Intro (00:01):

Welcome to Earthly, a Clemson University podcast discussing issues of agriculture, horticulture, nature, and design, impacting the world nation, state of South Carolina and even your home. Here's your host, Jonathan Veit.

Jonathan Veit (00:17):

South Carolina conservationist and lawmakers are pushing to have the Venus Fly Trap named the state's official carnivorous plant. The law would place the plant in a category that includes the state bird at the Carolina Wren, the state flower, the yellow jasmine, the state fruit, the peach, the state tree, the palmetto, and even the state snack, the boiled peanut. Today on Earthly, I'm joined by Trent Miller. Miller is plant collection manager at the South Carolina Botanical Garden. He's going to talk about the fly trap and why it grows natively in only one small sliver of the Carolinas. He's also gonna talk about other plants that are unique to the Pudo state. Trent, thanks for joining me on Earthly.

Trent Miller (00:54):

Thanks for having me.

Jonathan Veit (00:55):

There's a movement afoot to name the Venus Fly Trap, the South Carolina official State carnivorous plant. Not so much because the state needs such a thing, but to bring attention to the fact that it grows natively in a small area of the Carolinas. Tell us about the plant, why it's special and why it grows. Where it does,

Trent Miller (01:13):

It is a member of the Sundew family. So both of those types of plants have moving parts on their, their leaves. And for Venus fly traps, they actually have evolved pads instead of sticky substances on their leaves. So they use those little hairs that would've hold, would've held Sundew goo on them, uh, to actually act as triggers that detect movement of prey items on the little trap, which is the leaf, they have to be triggered like once or twice to be able to, um, actually close.

Jonathan Veit (01:44):

Is there something about that area of the, of the state that makes it want to grow there?

Trent Miller (01:50):

Yeah, so it grows in really nutrient poor moist sites in Carolina bays mostly. And those are on the coastal plain pretty much throughout the eastern seaboard of the US. Um, I think up to New Jersey, they're very acidic peat. Um, they are not connected to actual the water system, so they, they fill in with, with rainwater. So they're very isolated and so there's not a whole lot of competition because there's not very many nutrients in that soil. They've evolved to be able to, they're, they're small at ground level. They catch crawling insects, not flies actually that just happen to crawl across their pads. And they use that as fertilizer to supplement the nitrogen that they can't get from the soil.

Jonathan Veit (02:40):

Do you have any idea? How does it digest its prey?

Trent Miller (02:43):

So those, um, trigger hairs that I talked about, they, they kind of start this thing called Figma nasty, which is when a plant reacts to touch, um, you, you see it in mimosas, the sensitive plant that folds its leave up. It's the same kind of mechanism and basically that changes like the water pressure in certain cells on the, the trap. And so it's snap shuit that's where that fast movement is, and over time it'll continue to push closed and secrete this, these enzymes that digest it and it turns the insect into like to a goo and it just absorbs that through that leaf.

Jonathan Veit (03:19):

How big are the insects? I wondered that it could eat.

Trent Miller (03:22):

Generally they are pretty small like spiders, smaller spiders. Uh, some beetles, they're not, not very large.

Jonathan Veit (03:29):

So I read a report in the Charleston Post & Courier that the U.S. Wildlife Service was reviewing a petition to put the Venus flytrap on the endangered species list. To my knowledge, there hasn't been any decision on that. Is it endangered?

Trent Miller (03:42):

I don't believe it's listed as endangered currently. But it is, it's threatened by a lot of things. So it, it definitely fits the criteria for being considered protected in some way.

Jonathan Veit (03:52):

Are there native prey that can eat it?

Trent Miller (03:55):

If there was major disturbance in this side that would cause you know, a lot of destruction to the population, but I don't think that there's any herbivory that happens that actually impacts the population numbers,

Jonathan Veit (04:06):

The fly trap, can it be bred and captivity?

Trent Miller (04:09):

Yes,

Jonathan Veit (04:09):

And if it's bred and captivity, is it bred from plants that are poached? Like how, how does that work? Because I understand you can buy them, but I also understand that they're endangered or they're not on the endangered list, but they're sort of threatened. So do you have any idea how that system works of being able to breed and buy fly traps and is it illegal?

Trent Miller (04:32):

So ideally the plants, they all have to come from the wild at some point. So ideally the plants that we would use for propagation would be collected with a permit from, uh, whatever authority is managing the habitat where they are US Fish and Wildlife Service or some, some other, um, agency. And from those plants, we would use them to propagate either by seed tissue culture division. Um, there's many different ways to do that and there's a lot of breeding programs that actually, uh, make them more appealing to consumers because they are very small in the wild. They're breeding them for larger traps and more colorful leaves and stuff like that. So you can get those and know that they are for, for real propagated and not poached.

Jonathan Veit (05:19):

And so one of the things we're doing in today's podcast is we're not saying the exact location of where these things are located cuz we don't want people to go there and disturb them. So does the flytrap actually snaps, its, for lack of a better term, jaws closed? Or does it happen slowly?

Trent Miller (05:35):

So the first part is pretty fast. That's that Figma nasty that I had talked about. Um, but over time it will close very tightly and that happens over hours. And the teeth actually are there to be able to hold the prey in after that fast closure happens so that it has the time to, to squeeze, shut and become kind of waterproof so it can exude those enzymes and stuff.

Jonathan Veit (06:02):

How do you feed

Trent Miller (06:03):

They don't eat that much. You could probably put it outside and it would feed itself. Um, if, if you have insects around, I wouldn't take the risk of putting like something that's too big in there, a, a prey item that's way too big for the trap will likely cause it to rot. And so that's not advised. And some people put hamburger in there that will definitely kill your plant. So don't put ground beef in your Venus fly trap. And some people have, I've also heard have put uh, fish food in there and I haven't tried it. I wouldn't recommend it, but who knows. Moving

Jonathan Veit (06:40):

On from the Venus flytrap, it's my understanding that there are some other plants that grow exclusively in South Carolina.

Trent Miller (06:46):

Yeah, so there are a lot of plants that are very unique to the southeast. Uh, the southeast has a whole lot of crazy plant diversity and as you mentioned, they don't really follow political boundaries as well as, you know, we might like them to. So a lot of our rare plants are on our borders, like specifically in the mountains or maybe along the Savannah River. So we share them with bordering states. One example would be the Oconee Bell that's in North Carolina and Georgia and South Carolina. I believe that is it. It's been introduced elsewhere though, and that's just restricted to the Blue Ridge escarpment where the mountains go from the Piedmont straight up. They live in deep gorges on that area. So it's, it's a very narrow band of habitat that just happens to be where three states come together.

Jonathan Veit (07:38):

And I will have a picture of an Oconee bell on the website for the podcast, but could you tell us a little bit about what it looks like?

Trent Miller (07:45):

They're evergreen. They have small round leaves that are really glossy, really beautiful. If anyone is familiar with Galax, it's a common plant in the mountains around here. It's called Shortia Galacifolia because it looks like Galax and it's actually related to it, but it's much rarer. And so it's, it forms these tiny little rots, these little, uh, flat plantlets that don't really get much of a stem. And in early spring, maybe late winter, they'll have single white flowers that are kind of shaped like a, a lampshade that kind of nod down. Sometimes they can be blushed pink and they're really pretty. Um, but you have to be looking to see them.

Jonathan Veit (08:30):

Are they also rare and maybe endangered?

Trent Miller (08:33):

Yes, I believe that they are, they are endangered. That's mostly just because of the fact that we've developed a lot of land around the Blue Ridge escarpment and they are very selective in their habitat. They, they won't grow just anywhere. They need to be in a pretty moist environment that doesn't collect too much leaf litter and they like acidic soil that's on a slope. It's, it's, it's pretty niche.

Jonathan Veit (08:59):

Um, tell us about some other plants that we may not know about that are, uh, exclusive to our area or to the southeast.

Trent Miller (09:05):

So one that is endemic to South Carolina is a type of blueberry called Rainers blueberry. It only grows in one county in the Midlands. It's not much to look at, but it's, it's very cool. It, it's an evergreen crawling vine type of blueberry that, um, well likes to grow in, in moist picosins. It's where water kind of seeps out the side of a really sandy hill in the, the Sandhills area. And then we also have a pretty common plant in this area, but it's very restricted to the southern Appalachians, which is hydrangia radiata. It is similar to the more well-known hydrangea, essin. You can get that in a lot of different cultivars at garden centers. But this one is, it's got a lace cap flower and in the bottom of the leaf is a stark white because of all the hair on the bottom. It's really beautiful.

Jonathan Veit (09:54):

So that blueberry grows in one county in South Carolina. Mm-hmm.

Trent Miller (09:58):

<affirmative>, there's Carolina Hemlock, which is currently threatened and it's under review to be endangered. Mm-hmm. <affirmative> hemlock wooly adelgid a problem for that plant. It's a, an introduced invasive aphid like thing that is killing a lot of our Eastern hemlocks. And our Caroline Hemlocks Eastern Hemlock grows from, I believe Alabama all the way up to Canada. And then Carolina

Hemlock only grows in Georgia, South Carolina, Virginia, and Tennessee on rocky ridges or cliffs in the mountains. So it's, it's very restricted to certain habitats and it's got pressure from, um, an invasive pest.

Jonathan Veit (10:37):

Do we know where that pest came from?

Trent Miller (10:39):

Asia. It was an accidental introduction. Okay. Uh, probably on other hemlocks. Okay. That are from Asia. A lot of our rare plants are rare because of development and fire suppression. Fire used to be a very common phenomenon in South Carolina. We used to have tall grass prairie, we used to have a ton of longleaf, pine Savannah and even our mountains used to burn on, you know, a much more infrequent basis than a prairie, which you know, would burn, you know, every year, couple years. And that really has been a big driver behind a lot of the reduction in our native plant populations. That's why a lot of places that are in suburban areas have a lot of invasive plant issues because we're not supposed to have oak hickory forests everywhere. It should be grassland a lot of the places. But since we've stopped burning, we've opened up space for these aggressive non-native plants to come in and reduced our native plants that are really good for our local wildlife. So I would say that's one of the most important things to think about when we look at our rare native plants, how we have caused part of that. But some of it, some of them always were rare. Some of them are just restricted to very specific sites and never, never were that common. Um, but we've, we've got a role to play with all of them.

Jonathan Veit (12:05):

How long ago was South Carolina prairie?

Trent Miller (12:08):

That would've been in the 18th century. South Carolina was really more of a coastal colony at that time. So European settlers had not suppressed fire. So the natural systems were a lot more intact at that time. Now we have little pockets where people do still burn in like the Low Country and in, um, even on home sites, like some people will burn their front lawns. That's probably a practice that's just been passed down since, you know, people have been here so long. But a lot of our native plants that are really rare and endangered have been able to survive because we've chosen to keep burning for other purposes such as quail plantations or stuff like that.

Jonathan Veit (12:50):

What can a homeowner do or what can an average person do to encourage the growth of, uh, of native plants?

Trent Miller (13:00):

Well, buy them. Um, try not to buy exotic plants from big box stores if you can. If, if there's a good native alternative, go for that one. Also, it's pretty good to go with local ecotypes. So if you have a native plant society or a local botanical garden or something, then you can usually reach out and see if they have locally collected or grown seeds that they could, they could share with you. Um, I know that personally in, in my yard, I, I try to notice what naturally grows there and collect seeds from plants that are already on my property to use around in the landscape.

Jonathan Veit (13:40):

And what if the plants that are already on your property or the native plants aren't pretty? Cuz people like to look at things that are pretty.

Trent Miller (13:47):

Well, you can, you don't have to have only the plants that are native specifically to that site. You can look and see what's native to this general area and what does and does well in this kind of environment. And there are native cultivars that are not exactly the same as our wild types, but they, they are more attractive, kind of like how the Venus flytraps are bred to be more showy. These plants are bred to be more showy for reliable in home gardens. So that would be a good choice for that.

Jonathan Veit (14:15):

If a, if a person wants to replace a, a non-native plant with a native plant, how do they find out about the native equivalent? Is there a resource for them to do that?

Trent Miller (14:26):

Clemson's, HGIC website is really a great resource for a lot of things like that. There are a lot of native-focused nurseries and, um, seed sources that you can just look, look for online.

Jonathan Veit (14:40):

You are the plant collection manager at the South Carolina Botanical Garden. Tell us a little bit about your job and tell us about the South Carolina Botanical Garden and, uh, what, what it has to offer people.

Trent Miller (14:53):

So I basically try to keep up with all of our plants on our almost 300 acres of, uh, garden. So I make sure things are identified. Um, try to keep the signage up and keep track of the things that we're getting in and the things that, you know, we are deaccessioning because of old age or, you know, disease or we just need to remove. And so, like I mentioned, the garden is almost 300 acres. We've got an arboretum, we've got restored prairie, we've got all sorts of other constructed habitats on the natural heritage trail where you can see a lot of these rarer, endangered plants in the garden, such as the Oconee Bells. And then we have more typical garden space, like, uh, the visitor center grounds is that the visitor center is an old southern living model home and the grounds around that are more, more formally kept. And then we have, uh, you know, woodland trails and all sorts of stuff.

Jonathan Veit (15:51):

Are there any specific displays that people should know about? Any specific exhibits?

Trent Miller (15:54):

A lot of people really like our hosta garden that's kind of in the middle of the garden. It's, it's a pretty nice cool place with a artificial waterfall in a pond. And we've got the Desert Garden, which is right near the Geology Museum near the Visitor center. And that's kind of a, just a collection of desert southwest plants, mostly from Texas but also from other places. We've got a lot of California poppies blooming right now, which is beautiful.

Jonathan Veit (16:22):

Do they have events at the garden?

Trent Miller (16:24):

Yes, we have rentals for, um, weddings and stuff, but we also have public events, concerts, I believe in the spring and the fall. We have plant sales in the spring and the fall. We just finished up our, our spring plant sale. And, um, I believe that we have a lot of programming for adults and children for, you know, just educational purposes.

Jonathan Veit (16:45):

You like Master Gardener or something?

Trent Miller (16:46):

Like that? Master Gardener, master Nationalist or, uh, Native Plant Certificate and summer camps for kids. Okay,

Jonathan Veit (16:53):

Great. Trent, thanks for joining us on Earthly Today. We will have links to your bio and a few other resources on the Earthly website.

Trent Miller (17:02):

Thanks for having me. This has been a fun opportunity.

Outro (17:13):

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