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Doctoral student from Mount Pleasant travels world in search of daddy longlegs

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By Maryann Gogniat Eidemiller

Daniel N. Proud leaves no stone unturned while searching for his favorite arachnids -- the daddy longlegs, or harvestmen.

The native of Mount Pleasant Borough also looks under logs and leaf litter in tropical forests. He spent part of the summer doing just that at La Selva Biological Station in Costa Rica, where harvestmen were just beyond the front door.

"We found them in all different kinds of habitats, from tree trunks to on the ground," he said. "You can find them just about anywhere."

Mr. Proud, 24, a 2003 graduate of Mount Pleasant Area High School, is in the doctoral program in environmental and evolutionary biology at the University of Louisiana at Lafayette.

He recently returned from Costa Rica with 500 dead harvestmen in his luggage, stopped to visit his family here and then went back to the university to study the new specimens.

Mr. Proud has had a longtime interest in biology, but it did not start with arachnids. He attended Virginia Wesleyan College in Norfolk with a double major in biology and mathematics, then switched to biology after going on two undergraduate projects in Trinidad, the first when he was a sophomore.

"We started collecting things that people had never seen described before, and that was fascinating," he said. "That started me on research, and that's why I chose to go to grad school."

He returned to Trinidad after graduation and conducted research in Belize, too.

Harvestmen are invertebrates in the order Opiliones, the third-largest order in the class of arachnids. The order Acari -- mites and ticks -- ranks first. The order Araneae -- spiders -- is second.

Although harvestmen look like spiders and have four pairs of walking legs, they are not spiders. They don't have venom, don't bite and don't spin webs. Like spiders, their bodies are segmented, but the way the segments are joined makes the body appear to be one oval.

"There are more than 6,400 species, but so little is known about them," Mr. Proud said. "Most of what we know is generalized from a few species that have been studied more thoroughly, but in general, not a lot is known about the tropical species."

Harvestmen live on all continents except Antarctica, and according to fossil discoveries, they have changed very little in more than 400 million years. They are generally omnivorous, Mr. Proud said, and will eat fungi, flower parts and small, soft-body invertebrates.

Some species may differ in appearance. In the United States, harvestmen have dull, small brownish bodies and delicate, long legs. Mr. Proud has seen some that look like that abroad, too. But for the most part, he said, "in the tropics, they tend to be more colorful and their bodies tend to be bigger and a little more robust. They can also range from very small to fairly large."

Harvestmen are easy to find and capture. Mr. Proud studies some while they are alive, but all end up preserved in 70 percent ethanol.

At the university lab, he scans them under microscopes to look at legs, bodies, sensory hairs and, on the males, swollen leg segments that are glands. He dissects some, too.

"I'm interested in studying evolutionary relationships between some of the groups within the order of Opiliones," he said. "I'm also interested in structural morphology, which is how something is structured and how it's used."

Mr. Proud and his adviser, Dr. Bruce Felgenhauer, are focusing on leg glands, which Mr. Proud hypothesizes are used in reproductive behavior.

But why study harvestmen?

"One reason is to understand the diversity, and in actually describing the species as we are collecting, we are finding new species that have never been described before," he said.

"So we are really building that base of knowledge, not only of the harvestmen in the tropics, but on arthropods in general. Another reason is that we don't actually know the role they play in ecology, where they would be as part of the food chain."

Researchers also are looking at worldwide distribution to compare how groups are related and how that matches the theory of continental drift. Harvestmen also may be indicators of species disturbance in the destruction of rain forests.

Mr. Proud plans to return to Costa Rica and to collect harvestmen in Panama and Nicaragua. His ultimate goal is to teach and do research at a university or college.

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