Texas Gulf Coast Fern Society

July 2022 Vol. 24 No. 7

http://www.tgcfernsoc.org

Our meeting this month will be "blended" by meeting in-person at the Judson Robinson, Jr. Community Center (2020 Hermann Dr., Houston, 77004) and/or via *GoToMeeting* – member's choice.

A message from our President:

Howdy everyone!

I felt very bad about missing the summer party at Lisa and William's home. I'll bet a good time was had by all that were fortunate to attend.

Some of us received some much-needed rain last week. Our lawns, ferns and trees surely soaked it all up. I see the "Resurrection Ferns" all look beautiful with the little we got in our neighborhood.

This month's meeting is coming up fast. We need to contact Larry Rucker, if you haven't already, and let him know what you plan to bring so he doesn't have to go out and buy all the food & beverages for us. Please contact Larry Rucker by email, phone or text and let him know what you plan on bringing. Larry's contact information is: **herbie39L@att.com**, 832-453-2992. Put his phone number in your contact list so it's an easy call each month. So **please** don't wait till the last minute. Contact Larry ASAP and let him know your intended refreshment contribution. If you miss him in person he will reply to your message to confirm.

This month's meeting and presentation will be at the Judson Robinson Center. This presentation will use blended technology like the May meeting. The presentation will be by Professor Lewis Feldman Ph.D. The subject will be on the Botanical Gardens at UC Berkeley, where he is Director. We are truly fortunate to have another "Top Tier" fern experts sharing a bit of their knowledge with our Fern Society.

The raffle will be held after the meeting, as usual. I will bring in mounted pups of a few *Staghorn* cultivar and other plants for the table. I encourage others to share in this fun.

At the ending of this *Newsletter* you will find some photos of ferns from my trip last month to Tacoma, many of which can be grown here. Some of the photos are from The Hardy Fern Foundation plantings, within the Rhododendron Species Foundation gardens near Tacoma.

Pat

Sunday's Topic:
"A Tour of the Fern Gardens at: UC Botanical Garden"
By: Lewis Feldman

Lewis Feldman is the Director of the University of California Botanical Garden and Professor of Plant Biology at UC Berkeley.

He is a graduate of UC Davis and received his Ph.D. from Harvard, after which he came to Berkeley on a post-doctoral fellowship. Subsequently, he joined the faculty of the UC Berkeley Department of Botany (now the Department of Plant and Microbial Biology) where he has spent his entire academic career. He is a plant developmental biologist and for his research has focused on root development, emphasizing the controls of pattern formation. He remains involved in teaching and serves as a long-time instructor in Berkeley's large introductory biology class, with over 750 students. His main thrust as Director of the UC Botanical Garden is to ensure that the plant collection is curated and well managed, which involves raising funds to maintain and update the facilities for caring for the plants. Additionally, as Director, he works to promote Garden activities in Conservation, Education and Research.

Dues!

If you haven't yet paid your dues, please contact Ruby Adams. She may be contacted at: radams13@sbcglobal.net or cell 281.830.4633.

The American Fern Society (AFS)

The American Fern Society is over 120 years old. With over 900 members worldwide, it is one of the largest international fern clubs in the world. It was established in 1893 with the objective of fostering interest in ferns and fern allies. It exchanges information and specimens between members via their publications and spore exchange.

AFS non-professional membership ($20) includes access to the Spore Exchange and subscription to the Fiddlehead Forum.

Professional membership ($40) includes the benefits above plus access to the American Fern Journal.

Please note that donations to the AFS are not tax deductible.

To find out more about the Society and/or join, visit https://www.amerfernsoc.org/

2022 Officers and Committees:

President:	Patrick Hudnall
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2nd Quarter 2022 Treasurer's Report

Income:

Raffle:	$45.00
Donations:	$8.57
Interest:	$0.36

Expenses:

Program Exp.	$15.00
Website	$29.14
Balance on 12-31-2021:	$15,798.79
Balance on 06-30-2022:	$16,183.74
Net gain for 2nd Quarter:	$9.79
Net gain for 2022:	384.95

Beth Ayer, Treasurer

Minutes of Blended Meeting via "GoToMeeting" and In-person
May 15, 2022
Texas Gulf Coast Fern Society

Meeting was held at 2:00pm at the Justin Robinson Community Center in Hermann Park. Members unable to attend the in-person meeting could still participate on the "GoToMeeting" app.

Called the meeting to order at 2:30 pm.
Approximately 25 members present.

Presentation: "**Ferns & Lycophytes of Texas**" by **George Diggs, PhD.**

George Diggs is an evolutionary biologist and botanist who has taught for more than 30 years at Austin College in Sherman, Texas. His research interest include the plants of Texas, plant defense, evolution as it relates to human health, biogeography and the systematics of the Ericacease (the blueberry family). He has co-authored four books and more than 30 scientific articles and in his research he has traveled to all seven continents. He co-wrote, "The Ferns and Lycophytes of Texas" in 2014 with Barney L. Lipscomb. Information Online: www.fernsoftexas.org. You can get a lot of information on this website.

Texas has 127 species of native ferns & lycophytes which is the most of any state in the continental U.S. Florida is a close second with 113 native species. Virginia is third with 100 species. The total that is native and naturalized is 139 species. The newest species to the list is the Australian Water Clover (*Marsilea mutica*) that was found in 2021. It naturalized in Travis County. It is an aquatic that was probably spread from someone dumping an aquarium plant into a spring or lake.

Native "new" to Texas & U.S. is *Llavea cordifolia* (Llave's fern). New native from Big Bend State Park in the Trans-Pecos. It has moved over from Mexico. *Isoetes texana* is one recently described as new to science.

The smallest fern in Texas is the Carolina Mosquito Fern (*Azolla caroliniana*) which measures ½" long. Other tiny species are the *Botrychium lunarioides* (Winter Grape Fern). Also tiny is the *Ophioglossum crotalophoroides* (Dwarf Adder's tonque). The largest fern species in Texas is the *Dennstaedtia globulifera* (Beaded Cuplet Fern). Leaves grow to 13' long.

The strangest habitat for a fern is the red *Azolla*. It is an aquatic fern that floats on the water's surface. When it is exposed to a lot of sun, the leaves turn red. The *Pillularia Americana* (American Pillwort) lives its whole life underwater. It has tiny fiddleheads. Usually only see these when the water level goes down.

Notholaena greggi (Gregg's Cloak Fern) only grows in Big Bend inside the cracks of rocks. Its silver looking leaf has adapted to sunny locations. *Tectaria heracleifolia* (Broad Halberd Fern) actually grows inside the Devil's Sink Hole which is a collapsed limestone cavern in Edward's County. The drop off is 140'. Millions of Brazilian Freetail Bats reside there too. Ferns grow near the circular entrance on the vertical walls. Moist air hovers over the entrance. This seems to be the strangest location for ferns to grow in Texas.

Two ferns are tied for the strangest fern structure. *Psilotum nudum* (Whisk Fern) has no roots or leaves while the *Equisetum hyemale* (Scouring Rush Horsetail) has joined hollow stems with minute leaves. Both are ferns but with no fronds or fiddleheads yet DNA sequencing proved they are indeed ferns.

Probably the most problematic and the world's worst weed is the *Salvinia molesta* (Giant Salvinia). The mats get so thick that it can hold a cinderblock. It causes big problems in some parts of the world with mats up to a meter thick.

The fern with the most interesting history and distribution is the Sensitive Fern (*Onoclea sensibilis*). It is very sensitive to frost. If frost hits it, it dies to the ground. It has 2 leaves, a fertile frond & sterile leaves. It has a worldwide distribution: Eastern U.S. & Canada to Eastern Asia. Fossils of this species has been found in the British Isles. 57 million year old fossils are absolutely identical to today's plant.

Why are there more fern species in Texas than anywhere else in the continental U.S.? It is not because the state is so large. Alaska is 2.2 times bigger than Texas yet Alaska has only 68 ferns & lycophytes. Diversity varies with latitude. Costa Rica is one thirteenth the size of Texas and has over 1,000 species of ferns & lycophytes. The southern latitude of Texas means it has the habitat for a diverse number of ferns.

Texas has 10 major vegetation areas, each with multiple varied habitats. East Texas is the fern hot spot of Texas with its Bald Cypress Swamps to its winding rivers. Probably 100 to 1000 times more fern tissue than in West Texas. In the Hill Country, it is a lot of east meets west with regard to fern diversity. Edwards Plateau has many moist canyons that provide micro-habitats. Enchanted Rock in Edwards Plateau has 29 species while the entire state of Nebraska has only 33. Most ferns and lycophytes in Trans-Pecos occur in the Madrean Sky Islands which are isolated high elevation areas in the Davis Mountains. These tiny hospitable areas are separated by vast "oceans" of inhospitable desert.

What are ferns and lycophytes? Together they are called pteridophytes (ferns and fern allies) which are vascular plants that reproduce using single celled spores (no seeds). Fern spores are inside the sporangia. A cluster of sporangia is called a sorus.

There are about 300,000 species of angiosperms (flowering plants). About 840 species of gmynosperms (conifers and their relatives which produce seeds but no flowers). There are about 12,000 species of ferns and lycophytes (descendants of the most ancient surviving vascular plants). Around 400 million years ago on earth, plants evolved vascular tissue. One split into lycophytes and ferns while the other went into angiosperms. Lycophytes are the oldest group like club mosses, spike mosses and Quillworts. Ferns are only 3% of living vascular plants. These appear mostly in the tropics. There have been huge advances in understanding fern evolution. We now understand that the whisk fern (*Psilotum nudum*) & horseyails (*Equisetum*) are true ferns.

We consider 63 of the 127 native ferns to be of conservation concern at the state level. Many species are from only 1 county. 19 native fern species located in the U.S. are found only in Texas. Ferns are visually obscure so some are not even listed on an endangered species list because they don't have big flowers. *Phanerophlebia umbonata* (Chisos Holly Fern) and *Asplenium septentrionale* (Forked Spleenwort) are only found in the Texas Chisos Mountains. The *Dryopteris celsa* (Log Fern) is only found in a tiny county in North East Texas. The *Isoetes lithophila* (Rock Quillwort) is found nowhere else in the world except in a tiny place in the Hill Country.

The threats to Texas ferns and lycophytes lie in habitat destruction, introduction of invasive exotic species (like weeds from elsewhere), the over collection of rare species, climate change and people not aware of their economic importance.

To write a book on flora, one needs to create an accurate species list, check relevant scientific publications, contact and check main Texas herbaria and also to contact active Texas botanists. Field research is important. Also, herbarium research is necessary. The BRIT is the largest Texas herbarium with almost 1.5 million specimens. The University of Texas has the second largest with 1 million specimens followed by Texas A&M and Sul Ross. The scope of the project is needed. The book should include photographs, illustrations, maps, species descriptions, scientific names, evolutionary information and ecological information. Decide on the format. Write treatments & keys including making taxonomic decisions. Write the family key & introduction. Now all is needed are the reviews by experts, corrections by editors, making the transformation from a Word document to a digital file. Then finally comes the printing of the physical book.

Questions and Answers:

Q - How did glaciation affect fern growth patterns? A - Glaciers came down the Ohio Valley. Everything south of the glacier were growing environments for ferns and conifers. When glaciers receded, the plants and ferns moved north. That is why ferns are located in protected areas since glaciers receded.

A *Dryopteris sp.* is listed as endangered but a member found it in his neighborhood. A - Habitats are being transformed all over Texas. So you never know where plants will pop up. Beautiful woods are being knocked down and housing sites are put in their place.

Q – Is there any interest in establishing a fernery in Texas? A – An institution must be able to finance it. BRIT has

partnered with Fort Worth Botanic Gardens. Perhaps the Lady Bird Johnson Center would consider it or even Moody Gardens. There was a fernery in Atlanta, Georgia connected to a university. They had a water shortage and they could not water the fernery so a lot of the collection died. The Dallas arboretum has a fern grotto which is very popular. Darla showed a collection of ferns found on the field trip to East Texas last month.

Respectfully submitted by Ceil Dow.

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Some pictures from my Tacoma, Washington Trip
(Photos from the General area and from the RSF Garden)
By Patrick Hudnall


Cloud Forest


Blechnum niponicum


Dryopteris cycadina


Dryopteris wallichiana


Blechnum spicant


Dryopteris expansa

Doodia media


Equisetum sp