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The Tale of a Giant Sponge, A Hot Chili Pepper, and a Bat

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by Carlos A. Iudica

Although I had been a professional biologist for seven years when I began graduate school in Florida, I knew almost nothing about bats. In fact, I had spent two full years surveying a rain forest in Argentina, yet still had not given bats much thought. Then one day, while discussing plans for my master's research, Dr. Peter Feisinger, a professor in the zoology department, asked me if I'd ever considered working with bats. When he offered me a box full of literature on different species, I thought, "Why not?" Within a couple of weeks, I had fallen in love. Because I wanted my studies to focus on ecosystems, I thought bats might offer a good approach: the information I would gather about them would apply to many relationships in the food chain. I redirected my master's project, sought funding to support my field work (some of which came from BCI), and returned to my homeland of Argentina.

My research site was Calilegua (cal-ee-leg'-wa) National Park, the northwestern montane forest on the foothills of the Andes where I had previously spent four years as a biologist with the Argentina National Park Service. Although Calilegua is far south of the tropics and at the extreme geographical edge of most things considered tropical, the forest holds an amazing diversity of plants and animals. A lush thicket of wet ferns and orchids carpets the floor, and I had often observed tapirs, toucans, and troops of monkeys foraging amidst the giant ficus and towering, 100-foot-tall rosewood and walnut trees.

In addition to working with bats, something else was different on my return to Argentina. Almost without realizing it, during my time at graduate school, I had become more and more a conservationist. The University of Florida was a mecca for conservationists at that time, and I had been in the middle of it. Once in the field, instead of just gathering data as I always did before, I spent some time including local residents in my projects. After all, these people coexisted with the rain forest, and they deserved to know who I was, what I was doing in "their" forest, and why my work was important.

The local people are aware of the rain forest and its wealth, but because of folk tradition, they don't go into the forest. They may be willing to go near the edges to pick fruits and nuts or to hunt (illegally), but staying overnight in the forest is unthinkable. They believe there are creatures active only at night that will emerge from the plants and eat your brain. Believe it or not, this legend has actually been helpful in the conservation of the area, because people never stay in the forest for more than a few hours at a time.

The first thing I did was contact the state and local newspapers. I let them know about my project, and the response was excellent. Several newspapers published short articles about my work and the importance of research and conservation of the forest. The next step was to contact radio stations. FM radio had recently begun to flourish in Argentina. Most small towns had two or three stations, to which almost everybody in town listened. I gave short speeches as well as interviews, mixed with local news and weather reports, and I talked about bats as natural insect controllers, seed dispersers, and pollinators.

I also brought up a topic of particular interest to the local citizens: water. They all know water is important; their crops and animals depend on it. Although Calilegua receives approximately 79 inches of rain annually, 90 percent of the rain falls in torrential storms during the summer months (from roughly November through March). "The mountain rain forest acts as a giant sponge," I explained. "The plants and soil soak up the seasonal rains, hold them, then slowly drip water into the rivers that feed the town. But the continuous water supply could be lost if people cut down the trees. And birds and bats are important because they disperse seeds and plant new trees that will hold water for future generations."

With this explanation, the people seemed to understand that bats were connected with their year-round water supply, and that was enough for them to appreciate why I was there. From then on, I tried to create an atmosphere in which everybody in town would know about my research. During the full phase of the moon—when it's hard to catch bats because they are more visible to predators and therefore more cautious—I visited different towns to talk about the rain forest and bats. I also gave talks at high schools about bats and careers in biology.

During the new moon, I returned to the field, netting and taking notes on bats. Several findings were beginning to flag the significance of certain bat species in the forest ecosystem. Most important, I discovered that yellow-shouldered bats (*Sturnira lilium*) were dispersing seeds of the *Capsicum* pepper. This shrubby plant grows on the borders of the rain forest, producing small and extremely hot chili peppers. Locals preserve the peppers in jars with vegetable oil, and even people who are used to very hot peppers use only a few drops of oil to season an entire pot. To yellow-shouldered bats, though, these peppers are a treat. How they can consume this spicy plant is as yet unknown. They eat large amounts, then spread the seeds away from the mother plant, giving the seedlings a better chance to survive. This finding was well received locally because the people of the area handpick this small chili pepper, both for their own use and to sell in the farmers' markets. Some locals later suggested that anyone who goes to the forest to pick chili peppers should always leave a few peppers per plant to ensure that the bats have food and will disperse the seeds to generate more plants for the future.

The community's immediate understanding of the roles of peppers, bats, and the sponge effect in the rain forest proved to me that conservation truly begins with education. The people realized on their own that the progress we hope for on a large scale is the sum of many individuals who every day, little by little, do something to preserve nature's treasures.

Carlos A. Iudica is a Ph.D. candidate in the Department of Zoology at the University of Florida (UF). He has traveled widely throughout Latin America, worked with Frank Bonaccorso on the bats of Papua New Guinea, and earned his Master's Degree from the Tropical Conservation and Development Program at the Center for Latin American Studies at UF. He is presently studying fruit bats of the genus *Sturnira*.

SIDEBAR to "Tale of" STORY

Seeing is Believing

Several children had asked to go with me into the field at night, but their parents were concerned. (Remember the creatures that eat your brains?) However, a chance encounter with a farmer's family changed everything.

One afternoon I set up a mist net in the middle of a garden so I could patch holes in it. The owner of the garden joined me, and we chatted while fixing the holes. He mentioned that during the evening, bats fly over his vegetable and flower beds, and that I could catch them and get rid of them if I wanted. I told him that perhaps the bats were only eating insects—possibly crop pests—and maybe he didn't want me to get rid of them after all.

So I decided to leave the net up until after sunset, in the hopes of catching some bats to show him. By the time the bats began to fly, the gardener had brought his entire family to the garden, and two neighbor children had joined us.

Only minutes later, we caught two insect-eating bats, and I told my audience to wait while I untangled one and released the other. I walked back with a black myotis (*Myotis nigricans*) in my hands, and they were amazed. They had never seen a live bat.

The children told me they had believed that bats were blind and did not have eyes. They explained that their grandfather told them a bat was an old mouse that had grown wings to fly. Now they were observing a totally different animal, like nothing they had ever imagined. They could see for themselves that it was not a mouse.

This experience had a cascade effect, and soon teachers called, asking me to do the same demonstration with students at other gardens. I eagerly agreed, knowing that children are usually the best way to deliver a message to the community. They are highly motivated and interested, and they will often take what they learned back to their parents. I hope that each child with whom I spent time became an entire family I reached.

SIDEBAR CAPTION



A tiny black myotis helped local children see beyond the myths about bats.



Above: Carrying a *Solanum* berry, a yellow-shouldered bat searches for a nighttime roost where it can eat. Fruits, pollen, and insects are all part of this bat's diet. In northwestern Argentina, the author discovered yellow-shouldered bats were eating chili peppers and dispersing the seeds.



South America



The author examines a bat caught in his net at Argentina's Calilegua National Park. He estimates that 30 of the country's 57 species are found in the park, including five different fruit-eating bats.



Yellow-shouldered bat



The author checks for bats beneath a bridge near the edge of the forest. Although most bridges in the area were too low to serve as roosts, several types of insect-eating bats were found in old houses and warehouses on the forest's

edge.

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