Missouri Botanical Garden gives Madagascar double help

By Jo Seltzer, Special to the Beacon

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Madagascar. Far-away and exotic. Home of the lemur and the baobab tree. And desperately poor.

"It's a race against the clock," Armand Randrianasolo said when describing Missouri Botanical Garden's research program in Madagascar. Only about 10 percent of Madagascar's original habitat remains intact with more forests being destroyed all the time. As a result, many of the estimated 13,000-14,000 species of native plants may become extinct before they have even been identified.

Photo courtesy of Missouri Botanical Garden

Armand Randrianasolo, center back with blue cap, teaches trainees for the Missouri Botanical Garden in Madagascar.

Randrianasolo understands the complexities of botanical research in this modern living laboratory of evolution quite well. His scientific training includes a program set up by the Missouri Botanical Garden in Madagascar and a doctorate in taxonomy (botanical classification) from the University of Missouri St. Louis. As a researcher and associate curator of the Botanical Garden's William L. Brown Center, he aims to identify and preserve as much of Madagascar's unique flora as possible. As a Malagasy, as the people who live in Madagascar are called, he understands that a very poor population is concerned much more with survival than with concepts of biodiversity.

Much of his energy goes into programs that make it profitable for Malagasy villagers to participate in the conservation of the forests that he and the other garden researchers are studying.

WHY MADAGASCAR?

The Missouri Botanical Garden's involvement in Madagascar dates back to 1972. Director Peter Raven has long been interested in the relationship of plate tectonics and plant evolution; and the large island off the eastern coast of Africa provided a unique laboratory. Originally attached to both Africa and India, the island separated from Africa about 160 million years ago; 80 million years later it separated from India.

Since 1985, the garden has had a continuous presence there. Today its research and conservation efforts employ a full time staff of 60, all but one of them native Malagasy.

Because of its geographic isolation, about 80 percent of the plants and animals on Madagascar are found nowhere else on Earth. The flower in the photo is one of those unique specimens.

Photo courtesy of Wendy Applequist, William L Brown Center

Dombeya superba

Many know Madagascar as the home of 32 species of lemurs, primates native only to the island. For reptile fanciers, 59 species of chameleon are unique to the island. (Do we need to mention the giant hissing cockroach?) As for the large animals seen on safari in Africa, elephants, gazelles and giraffes are conspicuous by their absence. Evolution on Madagascar has clearly not paralleled evolution on its very close continental neighbor.

"Madagascar is actually a mini-continent, with a full diversity of climates and topographies," said Pete Lowry, curator and head of the garden's Africa and Madagascar Department. "It has high mountains, tropical deciduous forests, rain forests and semi-desert areas, each with its own set of flora and fauna. Many species live in very restricted geographic areas -- one river valley, two mountaintops, three tiny patches of forest."

CONSERVATION BEGINS WITH A DATABASE

From the beginning, the Garden's strategy has been to inventory the plants in botanically unknown regions and describe new species. (See TROPICOS at MoBot.org) As Lowry points out, its conservation efforts are based on a bedrock foundation of science. "You must know what you have before you can effectively manage and protect it."

In Madagascar, the garden first established a botanical presence in the capital city of Antananarivo and, in the late 1980s, worked with its university to establish a training program in fieldwork. Over the years, the garden has run dozens of training programs for Malagasy citizens. These last from one week to 18 months in duration, and in the long programs, students learn not only how to collect and identify plants, but how to budget and manage money, write reports and other valuable work skills.

But even with a large local staff, cataloguing and identification cannot keep up with the destruction of habitat.

THREATENED FORESTS

"One family can destroy a lot of forest," explains Randrianasolo. Madagascar is an impoverished country, with the majority of its people living on $200-$300 a year. Its population doubles every 20 years. In rural areas, subsistence farmers try to grow enough rice to feed their families with the practice known as "slash and burn."

They will cut down an acre or so of forest, and burn the trees to generate ash for fertilizer. The ash will allow them to grow rice for two or three years, before all the nutrients are used up or washed away during rainy season. Then the family moves on to another acre, slashes and burns it, and survives for a little longer.

One habitat very susceptible to slash and burn in Madagascar is the "littoral" forests on the eastern coast. These forests, growing on white sand, formerly formed a continuous narrow (about 3 kilometers wide) strip all along the coast, never more than 5 or 6 kilometers from the shore. They have been reduced to patches, but are home to about 1,200 unique species.

These littoral forests have become a major focus for garden research and conservation activity. Lowry and his staff have identified 77 new areas outside the established parks and reserves that are important to conserve; about a dozen of these sites are in littoral forests.

WORKING WITH THE LOCAL POPULATION

Wendy Applequist, assistant curator at the William L. Brown Center, says the Garden believes the local population should be compensated for sharing their forest.

Those efforts got a boost at a strategic planning conference held in St. Louis in 2002 that included Garden scientists from here and Madagascar. The Malagasy staff members pointed out that native populations do not know how or why to preserve species.

These Malagasy staff members were catalysts for a major expansion of the program into community based conservation. At one site, they stocked a community center

GIVE A MAN A FISH... TEACH A MAN TO FISH...

Photo courtesy of Missouri Botanical Garden

Armand Randrianasolo (in blue cap) tells of a painful lesson learned from the vegetable garden.

When he distributed seeds, he warned the cultivators that they must collect seeds from a portion of each of their crops to plant the next year's garden. His warnings were ignored.

When the gardeners asked for seeds to plant again, he told them he had none. Eventually, he relented for that year only, and distributed more seeds.

Another lesson taught about sustainable farming.

with many pamphlets on good farming practice. At others, they planted demonstration gardens to add vegetables to the basic diet of rice and bits of chicken.

Plant nurseries are an important component of the local efforts. There, fast growing trees are harvested as timber for homes. Slower growing native trees are raised for future income and to preserve the composition of the natural forest. At one site, the nursery grows a shrub that Garden scientists have determined is highly endangered. Local workers will be paid to repopulate the forest with these plants.

And villagers have established their own patrols to protect their forests from outsiders who come in and harvest the biggest trees.

BLESSING BASKETS

Perhaps the most tangible success story comes from expanding the market for a native craft: basket making. Although staff at one site, Mahabo, had been encouraging its women to sell their baskets at market, the effort had been only sporadically successful.

But when Washington University professor Ken Harrington put Randrianasolo in touch with the Blessing Basket Project, the effort took off.

Blessing Basket , headed by Theresa Wilson and headquartered in Granite City, had already been successfully selling baskets from developing countries in outlets such as Whole Foods. Blessing Basket pays its weavers 2 1/2 times the "fair trade" price. That helps make baskets with local and renewable grasses far more profitable than clearing forests and growing a few cassava roots for market.

Photo by Jo Seltzer

These Blessing Baskets were made in Madagascar.

It took time to raise the quality of the baskets to the high standards of Blessing Basket. The weavers also had to learn about sustainable resources. They learned to harvest the sedges by cutting the leaves rather than pulling the plants up by the roots. And the business has become profitable enough that some weavers are even converting rice fields into grasslands for baskets.

WASHINGTON UNIVERSITY BECOMES A PARTNER

Washington University now offers a course focused on the Garden's community conservation program in Madagascar. The interdisciplinary course, currently housed in Olin Business School, is taught by professors from several areas including Judi

McLean Parks (business), David R. Deal (law), Ken Harrington (Skandalaris Center for Entrepreneurship) and Frank Oros (Sam Fox School of Design).

In addition to assessing the economic impact of the Blessing Basket Project and other potential economic stimuli such as bee-keeping, students are involved in designing and testing other development projects. They were planning to implement some of the projects in Madagascar over spring break, but had to cancel the trip due to the present political situation.

Photo courtesy of Missouri Botanical Garden

Women carry sedges for Blessing Baskets.

One project has students supervised by Deal ensuring that both the endemic plants and the knowledge of how people use them attain legal status as the property of Madagascar. Native healers, for example, have extensive knowledge about the medicinal plants they use. Implementation of intellectual property law would recognize the value of traditional knowledge and prevent "biopiracy."

Missouri Botanical Garden's store of botanical specimens and knowledge about them is growing at a rapid pace. To maintain that growth, the staff is constantly adding new skills. As Randrianasolo put it, "We are trained as botanists, not social scientists or even conservationists." In his role as liaison between Garden projects in Madagascar and in St. Louis, he has learned those disciplines and more.