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Box Jellyfish Podcast and Scientist Interview

Carybdea

Researcher Angel Yanagihara works to unlock the secrets of venom of Carybdea alata, beautiful, and sometimes dangerous, angels of the sea.

Transcript

Ari: This is One Species at a Time, the story of Earth's biodiversity, one organism at a time. I'm Ari Daniel Shapiro.

Ari: Sometimes, something unexpected helps you figure out what to do when you grow up, or even once you're already grown up. That happened to Angel Yanagihara just after she finished her education. You see, she lives in Hawai`i and she's always been an avid ocean swimmer.

Yanagihara: So I was going out for a swim at about 6:30 in the morning. And as I was coming back in towards shore, I was stung by something on my neck. I couldn't see anything in the water.

Ari: So she dove down and swam as far as she could before coming up. But she got stung again, this time on her arms, so she went down once more, came back up, and got stung again on her legs.

Yanagihara: It was a fiery, painful sting as if you had touched something burning hot. And then I had difficulty breathing as well. But the pain was becoming more and more profound, so I really kind of went into a determined mode and just kept swimming towards the beach and finally, I did make it back. And it was just absolutely all I could do to get to the beach and then the next thing I knew I was in an ambulance.

Ari: The culprit? Creatures called box jellyfish – scientific name Carybdea alata, that'll be important later. They're as small and transparent as a Ziploc baggie. Yanagihara had run into a thicket of these jellyfish while swimming.

Yanagihara: They have 2-4 foot long vibrantly pink tentacles behind them.

Ari: The tentacles had stung her and caused the pain. But Yanagihara's saga that day was far from over. After the paramedics treated her on-site, Yanagihara thought it was silly to go to the hospital for just a jelly sting. Since she got some initial relief from the pain, she decided to drive herself home instead.

Yanagihara: About three quarters of the way home, the pain returned gradually and then suddenly, it was much more than I had experienced even at the worst point on the beach. So at that point, I tried the common arsenal that folks use to treat the symptoms, but basically nothing worked.

Ari: You were bed-ridden for a couple of days and then you had this rash that lingered for 14 weeks, and then, were you kind of riled up? Were you ready to get even?

Yanagihara: Well, it certainly got my full attention and as a biochemist, I wanted to know what was in this Hawai`ian box jellyfish venom.

Ari: She became totally absorbed in finding out what was actually in this venom. The question distracted her even on vacation.

Yanagihara: Actually had a trip planned to the east coast to visit a friend and just to relax and go shopping and things. And as soon as I landed, I told her, "Well, you know, I wanna do a literature search." So I thought this would be a perfect thing to write up as a research proposal. So not so much to get even, but certainly to put my brain where my pain had been.

Ari: So you're saying that instead of going shopping, you wrote a proposal.

Yanagihara: Exactly. I know, so that sort of started me on a different career path.

Ari: More than sort of. It steered Yanagihara down a new science path altogether. One she's been working away at ever since, learning all she can about the special stinging cells of the box jellies called nematocysts.

Yanagihara: This spring-loaded impalement device designed to pierce through the prey.

Ari: Because that's really the whole point of all of this. The venom wasn't meant for Yanagihara. The box jellyfish use it to attack the food they eat. Yanagihara just got in the way. These days, she's an assistant professor at the University of Hawai`i at Manoa trying to reduce the pain resulting from box jellyfish stings. By looking into home remedies like vinegar and hot water. And by developing drugs to tackle some of the most painful chemical ingredients in the venom.

Yanagihara: And we now have basically matched one for one – at least one, if not more – inhibitors for each of these hot button ingredients.

Ari: She's even got a couple of patents in the works. It's remarkable how these box jellyfish redirected Angel Yanagihara's life. In fact, the relationship keeps getting more and more personal for her. Take this story about a nematocyst expert she visited once in Italy.

Yanagihara: He leaned back in his chair and started laughing and he said, "Well, didn't you notice the poetry of this?" And I said, "Well, what do you mean?" He said, "Well, you're studying Carybdea alata. Do you know what alata means?" And I said, "Well, I don't really know Latin." He said, "Well, that would be winged ones. So these are the winged ones of the sea and here you are Angel. And so perhaps they reached out to you to be some kind of a spokesperson."

Meet the Scientist

Meet Dr. Angel Yanagihara, who you heard featured in the Box Jellyfish podcast:

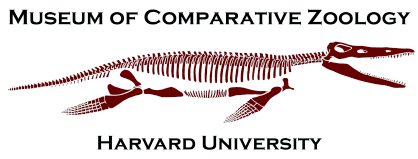
Where do you work?
I work at the Bekesy Laboratory of Neurobiology, Pacific Biosciences Research Center and Asia Pacific Institute of Tropical Medicine, John A. Burns School of Medicine, University of Hawaii at Manoa.

What do you study?
My research focus is bioassay directed biochemical characterization of cubozoan venoms.

What are three titles you would give yourself?
Biochemist, mom, student of life.

What do you like to do when you are not working?
Enjoy my family, ocean distance swimming and gardening.

What do you like most about science?
Failure! Again and again, careful consideration of a "failure" has led to a completely unanticipated and exciting new discovery.



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