

# BotSoc News



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Learning to identify plants is the key to learning how to *consistently* identify plants, botanical families and the relationships between them

By Bobby Hattaway



I have always liked plants. I think part of the reason I fell for plants is that I am always a fan of the underdog, and plants get ignored when it comes to other organisms, especially animals in general and furry animals in particular. But I did not fully appreciate the biological complexity of plants till I started to study them. To seriously study plants, I had to learn to identify them. That proved to be more difficult than I imagined it would.

I think the reason plant identification—"plant ID" for short—skills are the most rewarding for plant enthusiasts is that, after beginners gain some experience and basic knowledge, they can proceed on their own and teach themselves. That's why we have so many good self-taught botanists in the Georgia Botanical Society.

My goals in the series of articles that begins in this issue of the newsletter will be to:

- Discuss plant analysis (PA) as the best way to get started in plant ID.
- Suggest that beginners focus on woody plants in Georgia since that gives us a smaller universe to work with.
- Identify the pitfalls that the botanical novice is likely to encounter in plant ID in general and in woody plant ID in particular.
- Recommend strategies to deal with those problems.
- Generally discuss the process of keying plants—a discipline more complex than PA—and why that process is so useful and important.

Along the way, we'll also provide a guide to resources that can help with PA and plant ID, both in print and online, and even talk a little about the many phone apps

**Editor's Note:** Are there five people in the Georgia Botanical Society who don't know Dr. Robert "Bobby" Hattaway? Probably not. Nonetheless and for the record, he is a Georgia native and Ph.D. botanist with extensive field experience in Georgia, Florida and the Upper Midwest; immediate past president of the society; prolific teacher and field trip leader; and fervent advocate for plants and their importance as the source of all life on earth. He also believes that keying—methodically identifying plants—is a skill that deepens everyone's appreciation and enjoyment of the magical world of plants.

His multi-part series on plant identification begins here today.

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**BotSoc News**

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I just finished typing up and submitting a description to our Field Trip Chair Shannon Matzke for a summer field trip I hope to lead next year as she plans for 2023. Besides the 2022 Spring Pilgrimage, this will be the first regular field trip I hope to lead for the Botanical Society.

I was pleased to hear when she noted to me that she has received a lot of responses for 2023 trips from potential leaders. I find and believe field trips to be the heart of our society. On our membership renewal form there is a checkbox for "Field Trips/Trip Leader," and responses there indicate about 20 percent of the membership is interested in this type of event (and I believe many others just didn't check the box). Along with field trip attendance, these indicators let organizers know where to focus their attention. Reading about plants or seeing them on nature shows or at nurseries just doesn't compare to seeing them up close in the natural environment. In such settings you can see the role plants play in the ecosystem, their utilization of the geology, and the benefits they provide to the insects, birds, and other animals that live among them.

I've attended numerous trips myself. I find the trips exciting and fun as I get to participate in seeing and talking to others about one of my favorite topics: plants! In addition to finding trip information within the newsletter, Webmaster Merrill Morris has helped make upcoming trip descriptions and other information easy to find and access from our website [https://www.gabotsoc.org/?page\\_id=12](https://www.gabotsoc.org/?page_id=12). Do check it out. If you have ideas for a field trip location or have ever thought to lead a trip yourself (do lead one, it is easy and fun, and we are happy to have new leaders), message Shannon Matzke for trips throughout the year or Mei Lee Fung for trips for the pilgrimage. For those that lead trips, thank you, and for those that attend them, enjoy.

Membership Chair Jo Anne Romfh has pushed out a clever way for

members to see which other members are near their location. I often go on plant walks alone, but with this tool I might just message to ask the other members in my local area if they would like to join me. Perhaps this tool can be useful to you? Check it out from the Georgia Botanical Society email from [news@gabotsoc.org](mailto:news@gabotsoc.org) sent on September 25<sup>th</sup> at 5:02 p.m.

As we head toward the end of 2022, the society has begun to return to functions it had not had in recent years. Field trip restrictions are beginning to be lifted, the annual Spring Pilgrimage has returned, and now the return of the annual Holiday Party (see details on Page 11). If you have ideas for other projects, let me know. Thank you for being a part of the Georgia Botanical Society.

Go out and look at some plants. Have a great day!

*Timothy Estep*

## Learning to ID Plants—Continued from Page 1

now available for plant ID, including their benefits and their limitations. In this issue of the newsletter, we'll dive into PA beginning immediately below.

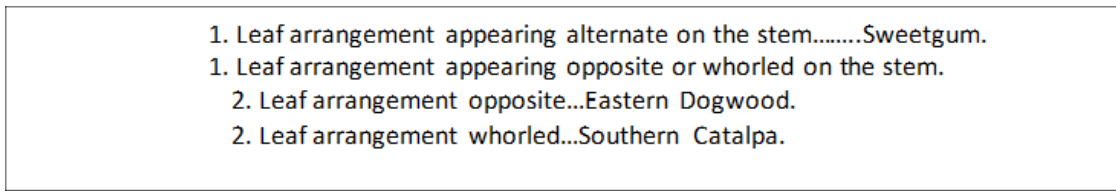
I hope you enjoy the articles!

*Bobby Hattaway*

## Use PA as a way to get started learning the more complex process of systematically keying plants

Keying plants is a systematic process of eliminating all plants but the one you have at hand. There are several kinds of keys. My favorite is a computer-based polyclave key, but good ones are rare. The greatest advantage is that with a polyclave key you can skip features that are not present on your plant, say fruit for example. However in this article, I will promote the use of the classic, tried-and-true dichotomous key.

This is the key type you are most likely to find. Dichotomous means two branches. So you read

- 
1. Leaf arrangement appearing alternate on the stem.....Sweetgum.
  1. Leaf arrangement appearing opposite or whorled on the stem.
    2. Leaf arrangement opposite...Eastern Dogwood.
    2. Leaf arrangement whorled...Southern Catalpa.

what is known as a couplet, giving choices like “leaves alternate” or “leaves opposite or whorled,” and after deciding

Figure 1: An example of an indented dichotomous key.

which choice fits your plant, you move further down into the key and keep making the appropriate choices until you eventually arrive at the end of the keying process which hopefully corresponds to your previously unknown plant. In so doing, you have eliminated all the other plants, including the look-alikes. The paired choices are known as couplet leads, and in a good dichotomous key, there are only two choices or leads. If there are more than two leads or choices to deal with, that can get confusing. In short, trichotomies or worse are discouraged.

I decided to not go into the types of dichotomous keys or the qualities of good keys in this article but to focus first on the problems the beginner has using keys. Perhaps the most difficult, if not downright frustrating, aspect of using a dichotomous key is losing your place while looking back and forth between the plant and the reference book you are using. Until you get more experience keying, doing an exercise known as plant analysis (PA) is the efficient way to go. PA is done *before* you start keying. The better the job that you do of PA, the easier the keying process will become. Since humans do not multitask well, until you gain experience and confidence in keying, the best advice I can give you is to work with a partner. That way one member of the two-person team can hold and examine the plant using a PA checklist or sheet (discussed momentarily) and maybe using a 10-power (10X) loupe. Meanwhile, the other person reads the couplets in the key. If you have a third person handy, they can look up terms that are unfamiliar. Then switch roles.

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## Learning to ID Plants—Continued from Page 3

Having a partner or not, the smartest approach to learning to key is to first key some tree you already know to practice how the key works. Most folks in the southeastern United States—one way or another—are at least familiar with the common, if not weedy, American Sweetgum (*Liquidambar styraciflua* Linnaeus, Figure 2 just below). The tree has leaves with margins which are not only

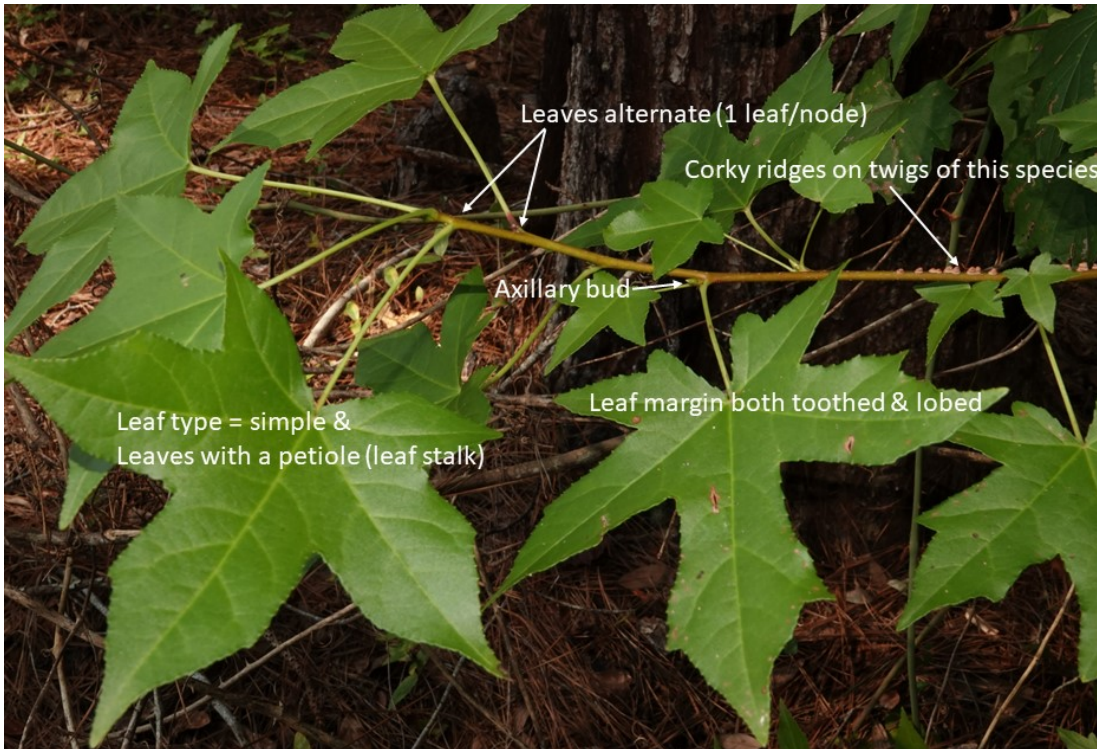


Figure 2, a view of the twigs and leaves of a sweetgum, or *Liquidambar styraciflua*.

strongly lobed, but the margins have little teeth also. It is aromatic when you bruise the foliage. The aromatic foliage trait is an item on my PA checklist. (If you want another very common tree to practice on, try loblolly pine (*Pinus taeda*). That species in Georgia is often called old field pine because it usually takes over an abandoned field in what is ecologically known as secondary succession.)

Back to the PA process. When you get good at it, you not only will not need a partner, but you will hardly have to look back at the plant after your initial examination of it. If you want a good one-page PA guide or checklist, let me know (email me at [botanikman@g-net.net](mailto:botanikman@g-net.net)), and I will send you one. I have several versions, including one that includes reproductive structures (like flowers and fruits) and a simpler version just for woody plants. For trees, you would only need the woody plant PA version.

Referring to Figure 2 above, which illustrates the twigs and arrangement of leaves of a sweetgum (*Liquidambar styraciflua*), lets run this plant through part of the PA process. Below are the first seven of 16 criteria in the checklist mentioned above:

1. Plant habit/aspect or life form – woody (tree, shrub, liana = woody vine).
2. Odor of foliage when bruised (if any, most will be nondescript): pleasant, aromatic, foul-smelling.
3. Anatomy of young stem/shoot (twig) – leaf, bud, and other scars on twigs; pith.
4. Leaves: type of arrangement on the stem (phyllotaxy) – opposite, alternate, or whorled.
5. Leaves: simple or compound (divided); if compound, note the type (e.g., pinnately or

## Learning to ID Plants—Continued from Page 4

palmately, etc.).

6. Leaves: type of shape, tip, base, margin.

7. Leaves: sessile or petiolate (including the length of petiole).

So by the numbers, sweetgum is a (#1) tree that is (#2) odorous with resinous fragrance when the foliage is bruised, with (#3) buds that can be seen at the base of the leaves, with twigs showing the characteristic corky ridges of this species, with leaves that are (#4) alternately arranged, with (#5) simple leaves that (#6) have 5 major lobes with teeth on their margins, and (#7) with a petiole (petiolate).

Now armed with this information, it is time to start going through the keys you have.

### After you arrive at a tentative ID, what's next?

When you think you have successfully identified a plant, besides checking with an expert or looking at specimens in an herbarium, how do you know whether or not you are correct? Real experts in plant ID are becoming an endangered species. Repositories of dried plant specimens, or herbaria, are also becoming increasingly rare because university administrators do not understand their value. When I mention looking at specimens in an herbarium, I am including online herbaria such as the SouthEast Regional Network of Expertise and Collections (SERNEC), which is my go-to online source. It is an online consortium of 233 herbaria in 14 states in the southeastern U.S. To use it, simply Google SERNEC.

But here, to answer the question posed above, let me begin by referring you to my

## With all the nifty new apps available today for plant ID, why learn to key plants?

There are smart phone apps and computer programs that some find useful, and I have been surprised to see how well some of these apps worked. I tried Google Lens, which came with my phone. PictureThis—Plant Identifier worked well, as did Seek by iNaturalist. FloraQuest is a University of North Carolina Apple ID app. (A new version may be available next year on Android devices.) And there are more.

Though I did *not* submit my answers, I even tried the apps on Richard Ware's monthly BotSoc plant contest and was amazed at how well they worked. They are fast, too.

So the obvious question is, why would anyone go the old-fashioned, classical keying route for plant ID when you have these apps? The answer I give won't be immediately obvious to beginners, but I think plant enthusiasts with more experience will more readily accept my answer as valid.

In the short run, these apps and computer programs are fast and are especially useful if the user does not have a clue about the approximate identity of the plant, i.e., what family or genus the plant is classified in. For example, if someone did not know they were looking at an aster, the apps would get you in the ball park.

Linda Chafin—author, teacher and Conservation Botanist with the Science and Conservation Program at the State Botanical Garden of Georgia in Athens—told me this about her experience with phone app identifiers: "I hope people will realize these apps are ONE tool and that the results need to be double-checked either on another app or preferably in a field guide or technical manual. Another viable option would be checking the ID on a website like Janie Marlow's NameThatPlant.net (Native and Naturalized Plants of the Carolinas and Georgia)]. I am currently seeing people look up something on the Seek app and taking it as gospel."

Besides Linda's valid concern, the biggest negative I see with the apps is that their use is tantamount to a black box. By that I mean that the user has no idea of what deductive process the machine or program used to arrive at the guess that it makes. In short, it is like magic. It's like going on a field trip and having the leader tell you what something is without giving

## Learning to ID Plants—Continued from Page 5

2016 article in our society journal, *Tipularia*, “HIPDAD: A New Set of Tools for Identifying Plants.” I will confess here that the title is a misnomer. That’s because the HIPDAD process is more about *confirming* an ID than doing the ID. Here are the components of the acronym: H stands for habitat; I for illustration; P for phenology (the relationship between climate and biological phenomena, including flowering time); D for distribution, or range; A for abundance (whether a plant is rare, uncommon or common in a given locale); and D (again) for description. This last, if done properly, includes the other five.

Illustrating how this works with a couple of these six HIPDAD criteria, let’s say that you live in Savannah (Chatham County). And in some local woods, you find a hickory that you have decided is a big shellbark hickory (*Carya laciniosa*). Using HIPDAD as a guide, let’s start with distribution (D) and abundance (A). You look up the distribution of that hickory in your references and find that a big shellbark hickory is uncommon in northwest Georgia and rare in the upper Piedmont. Furthermore, from the distribution/range information, perhaps including maps, you see this species has not only never been recorded in the Savannah area, it has not been documented in Georgia’s Coastal Plain. So you’ve just used D for distribution and A for abundance to rule out *Carya laciniosa* as your unknown hickory from Chatham County. It’s time to return to your sources for another candidate.

*Coming next time in January’s newsletter:*

- Pitfalls and other problems associated with tree identification in Georgia.
- Online resources that are often underutilized by beginners, including rich online resources such as SERNEC and BONAP (The Biota of North America Program Plant Atlas, including county-level species maps).
- Botanical books that belong on your bookshelf.

you any diagnostic information on why the plant is what the leader says it is. What possible negative consequences could come from using such a wondrous tool? The answer is – in the short term – not much. But ultimately, in my experience, the most meaningful approach to plant identification is to learn to key the plant the old-fashioned way.

The only other thing I might say about the apps is that, although they will usually get the user close to an accurate plant ID, they don’t do well for difficult groups. For example, they might get you to the yellow-eyed grass (actually not a grass) genus *Xyris*, but would be useless to adequately get you to which one you have—that is, the species. Similarly, rhododendrons might be another example of a difficult group.

***Renew your membership now for another year of fun, friends and field trips!***

Memberships in the Georgia Botanical Society run from January through December, so it’s not too early to renew your membership for 2023. And it’s easy to do. You can renew online by going to the BotSoc website/join [https://www.gabotsoc.org/?page\\_id=2](https://www.gabotsoc.org/?page_id=2). There you’ll find a link to the page where you can renew online. Or, if you prefer, print a PDF form for mailing to our membership chair, Jo Anne Romfh. You’ll find her mailing address on the form itself. If you are unable to go to the website and need a form, please contact Jo Anne at [joannromfh@aol.com](mailto:joannromfh@aol.com) or phone 678-461-4466.



## Trees of Georgia: American Sweetgum

# A tree of many names, sweetgum is also a tree of many uses and long history

By Richard Ware

The first reference to our American sweetgum (*Liquidambar styraciflua* Linnaeus) came from author and soldier Don Bernal Diaz del Castillo when he recorded ceremonies between Spanish conquistador Hernán (also Hernando) Cortéz and Aztec ruler Montezuma as he accompanied Cortéz in 1519 on his conquest of Mexico. Cortéz was offered three highly ornamented canes containing liquidambar (“liquid amber”) mixed with an herb they called tobacco, and after viewing the singers and dancers, took a little of the smoke of one of these canes.

Europeans were familiar with liquidambar, although for many years didn’t know where it came from. They finally learned it came from *Liquidambar orientalis*, which is found in the mountains of Turkey, and was gathered by wandering bands of Turcomans. The resin produced by our species is identical to that of *L. orientalis* and was introduced to Europe by Francisco Hernandez. He speaks of the nature of the resin as “hot in the third order, and dry, and when added to tobacco, it strengthens the head, belly, and heart, induces sleep, and alleviates pains in the head that are caused by colds. Alone, it dissipates humors, relieves pains, and cures eruptions of the skin ... It relieves wind in the stomach and dissipates tumors beyond belief.” The sweetgum, or liquidambar, was first described in the New World by Alvar Nunez Cabeza de Vaca who was on one of the most desperate Spanish expeditions in 1528 near the present Apalachicola, Florida.

**Other common names:** American Sweetgum, bilsted, redgum, sapgum, starleaf gum, gum, sycamore gum, gumwood, and alligatorwood.



Photos this page: Top and bottom, two views of the trunk of an American sweetgum (*Liquidambar styraciflua*), both showing the characteristically deeply fissured bark; middle, sweetgum foliage in fall colors. Photos by Richard & Teresa Ware.



## Trees of Georgia: American Sweetgum—Continued from Page 7

**Taxonomy:** Member of the witch-hazel family (Hamamelidaceae). *Liquidambar* comes from the Latin *liquidus*, which means fluid or liquid, and *ambar*, amber; in allusion to the fragrant terebinthine juice or gum which exudes from the tree. The species name *styraciflua*, means flowing with styrax



Top, the unmistakable, star-shaped leaves of the sweetgum (*Liquidambar styraciflua*) in fall colors (see also the photo illustration on Page 4 for spring and summer color); bottom, the corky wings often found on sweetgum twigs. Photos by Richard & Teresa Ware.

(storax, an aromatic balsam used in medicine and perfumery) for a flowering gum tree. There are three other closely related species, one in Mexico, one in central China, and a third in parts of Asia Minor, where the liquid storax of commerce is obtained.

**Description:** A large tree, 80 to 120 feet high and 3 to 4 feet in diameter (maximum 150 feet by 5 feet), with a long, tapering trunk and pyramidal or oblong crown; or, if open grown, and with old age, becoming very wide spread. The sweetgum is easily recognized by the alternate, long-petioled, star-shaped (maple-like), palmately-veined leaves with five long-pointed, saw-toothed lobes. Twigs often develop corky wings and have short-pointed winter buds covered by several scales. The gray or brown bark is deeply furrowed into narrow scaly plates or ridges. Minute greenish flowers are borne in early spring with the leaves, in small balls or heads, the male heads clustered and the female solitary and long-stalked, on the same tree (monoecious). The hard ball-like fruit, hanging on the tree in winter, is composed of many small fruits, each with two long curved or spiny projections and open in autumn to release one or two small, winged seeds together with large numbers of infertile

seeds resembling sawdust.

**Habitat and distribution:** Sweetgum, although a common bottomland tree of the South, is very

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## Trees of Georgia: American Sweetgum—Continued from Page 8

tolerant of different soils and sites but grows best on the rich, moist, alluvial clay and loam soils of river bottoms. It grows from Connecticut southward throughout the East to central Florida and eastern Texas. It is found as far west as Missouri, Arkansas, and Oklahoma and north to southern Illinois. A variety also grows in scattered locations in northeastern and central Mexico, Guatemala, Salvador, Honduras, and Nicaragua. In Georgia, the University of Georgia atlas indicates it has primarily been collected from the northern third and the southern third of the state, while our own Georgia Botanical Society atlas indicates it is found statewide. In



Sweetgum twig and terminal bud. Photo by Richard & Teresa Ware.

this

case I think ours is closer to the truth.



The hard ball-like fruit, shown hanging on a sweetgum in winter, is composed of many small fruits, each with 2 long curved or spiny projections which open in autumn to release 1 or 2 small, winged seeds, together with large numbers of infertile seeds resembling sawdust. Photo by Richard & Teresa Ware.

**Uses:** Sweetgum is superb for ornamental planting, ranking with the most beautiful of our eastern broad-leaved trees. It is hardy as far north as Massachusetts, is easily planted and grows fairly rapidly. The splendid fall coloring—gorgeous scarlet, orange and yellow tints, as well as purple, lilac and brown tones—together with its freedom from pests make it especially attractive on streets and lawns. Since pioneer times the gum which flows from this tree, which is called liquidambar or copalm balm, has been used for the treatment of sores, skin troubles, chewing gum, for catarrh, and the treatment of dysentery but fell into disuse because it was undersold by Oriental storax. When Formosa was cut off during World War II, it made a comeback, with the center of production being in Clarke County, Ala. Then it was used as a needed base of salves, adhesives, perfuming powders, soaps, and tobacco flavoring. Twelve birds, including the bobwhite, are reported to eat the seeds. Sweetgum wood, because of its interlocking grain, is strong and stiff. The hard, straight, close-grained heartwood is bright brown, tinged with red, and is sold as redgum, satin walnut, Circassian walnut or hazelwood. The sap wood is white and is sold as sap gum, as if from a totally different tree! The heartwood

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## Trees of Georgia: American Sweetgum—Continued from Page 9



One reason why some gardeners avoid American sweetgum: If you've ever stepped barefoot on a sweetgum fruit, it's an experience you won't soon forget. Photo by Richard & Teresa Ware.

has a satiny luster and pleasing, varying figure with few American woods equaling it in beauty of natural grain. With new technology, some of the difficulties with seasoning sweetgum wood have been overcome. And now that veneered furniture has so largely replaced solid pieces, sweetgum has come into prominence. Among its many uses are furniture, interior trim, railroad ties, cigar boxes, boxing, crating material, cheap flooring, barrels, woodenware and wood pulps. It is also one of the most important sources of plywood. Somewhere around 690 million board feet are cut annually, all from the South, with Louisiana and Mississippi far out in the lead.

**Famous sweetgums:** I was really surprised to find that there were no famous or historic sweetgum trees listed even though it is a fairly long-lived tree, possibly living to 300 years.

**Champion sweetgums:** The largest known sweetgum in Georgia has a circumference of 197 inches (16 feet, 5 inches), a height of 143 feet, a crown spread of 106 feet and is located in Effingham County. The national champion is located in Burlington, N.J. and has a circumference of 228 inches (19 feet), is 132 feet tall, and has a crown spread of 112 feet.

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## Society News

*Mark the date: Our annual holiday party is back!*

The Georgia Botanical Society Holiday Party returns December 3 to [Newman Wetlands Center](#), 2755 Freeman Rd., Hampton, Ga. 30228 (same location as the previously held year). Join us for a day of friends, cheer, plant talk, and memories, beginning at 10 a.m. We will have a potluck lunch, so bring your favorite dish, non-alcoholic drink, or dessert. After lunch, we may have a presentation followed by a stroll along the boardwalk. Long-time members to new members are all welcome to come. Ask plant questions, swap native seeds. I might even bring and show off my favorite houseplant. For questions on the event, email me at [timothyestep@hotmail.com](mailto:timothyestep@hotmail.com) or call 912-424-9758.

The Wetlands Center is an educational facility operated by Clayton County Water Authority. It features wildlife exhibits and has an outside, half-mile boardwalk that provides an opportunity to observe wading birds, woodpeckers, turtles, and a beaver lodge. You can find more information at: <https://newmanwetlandscenter.com/> (or use the hyperlink above).

*Timothy Estep*

**Looking for a late-year field trip?**

As of press time for this newsletter, there were two more outings planned for 2022, both led by Hal Massie. The first of those trips is set for Friday, Nov. 11, at Sprewell Bluff Wildlife Management Area in Talbot County and looks to feature old-growth longleaf pine and pyramid magnolia. The second is scheduled for Friday, Nov. 25 (Black Friday!) at Pine Mountain in Harris or Meriwether counties.

As always, check the [BotSoc field trips website](#) page for complete field trip listings, details and the latest updates.

**A warm welcome to the newest members of the Georgia Botanical Society!**

Our newest members—those that joined between June 1 and Oct. 1, all of them Georgia residents—are listed below. As you meet them at BotSoc events, workshops or field trips, please extend a warm welcome to them!

New members and their hometowns (all in Georgia)			
Mary Breen, Decatur	Jim Hanna, Thomson	Cheri Harrington, Rabun Gap	Roy Leonard, Pine Mountain
Terry May, Atlanta	Melanie Sherman, Stone Mountain	Anthony Simmons, Grovetown	Karen Smith, Buford



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