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WGLT Radio Sound Ideas Interview with Edgar Lehr, March 10, 2017

Edgar Lehr: It's always very exciting to...to look for them. When you go to... as a biologist you go to areas where nobody has been before, no scientists, and you're looking for an amphibians and reptiles and anything you find there can be potentially be new, as it was during my last expeditions to Peru.

Charlie Schlanker: You've named this one Attenborough's rubber frog. Why?

Lehr: Why does somebody not want to name a species after Sir David Attenborough? Such a fascinating and admirable person. He stands so much for biology. The the movies that are well known among the population, among students. I frequently use his movies in class. And he has done very good movies about frogs and pointed out their critical situation in the world. I saw his interview... when he turned 90 years old and was wondering "I should name a frog after him." That was looking at a databases, and realized not a single amphibian species has been named after Attenborough and I thought with my colleague we should change this.

Schlanker: That's a little bit of an oversight considering that he likes amphibians.

Lehr: Yeah exactly. So I was expecting that there ...maybe others named species after him, but not there of course. I think 16 species that have been named after him and now 17 with his frog added.

Schlanker: What did he say when you asked him?

Lehr: He was thrilled! I sent a letter to him asking him for permission what one normally should do when dedicating a species after a living person. You have to ask for permission because you don't want to insult a person. Imagine somebody has a phobia against frogs and you name a frog after this person. It, w...would, it wouldn't be good obviously yeah ---

Schlanker: ...Not good.

Lehr: -So,...I...I introduced, shortly, myself to him, and my colleague ...a photo of the frog, where we discovered it and asking for the permission to name it, and we gave the name, how it

would be called to him and now a little bit more than a week we got, I got a letter back from him with a personal note saying that he's thrilled and he likes and that he gave us permission to do so.

Schlanker: Why rubber frog what a...?

Lehr: I have actually no idea but this is the common ...popular term for this genus. I have no idea of who came up with this I... with this name rubber.

Schlanker: Let's talk about the frog itself. What does it look like and how...did you know right away that it was-

Lehr: ...yeah, ...

Schlanker: -different?

Lehr: Definitely for I have a lot of experience in the high elevation of the Andes working in Peru. So I have an idea of how the known species look there, and this was something where nobody has been before and it looked totally different. So it was immediately clear that we have found a new species.

Schlanker: What you may consider totally different and what I or any other lay person may consider totally different could be—

Lehr: --yeah—

Schlanker: --different things—

Lehr: --yeah.

Schlanker: What do you mean?

Lehr: For me, it's...a, ...like the experience, it's like the size, the combination of characters, such as the size, about 2 cm long. Then the coloration, a dark brown-greenish-gray, and...where it lived, and they're very isolated area and so...it was clear...

Schlanker: I was struggling through the paper and... there was a description of super tympanic striping-

Lehr: Uh huh.

Schlanker: -that was also distinctive. I'm guessing that has something to do with stripes over its ahh... ear pits.

Lehr: Ear exactly, ...these are kind of standard terminology. I agree with you that reading such papers is not very entertaining, these are working papers that one needs when he describes other species here to compare with. But these are kind of standard characters, in the form of a standard that is used by scientists for the purpose in describing frogs.

Schlanker: What makes it different from other similar types of geneses or species?

Lehr: Oh...geneses are more difficult actually we thought when we found it that it would belong to a different geneses. That also it is restricted to ah... in North and Central Peru at high elevations, yeah, and had all the character morphological character combinations with the Andes frogs yeah. And so then we were surprised when we ah, my colleague Doctor von May at University of Michigan, conducted genetic research, phylogeny, the evolutionary tree, and it was revealed industry that this frog is actually part of a different genus.

Schlanker: Which one?

Lehr: Pristimantis yeah where we kind of placed it. (Schlanker sighs) So we can see how different sets of characters are important to diagnose and identify species.

Schlanker: This is Sound Ideas. I'm Charlie Schlanker. We're talking with Edgar Lehr a Biologist at Illinois Wesleyan University who has discovered a new frog in the high Andes of Peru. When you found out that it was of a different genus than you thought it might be does that suggest anything about anything about the genus you thought it might be in the first place?

Lehr: Exactly, so we commented on this that researchers needs to be very careful by just using morphological character combinations because it can be totally misleading here. This is a sign that a different character combination have evolved ... convergently without reflecting relationships in the Andes among frogs. Now we are looking into the genus where we wanted to place this frog ah... at the beginning to see if the other frogs that maybe are misplaced in this genus and we have so far have found one potential candidate to which this frog that we described is very similar to.

Schlanker: But if it's not misplaced and there is convergent evolution what does that say about the Andes that produces these kinds of characteristics whether it's the webbing on the toes or the way the head looks or the jaw looks or the ear location look like?

Lehr: Exactly, this is another very interesting research topic to look how an environment kind of shapes an organism that lives in this. Here not only can we see this within the Andes of Peru there are similar cases in the mountains of Philippines or the Himalayas that the character the effectors of environment climactic conditions kind of shape the morphology of organisms that then appear to look similar without being related to each other.

Schlanker: So what about the Andes produces this?

Lehr: Oh the Andes are known to be a hot spot for biodiversity. Its...I spent this year its 20 years that I do research in Peru and it never gets boring. I mean you have to go to an isolated area and you if you do a good job, if you are committed to field work yeah then you can find organisms yeah and reptiles, amphibians that nobody before you has discovered.

Schlanker: You had to get there by horseback, how isolated is it?

Lehr: It is very much isolated. In 2012 I got a grant from National Geographic for especially for this protected area fully protected forest which was a step which I think in the mid 80's, but there no reports nobody... knows what is living there. Yeah and I thought why is that yeah? So I got the grant and the money to go there. Then I realized why nobody went there before me because it is so difficult to get access to it yeah. It's practically a rectangular artificially shaped area in the center of the Eastern Andes yeah. So it takes like... going by car to the next villages are usually in two walking distances from the entrance of the protected area yeah. So a combination of cars, asking locals with their horses to help you and then you have to walk not too much fun at very high elevations through rough terrain.

Schlanker: Frogs are usually considered low level rainforest types of things, but that obviously is not the case. How high

Lehr: no they

Schlanker: do they go and what is the climate?

Lehr: In Peru the record is close to the snow border.

Schlanker: Wow

Lehr: So close to 5,000 meters.

Schlanker: Pretty interesting for something without much of an internal temperature control.

Lehr: Exactly, so they are on the challenge but at this high of elevation the temperature changes very drastically. So the daytime you can have summer temperatures yeah ...and the night winter yeah. So they have to deal with these ...drastic changes and th...they manage to do so.

Schlanker: How do they do that? What sort of biochemistry does allow them to take the huge of fluctuations?

Lehr: Well I can comment on their behavior what they for example do when it gets cold they which would simply hide under stones and the stone layers there can store.... th..the heat yeah and so it's actually when you look under.... stones.. often it's not that cold under yeah. So they can select temperature level that are comfortable and when it g...gets warm they can get closer to the sun.

Schlanker: What's their food and what are their predators?

Lehr: ... Food... are arthropods such as insects for example spiders... whatever fits usually in the mouth of a small frog.

Schlanker: And their predators?

Lehr: Predators for this it hasn't been studied, but there can be snakes yeah of course snakes do not get reach such high elevations but at slightly lower there are snakes. It can be birds yeah that feed on them or large spiders for example.

Schlanker: This is Sound Ideas. I'm Charlie Schlanker. We're talking with Edgar Lehr about a new frog. He's from Illinois Wesleyan University. Do we know how... many of these there are? Are there likely to be and and what their range is?

Lehr: So we found... this new species inside and outside the protected area I think in total from 9 different places that we have mapped and we do not know how far more this distribution goes into the protected area or out of the other border of this protected area. It's unknown, but usually amphibians... from high elevations have relatively small distribution areas simply because of the borders that can be other mountains or deep welling's yeah so usually they're very restricted... more restricted distribution areas the higher one is in the Andes.

Schlanker: Why is it important for us to keep knowing these things to keep reaching out for thee th...the micro differences in in in taxonomy that we're that we're looking at?

Lehr: Yeah amphibians are often termed like the canaries of the cold mines because they're respond very sensitively towards changes and... or environments and when we see amphibians disappearing and this is something that happens worldwide now it's very scary and we should very much alarmed as humans to change them something here to kind of prevent them from from dying out and this has been observed even in protected areas...th...that amphibians are dying. We only can protect what we actually know. And the more we know the better we can protect it.

Schlanker: We've h...heard of about in the popular media we've heard... about those amphibian die offs, but we also heard about parthenogenetic developments of amphibians too. Were there odd sex link traits that you noticed at this altitude-

Lehr: No.

Schlanker: -in these populations?

Lehr: There's nothing known from high elevations that are that one has observed like malformations within frogs nothing...

Schlanker: When are you going back?

Lehr: I go back actually next Monday. Yeah. It was, it's been 10 years idea because I am on sabbatical now I am kind of flexible to...to travel and to do research. And I thought I want to go back to Peru so I'll go next week for two weeks.

Schlanker: What are you looking for then?

Lehr: I will go to Lima to the Natural History Museum of Collaborators Collaborators there for seems to be 20 years and I will revise specimens in the collection, I will meet several colleagues and friends and work with new species.

Schlanker: Congratulations.

Lehr: Thank you so much.

Schlanker: I'm Charlie Schlanker. We've been talking with Edgar Lehr of Illinois Wesleyan University. Thanks so much for joining us.

Lehr: Thank you for having me