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Hidden Treasures

By Dawn Stover

Gingers have long been part of our East Texas gardening palette. Most of us at one time or another have grown a Butterfly Ginger and praised it for its fragrant flowers or cursed it for its spreading nature. The Butterfly Gingers are but a small part of the *Zingiberaceae* or ginger family. Within the last few years, the arboretum has begun an interesting and fun journey down the road to ginger Nirvana. With around 47 genera and over 1000 species, we have a long road ahead of us, but are looking forward to our mission.

One of the best surprises for us in this world of *Zingiberaceae* has been with the genus *Curcuma*. This genus is best known as Hidden Ginger or Surprise Ginger and has beautifully exotic flowers often appearing at the base of lush foliage. This genus has been a surprise not only for the flowers, but also for their ease of growing and hardiness. Most *Curcuma* are native to tropical parts of Asia like India, Thailand, and Sri Lanka, and at least one species is native to Australia.

The flowers of *Curcuma* are actually quite small, but are borne in colorful, waxy bracts that can be pink, white, orange, or lavender. The inflorescence often resembles unusual looking pine cones. They make long lasting cut flowers, and breeders



are now hybridizing Hidden Gingers to produce longer stems for the cut flower trade. Some species bloom in the spring, while the great majority bloom in mid to late summer.

The earliest to bloom is the Giant Plume Ginger, *Curcuma elata*. Each inflorescence has soft pink bracts and can reach 1 foot tall.

In mid July, the bright pink inflorescence of the Aussie Plume Ginger, *Curcuma australaisica*, are beginning to show along with the white inflorescence of *Curcuma petiolata*.



A wonderful hybrid, simply called 'Sulee Hybrid' has an amazing, dark, orange-pink inflorescence.

The Siam Tulip, *Curcuma alismatifolia*, resembles a tulip and comes in varying shades of pink, white, or lavender



When not in flower, *Curcuma* make excellent foliage plants, offering a luxuriant tropical feel to the garden. The foliage can grow from 1 foot to 8 feet depending on the species. *Curcuma elata* can be used in smaller gardens where a banana is desired but not practical. Some species have dark maroon stripes down the middle of each leaf, and others have dark red stems. The hybrid 'Scarlet Fever' is a reluctant bloomer, but makes up for it in the bright red highlights in the foliage. *Curcuma petiolata* 'Emperor' offers foliage with beautiful white margins as well as stunning white flowers.

Curcuma are not difficult to grow if you know a few key points before planting. These gingers have a true dormant cycle and cannot be forced to keep their foliage even in a hothouse. Leaves will turn a buttery yellow before total senescence, and can be removed when papery and brown. Dormancy occurs in the drought cycle of their native climate, and as a result, the rhizomes need to be kept very dry in our winters. This can be a challenge as our winters often offer plenty of rain. Amending your soil with sand or composted bark is often enough to combat overly wet winter soils. Don't forget to add plenty of organic matter, since *Curcuma* need plenty of nutrients when they are actively growing. Beyond well drained winter soils, they are not terribly picky. Fertilization in the spring and once weekly watering during the summer are rather beneficial. As we experiment and learn about these plants, we are finding that they will accept a very sunny location; however morning sun is adequate.

I invite and encourage you to find a Hidden Ginger that fits your garden. Visit the arboretum to find the one that is right for you.

**Fabulous Fall Festival
Plant Sale
October 2, 2004
9:00 a.m.-2 p.m.
SFA Intramural Fields**



SFA Mast Arboretum News Summer 2004

P.O. Box 13000-SFA Station, Nacogdoches, TX 75962-3000
Phone: 936-468-3705 Fax: 936-468-4047 <http://arboretum.sfasu.edu>

“Big Jack,” Rare *Amorphophallus titanum*, Blooms at SFA Mast Arboretum!

By David Creech, Ph.D.

Who is Big Jack?

Big Jack is *Amorphophallus titanum* – the infamous Titan Arum or Giant Corpse Flower and it is found exclusively in the equatorial rainforests of Sumatra, Indonesia. The plant is said to grow in openings in the rainforest on limestone hills. The plant was discovered by Italian botanist Odoardo Beccari in 1878. The plant is endangered in the wild and very few exist in cultivation.

How rare is this blooming event?

After its discovery in 1878, seeds from the wild resulted in the first blooming of this species in cultivation at Kew Gardens in England in 1889. The first recorded bloom in the U.S. was at the New York Botanical Garden in 1937. There have been only about two dozen recorded flowering events in the U.S. since then. A flowering event is often turned into a giant extravaganza for those few botanical gardens and arboreta that have been blessed with a plant that survives and actually flowers successfully. This Texas plant proudly joins the list.

How does this plant do what it does?

The plant grows from a large corm which reaches weights up to 200 lbs. in the wild. Typically, the corms are smaller in cultivation but often top 75 lbs. or more. For most of their lives, corms produce solitary, highly dissected leaves over 12' high and 10' across. Leaves persist for about a year and senesce. The plant then enters a dormant phase of several months. A replacement leaf emerges and the plant begins growing a new root system and adding to the size of the corm. After a year or

so, the process is repeated. Infrequently, instead of a replacement leaf, the corm will generate the blessed event: a flower. In that season, the leaf will emerge only after the flower has collapsed. The entire life cycle of leaf growth, flowering, and dormant periods is botanically strange,



Dawn Stover, SFA Mast Arboretum Research Associate, is responsible for the daily care of the *Amorphophallus titanum*.

considering that these plants are found only in warm equatorial jungle habitats. Equally curious, in the wild, the stages are evidently quite randomly spaced, with some plants in various stages of growth at any given time. The evolutionary significance of this is a matter of great debate. The plant is known to live 40 years or more and can flower several times in its life cycle.

What's the big deal about this flower?

First, let's be correct. Titan Arum had the title of the largest "flower in the world" but technically, the "flower" is really an

"inflorescence," or a cluster of flowers. The spadix can reach over 6 feet tall (the tallest ever recorded was over 10 feet), and when fully open the spathe can reach about 3 feet across. Thousands of true flowers are hidden inside at the base of the spadix (the fleshy central column). The large frilly-edged leafy structure enclosing the spadix is called the spathe. Male and female flowers are separate and in a ring around the base of the plant, with the female flowers below and receptive first, the male flowers above and releasing pollen the next day. This means that the plant must be cross pollinated. A plant will not produce seed unless pollinated from another plant because of the timing of stigma receptivity and pollen release. We call this dichogamy.

How bad is the odor?

Very few people have been blessed enough to catch the corpse flower at its most powerful fragrance. Most bizarre to the general public is that when the flower is fully open, it emits the nauseating fragrance of rotten meat (hence its Indonesian common name ‘Bunga Bangkai’). The odor begins on opening of the inflorescence and lasts for about 8 hours. The flower typically stays open 18 hours to two days. The stench, strongest at night, is there to attract pollinators, thought to be carrion beetles and sweat bees in the wild. The odor is reported to be emitted in waves as a gas. As a colleague of mine at the University of Connecticut recently told me, “a good whiff at the wrong time caused great pain and made my sinuses hurt for several days.” This sounds like a sure fire way to create a lifelong *Amorphophallus* Avoidance Anomaly Syndrome. Rule: don’t stick your head into an open flower in the first eight hours.

The flower is actually hot?

Yes, isn’t that amazing? Along with the odor, while the flower is first open, the spadix warms itself with metabolic heat, in what is thought to be an adaptation to volatilize and disperse its horrible carrion smell and insect-attracting chemistry. Temperatures in the depths of this flower are said to reach 5 to 20 degrees above ambient.

Where did SFA’s “Big Jack” come from?

Jack originally came from Florida on June 1, 2000. The SFA plant was given to me as a dormant fist-sized corm by Russell Adams of Gainesville Tree Farm in Florida. Russ is an avid horticulturist focused on growing a wide range of very rare palms, desert plants and Aroids. During a visit to his nursery after a speaking engagement, I had the joy of touring his collection and talking the wonderful world of plants. At one point he showed me a dormant *Amorphophallus titanum* corm. There’s no doubt he saw my green-with-envy-I-want-that-plant look in my eye. He said no, he couldn’t part with it. I told him I would crawl two miles in the mud to get that plant for the SFA Mast Arboretum. He said no again, so I dropped it. We continued to tour and talk plants and just as I was about to drive away he handed me the corm with a few instructions on its care, and Jack was on his way to Texas.

Jack quickly made his home in a pot and was grown along with thousands of other plants and by some miracle the plant was always brought into the greenhouse when the cool weather arrived in the fall and was brought back into the shade house when spring was fully in place. There was a shifting up in 2002 to a 15-gallon pot. The plant made some waves in 2003 with an 8’ leaf and thick trunk. Jack was moved into the greenhouse in the fall 2003 and kept a healthy leaf all the way into February 2004 before crashing back to the ground. In March 2004, it was decided that Jack had done so well in 2003 that he deserved a big new pot. Jack was repotted by students in a lab and at that time the corm was healthy and weighed in at a respectable 26 lbs and 2 oz. We didn’t know it then, but Jack was thinking of flowering. Jack emerged in mid-June 2004 and while we thought we had a leaf, it wasn’t long before we realized Jack was producing a flower.

You pollinated Jack?

Yes! Pollen was mailed from a University of Connecticut plant that just finished flowering. The pollen arrived July 12, 2004. Clinton Morse and Matthew Opel at the University of Connecticut had just endured an exhausting three-week event that ended right before our Jack opened. However, Clinton tells me that the plant performed a bit less than expected and only stayed open 18 hours. The flower there was pollinated by frozen pollen from a plant at the Fullerton Arboretum that flowered several years ago. This means that Jack – with the University of Connecticut pollen – will be working with “fresh pollen.” The pollen was delivered in a Styrofoam container and was still cool when it arrived. Jack was pollinated on Monday, July 12 about 8 PM. The tiny amount of pollen was carefully dusted on to the stigmas through a window we cut in the lower section of the spathe. This was, of course, a very stinky job because Jack was effusing his charm quite vigorously at that time. Bot flies and other flies had found this carcass and were lighting on the spadix. Hopefully, we will have good fertilization, a seed crop, and baby Jacks. On Wednesday, we collected Jack’s pollen and that was mailed on to Jim Thompson at Disney World’s Animal Kingdom conservatory; a plant there is about to bloom! The pollen from this plant will be sent to Atlanta Botanical Garden where a **fourth** *Amorphophallus* flower is developing. The pollen chain will continue until there is an *Amorphophallus* in every household in America! Stay tuned.

How do we take care of Jack?

Essentially Jack has had to live his life on much the same regimen as all the other plants that surround him. We have a good organic substrate for him to live in. We fertilize him modestly and try to keep him moist. Even during the dormant period, the corm should be kept slightly moist.

What’s Jack’s Status?

There’s no humility here! Jack finished up at 61” tall and started opening on Monday July 12, 2004 around 1:00 PM. When he unfolded, there was no doubt about it; he was incredible, a truly amazing and mysterious botanical masterpiece. At 2 PM we still weren’t positive this was the real thing – heck, how many folks have had experience with this? – so we put out a Web alert that said we “think” he’s opening. At 3 PM, we knew we had an event and the announcement went out. The bloom opened to its finest that night around 8 PM and Jack began cranking out a stench that withered the crowd. The delightful smell of spoiled meat was powerful enough to be detected over 100 yards away. Flies made their way to our shade house. Jack was reeking right in the middle of a crowd of admirers.

Around eight that night we cut a small rectangular window in the side of the spathe and we brushed on, blew on and chanted on pollen mixed in a little powdered milk. The pollen had arrived from Connecticut only a few hours before, a gift from the University of Connecticut via Clinton Morse. We sealed up the window with duct tape, turned on a little Jungle Blues music, said a few prayers and Jack was pollinated.

On Tuesday morning Jack was still in fine shape but the spathe had moved upward a bit, as if he wanted to close. On Wednesday, pollen was extruded from the anthers and looked like tiny strands of grated cheese. That was carefully collected with a spatula, quickly placed in a bag with powdered milk to aid in the drying and shipped to James Thompson of Disney World where another Titan Arum was about to do its thing. So the pollen chain continues! From what I understand, the University of Connecticut plant failed to set fruit and the plant withered away . . . so we have three chances left here to get viable seed: SFA’s “Jack”, Disney World’s “Claire”, and Atlanta Botanical Garden’s corpse flower.

At this writing, Jack is nearing the end of his life. On Thursday night July 15th, the spadix flopped over around 9 PM. That meant that Jack’s spadix had been erect for about 77 hours from the first signs of opening. Evidently the spadix collapse normally takes place after 48 hours, but Jack fooled all of us. On Friday July 16th, Dr. Shiyou Li, Director of SFA’s Center for Medicinal Plant Research, collected a section of the spadix for analysis. Perhaps Jack’s contribution will continue as a cure for cancer or a disease.



We are soooooo proud of Jack. He’s done well. We know he wasn’t the biggest corm ever. Let’s face it: at 26 lbs. he was a small corm in the world of *Amorphophallus* corms. Everyone here can attest that he hasn’t had a plush lifestyle the last four years. But he’s a Texan. He’s an SFA Lumberjack. He loved the attention, the kids, the crowds and he’ll always be a memory to this wonderful garden in the Pineywoods of East Texas.

2004 Les Reeves Lecture Series

Mark your calendars now and plan to attend the remaining Les Reeves Lectures scheduled for 2004. Hear great horticulturists from all over the United States. The lectures are free and open the public. No reservation required. A rare plants raffle is held afterwards.

**Third Thursday
7:00-8:30 p.m.
Agriculture Building
Wilson Drive**

August 19: Aubrey King, King’s Nursery, Tenaha, TX, “Don’t Tell Me to Get Out of My Rut—I Like It Here!”

September 16: Dawn Stover, SFA Mast Arboretum, “Ginger and Spice and Other Things Nice.”

October 21: Ted Stephens, Nurseries Caroliniana, South Carolina, “Wow! Have You Seen That Weeping, Contorted, Variegated, Red-Flowered Grancy Gray Beard Run By Here?”

November 18: Jim Berry, PDSI, Alabama, “Tomorrow’s Plants Today.”

December 16: Dave Creech, SFA Mast Arboretum, “End of the Year Review.”

Summer Fun at Mill Creek Gardens

By Elyce Rodewald

Invertebrates and their connection to all parts of their environment were the focus of two weeks of outdoor adventure at Mill Creek for 43 young campers. Honey bees, dragonflies, grasshoppers, butterflies, and earthworms were just a few of the amazing invertebrates seen at the annual summer camp hosted by the SFA Mast Arboretum, Pineywoods Native Plant Center, and Pineywoods Sierra Club. Kids 6-11 years old explored rotten logs, open fields, streams, ponds, and woodlands in search of remarkable animals, plants, and fungi. Campers created clay insects and sweep nets, canoed, sang lots of silly songs, made new friends, and formed a connection to the natural world.



The camp week was highlighted by visits from Kerry Barnes, Sierra Club (The Snake Man); Toni Trees, US Forest Service (The Snake Lady); Joe Pase and Alan Smith, Texas Forest Service (The Insect Guys); Dr. Alan Sowards, SFA Department of Elementary Education (The Water Wizard); expert forest guides, Larry Shelton and Emily Goodwin; and Clarence Shepherd, Pineywoods Beekeeper Association.

Volunteers played a crucial role in making the camp a success. Fifty volunteers donated over 1000 hours to create this exceptional learning environment for the campers.

Here are a few quotes from campers overheard by leaders throughout the camp:

“Golly, Mr. Mike, this is the best time I ever had!”

“Wow, this is someplace I can get dirty and no one tells me I can’t.”

“I caught a salamander, *I caught a salamander*, I CAUGHT A SALAMANDER!!!”

“I’m amazed!”



For information about Mill Creek Camp 2005, please contact the SFA Mast Arboretum Education Office at 936-468-1832.