

the TROPICAL GARDEN

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SAVING FLORIDA'S WILD NATIVE ORCHIDS





Saving Florida's Wild Native ORCHIDS

text and photos By Kenneth Setzer

The Million Orchid Campaign

Hundreds of glass bottles align atop stainless steel racks, sparkling under grow lights in a lab. The order, sterility and white lab coats don't quite evoke the feeling of tropical profusion you get standing waist-deep in tannin-colored waters in a swamp. But in fact the bottles in question are tiny terraria, each housing hundreds of endangered native Florida orchids—plants you'd once see in abundance growing from trees all over South Florida, but which now require a trek deep into the Everglades, Big Cypress Swamp or Fakahatchee Strand to see, and that's if you get lucky.



perhaps no other plant conjures such strong emotions as the orchid. People go to great lengths—some legal, some not—to possess them, with often disastrous results for wild populations.

TOP
Bottles containing orchid seedlings growing in Fairchild's Jane Hsiao Laboratories.

BOTTOM
Volunteer Julie Berlin transfers orchid seedlings.

Though orchids grow throughout the United States, we are lucky in Florida to foster more than 100 native species—some of the most beautiful, showy and rare examples. Starting in the late 19th century, however, we began loving them to death. Collectors and plant lovers reaching South Florida tore orchids by the wagonload from live oaks, pond apples, cypress and anywhere else they could reach. They were shipped to buyers looking for pretty, exotic houseplants. Being native to the subtropics, they were not likely to survive for long in a cold, dry city dwelling. But being plentiful and inexpensive, they were simply thrown away when the flowers faded. More could always be taken from nature's seemingly infinite abundance. But the endless supply is now running out. Habitat destruction for agriculture, housing and cypress logging only compounded the dire situation for these orchids. Their scarcity, sadly, makes them a target for poachers who sell the now-rare plants at high prices. Consequently, finding wild native orchids is nearly a thing of the past. Fairchild aims to change that. As part of our mission to conserve the world of tropical plants, the Garden is dedicated to reintroducing our native orchids to areas that were previously their domain.

Dr. Carl Lewis, Fairchild's director, explains why these orchids are not likely to recover on their own: "In the natural process, an orchid produces a seed pod containing thousands of tiny seeds, as small as grains of sand. When the pod opens, the seeds are meant to be carried by the wind to suitable locations for them to germinate. An orchid seed's journey on the wind must take it to the perfect location, lodging it on a suitable host tree. The lighting, humidity and temperature must be ideal. Orchid seeds themselves contain very little of the nutrients needed to germinate, so they've developed a symbiotic relationship with a specific fungus to provide the necessary energy. They need to find both a suitable location and this particular fungus in order to germinate—a very rare event."

Propagation to the Rescue

While it is challenging for orchids to germinate in the wild, by propagating orchid seeds under idealized laboratory conditions, each seed pod can be nearly guaranteed to produce thousands of offspring.

"Scientists at Singapore Botanic Gardens have been propagating several native orchid species for several decades," Lewis says. "They've re-established orchids on trees in urban areas. It's been so successful that they are now reproducing naturally on trees in downtown areas in Singapore. I believe we can reintroduce so many native orchids successfully in South Florida that they are no longer rare, and therefore not of much value to a poacher—starting with the butterfly orchid, *Encyclia tampensis*, and the cowhorn orchid, *Cyrtopodium punctatum*, both of which grow at Fairchild. Our goal is to produce 1 million orchids in five years' time to be reintroduced onto trees in urban areas."

Growing 1 million orchids in five years seems mind boggling, but it adds up: One seed pod can produce approximately 12,500 seeds, which initially fill about 10 bottles. The Fairchild lab harvests about 16 seedpods a year, which will generate about 1 million plants in five years.



Harvesting and growing the dust-like seeds is no easy task. Trained Fairchild Micropropagation Lab Volunteers Susie Lau and Julie Berlin know this well. They and other volunteers in the Paul and Swanee DiMare Science Village's Jane Hsiao Laboratories have been trained in laboratory procedures and micropropagation, and are attentive to painstaking details. "First, the orchid seed pod exterior is sterilized," they explain. "Everything must be absolutely sterile to ensure no bacteria, mold or fungi are introduced that might contaminate and destroy the seeds. We also use an autoclave for sterilization where appropriate." Using established propagation methods, the volunteers mix very specific amounts of growing medium, which is then poured into sterile glass bottles. After it sets, the medium is ready to accept seeds. The seed pod is carefully opened with a scalpel, exposing the seeds within, which can then be sown within a bottle. "It takes about three to four months to actually see something green start to grow inside the bottles," Berlin explains. Each bottle is sealed with a foil wrapper, colored to indicate when the seeds within were sown, and placed on racks under grow lights.

Every two to four months, as the tiny grass-like seedlings fill their containers, they need to be gently—but quickly—removed with a forceps and transferred to a different bottle. The transfer is performed in a laminar flow cabinet (a carefully enclosed bench designed to prevent contamination) to ensure nothing can contaminate the process. There are currently about 150,000 individual orchids at different stages of development in the Micropropagation Lab, growing in 1,200 bottles. "From seeding to the time they can live out of the bottle depends on the species, but it takes about 18 months," Lau says. "Just recently, the first group of seedlings to outgrow living inside a bottle was removed and brought over to Fairchild's nursery to continue maturing."

The project is yielding more than rare plants: Fairchild researchers are taking the opportunity to study how our native orchids grow best, examining variables such as different growing media and types of lighting. This research will further benefit future conservation, including Fairchild's plans to restore populations of the native dollar orchid (*Prosthechea boothiana*) and cockleshell orchid (*Prosthechea cochleata*).

Engaging the local community—where these orchids will eventually return—is an important aspect of the program. Fairchild staff recently visited high school students at TERRA Environmental



Cowhorn/cigar orchid (*Cyrtopodium punctatum*) was heavily collected in the 20th century and is now relatively scarce.
Photo by Hong Liu/FTBG

Research Institute in Miami (see story, page 13), bringing along a delivery of stainless steel racks, lighting and bottles containing butterfly orchid and cowhorn orchid seedlings. The students' task is to raise the orchids, monitoring the ideal amount of light exposure required for healthiest growth. These student citizen scientists are getting hands-on experience in what it takes to conserve and restore a community of plants. Appropriately, many of these orchids will ultimately be attached to host trees at this and other local schools.

"At about six to nine months after leaving the bottles, the orchids can go back into trees they would naturally inhabit," Lewis says. "We are partnering with local South Florida communities, schools and municipalities to get the orchids into trees in urban and suburban areas. We'll need to physically attach them to their host trees—not an easy task to do a million times, so the community will play a large part in the reintroduction."

Being able to once again see native orchids bloom on landscape trees in our local urban and suburban areas will be exquisite, but the benefits go beyond the intrinsic beauty of orchids: Growing these orchids in populated areas will hopefully support wild populations by providing a source of genetic diversity and supporting the pollinators these plants need to eventually start reproducing naturally. It's not too late to restore some of our most vulnerable plants, 1 million orchids at a time. 



To learn more and become a supporter of the Million Orchid Campaign, visit: www.fairchildgarden.org/The-Million-Orchid-Campaign