

New Species Podcast
Seven New Grasshoppers with JoVonn Hill
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[bright, tech-y introductory music]

Zoe: Welcome to the New Species Podcast. I'm your host, Zoe Albion. On this podcast we learn about recent discoveries of species that are new to science, but not necessarily new to nature. We ask scientists how they find these new species and why they matter. We learn what makes a new species, and hear some behind-the-scenes stories along the way. So join us as we explore the biodiversity of our planet and the scientists who help us better understand it.

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Zoe: Welcome to the New Species Podcast. I'm your host, Zoe Albion, and I'm here with Dr. JoVonn Hill, Director of the Mississippi Entomological Museum & Assistant Research Professor at Mississippi State University. He's here today to tell me about his paper published in issue 11 65 of Zookeys in which he describes seven new species of grasshoppers from central Texas. Welcome JoVonn, thank you so much for coming on the podcast!

JoVonn: Yeah, thanks for having me.

01:07

Zoe: So to start us off, listeners are probably at least generally familiar with grasshoppers. But can you tell us what drew you to them and how you arrived at this project?

JoVonn: Oh, wow. Well, so when I was an undergraduate, I worked for a postdoc and he encouraged me to do my own project that he would kind of help guide me through. And he worked on tri-trophic level interactions. So herbivores, plants, and predators. And myself being from Mississippi, I came to Starkville, where Mississippi State University is, and we have actual prairies here around Starkville. And growing from Mississippi, I had no idea we had grasslands here, natural grasslands here in the southeast. And so it just fascinated me. And I wanted to work in them. And, you know, insects are incredibly easy to work with in terms of doing sampling and whatnot compared to vertebrates.

JoVonn: And so we did a project looking at grasshoppers, true bugs, spiders, and plants in these prairie remnants. And I started using Dan Otte's Grasshoppers of North America books to identify my grasshoppers and coming over to the Entomology Museum to kind of check my IDs and of course on all the tax. But grasshoppers are what stuck. They, I don't know, something about them I just liked, catching grasshoppers is a lot of fun. Dan's books made identifying them super easy and it just kind of stuck. And then one day I was over here at the museum identifying my grasshoppers and the director at the time, Dr. Richard Brown, said, hey, do you want to go to graduate school? And I didn't have anything else going on.

JoVonn: So I said, sure. And of course that was to work on ants. I did my master's on ant community ecology. But he always still encouraged me to work on grasshoppers and his major professor from Arkansas, Dr. Tommy Allen, had retired up to the Academy of Natural Sciences in Philadelphia where Dan Otte was. And so I kind of got an in with Dan and wound up doing a tour with Dan, taking Dan on a tour of the southeast in 2009 to work on a species group.

03:34

JoVonn: And by the end of the trip, he'd given me the group to work on for my PhD project. So my PhD work was on grasshopper taxonomy. Yeah. And it still amazes me to this day, how amazing it is that I used Dan's books to identify these grasshoppers when I was an undergraduate. And now I have an NSF funded project working with him to write the third volume of those books. It just blows my mind still, how dumb lucky I am, I guess.

Zoe: That's fantastic. And I'll ask you some questions about it later. But something I really loved about your paper is that in many ways it reads like a textbook. It's really user friendly. And I know that people will be able to use it to identify the grasshoppers that you've described.

JoVonn: So that was something I kind of set out to do this paper. And it was really weird, because I had a lot of fun in the field collecting these grasshoppers. It was, you know, we spent, I don't know, four summers or so, and we'll be going back again this year going out to Texas. And it's largely to work on private lands in Texas. There's a group that funds to do research on private lands. And I mean, most of Texas is in private hands. There's a huge state, but there's very little public land in Texas.

JoVonn: And so it's been great, you know, to be able to get into these areas, but they're spread out all over the state. So it's a lot of driving and a lot of seeing Texas. And, you know, we spend one year, we spent like a month in Texas in July, and most of the time our trips were two weeks, two, three weeks. We just kind of have a base camp, Airbnb, and then we'll work out of that. Then the next week we'll move to another one and work all the sites in that area. And so you get to kind of be at home in Texas for a little while. And so you get a good feel for it. And, but because it was, I don't know, it was just, they're just good times in my mind. And I learned a lot about the environments in central Texas. So I wanted this paper to be, not the normal kind of stuffy, you know, revision of, you know, X species group, blah, blah, blah. I wanted to put a little bit of that feel into it.

JoVonn: And so I wrote it, uh, differently. Um, one of the reviewers said it was too colloquial, but I said, ah, you know what, this is a, this was a fun paper and, you know, let's make it accessible to people and kind of, I wanted it to keep that feel, um, for it. And hopefully it came through.

06:27

Zoe: Yeah, I'm in total agreement. I think you definitely accomplished your goal. It's a really nice paper.

JoVonn: Thank you. Thank you. You know, I've written plenty of papers that are, you know, just kind of cutting, you know, the format, right, you know, revising this species group or whatever. And this one, yeah, it was like, you know, in my mind, thinking back, it was good times. It was an adventure. You know, I wanted that to come through. And, you know and read almost more like some of the early, you know, 1900s or literature, some of the early orthopterists, Morgan Hebard or A.P. Morse, Rehn, you know, all their papers where they're out in the out West, wherever, you know, their papers kind of read that way. They're on these trips. And so, yeah, just kind of harken back to that a little bit too.

Zoe: You accomplished that. And also you accomplished the diagnostic work that you set out to do. So I want to talk about first the reorganization that you did in your paper. We're diving into species groups here. And so, and we've touched upon this concept in other episodes of the podcast, but just for those who might not be so familiar, a species group is a group of species that are quite closely related. They could theoretically produce offspring together, but maybe they don't because of some geographic barrier or something like that. So these groupings, they're really useful for taxonomists because they're based upon morphology. So you took two other species of *Melanopus*, and they were previously in this other species group, *texanus*, but you're actually suggesting a brand new species group, a *discolor* species group. So you took these species, you put them with your seven new species, and you created this brand new group. Can you talk us through that and what the significance is?

08:23

JoVonn: Yeah, well, so, *Melanopus* itself is a large genus. It's the largest genus of grasshoppers in North America. There's close to 400 species. So, we break them up into these species groups because it's a little more manageable to deal with when you're doing revisions, when you're talking about things. If you just want us to talk about a group of species, instead of saying them all, you can say what group they're in. So, it is a group of closely related species. And you know, when somebody's talking about em, 'we're talked about the *discolor* group', 'oh yeah okay that's the group with the red tibia and the you know the stripe and this and that'. And so when Dan, so Dan Otte did a revision of the *Texanus* group and added a bunch of new species probably back in 2012 something like that he did a big paper something like 80 new species of *Melanopus* from North America. And he put *discolor* in with the *texanus* group at that time.

09:22

JoVonn: And I kind of saw that. And once, especially once I started working in Texas a lot, I realized that, huh, that's kind of weird because the, and I'd worked with the *Texanus* group, some in East Texas, and they are an early spring group. They're out April, May, June, that kind of period. And usually when my trips going to Texas are in July, they're gone. They're done for

the year and they're eggs underground at that point. And discolor is out and doing its thing in the summer. I thought that was kind of weird. But then also when you look at the genitalia, there's completely different morphology there. Discolor group has these long kind of tubular valves and the genitalia are really long compared to a lot of the discolor group. And discolor group, the valves are arching, definitely separated more. Like if you just saw the genitalia, you wouldn't have put those two together at all.

JoVonn: And then there's a few other morphological features, but definitely that temporal separation was a big thing combined with the morphology was why I felt they should be separated out.

Zoe: And six of your seven new species are from the Edwards Plateau, which is this really large and ancient plateau in Texas. And as you say in your paper, it's, it's really noteworthy because it's an area of high endemism.

JoVonn: So the plateau itself is kind of a cool area. So there's a, when we say high endemism, it means there's a lot of species that are found there and nowhere else in the world. Um, being from Mississippi and the Southeast, I'm more familiar with the North American coastal plain, which all of Mississippi lies in, but that province has just been recognized as a global biodiversity hotspot a couple of years ago. And I've described a lot of new species of grasshopper from there. But a less lesser known is the Edwards Plateau, I think it's not a large area compared to, you know, the North American coastal plain, but so high endemism, but also just that many new species of grasshoppers right there.

JoVonn: And most of them are all along the Balcones escarpment or also known as Texas Hill Country, right there along the eastern and southeastern edge of it. Was pretty remarkable, I think. And that's where the topography of the plateau gets divided a lot. Most of the plateau top is like you would think, a flat kind of tabletop, like a plateau. But that eastern edge is divided and rolling topography. Some of the rivers obviously come there and roll off the plateau and have divided the topography somewhat. So, and it's a gorgeous area. Rolling topography, open, a lot of cedar trees, but the cedars, there's controversy there whether the cedars should be there or not.

12:36

JoVonn: I suspect they probably came in as a result of fire suppression. That seems to be the most logical case. And especially from a biological standpoint. I mean, looking like the grasshoppers there occur in grasslands, right? Savannah's grasslands. And there are all these other cool plants that are that way. They don't come up in cedar forests. So I think a lot of the, especially the balcony area that's covered in cedars now, probably should be more open.

Zoe: And what does collecting grasshoppers look like?

JoVonn: Yeah, yeah. So it's funny. I have a new employee, Dr. Ray Fisher, who works on mites, interestingly, but he's gone with me the last year to help me catch grasshoppers. Because we're also working on a big North American *Melanopus* population-level phylogeny, worked on that with Lacey Knowles at the University of Michigan. And so we're catching, you know, at least 10 individuals of each species from a population for the sampling. And so we have to catch a lot of grasshoppers. And when I'm training Ray to do this, you know, he's collected mites for a long time, so for lazy sampling, all this other stuff. And he's like, man, this catching grasshoppers is where it's at.

JoVonn: It's like, you're just walking around with a net, chasing grasshoppers. And that's it. That was the great thing. That was when I was an undergraduate and learning this. Like, I mean, you know, I've worked on ants, pitfalls, baits, burlese, all that stuff. Grasshoppers, you just get a net and you just walk out into a field and you catch them. You don't need traps. You don't, you know, it's great. You're walking around in a sunny place and, you know, it's just the best thing. That is, you know, if I wasn't, if it wasn't my job, I'd probably be doing it for a hobby.

JoVonn: So that's what it looks like. And of course I have help. So also part of the study, like this work we were doing in Texas, wasn't just grasshopper focused. We also were doing pollinators. So I had people catching bees, butterflies. We did flies as well, carrion flies that we whenever we got to a site we'd set up a carrion trap and then pick it up when we were done collecting and there's lots of stories about picking up roadkill in Texas and and baiting our traps with it and terrible smells, um but uh, even a liquefied porcupine at one point-

[JoVonn laughs at the face Zoe made in reaction to "liquefied porcupine"]

Zoe: nobody nobody can see the face i just made but um....

[both laugh]

15:32

JoVonn: And so, and then also ants. So we, so at all the sites we go to, we're collecting all these different taxa, but everybody knows I'm looking for grasshoppers. And so, we're all walking around with nets, whatever. And so they're catching grasshoppers for me as well. And, you know, same thing, I'll grab bees, whatever I see, but, so, have a field team with me and we go out and hit our sites, you know, we have a planned route for the day. Usually we would get three or four sites in a day because there's just so much driving involved out there. And, you know, we go hit a couple sites, you know, usually spend about two hours at a site and making sure we got everything that's there.

JoVonn: And, you know, if you're in the field with me, usually about three o'clock means we're going to stop for ice cream and tea somewhere. And in Texas, every little town has a Dairy Queen. So that usually means a Dairy Queen stop for ice cream and tea. So-which kind of picks

you up because you know out there you know it's still central daytime but you're further west so it doesn't get dark till almost 10 o'clock so you can have long field days. We would put in 14-15 hour days and so that three o'clock pick me up would like get you through to the next few sites, until we would get home for dinner. So yeah. So that, you know, it's, kitchen grasshoppers is, you know, walking around with a net and ice cream and tea. Not really. I mean, we are doing science, right? But we're having fun too.

Zoe: Sounds like a great summer to me.

JoVonn: But it is, you know, it's also, you know, central Texas in July and August. So it is brutally hot. And for me going from Mississippi, which I'm used to the heat, but it's also heat with humidity. So it's different. And I have to be mindful because it's like, your sweat evaporates out there and you don't realize that you're too hot. So that tea is really important.

Zoe: And did your family do any collecting with you?

JoVonn: Yeah, so, well, so let me say my wife, Jennifer Seltzer also works in the museum here with me. She runs our screening center and she's also the the fly taxonomist on staff. So she would go along these trips as well and you know catch the flies and she would also usually blacklight at night because our former director Dr. Richard Brown is a lepidopterist and she studied under him and you know can pin leps and all that really great. So she would often blacklight at night, and uh, usually, you know, often would stay back and during the day and spread the leps from the night before and, and also sometimes pin the massive amounts of grasshoppers were bringing in.

JoVonn: But also I've done plenty of pinning in the car and the passenger seat of an F-150 going down these long straight Texas roads, just sitting there pinning grasshoppers. So, um, yeah, but, but yeah. And so, so the kids came with us and they often go out to field sites as well with net in hand. Um, Yeah. Yep.

Zoe: Sounds like a great experience.

JoVonn: Yeah. Yeah, it's been really enjoyable.

Zoe: And once you collected these specimens, you did some ID work, some diagnoses.

JoVonn: I mean, other grasshopper other other sub families. So we've got, you know, three to four main sub families of grasshoppers in North America. And you know, you think about the slant faced grasshoppers. They have, they make noise with their hind femurs. They have these little pegs on their hind femurs that they scratch against their forewings, stridulatory pegs, and that's usually species-specific calls for reproduction. Band-winged grasshoppers, they have their flight displays they do with their colorful wings. They have colorful patterns on the inside of their hind femurs that they do this kind of femur tipping and showing off those patterns. So, again,

and then crackling, they crackle their wings, crepitating, so these other displays. But *Melanopus* don't do any of these displays. They just jump on the female, they pounce on the female, and they try to copulate with them, and if it fits, then they reproduce. It's a little more complicated than that. But generally, the shape of the male genitalia corresponds with usually the length and size of the female receiving organ. But in those other groups where they have these other cues like the bandwings and the slant faces, the genitalia are not useful for taxonomy. So it's different ways of pre-copulatory or post-copulatory differentiation.

JoVonn: So in *Melanopus*, you have to talk about genitals. Because that's how you diagnose a lot of them outside of a species group. Because within a species group, externally, most of the species look largely the same. So you need to dissect the male genitalia because that's easier to describe than the female genitalia. And you need that to get species level diagnosis.

Zoe: Yeah, absolutely. And there are some beautiful illustrations of the individual species and then also some images and some illustrations of those reproductive organs in your paper. The illustrations are by Ashley Baker, I believe.

JoVonn: That's right. Yep, yep, Ashley unfortunately has moved on. She took a great job at the University of Idaho, but she worked for me for a couple of years and part of the grant we have with Dan Otte- so if you've ever looked at the first two volumes of Grasshoppers in North America. There are tremendous watercolor plates in the middle that Dan did to illustrate these grasshoppers. And the band-winged one is just amazing because he's got the wing illustrations as well. And when we're doing the third volume, I wanted to be able to carry that forward. Dan is in his eighties now and has largely switched to digital illustration, but I wanted to kind of have some of that feel in this third volume.

22:19

JoVonn: And so part of the grant was to have Ashley train with Dan on illustration. She was an art student here at Mississippi State that we hired early on as a kind of a, to produce graphics for our outreach program in the museum. And, but she went up to Philadelphia, worked with Dan and Dan came here a few times. And anyways, she started working with watercolors and produced those. And she's got a few other ones she's done digitally for some upcoming papers I have. But yeah, sad to see her go, but she was able to parlay this training and her own skillset, obviously, into a really nice job doing illustration for the extension service at University of Idaho.

Zoe: Yeah, there's so many ways to contribute to scientific discovery and to taxonomy. And I think illustration is sort of an underrated one.

JoVonn: Yeah, yeah. I always like to try to have that. It's just eye-catching. I mean, you can have the pictures and we can take great pictures now. But one thing, we have another illustrator here in the museum, Joe McGowan, and he always likes to say that illustrations are good because you can emphasize the things you want for people to see or to notice. And also you can kind of

merge things from different specimens, kind of get that overall thing. Because when people see a picture of something, they think it should look exactly like that, right? And there's variation within a species and you can kind of capture that more so in a drawing than you can an individual picture.

JoVonn: So you kind of get the overall gestalt of a species or species group in this case. And so I always like to try to have illustrations and it just kind of, I don't know, it's nice. And then, you know, I've done some papers where I'm no artist, but I've had Joe train me for a while and I can do some things a little bit. And it's always really gratifying when you have something published with your own drawings and it's kind of like, oh, look at me.

Zoe: Yeah, absolutely. Scientific illustrators are tremendously talented and they do, I think, a really good job, including Ashley for sure.

JoVonn: Yeah, and we've been incredibly lucky to have, for a period, we had two on staff here in the museum with Joe and Ashley. And Ashley was able to learn from Joe a bit too. So yeah, we've probably not the norm to have two illustrators on staff.

24:47

Zoe: That's fantastic.

JoVonn: Yeah.

Zoe: And speaking of your museum, that's where the types for this project are deposited, right?

JoVonn: That's correct. Yeah, the Mississippi Entomological Museum here. It's on the campus of Mississippi State University.

Zoe: I wanna talk about the names of your species for a minute because-

[JoVonn laughs]

Zoe: there are some great ones.

JoVonn: Yeah, please.

Zoe: let's take a little walk. Like, take me through them.

25:13

JoVonn: Okay, I'll just try to go in order through the paper best I remember. So *discolor* obviously was already described and it that kind of means contrasting color or two-colored,

something like that. And, and when you look at the species, you know, it's kind of different colored on top than it is the sides. It's kind of an ashy gray brown on top and then a tan color on the side and that kind of pattern repeats throughout the body a little bit. And that's what I'm guessing the name refers to. They actually didn't say in the original description of that, but logically that's what it would suggest.

JoVonn: And then I think the next one in the paper was *nelsoni*, I think, and because I think that's probably what is the one that's most closely related to it based on genitalia, which doesn't always hold in terms of close relatedness, but *nelsoni* named after Willie Nelson, famous Texas musician and American icon. Um, because we were in Texas and spent a lot of time in the car, we listened to a lot of Texas music, uh, Texas-themed music. Um, and you can't do that without listening to Willie Nelson. And he has it in the, in the, ah, etymology. I mentioned, that we have a little bit of Texas in our souls. Willie Nelson has a song that he wrote called Texas in my soul, uh, which is about Texas basically.

JoVonn: And so I thought that was kind of fitting. So name that species after him. I think next is *kendalli*, which was one Dan Otte described in that big paper a few years back. And then what else we got? *susdentatus*. So that one [laughs] means hogtooth. Sus- is Latin for pig or hog, and dentatus means tooth. And if you come into my office, I have a bunch of hog teeth from a wild boar that I just picked up in the field one day, a couple of years ago and just laid them on my desk, pulled them out of my pocket and dumped them on my desk. And they've been sitting here for years. People come in, they mess with them.

JoVonn: Always, they just turn into a thing of questions. But one day when I was working on the plates of the genitalia for the species. I didn't have a good name for it, but as I was cleaning up the photos, the shape of the genitalia reminded me of the shape of one of these hog teeth. I was like, oh, look, it's the same shape. And so, [laughs] literally that's how I came up with the name. And so now I'm definitely gonna leave these hog teeth on my desk because I have a story about them, I guess.

JoVonn: *corniculatus* means like an antler. And so the genitalia of this one species from around Kerr County or Kerrville, Texas, the genitalia look almost like, like antlers, uh, very multi-pronged and, uh, crazy. So, uh, so what that one means. *walkeri* is named after the musician Jerry Jeff Walker, who was a huge Texas musician. And one of his most influential albums was recorded at Luckenbach, Texas. And the species type locality is close to Luckenbach. I tried, tried, tried to find specimens in Luckenbach to set as the type locality. Luckenbach's this cool little town, many people will know it, but there's songs about it, but it's this tiny little town, it's almost just a post office, but it's kind of just a lot of culture and came like a, especially towards music, a big influential place in central Texas.

JoVonn: But I couldn't find any specimens of the species there. The habitat was just a little too degraded. And plus I didn't have access to a lot of property there either, so I was just kind of looking on road edges and whatnot. But anyway, so, but the type locality is close to there. And

named after Jerry Jeff Walker for his music. And I had listened to his music since, and Willie Nelson's for that matter since I was a kid. But a lot of his songs are really about central Texas and Texas in general. So I thought that was appropriate. Seemed good. And we listened to the music, you know, that music again, going between field sites and you know, kind of made us feel like Texans a little bit.

30:00

JoVonn: So, *Melanopus comanche*, named after the Comanche tribe, due to that being part of their former range, I always feel that's culturally important to recognize that, that and the Tonkawa tribe, both those have species named after them.

Zoe: Just for fun, is there a Walker and a Nelson song that you would recommend that people listen to to sort of get in the mind?

JoVonn: Oh, wow. Let's see, Willie Nelson. Wow. So, you know, every field expedition has to start out with Willie Nelson's On the Road Again. [laughs]

Zoe: Of course, of course.

JoVonn: That's the thing. But you know, Willie Nelson has been making music forever almost for decades and his songbook is huge. You know, a really pretty song, probably one of my favorites is Angel Flying Too Close to the Ground. It's a little kind of a sad, sad song, but it's very nice. Great guitar in it. Texas in my soul is good. Jerry Jeff Walker, wow, there's quite a few. I mean, he's both famous for writing Mr. Bojangles, which isn't necessarily about Texas, but Hill Country Rain is a good one. Leaving Texas is good. I like that one a lot. And it talks about one last look across the prairie. There is a line in that and that's one we play when we leave Texas. [laughs]

Zoe: You got the music all figured out, book ended.

JoVonn: That's right. Oh no, we have definitely a Texas playlist and it's largely them but there's lots of other genres mixed in in the car when we're going.

Zoe: Something that I always forget until I go out to another field season or another field project is that, you know, it is kind of like a unique experience. It's like a bubble. And so to have little special stuff, like the playlist.

JoVonn: That's right. And then when you hear those songs, it takes you back to those times. You know, same thing. I mean, even specimen labels, I can, you know, when I'm going through the collection, pulling out things and I see a label and I remember that day and it's like, oh. Oh yeah.

Zoe: Brings you right back.

JoVonn: That's right.

Zoe: After you spent all this time collecting, identifying, describing, why do you think that your new species of grasshopper is important? Like why do we continue to collect, to name, to identify? Why does it matter?

33:16

JoVonn: I'll speak a little more generally, especially coming from the Southeast. In Texas, I guess you can still count as the Southeast as well, parts of it anyway. But here in the South, our grasslands are where most of our, a huge part of our biodiversity are. And most people don't even know that we have natural grasslands in the Southeast. You know, I have a friend that's a botanist that talks about the myth of the squirrel that could go from the Mississippi River to the Atlantic Ocean and never touch the ground. Well, we know now that that's, you know, not true through historical evidence, quotes from settlers, botanical, biological information, all these cool little plants in the Southeast and species that are endangered inhabit grasslands.

JoVonn: Longleaf pine savannas are grasslands. We have prairies, we have rock outcrops, glades, all these things, but they were some of the first things to be developed because they were already open. You didn't have to clear them. Our Blackland prairies here were open. They were prime real estate for cattle and horse farms, and then of course, you know, they turned under the plow with cotton production. And so they were lost early on. And all we have now are these small little fragments. Within the last, I'll say seven years now, I've described close to 40 new species of grasshoppers, if we include these seven, from the southeast alone. And 34 of them, probably 35, are grassland inhabitants. So we almost, you know, we're in danger of losing all these species before we even knew they existed. Right here in our backyard in Eastern North America. You think, you know, oh, it's North America. We know, you know, most everything here. Well, we don't.

JoVonn: The first species I ever described, *Melanopus ingrami*, came from a cedar glade right outside of Nashville, Tennessee. These cedar glades around Nashville are full of endemic plants, and botanists have been studying them since the late 17 or 1800s. And literally the first step I took in that glade out of the car. I mean, my one foot was out of the car. The other foot was still in the car. A grasshopper jumped up and I was like, my god, what is that? First new species I described. And that's right outside of Nashville, Tennessee, a huge Eastern North American city. That botanists and biologists have been working in for, you know, over a century. And literally, so, and that's a grasshopper. That's not even, I mean, you know, it's not a small tiny insect. What else is out there to discover?

JoVonn: So yeah, document these things. And you know, there's still, I guess there's controversy recently I've seen about, you know, naming species after people and how we go about naming things. But, you know, partly I think you got to make it fun.

36:15

JoVonn: Also, *Melanopus* has over 400 species. Like you start pulling for names at some point. But I think for conservation, I think it's important to, why not put a fun name on something? And Texans love their music. And the central region of Texas, that hill country of Texas is one of the fastest growing places in the country, between Austin and San Antonio. And I have seen the development coming in, places like you can tell, they're just brand new, all these neighborhoods and mansions, and then right on the edge of people's properties are the old barbed wire fences. That was all probably rangeland, less than 10 years ago. So, anything you can do to help conserve something along the way, some of our biological heritage, yeah, do it.

Zoe: I think that's so well said. What's clear to me doing this podcast is, it's like such a moment of joy to name something. And so I think inevitably scientists end up naming species after people and places and things that they care about. And so like, such an interesting glimpse into the lives of the people that work on these specimens.

37:39

JoVonn: That's right. Yeah. I mean, if you look through some of Dan Otte's names, cause he's, he's described over, I forget what it is, over three quarters of the world's cricket fauna, something like that.

Zoe: Wow, wow.

JoVonn: And you know, tons of grasshoppers as well. And looking through his names. And if you know Dan, you're like, Oh, I know where that one came from or I know the story behind that one. And he often doesn't give his etymologies in his papers. But, but if you know him, you're like, Oh, I know the story there. So.

Zoe: It's special. It's just a reminder that scientists put our full selves into our work and you know, that can be, that can be a really good thing.

JoVonn: Yeah. Yeah. Although sometimes your family [laughs] may not like it, but when you're on vacation and you're packing your insect net.

Zoe: Oh yeah. Oh yeah. JoVonn, thank you so much for talking with me today. It's been such a pleasure, and I'm really looking forward to the third volume of the...

JoVonn: Grasshoppers of North America, volume three. And it'll be the *Melanoplinae* subfamily.

Zoe: Phenomenal.

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Seven New Grasshoppers with JoVonn Hill
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JoVonn Yeah. So yeah, we'll get there. It's a huge, huge undertaking. Probably over, it'll be over 600 species.

Zoe: Wow. Yeah. Thank you so much.

JoVonn: Yeah, thank you for having me.

39:07

Zoe: JoVonn's paper, "Diversification Deep in the Heart of Texas, Seven New Grasshopper Species", is in issue 1165 of Zookeys. See the episode details for an open access link to the paper, and to learn more about Jovan and his work, you can follow him on Twitter, @JoVonnH. You can also check out his institution's website, including the Mississippi State Moth Photographers Group, a digital guide to the identification of over 1,500 species of moths at mothphotographersgroup.msstate.edu.

[bright, tech-y music returns]

Zoe: Thanks for listening to this episode of the New Species Podcast. This podcast is created by Brian Patrick, and is edited and produced by Zoe Albion. If you would like to support us, please consider subscribing to our Patreon at <https://www.patreon.com/NewSpeciesPod>. And if you'd like to get in touch with questions or feedback, please e-mail us at newspeciespodcast@gmail.com.

[music fades out]

40:12

Zoe: All right. Is there anything else that you feel like you wanted to add or anything we missed?

JoVonn: I don't think so. I tend to ramble, so it's probably better just to leave it there.

Zoe: No, no. Rambling is encouraged. Rambling is encouraged for sure.