

Getting Curious with Jonathan Van Ness & Dr. Sara Ruane

JVN [00:00:02] Bienvenidos a "Getting Curious", I am Jonathan Van Ness, and every week I sit down for a 40 minute conversation with a brilliant expert to learn all about something that gets me in a very curious state of mind. On today's episode, I am joined by Dr. Sara Ruane, Herpetologist out at Rutgers University. Today, she blows my mind. We're going to talk about all things snakes, genres, species, invasive species, non-invasive species, big snakes, little snakes, poisonous snakes. What to do if you find a snake. All the different types of snakes, how the snakes work. You got to listen to this episode. It's major. I'm so excited about it. Take a listen. Welcome to "Getting Curious". This is Jonathan Van Ness. I'm so excited to welcome to the studio, Dr. Sara Ruane. Welcome.

SARA RUANE [00:00:50] Welcome to you too, Jonathan, for being here to talk to me about snakes.

JVN [00:00:54] Okay. Well, here's the thing. Yeah, my entire life, my first full sentence was "I don't like 'nakes". I've been scared of snakes my whole life. Like, so really, the question that I'm here to ask you about is, should we be scared of snakes?

SARA RUANE [00:01:09] Absolutely not.

JVN [00:01:10] So then my second question is, what is the fucking deal with them? What is going on? Did they, first of all, you know, in the Christian faith, I feel like I learned very early that that snake gave Eve the apple, honey, and the snakes used to have legs and God took them away. That is in the Bible, isn't it?

SARA RUANE [00:01:28] It is. So I was raised as a Catholic. And so I am familiar with the hatred of snakes that is thrust upon us in the Christian religion. But you know what? I got to tell you, snakes are just a very fancy kind of lizard. And so if you can handle lizards, snakes are not really any different.

JVN [00:01:48] So did snakes used to have legs?

SARA RUANE [00:01:49] Absolutely. Because they're a fancy kind of lizard. And there's a lot of lizards, actually, that don't have legs that are not snakes.

JVN [00:01:56] Okay, wait. Because also too I was thinking about this this morning, the joke, if the joke of God taking snakes' legs away is that they would never just be in high places. And that's why it took their lives away. The joke's on him because a lot of snakes climb trees.

SARA RUANE [00:02:08] Absolutely. Snakes can be pretty much anywhere except extreme cold. So worldwide, you have snakes that live in saltwater in the oceans. You have snakes that are up in trees. You have snakes that are just generally terrestrial on the ground. You have snakes that live underground and are hardly ever seen because they're burrowing and they're not really on the surface at all. So snakes can be really pretty much anywhere.

JVN [00:02:30] What's the last new snake we discovered?

SARA RUANE [00:02:34] Ooh, so there was a snake just, I just had it on my Twitter yesterday. There's a new species of a vine snake, so snakes up in trees. I don't know whether this is, you know, from a scientific standpoint of order, but the first, the most recent one that I know of is this thing called Vine Snake from Southeast Asia. This is a genus called a betula. And these snakes are crazy because they actually have horizontal pupils that give them binocular vision, which this

group of snakes, there's, I don't know, maybe 10 of them. They're the only snakes that have that kind of pupil going on.

JVN [00:03:09] What does that enable them to do?

SARA RUANE [00:03:11] So it gives them this-. So, you know, the way we see things in front of us is called binocular vision. And a lot of animals have their eyes more on the sides of their head.

JVN [00:03:18] Yes.

SARA RUANE [00:03:18] And so they're not seeing directly in front of them. They're getting more of the periphery and some of the in front of them. This gives these snakes, which are super visual hunters, the ability to see just like us, essentially.

JVN [00:03:30] Oh.

SARA RUANE [00:03:31] Yeah. And they're they're up in the trees. There's actually one species of these guys that hangs over the edge. They're in a bush or in a tree. Low branches hanging over water. And they grab fishing, yank them out of the water to eat them.

JVN [00:03:44] Wow. I need to see a video for this.

SARA RUANE [00:03:47] There's videos online of it for sure. You can Google it.

JVN [00:03:50] So but so you wait. So do we call you Dr. Ruane or Sara?

SARA RUANE [00:03:54] No, just call me. Please call me Sara.

JVN [00:03:55] Okay. Sara.

SARA RUANE [00:03:56] Yes.

JVN [00:03:56] So you were minding your own business from, you were born?

SARA RUANE [00:04:02] I was born. I was born in northeastern Pennsylvania.

JVN [00:04:05] Northeastern Pennsylvania.

SARA RUANE [00:04:07] Yeah.

JVN [00:04:07] And then when did you realize you wanted to study snakes?

SARA RUANE [00:04:09] So.

JVN [00:04:10] But you're, but you're also, you're, you're, you're, you're a, you're, you're an Assistant Professor at Rutgers.

SARA RUANE [00:04:17] Yeah.

JVN [00:04:17] Which is like, that's like a really good school, I feel like, Rutgers is like one of the really good one. She's like a very smart school. But you're but you're a doctor. So you finish it. You're a doctor.

SARA RUANE [00:04:24] I am a doctor.

JVN [00:04:25] In your title.

SARA RUANE [00:04:25] Yes.

JVN [00:04:26] She has a full title. But herpetology is really the study of amphibians and reptiles.

SARA RUANE [00:04:31] That's true. So I am a herpetologist. I know more than average about amphibians as well as reptiles, but I really do specialize in snakes, that's my-.

JVN [00:04:41] You're a snake girl.

SARA RUANE [00:04:42] I'm a real snake girl. You could absolutely call me that and I would be happy.

JVN [00:04:45] So when did you know that you wanted to study them? So I can think back to being, I'm going to say three, four or five years old and being really wild about being outside and putting things in jars. Bugs, worms, any. Any kind of thing that was grabbable, I'd love to put it in a jar and look at it. And the one thing I did every single weekend as part of my Catholic upbringing was I would spend the night, on Saturday night, at my grandma's house, my grandma and grandpa. And then Sunday morning I go to church with them and we'd come back from church and I would change my clothes. We would grab their dog and we'd go out for a hike in the woods. And they knew all sorts of places because they grew up in that area. My grandfather grew up on a farm and it's like drive down the highway and pull over on the side of the road and then you just march into the woods and there's some path there. And so I would do this every Sunday with them. And my grandmother, not my grandfather, was very encouraging about things like, "Hey, let's flip this rock over and see what's underneath it". And so that was very exciting. You never knew what you're going to find. Salamanders, frogs. There's not really any lizards around there. But occasionally a snake. And in retrospect, I don't think my grandparents would've known a venomous snake from not. But we never encountered anything bad. And I would just grab these things and bring them home. And one summer I had like a miniature zoo set up in my grandmother's yard where I was charging people in the neighborhood. You know, a dollar to come and look at these things I caught.

JVN [00:06:12] Oh my god, I love that. I had like a mini traveling spa and you had like a, I love that.

SARA RUANE [00:06:16] I would love a mini traveling spa too though.

JVN [00:06:19] We were breaking our gender norms.

SARA RUANE [00:06:21] Exactly.

JVN [00:06:21] 'Cause really what it mean, what I think it's great, is there, is there tons of female herpetologists?

SARA RUANE [00:06:26] You know, there are a decent number growing, but it's definitely been a very male dominated field. And particularly when you get into snakes, it tends to still be slightly more men than women. If I had to put, I don't have numbers and I'm sure some of the societies I belong to could give you numbers, but it's definitely not for snakes going to be the majority women. It tends to be a lot more men.

JVN [00:06:52] Do you feel like science, like the sciences in general, I mean, this kind of blanket. But do you feel like it's becoming more accept- or more accepting or geared towards women?

SARA RUANE [00:07:00] For sure. I think there's a lot going on that is now about recognizing the fact that women and minorities and people who haven't necessarily had the same opportunities in science, that something needs to be done to sort of help them out, make sure that they're being recognized. And so that's been, I think, on everyone's mind a lot in the last 10 to 15 years. And I can say, at least from my perspective, I've never personally felt like I've been held back because of my gender. But I know that's not going to be the case for everybody and that, you know, you can kind of be cognizant of these things. And if there's anything you can do to improve it, we should.

JVN [00:07:37] Love. Great. So, snakes.

SARA RUANE [00:07:40] Yes.

JVN [00:07:41] Where is the biggest battleground kind of hotspots for snakes coming in contact with people? Like where we need anti-venom, like, where's that going on?

SARA RUANE [00:07:50] So one of the things I'm working on right now is I'm writing a grant that deals with venomous snakes, which is not my, my general area of expertise necessarily. And so in prepping for this grant, I've been doing a lot of reading about snake bite statistics in general. And so the places I would say India, number one, is the place where people come into contact with a lot of venomous snakes and unfortunately get bit by a lot.

JVN [00:08:14] Is it the cobras?

SARA RUANE [00:08:16] It's really so you might think it's cobras and there's certain-

JVN [00:08:18] The mambas.

SARA RUANE [00:08:18] It's not mambas, they're in Africa.

JVN [00:08:20] Oh fuck, who is it? Who's killing the people in India?

SARA RUANE [00:08:23] It's one of the, well, cobras are part of it. Right? So cobras do come into contact with people and bite them.

JVN [00:08:27] Which is like a hood snake.

SARA RUANE [00:08:28] They have the little, the little hood.

JVN [00:08:31] Fuck, Jesus Christ. What kind of snake is a cobra?

SARA RUANE [00:08:32] So a cobra is something called-

JVN [00:08:33] A pit viper.

SARA RUANE [00:08:34] There are no.

JVN [00:08:35] Shut up, Jonathan.

SARA RUANE [00:08:37] So you're say-, you're you're yelling out a lot of terms I'm going to mention. So they're almost right, but not in the order, you're saying them.

JVN [00:08:43] Correct.

SARA RUANE [00:08:44] So cobras are a elapids, elapids are a group of venomous snakes that have what we would call fixed front fangs. So their front fangs don't fold up into their mouth. So they're not very large. They're short. And the venom from cobras tends to be something called neurotoxic, which means it shuts down your nervous system.

JVN [00:09:01] So these are lipids. Who are these snakes again?

SARA RUANE [00:09:04] Elapids.

JVN [00:09:04] Elapids.

SARA RUANE [00:09:04] Elapids. I'm like, eh.

JVN [00:09:07] Elapids.

SARA RUANE [00:09:07] Yeah, elapids.

JVN [00:09:08] So cobra is an elapid.

SARA RUANE [00:09:09] Cobras are elapids, mambas are elapids, coral snakes are elapids. We have coral snakes in the southern United States.

JVN [00:09:16] Red touch yellow, friend or no.

SARA RUANE [00:09:18] Kill a fellow.

JVN [00:09:19] Kill a fellow. Yes.

SARA RUANE [00:09:19] Yeah.

JVN [00:09:20] So coral snakes are a elapids.

SARA RUANE [00:09:21] Yes.

JVN [00:09:22] And then elapids' fangs are what again?

SARA RUANE [00:09:25] They're fixed. They can't move them back and forth. They're not on a hinge. They're just like our teeth. Right? They don't move around.

JVN [00:09:31] So a cobra's mouth, that, the fangs are just already like this and in there.

SARA RUANE [00:09:35] Just already. Yep, they're erect.

JVN [00:09:37] And so then it would just go "aaaaah".

SARA RUANE [00:09:38] Yeah. It would just open its mouth and bite down. But then things like pit vipers that you mentioned or vipers in general, which includes things like rattlesnakes and the Russell's Viper, which is the big biter in India.

JVN [00:09:50] Oh so the pit vipers, so the one that's causing the most bites in India.

SARA RUANE [00:09:54] I think causing the most bite is these pit vipers called Russell's Viper.

JVN [00:09:57] Russell's Vipers.

SARA RUANE [00:09:58] Yeah, because people are out working in a lot of agricultural areas and perhaps not wearing necessarily long heavy pants, it's hot out, you might not even have shoes on, and so these snakes aren't out looking to bite people, but you're in a place that's good for hanging out. Because think about your working out in a rice field. It's full of rats or mice. The best thing for a snake to eat. And so you're accidentally stepping on them.

JVN [00:10:20] Right and just reactively.

SARA RUANE [00:10:21] It just reactively bites. Right? The snakes. I can tell you, I've caught thousands of snakes and no snake has ever approached me to bite me. They are just trying to hightail it out of there.

JVN [00:10:30] So, OK, we're going to come back to that because yes. So. Ok, wait, so elapids.

SARA RUANE [00:10:34] Yes. Back to elapids.

JVN [00:10:35] And then pit vipers are another type.

SARA RUANE [00:10:38] So they're another kind of, there are another group of snakes they fall under. So there's pit vipers and true vipers. They're in the same group called Vipers. True vipers don't have pits. Those pits sense heat.

JVN [00:10:48] Are those the heat snakes or whatever?

SARA RUANE [00:10:49] Yeah, absolutely. That's absolutely what they are. So those guys all have these fangs that can be fairly gigantic because they fold them up into the roof of their mouth. So when their mouth is closed, they don't have to worry about their fangs puncturing through the bottom of their mouth. They just fold those bad boys up there. And then when it's time for biting, they erect them out and slam them in.

JVN [00:11:12] And those are vipers?

SARA RUANE [00:11:13] Yep.

JVN [00:11:13] And the only difference between a viper to pit viper is pit vipers have the heat-seeking ones.

SARA RUANE [00:11:17] Absolutely.

JVN [00:11:17] So what's an example of a viper?

SARA RUANE [00:11:19] So an example of a viper would be in England, you have this group of vipers called European adders.

JVN [00:11:26] And they're poisonous?

SARA RUANE [00:11:27] They're venomous. Yeah.

JVN [00:11:29] Really venomous? Or just like-?

SARA RUANE [00:11:30] No, there's like, you know, just because a snake has venom and can inject it into you does not mean you're going to die. It might mean you should go to the hospital and get it checked out or it might mean you need to go to the hospital and get some serious anti-venom going on. Yeah, absolutely.

JVN [00:11:49] Would you need to for a European Adder?

SARA RUANE [00:11:50] Probably not. Probably not.

JVN [00:11:52] But you probably should-. But should you go to the hospital?

SARA RUANE [00:11:54] You should go to the hospital. If you get bit by a snake. You have any reason to suspect it's venomous. The best thing you can do is go to the hospital.

JVN [00:12:01] So there's elapids, pit vipers, vipers. Is there another kind?

SARA RUANE [00:12:04] So then we get into some kind of interesting things where things are not necessarily following a set path.

JVN [00:12:11] What are you anacondas?

SARA RUANE [00:12:12] Anacondas are big constrictors.

JVN [00:12:14] Oh, yeah, constrictors. Oh yeah, constrictors.

SARA RUANE [00:12:17] Constrictors are another group of snakes. Constrict-.

JVN [00:12:20] Is they're a venomous constrictor?

SARA RUANE [00:12:21] Nope.

JVN [00:12:21] None?

SARA RUANE [00:12:22] Wait, wait. Hold on. Let's. So I don't want to get super technical about it.

JVN [00:12:27] No, I'm so here for it. I'm so fucking here for it.

SARA RUANE [00:12:28] OK. As long as you're here for the pedantical, technical parts of things.

JVN [00:12:33] Does pedantical mean technical in "scientist"?

SARA RUANE [00:12:34] I mean pedantic just means I'm being so exacting about.

JVN [00:12:38] Yeah, exactly perfect.

SARA RUANE [00:12:39] Yeah, exactly perfect. I'm not going to let you get away with an exception.

JVN [00:12:41] Got it.

SARA RUANE [00:12:42] All right. So there are snakes that maybe, that may use constriction as part of how they kill stuff. But some of these snakes may also be what's called "rear-fanged", where rather than having some fancy front teeth, that, that actually have ducts that connect to a big venom gland, which is like our salivary gland. Venom is just modified saliva essentially is the best way to think about it. That can kill stuff. And you can think about like your own saliva starts digestion before you even swallow. Right? Starts breaking down carbohydrates like as you chew the saliva into food, snake venom does the same thing. It's actually pre digesting a lot of what they eat. And since they swallow things whole and they don't chew it up, they need all the help they can get. So there are snakes that use constriction as their main method of killing stuff. But some of those snakes that use constriction may also have a little bit a bigger teeth in the back of their mouth. And they don't have a duct that connects to a venom gland, but their saliva may have some toxins in it that they can kind of chew into what it is they're eating.

JVN [00:13:47] Oh, and those are a more molar tooth?

SARA RUANE [00:13:49] Well.

JVN [00:13:49] Or are there fangs in the back?

SARA RUANE [00:13:52] They're all, all their teeth kind of look the same. They're all kind of re-curved backward so that when they grab onto something, it only goes one direction back.

JVN [00:14:00] OK, ok, ok. So the teeth in the back, they are kind of like fangs, but they're on the side.

SARA RUANE [00:14:05] Yeah. And they're, they're big and they have a little bit of a groove in them sometimes to help the saliva kind of get in to what it is. But it's not like a you could think of elapids and vipers as having these syringe-like teeth. It's like injecting a-

JVN [00:14:17] Yes.

SARA RUANE [00:14:17] Shot into you, a venom.

JVN [00:14:19] And there's just like two? In the front?

SARA RUANE [00:14:20] And there's two in the front. Although sometimes the extra ones just like shark teeth, right? They've got extras ready for when they get broken.

JVN [00:14:27] Oh, right behind it?

SARA RUANE [00:14:29] Yep.

JVN [00:14:29] Oh that's interesting.

SARA RUANE [00:14:29] Yeah.

JVN [00:14:30] But some vipers like have those more built in and other ones like might not.

SARA RUANE [00:14:34] Yeah.

JVN [00:14:34] It just depends on the species.

SARA RUANE [00:14:35] It just depends on the individual really.

JVN [00:14:37] So there's constrictors, are there any other kind?

SARA RUANE [00:14:38] So there's constrictors. I mean there's snakes that just bite stuff and swallow it. Like they just see something they're gonna eat and they overpower it through sheer force. And just-

JVN [00:14:48] They aren't poisonous?

SARA RUANE [00:14:49] No.

JVN [00:14:49] They just bite it to death?

SARA RUANE [00:14:49] They just, well, they just swallow, they just grab it and start eating it.

JVN [00:14:53] Like who are those?

SARA RUANE [00:14:54] So indigo snakes, they, they don't use constriction in the traditional sense.

JVN [00:14:58] Oh God, Jesus Christ. Julie, fuck off. I love Julie so much. She really wants a break, but I'm really into these fucking snakes. We're going to take a really quick break.

SARA RUANE [00:15:06] Alright.

JVN [00:15:06] Really quick break. We'll be back with more "Getting Curious" right after this.

SARA RUANE [00:15:08] All right. All right.

JVN [00:15:20] Welcome back to "Getting Curious", this is Jonathan Van Ness. Honey, we're talking snakes, we're talking all the snakes. Okay. So. Dr. Sara Ruane.

SARA RUANE [00:15:34] Yeah.

JVN [00:15:34] Dr. Sara Ruane, but Dr. Sara.

SARA RUANE [00:15:37] Yeah. Just call me Sara.

JVN [00:15:39] Professor of Herpetology at Rutgers University. So there's a concern-. So Indigo snakes.

SARA RUANE [00:15:43] Yeah. So indigo snakes are a snake that is not necessarily what you think of as a traditional constrictor. It doesn't grab something, wrap every piece of its body around it and squeeze it to death. But it grabs something and it's sort of like pushes it up against something and kinda mashes it into, let's say, a rock or a tree, a log that's on the ground, mashes it up in there to kind, to kinda do some quasi constriction, but also then just gets it oriented so that it can get it by the head and just start swallowing it.

JVN [00:16:11] Wow.

SARA RUANE [00:16:12] Yeah, yeah.

JVN [00:16:13] What's another one like that?

SARA RUANE [00:16:14] Oh, there's a lot of snakes like that. So racers. Black racers, which we have in New York, in New Jersey, in the Northeast in general. Those guys are these very visual, alert, looking at everything and they eat anything that they can overpower. I was just on a trip where we had one that had been hit by a car.

JVN [00:16:34] No.

SARA RUANE [00:16:35] I mean, that's like one of the number one ways I actually collect snakes is I pick up roadkill. For DNA samples.

JVN [00:16:40] And it was alive? Or?

SARA RUANE [00:16:42] No. I mean, some-. Sometimes they're not totally dead, which sucks. Right? Put them out of their misery.

JVN [00:16:47] So you do DNA samples?

SARA RUANE [00:16:48] I do a lot of DNA sampling in and dead snakes on the road are a great way to get DNA samples. And I always think of it as, you know, what? These things are living on in science, even though they they met an untimely death on the road.

JVN [00:17:00] And what do DNA samples from the snakes do for you?

SARA RUANE [00:17:02] So for me, what I've really specialize in is how snakes are related to each other. And we can figure out a lot about that based on their DNA sequences.

JVN [00:17:12] Wow. So you went to school and became a doctor for snakes.

SARA RUANE [00:17:18] Yeah.

JVN [00:17:18] And then you after school. Was it seven years or something like? Jesus.

SARA RUANE [00:17:22] Yes, it was. It was.

JVN [00:17:24] Your undergrad was in like biology or something?

SARA RUANE [00:17:25] My undergrad was in biology. I did a masters degree. I worked on Turtles for my masters, not snakes. And then I did a PhD and that was five and a half years.

JVN [00:17:33] Jesus.

SARA RUANE [00:17:33] I was in school until I was 30.

JVN [00:17:36] Wow. So. So. And then what was your first job out of school?

SARA RUANE [00:17:40] So the first thing, a lot of times, so if you want sort of an academic career, you want to be a professor, you want to be a curator in a museum. A lot of times what you do is what's called a "postdoc position", where you do more training in whatever it is you kind of specialize in. But with somebody else, maybe a different technique, maybe a different group of organisms, whatever. I did a post-doc at the American Museum of Natural History right here in New York. So in my growing up, in middle school, I moved to New York City. So I lived in New

York for a very long time as well. But I did a post-doc at the American Museum of Natural History and worked on snakes from Madagascar during that time.

JVN [00:18:14] What? You did?

SARA RUANE [00:18:16] Yeah.

JVN [00:18:16] What were those like?

SARA RUANE [00:18:17] They're crazy, they're the best snakes.

JVN [00:18:19] Because Madagascar is that little island off the bottom right hand side of Africa. Right? And in the day, didn't she used to be a part of Africa? And you can almost tell where it used to fit in?

SARA RUANE [00:18:26] Yeah, yeah. You can, you can, if you cut out in Madagascar, you can-

JVN [00:18:30] Was that earthquakes or something? Why does it do that?

SARA RUANE [00:18:31] It's just continental drift.

JVN [00:18:33] God, that fucking Pangea.

SARA RUANE [00:18:37] Yeah, it's fucking Pangea. Absolutely.

JVN [00:18:37] What are the snakes in Madagascar like that are different than mainland Africa? 'Cause, is there any differences?

SARA RUANE [00:18:41] Yeah. So I mean, the really cool thing about the Malagasy snakes is that what happens is you get one individual species. I don't know how many representatives, but Madagascar breaks off completely from India. So India, Madagascar was connected to India as India broke away and then India breaks away fully. So we start Africa, Madagascar, India. India, Madagascar, breakaway. India keeps on go in. Madagascar just stays.

JVN [00:19:07] Stays.

SARA RUANE [00:19:07] Yeah, it just sticks in the middle between the two. So that's about 70 million years ago. So a really fucking long time ago.

JVN [00:19:14] Yeah.

SARA RUANE [00:19:15] And then what happens is somewhere there's, no there's no one-. There's a couple of snakes on Madagascar. There's some boas and there's these things called worm snakes or blind snakes, which are really rinky dink. You would think they were an earthworm when you saw them. I mean, they're real snakes. They're not my, my area of-.

JVN [00:19:32] 'Cause they're just good more single organism-y snakes or something? Not as smart, they don't have eyes.

SARA RUANE [00:19:38] They're not as smart. They don't seem as smart. That's for sure. They eat, a lot of them feed on termites and ant pupa and really not that exciting. They can't open their mouths really big either. So some African snake or a group of them ends up getting to Madagascar through, you know, there's there's some sort of monsoon or hurricane or tornado or

whatever kind of climatic event you want to call it, a weather event. And a big bunch of things get blown out to Madagascar. The currents are right. And this group of snakes gets there and there's nobody there to compete with them. So now it's a free for all for these snakes. And maybe this is 30 or 40 million years ago this happens. And these snakes just, they can fill every single ecological niche that's available because no one else is doing it the way a snake would do it. Right? So these snakes just go crazy. They go crazy. And now all the snakes there, there's all these snakes, they're not found anywhere else in the world. And they fill every single-

JVN [00:20:37] Did they kill all the birds and stuff?

SARA RUANE [00:20:39] No, because they, they, they've coevolved with the birds there. So the birds have plenty of smart ways to avoid the snakes. It's, it's in balance with respect to the birds that are there. And most of the-, most of the snakes there are really not necessarily a few of them would take a bird given the chance, but a lot of them are really lizard eaters, which is funny because I told you snakes are just fancy lizards. Right? So-

JVN [00:21:00] So they're a little bit cannibal-y.

SARA RUANE [00:21:01] A little bit. Some snakes will even eat their own species.

JVN [00:21:04] I feel like I've seen that.

SARA RUANE [00:21:05] Yeah. They don't care.

JVN [00:21:06] So. So after you did that, you did that at the university here.

SARA RUANE [00:21:10] Yeah. I did that for three years at the American Museum of Natural History. And then I did less than a year at Louisiana State University's Museum of Natural Sciences down in Baton Rouge. So I spent a year living in Louisiana, which was awesome. But I was only there for about three months when I got hired at Rutgers.

JVN [00:21:28] Oh, got it. So then you came back to Rutgers.

SARA RUANE [00:21:29] So then I came back to Rutgers. And I live in New Jersey.

JVN [00:21:31] And now you've been studying since you've been at Rutgers is the whole time been studying about how snakes are related?

SARA RUANE [00:21:36] Yeah. Pretty much. And then there's a lot of variations on that. So I look sometimes at populations and how populations are related to each other and the gene flow between different populations. And what does that mean in the grander scheme of things?

JVN [00:21:50] What's that an example of like? Is that like how good cottonmouths in western New York breed with like whatever so-and-sos?

SARA RUANE [00:21:59] Yeah. So let's say, for example, one of the projects that I'm working on right now is in the New Jersey Pine Barrens, which is southern New Jersey. It's this remnant pine forest that's got all this sandy soil associated with it. And it really looks like what you would see in the southeastern United States, but it's this remnant pine forest and it's really disconnected from other habitat like that. And so because it's disconnected, you get all these snakes and other animals that are really southeastern animals, but they're in New Jersey, they're in southern New Jersey. All these really cool snakes. Pine snakes, scarlet snakes, all the, all these different snakes that if you like snakes, this is really primo stuff. And so what I'm interested in knowing with that

particular project is what's the conductivity for gene flow with these other populations that are further south when there's no place for them to live in between? Is there any possibility or these populations so isolated that that's it? Right? You've got to maintain that, those populations maintain that genetic diversity or that's it for the New Jersey snake. So that's one of the projects I'm working on right now.

JVN [00:23:02] So what did you find? What have you found so far?

SARA RUANE [00:23:04] Well, I just sent out the DNA samples last week, so.

JVN [00:23:08] Oh my god, so we're going to have to find out on Twitter later.

SARA RUANE [00:23:10] I will put it on my Twitter 100 percent.

JVN [00:23:13] So, OK, so then India was the first place where you said it's and it's the? You said that it was the Russell Vipers and the Cobras.

SARA RUANE [00:23:21] Yes. Yes.

JVN [00:23:21] And so really, like, there's probably projects in India about like getting anti-venom on those snakes.

SARA RUANE [00:23:26] Yeah. And there is anti-venom available. It just— Can you get to the hospital? Is it actually available when you get there? Right?

JVN [00:23:32] Because are both of those going to kill you? Cobra. Maybe not. But the black Russell. Yes.

SARA RUANE [00:23:36] But the Russell Viper and Cobra. Both of them could cause a death.

JVN [00:23:41] Does it depend on where it bites you?

SARA RUANE [00:23:42] Absolutely. It depends on where? It depends on your age. It depends on your own personal immunity, not immunity, but just how your body reacts to it. With something like a viper, I mentioned earlier that elapids are called neurotoxic snakes a lot of the time because they shut down your nervous system, your diaphragm stops being able to pump up and down and you stop breathing. Vipers, a lot of times, it's not a 100 percent rule, but vipers a lot of the times cause necrosis which mean your tissue—

JVN [00:24:10] Oh, dead flesh.

SARA RUANE [00:24:12] Yeah. Right. So although people often die more untreated, if you get treated, in enough time, right? You go to the hospital in a timely manner and you get treated. You're given appropriate anti-venom, medica-, you know, you're, you get things done. You're probably going to live. And if you do this in the United States, you're gonna be fine. Right? The United States, people who get bit in the United States are like men between 16 and 50 who are drunk and are like, "Watch me kill this snake". Right?

JVN [00:24:42] And are they rattlesnakes usually?

SARA RUANE [00:24:44] A lot, yeah.

JVN [00:24:44] Or cottonmouth.

SARA RUANE [00:24:44] It's usually rattlesnakes, probably followed by cottonmouths.

JVN [00:24:49] And what's the most poisonous snake in the U.S.?

SARA RUANE [00:24:52] There's a, there's a rattlesnake in the southwest called the Mojave Rattlesnake. And it tends to have certain populations. So this is why looking at populations are so important. There are certain populations that have a special cocktail of venoms that are a little bit more toxic and a little bit more potent on people than other populations. And so getting bit by one of these Mojave rattlesnakes.

JVN [00:25:16] Are those in New Mexico, Arizona?

SARA RUANE [00:25:19] So New Mexico, Arizona. Yeah. Exactly.

JVN [00:25:20] And those, those Mojave rattlesnakes have a more potent cocktail than the?

SARA RUANE [00:25:25] Than their neighbors. Yeah.

JVN [00:25:26] And those are also Mojave rattlesnakes.

SARA RUANE [00:25:28] Yeah.

JVN [00:25:28] So that just happened from like?

SARA RUANE [00:25:30] From evolution, baby. Right?

JVN [00:25:32] Wow.

SARA RUANE [00:25:33] It's all evolution. Right? So there's something going on in those populations. It could be to-. Let's say it could be two things. It could be whatever it is the snakes eat in those, in those particular places. You know, there-.

JVN [00:25:45] The rats in, the rats in New Mexico maybe responded with their spit more.

SARA RUANE [00:25:49] Yep. Yep. Exactly. Or it could just be random and it doesn't cause a problem and it just runs away. Right? It just becomes kind of this. Oh well we had a mutation and it's not bad. In fact, it's sort of good.

JVN [00:26:02] For the snake?

SARA RUANE [00:26:03] For the snake. So it sticks around, but it could be in response to what they're eating, gets more and more immunity to the venom. So the snake is, over many generations is being selected for with respect to having more and more potent venom.

JVN [00:26:17] Oh.

SARA RUANE [00:26:18] And it's this evolutionary arms race between the predator and the prey.

JVN [00:26:20] Ok, so where else is there like big interaction between like unwanted snake bites? Like, like so there's India, number one.

SARA RUANE [00:26:26] India's a big one. India is number one, there's maybe ten thousand deaths a year in India.

JVN [00:26:30] Wow.

SARA RUANE [00:26:30] Is one of the estimates I've seen and certainly over maybe 100,000 bites from venomous snakes. Another place is just the, generally Latin America can be, can be bad news. There's things like fer de lances, which I would call bothrops because that's the genus and that's how I talk as a scientist. But there's a, there's.

JVN [00:26:50] That's another type?

SARA RUANE [00:26:51] Yeah, that's another kind. It's a pit viper. So you're talking about-. The Russell's Viper, you know, it, over in India. But now we're talking about pit vipers in the Americas. There's this snake called "bothrops". They're called "fer de lances". These guys, they can get pretty big. And if you get bit by one and you don't go to the hospital, look, that's pretty bad news. And in a lot of places, you're in super rural areas. Not every place is developed the way the U.S. is. There may not be hospitals that are within the distance you needed to be in order to get effective treatment. They may not have what you need. And in some places, people use a lot of folklore when it comes to how to deal with stuff. And unfortunately, you know, that doesn't always that, if it doesn't do anything, it doesn't do anything right, you're not going to survive from it. A lot of sub-Saharan Africa is another place where particularly there's, every place, I'll tell you this, every place that snake bites are a problem are places that have two things in common. They have both elapids and vipers present in pretty high diversity and densities. So you've got things like cobras and vipers both in the same place and it tends to be countries that don't have really good medical care. And those two things combined are where people end up dying.

JVN [00:28:08] I have so many questions and Julie is holding up that break things. So we're just going to take two seconds.

SARA RUANE [00:28:11] Go ahead.

JVN [00:28:24] Welcome back to "Getting Curious", this is Jonathan Van Ness. Dr. Sara Ruane, herpetologist extraordinaire. So also. OK. So what are the snakes in Africa?

SARA RUANE [00:28:33] So snakes in Africa that are of note are, there are puff adders which are another kind of viper. There's a couple, a handful of different kinds of cobras off the top of my head. I don't know if there's as many as 10, but there's a decent number of cobras.

JVN [00:28:51] Is there a king cobra in Africa, too?

SARA RUANE [00:28:53] No. So king cobras are found really only in Asia, Southeast Asia. They don't get into Africa.

JVN [00:28:59] And then, but then there's just like other cobras in Africa?

SARA RUANE [00:29:01] But there's all these other cobras. There's cobras all the way from Africa into the Philippines.

JVN [00:29:06] And are water moccasins and cottonmouth the same thing?

SARA RUANE [00:29:08] They sure are. A lot of times people think that every water snake they see in the United States is some cottonmouth or water moccasin. They only go as far north as like

southern Virginia. You don't get them this far north. I got into a fight at a friend's baby shower with her father about it.

JVN [00:29:24] But they come up in the Mississippi, don't they?

SARA RUANE [00:29:26] I mean, there along the Mississippi River. But-

JVN [00:29:28] I feel like we had them growing because I'm from like rural, like Quincy like or Quincy, Illinois. It's like five hours southwest of Chicago.

SARA RUANE [00:29:34] I mean, you do, you do get them coming up into southern Illinois? For sure.

JVN [00:29:37] Yes. We're like west central Illinois, right in the middle of Illinois. But all the way on the west side.

SARA RUANE [00:29:41] Yeah.

JVN [00:29:42] But that's six hours south of Chicago.

SARA RUANE [00:29:44] Yeah. They come up, they come up into Illinois. So I'm not going to debate that they're there.

JVN [00:29:48] So they, so you think that they're there? The water moccasins.

SARA RUANE [00:29:50] I mean, I, I have to really look at the maps to tell you for sure. But I mean, yeah, they're probably there.

JVN [00:29:57] So you see where she is.

SARA RUANE [00:29:58] Yeah, I see exactly. Yeah. No, I mean that that's that's far enough south that I would think that you-

JVN [00:30:02] Like sometimes but not like the most extensive.

SARA RUANE [00:30:04] It might not be-. That's like getting towards more, more towards the edge of their range. But you know. Yeah.

JVN [00:30:09] You could have a family there.

SARA RUANE [00:30:10] You could have a small family of cottonmouths, a nest. That's why people love to tell me about nests of snakes.

JVN [00:30:16] Oh. Oh.

SARA RUANE [00:30:16] But they're not. They're not in nests. That's just something people say.

JVN [00:30:19] OK, wait. So Australia.

SARA RUANE [00:30:22] Yeah.

JVN [00:30:22] Isn't there like one that really kills the shit out of people in Australia?

SARA RUANE [00:30:24] The thing is people in-

JVN [00:30:24] And it kills the cows.

SARA RUANE [00:30:26] The thing about Australia is that unlike anywhere else in the world, most of the snakes are venomous snakes.

JVN [00:30:33] Most of them.

SARA RUANE [00:30:34] Everywhere else. I would tell you. Nope, it's a harmless snake. It almost definitely is. In Australia. So Australia is interesting in the same way Madagascar is where this group of snakes gets in there, there's nothing going on with other snakes and they just diversify like crazy. And the group that got in there happens to be elapids, which is part of that cobra family we talked about. And so Australia is chock full of elapids. There's some pythons, but I mean.

JVN [00:30:59] Oh, what kind of pythons? Are those vipers?

SARA RUANE [00:31:01] Pythons are constrictors.

JVN [00:31:01] Oh, they're constrictors.

SARA RUANE [00:31:02] Yeah.

JVN [00:31:02] Pythons are constrictors.

SARA RUANE [00:31:03] Pythons are constructers

JVN [00:31:04] So there are some pythons. But there's?

SARA RUANE [00:31:05] But there's lots of the elapids. Lots and lots and lots and lots and lots. And just like I said earlier, not all venomous snakes are dangerous to people, but pretty much all the snakes there are venomous, even though they're not all that dangerous. But people in Australia.

JVN [00:31:19] Is it a black adder that they're, that really kills the shit out of-?

SARA RUANE [00:31:21] There's something called a black snake, that's there. Pseudechis. That is one that, red bellied black snakes.

JVN [00:31:27] Because I think that's that's the one that killed the guy who we did this episode of "Queer Eye" in Australia.

SARA RUANE [00:31:32] Oh my god, and a guy got killed?

JVN [00:31:33] No, he didn't get killed. But his cow. He had a cow and then a dog.

SARA RUANE [00:31:37] And a dog. Yeah. I mean, you know, when things are out in the same habitat, sometimes there's these casualties that happen.

JVN [00:31:44] So Australia, there's like the most maybe poisonous of-

SARA RUANE [00:31:47] The most, the most potent venomous snakes are Australia. Probably. But not that as many people compared to, say, India get killed because medical care is very good. People-.

JVN [00:32:00] And more people in India, probably.

SARA RUANE [00:32:01] There's more, well for sure, there's more people. But I think if you were to break it down by bites per person, you're still going to see that Australia's going to have-. Because also Australia, a lot of it, unless you're actually in the outback, is clustered in a lot of cities along the coast. Right? Most of the snakes, not all of them, but most of them are not trying to hang out in your suburban backyard. If they can avoid it, they don't want to be there. And all-, like I said earlier, snakes, given the chance, just want to get the hell out of your way.

JVN [00:32:29] OK. Colorful snakes.

SARA RUANE [00:32:31] Yeah.

JVN [00:32:31] What are the most colorful bright ass snakes? Like what would you say is the prettiest? Is it that yellow one that Brittany danced with that one time?

SARA RUANE [00:32:38] So. So that was a an albino Burmese python. Yeah, they're pretty. You know what? Albino snakes like that, you don't really see them in the wild a whole lot. So I want to only talk about wild type colorful snakes. In captivity when you're breeding snakes, it's just like dog breeds. Right? You can get all sorts of crazy looking things going on that you would never see in the wild.

JVN [00:33:00] 'Cause it would get eaten if it was in the wild.

SARA RUANE [00:33:00] Because it would get eaten, because it's obvious. Right?

JVN [00:33:02] Yes.

SARA RUANE [00:33:02] You don't-. This does not fit your environment. You're out of luck pretty fast.

JVN [00:33:06] So that was a white-?

SARA RUANE [00:33:07] That was an albino burmese python.

JVN [00:33:08] An albino. Okay. Got it. Got it.

SARA RUANE [00:33:10] Yeah.

JVN [00:33:10] What? Ok. So what other, what is like really colorful ones?

SARA RUANE [00:33:14] So there are some really cool colorful snakes out there. So there's one in Madagascar that's got, it's black and it has a yellow venter, which is its belly. And then going down, starting at the top of its head, it's got rows of pink, bright pink dots going down it. And then they change from pink to blue.

JVN [00:33:30] Cute.

SARA RUANE [00:33:30] Yeah. They're super and they're pretty, they're like this big. They are really cute.

JVN [00:33:35] And then what else?

SARA RUANE [00:33:37] So then there's these snakes in Southeast Asia called Chrysopelea. They're actually flying snakes.

JVN [00:33:43] I think I've seen those. They jump from tree, yes.

SARA RUANE [00:33:45] They jump from tree to tree. They're like a flying squirrel, but in snake form.

JVN [00:33:48] What color are they?

SARA RUANE [00:33:49] So they're black and they've got a lot of yellow going on them, too. So this beautiful black and yellow. But even in the U.S., we have I mean, think about coral snakes, red, yellow and black.

JVN [00:33:58] Yeah, red touch yellow, kill a fellow. But red touch black friend of Jack.

SARA RUANE [00:34:00] Yeah.

JVN [00:34:00] Just saw on the news. This one lady found an actual coral snake. She found like this poisonous one. Which are more rare than the non-poisonous one, right?

SARA RUANE [00:34:06] It's really rare. So in the U.S., coral snakes are really hard to find. They spend most of their time underground or under stuff. And so you almost are always seeing I have a tattoo on my foot.

JVN [00:34:20] Oh.

SARA RUANE [00:34:20] Of this is a king snake. Not a coral snake.

JVN [00:34:22] Yes. Because that's red touch black, friend of Jack.

SARA RUANE [00:34:25] Yep. This is what I worked on for my dissertation, for my PhD. So I know a lot about the non-venomous guys. These guys are beautiful and it's very rare to actually see in the U.S. a coral snake. They're really hard to come by. And I'll also, just since we're since we're touting this very famous little rhyme, once you go south of the border, don't rely on that because the snake smarten up. And the way the mimics the harmless ones look, they look just like the coral snake. They don't-

JVN [00:34:52] Oh, really?

SARA RUANE [00:34:52] They don't follow our nice little rhyme.

JVN [00:34:55] So up here, it does. But then in Mexico, you might have a red that touches yellow that will yellow will kill a fellow?

SARA RUANE [00:35:01] Absolutely. Yeah. All of them. All of them may kill a fellow. Doesn't matter. All of them start killing fellows.

JVN [00:35:07] All of them might. So there are some that red touch black are poisonous there?

SARA RUANE [00:35:09] Yeah. They don't care.

JVN [00:35:10] Oh, that's what you're saying.

SARA RUANE [00:35:11] And the other way around. Like both, both directions. They don't care.

JVN [00:35:15] And that just means me have the fucking chills.

SARA RUANE [00:35:17] You're never going to, unless you're looking for these things you're not going to see one.

JVN [00:35:20] That literally give me the fucking chills. So what about invasive species? 'Cause you know, there's that one, I think Guam got invaded by like those-

SARA RUANE [00:35:26] Oh, brown trees snake.

JVN [00:35:27] Yes.

SARA RUANE [00:35:27] Yeah, they're bad news.

JVN [00:35:29] So what's the deal with those?

SARA RUANE [00:35:30] So brown tree snakes are like eating machines. They are generalist predators. They just eat whatever the hell they can stuff down their throats. They are one of those, as I mentioned earlier, rear-fanged snakes. So they got a little action in the back of their mouth. If you let one chew on your hand, which I can't imagine you would let happen. But if you were so inclined to let this snake chew on your hand, you get some swelling, some itchiness, you might, you might feel something. You're not gonna die. At least I don't think you're gonna die.

JVN [00:36:00] Are they making any strides to-? Are they going to get rid of them?

SARA RUANE [00:36:03] So they sort of, you know, what?

JVN [00:36:04] 'Cause they're really fucking up the birds.

SARA RUANE [00:36:07] They're really fucking up the birds. They are. I mean, in some places, you don't even hear birds now because these snakes came and ate them all. And, you know, I love snakes, but I don't want the ones that don't belong where they don't belong to be there.

JVN [00:36:16] Is there any other of those going on?

SARA RUANE [00:36:18] I mean, Burmese pythons in Florida are causing some trouble.

JVN [00:36:21] Yes. That one guy shot that one Burmese python in the head.

SARA RUANE [00:36:25] That huge one. Yeah.

JVN [00:36:25] It was like-. And that was basically people getting pet snakes and letting them go.

SARA RUANE [00:36:28] Yeah. So one of the things I've heard, and it's like a lot of things, all of a sudden there's all these snakes out there that don't belong there. So I've gotten the impression

from what people of backtrack that Hurricane Andrew in the early 90s ravaged some places where there were wholesalers of exotic animals and these things got loose. And that's part of it. And also just irresponsible people letting shit go. Right? Like-.

JVN [00:36:50] That's fascinating.

SARA RUANE [00:36:51] It's a combination of the two probably. Just letting stuff go and you know what? I hate to say this, but from my perspective and knowing snakes, I mean, I don't know how you're ever going to eradicate those Burmese pythons out of the Everglades. The ability for the snake to live there and you to find it is not an even-Steven sort of deal.

JVN [00:37:11] Because they're so good at hiding?

SARA RUANE [00:37:13] They're so good at hiding. And snakes are-. I spend so much time looking for snakes, I get-.

JVN [00:37:17] And what I want to get to now, is their personalities. And how they-?

SARA RUANE [00:37:20] Oh ok.

JVN [00:37:22] 'Cause like, where have you all studied snakes?

SARA RUANE [00:37:25] So I've studied snakes in the United States, a whole bunch. I just got back from Louisiana where I spent two weeks with some colleagues catching snakes like crazy, which was awesome. I've been to Madagascar, Panama, Mexico, Brazil. Those have been the main places I've done work. I'm trying to think if there's any place, I've been to most of these countries multiple times, but that's been, been sort of my main focus. I've also been Australian and I've caught some stuff there, although that was not for a specific trip.

JVN [00:37:55] So when you go out on these expeditions.

SARA RUANE [00:37:57] Yeah.

JVN [00:37:57] Do you guys like go out with antivenom of like the most prominent snakes for that area?

SARA RUANE [00:38:01] So no. So the thing is, is that-.

JVN [00:38:03] Well, girl, should you?

SARA RUANE [00:38:03] Yeah. I mean-.

JVN [00:38:04] I would like to have you back.

SARA RUANE [00:38:06] I know, I would love to come back. Here's the thing. It's not just like, "Oh, you got bit, you give it", right? You really do need the kind of doctor none of us are on these trips to supervise this. Right? Like none, like I have a PhD.

JVN [00:38:21] You can't just shoot the anti-venom in your ass?

SARA RUANE [00:38:23] No.

JVN [00:38:23] Like in your butt cheek muscle.

SARA RUANE [00:38:24] No. No.

JVN [00:38:25] It have to around where the bite was?

SARA RUANE [00:38:26] It has, well, I don't know, you know what, honestly, I don't even know where they necessarily give it to you when you, I've never been bit by anything venomous because I'm super careful. When I deal with venomous snakes, I take utmost precaution. But the thing is, is you might need how many vials? I don't know. I don't know how to monitor that. And you can have really bad reactions that involve its own treatment. Right? You can go into anaphylactic shock.

JVN [00:38:48] Oh, if you're allergic.

SARA RUANE [00:38:49] Right? You can have something called serum sickness, which makes your kidneys shut down. You can have all these other bad things happen to you. And a lot of times, you need many, many rounds of it. Also, it doesn't stay, necessarily stay usable for the amount of time. And I don't know how as a non-medical, as not being a hospital-, I don't even know how you would buy it to bring it with you. Right? It's really expensive. I've heard that if you have to go through a full course of treatment where you need 10 to 20 vials, you know, it's like \$20,000.

JVN [00:39:21] And that isn't covered under your health insurance ever?

SARA RUANE [00:39:23] I mean, it is if you're, if you get bit and you go to the hospital in the U.S. and you have health insurance, but they're not just going to give you the anti-venom to take with you for free.

JVN [00:39:30] Right. It's like a-, got it, got it, got it, that make sense.

SARA RUANE [00:39:33] Yeah. They don't just give it out.

JVN [00:39:35] So in your experience, like of, you know, observing and like catching them like, are some more? Like, you know, 'cause like I have a cat, Harry Larry. He's not your typical cat. He loves people. He loves to be. He has to, like, sleep on your face. He's not into hiding. He like is not into like, he's very curious. He loves people.

SARA RUANE [00:39:50] Ok.

JVN [00:39:50] Is there some cat-, or is there some snakes that are more?

SARA RUANE [00:39:53] Yeah, absolutely. Snakes have different species, have different personalities. Like I can tell you this, if you pick up a water snake, you catch a water snake. Let's say here in New York State or New Jersey, it's gonna bite the crap out of it.

JVN [00:40:06] It is?!

SARA RUANE [00:40:06] Yeah. Yeah. But I mean, I get bit by non-venomous snakes all the time.

JVN [00:40:10] But it's non-venomous?

SARA RUANE [00:40:10] Yes, so I don't care.

JVN [00:40:10] But you bleed?

SARA RUANE [00:40:11] A little bit.

JVN [00:40:12] Oh my fucking God. So, so it fucking-.

SARA RUANE [00:40:14] I mean, I get bit by snakes all the time.

JVN [00:40:17] And it hisses?

SARA RUANE [00:40:17] No, most snakes don't hiss. That's, that's just like for movies.

JVN [00:40:20] So as it's going to bite you.

SARA RUANE [00:40:23] Yeah.

JVN [00:40:23] You see it drawback. You see it's fucking mouth open.

SARA RUANE [00:40:25] And you know what? If you're with me or you're me, you hang on to that fuckin snake because if you let it go, I will go bananas. Oh, if somebody, if I was out with somebody who got bit and then like through the thing. I would, I would be livid.

JVN [00:40:37] Why? Why?

SARA RUANE [00:40:39] 'Cause we're doing work. This is my job. You're just throwing it away. I'd go bananas.

JVN [00:40:43] Oh, so you better just take the fucking bite.

SARA RUANE [00:40:45] You just take it. You just take it. You commit. Right? The key to catching snakes is you commit. It doesn't matter, if you can get just the last eighth of its tail and you grab that thing.

JVN [00:40:54] Oh my fucking god.

SARA RUANE [00:40:55] It's going to whip around and bite.

JVN [00:40:56] No!

SARA RUANE [00:40:58] I was at, I was in Belize, is another place I forgot. I've been to Belize. I was in Belize last year and we caught this snake. Sometimes they're called puffing snakes or chicken snakes, but they're beautiful. They're black with yellow spots all down them and yellow stripes. They're called tiger snakes sometimes, too, because of that.

JVN [00:41:13] I just want you to know that my stomach hurts right now hearing this story and I'm covered in chills. But I want, I got to hear it.

SARA RUANE [00:41:19] You're good, but you're good. So this thing was nine feet long. And I don't know what my myself and my my colleague, Frank Burbrink, who I was with. He was also my PhD advisor. He and I took this snake. We had caught it. It was going crazy, like trying to bite.

JVN [00:41:36] Where were you?

SARA RUANE [00:41:36] Just like on the side of the road in Belize.

JVN [00:41:37] In Belize. And you had parked the car like when you were a little girl.

SARA RUANE [00:41:40] We saw crossing, crossing the road. We're in a van. We put the brakes on the van and ran out. And just, I just jumped on the snake like it was in some.

JVN [00:41:47] And it was a nine foot.

SARA RUANE [00:41:48] It was an nine foot long snake. It was-.

JVN [00:41:50] How wide?

SARA RUANE [00:41:51] It's like this.

JVN [00:41:52] And it's black and yellow.

SARA RUANE [00:41:54] Yeah, it's beautiful. Beautiful.

JVN [00:41:55] And it's morning or night.

SARA RUANE [00:41:56] It's like 10:00 a.m..

JVN [00:41:59] And so you jump out of a car.

SARA RUANE [00:42:01] I jump out of the car. This is called "road cruising".

JVN [00:42:03] And you big sister straddle it. Like you big sister straddle it.

SARA RUANE [00:42:04] Yeah, I straddle it.

JVN [00:42:05] And it's slithering like normal.

SARA RUANE [00:42:06] Yeah. Well, it's trying to get the hell out of there because it now it knows, you know, something's up.

JVN [00:42:09] That you see it. Yeah.

SARA RUANE [00:42:10] I see it. Right? So it's trying to get away. So I was able to grab-, I saw it and I jumped onto it because you have to commit. Right? Anytime you don't commit the snake gets away. So you have to commit. You just, it doesn't matter. One time I got like tons of crazy scratches all over my face and people from the villages were coming to look at my face because I looked so insane and, you know, people are like, "You did that for a snake"? They don't. They think it's crazy. You probably, you look like you think it's crazy. So anyways, I'm holding this snake and then the person I'm with is dealing-.

JVN [00:42:37] And you're on its head or on its midsection?

SARA RUANE [00:42:38] I'm like on its lower half of its body. So it's looking at me and it's just whipping around and trying to bite me in the face. So I'm like covering myself. But I mean, it's just-.

JVN [00:42:47] And you knew it wasn't poisonous?

SARA RUANE [00:42:49] Yeah. It's just like, it's like recognizing people. Like, if you've seen them once, you know what I mean? You know what things look like. Right? That's not to say people don't occasionally make a mistake. But this is an easy one. So the snakes going crazy. So anyway, at some point, we put it in-, pillowcases are one of the tools of my trade, you stuff the snake in a pillow case. We get it under control. We drive back with it. And so then the next day we're like, all right.

JVN [00:43:09] Do the snakes ever die from stress? Just from being caught?

SARA RUANE [00:43:11] I've never had it happen. So they're pretty good. You put them in a pillow case and they just kind of hunker. You know?

JVN [00:43:16] Calm down.

SARA RUANE [00:43:17] You don't poke them with a stick or-. I mean, snakes don't have ears, so you could shout and be noisy and they don't care too much. They feel vibrations though. Anyway, so we take the snake out and we're thinking, we're gonna take, we always like to take next photos of things. So we get the snake out. And I don't know what I was thinking. I said, "Let's just get this log and we'll put the log in a spot where if the snake goes off it, it's easy to pick it back up because we still need our DNA sample. So, and we want to get the photographs first. So we're taking these photographs. And I put, and I try to put this thing on this log and the snake was not having it. This snake's personality was feisty and like, "I'm not putting up with your bullshit. And I don't care that you want to photograph me. And for all I know, you're gonna eat me". Right? That's what these animals think. You're gonna eat them because they cannot fathom that there's another reason you're hassling them. So I put this thing down and it just takes off. So now I grab it. But I only have maybe the last eighth of its body and the snake's nine feet long and I'm five, two and a half. So this snake just doubles back. And it's like almost as tall as me and is trying to bite me in the face and actually rip, I've never had this happen, it ripped a hole in my shirt. And the person, my friend Frank who I'm with described it as like the scene in the Michael Jackson video where they've got their hands taped together and everyone has a knife and they're just dancing around in a circle.

JVN [00:44:29] Yes.

SARA RUANE [00:44:29] It was like that.

JVN [00:44:30] But did get you?

SARA RUANE [00:44:31] I mean, it bit me a couple of times, but not in the face, yeah.

JVN [00:44:35] And you bled? It gouged you?

SARA RUANE [00:44:37] It gouged me, but snakes don't have, you know, you think about this? Snakes open their mouth super big to swallow stuff whole. It means they don't have a lot of muscles that are huge in chompy in their mouth. They don't have a lot of bite force. So when they bite down, it's super weak because they don't chew. They don't chew and they open their mouth real big. So when they bite down, even though their teeth are super sharp like little needles, so you get these little pinpricks, but there's no chomp. There's no, I mean, I mean a really big snake will hurt.

JVN [00:45:02] Have you ever got bit by a venomous snake?

SARA RUANE [00:45:04] No.

JVN [00:45:04] Never.

SARA RUANE [00:45:04] I'm really careful.

JVN [00:45:05] And then in the, in the wild, what's the most venomous snake that you've caught?

SARA RUANE [00:45:10] Ooh, so I was in Brazil and we caught this thing called a bushmaster, which is the biggest venomous snake in the new world. So king cobras are bigger when you go to Asia. But as far as North or South America, these things can get like 14 feet long. And this one was about, I'm going to say, it was about eight feet long and it was massive. Its girth was like as big as my head.

JVN [00:45:32] Oh fuck.

SARA RUANE [00:45:33] It was crazy. And it was so aware and it had this real regose skin and-.

JVN [00:45:37] What skin?

SARA RUANE [00:45:38] Regose. So it was real, real bumpy and rough, almost like a crocodile.

JVN [00:45:42] Why? Sick? Warts?

SARA RUANE [00:45:43] It's just the way. No. That's just the way it is. That's just the way it's skin. It's just like this real hefty-.

JVN [00:45:47] Was that morning? Night?

SARA RUANE [00:45:49] So it was found not by me, but one of the people we were with who was walking down this path, had no shoes on. Like going to take a shower in some waterfall. And this thing was just coming across the path and everyone's speaking Portuguese because we're in Brazil. And he just starts yelling, "Get the crab, get the crab". And the crab is the stick that has a pincher on the end. It's, I would call it a tong so that you could grab it and move it. And it was, everyone screaming and going crazy. And people are yelling, "Bushmaster, Bushmaster". I was actually wearing a shirt with a Bushmaster on it at the time because I was-.

JVN [00:46:21] Meta.

SARA RUANE [00:46:21] Right? Right?

JVN [00:46:22] Yeah.

SARA RUANE [00:46:23] So then this, I was just, if you got bit by this thing, we were about two or three hours on a really terrible road. So the road was so bad that the door fell off our car at one point because it was so bumpy. Also, we had the door open because we were ready to jump out and catch snakes and the combination made the door just fucking fall right off. But yeah, no, this snake was pretty badass.

JVN [00:46:46] And you got a DNA sample of it?

SARA RUANE [00:46:47] Yeah, actually, yeah. That snake is actually in a museum in Brazil now.

JVN [00:46:50] Okay. It's alive. It's alive. Oh, they killed it then?

SARA RUANE [00:46:54] Yeah.

JVN [00:46:54] Why?

SARA RUANE [00:46:55] Well, sometimes here's the thing. One of the worst parts of the kind of stuff that I or some of the people I work with do sometimes is sometimes we need things that you can't get from a snake while it's alive, like maybe we need to know what it eats. And you've got to cut it open to find out.

JVN [00:47:09] But that's like, not an endangered snake so you do it.

SARA RUANE [00:47:12] No. It's always done under very, very strict guidelines where we're making sure we're not putting any populations in danger. We never, ever, I can say this. Nobody I know who works in biology and does this kind of stuff got into, got into the field because that's what they want to do. Right? So that's always done under very, very strict guidelines.

JVN [00:47:29] So what have you found about like snakes like doing each other? Like does a viper ever fuck an addler? And we get like a cross thing.

SARA RUANE [00:47:38] So, yeah. So you can get some, first off, for people who keep snakes in captivity as pets and breed them on purpose. You can get all sorts of crazy shit to happen, right? If you're stuck in an aquarium or a sweater box tends to be how you keep snakes in cap-. If you, if you have 500 snakes, they're not all in 500 aquariums. They're in a rack of sweater boxes with shavings and a hiding spot and a water bowel that you just pull out of rack. If you're stuck by yourself in a sweater box for nine months of the year and then you get in there with some lady snake, right? Like yeah, no, they're going to make something happen. Whether or not that can be fertile. Depends on how closely related the species are. But yes, snakes in captivity absolutely can get really weird crosses between different species. In the wild, you don't see it as much. Part of that is just because it probably doesn't happen as often. But also, what are the chances that you come across that particular hybrid snake? But it does happen because evidence—

JVN [00:48:35] Have you ever found one in snake?

SARA RUANE [00:48:35] Personally, I haven't. But there's several, several studies that have found hybrid snakes between these things called bull snakes and fox snakes, which are related but not super closely related. You also, one of the most interesting things I've seen is so we talked a little bit about cottonmouths or water moccasins, but there has been some evidence that they can hybridize, but in particular that the male, that occasionally, there's, there's some video of this, of a male cottonmouth battling, they do kind of trying to wrestle each other, that the boys, wrestle each other for access to females or for territory where females live. Where you have cottonmouths and copperheads actually wrestling with each other. And they're pretty closely related, but they're pretty different at the same time. So it's pretty wild that that's been documented. So it does happen. It's not the norm, but it does happen.

JVN [00:49:28] Ok. And really quickly, like breeding balls.

SARA RUANE [00:49:30] Yeah.

JVN [00:49:31] Snakes that have live babies. Snakes that have eggs.

SARA RUANE [00:49:33] Yeah. So some snakes give live birth and some snakes lay eggs. It tend-

JVN [00:49:39] Is there a viper adder thing there?

SARA RUANE [00:49:40] So pit vipers in the new world, so in the Americas, all give birth to live young except for the Bushmaster which lays eggs.

JVN [00:49:49] So bushmaster lays eggs, while the other vipers?

SARA RUANE [00:49:51] Yeah, all the rattlesnakes. The cottonmouths, the copperheads, they all just pop out babies.

JVN [00:49:55] Live slitheringly babies.

SARA RUANE [00:49:57] Yeah, ready to ruckus.

JVN [00:49:58] And do they mate ball?

SARA RUANE [00:49:59] So not all snakes do that. So garter snakes, which also do have live babies, they do those mating balls where they all come out of the same general den site, early spring, even late winter. And they just chase down females and all the males are trying to mate with her. And a lot of them do mate with here.

JVN [00:50:18] And that's how anacondas are too?

SARA RUANE [00:50:20] Anacondas can have mating balls too. I've seen some videos that show them doing that as well.

JVN [00:50:24] And then what are the-?

SARA RUANE [00:50:24] Or that males will fight with each other over access. But you'll see a pile of anacondas sometimes in videos.

JVN [00:50:29] Do the elapids do. Are those more egg layers or something?

SARA RUANE [00:50:33] So most of elapids lay eggs.

JVN [00:50:34] Elapids.

SARA RUANE [00:50:35] Yeah, most of them do lay eggs. So it tends to be, it pops up here or there. In general, this is a real generality. You see more live bearing, live babies coming out in snakes that live in colder areas. And it's probably because there's not as much time for development in the egg so that they can be ready to go and hibernate in the fall. So a lot of rattlesnakes, a lot of the things you see in the north, in the more northern latitudes tend to be live bearers. But on the other hand, all kinds of boas give birth to live young, too.

JVN [00:51:05] Ok. Last two things.

SARA RUANE [00:51:06] Yep.

JVN [00:51:06] Do snakes hibernate?

SARA RUANE [00:51:08] A lot of snakes do hibernate.

JVN [00:51:09] But some don't.

SARA RUANE [00:51:10] But some, if they don't live where they don't have to. But if they live where they do have to.

JVN [00:51:14] Where it's colder.

SARA RUANE [00:51:14] Where it's cold, they absolutely do.

JVN [00:51:15] Ok. The last thing. Yeah. What do you do if you see a snake? Like what you do if you like-

SARA RUANE [00:51:21] If you see a snake or if you see a snake? If I see a snake, I chase it down.

JVN [00:51:25] No. If we do.

SARA RUANE [00:51:25] Ok.

JVN [00:51:25] If it's in your house or something?

SARA RUANE [00:51:26] If it's in your house, you should probably if you feel comfortable getting close, snakes aren't going to attack you. Right? Close the doors to the room.

JVN [00:51:34] But we need it removed.

SARA RUANE [00:51:35] If you need it removed. Call. Call the, whatever state you're in. Let's say you're in the United States. Call whatever your state's "Fish and Wildlife" is and ask them what you should do. And they will almost certainly send somebody over. You could also call up somebody like me. You look up, you know, "New Jersey snakes" and my name will come up. Most people who work on snakes or on wildlife are happy to come help when they can. But in particular, I would call your state, like "New Jersey Fish and Wildlife dot gov" like you want the ".gov" website. And they, these people love animals. They're gonna come over and do whatever they can to help you out. They don't want people to be scared. And that's who I would call first and foremost is your state's "Fish and Wildlife" office.

JVN [00:52:17] And like, don't kill it?

SARA RUANE [00:52:18] And don't kill it. Right? It's almost certainly harmless. And you know what? Even if it's not, you trying to kill it is putting you into contact where you're more likely to get bit. The best thing you could do is, you know, I don't know what, it's in your bathroom, close the door. Put something along the bottom of the door so it doesn't get out and just call somebody on the phone. Don't start fooling around, trying to kill it yourself. Because, again, that's a good way for you to get bit.

JVN [00:52:41] Dr. Sara Ruane. Thank you so much. Last 45 seconds, they're going to kill us to get out of here. Is there anything that you need to say? Where we can find you? Any work coming up?

SARA RUANE [00:52:50] So you can find me on Twitter @Sara_And_Snakes. And all I really talk about is snakes and work and things like that. And you can also find me or find my Twitter on my website, SaraRuane.com.

JVN [00:53:05] Great. Thank you so much for coming today, Dr. Ruane. Sara, thank you so much. I appreciate it. And let's go outside and make some content.

SARA RUANE [00:53:10] All right. Awesome.

JVN [00:53:15] You've been listening to "Getting Curious" with me, Jonathan Van Ness. My guest this week was Dr. Sara Ruane. You'll find links to her work and socials in the episode description of whatever you're listening to the show on. Follow us on Instagram and Twitter @CuriousWithJVN. We are doing all the follow ups, all the post stops, all the pre ops, all the ops on all the stories. We're following you along. It's our best journalistic stab at integrity with a side of comedy. It's gonna be so much fun so follow along there. Our theme music is "Freak" by Quiñ. Thank you so much to her for letting us use it. If you enjoyed our show, introduce a friend. Show your auntie your uncle how to download podcasts. Show everyone that'll listen. Be annoying about it. It's ok. We got to spread the good word of "Getting Curious", honey. Also "Getting Curious" is produced by Cody Zigler, Emily Bossak, Julie Carrillo, Rae Ellis and Colin Anderson. Our social media coordinator is Lara Neiman and our special booking consultant is Mary O'Hara. Thank you so much for everyone that made this possible. We love all of you, and we'll see you next time on "Getting Curious".