fruits Field Guide of Illinois, Iowa and Missouri* by Teresa Marrone
- *Missouri Wildflowers: A Field Guide to Wildflowers of Missouri* by Edgar Denison
- *Wildflowers of the Midwest: A Field Guide to Over 600 Wildflowers in the Region* by Don Kurz
- *Kaufman Field Guide To Nature Of The Midwest* by Ken and Kimberly Kaufman

OTHER USEFUL BOOKS

These are not field guides, but they're good for adding to your knowledge of how to identify plants.

- *Botany in a Day: The Patterns Method of Plant Identification* by Thomas J. Elpel
- *Plant Identification Terminology: An Illustrated Glossary* by James G. Harris and Melinda Woolf Harris
- *Botany for Gardeners, Fourth Edition: An Introduction to the Science of Plants* by Brian Capon

SMARTPHONE APPS

LeafSnap – free, primarily works on plants, also offers care information for them, uses algorithms for identification

PictureThis – free, primarily works on plants, includes care info and disease diagnosis, uses algorithms for identification

iNaturalist – free, can identify any living thing you can take a picture of, uses algorithms for initial identification and other iNaturalist users can also help with identifications/corrections

HOW TO USE IDENTIFICATION APPS

It really is as simple as taking a picture of the plant! A few things to keep in mind:

- Sometimes one leaf isn't enough; the leaves of very different plants may look quite similar. If you have the option to upload more than one photo (as with iNaturalist) get a few pictures, including at least one of the whole plant.
- Not all apps save your observations. For those that do, make sure you hit the save button after you enter in the photo and any other relevant information or you'll lose your observation!
- Never use an ID app as your ONLY tool for identifying plants! They are not 100% accurate, and you always want to verify with other sources like field guides, websites, other naturalists, etc.

WEBSITES

- If you think you might know what species you've found, do an online search and see what websites and images pop up. Compare them to the plant you're trying to identify and see if they match.
- State and Federal natural resources departments (such as MO Dept. of Conservation) often have good information on native species on their websites
- You can access your account at iNaturalist.org or on the app and search for the species you think you've found and see if anyone else has observed it in your area.
- MissouriPlants.com is a fabulous, user-friendly resource for identifying vascular plants throughout the state.

OTHER NATURE NERDS

- Your fellow MO Native Plant Society, MO Master Naturalists, and Ozark Audubon members are a wealth of accumulated knowledge and experience!
- University natural history departments (biology, ecology, etc.) may have staff or students able to help with identification
- State and Federal parks, refuges, etc. often have staff biologists who know a lot about native species

OTHER NATURE NERDS—ONLINE!

- Missouri Native Plant Society FB group - https://www.facebook.com/groups/251725834062
- Missouri Wild Food Foraging FB group - https://www.facebook.com/groups/missouriwildfoodforaging
- Missouri Native Plant Exchange - https://www.facebook.com/groups/217106639025700

TROUBLESHOOTING

- There are multiple species that look very similar to my mystery plant!
  - Sometimes it comes down to VERY tiny details, so go through your list of traits (color, size, etc.) and compare very carefully.
  - Research the candidate species and see if anyone mentions how to discern them from similar species or mentions special details about the species that you hadn't noticed or heard of before
  - Sometimes it's okay to just say "Well, I'm not sure what this is!" You might find out more information later that helps you get a solid ID.

TROUBLESHOOTING

- I can't find the plant in my field guides!
  - There are a LOT of non-native plants in North America, and most field guides focus only on native species.
  - You may need to rely on other tools like identification apps that have a broader focus than just native species
  - Is it an obviously cultivated plant? Good chance it's not native. Same goes for frequently disturbed land like parks, roadsides, etc.

GET IN TOUCH!

- You are welcome to keep in touch with me at rebeccathenaturalist@gmail.com – I'm happy to help with figuring out what plant you've found to the best of my ability
- Check out my website, **http://www.rebeccalexa.com**, for information on my classes, nature articles, and more!

Any final questions?