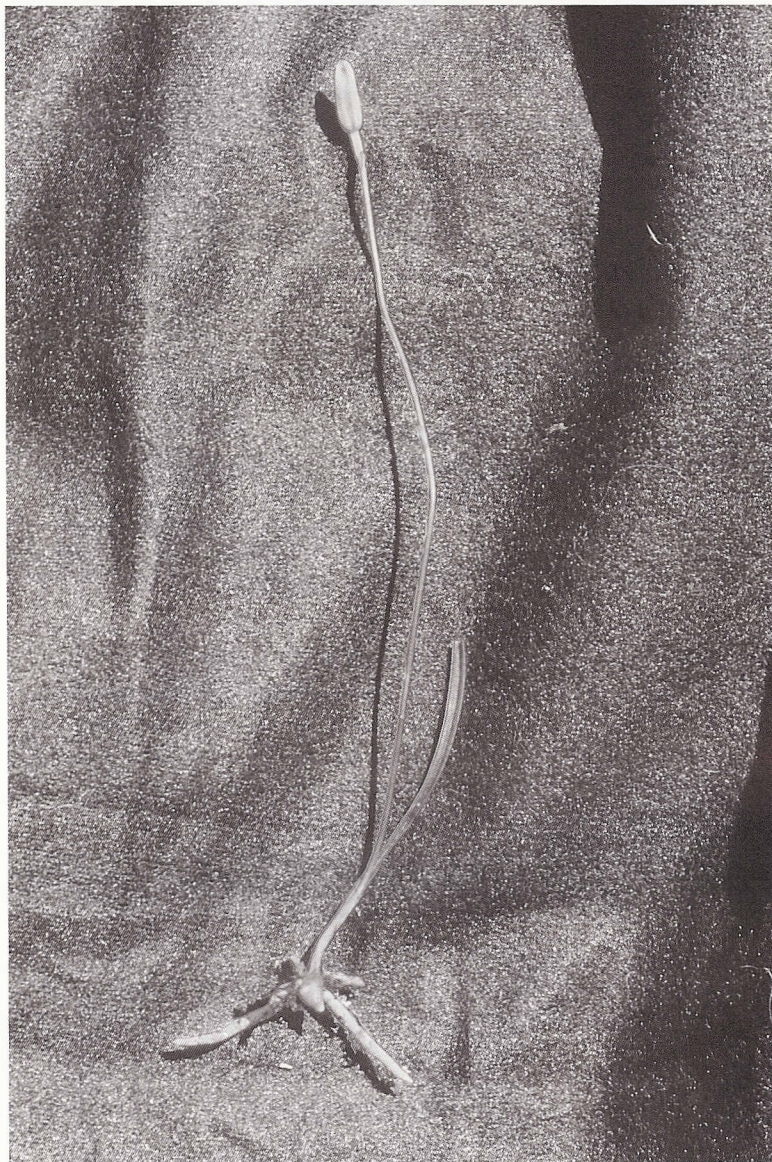


# THE PUZZLING



## CARTER'S ORCHID

by Andrew Martin

It was a mild winter day in Everglades National park. I was deep in a hammock in Long Pine Key with Dick Reimus, a park volunteer and expert on local flora. We were looking for orchids. A light rain began to fall, jarring a few groggy mosquitoes from the underbrush. We searched for a while longer, unsuccessfully, then broke for the open air, emerging from the hammock on its eastern side. Except for our drenched clothes and dampened spirits, we seemed no worse for the wear. But it was time to go.

We got our bearings and headed back the way we came, through the pinelands. As always, the limestone was tricky to walk on. So I kept my eyes to the ground. Here and there, I spotted a tuft of broomsedge or a lone cabbage palm, clinging to precious morsels of soil. Then I saw them, three wiry stems poking out of the bedrock. Looking closer, I noticed that each bore a cluster of seed capsules.

Naturally, I turned to Dick. "What's this?" I asked.

With these two words, my journey of discovery was soon underway. What I had found that day, though it was not immediately obvious to me at the time, was a type of orchid. In my defense, I hadn't realized that orchids could look so scrawny. Repeated visits to the Fairchild Tropical Garden in Coral Gables had led me to believe that orchids were robust and showy, like the *Phalaenopsis* plants perched on prosthetic live oak limbs in the garden's conservatory exhibit. What's more, these orchids weren't even flowering, and had they been, I'm not sure I would have been all that impressed by them. It was odd looking, to say the least.

But what was most unusual about this specimen was its location. It was growing in a clump of grass, on a vast acreage of barren limestone. And, for good reason, it didn't appear to be very common in the area, either. It turns out, I had found one of the rarest orchids of this region, *Basiphyllaea corallicola*, commonly called Carter's Orchid.

Looking back, I probably should have known there was more to this orchid than meets the eye. After all, it was growing in pine rockland, an environment that thrives on adversity. This unique ecosystem with its sole canopy species, South Florida Slash Pine (*Pinus elliottii* var. *densa*), occurs on exposed limestone outcroppings. As a result, it sits a little higher than the surrounding glades and is subject to prolonged droughts and frequent fires.

Once, pine rocklands grew solidly along an extensive limestone ridge as far north as Fort Lauderdale. This ridge, called the Atlantic Coastal Ridge, supports the main cities of Florida's East Coast, including Miami and Fort Lauderdale. It extends well north, starting somewhere near the Georgia border, and ends at its southern extremity inside the boundary of Everglades National Park. From about Miami's Coconut Grove southward, the ridge takes on a "rocky" appearance, exposing a spine of porous oolitic limestone. From Miami, it moves southwest through Homestead then west into Everglades National Park, where it occurs at Long Pine Key. For obvious reasons, principally that it lost out to prime real estate developments, only fragments of the original forests remain. By most estimates, pine rocklands occupy less than 10% of their former range, the majority of it in Everglades National Park.

Though deceptively generic looking from a distance, pine rocklands support a diverse community of understory flora, including many endemic species found nowhere else in the world. Shrubs, palms, herbs, and grasses grow openly on the forest's limestone floor. And willows and ferns colonize the interiors of giant solution holes. Growing among all of these, though never to the extent of being common, are some species of orchids.

Of the more than 50 species of orchids native to Florida south of Lake Okeechobee, only a few are hardy enough to adapt to the conditions in pine rocklands. In his 1992 article, "Orchids of South Florida's Pine Rocklands," in the *Fairchild Tropical Garden Bulletin*, Chuck McCartney alludes to 16 of these species, few of which are found exclusively in open pinelands. A number of these orchids, such as *Habenaria floribunda*

[was *H. odontopetala*] or *Ponthieva racemosa*, are more likely to be found in a tropical hardwood hammock in the pineland rather than in the pineland itself. According to McCartney, even *Bletia purpurea*, dubbed the "pine pink," is not a full-time resident in open pineland. More often, he says, it is found on the lip of solution holes in pinelands, where it is marginally protected from fire. Others, such as *Calopogon tuberosus* or *Zeuxine strateumatica*, are lowland species which grow in finger glades on pineland edges. Still, a few orchids of pine rocklands do grow unprotected on bare limestone, seemingly undaunted by the many ground-level perils facing them. Among the rarest of these is *Basiphyllaea corallicola*.

The most telling thing about this orchid may be its name. The genus *Basiphyllaea* is derived from the Greek *basis*, meaning "base" and *phyllon*, meaning "leaf," while the specific epithet comes from *korallion*, Greek for "coral," and the Latin suffix *-cola*, meaning "inhabitant." Combined, this mouthful roughly translates to "basal leaf inhabiting coral," referring to the orchid's characteristic single basal leaf and its peculiar habit of growing from cracks in oolitic limestone (sometimes mistakenly called "coral rock"). A fairly recent revision of the genus *Basiphyllaea* made the geographically distinct species *Basiphyllaea angustifolia* a synonym of *Basiphyllaea corallicola*, thus extending *Basiphyllaea corallicola's* previously known range from southern Florida and the Bahama Islands to Cuba, Puerto Rico, and Hispaniola.

As the genus *Basiphyllaea* is understood today, it contains only two other species: the wide-leaved *B. sarcophylla* of Cuba, the type species of the genus, and *B. wrightii*, which was just transferred to *Basiphyllaea* from the genus *Bletia* in 2000.

In addition to being incredibly rare, *Basiphyllaea corallicola* is also very hard to spot. It often grows from clumps of grass on limestone substrate – usually in pinelands – where it blends in easily with its environment. Although a perennial, it has been known to lay dormant for years, showing nothing more above ground than the single basal leaf. But when properly motivated, a wiry stem emerges, sprouting a small cluster of almond-shaped green buds. The mature buds don't always open, but when they do, their sepals part just enough to reveal tiny pinkish flowers. Flowering typically occurs between September and November in South Florida. On top of everything else, *Basiphyllaea corallicola* grows on a microscale, rarely exceeding a foot in height.

It's amazing, really, that it has been discovered at all. Long Pine Key, where I stumbled up on the orchid, includes more than 20,000 acres of pine forest and none of it is a pleasure to navigate on foot. The pineland floor is usually riddled with holes where organic acids have eaten away at the limestone. The dissolving action of these acids creates a variety of obstacles – cavernous solution holes and crumbling bridge formations, among others – which conspire to topple unwary victims to the ground.

One wonders, then, how it was possible to explore the pinelands a hundred years ago, before they were tamed by roads and urban settlements. In 1900, when Miami was a fledgling city of less than 2,000 people, Henry Flagler, the visionary tycoon behind the Florida East Coast Railway, was overseeing the extension of the railroad from Miami to Homestead. Then, the pinelands grew as a vast unbroken wilderness along the Atlantic Coastal Ridge, interrupted only by the railroad grade that was slowly inching southward. In those days, there were no roads leading into the heart of the Everglades. Explorers traveled by way of a horse or a horse-drawn wagon, enduring unimaginable hardships along the way.

Yet *Basiphyllaea corallicola* was first discovered almost a century ago, when a

trio of botanists, made up of Alvah Augustus Eaton, John Kunkel Small, and Joe Jackson Carter, gazed on the orchid in a South Florida pineland. Eaton, who worked as an assistant to Oakes Ames, a renowned Harvard orchidologist, had been sent by his boss on a three-year botanical expedition to southern penninsular Florida. He was joined shortly thereafter by Small, an eminent field botanist from the New York Botanical Garden, and Carter, a lesser-known botanist, who hailed from Pleasant Grove, Pennsylvania. Really, the purpose of the expedition was to search for orchids.

The discovery of this particular orchid was made in an area formerly known as Longview, southwest of present-day Florida City. Legend has it that this area got its name from hunters on the lookout for game, who built an observation tower there to afford a "long view" over the prairie to the neighboring pinelands. In 1902, William J. Krome, who led the effort to survey the route for the Homestead (and later Key West) extension of the railroad, established an outpost in the area, called Camp Longview. Eaton, Small, and Carter put up in a remote cabin near Camp Longview, from which they made daily field excursions. On November 10, 1903, Carter spotted the orchid as the three were riding in a wagon through a stretch of pinelands.

In a letter to Oakes Ames, published in Donovan S. Correll's *Native Orchids of North America North of Mexico*, Eaton made no attempt at disguising his envy as he recalled the details of Carter's rare find:

"We started out at 6 and had just gone 400 yds or so when Carter spotted the orchid I spoke of. Usually they work it by having Carter ride the middle seat on my side and Small the back one with me, but this time, they were both on the same side. A most extended search failed to reveal more, and it was my luck to have it on the wrong side of the wagon. Small gave me a piece and you may be able to get an idea of it and grow the root on. The spike lookt much like *Calopogon*: the bulb like *Triorchis* [now *Pteroglossapis ecristata*], one radical leaf, conduplicate, thick, horizontal. I hope you may be able to make something of it."

**"I probably should have known there was more to this orchid than meets the eye. After all, it was growing in pine rockland, an environment that thrives on adversity."**

The type specimen of this orchid would not be collected until October 31, 1906, when it was again spotted by Carter in the same locality. In 1910, Small named the orchid *Carteria corallicola* in honor of Carter. However, the species name subsequently was transferred to Rudolph Schlechter's 1921 genus, *Basiphyllaea*, in 1924, when Oakes Ames discovered that *Carteria* already had been used for a genus of algae. From then on, Carter's Orchid became known as *Basiphyllaea corallicola*.

More than 60 years would pass before the elusive orchid would be found again in South Florida. This time, the discovery was credited to Frank Craighead, Sr., an orchid enthusiast and conservationist involved with the early affairs of Everglades National Park. It appears that between 1967 and 1971, he found a small

population growing in the southeastern portion of Long Pine Key. Craighead later revealed the location to botanist George Avery.

In September 1982 came the discovery of another Carter's Orchid population growing in the eastern region of Long Pine Key, apparently not far from the Craighead site. The discovery was made by Jim Snyder, a park biologist, and was the first documented sighting of the orchid in Everglades National Park. In the 18 years that followed, the orchid would be found four more times in Long Pine Key.

In late January of 1988, Alan Herndon, an Everglades National Park botanist, found a population in a very different place, in a pine rockland on Big Pine Key in the Lower Florida Keys. It was the first such sighting of the orchid outside of Dade County. The orchid would be found again in Big Pine Key several years later by botanical inventory specialist Joe O'Brien.

And in September of 1991, a population was first seen by environmental consultant George Gann at the Charles Deering Estate, the property of a once-prominent Dade County resident, which has since become a county park. The colony was found growing in the shade at the edge of a hardwood hammock, a very different habitat from any the orchid had been found in before in Florida. To date, the Deering Estate population is also the largest ever discovered in Florida and the farthest north that *Basiphyllaea corallicola* has been found throughout its range.

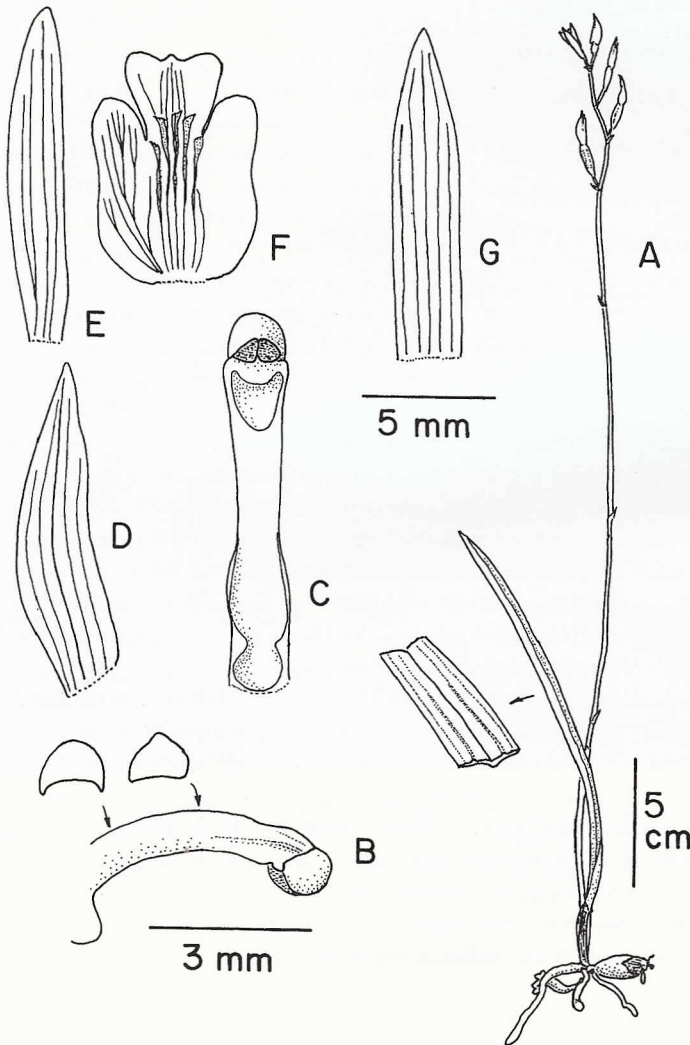
After reading about these wide-ranging discoveries of Carter's Orchid, curiosity got the best of me. I returned to the site where I had discovered the orchids with Dick Reimus six months earlier. When I finally found them, they looked very different: withered, brown, and quite dead. I realized how fortunate I had been the first time to find the orchids, when the last of their critical seed capsules were still hanging on.

This time, though, the experience was barely satisfying. I was also searching for answers. Why were they here, I wondered, at this particular place and time? An obvious clue lay a few yards away, in the form of a blackened pine stump. For what it was worth, I knew the area had been recently burned.

The quest for answers is what led me to look with more detail into the fire management history of Everglades National Park. Following the creation of the park in 1947, emphasis was placed on fire suppression in fire-prone areas such as Long Pine Key. In the 1950s, after years of fieldwork, biologist William B. Robertson concluded that fire, a necessary component of pineland ecosystems, was needed to reduce fuel loads in the pinelands and to turn back the inevitable tide of hardwoods that threatened to overtake them. Robertson also argued that fire preserved the continuity of many rare and endemic pineland plant species.

Based in part on the Robertson study and on further investigations by scientists and park managers, the park has, since 1958, adopted a regimen of regular prescribed burns in the pinelands. In 1963, the first Fire Management Plan – essentially, a plan outlining the history, principles, and practices of active fire management in the park – was created, further endorsing the use of prescribed burns in the routine maintenance of fire-controlled areas. With the 1973 Fire Management Plan came the establishment of defined fire management units in Everglades National Park. As a result, Long Pine Key was divided into a number of discreet compartments, "fire blocks" in the parlance of fire managers.

Subsequent plans have relied on the growing body of knowledge about pinelands and fire. Based on ongoing research in the



A. Plant habit with an enlarged section of the leaf. B. Column, lateral view with two cross-sectional cuts. C. Column, ventral view. D. Lateral sepal. E. Petal. F. Lip. G. Dorsal sepal. Drawing by J. D. Ackerman, reproduced here with the permission of the New York Botanical Garden Press. This drawing originally appeared on page 14 of "An Orchid Flora of Puerto Rico and the Virgin Islands," *Memoirs of the New York Botanical Garden*, Volume 73, June 30, 1995.

pinelands, prescribed burns are now set in the wet season rather than the dry season, which limits their destruction and severity. Traditionally, burns also had been spaced at four to six-year intervals in fire blocks. Now, most blocks are burned every two to three years, to favor herbaceous species over hardwood shrubs and trees.

Like many plants in the pinelands, Carter's Orchid is unquestionably fire adapted. Its water-storing base takes hold in limestone crevices, protecting the orchid from fatal fire damage and supporting it through periods of sustained drought. In theory, this device could allow the orchid to survive for a considerable period of time underground. This also raises an interesting possibility: that *Basiphyllaea corallicola* is far more numerous than it appears.

Another possibility: fire may stimulate emergence of the Carter's Orchid flowers. Throughout South Florida's history, Carter's Orchid has been found in flower (or in some reproductive phase) about 10 times. More than half of these occurrences were in Long Pine Key, an area with an active fire management program dating back to the late 1950s. Bearing this in mind, I decided to put the theory to test. I compared the park's old burn records to Carter's Orchid locations in Long Pine Key, and I found the following:

In the case of the earliest known discovery in the park by Craighead, an exact date is impossible to pin down. Fortunately, we do have a location. In a letter written to Dr. Carlyle A. Luer, an associate of the Marie Selby Botanical Gardens on January 3, 1982, George Avery revealed that Snyder's population was found "about 1/8 mile from where Dr. Frank Craighead Sr. found *Basiphyllaea* 10 or 15 years ago." Burn records show that a long interval passed between fires in that area, from 1964 to 1976. Since Craighead had apparently found the population between 1967 and 1971, this would seem to negate a prescribed burn as the cause. On the other hand, the orchids may have emerged after a more local disturbance occurred in the area.

The next discovery, by Jim Snyder, came under some rather unusual circumstances. To measure the effects of fire on the forest understory, Snyder had set up several acre-sized plots in the pinelands. The plots were cleared of ground cover first and then burned. When the plots regenerated, he collected vegetation samples and analyzed them. It was during this collection phase that he spotted several Carter's Orchid stems growing in one of the plots.

In a recent conversation, Snyder said he had no problem recalling that the plots had been burned on his wedding anniversary, August 9, 1980. Snyder discovered the orchids two years later, on September 21, 1982.

Following Snyder's discovery came four more:

- Found by Alan Herndon, October 2, 1987, in western Long Pine Key. Area was last burned August 1986.
- Found by Ruben P. Saulea, September 27, 1988, in eastern Long Pine Key. Area was last burned August 1987.
- Found by Chuck McCartney, November 12, 1988, in eastern Long Pine Key. Area was last burned August 1986.
- My own discovery of the orchid came on December 28, 1999, in the western region of Long Pine Key. The corresponding block had been burned earlier in the year, in July or August, suggesting that fire might have been a factor.

Though it's hard to draw conclusions from the evidence at hand, it at least hints at an intriguing possibility: that *Basiphyllaea corallicola* requires a major disturbance to coax it into flower.

## 2001 Checklist of the Orchids of North America North of Mexico

This checklist is now available for downloading online courtesy of Paul Martin Brown, FNPS member and Editor, *North American Native Orchid Journal*. Please request the checklist by sending email to [naorchid@aol.com](mailto:naorchid@aol.com).

## NATIVE ORCHID RESTORATION PROJECT

**M**ORE DIFFERENT SPECIES OF ORCHIDS OCCUR IN FLORIDA than anywhere in the continental United States, with important population centers occurring in South Florida. But since the turn of the century, the South Florida ecosystem has suffered major disruptive changes. Drainage of wetlands with resulting changes in vegetation, changes in fire regimes, loss of pollinators, and poaching have all taken their toll on native orchid populations. The great depletion of orchids is an indicator of the changes set in motion by past human mistakes.

Now, a coalition of conservation and botanical science organizations seeks to reverse this course of extinction and even start new orchid colonies to speed restoration. The Native Orchid Restoration Project (NORP) seeks to answer a number of important questions regarding the reproduction of native orchids, including:

- Why do native orchids do so poorly in captivity?
- What can we do to increase their chance of survival when we start new colonies?
- Can we make native orchids readily available to the public to prevent poaching?
- Can we start colonies in ways that promote natural restoration?
- What is the natural inoculation to prevent pests and disease?
- What are the critical factors in reproduction and survival (e.g., pollinators, humidity, or other components of habitat)?

The Naples Orchid Society Conservation Committee started NORP in January 2002 with intentions to do a small project with the local parks and preserves. With the enthusiasm and interest of many others, the project has grown far beyond expectations, and is applying for nonprofit corporation status. Organizations presently supporting the project include the Big Cypress National Preserve, Fakahatchee Strand State Preserve, Florida Panther National Wildlife Refuge, Picayune State Strand Forest, Rookery Bay National Estuarine Research Reserve, Naples Orchid Society, Smithsonian Environmental Research Center, Selby Botanical Garden, Conservancy of Naples, and Corkscrew Swamp, Audubon Sanctuary.

NORP recently applied for a grant and should the project move forward, the Naples Chapter FNPS intends to support the effort with volunteer in-kind services.

**INFO:** contact Duane Repp, Naples Chapter FNPS, via email at [DLRMAN@aol.com](mailto:DLRMAN@aol.com), or write the NORP at:

Native Orchid Restoration Project  
PMB 134, 4888 Davis Blvd  
Naples FL 34104

*continued on page 13*

# The Puzzling Carter's Orchid

continued from page 7

---

Wedge in limestone crevices by its thick base and roots, perhaps this long-lived perennial lies dormant for a time, then appears opportunely after a fire. Or, perhaps it doesn't. Maybe, because of this, it's not as rare as we think. Maybe it's out there, but we're just not seeing it. Or, maybe it's not.

To our credit, much of what we know today about the

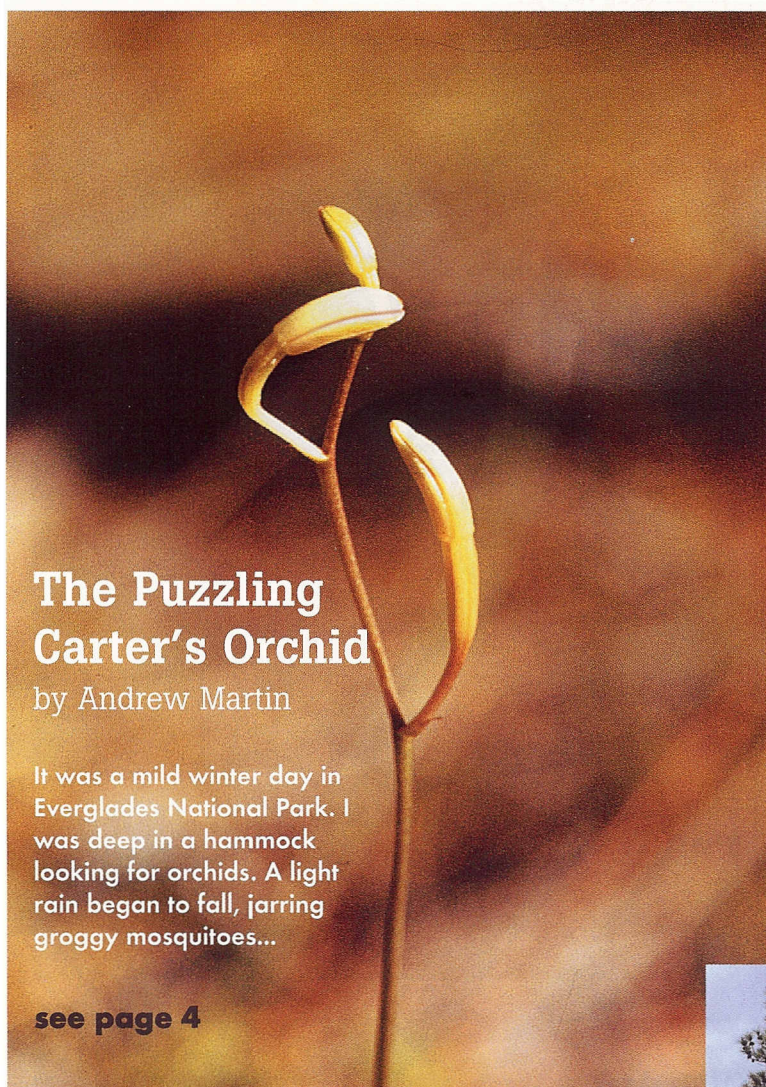
Everglades biota has been pieced together since the early days of botanical exploration, since Carter and company roamed the area in search of the unknown. Carter's Orchid, however, remains a great puzzle, its life cycle as curiously fragmented as South Florida's pine rocklands.

And after nearly a century, we still can't figure it out. ✨

---

**ABOUT THE AUTHOR:** Andrew Martin is an orchid enthusiast and botany technician involved with a wide range of vegetation research projects in Everglades National Park. This is Andrew's first article for *The Palmetto*, and the editor sincerely hopes her tardiness won't make it his last!

**EDITOR'S NOTE:** Many thanks to Chuck McCartney, longtime FNPS member and orchidophile, who reviewed and edited this article, and provided all of the photos as well as a reference for the line drawings.



## The Puzzling Carter's Orchid

by Andrew Martin

It was a mild winter day in Everglades National Park. I was deep in a hammock looking for orchids. A light rain began to fall, jarring groggy mosquitoes...

see page 4

The exposed Miami limestone ridge, on which Carter's Orchid grows, supports a forest dominated by South Florida Slash Pine. The largest remaining tract of this forest is Long Pine Key in Everglades National Park. **RIGHT:** A single Carter's Orchid plant in eastern Long Pine Key displays two developing seed capsules. The plant springs from a crack in the jagged oolitic limestone. Pine needles litter the ground. **ABOVE RIGHT:** The lowermost bud on the inflorescence reveals the underside of the pinkish lip.

Photos by Chuck McCartney

