New Species Podcast
A New Begonia with Dipankar Borah
Published May 13 2025

00:00

[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 with 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. Dipankar Borah, Assistant Professor in the Department of Botany at Kaliabor College in Assam, India. They're here today to tell me about their paper published in volume 63 issue 1 of the New Zealand Journal of Botany in which they and their coauthors describe a new species of Begonia from Arunachal Pradesh in Northeast India. Welcome Dipankar, thank you so much for coming on the podcast!

Dipankar: Thank you. Thank you, Zoe. I feel privileged to be with you in this podcast today.

Zoe: I'm so glad to have you. We are really lacking in new species of plants on this podcast. And Begonias in particular are known and loved in so many parts of the world, including my own. So can you begin by giving us a little bit of background on the Begonias?

Dipankar: Yes, definitely. So Zoe, Begonias are particularly a fascinating group of plants. They are loved worldwide for their striking foliage, many of which shimmer or display unique color patterns and combinations. Some of the colors they exhibit are rarely seen in any other plant group. Additionally, Begonia species easily form hybrids, making them an exciting group for experimentation and cultivation.

01:23

Dipankar: Many people admire them for their ornamental foliage rather than their flowers as they remain visually stunning even without blooming and plus are relatively very easy to grow. Aside from requiring good watering, they are not very demanding **also.** From a botanical perspective, Begonia is captivating due to its immense diversity. These plants are actively spatiating, meaning that they continue to evolve into new forms, stabilizing within specific micronitres. In many cases, just a few kilometers apart away from one Begonia population, another micronitre exists where a different Begonia might have evolved. This constant process of diversification and adaptation makes studying Begonia both thrilling and scientifically significant for me, especially in this remote tropical forest where they are still being discovered.

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Dipankar: I can also recognize a Begonia instantly because I have seen so many that in their general form is somehow ingrained in my subconscious. I instinctively process whether a plant is a Begonia within seconds, but taxonomically the group is primarily identified by its characteristic asymmetric leaves, then the three winged capsular fruits and I think the Bifid styles. So Begonia belongs to the order Cucubritils, which has this family Cucurbitaceae and includes the gourds and squashes, all those plants that we see or eat almost daily.

03:03

Zoe: I love how you bring the ability to feel that it's a Begonia in. I think that's such a special skill that we develop over time when we're working with one particular group of taxa. I know you're a botanist and also an assistant professor. Can you talk a little bit about your work and how you became interested in taxonomy and Begonias in the first place?

Dipankar: Yes, yes definitely. So, I'm a botanist by passion, but a teacher by profession. My journey started into taxonomy like in my graduation days when my professor, his name was Pradeep Mahanta, introduced me to this fascinating world of plant names through the study of the tea garden weeds. So we have a lot of tea gardens here in Assam. So from there I started identifying and memorizing the plants around my college campus and my curiosity grew and grew as I ventured into new areas.

Dipankar: But my love for the plants and flowers was rooted into me long before that. Planted quite literally by my mother. Despite her daily course, she always devoted time to her garden, filling every available space, even the backyard with plants. So while foods were a natural part of our diet, often gathered around our home, and we used to like that time also, still I'm very fond of those. So watering her plants, watching butterflies and spiders flit among the flowers, and then experiencing the quiet rhythms of nature must have instilled in me an unconscious love for the natural world.

Dipankar: And then later during my PhD, under the Professor Ipidas, I learned how to describe plants scientifically, which shaped my career in taxonomy. And now I spend much of my time exploring the landscapes of Northeast India, identifying plants and giving names to those that have been.

05:21
And then did I talk about APDASA and all these parts?

05:29
Um, not yet. You had, you had started talking. Oh yes. You talked about, um, your experience as a student, um, identifying plants around the campus. And then, um, I think that's about where you cut off. Okay. Okay. So I, I think I stopped at like, uh, this one where I had told that how my, uh, botany interest literally is planted by my mother.

05:57
And then I didn't talk about this PhD days. Yeah, not yet. OK, let me start from there. It was in a flow, so it was going good. But then it cut off. OK, let's start from that part.

Dipankar: So later during my PhD days, under the guidance of my professor, Ipidas, I learned how to describe plants scientifically and we shaped my career into taxonomy. Now I spend much of my time exploring the landscapes of Northeast India, identifying plants and giving name to those which are yet to be recognized. So my daily work involves teaching undergraduate students botany, but my passion for plant exploration takes me to fill whenever I can. On weekends, on holidays, I venture to the lower Himalayan foothills in search of plants.

Dipankar: And occasionally when I have longer break, I travel to the higher reaches, though these opportunities are very rare. my work is constant balance between teaching and then discovery. Both aspects swell my love for botany. And beyond this research and teaching, I am also invested in shaping students connection to nature and then finding the roots in life.

Dipankar: In today's fast paced stressful world, many young students find fleeting excitement in gadgets, but remain detached from the natural world as we are also part of those as we are mid-aged people, isn't it? So I strive to change that. Much of my time is spent making students aware of their surroundings, observing, hunting for flowers and fruits in the wild, distracting and learning from them. We trek to forests, cook food from the wilderness, and then find joy in the simple yet profound experiences. Through these moments of exploration and laughter, I hope to rekindle their sense of wonder and then help them build the lasting bond with nature.

Zoe: That was beautiful. Do you also write poetry?

Dipankar: No, no, I did used to, but somehow got off.

Zoe: Wow, that's amazing.

Dipankar: Thanks.

Zoe: Yeah, that sounds incredible. And I can hear your passion coming through, especially the plants that we see all around us every day. Sometimes there's not enough appreciation for them.

ZoeL I think that Begonias are quite beautiful, and your new species is absolutely no exception. **It's very beautiful as well.** For those who haven't seen the pictures from your paper, can you describe what your new species looks like?

08:53

New Species Podcast
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Yeah, you turned your microphone off, no? Oh, oh, Did you not hear the last? It's OK. got it. OK, I got your question for you. You last told that for those who have seen the pictures in your paper, could you describe your new species? Isn't it? Yes.

Dipankar: OK, so so far I've published many biganias, I think almost 12. And just now one paper is in, so it will be coming soon that we named after the Himalayas, the mighty Himalayas and we named it as Himalaya. So I have published like 12 Begonia species neuroscience and then extended the distribution of seven others. *Begonia ziroensis* is particularly interesting because it is one of the few Begonia species that is adapted to the temperate regions that is occurring above 2000 meters in elevation.

Dipankar: So it is a rhizomatous herb growing between 10 to 20 centimeter tall. The leaves are highly dissected. It seems like it's incised from all the sides and it's green and covered with woolly hairs on the petioles also. Its inflorescence are axillary bearing like four to seven flowers. The flowers are pure white. Male flowers have four temples and more than 100 stamens clustered in the center, while the female flowers have five petals with a very distinctive yellow stigma in between.

Dipankar: The fruits are tree-winged and densely covered with short hairs. The central wing must be somewhat oblong and the lateral wings are narrower. But if I say all these characters, it looks like it is similar to all the Begonias. So when we tend to describe one Begonia or I have to tell you that it's separate from the others, I have to use the taxonomic terminologies. So that's why I find it difficult to generally describe the Bikonia in front of somebody. **I think you got it. Definitely.**

Zoe: I've never asked this on the podcast before, but does your new species smell good?

Dipankar: Do you know? Not that smelly also. It is not that bad, I think. It's a very mild one. You can't even get too much of it because I know that a lot of the other Begonias smell really beautiful. Not to say it's not still a special species.

Zoe: Can you tell us a little bit about how you found the new species? Is there a story there?

Dipankar: Yeah, definitely. Of course. So much of my stories are similar in that I venture into the forest. I go for a long time and then I spot something interesting that is glittering in the dark and then I collect them and later on bringing into the lab and then describing all those parts. if I go specifically, I have to name some people and the location where I had gone.

Dipankar: So I would start like this discovery happened in July 2023 when I was invited by Milo Tassar, the then Divisional Forest Office of Talle Valley Wildlife Sanctuary. So this is a wildlife sanctuary that is present in the Jiro Valley of Arunachal Pradesh. So it's a very pristine valley where the coldest valley, I would say bitter, it will pinch you sharp. So he asked me and my

friend Dr. Mohmang Taram to visit an area near the sanctuary to identify the suitable species for creating a botanical park.

Dipankar: So with that purpose in mind, we set off on a trek. It was about 10 kilometers long. Since the monsoon, which lasts from like much to August in our region, makes this route inaccessible by vehicle. So we had to trek by foot only. So along the way, we savored the fruits of at least four species of rubies, the wild raspberries. So most of you haven't, I think, tasted one. So it's very sweet. if you go to it and then a wild rose are greeted in the sanctuary's entrance. So there was too many of these flowers which were commonly seen in the gardens and nurseries. Their relatives are there in the forest.

Dipankar: The forest was lush but many plants were not in bloom. So we were mostly enjoying the scenery rather than expecting any major discoveries. Upon reaching the site, the forest guards guided us along a small trail where various orchids have been planted to showcase the sanctuary's orchid diversity. However, it wasn't the right season for orchid blooms also. So we saw very little more than the green foliage. As we continued something, red caught our attention. I was very excited. Then Momang shouted, is an agapitis in flower. So agapitis is a very complex group. I leave it like that only when I see it in the field. I keep it like it's an agapitis. That's okay for me.

Dipankar: So just a few steps again, we spotted something more intriguing, a small white flower. Given the landscape scarcity of blooms, at that moment, any flowering plant would have excited us. So we approached and our excitement grew. It was a Begonia. And from that point, the process followed a similar path. Careful dissection, then extensive study to confirm its identity, and then finally the realization that we have found a new species for science. This led to the writing of the description diagnosis and eventually submitting it for publication.

Dipankar: So my work on Begonia wouldn't have been possible without the invaluable guidance of Dr. Mark Hooks, who is a taxonomy research leader for Southeast Asia. And he's not only an expert on Begonia, but also a great teacher and collaborator in my research. So somehow it then accepted by New Zealand Journal of Botany and was published here in the volume you mentioned.

Zoe: We learn almost every single episode on this podcast about how collaborative science is. It's really interesting to hear about your story of discovery. I find it so relatable that you guys, you know, we're going step by step, essentially. Taking me on a hike, it takes like five hours because every few steps there's something I want to look at. I think a lot of people who are interested in science feel that way. One thing I'm curious about, so with animals, you just collect the entire specimen, right? If there's a frog, you take the whole frog, with a few exceptions, especially for fossils. But plants, they have all these parts, including the roots, the leaves, the stems, and then the flowers, especially. So once plant specimens are taken from the field, how are they typically preserved?

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Dipankar: So once plant specimens are collected from the field, their preservation actually depends on the duration of the expedition. For long expeditions, we press the specimens immediately in the field to prevent deterioration. However, for shorter trips of one to two days, we often transport the plant in sealed polybags to our lab or home where they are carefully arranged between blotting papers or old newspapers and pressed under a heavy flat material.

Dipankar: The frequency of changing blotters depends on the plant characteristics. Chartiseous dry or papery plants require one or two changes, whereas flaccid or succulent plants like Begonia need more frequent blotter changes to prevent rotting. Additionally, Begonia specimens require extra care due to their delicate nature. Once sufficiently dried, the samples are then treated with a formaldehyde solution for preservation, blotted again, and then mounted into thick herbarium sheets. These are stitched, labeled with relevant collection details, and finally submitted to a herbarium for long-term storage and study.

Zoe: it sounds like a lot of work, but in the end you have a beautifully preserved specimen. Another question I have for you, plants can have both varietals, which you know of course are naturally occurring genetic variations, and they can also have cultivars, which are variations intentionally induced by humans. So for example, when people breed apples for sweetness, that would be a cultivar. So I'm really curious, when you as a botanist are going out and describing a new species, how do you know that your plant is a brand new species and not just a varietal or a cultivar?

Dipankar: Yeah, sure. Naturally occurring varieties and hybrids are not very common in the wild, especially in this remote Himalayan region where we conduct our explorations. These areas have vast expanses of forest with minimal human habitation. So making the escape wild plants into the wildest cultivated plants into wild is very unlikely. However, there have been cases that's the opposite where wild plants were unknowingly cultivated in the gardens only to be described as new species when they later bloomed.

Dipankar: For many of the plant groups that I work upon, hybrids are not that common also. And it's even very rare or in fact, it's impossible to get a hybrid in the wild but for Begonia it's not that impossible. To determine whether a plant is a true species rather than a hybrid, we carefully examine its characteristics and look for potential parent species in the surrounding area. And if no closely related species are present and the plants exhibit distinct stable traits we conclude it is likely a new species.

Dipankar: So in fact I have currently two undescribed Begonia specimens that I suspect may be hybrids because we have found relatable characters like parent species of these hybrids possibly near the study area where we have occurred there. And we are still studying them to confirm their identity.

Zoe: That's so interesting. I'll be really curious to see what you find. Your paper also collected and identified a related species to your new species, *Begonia siemensis*, which was a new record for India. What is the sort of significance of this finding and why did you feel that it was important to share it in your paper?

Dipankar: Yeah, actually during one of my trips to Kimin in another area and that is also in Anachal Pradesh, we collected a Begonia that left us puzzled for a while. After thorough examination, we confirmed it is *Begonia siemensis*. So until our publication, this species was only known from Laos, Myanmar and Thailand. So our collection marked its first record in India, extending its known distribution by approximately 1000 kilometers.

Dipankar: Such findings are significant because they provide new insights into this species distribution, which is crucial for conservation. A species known across a broader range is often more likely to possess in the wild, as it may have suitable multiple habitats. So documenting news records also helps refine our understanding of the plant diversity of the region and informs future conservation strategies that can be implemented or drafted for it.

23:33

Zoe: Really nice. And if someone wanted to study your type specimens, where can they be found? And kind of how did you and your co-authors come to that decision?

Dipankar: Yes, Zoe, we have the option to submit type specimens of various herbaria across the country, but we typically choose those herbaria which are very near to us, such as CAL, the Herbarium Botanical Survey of India, Calcutta. It is also the largest herbarium in India and offers a convenience of easy specimen submission via post. So additionally, accession numbers are issued quickly also for those specimens or type specimens that we deposit in those herbaria and specimens are digitized with a very short span of time ensuring its broader accessibility.

Dipankar: Apart from CAL we also frequently submit type specimens to Assam and Arun. These are the local herbarias of northeast India and for *Begnonia zeroensis* we have submitted the holotype at CAL and the isotype at Assam to ensure that the specimens are preserved and accessible for future research in both this herd barrier as well as regions within the country.

Zoe: And I'm also wondering how you and your co-authors decided to name your new species.

Dipankar: Yeah Zoe, that's a very interesting question. As I mentioned earlier, the diversity of Bikonia in North East India, particularly in Arunchal Padesh, that state, is very vast. So each specific area within the state often harbors a distinct species. And we maintain, or we prefer, naming them after the place of origin to highlight the presence in that region. Like, Begonia zeroensis is named after the Ziro Valley to emphasize that this beautiful plant is part of its unique biodiversity. So another important reason is that naming species after location honors the land and the community in which forest it thrives.

New Species Podcast
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Dipankar: So when a species bears the name of the place, it fosters a sense of pride and ownership among the local people, encouraging them to see it as a part of their natural heritage, something valuable and worth protecting. So this sense of belonging can in turn contribute to its conservation efforts. That's why we often choose place-based or community-based names for the newly discovered Begonia species.

Dipankar: One paper we are still in draft, actually in draft year, we haven't submitted yet that

26:31
paper that describes a Begonia that we have honored for the community in whose land this plant is found. And we have taught a name for it as *Begonia nyishiorum*. It honors the Nyishi community. And another species, it will be coming soon, that is of another group, is Strobilanthes. And we have named it as *Strobilanthes sardukpenorum* for the Sherdukpen community because they have donated the land where this species grows.

Zoe: And if folks want to read more of your papers and learn more about your new species, I'll link your research gate profile in the description of this episode. My last question for you is about, kind of, biodiversity as a whole. There are so many plants in the world. Why do you think it's important to continue to describe new species of Begonias, new species of plants, and why do you think your work matters?

Dipankar: That's a very hard question, Zoe. And I think this question has troubled me for the past many years, especially as the number of new species being described from this region keeps growing. I have personally described species and does it truly matter? Could I have done something more meaningful for them? So I often have felt disappointed that, despite numerous research articles detailing species identification, distribution and ecology, their fate remains unchanged, and that is they are leading towards extinction.

Dipankar: So if a plant is medicinally or horticulturally valuable, it gets exploited and if it isn't, the habitat gets destroyed. In the past few years, I have witnessed deforestation and habitat loss at a rate far greater than what I have seen over the previous two decades combined. So many of the species I have described, the plants I have once held in my hands may no longer exist now. I have wrestled with the question of how my research truly helps the species I write about, and I still myself get lost in the thought over it.

Dipankar: And one thing only keeps me going that the power of a name. A name gives a species identity and without it no one will care. So my role then is to recognize the known and name the known. And the excitement of finding species new to science is still there. And so is the realization that my work is rarely used by policymakers or the government to protect these plants. But this will definitely do something for it. So perhaps in the future, some of these species will prove to be more important than we know today. Or perhaps every species simply has an inherent right to exist and losing them due to human actions is unacceptable.”

29:41
If I go deeper into this question, it would take a long time. But if you have that, can add something more to it. Yeah, if you'd like, think we have time. Go right ahead. definitely. Then, Joy, actually, I live in the Sáam, a place the world knows for its one-horned rhinos.

30:10
but very few would recognize it as a home to one another species, Chlorophyta maesamicum, a plant that is found nowhere else. So this imbalance in the attention is a part of the problem. Unlike the impenetrable forest of Himalayan states, Assam has lost much of its forest cover since the 1990s, 1900s actually. The remaining patches are under constant threat from logging and human expansion.

30:38
With a very few protected areas like Kajiranga and Manus, these thrive well under government's protection. The lesser known forests like Bihali, Dulung, and many some others are some of the last semi-averging forests in this Himalayan foothills, and they face an uncertain future. So one of my proudest efforts was leading a research in Bihali for six years, documenting plants, birds, mammals, snakes, and butterflies. It was not a

31:08
one of my work but joint and collaborative work definitely and we have described three plant species new to science from this forest and our findings were used to urge the government to upgrade the bihali into a wildlife sanctuary. So it was first a reserve forest and it is now preliminary notified as a wildlife sanctuary. We were thinking that it would give some more protection to the forest but its future still remains uncertain due to this

31:37
border conflicts that we often humans have amongst us. So with each passing day the state of this forest grows more dire and the future of taxonomy seems uncertain. So does my work matter? The question still lingers and I am not sure but perhaps in some very small way it takes a step in the right direction. I hope.

32:05
I definitely think so. Some of the themes and the questions that you've brought up are really not unique to your work in botany and really not even unique to your work in in a some I mean, there are many parts of the world's that whose biodiversity really suffers due to human conflict. And I really believe that by doing the work that you do, and by publishing your new species, you're definitely contributing to

32:34

more information about the natural habitats that we have and that we're losing. So I definitely wrestle with the question too, but ultimately I think we're really doing our best and I think that matters.

32:50
Yeah, I also think so. And that's why I'm still going for that. And then doing what I do and doing what I love. And that's important, too. Doing what you love is really powerful and it's bound to make the world a better place. Yes. Thanks, Joey. We hope for the best. Yeah. And thank you so much, Deepankar, for coming on the podcast. It's been really wonderful to talk to you and

33:19
I've learned a ton and I'm excited to read your new papers in the future. Yeah, definitely. Definitely. I will show share with you and then we will keep in touch through this, I would say email. And then I have when you first approached me till then I didn't knew about that podcast that you have. And then I have gone through several of this podcast. One was on plants, I think one was on iris.

33:47
I like that very much because I was searching on all those. I got to know that you were an entomologist, right? Yeah, that's right. And you work on which group? So I used to be, I used to work on spiders. Now I actually work for the state forest service where I live. So I'm more focused on invasive species.

34:13
Okay, so do you have any invasive species from here? have outbursts Like from India to the United States? Yeah, yeah, yeah. Ooh, I don't know. I don't think so. think India has something from North America at least. I'm not sure. Mostly what we have is... Here, I can stop the recording.

[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.

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