Tracey Peake: Hello, and welcome to NC State's Audio Abstract. I'm your host, Tracey Peake. Spiders have a special place in Halloween lore, but they're more than just scary, hairy, creepy crawlers. We're speaking today with Matt Bertone, an entomologist here at NC State, about what is and isn't true about our eight-legged friends and why you may not want to grab a broom when you see them in your house. Welcome, Matt.

Matt Bertone: Thank you for having me.

Tracey Peake: Let's get started. In the fall, I tend to notice a lot more spiders around my house. Is there a reason why we seem to see so many, and particularly those big orb weavers? You know, the ones that build those really amazing webs that you're afraid to walk face-first into in the morning when you come out of your house, like on the porch and stuff?

Matt Bertone: Yeah, yeah.

Tracey Peake: Is there a reason for that?

Matt Bertone: For them in particular, there is a reason. That's because most of the year, they're growing up. Most of those spiders only live one generation per year. They overwinter as eggs, and they'll hatch and they'll be very small, and people don't notice them. By the end of the year, they're big, they're mating, they're living at the end of their lives, and so they're the biggest they're going to be.

Tracey Peake: Okay, so this is like the time of year where orb weavers are living their best lives, which-

Matt Bertone: Exactly. The golden years on this November.

Tracey Peake: Okay. The golden years for the orb weavers. Excellent. So that brings me sort of to our next question, which is, what is the general life cycle of the spider? Do spiders hibernate? Do they all die when it gets cold and have just egg sacs out in the world? How does this work?

Matt Bertone: Yeah, so it all depends on the species or family type of spider. Some spiders only live one generation per year, like I said, and they'll die off every year and then new ones will come out the next year. Other spiders may live years to even decades, so it all depends on what type of spider.

Tracey Peake: Is there a particular species that we could think of, one that hibernates and one that just dies that's pretty common, that we might be familiar with here in North Carolina?

Matt Bertone: Well, one of the major ones that people ask about is the black and yellow garden spider. That's a really big ... They sometimes call them writing spiders or whatnot. They write those zigzags in their big webs. Those are one generation a year. Other spiders, like Wolf spiders and some of the ground spiders, may live longer than that. Some of the household spiders can live multiple years, and so some of the ones that you're seeing around your home could have been there a year or two ago still.

Tracey Peake: Do all spiders, would they prefer to live in my nice, warm home over the winter, or are there just particular species that are house spiders? What do we mean when we say house spider?

Matt Bertone: So some spiders have common names with house in their common name, and so those are typically ones we most often see around our homes. Other spiders are accidental. They come running in from outside, they get stuck in the home, but they'd really prefer to be outside. And other spiders are very rarely going to be found on or in the home.

Tracey Peake: How many species of spiders are sort of house-adapted or little spiders that like to hang out in your house?

Matt Bertone: Basically a handful of species, and actually a few different groups. We have things like cobweb spiders. A few of those are common in homes, especially the common house spider, Parasteatoda tepidariorum, which is mottled, little kind of fat-bodied, mottled spider, lives in these irregular cobwebs. Especially they'll be on the house, at a part of the house, or in corners, crevices around the house. That's one of the most common ones, but you will also have cellar spiders, which are these very long, thin-legged ones, often in attics or in basements, garages, but also in the rest of the house. Those are a completely different family of spiders. They have many millions of years' separation from those other spiders.

Tracey Peake: So for house spiders that live in your house year-round, what do they find to eat? I get it in the summer and the spring. We're opening doors and bugs and things are coming in. In the winter time, is it harder for them to find food in your house?

Matt Bertone: Probably a little bit more. In fact, some spiders feed on other spiders, so there's that thing. Actually, the cellar spiders will feed on other spiders. There's some ... all different groups of spiders that are cannibals, although if you're one family of spiders versus another, it's not really cannibalism. You're just eating a similar type of organism. They will find small bits of prey. Some household arthropods and other and insects that live in the home also, along with spiders year-round, they may be caught in webs or captured by spiders as well. And lastly, many spiders can go months to years without food, and so they don't actually necessarily need to feed every day. In fact, most spiders only feed every week or a couple of weeks, and they can live happily with not feeding for a year, some of them.

Tracey Peake: Oh, do spiders need water the same way that we do too, because I'm thinking back to the whole cellar spiders really seem to like the shower area, and I don't know why.

Matt Bertone: Yeah, they may like more humidity, but they don't really drink water like we do. They get most of their liquids from their prey, and they can actually fairly well keep from dehydrating. They can close off their breathing organs so that they don't lose air, lose water, from there. Like I said, very low metabolism, so they're not really wasting a lot of water or anything like that. But different spiders are adapted to different situations. Some will dry out in homes because it's not humid enough, say, and those are more of the outdoor spiders, say.

Tracey Peake: Okay. So outdoor spiders would prefer to stay out there.

Matt Bertone: Yes.

Tracey Peake: And we're all very happy about that, because there are a lot of them in the world. There's an entire mythology or urban legends around spiders, and so I thought maybe we could address three of the most popular ones that I've heard in my life and see what the truth of the matter may be. So, number one. When we are sleeping, are we swallowing spiders?

Matt Bertone: No.

Tracey Peake: Good. Good.

Matt Bertone: Yeah. I don't know where that came from. I mean, I guess you could think that. Spiders are very common in homes and around homes, so it's not unusual to think that you have spiders basically all around, but spiders are not interested in crawling in your mouth.

Tracey Peake: Well, that is so refreshing and good to know. I'm pleased.

Matt Bertone: Yes. You know, most of the web spiders remain in their webs. They don't move a lot, so they wouldn't need to be crawling around anyway. The more mobile spiders, they're very good at sensing other organisms around them and they're very observant of their environment, so they would know that there's a large organism sleeping there, and they're not really going to try to go after something that's going to roll over and crush them or eat them or anything like that.

Tracey Peake: Even inadvertently, because that would be terrible. Okay. Another one of the myths that I've heard is that the granddaddy long-legs, the sad little granddaddy long-legs, is actually the most venomous thing in the entire world, and we're only safe because their little fangs can't penetrate our skin.

Matt Bertone: I've heard that, and first, you got to clarify what a daddy long-legs is. It's funny because it actually refers to commonly three different types of organisms across the English-speaking world. In England, if you said daddy long-legs, you'd be talking about a crane fly, which is the big mosquito hawks, the big crane fly things, which-

Tracey Peake: Right, that everyone thinks is a giant mosquito, but it is not.

Matt Bertone: Exactly, which is another myth. They're not mosquitoes, they don't eat mosquitoes, but they're an insect. They're a fly. They're not a spider. The other one, our daddy long-legs, are the long-legged, little ball-like things that live out in the environment. Those are harvestmen. They're a type of relative of spiders. They're not an actual spider.

Tracey Peake: Okay, so it's not really a spider.

Matt Bertone: Not true spider. They are not venomous at all. They don't even have fangs. They actually use little pincher-like mouth parts that rip apart prey, and mostly they scavenge or feed on slow-moving animals, things like that. They're not really aggressive hunters or very good hunters, as true spiders are. And then the cellar spiders that I described before, those are what are also sometimes called daddy long-legs because again, they have very long, thin legs. They did a MythBusters on that because they wanted to prove this, see or disprove it, and they did find that their fangs are very small, too small to pierce the skin and even then their venom is not dangerous, so they're functionally harmless.

Tracey Peake: Well, good. That's also good to know. The granddaddy long-legs that I'm familiar with is the little huntsman creature that's not actually a true spider. That's what people used to call them where I was.

Matt Bertone: And they're completely harmless. That's what I typically know of because a cellar spider is a cellar spiders to me, and I'm not British, so the flies, I call them crane flies.

Tracey Peake: Okay. Well, good. See, I feel so much better talking to you. And then the third one is, have spiders ever actually laid eggs in living people or hatched out? You hear that urban legend all the time about the lady who gets the spider bite, and then a few weeks later she gets a bump on her face, and then oh my god, baby spiders come flying out of her head.

Matt Bertone: I've heard that one, too.

Matt Bertone: That does not happen at all. So spiders, there was even a story out of Australia where somebody claimed that there was a spider burrowing through their abdomen and they could see like a red line through their skin. Spiders are very adaptable organisms, but the first thing is, they're very soft-bodied, and they're very delicate in a lot of ways. They are very easily injured. If you puncture a spider, it won't be able to move anymore, so spiders, if they get squished even a little bit, they can be mortally wounded because they need pressure to move their legs out. They don't have muscles to move their legs out. They use hydrostatic pressure, basically.

 They also don't have any egg-laying device, any hard egg-laying device, so they wouldn't be able to inject eggs into anything anyway. Spiders lay their eggs, they're very soft, circular, spherical eggs. They almost always in an egg sac. Either in a round egg sac where they lay it on a surface and then cover it with a thick silk. Some spiders, like wolf spiders, will carry around their eggs with them and then when they hatch, they'll actually carry the babies around on their abdomen. Other spiders leave the eggs to survive on their own, but none, unless they're laying eggs in the crack or crevice in some bark of a tree, something like that, they can't lay eggs in anything else.

Tracey Peake: Again, that is excellent to know. Here's sort of a related question. Are all spiders venomous?

Matt Bertone: That's a good question. Almost all spiders in the world are venomous, have venom. Just because they have venom doesn't mean they're dangerous, so we usually distinguish the medically important spiders from the ones that are non-important, basically about the same as a bee sting, a wasp sting, or even less. There are a few groups of spiders that don't have venom at all. We have some around here, these feather-legged uloborid spiders. They actually don't have venom. They're really interesting in that they basically, when they catch the prey in their web, they compact it really quickly with some really strong silk, and then they poke holes in it with their fangs, which again, don't have venom. Then they vomit all over it to suck out the juices. So they don't need the venom because they've quickly compacted the prey in some web.

Tracey Peake: So they squish it to death and then vomit on it.

Matt Bertone: Basically, yeah. I don't know if that's better or worse.

Tracey Peake: I don't know if that's better or worse, right.

Matt Bertone: Yeah. But they're completely harmless to humans. They're very small. They're actually really kind of nice-looking spiders, and they're fairly common around here, but there are a couple of other groups of spiders around the world that don't have venom, but by and by, basically, almost all spiders have venom.

Tracey Peake: Right. And most of them, if they bite you, you're going to get something that looks like maybe a little mosquito-bite-type thing?

Matt Bertone: Yeah, so spider bites are really rare. A lot of people, anytime they have a red welt or some kind of unknown bump on them, they'll blame a spider. It's very, very rare for spiders to bite. There are basically a few factors. Spiders that have fangs that're too small to break the skin, they're functionally harmless, because even if they tried to bite you, you wouldn't feel it. They wouldn't be able to deliver the venom. Then there are the spiders that're big enough to bite, and they can inject venom at the bite site. Those are only going to bite in defense. There are no spiders that actively attack humans. We're not their food. There's no point for them to do that. These animals use their venom mostly to take down prey and help start to digest their prey there. It's also used for defense, though, especially when they're being crushed under an animal or humans.

Tracey Peake: A giant foot.

Matt Bertone: Exactly. So if you reach in somewhere and you don't notice and you squish the spider against your hand, it's obviously afraid for its life, and it's going to bite to warn you and to make sure that you ...

Tracey Peake: Move your hand. Right.

Matt Bertone: Move your hand and it can get away. So those are really the only times spiders bite is when they come in contact with your skin and they feel threatened enough that they will bite.

Tracey Peake: Well, that's good to know as well. If you're a person who is kind of, I guess a spider agnostic, you know that they're going to be in your house, you're not seeking them out to set them on fire or burning down your entire house because there was a spider in it, as we've seen-

Matt Bertone: A little bit more harmful than the actual spiders.

Tracey Peake: Yeah. Right. Are there good ways to maybe deter them from coming into your house, that aren't harmful to the environment or that won't necessarily kill the spider but might be discouraging?

Matt Bertone: Yeah, it's not always easy. Basically, anything you do to kind of weatherproof your house or keep cracks and crevices, things like that, not leaving doors open, that'll kind of help as a barrier to keep things from coming in. All types of insects and other arthropods, too. But they will usually inevitably get into the home, and if it's in a space or area that you're really not worried about or concerned about, we can always leave them. You won't notice them, and most people don't even notice the spiders that are in their house anyway. If it is in a place that you really don't want it or whatnot, you could always capture it and remove it. Put it outside, put it in your garage or basement, somewhere in a different part of the house. Most spiders are going to be fine if you let them outdoors.

 Now, if it's really cold outside, like below freezing, it may be difficult. You may actually kill the spider by letting it outside and it hasn't acclimated. Other spiders that are outside already have kind of acclimated to the winter, and they'll survive in cold temperatures, but they can't take that quick jolt of it. But in those cases, you can always just keep the spider in the container for a little while until it's a nice day, let it outside, let it acclimate. But really, most spiders are not aggressive. They are harmless, and there are good ways to capture them and remove them without killing them or spraying chemicals, things like that.

Tracey Peake: What would the world be like if there were no spiders?

Matt Bertone: There would be a lot more small organisms around the millions of tons of biomass every year across the world. They collect a lot of organisms and feed on them, and they're basically everywhere. Spiders are up in the high Arctic, they are in deserts. Everywhere, basically. Very well-adapted, very hardy organisms. So they're eating a lot of biomass out there. They're also eating a lot of other spiders, so that's part of it. They're very good pest control in agriculture and even in homes. They are general predators, though. There are some spiders that are more specialists, but all these general predators will feed on anything that they can eat, and so sometimes they're eating beneficials, but also they're eating pests.

Tracey Peake: Right. So the world would be a lot buggier and kind of more annoying.

Matt Bertone: Probably, yeah. There may be some other things that would come and take the spot of the spiders, but spiders are hugely numerous outdoors and everywhere in the world, and so basically, they're a top predator in some of the situations.

Tracey Peake: How many species of spider have we found so far? I won't say are there, because there might be some hiding somewhere.

Matt Bertone: There are definitely a lot being described and a lot more to be discovered, but it's around 40 thousand, 50 thousand species have been described. It's a lot, and there could be a lot more. There aren't a lot of spider taxonomists out there, and there's a lot of little tiny spiders hidden in weird locales that are awaiting discovery. But it's a pretty diverse group of arthropods.

Tracey Peake: So future entomologists out there, you have a whole career ahead of you finding spiders that haven't been discovered yet. What is your favorite spider fact?

Matt Bertone: There's a lot that come to mind. Spiders balloon on silk, so they let out some silk when they're young. Often many spiders outdoors, they'll let a string silk, and that'll catch the wind and they'll fly to, fly in quotes, to different places. They've actually found them up in hot air balloons and up in the atmosphere, so you'll find spiders up thousands of feet up in the atmosphere. There's a type of spider that lives underwater, which is really interesting, and it makes a little silk bell and fills it with air, and just lives underwater. Lots of spiders eat vertebrates, so eat lizards and mice and snakes and things like that. Even these very small spiders have very strong webs and can catch big prey, and then they can slowly take it down with their venom and eat them.

 There's just lots of different things. One of my favorites around is a spitting spider that actually spits silk at their prey to wrap it up from some distance, and then they can go gently bite it and take care of it.

Tracey Peake: Where do the spitting spiders live?

Matt Bertone: We have them here.

Tracey Peake: Oh, wow.

Matt Bertone: We have them in homes. They actually can be common in some homes, and they're very delicate little harmless spiders. They're actually very closely related to brown recluses, but they are harmless because they've got these little tiny fangs that are specially designed to spit that silk out.

Tracey Peake: Spit silk at people. Or prey, not people.

Matt Bertone: Yeah. I've never had one spit silk in me, although you probably wouldn't even feel it, it's so light and delicate, but yeah.

Tracey Peake: Yeah. Do you have a favorite spider species?

Matt Bertone: Not a favorite. There are a lot of spiders I like. One of my favorites is called a purse web spider. They are a type of primitive, it's called a mygalomorph, which are related to tarantulas. They're a type of, technically a type of trapdoor spider, and we have them around here, actually, but they build a little silken tube in the ground that either comes up and goes along the ground, or often goes up the bases of trees, and they lie in wait inside there. They have these giant fangs that are almost half the size of the body, and when an insect walks on that tube, they grab it from the inside and rip it and bring it into the tube, and then they repair the tube and wait for more prey.

 One of my other favorites is a very strange group of spiders called the lampshade weavers, the family Hypochilidae. They're only found in weird locales in the world. We actually have a few species in the Western mountains of North Carolina. They create these big, it looks like somebody stuck a small lampshade onto a rock and it kind of comes out from there. In the center of that is this spider, this big ... They're pretty creepy-looking, but they're harmless, and they're this weird spider that's kind of ... It's distantly related to just about all other spiders. It's kind of in the middle of being a primitive spider and a more advanced spider. It's a very strange group, and we're fortunate enough to have it, actually, in North Carolina.

Tracey Peake: Wow. Is there a particular area in North Carolina where these things live?

Matt Bertone: In the mountains. They're typically on rocks, on granite outcrops or rocks, and I've seen them in Pisgah National Forest and places like that. If you just look on the undersides of these, in the flat, vertical faces of these rocks, you'll see these big kind of webs, this characteristic, like I said, lampshade web. And in that center, there'll be this kind of big ... They almost look like cellar spiders with their really gangly legs, but they're also kind of mottled and moss-like to hide on that surface.

Tracey Peake: Oh, neat. So it looks like lichen or something stuck on the surface of a rock.

Matt Bertone: Yeah. I'd only read about them. Then finally I was able to see some, and they're pretty impressive spiders.

Tracey Peake: That's excellent. Well, I am pleased that you could be here today to tell us a little bit more about spiders and how they can be in your house-

Matt Bertone: Me, too.

Tracey Peake: and how they're helpful, and maybe debunk some myths that people had. Thank you again for being here, Matt.

Matt Bertone: Of course. Thank you for inviting me.

Tracey Peake: We have been speaking today with Matt Bertone, an entomologist here at NC State University. This has been the Audio Abstract. I'm Tracey Peake. Thanks so much for listening.