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Earl Core Student Report: Mistletoe – it's not just for the holidays!

By Nicholas Flanders, Old Dominion University

The oak mistletoe (*Phoradendron leucarpum*) is a native epiphytic shrub abundant in many urban areas and forested wetlands across the Southeast. A hemiparasite, it acquires water and dissolved nutrients from branches of host trees and is highly visible in winter in deciduous canopies. While holiday tradition has helped to maintain mistletoe as a general concept in public consciousness, undergraduate assistants consistently expressed to me an ignorance of its local occurrence. In contrast, mistletoe collection activities in urban areas tend to attract public attention, and interactions with older residents have often included helpful accounts of local mistletoe abundance coupled with stories of someone they knew harvesting mistletoe during the holiday season using a firearm. Public awareness of the presence of oak mistletoe in the landscape of the Southeast is obviously in decline, and despite being a common and often highly visible plant many basic aspects of its biology and ecology remain unanswered.

The high visibility of oak mistletoe and its dependence on birds for seed dispersal beyond the host tree of origin make it a nice system for investigating general questions about the role of dispersal in determining plant distributions. Such information about the distribution of oak mistletoe in the Southeast could also have conservation implications. Mistletoes in general can be considered keystone resources, and in addition to being food resources for fruit-eating birds in forested wetlands and urban areas of the region the species serves as the sole larval host-plant for the great purple hairstreak butterfly (*Atlides halesus*) in the Southeast.

In 2015 I began projects designed to quantify the relative influences of dispersal and local environmental conditions on the distribution of oak mistletoe in eastern Virginia and North Carolina. I have been collecting data at randomly selected plots in different forested habitat types on the co-occurrence of oak mistletoe, potential host trees, and fruit-eating birds. I also began simulating dispersal to different local light environments in the field by planting oak mistletoe seeds on branches of host trees in forested wetlands of southeastern Virginia either within 15 m of the forest edge or greater than 15 m from the forest edge. In an attempt to eliminate the influence of nuisance variables that could bias results from the field planting I initiated a more controlled planting experiment in 2016.

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Earl Core Student Report: Prescribed fire is not a panacea for *Pinus* woodland recovery

By Jonathan Kleinman, University of Alabama

Longleaf pine (*Pinus palustris*) forests are characterized by widely spaced canopy trees and open midstories (Figure 1). On the forest floor, flammable pine needles and other fine fuels support surface fires, which reinforce longleaf pine dominance by top-killing less fire-resistant plants. Fire-maintained longleaf pine forests host exceptionally high floristic diversity, which can exceed 40 plant species per square meter. Though among the most biodiverse ecosystems in North America, longleaf pine forests are also among the most endangered, occupying less than 5% of their pre-European settlement extent¹.



Figure 1. Longleaf pine forest in the Oakmulgee District, Talladega National Forest, Alabama.

In Alabama, the Oakmulgee District of the Talladega National Forest contains the largest remnant of the longleaf pine ecosystem in the state. On 27 April 2011, the Oakmulgee District was impacted by an EF3 tornado, which was one of 362 tornadoes that occurred during the April 2011 Super Outbreak. Within seven months, accessible areas were salvage logged as a cost-effective means to reduced hazardous fuel loads and mitigate potential insect outbreaks.

Despite the potential socioeconomic benefits of salvage logging, its long-term ecological effects remain uncertain. Based on field data collected in 2016, post-tornado salvage logging reduced ground flora diversity but not longleaf pine sapling densities^{3,4}. In other words, salvage logging altered early-seral ground flora assemblages, but did not inhibit recovery toward pre-disturbance canopy conditions. Altered ground flora assemblages were attributed to salvage-mediated

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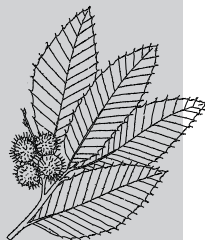
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**From The Editor's Desk:**

Joe Pollard, Newsletter Editor



Here's the summer issue of *Chinquapin*, and it's still summertime! Hopefully there will be two more issues this year, so we won't fall short of our goal like last year. As always,

suggestions from the membership are welcome, and contributed articles are even MORE welcome. Contact me (joe.pollard@furman.edu) if you are interested in submitting something.

Members often tell me that they particularly enjoy reading the research summaries submitted by recipients of the Earl Core Student Research Awards. If you feel that way you're in for a treat, because this issue includes not one but *two* Earl Core reports. Both Nick Flanders and Jonny Kleinman are promising botanists doing fascinating research.

The previous issue had been sent to the



printers before the ASB meeting last spring, so this is the first chance to report on our annual meeting. You will find an insert with the minutes of the SABS business meeting and the treasurer's summary report, plus a section



of the newsletter announcing the winners of our society's awards. We had an excellent meeting in Memphis, and I think I speak for the whole society in thanking the organizers. I had the opportunity to go on the SABS field trip on Saturday morning, and it was an absolute delight. The rare juxtaposition of an old-growth forest in an urban setting was interesting and unusual, and the spring wildflowers were spectacular. I've included a few photos for those who couldn't be there.

NEWS FLASH: Election Results

The SABS Council will be joined by the following new officers and members:

President-Elect: **Rebecca Cook**

Membership secretary: **Michael Held** (re-elected)

Member-at-large to Council: **Conley McMullen**

Student representative: **Katie Horton** (appointed)

SABS Welcomes Our New Members

Ericka Allen
Sarah Brown

Sara Cline
Ethan Malachi Gray

David Luzader
Rich Reaves

George Rogers
Amanda Slaughter

News from the 2019 Annual Meeting

Student Presentation Awards at the Annual Meeting

Oral presentation – **Marietta Shattleroe** (Appalachian State University): Investigations of the Forgotten Geum, *Geum geniculatum* Michx., Bent Avens.

Poster presentation – **Claire Ciafre** (Austin Peay State University): The confluence of disjunct plant species in a remarkable Eastern Highland Rim seepage grassland, Putnam County, Tennessee.

Earl Core Student Research Award

Cheyenne Moore (Bucknell University; advisor Dr. Chris Martine): The conservation challenge of linear populations: Using field surveys and herbarium collections to inform the populations genetics of a Pennsylvania rare plant, *Baptisia australis* var. *australis*. Award = \$1200.

Mason McNair (University of Georgia; advisor Dr. Wendy Zomlefer): Delineating taxa within the *Sarracenia rubra* species complex. Award = \$1,200.

John Fahey Biological Field Station Scholarship

Brandy Benz (North Carolina State Univ.) Fern Identification & Ecology Course, Highlands Biological Station

Robert Helsel (Rutgers Univ.) Mosses: Structure, Ecology, & Identification Course, Eagle Hill Institute

Aryan Kadkhodaei (Univ. of Virginia) Plant Diversity/Evolution/Conservation Course, Mountain Lake Biol. Station

Richard and Minnie Windler Award

Systematics: **PW Schafran, EA Zimmer, WC Taylor, LJ Musselman**. A whole chloroplast genome phylogeny of diploid species of *Isoetes* (Isoetaceae, Lycopodiophyta) in the southeastern United States. *Castanea* 83(2):224-235.

Ecology: **TM Shearman, GG Wang, RK Peet, TR Wentworth, MP Schafale, AS Weakley**. A community analysis for forest ecosystems with natural growth of *Persea* spp. in the southeastern United States. *Castanea* 83(1):3-27.

Elizabeth Ann Bartholomew Award

The 2019 Elizabeth Ann Bartholomew Award was presented to **Michael Held** of St. Peter's University.

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habitat homogenization (i.e. deadwood extraction). Field sampling was repeated in 2017, and, with the support of the Earl Core Student Research Award, conducted again in 2018 after an operational-scale prescribed fire.

Forest recovery after disturbance is shaped by the various abilities of plants to survive disturbance, and colonize and compete in altered biophysical conditions⁶ (Fig. 2). The overarching objective of the 2018 field campaign was to assess how prescribed fire influenced forest recovery in areas differentially impacted by wind disturbance and salvage logging. It was hypothesized that prescribed fire would a) enhance longleaf pine recovery by suppressing hardwood competition, and b) promote ground flora community convergence by imposing consistent selective pressures on plants with common life-history strategies.

To test the first hypothesis, seedling and sapling densities were compared by species before and after prescribed fire. To test the second, multivariate analyses were used to compare ground flora assemblages based on the composition and foliar cover of woody and herbaceous plants. Furthermore, to achieve a mechanistic understanding of floristic succession, trait-based analyses were conducted to assess changes in the representation of species-specific life-history strategies². Life-history traits included life cycles, growth habits, light requirements, dispersal vectors, resprouting abilities, and Raunkiaer life forms⁵ (i.e. locations of perennating tissues).



Figure 2. The longleaf pine seedling on the left resisted prescribed fire. The shortleaf pine seedling on the right was top-killed, but endured by resprouting.

Although prescribed fire effectively reduced hardwood densities, thereby supporting the first hypothesis, ground flora assemblages remained disparate before and after prescribed fire. Trait-based analyses are ongoing, but initial results indicate that prescribed fire did not substantially increase the relative abundance of plants with fire-adapted life-history strategies. Indeed, the study area, which was burned in 2010 before the tornado and in 2014 before field sampling, was already in a fire-maintained condition before the 2018 prescribed fire. As such, the 2018 prescribed fire did not offset salvage-mediated differences in ground flora assemblages. Based on these results, leaving some wind-disturbed patches unlogged is encouraged to promote stand-scale plant diversity, and continued use of prescribed fire is recommended to improve longleaf pine recovery.

Jonathan Kleinman is a Ph.D. candidate at the University of Alabama. His advisor is Dr. Justin Hart.

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Edible Wild Plants: Barking Up the Right Tree

By Lytton John Musselman, Old Dominion University



Figure 1. Harvesting inner bark from Scots pine, SUNY College of Environmental Science and Forestry Ranger School, Wanakena, New York.

There is not much appeal in eating tree bark. Because of the plethora of wild edibles in the Southeast, eating tree bark, pine seeds, and tree leaves has received little attention. But the inner bark, more precisely the cambial layer, was an important food in different parts of the world. The Sámi people of Lapland harvested the inner bark of the Scots pine, *Pinus sylvestris*, dried it and used it as a survival food. I tried this with Scots pine in the Adirondacks and the result was a fibrous, tasteless mass suitable as a high fiber meal for beavers (Fig. 1). I think my students and I missed the optimal time of collecting when the sap is rising.

In the American West, Native Americans prepared a similar food from Ponderosa pine, *Pinus ponderosa*. Trees with the scars of this harvest are now preserved as archeological relicts. I have not tried Ponderosa pine but rather a different gymnosperm, red spruce, *Picea rubens*, that forms dense stands at higher elevations in the Appalachians. The taste? Less resinous than expected but not something that will turn up on the Food Channel. However, both pines and spruces are a good source of emergency food.

I am unaware of any bark harvest in the southeast like that of Laplanders and undergraduates. But there are other parts of pines that are edible. One of the easiest to harvest is the young spring shoots of white pine, *Pinus strobus* (Fig. 2). At this stage the shoots are tender and contain considerable sugar. They can be steamed as a snack, or chopped and used in a salad. In my opinion they are the only pine shoots in our region worth collecting for food. I have tried the young terminal shoot, the “candle stage” of young longleaf pine (*Pinus palustris*) and was repelled by the intense turpentine taste—not unexpected in a species used for naval stores resins.



Figure 2. Early spring growth of white pine, Wisconsin River bluffs, Wisconsin.

The tastiest product of pines is the seeds. All pine seeds are edible but small and difficult to extricate from the seed coat. Best known are the large seeds of the pinyon pine of the American Southwest (*Pinus edulis* and some other species) and the widely grown *Pinus pinea* (umbrella pine) native to the Middle East and usually sold simply as pine nuts. They are a valued component of Arab dishes

when cooked with meat and rice.

Of our southern pines, only longleaf pine has seeds large enough to harvest. I have yet to find an efficient means of cracking the seeds and removing the nutmeat (Fig. 3). While a pain to extract, the seeds are tasty and full of oils. Because of the oil, they soon become rancid and should be stored in a refrigerator.



Figure 3. Seeds of longleaf pine. Upper left, the complete seed with wing. Upper right, outer seed coat removed. Center, seeds ready to eat with papery layer removed.

The best-known gymnosperm flavoring comes from junipers, species of the genus *Juniperus*. *Juniperus communis* is one of the most widespread junipers globally but in the southeast our most common juniper is *Juniperus virginiana*, commonly known as red cedar. The



Figure 4. Ripe juniper cones, Lancaster County, South Carolina.

“berries”, technically cones, can be dried and used as a condiment (Fig. 4). In fact, they can be purchased in yupified grocery stores in the spice section. But it is easy to collect your own. The trees may have the berries any time of year. I dry them in a dehydrator then store them in a refrigerator. Be selective

when harvesting juniper berries. I have found a wide range in the flavor among different trees.

Because they are strong and resinous, juniper berries are suitable to flavor wild game. I use them when preparing sauerbraten from venison. The berries can also be used to flavor alcoholic drinks. Put ten average-size berries in a cup of vodka and store in a cool place for a month. Serve as an aperitif with your sauerbraten. Arguably, your drink will rival that of the popular gin, *The Botanist*, that is flavored with numerous plants native to the Isle of Islay—among them *Juniperus communis*.

One of the trees under-utilized by wild food foragers is mulberry (Fig. 5). The use of the fruit for pies and crushed for drinks is well-



Figure 5. Mulberries. Left: red fruits of the white mulberry tree. Middle: white fruits from the same species. (White mulberry images from Norfolk, Virginia.) Right: dried white fruits from the black mulberry in the bazaar in Sulaimani, Iraq.

continued on next page

known. Until I saw sacks of dried mulberry fruits in the large bazaars in the Kurdish cities of Irbil and Sulaimani in Iraq, I did not appreciate what a sweet snack they make. The Iraqi product is made from *Morus nigra* but with a twist—the white fruited form of the black mulberry is sweeter than the black or dark-purple form. Yet another twist is the weedy *Morus alba* brought to this country by the English who wanted to start a silk worm industry. The worm turned: silk is not produced, and the tree is now a weedy denizen of urban areas. Ironically, most of the fruits of the white mulberry are red but, again, the white fruits are tastier than the red. The dehydrated fruits of white mulberry are sweet and comparable to those from black mulberry. Mulberry trees are

unisexual. Don't be discouraged if you have only a male tree, it is still useful for food. The young leaves are tasty raw or steamed. Harvest when the tree is in flower in early spring.

WARNING! As with all wild plants use caution and moderation when eating them.

(Adapted from the forthcoming *Edible Wild Plants of the Carolinas: A Forager's Guide* by Lytton John Musselman and Peter W. Schafran to be published by University of North Carolina Press as part of their Southern Gateways Guide series.)

Mistletoe *continued from p. 9*

The controlled experiment was designed to jointly estimate the effects of local light environment and flood regime on oak mistletoe establishment. I hypothesized that in addition to light availability, flood regime is an abiotic factor capable of influencing oak mistletoe establishment and distribution by influencing host tree physiology in forested wetlands and making them more vulnerable to infection. In winter 2016-2017 I transplanted 116 saplings of red maple (*Acer rubrum*), a common host in my study area, from a single population in Halifax County, North Carolina into pots. These potted red maple saplings were transported to the Virginia Tech Hampton Roads Agricultural Research and Extension Center in Virginia Beach, Virginia and placed in plastic tubs (4 pots per tub). Tubs were subjected to one of 3 growing season flood regime treatments beginning in 2017. Water in tubs subjected to the continuous flooding treatment was maintained near the level of the soil in the pots over the entire growing season. Water in tubs subjected to the partial flooding treatment was maintained at this level for 2 weeks at a time in between 2-week periods when natural precipitation was the sole water source. I drilled drain holes in the bottom of tubs subjected to the unflooded treatment.



Figure 1. Volunteers planting oak mistletoe (*Phoradendron leucarpum*) seeds on potted red maple (*Acer rubrum*) saplings at the Virginia Tech Hampton Roads Agricultural Research and Extension Center in February, 2018

After maintaining the flood regime treatments during the 2017 growing season I planted oak mistletoe seeds collected from a single population in Great Dismal Swamp National Wildlife Refuge on the potted saplings the following winter (Fig. 1). I planted at a rate of 2-10 mistletoe seeds per sapling for

a total of 599 seeds planted. In addition to reinitiating flood regime treatments during the 2018 growing season I subjected germinated mistletoe seeds to one of 4 light availability treatments under a split plot design. Within the large plot flood regime treatments I applied sub-plot light availability treatments randomly at the sapling level, consisting of broadcloth covering of seeds to create complete shade,

70% shade cloth covering to create moderate shade, and translucent tulle and no covering as control treatments. Funds from the Earl Core award allowed me to continue flood regime treatments in 2018 and to initiate light availability treatments.



Figure 2. Established oak mistletoe (*Phoradendron leucarpum*) seedlings as evidenced by the presence of leafy stems

In 2019 I reinitiated growing season flood regime treatments and replaced light availability treatment materials that had been deployed in the field since the growing season of 2018.

I first checked the planted mistletoe seeds 3 months after planting and found 360 seeds remained and an overall germination rate among remaining seeds of 89% with little variation across flood regime treatments. As of my last check in May 2019 I found an overall survival rate of 58% after 15 months and an overall rate of establishment indicated by the presence of a leafy stem of 41%. I analyzed survival and establishment data using generalized linear mixed models in an information-theoretic framework and found positive relationships between light availability and both survival and establishment but no relationships with flood regime.

Other evidence for a positive relationship between light availability and oak mistletoe establishment includes a much higher establishment rate for seeds planted on the potted host trees than for seeds planted in the field. Field sites had consistently lower levels of light availability than the site hosting the controlled experiment due to canopy shade, and the only field sites with successful oak mistletoe establishment were at the forest edge or within an interior canopy opening. This result coupled with a preliminary lack of correlation between distributions of oak mistletoe, its host trees, and its avian seed dispersers suggests that local environmental conditions are more important than dispersal limitation in determining where oak mistletoe can establish in eastern Virginia and North Carolina.

Nicholas Flanders is a Ph.D. Candidate at Old Dominion University. His advisor is Dr. Lytton Musselman.

Botanical Brainteasers

By Joe Pollard and Janie Marlow

Our spring Brainteasers [Chinquapin 27(1)] were: (A) *Rubus pensilvanicus* (= *R. argutus*) blackberry; (B) *Morus alba*, white mulberry; (C) *Muscadinia rotundifolia* (= *Vitis rotundifolia*), muscadine; (D) *Fragaria virginiana*, wild strawberry; and (E) *Amelanchier arborea*, serviceberry. Apart from the tasty pictures, this puzzle included a juicy clue about common names not always matching plant anatomy. Of the four with “berry” in their common name, none have fruits that are technically berries. Blackberries are aggregates of drupelets. Mulberries are multiple achenes with fleshy sepals. Strawberries are accessory fruits (aggregates of achenes on a fleshy receptacle). Serviceberries are pomes. Of these five species, only *Muscadinia* produces a true berry, so it’s the odd one out, but ironically it’s the one that doesn’t have “berry” in its name: it’s called muscadine, scuppernong, or simply grape.

We received four entries on this one. Everybody did well on the identifications. Both Jim Hull and Sam Pratt recognized the irony about berries, so we’ll declare them joint winners. At the end of the year we’ll total up the scores and decide on a winner. Playing every time is a big advantage.

So here’s the second Brainteaser of volume 27. This group includes some very strange-looking plants. As usual, provide scientific and common names for the 5 plants, and explain why one of them doesn’t really belong with the other four. Send your answers to joe_pollard@att.net (that’s an underscore character between first and last names). Email is preferred, but you can also use snail-mail to my address found elsewhere in this issue. Color photos will be posted online at <http://sabs.us/publications/chinquapin-issues>. [Photo credits: A, B, C: JK Marlow; D: AJ Pollard; E: K Bradley]



Among Ancient Baobabs in Southwestern Madagascar

By L. L. Gaddy, President – *terra incognita*

Madagascar had long been on my bucket list, and, in 2018, because of a cancelled trip to Uganda (Ebola outbreak), I got my chance to see the enchanted island. My route was Washington-Istanbul-Nairobi-Antananarivo. After landing in the capital Antananarivo (“Tana”), I would first fly to the southwest of Madagascar, then I would travel to the northeast and see rain forests and, finally, travel to the northwest to see the biodiverse isle of Nosy Be (nosy = island in Malagasy). I had hoped to see most of the island in my allocated 14 days, but, as I later learned, my plans were overambitious. I, in fact, never made it out of southwestern Madagascar.

I first flew to Toliara (Tulear), near the southern extremity of the Great Reef of Madagascar, a 300-mile long pristine coral reef along the Mozambique Channel. Southwestern Madagascar lies from around 19 to 25 degrees in south latitude and, with less than 20 inches of rain per year, is the driest part of island. The region is dominated by species-rich thorn and shrub forests with scattered baobab trees adjacent to one of the least disturbed coral reefs in the world. Toliara is a picturesque little town, streets full of “pousse-pousse” (bicycle rickshaws) and lined with flame trees (*Delonix* sp.). I immediately installed myself in the Hyppocampo (Seahorse) Hotel on the channel to enjoy the town, the pet lemurs, the food (French-Malagasy), and the spectacular sunsets. After a day of decompressing from jet travel, I was ready to head up the coast along the barrier reef to see the baobabs of Ifaty Forest.

The word baobab is derived from the Arabic *bu hibab* (“fruit with much seeds”) in reference to the large fruit pod of the tree. Baobabs are taxonomically placed in the subfamily Bombacoideae of the Malvaceae, a plant family that includes okra, cotton, and mallows. They are in the genus *Adansonia*, named for Michel Adanson, a French naturalist and explorer. Of the eight species of baobabs known, six are endemic to the island of Madagascar. In the southwest of Madagascar, three noteworthy baobabs occur: Grandidier’s baobab (*Adansonia grandidieri*), the fony baobab (*Adansonia rubrostipa*), and the Za or bozy (*Adansonia za*; the word “Za” is a Malagasy/tribal term for baobab). In northern Madagascar, one finds the bozy malandy (*Adansonia madagascariensis*), Perrier’s bozy (*Adansonia perrieri*), and the bozy mena (*Adansonia suarezensis*). The remaining two species of baobab are found outside of Madagascar. The African baobab (*Adansonia digitata*) has a wide distribution across Africa, while the most far-flung species, the boab or dead-rat tree (*Adansonia gregorii*), is found in northwestern Australia. Madagascarian baobab flowers are pink to reddish in color, while African baobabs have white flowers. Pollination is by lemurs, hawkmoths, and butterflies. The baobab fruit

is a globe-shaped pod approximately 3 to 5 inches in diameter with hard seeds surrounded by an edible pulp.

In Ifaty, I saw my first baobabs (Fig. 1). In the Reniala Reserve near Ifaty, about twenty miles north of Toliara, one finds a strange forest dominated by fony baobabs mixed with shrub and thorny cactus look-alikes in the Didieraceae family (there are no native cacti here). The sparse canopy of these fat-trunked trees makes one realized why the baobab is sometimes call the “upside down tree” – the limbs look like roots. Here, the trees are thought to be around 500-1000 years old, and every baobab seems different from the next. After a few hours hiking in this forest, I fell in love with these interesting trees and wanted to see more.

After discussions with my driver and the local naturalists, I discovered that I could take a jeep trip, fording several rivers and skirting the best part of the barrier reef, see several species of baobab and a few of the oldest known baobab forests, and end up in Morondava, the next major town to the north. I negotiated a price and route with my driver and we planned to leave the next day. The problem was there was no public road, only dirt trails across private land for the 300-mile trek. This “outback” journey would also take us through small towns (some without electricity) and across the Mangoky River, one of Madagascar’s longest and widest rivers (on a rickety iron ferry—there are no bridges). Other creeks and small rivers would have to be forded; if the waterways started to rise (it was the end of the dry season), we would have to turn back.

It is thought that the original baobab forests of Madagascar were much denser than they

are now. Clearing for agriculture has broken up continuous baobab forest, and anthropogenic fires have opened up the landscape – fortunately, baobab bark is thick and is tolerant of hot fires. Today, the survivors, lone baobabs and small



Figure 2. A gigantic specimen of *Adansonia grandidieri*

stands of baobabs, are scattered over the landscape; few “forests” of the trees remain outside of national parks and reserves. Many of these lone trees are ancient and spectacularly beautiful (Fig. 2). The people of Madagascar are proud of their ancient baobabs (I photographed a captain in the Malagasy army standing in amazement beside a baobab giant, with his AR-15 under his arm), and most would never permit the cutting of these ancient giants. In Africa, where old baobabs are considered sacred, researchers have noticed a sudden die-off of these trees. This does not appear to be happening to the baobabs in Madagascar’s southwest, but, at 1500 years old, many of these trees are probably near their life’s end.

The fony baobabs of Reniala in Ifaty Forest averaged about 50 feet tall or less and rarely were over three feet in trunk diameter. As we drove north, however, we started seeing larger baobabs. Near Andavadoaka, a solar-powered coastal community on Madagascar’s pristine barrier reef, we spotted a stand of squat, Grandidier’s baobabs



Figure 1. *Adansonia rubrostipa* at Ifaty

Return Service Requested

Ancient Baobabs *continued from p. 15*



Figure 3. Dwarfed *Adansonia gradidieri* near Andavadoaka

that looked like huge sprouting potatoes (Fig. 3). The trees were growing in sand and limestone between salt flats and the rear dunes of the beach. They were unbelievable, dwarfed remnants of primeval Madagascar, possibly germinating over 1500 years ago.

Continuing northward to the Mangoky River valley, you enter a landscape dominated by scattered giant Grandidier's baobabs. They tower over other trees in the short canopy of the dry, spiny scrub and in open savannahs. These giants grow to

over 100 feet in height and to nearly 25 feet in diameter. The trees of the iconic "Allee de Baobabs" near Morondava (Fig. 4) are Grandidier's baobabs – tourists (including me) get up at 4:00 AM to catch a glimpse of these trees in the early morning sunlight. This species' namesake, Alfred Grandidier, was a French naturalist who embarked on a voyage around the world at the age of 20 and made a stop in Madagascar; he ended up making two return expeditions to island.

Near Toliara, there are several ancient baobabs identified as *Adansonia rubrostipa*, the fony baobab. Two of these trees, one called the



Figure 4. The "Allee de Baobabs"
(Avenue of the Baobabs)
near Morondava

"Grandmother" tree, have been aged by carbon (^{14}C) dating, as annual rings are difficult to discern in baobabs. Such data indicate that these trees are at least 1100 years old and may be as old as 1600 years. Studies on African baobabs (*Adansonia digitata*) indicate that baobabs may be the oldest living angiosperms (up to 2000 years), surpassed in age only by gymnosperms such as the bristlecone pines of California.

The baobab, though found in Africa proper, in Australia, and planted in India, is, like the endemic lemur and the widespread chameleon, a symbol of Madagascar. And what an

appropriate national symbol for the fourth largest island on the earth, an island that harbors such a strange and unique flora and fauna.

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