



Encyclopedia of Life

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## Quinine Tree Podcast and Scientist Interview

### *Cinchona pubescens*

In a large greenhouse at the Missouri Botanical Garden in St. Louis, Missouri, there grows a slender sapling of *Cinchona pubescens*, a tree that has played a remarkable role in human history. Journeying to this artificial tropical forest under glass, Ari Daniel Shapiro asks curators Carmen Ulloa Ulloa and Charlotte Taylor just what makes this famous “fever tree” special. He also learns how it’s possible to open a three-hundred-year-old bundle of dried plant specimens and disappear—happily—into the past.

### Transcript

**Ari:** From the Encyclopedia of Life, this is: One Species at a Time. I’m Ari Daniel Shapiro.

Picture your classic tropical paradise postcard. A pounding waterfall. Colorful birds in the mist. Lush greenery.

It looks and feels like a tropical forest. But actually, we’re in St. Louis...at the Missouri Botanical Garden...inside the Climatron...a giant domed greenhouse filled with plants, including a kind of tree called *Cinchona pubescens*. The single specimen at the Botanical Garden is small – a cutting as long as your arm growing in a flowerpot.

To associate curator Carmen Ulloa Ulloa, it’s a reminder in miniature of the *Cinchona pubescens* trees back where she comes from in Ecuador that stand as tall as a 5 or 6-story building.

**Ulloa Ulloa:** The *Cinchona* has particularly beautiful flowers. The color of the flowers are pinkish. And it has white hairs on the petals.

**Ari:** And can you give me a sense of the size? Like, is it a kind of tree I could hug and get my arms all the way around?

**Ulloa Ulloa:** Oh, yeah, they don’t get to be that large in diameter.

**Ari:** The bark of Cinchona pubescens contains a molecule called quinine. It's been used to cure fevers and it's an anti-malarial medication.

**Ulloa Ulloa:** Now, you have to remember that these trees grow in the cloud forest.

**Ari:** What's a, what's a cloud forest?

**Ulloa Ulloa:** Oh, it's like in a fairytale story, at least to me.

**Taylor:** Oh my goodness, I think the cloud forest is about the most wonderful place I've ever been.

**Ari:** Charlotte Taylor is also a curator at the Botanical Garden.

**Taylor:** It's just enchanting. You go in, and there's mist. And the clouds close around you and then they open up, and you have a view, and then the clouds close back. And it flowers all year round – so you always have colored flowers and hummingbirds.

**Ari:** But the duo spends most of their time these days in a very different place than a cloud forest.

**Ari:** Taylor turns the handle on a cabinet that extends from floor to ceiling. It glides to the left along with all the neighboring cabinets. Taylor's standing in the herbarium, which contains over 6 million plant specimens from all over the world.

**Taylor:** We have aisles and aisles and aisles of material waiting for identification. And so the specimens are organized in folders, and they lie out flat. The plants are collected in the field – they're flattened and pressed and dried.

**Ari:** And painstakingly labeled. Like this one collected in Peru in 1944.

**Taylor:** It's a specimen of a wild Cinchona collected at 5000 feet flowering in February. With the specimen is appended the analysis of bark samples.

**Ari:** And why is what you're doing here in the herbarium important to Cinchona pubescens?

**Taylor:** If you want to know about this plant all the way across the Americas, you can lay out our specimens and get enough data to get a very good picture. So that we can find out what kind of habitat it grows in, we can find out the extent of variation in habitat. And when we put this picture of this species together with all of the other species, we have a pretty good picture of the flora.

**Ari:** It's an archive of the plants on Earth. <more than just americas>

Identifying all these specimens keeps Taylor busy. It's a daunting task – surely something that'll last beyond her lifetime. But she loves it in here, tucked in amongst all the dried plants.

Can you tell me what it's like when you get in the zone in this room?

**Taylor:** <laughs> I will be honest – I can't describe it very well for plants, but I can describe it pretty well for my hobby, which is that I fly gliders. And when you are flying the gliders, it is you, and the airplane and the sky. And then you disappear.

I am organizing the information and seeing new, emergent properties from these plants. We suddenly see similarities between forests in two different areas of Bolivia and Ecuador. And then we know that there's a whole vegetation that needs to be preserved that's unique and different.

**Ari:** Are you saying that you can kind of see the beauty even when they're flattened and dead?

**Ulloa Ulloa:** Of course!

**Taylor:** Oh, gosh, yes! They're gorgeous.

Ulloa Ulloa: And our opportunity to work with specimens that can be, for example, 300 years old is just fascinating to us.

Taylor: You start looking at them and then you can't stop looking at them cause they're so wonderful. And then every new one is so interesting, and then you get something in – a specimen in – from something that's unexpected. And it changes our view completely of what we thought these plants contain genetically and what they were able to do. You open this bundle and you go, "Whoa, woo, that's cool! Wow, that's the second collection of that ever! Wow, no one's ever seen that before!" And it gets addictive, I'll warn you..

Our series, One Species at a Time, is produced by Atlantic Public Media in Woods Hole, Massachusetts. I'm Ari Daniel Shapiro.

## Meet the Scientist

Meet Dr. Carmen Ulloa Ulloa, who you heard in the Quinine Tree podcast:



### **Where do you work?**

I am a scientist at the Missouri Botanical Garden.

### **What do you study?**

Growing up in Ecuador's capital city Quito, in the heart of the Andes Mountains it has been natural for me to study plants of the 'top' of these mountains.

### **What are three titles you would give yourself?**

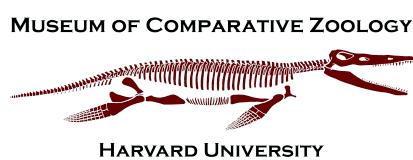
Botanist, editor, home cook.

### **What do you like to do when you are not working?**

I love to cook! I was featured with on National Public Radio on Dr. Zorba Parter's "On Your Health" radio program.

### **What do you like most about science?**

Exploration, discovery, education.



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