Volume 31: Number 2 > 2014

The Quarterly Journal of the Florida Native Plant Society

Palmetto

Fern Conservation in a Biodiversity Hotspot • Saving the Endangered Florida Key Tree Cactus

Featured Flora by George Rogers: *Ficus aurea* (Strangler Fig)

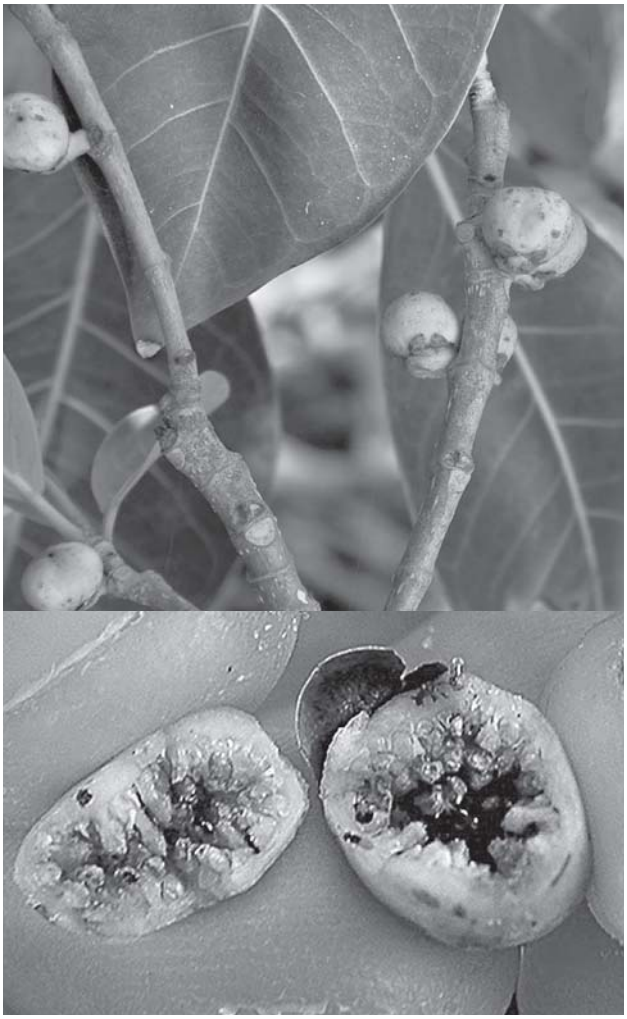
Why Do Figs Taste Crunchy?

As a kid vacationing in Florida, I found it scary that a malevolent tree strangles innocent others like the living garrote of the green world. A more mature perspective is less ghastly, and of course the ficus, or fig, does not actually strangle anything; it merely exploits its host tree for a cheap perch in the sun, growing over and around the host, competing for light and eventually root space. I'll bet the host generally lives a long and prosperous life despite its hitchhiker.

The young strangler fig sitting in a tree sometimes looks like a parasitic mistletoe early on, and some observers have attributed the ficus with a propensity for parasitism. However, tree biologist Peter Tomlinson emphasizes the exploitation to be merely epiphytic. But when the host dies does the strangler benefit nutritionally from the host's decay? Probably not.

Forest tree babies struggle for light under taller canopy trees, so each forest tree species needs a coping adaptation to survive its shaded youth. Many evolve large food-filled nuts to sustain the sapling until it rises high enough to compete effectively or until a canopy gap opens. Figs have a different plan: they form lots of tiny seeds (technically achenes) dispersed by birds to lodge in nooks and crannies high and bright on mature trees. Then they grow backwards – from the tree canopy downward to the ground.

Native strangler figs (*Ficus aurea)*, are one of 750 ficus species worldwide. The other Florida native, the bearded fig (*Ficus citrifolia)* is mostly restricted to the southern tip of Florida and the Caribbean. Its whiskerish dangleroots reputedly account for the island name Barbados, translated as "bearded." Florida is home to numerous cultivated figs, some of them escaped nuisances. These garden figs include the banyan, bo tree, counciltree, Cuban laurel fig, edible fig, India rubbertree, and more.



Above: *Ficus aurea* plant with figs. Bottom: opened fig showing the tiny orange seeds, which are technically fruits. The entire fig is a hollow open stem, and the hollow seed-lined space is the cave, where you can often find dead wasps. Photos: John Bradford.

The fruit, also called a fig, is a swollen stem with a hollow cave inside. The cave is lined with tiny male and female flowers followed by seedlike fruits. Pollination is by itsy bitsie teenie weenie wasps who enter through a portal at the end of the fig. The stranger fig has just one species of pollinating wasp (*Pegoscapus mexicanus*), which is perhaps why it does not (or not often) hybridize with bearded fig, which has its own wasp pollinator.

With variation among species, the general pattern is that female wasps enter the fig fruit and lay their eggs into the ovaries of specialized female flowers. Male wasps hatch forth from the eggs inside those flower ovaries and proceed to fertilize the immature female wasps while the girls are still confined within their fig flowers. How do they do that? The motivated guys chew their way through the flower ovary wall to the females, who later use those chew-holes to escape.

Upon exiting its flower-ovary but still inside the fig chamber, the pregnant female wasp packs pollen into a specialized pocket on her body. Then she flies out to visit a different fig to transfer pollen and lay eggs. She must deliver pollen reliably, because no pollen means no flower ovary growth, and no ovary equals no nursery for her babies. Something to try: bust open *Ficus aurea* fruits, poke through the crunchy seeds, and find the little wasps inside.

One or more interloper wasp species use stranger figs as brood chambers without contributing to pollination. One such sneaky pete (*Anidarnes bicolor*) injects its eggs from the outside of the fig, positioning them to mature on the inside, relying upon successful pollination by the proper pollinating wasp.

Starting out as epiphytes and living years on high before rooting in the ground, stranger figs contort around the host, which is why Bonsai enthusiasts like them. Strangler fig and related species have something unusual: bands of living

Continued on page 11

Why Do Figs Taste Crunchy? Continued from page 2

storage tissue (axial wood parenchyma) layered in broad bands in the otherwise dead wood (normal wood is composed of predominantly dead water-pipe and support cells). The oddly abundant living storage tissue is conspicuous as light-colored horizontal bands alternating with the darker bands of proper dead wood. The living bands sequester water and starch, not a normal wood function in other plants. Why do figs do this?

Most epiphytes face a dry life trapped above the ground, using their roots to cling to the host instead of accessing groundwater and storing starch like conventional roots. Epiphytes throughout the plant world consequently develop diverse coping adaptations: succulence, animal symbioses, suspended animation, the expandable pseudobulbs and sponge-covered roots of orchids, the tanks of epiphytes, elaborate scales and hairs, and more. The weird and plentiful storage tissue seems to be the ficus answer to the basic epiphyte lifestyle challenge. There's just a wee bit of "cactus" built in.

This article previously appeared in the blog treasurecoastnatives.wordpress.com/ and has been edited for *Palmetto*.

About the Author

George Rogers received his PhD in botany from the University of Michigan and did postdoctoral work at Harvard. He serves as chairman of the Horticulture Department at Palm Beach State College and is a practicing plant taxonomist who contributes occasionally to the Generic Flora of the Southeastern United States. George is the author of *Sustainable Landscapes, Native Plants, and Weeds for South Florida*. His website on grasses of Palm Beach and Martin Counties is online at floridagrasses.org.