Natural Range Expansions and Neonativity:

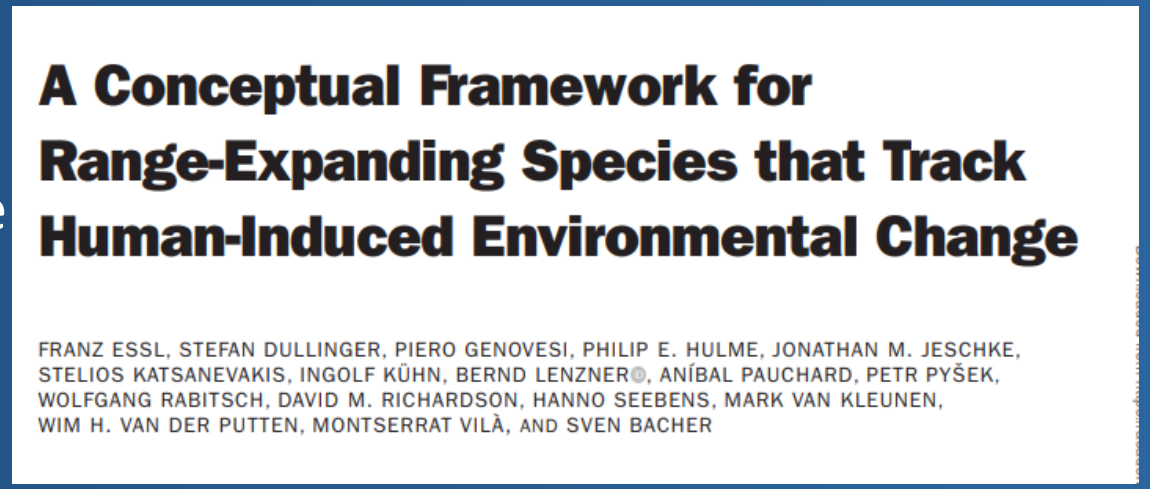
examples from Florida

James J. Lange

Research Botanist, Fairchild Tropical Botanic Garden

Everglades Cooperative Invasive Species Management Area

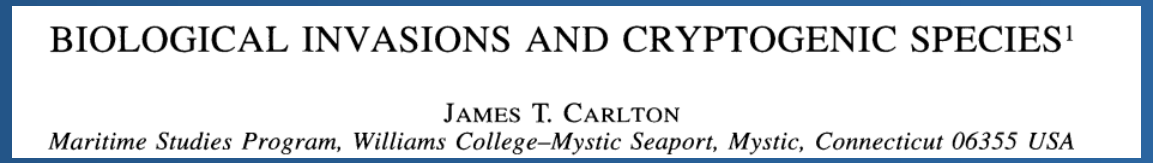
Neonative: “those taxa that have expanded geographically beyond their native range and that now have established populations whose presence is due to human-induced changes of the biophysical environment, but not as a result of direct movement by human agency, intentional or unintentional, or to the creation of dispersal corridors such as canals, roads, pipelines, or tunnels” (Essl et al 2019).



A Conceptual Framework for Range-Expanding Species that Track Human-Induced Environmental Change

FRANZ ESSL, STEFAN DULLINGER, PIERO GENOVESI, PHILIP E. HULME, JONATHAN M. JESCHKE, STELIOS KATSANEVAKIS, INGOLF KÜHN, BERND LENZNER, ANÍBAL PAUCHARD, PETR PYŠEK, WOLFGANG RABITSCH, DAVID M. RICHARDSON, HANNO SEEBENS, MARK VAN KLEUNEN, WIM H. VAN DER PUTTEN, MONTSERRAT VILÀ, AND SVEN BACHER

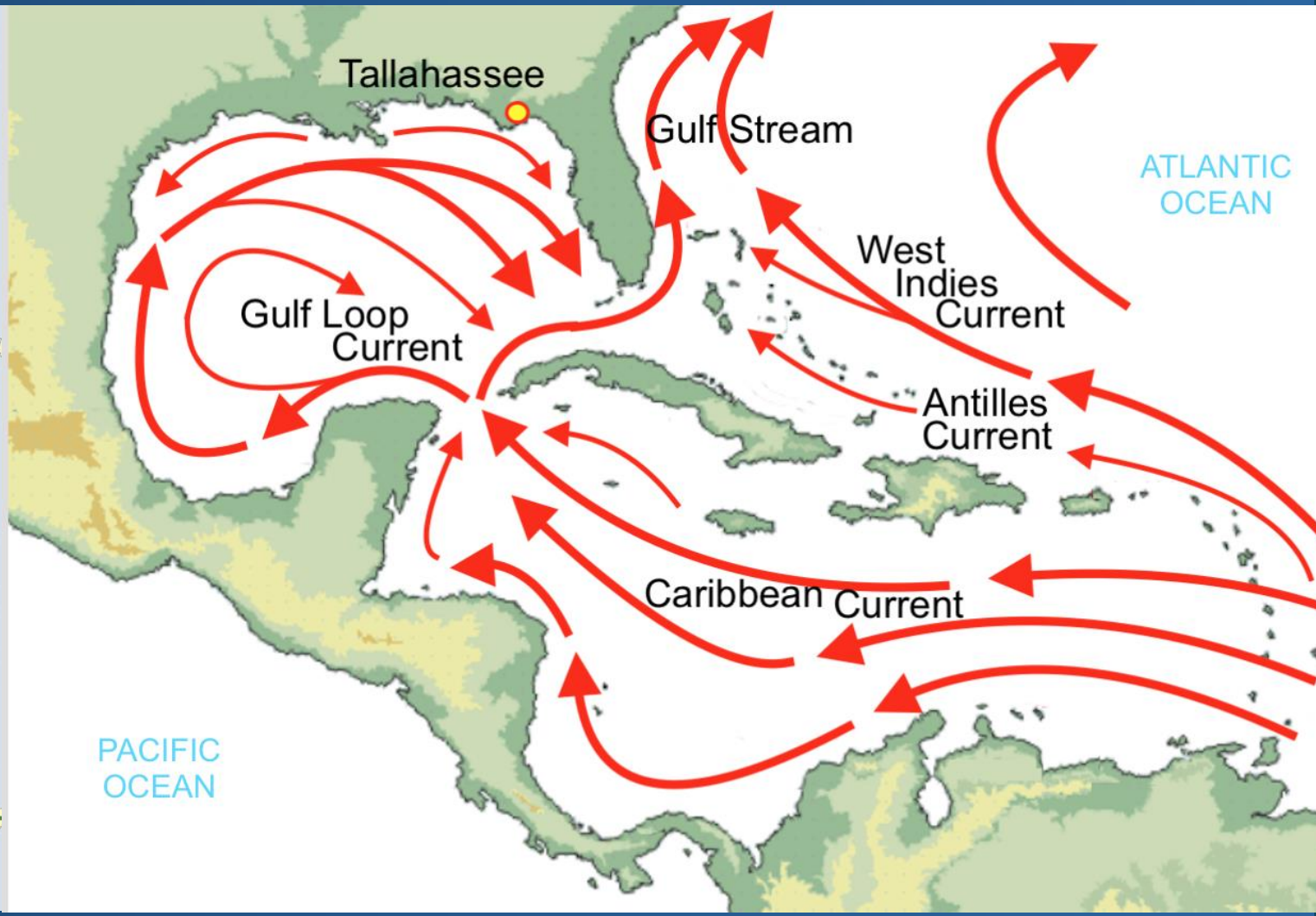
Cryptogenic: taxa for which indications for alien status in a study region are available but for which definitive evidence is lacking, implying that the species could be native (Carlton 1996).



BIOLOGICAL INVASIONS AND CRYPTOGENIC SPECIES[1]

JAMES T. CARLTON

Maritime Studies Program, Williams College–Mystic Seaport, Mystic, Connecticut 06355 USA



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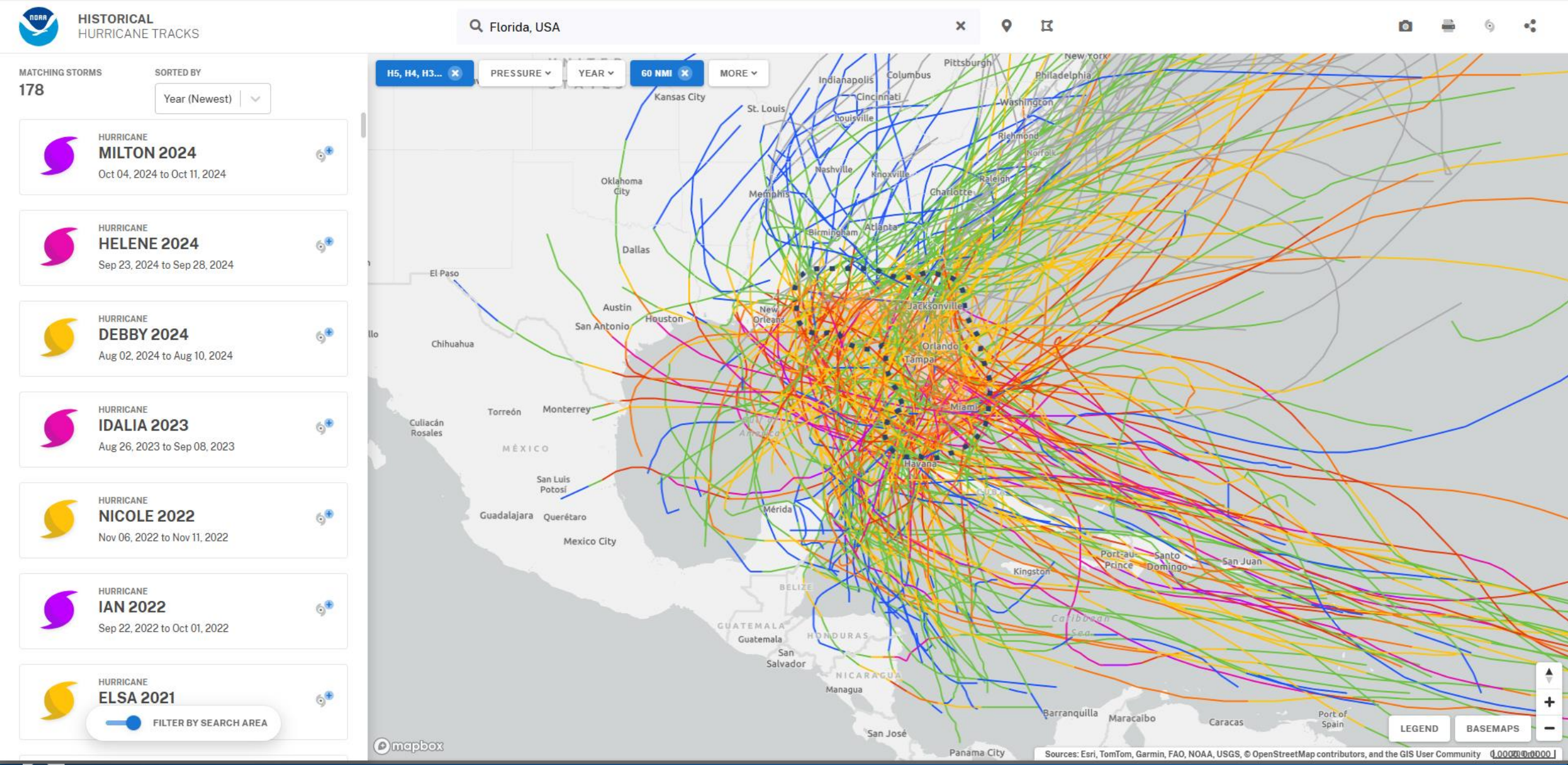

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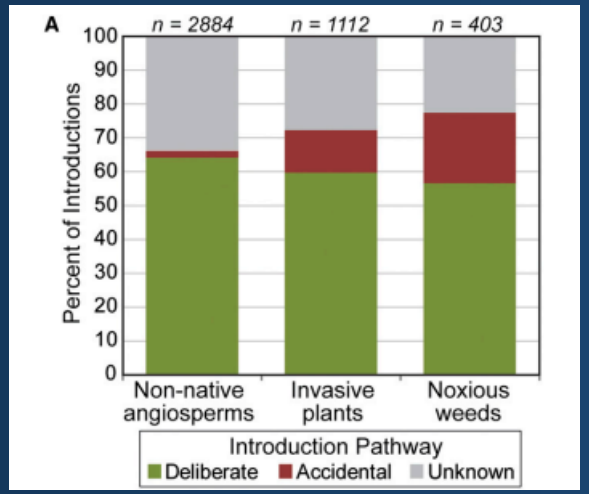
Botany
American Journal of Botany 100(7): 1287–1293. 2013.

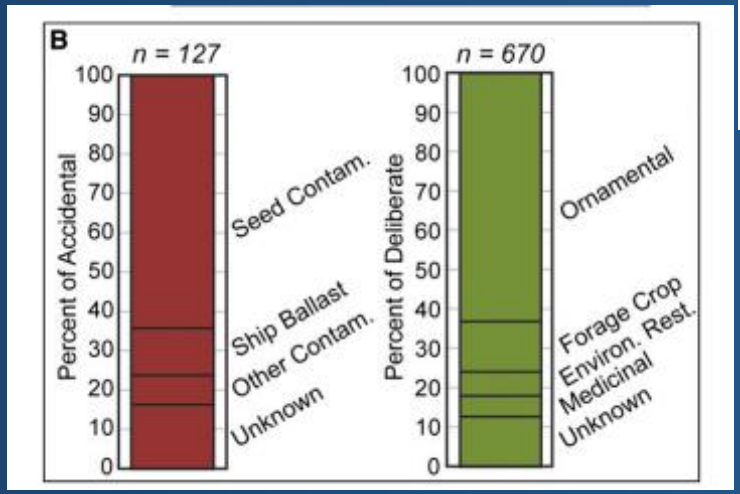
SPECIAL INVITED PAPER—GLOBAL BIOLOGICAL CHANGE

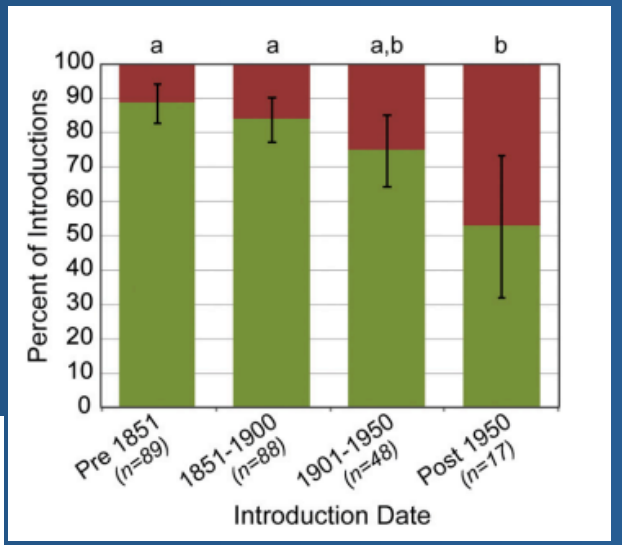
ACCIDENTAL INTRODUCTIONS ARE AN IMPORTANT SOURCE OF INVASIVE PLANTS IN THE CONTINENTAL UNITED STATES[1]

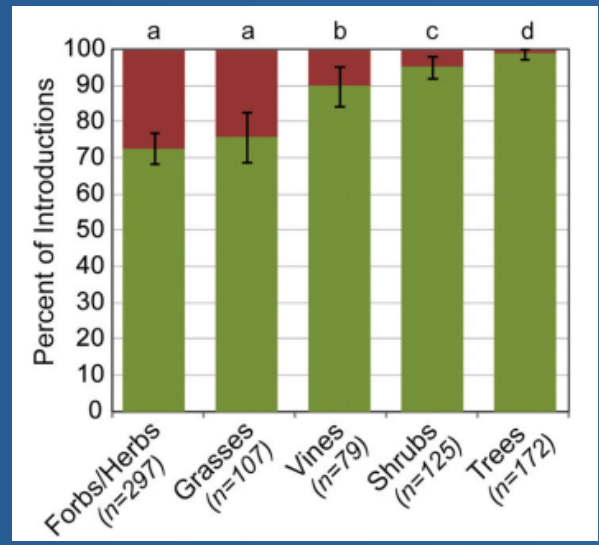
NORA E. LEHAN[2], JULIA R. MURPHY[2], LUKAS P. THORBURN[3], AND BETHANY A. BRADLEY[2,4]

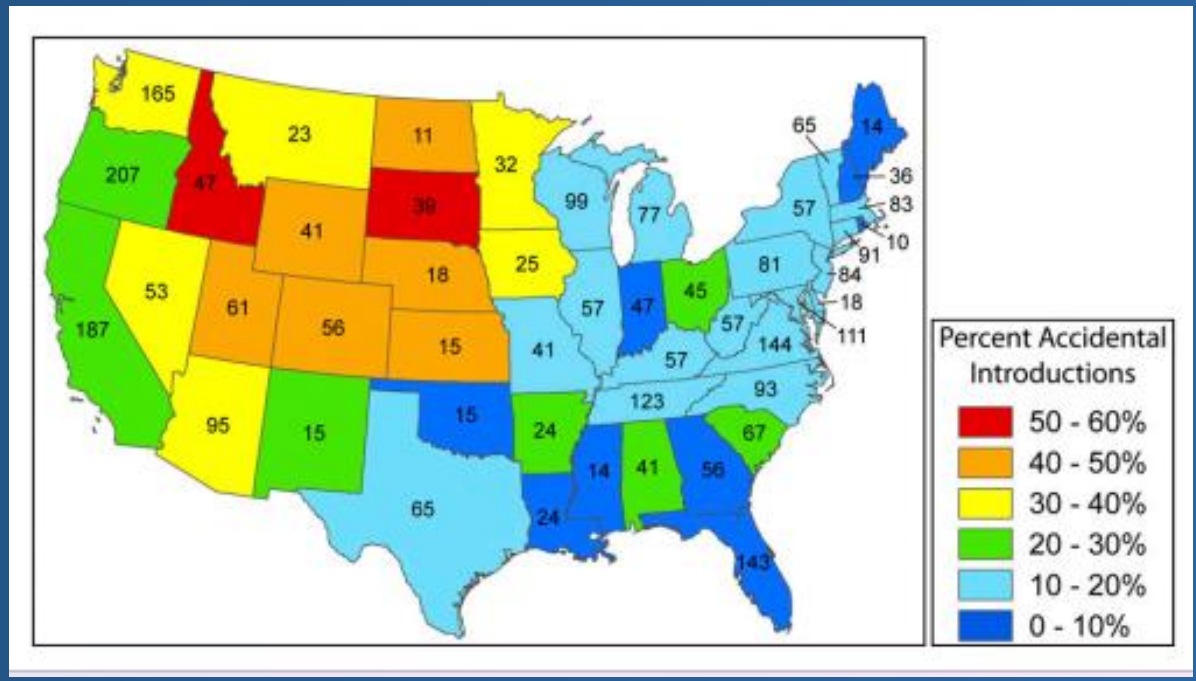
[2]Department of Environmental Conservation, University of Massachusetts, Amherst, Massachusetts 01003 USA; and
[3]Department of Biology, University of Massachusetts, Amherst, Massachusetts 01003 USA











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Neonative: ….

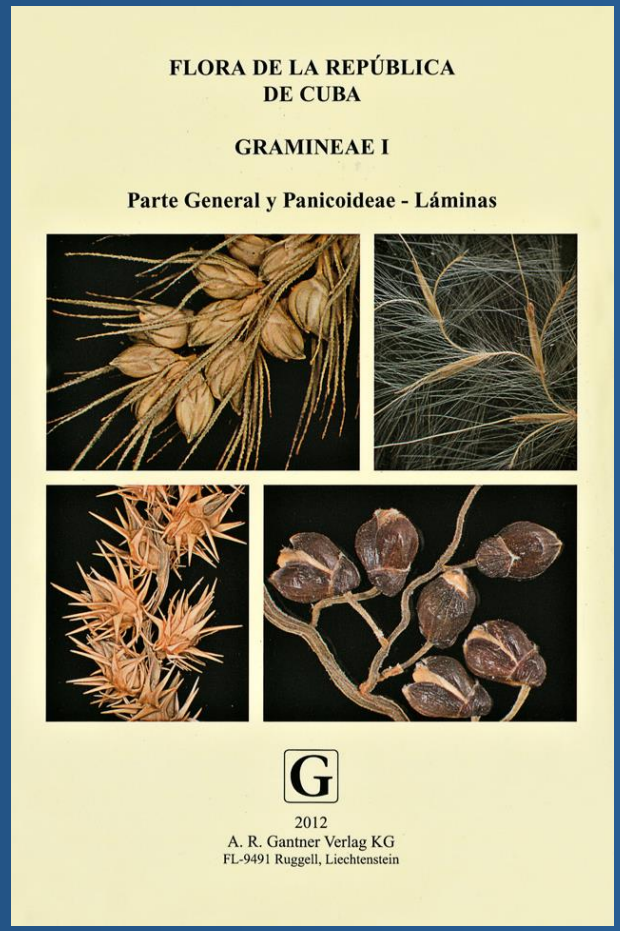
Parapophyte: synanthropic species **of unknown origin**, *often widespread globally (pantropical or cosmopolitan), whose native range **cannot be determined**, making it difficult to classify them as native (apophyte) or introduced (anthropophyte).*
– Nápoles et al. (1990)

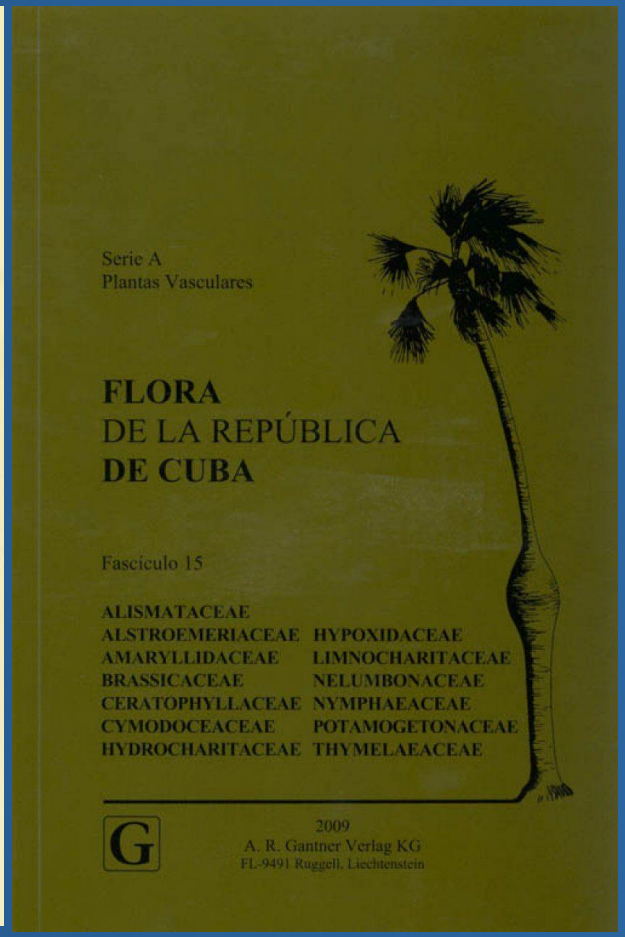
Synanthrope: taxa that have evolved to live near humans and benefit from human settlements and their environmental modifications, not including domesticated plants or animals

Extrapophyte (i.e. “expansive” Flora of Cuba): a native plant that grows in disturbed lands, and "exceeds (exceden)" or "expands beyond" its natural habitat

CLASIFICACION DE LA FLORA SINANTROPICA DE CUBA

Nancy Esther Ricardo Nápoles, Pedro Herrera Oliver y Enrique Pouyú Rojas, Instituto de Ecología y Sistemática, Academia de Ciencias de Cuba





Long delays in identification and publication of naturalized species: a case study of introduced grasses in Hawai'i

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1 School of Life Sciences, University of Hawai'i at Mānoa, 3190 Maile Way, St. John 101, Honolulu, Hawaii 96822, USA

2 Herbarium Pacificum, Bishop Museum, 1525 Bernice Street, Honolulu, Hawai'i 96817, USA

Corresponding author: Kevin Faccenda (faccenda@hawaii.edu)

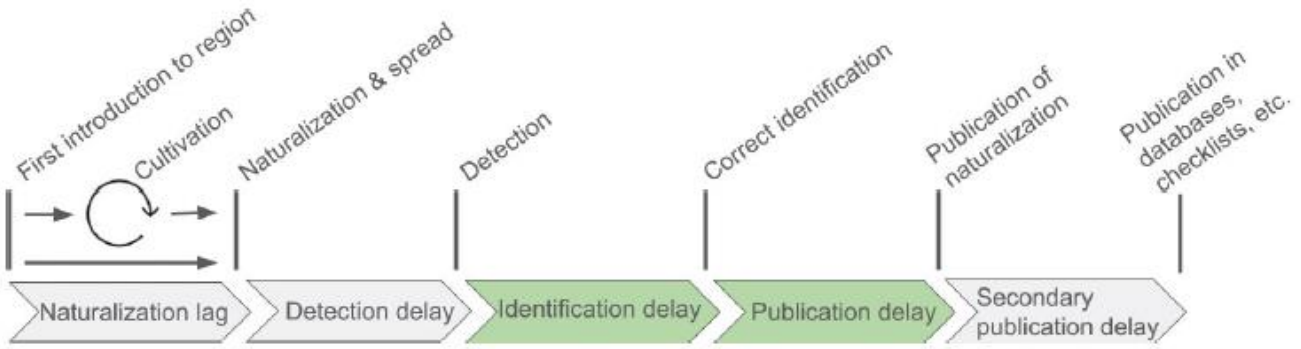


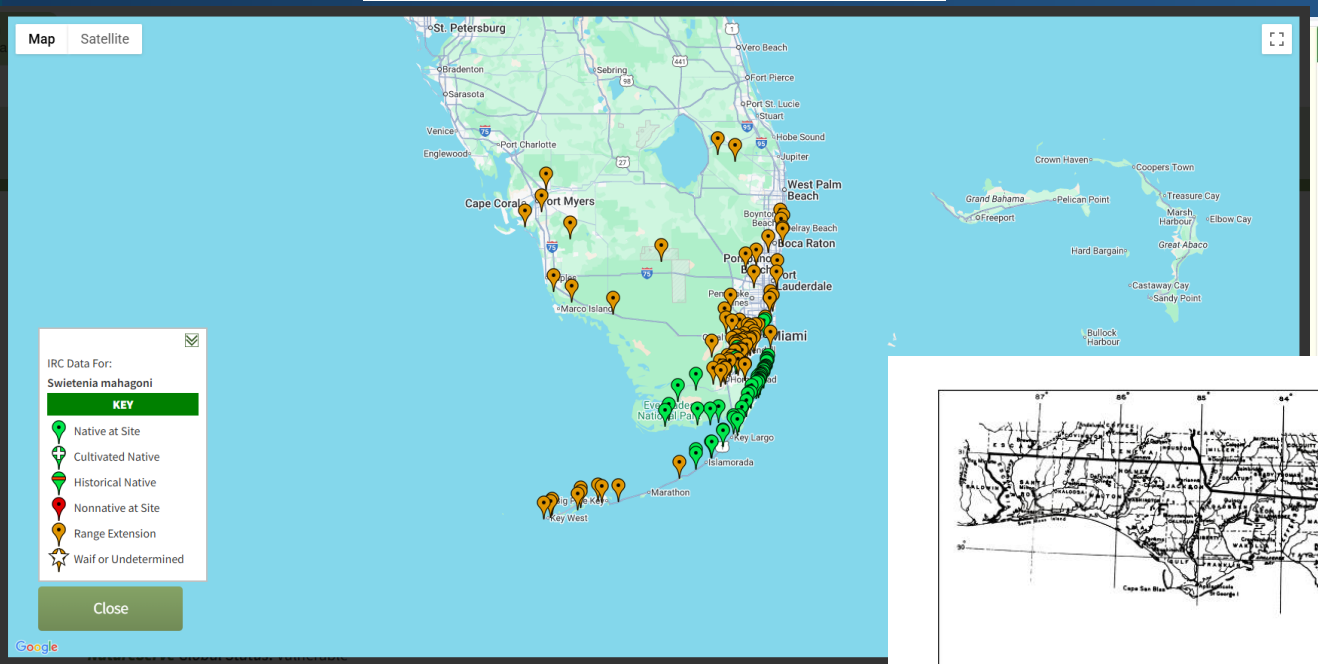
Figure 1. Conceptual diagram showing the lags and delays associated with naturalizations. Delays are associated with human processes, while naturalization lag is associated with biological processes. Components highlighted in green are quantified in this study.

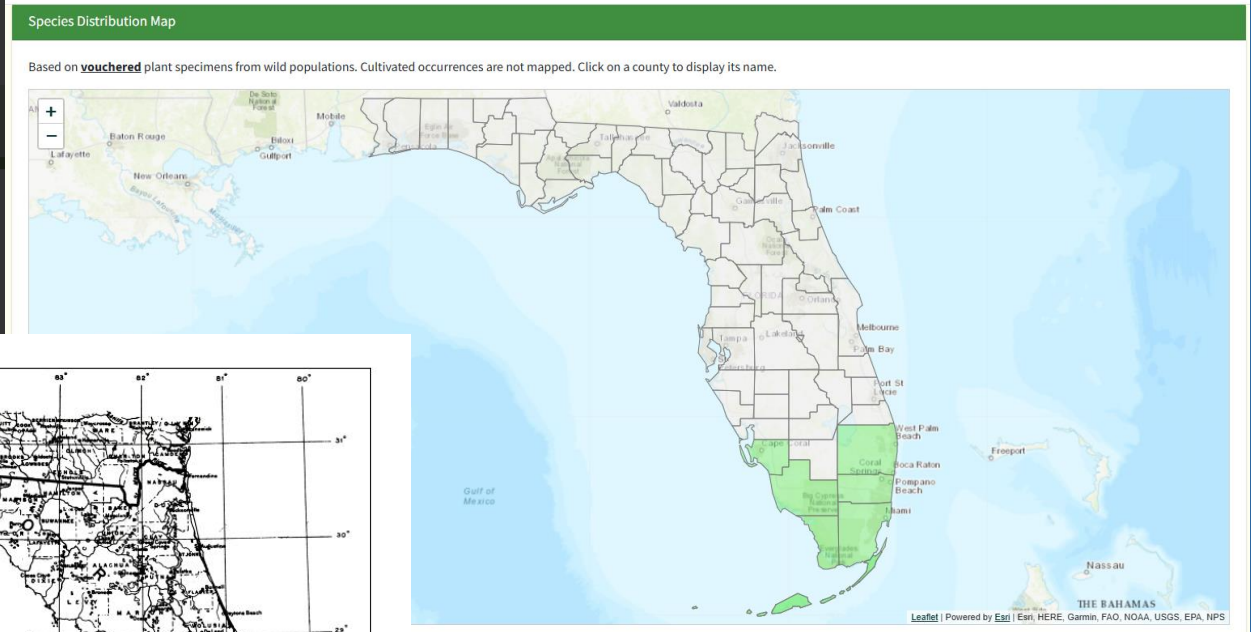
Table 1. Summary of delay periods. n = 260 species unless otherwise noted. Identification delays for grasses first collected after 1930 are separated as the annotation labels after 1930 are usually dated. *Assuming undated identifications were made the same year the specimen was collected.

	Median delay (years)	Mean delay (years)
Identification*	1	18
Identification, specimens after 1930* (n = 149)	4	19
Publication	6	14
Naturalization - publication of any name	17	27
Naturalization - publication of correct name	20	32

The Institute for Regional Conservation

Conservation of rare plants, animals, and ecosystems





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Conservation of rare plants, animals, and ecosystems

Scientific Name	Common Name	Group	Native Status
Argemone albiflora	Carolina poppy, Bluestem pricklypoppy	Dicot	Doubtfully Native
Corchorus aestuans	Jute	Dicot	Doubtfully Native
Halophila johnsonii	Johnson's seagrass	Monocot	Doubtfully Native
Heteropogon contortus	Tanglehead	Monocot	Doubtfully Native
Heteropogon melanocarpus	Sweet tanglehead	Monocot	Doubtfully Native
Ipomoea lacunosa	Whitestar	Dicot	Doubtfully Native
Ipomoea pandurata	Wild potato vine, Man-of-the-earth	Dicot	Doubtfully Native
Ipomoea x leucantha	Morningglory	Dicot	Doubtfully Native
Leptochloa mucronata	Red sprangletop	Monocot	Doubtfully Native
Modiola caroliniana	Carolina bristlemallow	Dicot	Doubtfully Native
Muhlenbergia schreberi	Nimblewill muhly	Monocot	Doubtfully Native
Nymphaea jamesoniana	Jameson's waterlily, Nightblooming waterlily	Dicot	Doubtfully Native
Oenothera biennis	Evening primrose, Common evening primrose	Dicot	Doubtfully Native
Portulaca oleracea	Purslane, Little hogweed	Dicot	Doubtfully Native
Solanum caroliniense	Horsenettle, Carolina horsenettle	Dicot	Doubtfully Native
Spermolepis divaricata	Roughfruit scaleseed	Dicot	Doubtfully Native
Spermolepis echinata	Bristly scaleseed	Dicot	Doubtfully Native
Stylosanthes biflora	Sidebeak pencilflower	Dicot	Doubtfully Native
Urtica chamaedryoides	Heartleaf nettle	Dicot	Doubtfully Native
Wolffia columbiana	Columbian water meal	Monocot	Doubtfully Native

20 species

ECISMA

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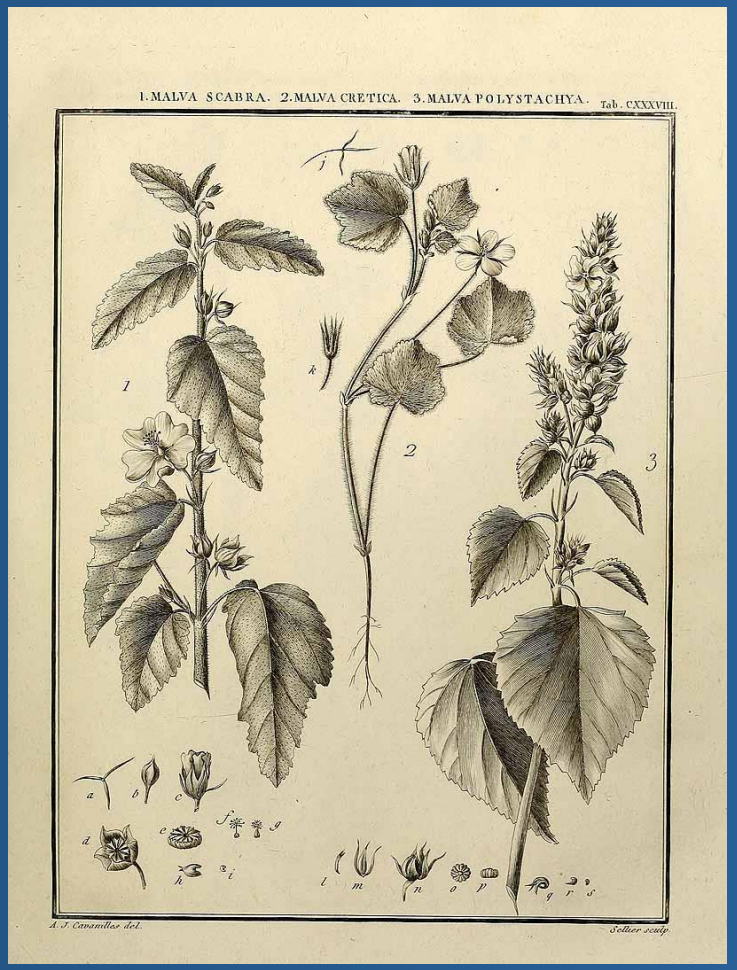
Conservation of rare plants, animals, and ecosystems

Malvastrum americanum - native “waif”



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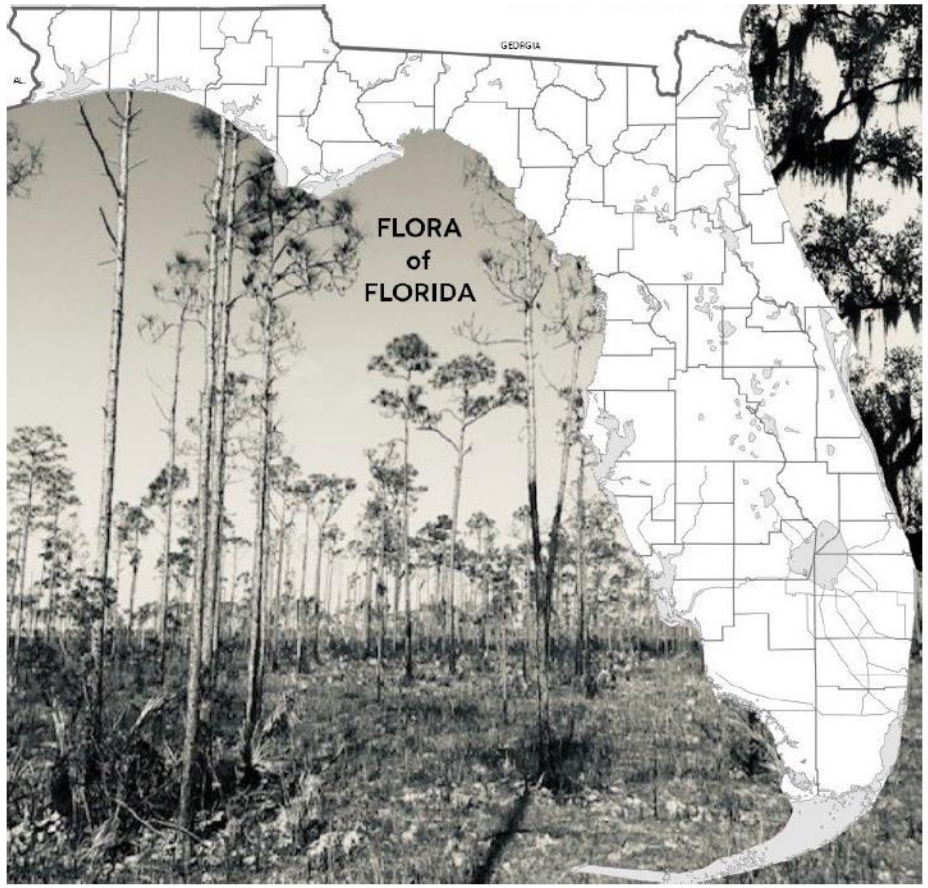
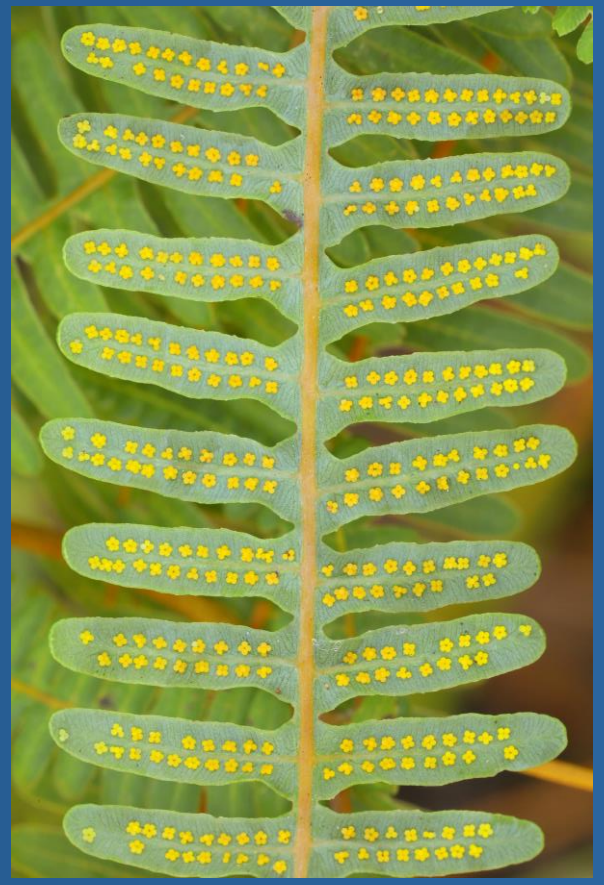


Alan R. Franck
28 February 2025
University of Florida Herbarium, Florida Museum of Natural History
https://www.floridamuseum.ufl.edu/herbarium/florida-flora/

- Franck lists 29 taxa of “ambiguous nativity”, i.e. cryptogenic, parapophyte
- Only agreement on *Halophila johnsonii* (*ovalis*)

- *Bidens alba*
- *Dicranopteris flexuosa*
- *Scleria gaertneri*
- *Scleria eggersiana*
- *Scleria lacustris*
- *Scleria microcarpa*

Dicranopteris flexuosa (drooping forked fern)



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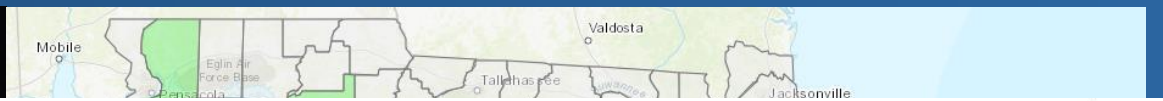
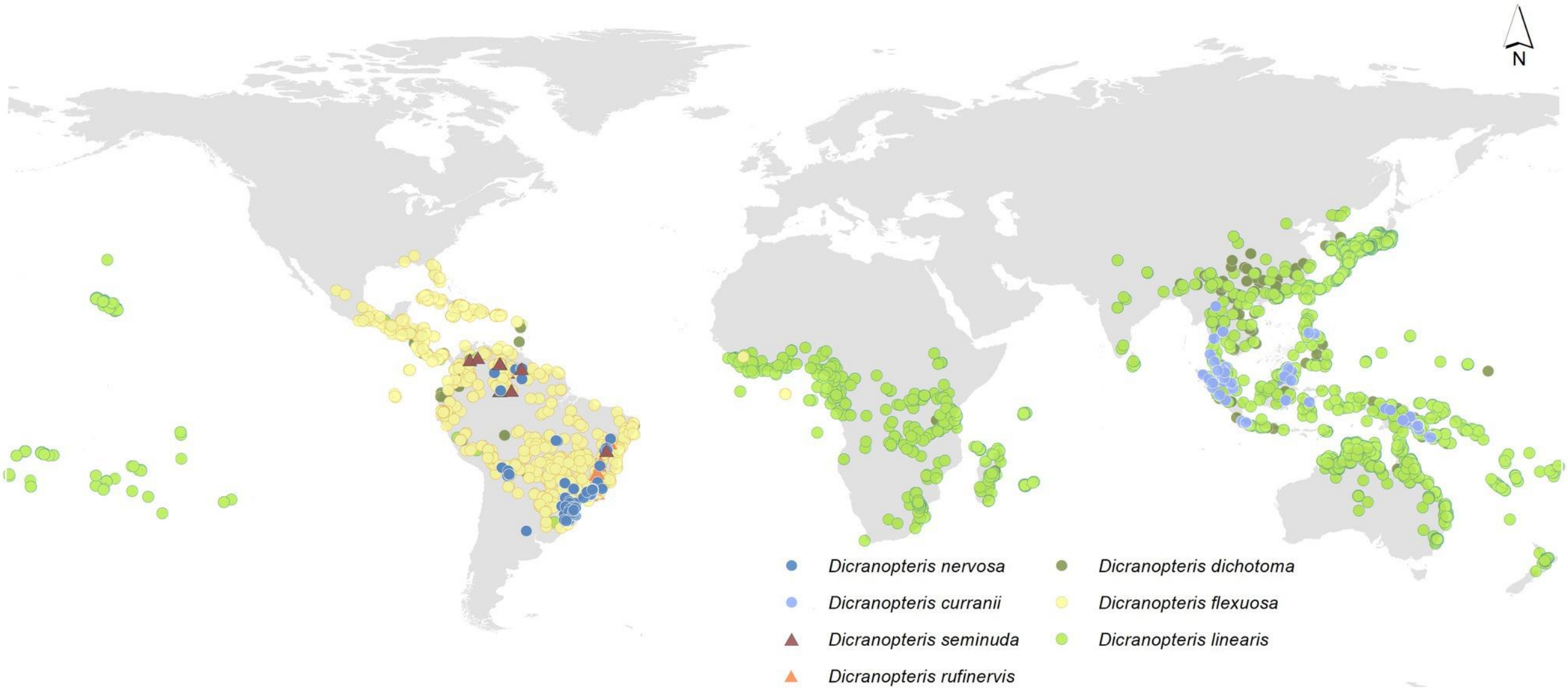

Mobile
Valdosta
Tallahassee
Jacksonville


N
Dicranopteris nervosa
Dicranopteris curranii
Dicranopteris seminuda
Dicranopteris rufinervis
Dicranopteris dichotoma
Dicranopteris flexuosa
Dicranopteris linearis

Zambia

Senegal

Jacono 2001:

-…examined both Neotropical and African specimens *of Scleria lacustris* and found **African plants taller and more robust, with larger, better developed panicles**.

-…**leaves on African specimens as acute and those on Neotropical plants as obtuse**.

-Core (Cuba; 1936) described leaves as "**6 mm to 1.6 cm wide.**" Florida plants, 61 to about 230 cm in height, stand two to three times taller than specimens from Cuba. Also the leaf width is broader, **11-25 mm wide**

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ELEOCHARIS MUTATA (CYPERACEAE), NEW TO THE FLORA OF FLORIDA, U.S.A.

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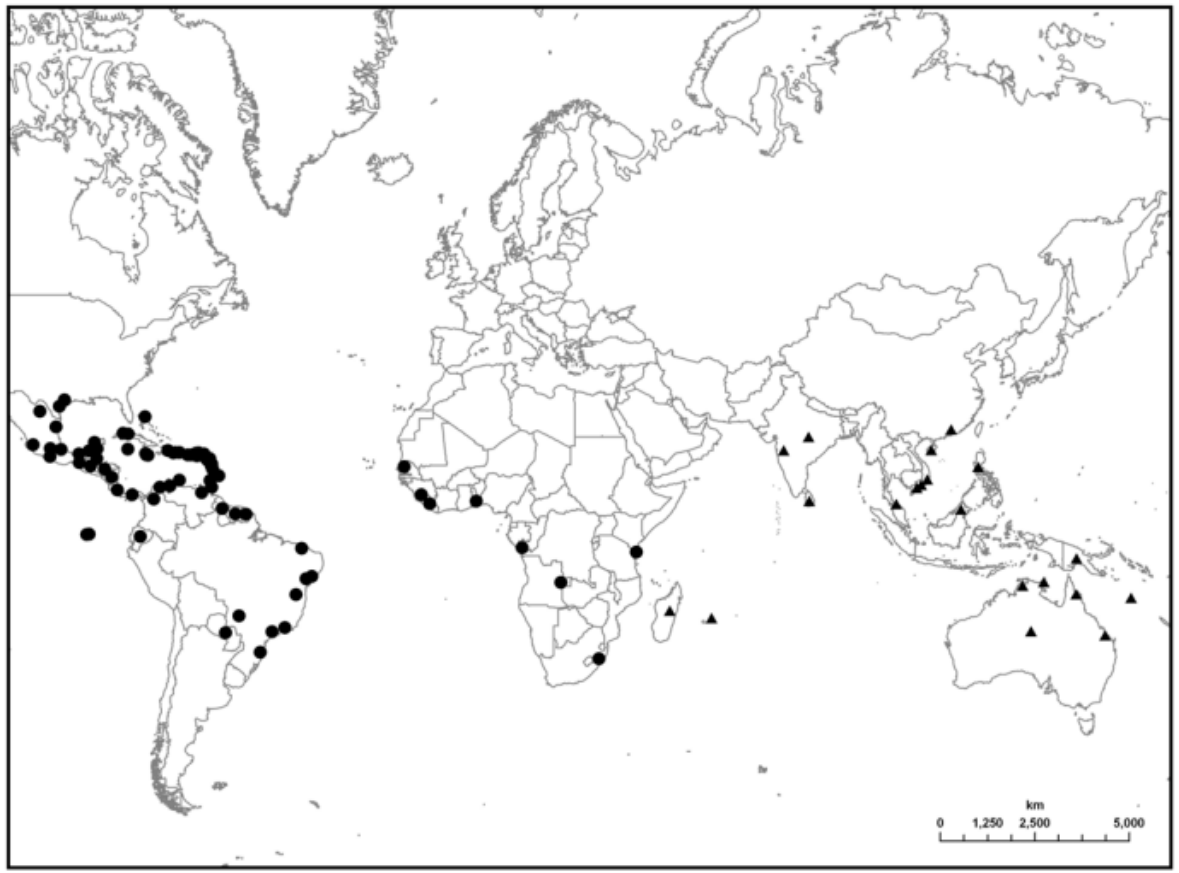
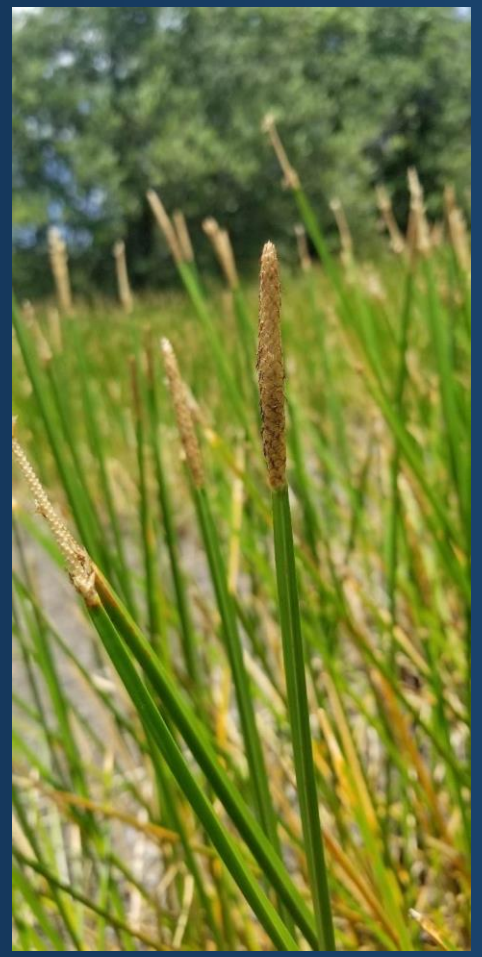
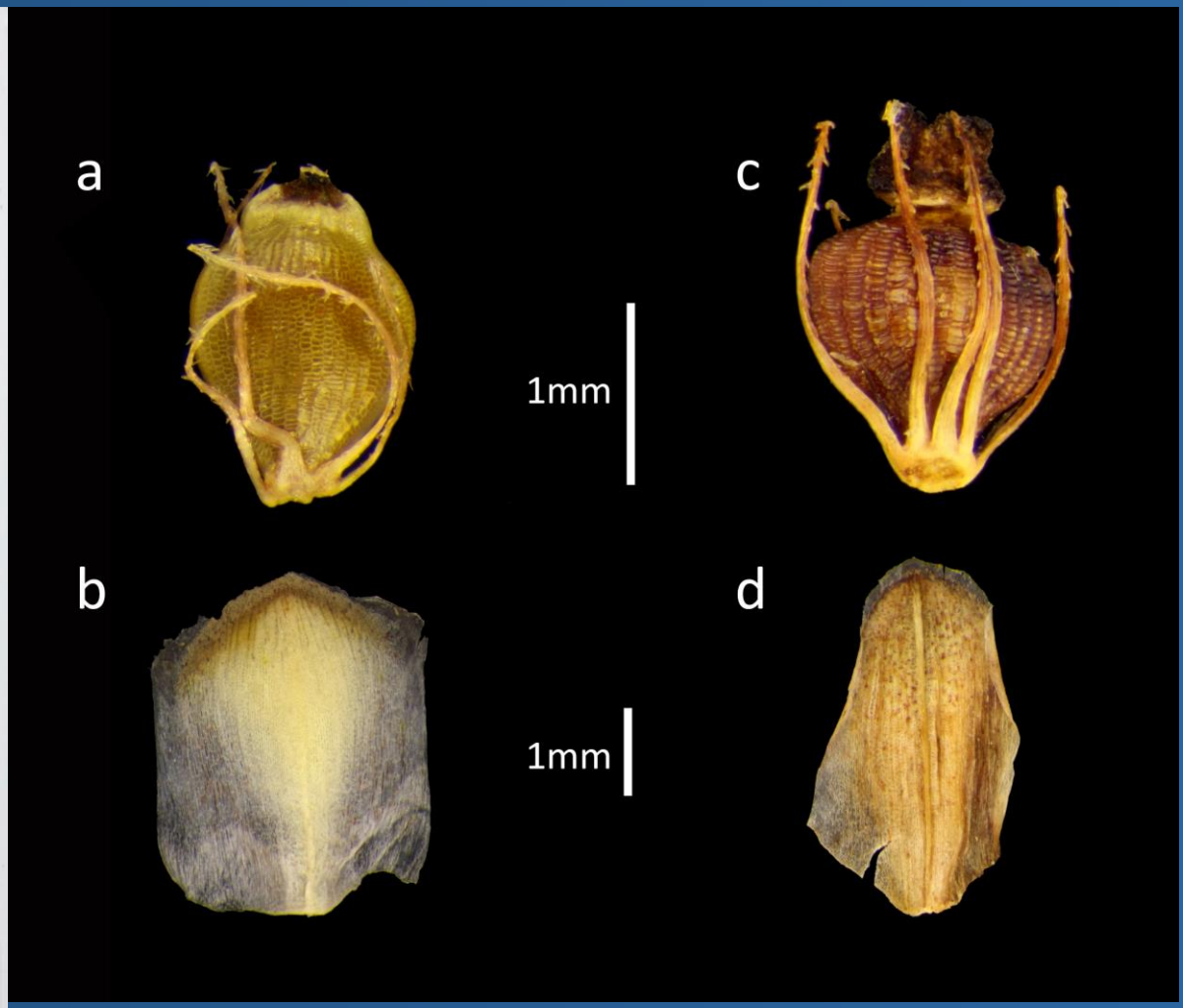


Fig. 20. Geographic distribution of *E*leocharis *mutata* (●) and *E. spiralis* (▲). Each dot represents the general geographic location of one or more specimens.

"widely distributed, sub-pantropical species in coastal habitats from Southeast Texas, Mexico, Central America, tropical South America, the Caribbean Basin, and tropical Africa. Ecologically, it can be dominant, and form vast, pure stands in coastal wetlands"





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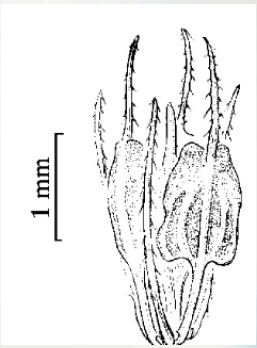

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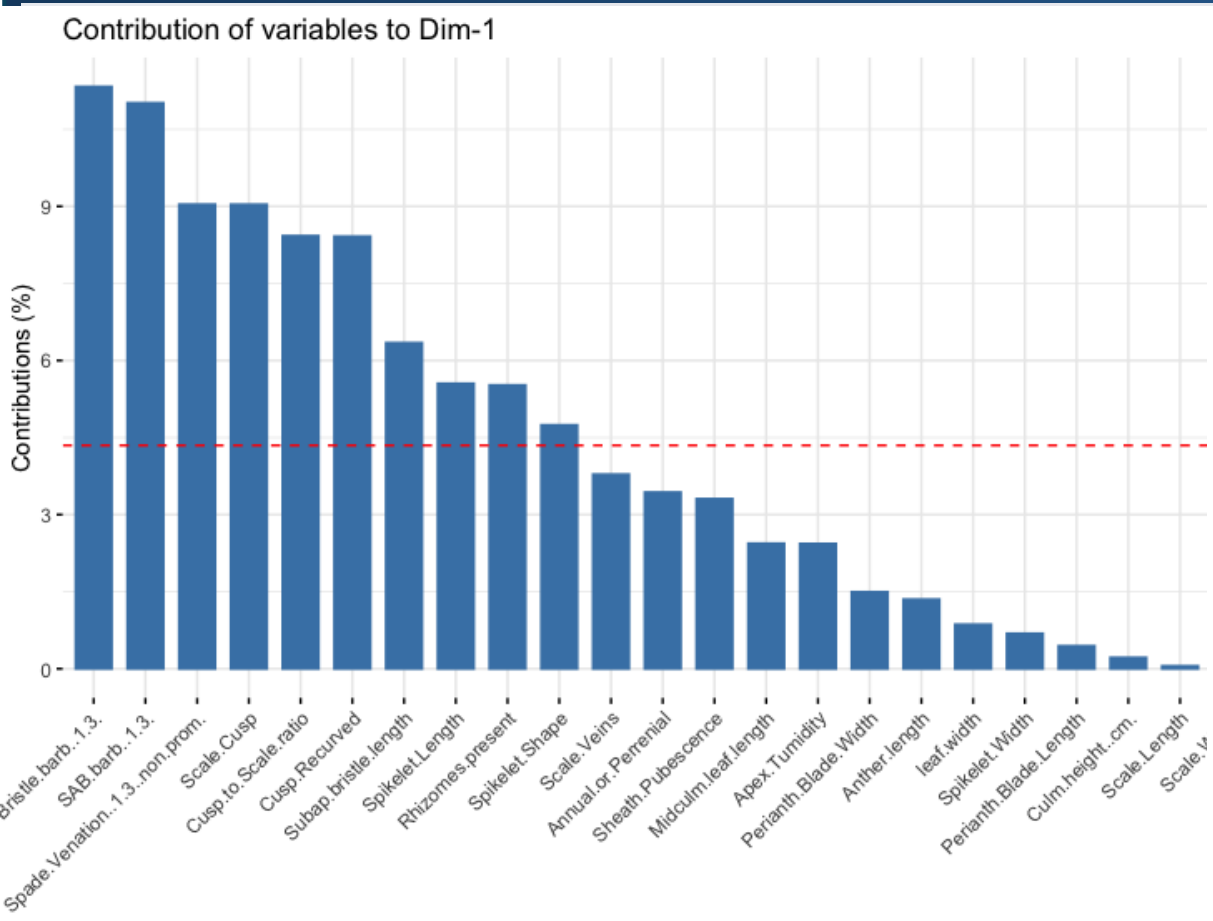
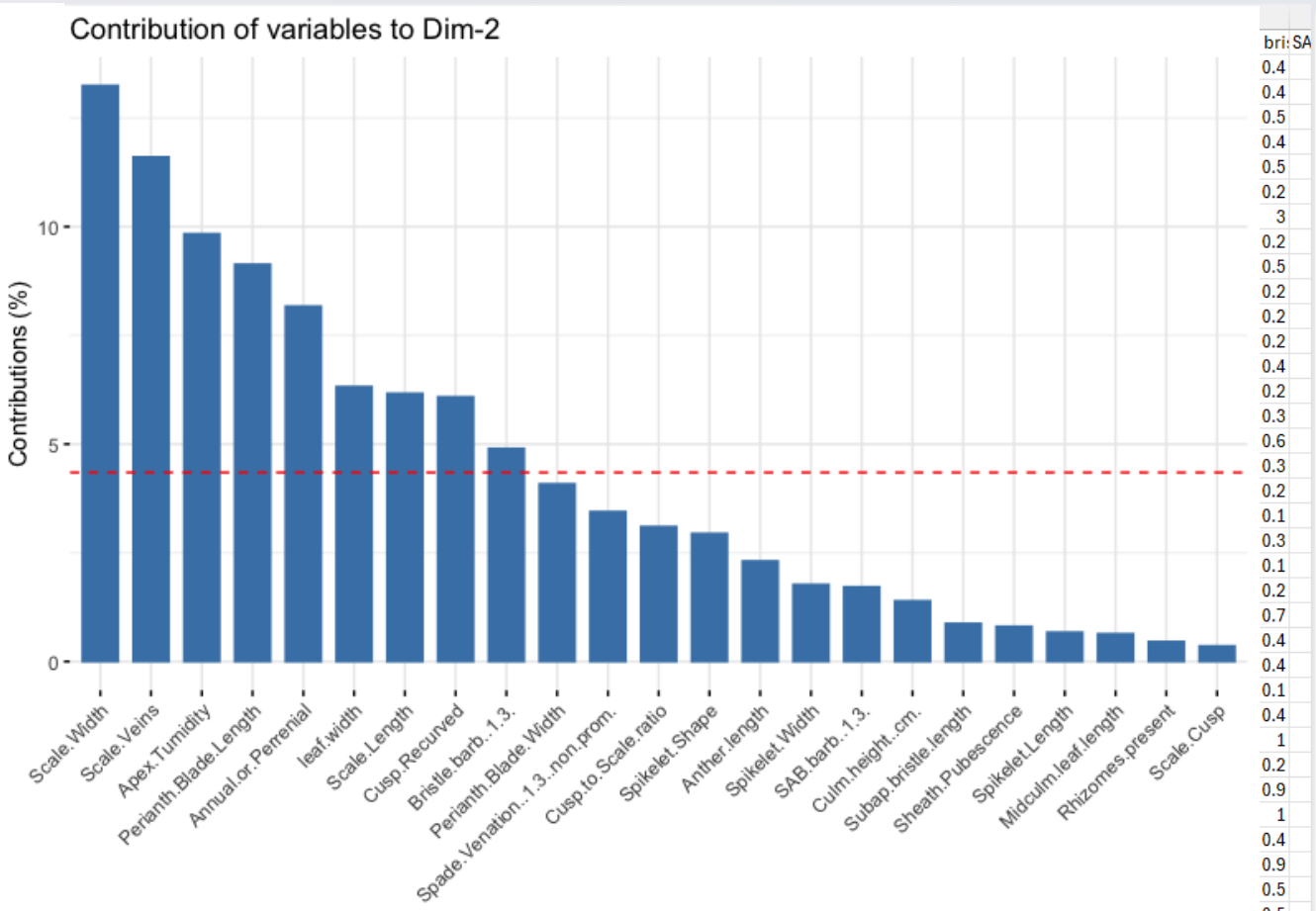
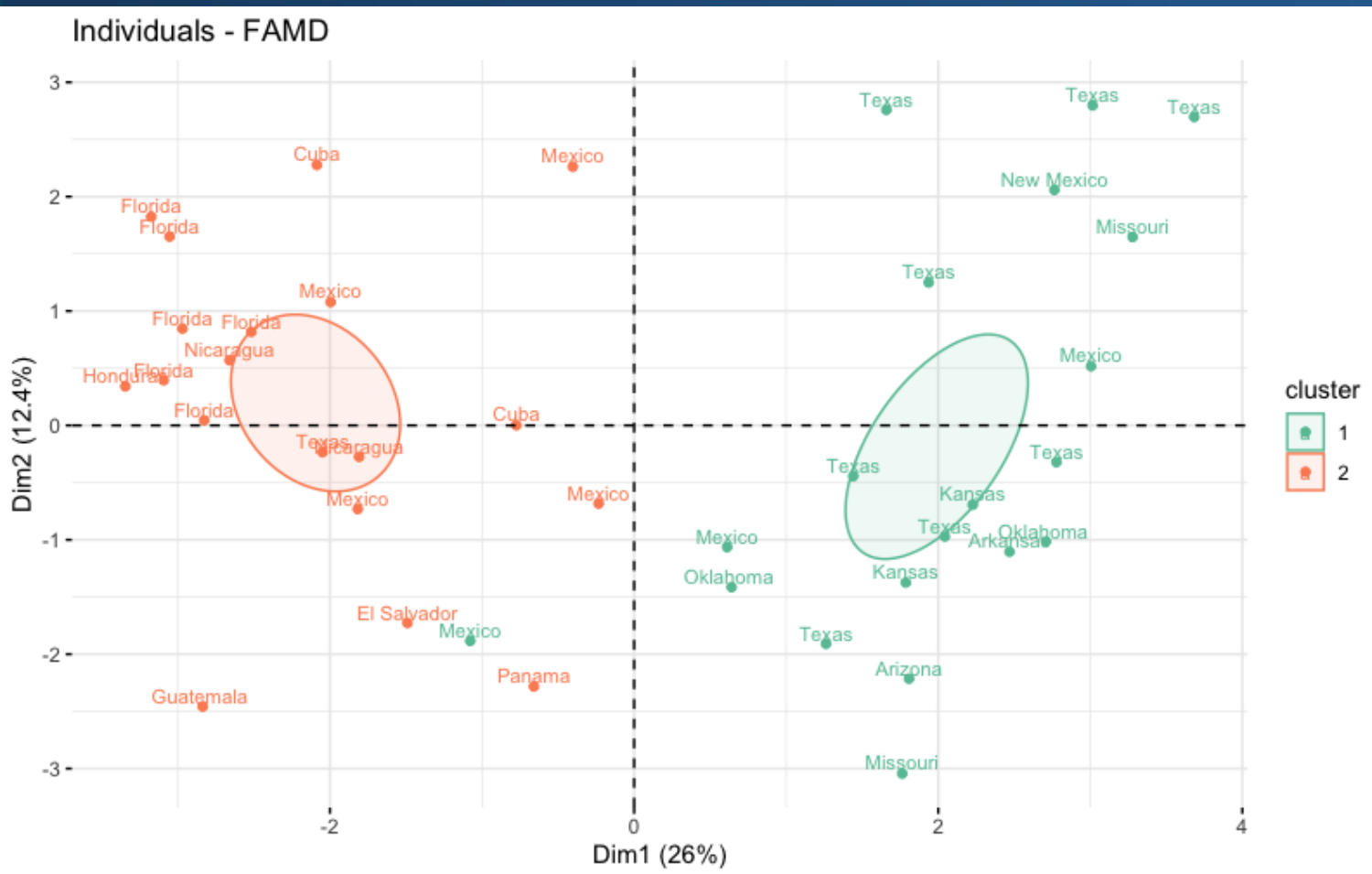
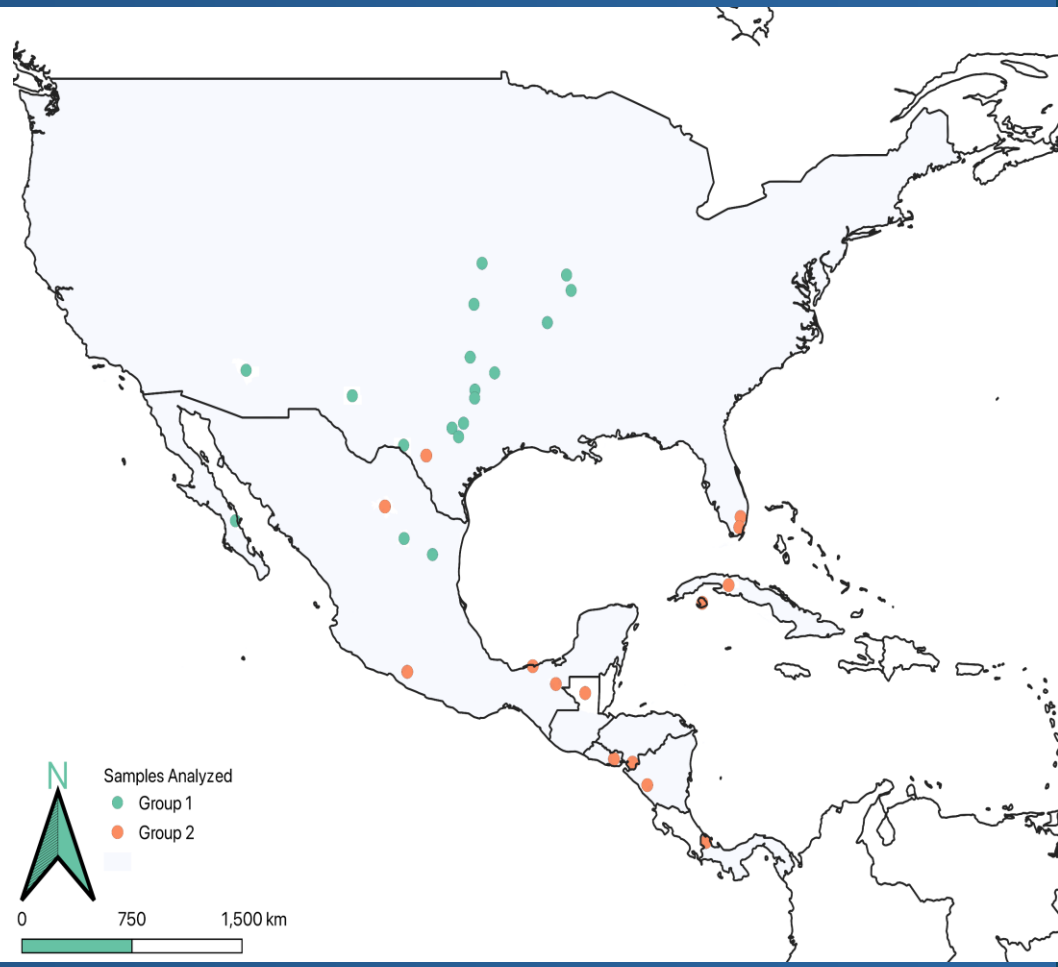




37	Thomas, F	Cuba	Matanzas	Cienaga d	2/28/2009		22° 21' 6.0	81° 21' 19.	Y	P	Y	5	0.6	29	0.8	0.3	Ellipsoid	2.5	1.5	1.6	+	0.64	strigose b	2	5(3)	1.8	0.6	0.4
38	Carr 30666	USA	Texas	Val Verde	5/23/2012	2680035	29° 43' 53'	101° 00' 29.8" W			Y	15.2	0.7	47	1.8	0.4	Ovate	3.5	2	1.9	+	0.542857	strigose b	2	7(3)	2	1	0.7
39	Correll 317	USA	Texas	Taylor	1965				N	A	N	5.4	0.3	36	1	0.4	Ovate	2.2	1.5	2.4	+	1.090909	strigose	3	5(3)	1.7	1	0.3
40	Martinez 1	Mexico	Chiapas	Ocosingo	########				Y	P	N	4.3	0.5	32	0.9	0.5	Ellipsoid	2.1	1.3	1	+	0.47619	strigulose	1	5(3)	1.6	0.5	0.1
41	Lundell 11	USA	Texas	Dallas	1942				N	P	Y	8.1	0.4	94	1.3	0.5	Ovate	2	1.3	1.9	+	0.95	strigose	3	7(3)	1.8	0.6	0.4
42	Peterson 6	Panama	Bocas del	Toro	28-Jan-89	4242163			N	A	N	9.2	0.8	36	1	0.4	Ellipsoid	2	1.1	2	+	1	strigose b	2	7(3)	1.4	0.5	0.3
43	Demaree 1	USA	Oklahoma	Murray	7/4/1936				N	A	Y	9	0.3	33	1	0.3	Ovate	2	1.5	2.5	+	1.25	strigose b	3	5(3)	1.5	0.8	0.5


Individuals - FAMD
Dim2 (12.4%)
Dim1 (26%)
Texas
Texas
Texas
Cuba
Mexico
New Mexico
Florida
Florida
Missouri
Texas
Mexico
Florida
Florida
Nicaragua
Mexico
Honduras
Florida
Florida
Cuba
Texas
Nicaragua
Texas
Texas
Kansas
Mexico
Mexico
Texas
Oklahoma
Arkansas
Oklahoma
Kansas
El Salvador
Mexico
Texas
Panama
Arizona
Guatemala
Missouri
cluster
1
2


N
Samples Analyzed
Group 1
Group 2
0
750
1,500 km

Goniopteris moranii (syn.: Thelypteris guadalupensis; Thelypteridaceae), New to Florida and the Continental United States

Authors: Lange, J. J., and Angelo, C. L.

Source: American Fern Journal, 110(2) : 75-78

Published By: The American Fern Society

Fig. 1 A. Habit of mature *Goniopteris moranii* frond. B. Fronds of immature sporophyte. C. Sporangia on the abaxial surface of *G. moranii* frond. D. A single proliferous bud with plantlet at apex of frond. Bars = 2 cm.

Trichomanes galeottii (Hymenophyllaceae), New to Florida and the Continental United States, with notes on T. holopterum in Florida

Authors: Lange, James J., Angelo, Courtney L., Skok, Andrew, and Palmer-Skok, Virginia

Source: American Fern Journal, 115(1) : 77-84

Published By: The American Fern Society

Fig. 3. a.) *in situ* specimen of *T. galeottii* growing epiphytically at the base of *Taxodium*; b.) pinnae of *in situ T. galeottii* displaying simple marginal trichomes, c.) abaxial rachis of *T. galeottii* disaplying predominantly simple trichomes atop darkened, bulbous basal cells (Lange 325); d.) abaxial rachis of *T. holopterum* displaying predominantly clavate trichomes along with multi-

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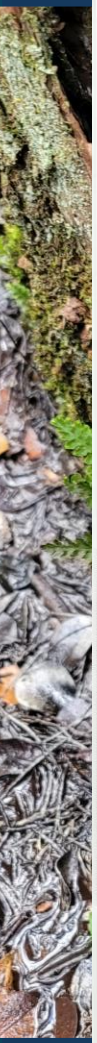

Flora of Florida

Trichomanes galeottii E.Fourn.
Galeotti's bristle fern

HYMENOPHYLLACEAE

COLLIER: Big Cypress National Preserve. West of Loop Rd., roughly 1.4 km south of Gator Hook trailhead. Scattered individuals both epiphytic on *Taxodium* in dense bryophytes and in humus on small hummocks. Sympatric with *T. holopterum*. Dense subcanopy of *Chrysobalanus* beneath *Taxodium*, with abundant *Telmatoblechnum* in understory. 25.818900, -81.101308. Collected with permission. Study BICY-00190.

Jimmy Lange # 325 March 8, 2024
w/ J. Possley, A. Skok, and S. Walsdorf

Flora of Florida

Trichomanes holopterum Kunze
Entire-winged bristle fern

HYMENOPHYLLACEAE

COLLIER: Big Cypress National Preserve. West of Loop Rd., roughly 1.4 km south of Gator Hook trailhead. Scattered individuals epiphytic on *Taxodium* in dense bryophytes. Hundreds of mature sporophytes in area. Sympatric with *T. galeottii*. Dense subcanopy of *Chrysobalanus* beneath *Taxodium*, with abundant *Telmatoblechnum* in understory. 25.823818, -81.101848. Collected with permission. Study BICY-00190.

Jimmy Lange # 326 March 8, 2024
w/ J. Possley, A. Skok, and S. Walsdorf