

The Ant Shrink

It's always 80 degrees inside the insectary, where miniature worlds thrive within 11 Tupperware containers. The room might seem calm, but each world bustles with the energy of New York City – only bloodier. Queens command soldiers. Rivals rip each other's heads off. Crickets are decapitated and devoured for dinner. At least, that's what Dr. Deby Cassill says.

Dr. Cassill is an evolutionary biologist and professor at the University of South Florida St. Petersburg. Her specialty is ants. With a background in psychology, Dr. Cassill studies ants like a professional shrink. She calls them her “window into how life works.” For her, work is play.

“Teaching is half of what I love to do,” she says. “The other half is setting up an experiment and letting the ants tell me a story.”

She is 62 but looks 10 years younger. Blonde hair swings to her shoulders. She wears a white turtleneck tucked into a pair of close-fitting gray jeans – what she calls her winter “uniform.” Pinned to her jacket is a green-and-gold Apple Award, which students give their favorite professors. With her infectious laugh and down-to-earth sense of humor, it's no wonder she's a favorite.

In second grade, young Deby chased bugs with a handmade butterfly net and watched, captivated, as ants communicated with their antennae. She went to school for psychology but never lost her fascination with ants. After working for years as a bureaucrat, she enrolled in Florida State University to study biology.

The first time she saw an ant colony through a microscope, she was “hooked.” The brilliant colors made her forget the acrid smell of ant pee. “Oh!” she exclaims, remembering.

“The eggs are like the most beautiful white grapes you could ever imagine,” she says. “Then the larvae are like freckled jellybeans only clear ... they're just adorably cute and they turn green when you feed them.”

In an early experiment, Dr. Cassill disproved the idea that worker ants controlled fertility by feeding some larvae more than others. She dyed sugar water green – ants love the taste of green McCormick food coloring – so she could tell which larvae had been fed. She starved another group of larvae for 48 hours, “which

you can't do with human babies!" she teases. When she reunited the groups, worker ants only fed the hungry larvae. They distributed food equally, proving that workers did not control larval fertility.

It wouldn't be the last time Dr. Cassill disproved a former theory. "I love this. I'm blonde. I'm older. I'm a female," she says. "I've gone toe to toe with the best minds in biology, and I'm slowly but surely knocking the legs out of ... their theories with data."

A researcher at USF St. Petersburg since 2001, Dr. Cassill studies patterns in ant feeding, housing and interactions. She is the Ken Burns of the ant world. Documentary videotapes line her lab, with labels like "Crazy Ant Interaction with Aphids, 8/12/09." She watches them over and over, analyzing data. Her favorite discovery is that ants have personalities: some ants scatter in terror when she drops a bead onto their container, while others charge with open mandibles. But she never arranges ant marriages.

"Ants must fly before the love turns on," Dr. Cassill says, flinging her arms wide.

For Dr. Cassill, love turned on right after college: she married her sweetheart in 1969. But in 1994, after 25 years of marriage, her husband died. While she pursued a Ph.D. at Florida State University, she and her son Daniel lived on \$800 a month. They learned the difference between want and need. Two years later, her son, then 17, was driving home from work when his Thunderbird hydroplaned on a wet road and hit a tree. He lay in a coma with a 50 percent chance of survival. Work was the "stabilizing force" in Dr. Cassill's life for those seven weeks. When Daniel awoke, she resolved to care for her son and still pursue her life's work. She has succeeded for the past 13 years.

Though her family is supportive, they don't always understand her fascination with ants. "Deby, why do you try so hard to be different?" her mother sometimes asks.

"Mom, I'm not trying, this is just me!" Deby Cassill answers.

Dr. Cassill's major discovery came in 2003, when her Skew Selection theory challenged an accepted evolutionary principle.

"My very average self started looking at data and realized there's a whole different way of looking at this," she explains.

Most evolutionists thought parents "invest equally" in their offspring: whether they turn out strong or weak is only random. Dr. Cassill disagreed. Parents "skew the quality" of these offspring, she claims. In other words, "they bias who will survive and who will reproduce." In the wild, hog piglets get unequal amounts of milk, and some become runts. That way, when predators eat the runts, it gives the mother and her stronger offspring time to escape. Dr. Cassill is

modest about her discovery. “Common sense kind of kicked in,” she says.

Ten years from now, she hopes to have won a scientific award for her Skew Selection theory. With no plans for retirement, she calls her work “one of the sweetest gigs around.” She teases students, “I’m gonna go at this till I’m drooling and I can’t remember where my classroom is!” For now, Dr. Cassill is happiest in her warm lab, where a sign reads: “These Premises are Patrolled 24 Hours a Day by Fire Ants.”