Europe Medical

Meet the "lizard lady," Tracy Langkilde, Associate Professor and Head of the Department of Biology at Pennsylvania State University. Winner of the Ecological Society of America's prestigious George Mercer Award, Dr. Langkilde received a B.Sc. in Biology from James Cook University, Australia, and a Ph.D. in Ecology and Evolutionary Biology from the University of Sydney, Australia. She and her students are exploring how interactions among species can shift over time in response to changes in the environment. Currently, several projects in her bustling laboratory are focused on how the arrival of an invasive species (one that is new to a particular geographic region), the fire ant (*Solenopsis invicta*), affects the behavior, morphology, and physiology of a native species, the fence lizard (*Sceloporus undulatus*).

"Reducing the abundance of an invasive species can buy native populations enough time to respond naturally."

A fire ant prying up a scale on a fence lizard's head in order to inject venom into the underlying skin

An Interview with Tracy Langkilde

Much of your research is on fire ants and fence lizards. Why study these particular organisms?

Interactions between species can change over time. To find out how such changes occur, I'm studying how communities respond to recent perturbations, such as the arrival of invasive fire ants. These ants reached the United States in the late 1930s. They give really painful stings, and so people report them immediately. Thus, we know when fire ants reached different regions and first encountered native fence lizards. With this information in hand, we can observe how fence lizards from different regions have responded to fire ants over time.

Have adaptations to fire ant attack evolved in fence lizard populations?

When faced with a threat, the usual response of a fence lizard is to sit still, close its eyes, and hope the threat goes away. But fire ants never go away, and just a few of them can kill an adult lizard in less than a minute. So over time, new ways of dealing with fire ant attacks have evolved in lizard populations. Instead of sitting still, the lizards shake their bodies very rapidly, scratch at the ants with their back legs, and perform a 360-degree back flip—each of these behaviors can send fire ants flying off their bodies like little missiles. The lizards' legs have also evolved, becoming longer, making these behaviors more effective.

Are there practical applications of your work?

Some invasive species harm native species or cause billions of dollars of economic damage each year. It can be very hard to get rid of such species. I don't think we're ever going to get rid of fire ants, for example, or cane toads in Australia. In such cases, there is tendency to not even try. My research suggests that we should attempt to reduce the abundance of an invasive species to the point where they don't wipe out native species. This can buy native populations enough time to respond naturally, as happened when adaptations to fire ant attacks evolved in fence lizard populations.

You've done field work in many different parts of the world. Tell us about a memorable experience.

As an undergraduate in Australia, I worked in an area infested with deadly snakes called taipans. After that, I was petrified of snakes. So when my Ph.D. advisor said, "Do you want to come and work with 10,000 snakes?" I thought, "Sure, that sounds . . . Oh my gosh, I am going to die." But it was amazing. We were studying male courtship behavior in the garter snake dens of Manitoba, Canada. The dens are in caves where the snakes spend the winter. In the spring, tens of thousands of snakes emerge over a few weeks. We'd go into a den and pick up an armful of 100 males. The males mostly ignore you except maybe to rub their chin on you to see if you're a female. That experience quickly got me over my snake phobia!

What do you find most rewarding about your job?

I love the variety my job offers, getting paid to travel to fascinating places, and being my own boss. I also love helping students discover how cool it is to do research. Students often say, "I'm really good in the field, but I'm not excited about analyzing data." But after collecting their own data, they can't wait to analyze it and find out what is going on. Working as a professor has also led to personal discoveries. For example, I was worried about juggling work demands with having a child. But I get as much done as I did before; it just takes less time to do it. Having a child has put things in perspective—my life is more balanced, and this has positively affected my research. I've taken my son to conferences and into the field with me, and he loves it!