

## **Eight-legged friends**

*Or, how a nice girl from Michigan ends up spending her days in a room full of spiders*

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Sex, death and potential clues about evolution all lie behind the door to room 243 of the Fleischmann Agriculture building on the University of Nevada, Reno campus.

The place is a spider laboratory.

Scattered across three out of the four long, narrow tables in the dimly lighted lab are stacks of covered plastic containers, each holding a single fishing spider, a brown arachnid about the size of a quarter. There's a clear aquarium swarming with crickets — spider food — and thin strands of spider silk extending from the top of a bookshelf to the ceiling, evidence of spiderlings that have escaped their nursery. Kelly Kissane, who's earning a doctorate in ecology, evolution and conservation biology, is three years into a research project that could help determine how species evolve. She keeps and breeds fishing spiders as research subjects.

She's also one of two entomologists in northern Nevada who identify spiders, and is an ardent defender of the creatures, which she says often get blamed for bites caused by insects.

"Spiders get a bad rap, they really do," Kissane said.

What causes a new species to form? Is it a lack of genetic mixing? Do pheromones — chemical substances released to stimulate responses — play a part? Is it caused by behavior?

For answers, Kissane looks to the fishing spider, a spider that is somewhat picky when it comes to mating.

"That's very unusual," Kissane said.

Different groups of fishing spiders, even those that live within a few miles of each other, act differently to attract mates, Kissane said. A scientist would expect mating behavior to be the same, even though the groups were independent, Kissane said. Yet they have different mating behaviors — fishing spiders from the Great Lakes region in Michigan refuse to mate with fishing spiders outside the region.

“This surprised me,” Kissane said. “The life of a male spider is all about mating, once it reaches sexual maturity.”

The different mating behavior may mean that the fishing spider is in the process of becoming more than one species. Kissane’s research, which she expects to complete in two years, will help determine what mechanisms are involved in one species becoming more than one species. Ultimately, it may add to our understanding of evolution.

But what people really want to know is: How does a nice, 40-year-old woman from Michigan end up spending her days in a darkened room with a bunch of spiders?

“The most common question from people is ‘why do you study spiders?’” Kissane said.

There’s a practical answer: Fishing spiders have a two-year life span, making it possible to study several generations over a short period of time, as opposed the many years it could take to study wolves or other mammals, which live longer and have longer gestation periods.

There’s also a personal reason.

“I think they’re fascinating,” Kissane said.

Her curiosity was sparked in 1995, when she was an undergraduate at the University of Arizona in Tucson studying genetics.

“Down the hall was the arachnology lab, and it had some fishing spiders from Florida,” she said.

The fishing spider is one of the few types of spiders that lives in an aquatic environment, a fact that intrigued her. So she read up on the critters — at least, what she could. There are only about 10 scientific papers written on fishing spiders, she said.

Kissane earned a master’s degree in entomology, the study of insects, at the University of Maryland-College Park, but her research there was focused on spiders. Fishing spiders remained an interest.

“I always wanted to do this project,” she said about her work at UNR.

She and her adviser, UNR biology professor Richard Rust, agreed before she came to the school in 1999 that she would do the research project, even though fishing spiders are not found in nature in Nevada.

Things didn’t go smoothly at first.

“I killed a lot of spiders when I started out,” she said.

Kissane learned the hard way that fishing spiders die very quickly without water, and they die with too much. Many die during the process of molting, the growth period when they shed their exteriors. They eat each other.

“Most spiders are cannibalistic,” Kissane said, picking up a quart-sized plastic container filled with hundreds of tiny, scampering fishing spider offspring. She’ll have to separate them into individual containers within a few weeks.

And although one egg sack — a female fishing spider can lay up to three during her lifespan — can contain up to 1,500 spiderlings, most do not survive. Kissane has about 200 mature spiders in the lab, roughly 40 per geographic group.

She feeds them each one cricket per week. Fishing spiders inject their prey with digestive enzymes that liquify the meal, then partially chew it.

“What’s left is not really distinguishable,” she said.

She also mates the spiders.

“She’s from Ohio,” Kissane said, pointing to a single spider resting in a corner of a square glass aquarium. Later, the spider will be mated with another fishing spider, an episode Kissane will videotape.

And when she must, Kissane kills them.

She picked up a container holding a fishing spider about the size of a 50-cent piece, a type that lives near streams. She keeps him for DNA research, and must kill him in order to get the data. She can’t allow him to die a natural death, Kissane said, because his body will immediately decompose, and the DNA information will be lost. He’s a mature a spider, and for the past few months Kissane has been aware of the necessity of her grim task.

“I haven’t done it yet,” she said. “But I need to.”

People sometimes are reluctant to walk into the Carson City office of Nevada state entomologist Jeff Knight. One person refused to enter.

The office is full of bug specimens: insects and spiders that people have brought in for identification. He sees about 300 to 400 spiders per year. He has his theories on arachnophobia — fear of spiders — one of the more common specific phobias, according to the U.S. Food and Drug Administration paper “Fighting Phobias.”

“I think anything that has more than four legs and has fangs and is fuzzy, we’re going to be a little afraid,” Knight said. “We’ve been conditioned to be.”

Blame Hollywood, he said. Comedy/horror films like this past summer’s “Eight Legged Freaks” and 1990’s “Arachnophobia” portray spiders as human-eating monsters. And last spring’s blockbuster “Spider-Man,” based on the Marvel comic superhero who gets his powers after being bitten by a radioactive spider, didn’t do much for arachnids.

“Even then, the spider was kind of the villain who bit (main character Peter Parker),” Knight said.

Like Kissane, Knight said spiders get a bad rap.

“They’re one of the most beneficial groups we have,” Knight said, referring to spiders’ propensity to eat insects. “They’re basically eating machines.”

Eating machines with no real taste for humans.

“Spiders are really, really reluctant to bite humans,” Kissane said.

A spider will bite in self defense, Kissane said, if you accidentally stick your hand in its web, brush one off your clothes or do something else that causes it to feel threatened.

Most are not poisonous, but northern Nevada is home to the black widow, which releases a neurotoxic venom when it bites. Such a bite can cause stomach cramps, nausea and swelling around the bite. Reactions will vary depending on the person, Knight said, and the amount of venom the spider releases when it bites. Black widows are shiny and black, and the females have a red hourglass-shaped mark on their abdomens, Kissane said. If you spot one in your home, Kissane suggests calling an exterminator, because some people do experience severe reactions when bit by a black widow.

Although not poisonous, the tarantula is another spider that causes a stir in northern Nevada.

“We got a lot of calls this fall,” Knight said, from people who found tarantulas in their homes.

Hairy, and with a leg span that may be as wide as 5 or 6 inches, the tarantula is not something many people want to live with, but these spiders rarely bite.

Like most spiders, tarantulas often move indoors in the fall to get away from the cold weather. Tarantula populations go up and down, Knight said, and this year’s calls complaining about tarantulas in houses came mostly from areas that butt up against native vegetation, primarily from the north valleys, Spanish Springs and Hidden Valley areas.

Tarantulas are enjoying some popularity as pets, a trend both Kissane and Knight seemed reluctant to embrace. Tarantulas are fragile — if one is dropped, its exoskeleton, or external covering, probably will crack, causing it to bleed to death, Kissane said. Some non-native varieties found in pet stores, such as the cobalt blue tarantula, can be aggressive, she added.

But most spiders people deal with are simply run-of-the-mill house spiders, quietly spinning their webs in ceiling corners and trapping those pesky flying insects. The urge to swat them with a broom may be strong, but can be modified into an uneasy tolerance. Genuine affection for the spider cannot be far behind.

Just ask Kissane, who once was afraid of spiders.

“When I first started working with them, I never touched them,” Kissane said.

Instead of picking up her research subjects, she spent a lot of time trying to scoop them up with little plastic tubes the size of film cannisters. But spiders are quick, and Kissane grew frustrated enough to start picking them up with her hands. They rarely bite her, and some are calm enough to allow her to carry them around the lab.

“You get attached to them,” she said.



**Liz Margerum**/RENO GAZETTE-JOURNAL

MEET MY FRIEND: Kelly Kissane, a doctoral candidate at the University of Nevada, Reno, holds one of the fishing spiders she uses for her research. She's also one of two entomologists in the state who identify spiders for the public. Spiders, she said, get a bad rap.