

Stranglers, Lovers, and Tubes: Trees Cohabiting with Cabbage Palms



Figure 1: Anastomotic roots of strangler figs fuse together rather than remaining separate.

Of all the plants that grow on, up, in, and around our native cabbage palm (*Sabal palmetto*), some of the more intriguing relationships are unlikely pairings with dicotyledonous trees. Cabbage palms, with their upward-pointing, debris-catching bootjacks¹ are uniquely suited to facilitate other plants germinating well above ground.

The most common flowering plants growing epiphytically on cabbage palms are figs, and there's a rogue's gallery of invasive, non-native figs that include laurel fig (*Ficus microcarpa*), bo tree (*F. religiosa*), banyan (*F. benghalensis*), council tree (*F. altissima*), and that office stalwart, weeping fig (*F. benjamina*). These five interlopers are joined by two valuable native figs — strangler fig (*F. aurea*) and further south, wild banyan tree (*F. citrifolia*).²

All these figs depend on the same strategy — tiny wasps fertilize the small figs, birds eat the fruit and expel the seeds where they perch. Those seeds that find themselves in moist detritus accumulated in the palm bootjacks can germinate and begin their next life stage as epiphytes.

But, unlike common epiphytic ferns such as the shoe-string fern (*Vittaria lineata*) or golden polypody (*Phlebodium aureum*), these figs have aspirations of becoming trees in their



Figure 2: This sizable (20-foot girth) strangler fig at a bank on St. Armands Key, Sarasota shows no sign of impeding the palm growing within it.

own right and consequently are not content to remain aloft. Hanging on with feeder roots in the decomposing under-canopy of the palm, these figs extend different, ambitious aerial roots down towards the ground, typically creeping around the palm trunk, but sometimes hanging downward. These roots exhibit what might be called anastomotic inosculation, which is the ability of separate tissues to converge and merge, fusing together instead of remaining distinct. [Fig. 1] If you'd like to see strangler fig roots in various states of anastomotic inosculation, plan a visit to Sanibel. The road traffic is daunting, but a rented bike will enable you to pass cars while on the bike path and you'll spot dozens of strangler figs, typically our native *Ficus aurea*. Other trees exhibit less frequent propensities to self-graft and these are typically thin-barked species such as gumbo limbo, non-native crepe myrtles and Chinese elms, yet thicker-barked live oaks and invasive camphortrees (*Cinnamomum camphora*), also self-graft.

When the striving roots make contact with terrestrial soil, the fig has a new source of nourishment and growth takes off. The result can be a massive tree that towers over the palm that originally gave it sustenance. Because these plants abandon their

purely epiphytic phase of life to become rooted in the ground, they are referred to as hemiepiphytes, technically primary hemiepiphytes since they start in the trees and end up rooted in the ground. Secondary hemiepiphytes (AKA nomadic vines) start rooted in the ground and migrate up into the trees and may ultimately lose contact with the earth.³

Ficus aurea is better known in South Florida as the strangler fig, suggesting something from a lurid cover illustration of *Strange Tales*. And it is not hard to find texts⁴ or online videos⁵ predicting inevitably dire consequences, usually the death of the host palm. Popular explanations for the lethal mechanisms vary: constriction of the trunk and roots (unlikely) as well as competition for light, nutrients and water (more probable) are all invoked.

Yes, in theory, every strangler fig might conceivably overwhelm and kill its cabbage palm host, and so one might wonder, based on prolific fig production and the impressive number of seeds in each fig, why any cabbage palms remain at all. In reality there are several factors working against the figs.⁶ The first is cold — they do not do well in freezes. That limits their range to the southern half of the state and even there they can be repeatedly temperature pruned by occasional cold spells.

Another limiting factor is fire.⁷ If you drive Highway 29 from Immokalee south you'll note the palms between the highway and the canal on the left sometimes have strangler figs, while the palms beyond, on the east side of the canal, an area that burns with greater frequency, as a rule do not.

So while cabbage palms may be the most common host plant for strangler figs in Florida, the palms are no pushovers. It's true that the fig's roots frequently surround and encase the palm trunk, but cabbage palms can't really be "strangled" in some boa constrictor sense of an ever-tightening embrace that squeezes the life out of a victim or acts like a tourniquet on the tree's cambium. That's because cabbage palms don't exhibit what is known as secondary growth — cabbage palms don't have a cambium layer or need to keep expanding as the tree ages. Yes, the fig does compete somewhat with the palm for light, water, and nutrients, but the palms are remarkably persistent. [Fig. 2]

The main evidence that *Ficus aurea* doesn't spell certain death for cabbage palms is the large number of palms that continue living when overtaken by the ungrateful figs they nurtured. It is far easier to find *Ficus aurea* encircling a living palm than a fig with a cylindrical central cavity defining where a palm trunk once grew, a hollow columnar trunk or "tube tree." Imagine wrapping a candle with string dipped in plaster and then imagine the candle melting. The result would be a hollow cylinder with the solidified string representing the encircling roots of the fig. Such tube trees are relatively rare in Florida, but are more common in freeze-free tropical settings where fire is less frequent and the host tree is a dicotyledonous species that relies on its cambium layer to expand in girth and grow.

An online query in search of these curious hollow fig trees was answered by Melissa Nell, a naturalist who knew where some could be found at the Emerson Point Preserve, which is on a peninsula separating the mouth of the Manatee River from Tampa Bay and near the northern range limit of *Ficus aurea*. Melissa took me to the Portavant Temple Mound where there are plenty of palms with no figs, plenty with figs just getting started, and many with fig and palm coexisting. We inspected several pairs with both partners living and then she pointed out a distinctive tube tree where it was easy to photograph a circular patch of daylight out the top of the living cylinder. [Fig. 3] Sensing I was more interested in these hollow figs than the cohabitating pairs, Melissa suggested we drive out to the end of the point, the site of a former proposed real estate development that now features park pavilions with concrete supports that were molded to look like cabbage palm trunks.

We walked along the shore of Tampa Bay past wading fisherman and upturned sea grapes until we found another delicate tube tree. Because such hollow fig trees are relatively rare, we know that strangler figs don't inevitably lead to the demise of their palm hosts.

Several cabbage palm epiphytes grow in the decomposing palm bootjacks, additionally nourished by detritus raining down from any plants towering above the palms. I've asked several botanists the name of these dark accumulations of decomposing bootjacks and fern rhizomes and have gotten no answers. Landscapers who deal with the same phenomenon on other cultivated palms have told me they call it 'the nut'. I've taken to calling it 'dark matter'.

Epiphytic ferns are well-adapted to palm life and create a mass of rhizomes, living and dead, that persist after the fronds have fallen or rotted away. It would seem that at some point the ferns are growing as much in decomposing fern rhizomes as



Figure 3: This hollow column of anastomosed fig roots (tube tree) resulted when a former cabbage palm host died and rotted away.

decomposing palm bootjacks. In areas of high humidity where the epiphytes are less likely to dry out, the dark matter can extend six feet or more below the palm canopy. So while small plants like the golden polypodies can simply keep creeping higher, colonizing new bootjacks, the figs have a real problem because any young figs that don't get their roots down to the ground fast enough run the risk of falling out of the palm. That's because of the inevitable weight increase that accumulates as the fig ages and gains size. As the lower decomposing palm fronds rot away, the now heavier figs become increasingly susceptible to gravity, wind, and upwardly mobile raccoons. When figs can't get their roots to the ground, their trunks, branches, and leaves can end up dangling, hanging upside down from their feeder roots. A walk along the southern shore of Tampa Bay in Manatee County's Robinson Preserve reveals several of these precarious plants. [Fig. 4]



Figure 4: This strangler fig is in danger of falling from its host palm.

Occasionally the figs actually fall out of their host tree. And along the boardwalk of Audubon's Corkscrew Swamp Sanctuary in Collier County, one can see a native fig that blew out of a cypress tree (and survived).

Because the bootjacks catch seeds from other tree species, a variety of unlikely "strangler" trees have been found wrapped around cabbage palms. In addition to the figs, the invasive umbrella tree (*Schefflera actinophylla*) and native *Clusia* can be found growing in cabbage palms. The most common native non-fig 'stranglers' seem to be live oaks, but I've found a strangler slash pine on Camino Real Street in Sarasota and a strangler magnolia at Bok Tower Gardens.

[Fig. 5] Such stranglers occur when seeds from trees that normally germinate in the ground, fall in the leaf base of a cabbage palm, germinate, and somehow get their roots to the ground. Obviously, the odds of this happening are increased the closer the germinating seed is to the ground to start with.

The most famous example of a "strangler oak" is a testimony to American modesty and euphemism because this is a big live oak with a cabbage palm growing out of it, and it has been dubbed the 'Love Tree' or 'Kissing Tree'. Found at 6 Cordova Street in St. Augustine, the love tree became a tourist destination



Figure 5: Exposed roots of a "strangler magnolia" photographed at Bok Tower Gardens.

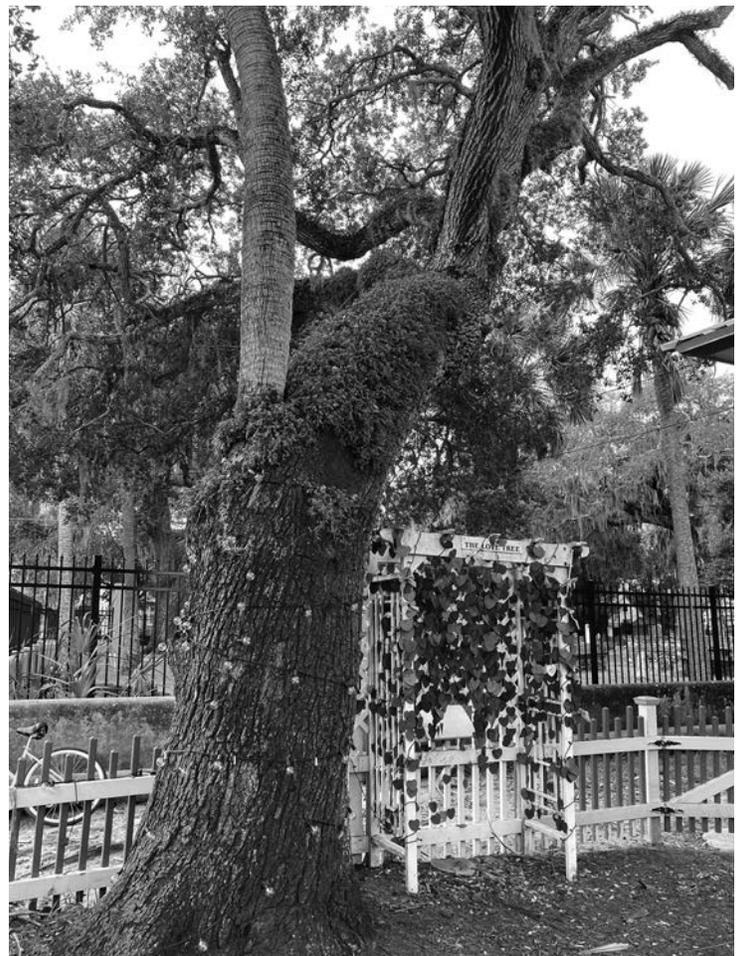


Figure 6: The dramatic St. Augustine tourist destination: the love tree at 6 Cordoba.

complete with legends and an admonition that kissing under the tree promises sustaining love. [Fig. 6] It is tempting to assume a palm seed germinated in a hollow oak and grew up through it. But close examination reveals where the oak woundwood⁸ grew around the palm and fused. [Fig. 7] It is impossible to determine if the acorn germinated in a bootjack, or simply right next to the palm — both alternatives are possible. I believe it is wrong to



Figure 7: Close-up of the Cordoba love tree showing where woundwood has encircled the palm and grown together.

infer that massive oaks several feet in diameter must surely pre-date the scrawny palms they embrace. It is not too hard to find examples of live oaks engulfing nearby cabbage palms. This unlikely oak/palm 'love tree' relationship can be attributed to the cabbage palm's ability to thrive immediately adjacent to other trees and live oaks' impressive ability to produce woundwood, which predisposes them to grow around and engulf adjacent objects.

For some unknown reason, St. Augustine appears to be the love tree capital. Other examples can be found on Bridge Street

in front of the playground, at the southwest end of Dumas at St. Francis, and on the Ameris Bank property on North Ponce de Leon Boulevard. My wife, Julie, discovered another one in a vacant lot at 160 Marine Street. There's rumored to be one on the grounds of the Mission of *Nombre de Dios*, but the site is now off-limits due to a recent archaeological find. Sharp-eyed naturalists throughout the range of cabbage palms have spotted others — two accessible dramatic examples are found on North Riverside Drive (south of Rio Vista) in Edgewater, and in Old Fort Park in New Smyrna Beach.

Since oaks can germinate on palms and reach maturity, the allure of reciprocity demands we ask if palms can germinate on or in oaks and survive? It's easy to find small palms that have germinated in the detritus that builds up in the crotches of oaks and there was a young palm growing in the 'Old Senator' in the Howard Johnson parking lot at 137 San Marco, St. Augustine, but someone cut it out.

Consequently, I try to remain open to the scenario that a cabbage palm could somehow germinate inside a hollow live oak to create an alternative form of love tree. One candidate was discovered on the north shore of Upper Myakka Lake by my environmentalist friend, Jon Thaxton. Jon has been exploring this isolated area for two decades and keeps tabs on many of the oaks, recounting their past and speculating about their future. These massive trees are growing on a sandy ridge parallel to the lake shore and as we walked we ruminated about what happened centuries ago to create this elevated oak seedbed. He is slowly amassing his own time-lapse understanding of how the hammock changes.

Mostly we walked silently, pausing to pick up litter, or to rescue fallen orchids or bromeliads to get them up off the ground, that they might produce another generation of seeds. Jon navigated through a combination of memory and intuition. Most of the walk was not on any trail and Jon took pains to avoid walking through spider webs — not because he doesn't like spiders, but because he does. We walked past recumbent "gator-back" saw palmettos forty feet long, now in decline — Jon remembers when they were healthy. After about two miles we came to the pair. Jon said nothing to tip me off, but I spotted it from a distance and stopped. The context was fascinating. Just a few feet away were what appeared to be two sibling palms of roughly the same height and conformation. The palm emerged from the oak above our heads, so I contrived a means to affix my iPhone to my walking stick and took a number of photos, none of which explicitly ruled out the possibility that this palm might have germinated inside the oak. For instance, there were no signs of any sutures where the two sides of an enfolding oak met, and we could see many adventitious palm roots cascading over the oak bark, which lent the appearance of the palm originating in

Continued on page 15

Stranglers, Lovers, and Tubes

Continued from page 7

the crotch of the tree. [Fig. 8] Despite the tantalizing possibility that this pair defied the usual courtship pattern, Jon is inclined to believe the palm predated the oak, in no small part because of the nearby presumptive palm siblings. A definitive answer will have to wait until the oak dies. Since the oak is clearly in decline, it may not be long. Jon will keep me posted.

The ability of cabbage palms to thrive alongside other trees and the unique architecture of their bootjacks, combined with special proclivities of figs and live oaks results in some of the more intriguing plant partnerships found in Florida.



Figure 8: This cabbage palm growing in Myakka River State Park is a possible candidate for being a palm that somehow germinated inside an oak.

Notes

1. Cabbage palm bootjacks are the forked "Y"-shaped leaf bases of the cabbage palm frond. They are named for their resemblance to manufactured bootjacks, which facilitate the removal of boots. Bootjacks are marcescent — they remain on the tree for an indefinite period of time after they die.
2. "*Ficus aurea* and *Ficus citrifolia* are both outstanding Florida native trees to attract a wide variety of birds, especially cedar waxwings, not to mention that their leaves serve as larval food for the ruddy daggerwing butterfly and several species of moths." Roger Hammer, responding to Sam Van Leer, Facebook posting, Florida Flora and Ecosystematics. December 2, 2017.
3. Zotz, Gerhard. "Hemiepiphyte: A Confusing Term and its History." *Annals of Botany* 111, no. 6 (June 2013): 1015–20.
4. "This tree wraps around and grows up a host tree, eventually engulfing and killing the host." Center for Aquatic and Invasive Plants | University of Florida, IFAS. "*Ficus Aurea* Strangler Fig." <https://plants.ifas.ufl.edu/plant-directory/ficus-aurea/>.
5. EatYourBackyard. "The Dreaded STRANGLER FIG - A Palm Tree Killer or Not?," May 17, 2016. <https://www.youtube.com/watch?v=JRIsuqFcQI8>.
6. Lamén, Timothy G. "Strangler Fig Trees: Demons or Heroes of the Canopy?" In Lowman, Margaret D., and H. Bruce Rinker. *Forest Canopies*, 1st ed., 180–82, 2004.
7. Putz, Francis E., and N. Michele Holbrook. "Strangler Fig Rooting Habits and Nutrient Relations in the Llanos of Venezuela." *American Journal of Botany* 76, no. 6 (June 1989) pp. 781-788. https://www.researchgate.net/publication/250269908_Strangler_Fig_Rooting_Habits_and_Nutrient_Relations_in_the_Llanos_of_Venezuela.
8. "...woundwood is the tissue that seals larger wounds in trees and returns the function to the stem." Luley, Christopher J. "Biology and Assessment of Callus and Woundwood," Continuing Education Unit, International Society of Arboriculture. n.d., 10. https://www.treeroot.com/wp-content/uploads/2016/04/Arborist-News-Callus-and-woundwood_Luley.pdf

About the Author

An attendee at the first FNPS annual meeting, Jono Miller is a former Director of the Environmental Studies Program at New College of Florida and has just written *The Palmetto Book: Histories and Mysteries of the Cabbage Palm*, which will be available from the University Press of Florida starting in mid-March. It contains two dozen essays dealing with both the natural and cultural history of our state tree, and this article consists of bonus material not included in the book. If you have interesting examples of, or stories about, cabbage palms, he'd love to hear about them by email cabbagepalm@gmail.com. Or post your observations and view more photos of love trees and stranglers at <https://palmettobook.blog>.

Support the FNPS mission with a purchase from our online store

Whether you are looking for a gift for a plant-loving friend or something for yourself, you'll find a variety of unique FNPS-branded merchandise in our online store.

Purchase a full-color poster featuring native plants appropriate for your region which includes planting information, or choose from apparel, home decor, tote bags, phone cases, coffee mugs and more!



Visit: <https://www.fnps.org/support/stores>