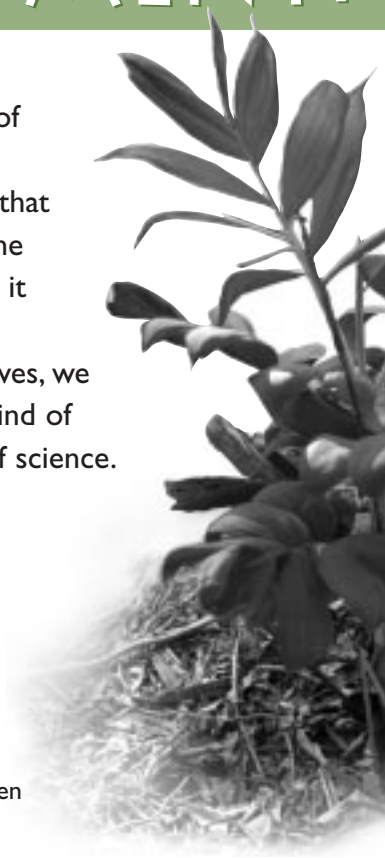
COLLECTIONS DEVELOPMENT:

Sometimes it takes an excited enthusiast exclaiming about the breadth and quality of MBC's *Chamaedorea* collection or a visiting researcher who is visibly impressed with an unusual cycad to remind us that what they're seeing is a culmination of effort that goes back many years and to remote areas of the world. Invisible to those accessing the collection in a protected garden is the extraordinary knowledge, skill, and sheer effort it takes to obtain seeds in their native habitat. With most of the germinated seedlings they sent us now incorporated into MBC's grounds as healthy population representatives, we asked Botanists Dr. John Janovec and Amanda Neill to recall their adventures on the kind of expeditions that make it possible for MBC to carry out its purpose as an institution of science.



Exploring the Palms and Cycads of the Maya Mountains of Belize:

Reflections on MBC-Sponsored Expeditions to Belize, 1999-2001

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The sun was setting as we reached a hilltop overlooking San Jose Village, a Mopan Mayan community located in the remote foothills of the southwestern Maya Mountains of Belize. We could see smoke rising from palm-thatched houses across the landscape. An orange haze dimly illuminated a forested, mountainous horizon.

We had been traveling all day from Belmopan, the country's capital city, on the washboarded, unpaved Southern Highway, through winding mountain passes. Enthusiastic but nervous on our first journey into the wild country of southern Belize, we could not have imagined what we were about to experience on this hilltop, or how it was to affect our lives.

This was December 1997, our first journey into Belize to collect plant material of wild nutmeg trees for a doctoral research program at Texas A&M. It is a small country nestled on the Caribbean Sea between the Yucatan to the north, Guatemala to the west, and Honduras to the south. We arrived with little knowledge of the country, its people, or their culture.

But we did have a list of collecting localities and the name of a man living in a remote village who was an experienced guide, Valentino "Tino" Tzub, a 40-year old Mopan Mayan.

And as we stood there on the hilltop—his hilltop—it wasn't long before we were greeted by members of his family. They directed our attention to a small-statured man resting in a fishnet hammock strung between two of the main posts holding up the palm-roofed house.

Noticing that we had official working papers about the protected forest in these mountains, he grabbed a wrinkled map of Belize from the wall.

He pointed out that he was the lead guide/porter for the CI's rapid-assessment expedition into the area. He then sketched the path of our hike and provided us with a list of food and supplies we would need. Led by Valentino, we headed north into the Maya Mountains the next morning, accompanied by an assistant guide and horse to carry our camping and collecting gear.

During this trip, we made a serendipitous discovery. Valentino happened to mention a special plant he referred to as the "corn palm." He said it occurred in only one cave and he wanted to show it to us. As we began to climb down into the vegetation-packed, crater-like formation, we realized the "cave" was actually more of a sinkhole. At the bottom, along with an ancient Mayan kiln and old ceramic shards, we found ourselves

ON EXPEDITION

peering into a dense population of cycads. Following good botanical practice, we made plant specimens, including the staminate cones, and took photographs. Soon after we returned from this trip, two things happened in succession that led us back to Belize. Dr. Dennis Stevenson of The New York Botanical Garden told us about his recent discovery of the type specimen of *Zamia prasina* in London's Kew Herbarium, which we connected to the specimens from the sinkhole. We were then introduced to the Montgomery Botanical Center and learned of their support program for field collection expeditions focused on palms and cycads.

Supported by MBC collaboration, we returned to Belize in August 1999 to look specifically for cycads and palms. In addition to locating collections of cycad seeds, we found seeds of the palms *Shippia concolor* and *Colpothrinax cookii*.

In 2001, MBC funded another project to support Valentino and his Mayan Rainforest Guide Service in exploring and monitoring palm and cycad populations followed by a collecting trip in June of the same year. This proved to be a highly productive collaboration. Valentino and his team located new populations of *Zamia prasina* (in both caves and sinkholes), among which we were able to find a cone with mature seeds.

An interesting addition to our group was a high school student from a Kansas soil ecology laboratory who came to sample soils of the *Z. prasina* habitat. Through his independent research project, he showed this unique cycad prefers a nitrogen-rich soil formed from bat guano beneath ceilings and walls of caves and sinkholes. This sinkhole species, referred to by Mayans as the "corn palm," must have a fascinating life history that needs to be revealed in future studies on its population biology, reproduction, and dispersal ecology. We speculated about rodents, bats, and birds as the dispersers, but these ideas remain to be tested.

Hunting for other cycads and palm species led to more collecting and studying. We discovered a small population of *Zamia picta,* as well as palm species in the genera *Attalea*, *Calyptrogyne*, *Chamaedorea*, *Geonoma*, and *Reinhardtia*. We made the first reported voucher specimen of *Chamaedorea ehrenbergiana* in Belize, a palm with tightly-clustered ascending infructescences.

Valentino directed us to another collection of a *Chamaedorea* species that didn't fit the identity of *C. pinnatifrons* or *C. tepejilote*—the two common understory palms of Belize. It had larger leaves, stouter stems, and infructescences held low on the bare stem without surrounding leaves. These all deserve further investigation in the field, and different areas of the Maya Mountains should be explored to find other species.

While looking for palms and cycads in the Mountain Pine Ridge area, we took the opportunity to visit Caracol, a spectacular Mayan ruin near the Guatemalan border. The findings in Caracol amaze the archaeological teams working in the area: man-made reservoirs and canal systems, past use of mercury in art and worship, and the construction of large temples.

We climbed the many stone steps to the top of the towering main temple. As we stood at this high vantage point gazing through binoculars over the brilliant green mountains to the south and the burning and deforested hills of Guatemala in the west, we thought again about our unique experiences in the Maya Mountains—the organisms they harbor, and the watersheds they produce that protect the beautiful coral reefs off Belize's Caribbean coast.

We tried to imagine what it would have been like 1300 years ago when these temples were new. My thoughts took me back to the sinkholes and caves of the karstic topography of the Maya Mountains where the ancient distribution, propagation, and use of the *Zamia prasina*, as well as others like *Euterpe precatoria* and *Attalea cohune* are mysteries calling for further research.

We've remained in close contact with our friend and colleague, Valentino Tzub—the man, the guide, and his forest. Since the June 2001 trip, Hurricane Iris struck the Maya Mountains causing much natural damage to the forests and human communities of the region. From what Valentino tells us, the caves and sinkholes have been covered by debris and he has been unable to access the *Z. prasina* populations that we studied together.

We are fortunate that the viable seeds we collected are now growing under the protective green thumb of MBC staff; important germplasm has been preserved. However, we should strive to support local people such as Valentino in long-term monitoring, collection, and perhaps even reintroduction programs focused on palms and cycads of Belize and the Maya Mountains.

Only through collaborations with individuals like Valentino Tzub can we hope to understand and protect these important plants—or have someone to lead us to back to those populations now that the hurricane has passed.