



FDACS-P-00124

January - March 2022

Volume 61, Number 1

TRI-OLOGY

A PUBLICATION FROM THE DIVISION OF PLANT INDUSTRY, BUREAU OF ENTOMOLOGY, NEMATOLOGY, AND PLANT PATHOLOGY
Division Director, Trevor R. Smith, Ph.D.



BOTANY

Providing information about plants:
native, exotic, protected and weedy



ENTOMOLOGY

Identifying arthropods, taxonomic
research and curating collections



NEMATOLOGY

Providing certification programs and
diagnoses of plant problems



PLANT PATHOLOGY

Offering plant disease diagnoses
and information





Zephyranthes simpsonii, redmargin zephyrlily; Simpson's zephyrlily, submitted for identification by Stephen Jenner and Alicia Velazquez, FDACS-DPI, a new county record for Sumter County. Photo from Shutterstock

ABOUT TRI-OLOGY

The Florida Department of Agriculture and Consumer Services-Division of Plant Industry's (FDACS-DPI) Bureau of Entomology, Nematology, and Plant Pathology (ENPP), including the Botany Section, produces TRI-OLOGY four times a year, covering three months of activity in each issue.

The report includes detection activities from nursery plant inspections, routine and emergency program surveys, and requests for identification of plants and pests from the public. Samples are also occasionally sent from other states or countries for identification or diagnosis.

HOW TO CITE TRI-OLOGY

Section Editor. Year. Section Name. P.J. Anderson and G.S. Hodges (Editors). TRI-OLOGY Volume (number): page. [Date you accessed site.]

For example: S.E. Halbert. 2015. Entomology Section. P.J. Anderson and G.S. Hodges (Editors). TRI-OLOGY 54(4): 9. [Accessed 5 June 2016.]

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ACKNOWLEDGEMENTS

The editors would like to acknowledge the work of all those who contributed information and explanations by providing data, photographs or text, and by carefully reading early drafts.







We welcome your suggestions for improvement of TRI-OLOGY. Please feel free to contact the [helpline](#) with your comments at 1-888-397-1517.

Thank you,

Gregory Hodges, Ph.D.
Editor
Assistant Director, Division of Plant Industry

Patti J. Anderson, Ph.D.
Managing Editor
Botanist, Division of Plant Industry

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Cover Photo

Trachyderes succinctus, a longhorn beetle, lateral view, a new Continental USA record. Photo by Kyle Schnepp, FDACS-DPI



HIGHLIGHTS



1 *Nandina domestica* Thunb. (heavenly bamboo, nandina), a new county record for Okaloosa County.

This species is native to Japan and central Asia, has over 60 named cultivars and has escaped from cultivation in 14 Florida counties. Nandina is listed as a Category I invasive by the Florida Exotic Pest Plant Council (now Florida Invasive Species Council).



1 - *Nandina domestica*, heavenly bamboo, fruit and leaves.
Photo from Shutterstock

2 *Trachyderes succinctus* (Linnaeus), a longhorn beetle, a new Continental USA record.

One specimen of this species was collected in a Lindgren funnel trap at the Port of Miami. This species is extremely widespread in South America, much of Central America and the West Indies.



2 - *Trachyderes succinctus*, a longhorn beetle, pronotum.
Photo by Kyle Schnepf, FDACS-DPI

3 *Paratylenchus projectus* Jenkins, 1956, a pin nematode, was intercepted at Agricultural Interdiction Station 9A on propagative runners of strawberry (*Fragaria x ananassa* Duchesne) shipped from Simcoe, Ontario, Canada. Large populations of this nematode in Canada and the northern United States have been associated with growth suppression of many crops, including sunflower, strawberry and tobacco.

4 *Phyllosticta* (= *Guignardia*) *citricarpa* (McAlpine) Aa is the causal agent of Citrus Black Spot (CBS) disease, found infecting Florida *Citrus sinensis* (sweet orange) in 2010. Since that time, citrus groves in Collier, Charlotte, Hendry, Lee and Glades counties have reported CBS infections (Pest Alert DACS-P-01723). In addition to *P. citricarpa*, two other well-studied species of *Phyllosticta* are known to infect citrus, *P. capitalensis* and *P. citriasiana*. Awareness of these *Phyllosticta* species and their attributes when scouting for and diagnosing citrus diseases is of the utmost importance. For that purpose, this issue of Tri-ology provides a comparison of *P. capitalensis*, *P. citriasiana* and *P. citricarpa*.



3 - Photomicrographs of *Paratylenchus projectus* from Canada, intercepted in Florida.
Photo by Silvia Vau, FDACS-DPI



4 - *Citrus sinensis*, sweet orange, healthy flowers, leaves and fruit.
Photo by Ellen Levy Finch, Wikipedia





BOTANY

Compiled by Patti J. Anderson, Ph.D. and Alex de la Paz, B.S.

This section identifies plants for the Division of Plant Industry, as well as for other governmental agencies and private individuals. The Botany Section maintains a reference herbarium with over 16,000 plants and 1,400 vials of seeds.

QUARTERLY ACTIVITY REPORT

	JANUARY - MARCH	2022 - YEAR TO DATE
Samples Submitted by Other DPI Sections	1,040	1,040
Samples Submitted for Botanical Identification Only	260	260
Total Samples Submitted	1,300	1,300
Specimens Added to the Herbarium	299	299

Some of the samples submitted recently are described below.

1 *Nandina domestica* Thunb. (heavenly bamboo, nandina), from a genus of only one species, but with over 60 named cultivars, native to Japan and central Asia, in the plant family Berberidaceae. This species has escaped from cultivation and has been documented in 14 Florida counties, scattered from Escambia to Marion, and is listed as a Category I invasive by the Florida Exotic Pest Plant Council (now Florida Invasive Species Council). In addition, the plants are tolerant of a wide range of growing conditions and can thrive in sun or shade. This is a new county record for Okaloosa County. *Nandina* is an evergreen shrub, usually no more than 2 m tall, growing in clumps and spreading by underground rhizomes and by seeds. The leaves are composed of nine to 81 trifoliate leaflets, in bi- or tri-pinnate arrangements, making them highly decorative and attractive to gardeners. The leaflets are 2-6 cm long and turn red in autumn, adding to their desirability in Florida landscapes. Flowers grow in large, erect clusters (panicle inflorescences) with hundreds of tiny flowers. Flowers are 5-7 mm across with white to cream-colored petals and sepals. The bright red berries (6-9 mm in diameter) are attractive to humans as well as birds, although there has been a report of toxicity to cedar waxwings. The cyanogenic compounds found in the plant are known to be toxic to cattle, sheep and other ruminants. Flowering occurs in spring and summer with fruiting from September through December. The plant is found naturalizing in disturbed sites such as forested areas of suburbs and old home sites as well as wooded flood plains, wet hammocks and pine flatwoods. (Okaloosa County; 03022022-



1a - *Nandina domestica*, heavenly bamboo, flowers, fruit and summer leaves.
Photo from Shutterstock



1b - *Nandina domestica*, heavenly bamboo, leaves with fall color.
Photo from Shutterstock



01706; Ethan Kelly; 1 March 2022.) (Kaufman and Kaufman, 2007; Langeland, *et al.*, 2008; Mabberley, 2017; Nelson, 1996; Wunderlin and Hansen, 2011; Wunderlin and Hansen, 2015; http://floranorthamerica.org/Nandina_domestica [accessed 21 March 2022]; Florida Invasive Species Council [accessed 21 March 2022]; <https://vet.uga.edu/toxicity-due-to-nandina-domestica-in-cedar-waxwings-bombycilla-cedroru/> [accessed 17 March 2022]).

2 *Dichanthelium scabriusculum* (Elliott) Gould & C. A. Clark (tall swamp witchgrass, woolly witchgrass), from a genus of 70 to 100 species of temperate and tropical America, in the plant family Poaceae (Gramineae). This species is native to the eastern United States, ranging from Massachusetts south to Florida and west to Texas and Arkansas where it grows in moist, low, open or shaded woodlands and swamps, often along streams or ditches. In Florida, it is found throughout most of the state from the western panhandle southward down the peninsula to its southern limit in Palm Beach County. The sample submitted for identification this reporting period is a new county record for Flagler County. *Dichanthelium*, from the Greek *di* meaning twice and *anth* meaning flowering, alludes to the two distinct flowering periods of species in this genus, one in spring and the other in fall. The morphology of the plant often differs between the two phases. Plants are perennial herbs often forming large clumps with erect, robust, purplish culms (stems) reaching a height of 70-150 cm in the spring/summer phase. The culm internodes are scabridulous (slightly rough; minutely scabrous) to almost glabrous, and nodes are glabrous or puberulent. The basal leaves are in a well-differentiated rosette, while stiff, linear, mid- to upper culm leaves are 12-25 cm long and 7-15 mm wide, ascending to spreading, with glabrous or sparsely pubescent blade surfaces and scabridulous margins. The leaf sheaths are sparsely to densely papillose-hispid with ciliate margins, and the membranous ligule is 0.5-1.2 mm long. The inflorescence is a terminal panicle composed of numerous, glabrous (rarely sparsely puberulent), ovoid-ellipsoid, purplish spikelets, 2.2-2.8 mm long and 1-1.2 mm wide. In the fall phase, this species branches from the mid- and upper culm nodes, developing numerous, well-separated, dense fascicles of many reduced blades and hidden secondary panicles. *Dichanthelium scabriusculum* is the tallest and most robust species of *Dichanthelium* in our flora, making it one of the easier to identify species in this notoriously difficult genus of grasses. (Flagler County; 01122022-00241 and B2022-17; David Brown; 11 January 2022). (Barkworth, 2003; Weakley, 2020; Wunderlin and Hansen, 2011).

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2 - *Dichanthelium scabriusculum*, tall swamp witchgrass, herbarium specimen. Photo by University of South Florida Herbarium, Florida Plant Atlas

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🔍 BOTANY IDENTIFICATION TABLE

The following table provides information about new county records submitted in the reported quarter. The table is organized alphabetically by collector name. The full version with more complete data is downloadable as a [PDF](#) or an [Excel](#) spreadsheet also organized by collector name, except new county records are listed first.

COLLECTOR NAME	COLLECTOR 2	LIST NUMBER	RECEIVED DATE	PLANT NAME	COUNTY
Abby Bartlett	Jimmy Hernandez	457	1/20/2022	<i>Tridax procumbens</i>	Flagler
Alexander Tasi	Victoria Benjamin	1974	3/11/2022	<i>Myriophyllum aquaticum</i>	Brevard
Chase Groninger		2558	3/31/2022	<i>Allium canadense</i>	Brevard
Chase Groninger		2620	3/31/2022	<i>Pilea microphylla</i>	Brevard
Chase Groninger		2634	3/31/2022	<i>Quercus nigra</i>	Brevard
Chase Groninger		2640	3/31/2022	<i>Bromelia pinguin</i>	Brevard
Chase Groninger		2641	3/31/2022	<i>Vicia floridana</i>	Brevard
David Brown		241	1/18/2022	<i>Dichantheium scabriusculum</i>	Flagler
David Brown		253	1/18/2022	<i>Spermacoce remota</i>	Putnam
David Brown		341	1/18/2022	<i>Plantago major</i>	Putnam
David Brown		344	1/18/2022	<i>Oxalis debilis</i>	Putnam
David Brown		475	1/21/2022	<i>Euphorbia hypericifolia</i>	Flagler
David Brown		790	2/1/2022	<i>Magnolia virginiana</i>	Flagler
David Brown		893	2/8/2022	<i>Butia capitata</i>	Putnam
David Brown		983	2/8/2022	<i>Ricinus communis</i>	Putnam
David Brown		1205	2/15/2022	<i>Schinus terebinthifolia</i>	Putnam
David Brown		2392	3/24/2022	<i>Asparagus aethiopicus</i>	Putnam
David Brown		2616	3/31/2022	<i>Poa annua</i>	Putnam
Deann Hansen		647	1/27/2022	<i>Alternanthera brasiliana</i>	Volusia
Deann Hansen		952	2/8/2022	<i>Odontonema cuspidatum</i>	Volusia
Deann Hansen		1538	2/28/2022	<i>Crassocephalum crepidiodes</i>	Volusia
Deann Hansen		1976	3/11/2022	<i>Cercis canadensis</i>	Volusia
Deann Hansen		2094	3/16/2022	<i>Prunus angustifolia</i>	Volusia
Deann Hansen		2293	3/22/2022	<i>Rumex verticillatus</i>	Flagler
Deann Hansen		2380	3/24/2022	<i>Gibasis pellucida</i>	Volusia
Deann Hansen		2381	3/24/2022	<i>Syagrus romanzoffiana</i>	Volusia
Deann Hansen		2515	3/29/2022	<i>Dolichandra unguis-cati</i>	Volusia
Diane Mccoll	Rachel Conklin	461	1/21/2022	<i>Asparagus setaceus</i>	Flagler
Diane Mccoll		462	1/21/2022	<i>Iva imbricata</i>	Flagler
Diane Mccoll	Rachel Conklin	599	1/26/2022	<i>Kalanchoe x houghtonii</i>	Volusia
Ethan Kelly		85	1/5/2022	<i>Commelina diffusa</i>	Escambia
Ethan Kelly		203	1/11/2022	<i>Dolichandra unguis-cati</i>	Okaloosa
Ethan Kelly		1285	2/17/2022	<i>Ionactis linariifolia</i>	Santa Rosa
Ethan Kelly		1480	2/23/2022	<i>Paulownia tomentosa</i>	Santa Rosa
Ethan Kelly		1706	3/3/2022	<i>Nandina domestica</i>	Okaloosa
Ethan Kelly		1708	3/3/2022	<i>Elaeagnus umbellata</i>	Okaloosa
Ethan Kelly		1709	3/3/2022	<i>Cyrtomium falcatum</i>	Okaloosa
Ethan Kelly		1712	3/3/2022	<i>Ilex cornuta</i>	Okaloosa
Ethan Kelly		2369	3/23/2022	<i>Paulownia tomentosa</i>	Escambia
Jeanie Frechette		2473	3/29/2022	<i>Ipomoea cordatotriloba</i>	St. Lucie
Jesse Krok	Kelsey Pitchford	492	1/24/2022	<i>Eriobotrya japonica</i>	Seminole
Jimmy Hernandez	Alicia Velazquez, Nora Marquez, Mary Sellers, Stephen Jenner, Abby Bartlett, Timothy Stumpp, Harry Morrison	1375	2/22/2022	<i>Psychotria nervosa</i>	Sumter
Laura Ureta		449	1/21/2022	<i>Solanum diphyllum</i>	Flagler
Lisa Tyler		402	1/19/2022	<i>Myriophyllum aquaticum</i>	Duval
Mark Laurint		525	1/24/2022	<i>Ageratum conyzoides</i>	Clay
Mary Graham		1883	3/11/2022	<i>Dalbergia sissoo</i>	Hendry
Matthew Brodie	Mary Graham	730	2/1/2022	<i>Imperata cylindrica</i>	Glades
Noemi Negron	Alexander Tasi	1975	3/11/2022	<i>Melilotus albus</i>	Indian River
Nora Marquez	Abby Bartlett, Jimmy Hernandez	534	1/21/2022	<i>Emilia sonchifolia</i>	Flagler

COLLECTOR NAME	COLLECTOR 2	LIST NUMBER	RECEIVED DATE	PLANT NAME	COUNTY
Nora Marquez		757	1/28/2022	<i>Youngia japonica</i>	Putnam
Nora Marquez	Stephen Jenner	853	2/3/2022	<i>Arundinaria gigantea</i>	Hernando
Nora Marquez	Jimmy Hernandez	1155	2/14/2022	<i>Schinus terebinthifolia</i>	Sumter
Nora Marquez	Abby Bartlett	2146	3/16/2022	<i>Wisteria sinensis</i>	Levy
Nora Marquez	Abby Bartlett	2149	3/16/2022	<i>Arundo donax</i>	Levy
Nora Marquez		2341	3/24/2022	<i>Wisteria sinensis</i>	Putnam
Nora Marquez		2343	3/24/2022	<i>Asparagus setaceus</i>	Putnam
Nora Marquez		2646	3/31/2022	<i>Aspidistra elatior</i>	Putnam
Nora Marquez		2648	3/31/2022	<i>Alpinia zerumbet</i>	Putnam
Nora Marquez		2659	3/31/2022	<i>Hedera helix</i>	Levy
Rachel Conklin		468	1/21/2022	<i>Tradescantia zebrina</i>	Volusia
Rachel Conklin		469	1/21/2022	<i>Monstera deliciosa</i>	Volusia
Rachel Conklin		715	2/1/2022	<i>Piper auritum</i>	Volusia
Rachel Conklin		1394	2/22/2022	<i>Ricinus communis</i>	Flagler
Ray Jarrett	David Brown	2578	3/29/2022	<i>Bromus catharticus</i>	Volusia
Ricardo Areingdale		1240	2/15/2022	<i>Cirsium horridulum</i>	Suwannee
Ricardo Areingdale		1942	3/9/2022	<i>Cirsium horridulum</i>	Gilchrist
Richard Blaney		2078	3/16/2022	<i>Cupaniopsis anacardioides</i>	Glades
Stephen Jenner	Alicia Velazquez	2551	3/30/2022	<i>Zephyranthes simpsonii</i>	Sumter
Victoria Benjamin		896	2/8/2022	<i>Ammannia latifolia</i>	Osceola
Victoria Benjamin		2143	3/16/2022	<i>Emilia praetermissa</i>	Brevard



ENTOMOLOGY

Compiled by Susan E. Halbert, Ph.D.

This section provides the division's plant protection specialists and other customers with accurate identifications of arthropods. The entomology section also builds and maintains the arthropod reference and research collection (the Florida State Collection of Arthropods with over 10 million specimens) and investigates the biology, biological control and taxonomy of arthropods.

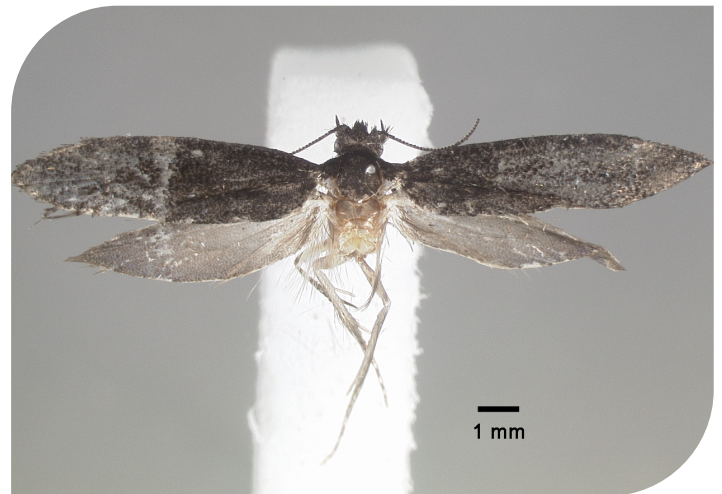
	JANUARY - MARCH	2022 - YEAR TO DATE
Samples Submitted	1,343	1,343
Lots Identified	1,922	1,922

1 *Trachyderes succinctus* (Linnaeus), a longhorn beetle, a new Continental USA record. One specimen of this species was collected in a Lindgren funnel trap at the Port of Miami. This species is extremely widespread in South America, much of Central America and the West Indies. Life history notes indicate the species feeds in dying or recently dead trees. This species is not known to be a pest. (Miami-Dade County; E0406-01-01282022-00787; Antonio Forestier-Rivera, U.S. Customs and Border Protection; 22 December 2022.) (Kyle Schnepf.)

2 *Elatobia carbonella* (Dietz), a tineid moth, a new Florida State record. This charcoal-black moth is related to clothes moths. Its larval habits are unknown, but it may be associated with forest fires. Although some authors (Gaedike, 2019) synonymize this species with the European *E. fuliginosella* (Lienig & Zeller), genitalic dissection supports *E. carbonella* as a distinct species, distributed in eastern North America, more abundantly in northern states (Landry *et al.*, 2013). *Elatobia fuliginosella* in Europe has been found in insect holes bored in burnt pine bark on live trees where it is thought to feed on fungal mycelium or insect detritus. If *E. carbonella* has similar habits, then it may depend on good fire management. Four other specimens from Florida were found in the Florida State Collection of Arthropods, from Ocala National Forest (Marion County) and Torreya State Park (Liberty County). (Levy County; E0089-01-01102022-00150; James Hayden, Jeffrey Slotten and James Troubridge; 31 December 2021.) (Dr. James Hayden.)



1 - *Trachyderes succinctus*, a longhorn beetle, dorsal view.
Photo by Kyle Schnepf, FDACS-DPI



2 - *Elatobia carbonella*, a tineid moth.
Photo by James Hayden, FDACS-DPI



3 *Cecidomyia retinicola* (Osten Sacken), a pine pitch midge, a notable find. Numerous bright orange larvae were discovered feeding in a resin mass exuded from *Pinus elliotii* in Vero Beach. According to Gagné (1978), this midge occurs widely in the United States and Canada infesting many different pine species. Females lay eggs on all plant parts, and larvae crawl to pitch masses and embed themselves either singly or gregariously. Damage caused by feeding larvae may kill growing shoots. These are the first specimens of this species in the Florida State Collection of Arthropods. (Indian River County; E0873-01-03012022-01665; Noemi Negron and Alexander Tasi; 1 March 2022.) (Dr. Gary Steck.)

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3a - *Cecidomyia retinicola* larvae in a resin mass on *Pinus elliotii* collected in Vero Beach.
Photo by Alexander Tasi, FDACS-DPI



3b - *Cecidomyia retinicola* larvae, dorsal view.
Photo by Gary Steck, FDACS-DPI

🔍 ENTOMOLOGY SPECIMEN REPORT

Following are tables with entries for records of new hosts or new geographical areas for samples identified in the current volume's time period as well as samples of special interest. An abbreviated table, with all the new records, but less detail about them, is presented in the body of this web page and another version with more complete data is downloadable as a [PDF](#) or an [Excel](#) spreadsheet.

The tables are organized alphabetically by plant host if the specimen has a plant host. Some arthropod specimens are not collected on plants and are not necessarily plant pests. In the table below, those entries with no plant information included are organized by arthropod name.

PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Adonia merrillii</i>	Christmas palm	<i>Paraleyrodes bondari</i>	Bondar's nesting whitefly	Narciso Rodriguez Medina	New Florida host record
<i>Baccharis halimifolia</i>	salt bush	<i>Phenacoccus sisymbriifolium</i>	mealybug	Brad Danner, Krystal Ashman, Elijah Talamas, Natalie McGathey, Maximilian Carfagno, Nicole Benda, Alejandro Montoya	New Florida host record
<i>Bidens alba</i>	beggarticks	<i>Phenacoccus sisymbriifolium</i>	mealybug	Nora Marquez	First in county
<i>Bidens alba</i>	beggarticks	<i>Phenacoccus sisymbriifolium</i>	mealybug	Victoria Benjamin	First in county
<i>Bischofia javanica</i>	Javanese bishopwood	<i>Lindingaspis floridana</i>	floridana scale	Leicet Diaz	New Florida host record
<i>Chamaecrista fasciculata</i>	partridge pea	<i>Crypticerya genistae</i>	monophlebid scale	Noemi Negron, Jeanie Frechette, Carlos Averhoff Chirino, Teresa Ortelli, Alexander Tasi	First in county
<i>Citrus sinensis</i>	sweet orange	<i>Fiorinia phantasma</i>	phantasma scale	Holly Henry	First in county; New Florida host record
<i>Coffea arabica</i>	Arabian coffee	<i>Leucoptera coffeella</i>	coffee leafminer	Scott Krueger	First in county
<i>Duranta erecta</i>	golden dewdrop, pigeonberry, skyflower	<i>Milviscutulus mangiferae</i>	mango shield scale	Muhammed Ahmed	New Florida host record
<i>Ficus aurea</i>	Florida strangler fig	<i>Melanaspis leivasi</i>	leivasi armored scale	Shannan Webb, Riccardo Tordi	First in county
<i>Galactia striata</i>	Florida hammock milkpea	<i>Crypticerya genistae</i>	monophlebid scale	Phellicia Perez	New Florida host record
<i>Gardenia jasminoides</i>	gardenia	<i>Thrips parvispinus</i>	thrips	Alexandra Revynthi	First in county
<i>Ipomoea indica</i>	oceanblue morning-glory	<i>Spartocera batatas</i>	giant sweet potato bug	Scott Krueger	New Florida host record
<i>Iris</i> sp.	iris	<i>Pinnaspis aspidistrae</i>	fern scale	Ethan Kelly, Larry Violett	New Florida host record
<i>Lactuca sativa</i>	lettuce	<i>Acyrtosiphon lactucae</i>	lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Autographa californica</i>	alfalfa looper	Jakira Davis, Ryan Brown, Eric Dougherty, Dyrana Russell	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Autographa californica</i>	alfalfa looper	Jakira Davis, Ryan Brown, Eric Dougherty, Dyrana Russell	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Cadra figulilella</i>	raisin moth	Jakira Davis, Ryan Brown, Eric Dougherty, Dyrana Russell	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts, Dyrana Russell	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts, Dyrana Russell	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Mary Jane Echols	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	David Brown, Laura Ureta	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Jakira Davis, Ryan Brown	Regulatory significant



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Mentha</i> sp.	mint	<i>Eupteryx decemnotata</i>	Ligurian leafhopper	Sam Hart	First in county
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	<i>Bemisia tabaci</i>	silverleaf whitefly	Patti Anderson	New Florida host record
<i>Myrsine cubana</i>	myrsine; colicwood	<i>Ceroplastes rubens</i>	red wax scale	Dagne Vasquez	New Florida host record
Palmae	palm	<i>Fiorinia phantasma</i>	phantasma scale	Muhammed Ahmed	First in county
<i>Persea americana</i>	avocado	<i>Davidsonaspis aguacate</i>	armored scale	Jakira Davis, Ryan Brown, Eric Dougherty, Dyrana Russell	Regulatory significant
<i>Phaseolus vulgaris</i>	bean	<i>Nipaecoccus nipae</i>	coconut mealybug	Narciso Rodriguez Medina, Renan Espino Martinez, Hanoy Carmenate, Maria Dulzaides	New Florida host record
<i>Pinus elliotii</i>	slash pine	<i>Cecidomyia resinicola</i>	pine pitch midge	Alexander Tasi, Noemi Negron	Notable find
<i>Pinus</i> sp.	pine	<i>Lepidocyrtus pallidus</i>	springtail	Ryan Brown	First in county
<i>Pinus</i> sp.	pine	<i>Orchesella bulba</i>	springtail	Ryan Brown	First in county
<i>Psychotria nervosa</i>	wild coffee	<i>Willowsia pyrrhopygia</i>	springtail	Jimmy Hernandez, Stephen Jenner, Nora Marquez, Harry Morrison, Mary Sellers, Timmothy Stumpp, Alicia Velazquez, Abby Bartlett	First in county
<i>Quercus</i> sp.	oak	<i>Rhytidoporus compactus</i>	burrower bug	Robert Longtin	First in county
<i>Rhododendron</i> sp.	azalea	<i>Heterothrips azaleae</i>	azalea thrips	Lisa Tyler	First in county
<i>Ruellia blechum</i>	Browne's blechum; green shrimp plant	<i>Phenacoccus sisymbriifolium</i>	mealybug	Nora Marquez	New Florida host record
<i>Saccharum officinarum</i>	sugarcane	<i>Saccharicoccus sacchari</i>	sugarcane mealybug	Alexander Tasi, Victoria Benjamin	First in county
<i>Schefflera actinophylla</i>	schefflera	<i>Protopulvinaria pyriformis</i>	pyriform scale	Ethan Kelly	First in county
<i>Schinus terebinthifolia</i>	Brazilian pepper	<i>Xystrologa grenadella</i>	bark moth	Ben Davis	First in county
<i>Strelitzia nicolai</i>	white bird of paradise	<i>Lepidosaphes beckii</i>	purple scale	Keith Zugar	New Florida host record
<i>Trifolium repens</i>	white clover	<i>Porphyrosela minuta</i>	clover leafminer	Chase Groninger	First in county
<i>Vernonia gigantea</i>	giant ironweed	<i>Insignorthezia insignis</i>	greenhouse ortezia	Jeanie Frechette	New Florida host record
<i>Xanthosoma sagittifolium</i>	arrowleaf elephant's ear	<i>Aleuroglandulus subtilis</i>	whitefly	Kyle Schnepf	First in county
<i>Zanthoxylum fagara</i>	wild lime	<i>Falconia maculipennis</i>	mirid bug	Jeanie Frechette, Alexander Tasi	First in county
		<i>Acantholomidea porosa</i>	scutellerid bug	Rolando Figueroa-Vargas	First in county
		<i>Amblypsilopus psittacinus</i>	long-legged fly	Alesha Fuller	First in county
		<i>Automeris io</i>	io moth	Noemi Negron, Alexander Tasi	First in county
		<i>Disonycha quinquelineata</i>	leaf beetle	Rachel Conklin	First in county
		<i>Elatobia carbonella</i>	tineid moth	James Hayden, James Troubridge, Jeffrey Sloten	New Florida State record
		<i>Eupteryx decemnotata</i>	Ligurian leafhopper	Scott Weihman	First in county
		<i>Hellula phidilealis</i>	cabbage budworm moth	Noemi Negron, Alexander Tasi	First in county
		<i>Heteropsylla quassiae</i>	psyllid	Julien Beuzelin	First in county
		<i>Ips avulsus</i>	bark beetle	Jeffrey Johnson	First in county
		<i>Ips calligraphus</i>	ips engraver beetle	Jeffrey Johnson	First in county
		<i>Latrodectus geometricus</i>	brown widow spider	Jessica Mills	First in county
		<i>Leptoglossus oppositus</i>	northern leaf footed bug	Younes Belmourid	First in county



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
		<i>Neophyllaphis araucariae</i>	Norfolk Island pin aphid	Monica Triana	First in county
		<i>Neurothrips magnafemoralis</i>	thrips	Scott Weihman	First in county
		<i>Polyamia obtecta</i>	leafhopper	Alexander Tasi	First in county
		<i>Psaphida resumens</i>	figure-eight sawfly moth	Noemi Negron, Alexander Tasi	First in county
		<i>Sigela sordes</i>	erebid moth	James Hayden, James Troubridge, Jeffrey Slotten	First in county
		<i>Sophonia orientalis</i>	two spotted leafhopper	Eric Dougherty, Jakira Davis	First in county
		<i>Sophonia orientalis</i>	two spotted leafhopper	Scott Weihnam, Alexander Tasi	First in county
		<i>Trachyderes succinctus</i>	beetle	Lynn Ramos	New Continental USA record
		<i>Trichosiphonaphis polygonifoliae</i>	aphid	Monica Triana	First in county



NEMATODOLOGY

Compiled by Renato N. Inserra, Ph.D., Silvia Vau, Ph.D., Janete Brito, Ph.D.,
Sergei A. Subbotin and Dyrana Russell, D.P.M.

This section analyzes soil and plant samples for nematodes, conducts pest detection surveys and provides diagnoses of plant problems, in addition to completing identification of plant parasitic nematodes involved in regulatory and certification programs. State of Florida statutes and rules mandate the predominant regulatory activities of the section. Analyses of plant and soil samples include those from in-state programs, plant shipments originating in Florida destined for other states and countries, as well as samples intercepted in Florida from outside the United States.

QUARTERLY ACTIVITY REPORT

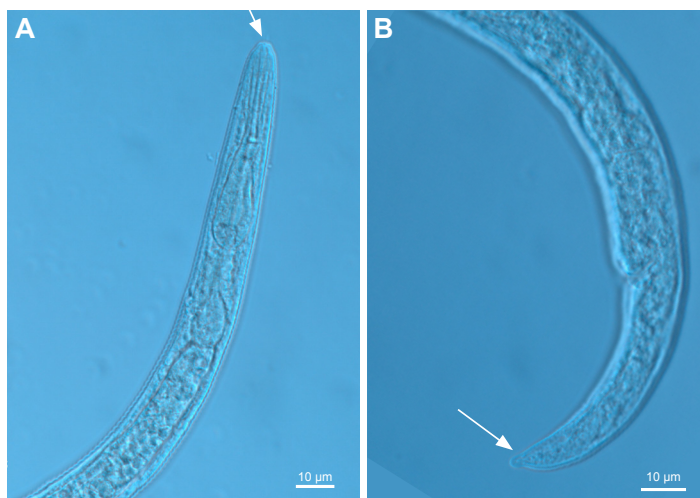
	JANUARY - MARCH	2022 - YEAR TO DATE
Morphological Identifications	3,656	3,656
Molecular Identifications *	134	134
Total Identifications	3,790	3,790

* The majority of these analyses involved root-knot nematode species.

Nematode of Special Interest

1 The pin nematode, *Paratylenchus projectus* Jenkins, 1956, was intercepted at Agricultural Interdiction Station 9A in White Springs, Florida, on propagative runners of strawberry (*Fragaria x ananassa* Duchesne) shipped from Simcoe, Ontario, Canada (Hamilton County; 101420121-9770; Dyrana Russell, Logan Cutts, Eric Dougherty, Jakira Davis; 14 October 2021).

The Florida strawberry industry relies on out-of-state propagative strawberry plants ("resets") to establish new production fields within the state. Every season, strawberry resets are shipped to Florida from nurseries in Canada, California and North Carolina. In the last two decades, the phase out of methyl bromide production has complicated pest management of strawberry transplants in nurseries and impacted the control of pests and diseases. During the past strawberry season, a population of a pin nematode, *Paratylenchus projectus*, was detected on strawberry resets imported into Florida from a large nursery supplier in Canada, where this nematode has been reported in many localities (Wu, 1975). Preliminary results of molecular and phylogenetic analyses using D2-D3 of 28S rRNA gene sequences indicate this intercepted population clusters in the phylogenetic tree in the clade containing *P. projectus* populations from California and other localities. These analyses, however, are still in progress using other DNA gene sequences. *Paratylenchus projectus* was described from Maryland (Jenkins, 1956). Subsequently, it has been



1 - Photomicrographs of *Paratylenchus projectus* from Canada, intercepted in Florida. Female anterior (A) and posterior (B) body. Note trapezoid head (arrowed) in A and digitate tail terminus (arrowed) in B.

Photo by Silvia Vau and Scott Burton, FDACS-DPI

reported in many countries and continents. Esser (1992) lists *P. projectus* among other pin nematodes occurring in Florida without providing morphological data for the Florida population or information on the geographical distribution of the species within the state. Large populations of this nematode have been associated with growth suppression of many crops including sunflower (*Helianthus annuus* L.), strawberry and tobacco (*Nicotiana tabacum* L.) in Canada and states in the northern United States (USA) (Coursen and Jenkins, 1958; Crow and MacDonald, 1978; Smolik, 1987). However, there are no reports indicating this nematode has been detected in Florida strawberry operations. Florida growers should require nurseries to certify their strawberry resets free from plant-parasitic nematodes and other damaging organisms. The use of nematode certified strawberry resets prevents the dissemination of exotic, damaging nematodes and improves the yield in strawberry operations. Nematode surveys in Florida strawberry fields should be conducted to monitor species variations in the populations of plant-parasitic nematodes.



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Wu, Y.L. (1975). *Paratylenchus projectus* (Paratylenchinae: Nematoda) and some closely related species. *Canadian Journal of Zoology* 53: 1875-1881.

COLLECTORS

Collectors submitting five or more samples processed for nematological analysis during January-March 2022.

COLLECTOR NAME	SAMPLES PROCESSED
Alexander Arbelaez	115
Ashley Nolen	18
Austin Hawes	9
Bobby Floyd	14
Brian Alford	8
Craig Landress	6
Emily Safran	12
Eric Rojas	256
Ethan Kelly	10
Frank Burgos	304
Grayson Grume	92
Jakira Davis	8
Janie Echols	12
Jeanie Frechette	5
Mark Laurint	6
Michael Bentley	76
Nora Marquez	169
Peter Carbon	8
Ricardo Areingdale	11
Richard Blaney	71
Richard Bloom	37
Rogelio Blanco	204
Ryan Brown	9

SAMPLES FOR MORPHOLOGICAL ANALYSIS

Certifications and Regulatory Purposes

	JANUARY - MARCH	2022 - YEAR TO DATE
Multistate Certification involving California	986	986
Multistate Certification excluding California Certification	1,948	1,948
Citrus Certification (Citrus Nursery Certification, Site or Pit Approval)	70	70
Total	3,004	3,004

Other Purposes

	JANUARY - MARCH	2022 - YEAR TO DATE
Identification (other organisms)	0	0
Interdiction Station (AIS)	38	38
Plant Problems	10	10
Survey	104	104
Total	152	152

SAMPLES FOR MOLECULAR ANALYSIS

	JANUARY - MARCH	2022 - YEAR TO DATE
Regulatory Purposes	82	82
Other Purposes	0	0
Identifications	52	52
Surveys	0	0
Total	134	134





PLANT PATHOLOGY

Compiled by Hector Urbina, Ph.D.; Jodi Hansen, M.S.; Taylor Smith, B.S.; Kishore Dey, Ph.D.; Callie Jones and Maria Velez-Climent, M.S.

The Plant Pathology section provides plant disease diagnostic services for the department. The agency-wide goal of protecting the flora of Florida very often begins with accurate diagnoses of plant problems. Management recommendations are offered where appropriate and available. Our plant pathologists are dedicated to keeping informed about endemic plant diseases along with those diseases and disorders active outside Florida in order to be prepared for potential introductions of new pathogens to our area.

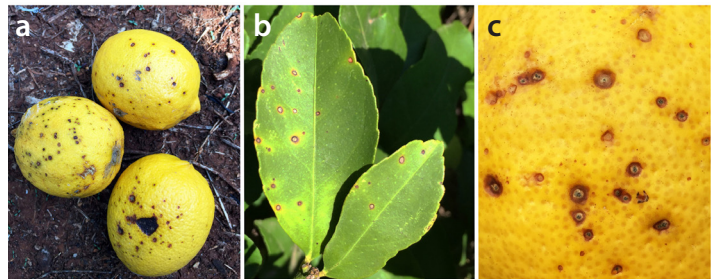
1 Comparison of three *Phyllosticta* species associated with citrus

***Phyllosticta* (=Guignardia) citricarpa** (McAlpine) Aa is the causal agent of Citrus Black Spot (CBS) disease, found infecting *Citrus sinensis* (sweet orange) in 2010 at a residential property in Immokalee, Collier County. Since that time, citrus groves in Collier, Charlotte, Hendry, Lee and Glades counties have reported CBS infections (Pest Alert DACS-P-01723). The most common symptom of CBS on fruit and leaves is 1-5 mm spots with dark reddish-brown borders surrounded by light brown, embedded lesions containing black fungal fruiting bodies called pycnidia. Hard spot lesions are the most common symptoms of CBS in Florida and are seen exclusively on fruit. CBS is managed in groves through timely fungicide applications, leaf litter treatment, cultural controls and quarantine measures. Nonetheless, every year from September to May, CBS-infected fruit are submitted by state and federal inspectors to FDACS-DPI Plant Pathology Section for confirmation. Some of these CBS-infected fruits represent an expansion of the CBS quarantine zone (Collier County; P0626-03302022-02598; Juan Amador, 29 March 2022).

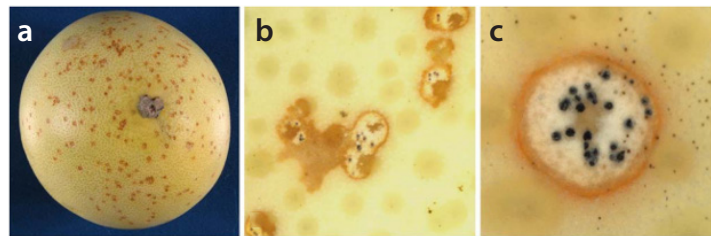
In addition to *P. citricarpa*, two other well-studied species of *Phyllosticta* are known to infect citrus, *P. capitalensis* and *P. citriasiana*. Awareness of these *Phyllosticta* species and their attributes when scouting for and diagnosing citrus diseases is of the utmost importance. For that purpose, the following information provides a comparison of *P. capitalensis*, *P. citriasiana* and *P. citricarpa*.

Phyllosticta capitalensis Henn. is an endophytic fungus causing secondary infection on citrus following mechanical injury. Symptoms of *P. capitalensis* appear as small, black spots on the rinds without any reproductive fungal structures. This is a broadly distributed fungal endophyte present in several crops and ornamentals in multiple countries. In Florida, *Phyllosticta capitalensis* has been reported on kumquat (Tri-Ology 2021, 60 No. 1).

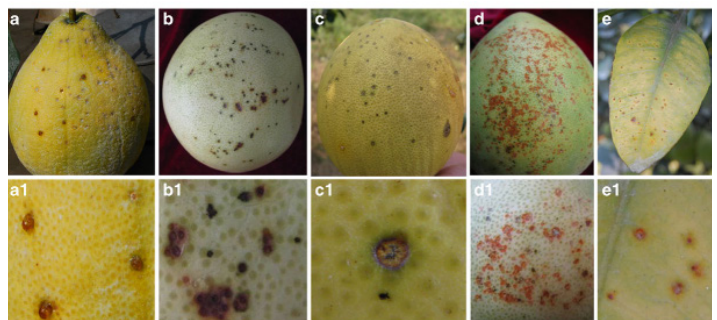
Phyllosticta citriasiana Wulandari, Crous & Gruyter causes a disease known as Pummelo Tan Spot (PTS) exclusively on pummelo (*Citrus maxima*) and has been reported only in Asia. Symptoms of PTS appear on fruit beginning at maturity (early August in Guangdong and Fujian, China). Initially, the red-brown spots are 2-3 mm in diameter, then coalesce to form 1-6 mm, sunken, crater-like, reddish-brown to black-



1 - Citrus black spot symptoms produced by *Phyllosticta citricarpa* in *Citrus* spp. from Guarnaccia et al., 2019. (a) Typical hard and virulent spot with sunken necrotic lesions on *Citrus limon* fruit (b) Hard spot lesions with a dark brown raised border on *C. limon* leaves (c) Freckle spot containing pycnidia on *C. sinensis* rind.



2 - Pummelo tan spot produced by *P. citriasiana* on *Citrus maxima* from Wulandari et al., 2009. *Phyllosticta citriasiana*. a-c. Symptoms on fruit of *Citrus maxima*. (a) red-brown spots, 2-3 mm in diameter



3 - *Phyllosticta citriasiana* on fruits and leaves of *Citrus maxima* (pomelo) from Wang et al., 2011. (a) and (a1) Initial spots with amber gum on fruits. (b) and (b1) Middle stage of disease, reddish-brown to black-brown spots on fruits. (c) and (c1) Final stage of disease, sunken and crater-like spot with black dots in the center. (d) and (d1) While storing, transporting and marketing, tan and slightly sunken spots. (e) and (e1) Symptoms on leaves. a1, b1, c1, d1 and e1 Enlarged spots corresponding to a, b, c, d and e respectively.



brown spots, maturing to become grey-brown to grey in the center with a reddish-brown rim. Tiny, slightly elevated, black dots (pycnidia) develop in the center of the spots, often surrounded by a green halo. During storage, transportation or marketing, slightly sunken tan spots of various sizes and shapes develop on the fruits. Finally, the whole rind of fruit becomes grey-brown and shriveled, but the infection is limited to the rind. Leaf symptoms are observed only on mature leaves as tan, pin-like, slightly sunken spots, then enlarge to 2-3 mm in diameter and fade to grey from the center. Black dots (pycnidia) are commonly present in the center of leaf spots. Although *P. citriasiana* is absent from Florida, there is a growing concern it could be mistakenly diagnosed as *P. citricarpa* and inadvertently establish in Florida. Grapefruit (*Citrus x paradisi*) is a hybrid of Valencia orange and pummelo and possibly, because of this relatedness, might become a new host of *P. citriasiana*.

QUARTERLY ACTIVITY REPORT

	JANUARY - MARCH	2022 - YEAR TO DATE
Citrus black spot	29	29
Citrus canker	51	51
Citrus greening / HLB	53	53
HLB Certification for out-of-state shipping	0	0
Import inspections	2	2
Interdictions	17	17
Palm phytoplasma	7	7
Pathology, General	489	489
Soil	44	44
Totals	692	692

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COMPARISON AMONG THREE PHYLLOSTICTA KNOWN TO INFECT CITRUS

Characteristic	<i>P. capitalensis</i>	<i>P. citricarpa</i>	<i>P. citriasiana</i>
Host / Pathogenicity	Endophytic in citrus and other woody plants / secondary pathogen in citrus	Pathogenic in all commercially grown citrus species and cultivars, except for sour orange (<i>C. aurantium</i>), its hybrids and pummelo	Pathogenic in <i>Citrus maxima</i> only, in Florida commercially grown in Hillsborough County only
Disease	Post-harvest disease found in citrus fruit only after mechanical injury (no pycnidia production)	Mainly pre-harvest disease with pycnidia, present in fruit and leaves	Pre- and post-harvest disease with pycnidia production present in fruit and leaves
Distribution outside Florida	Worldwide	Asia, Australia, Africa, Europe, Florida, and South America	Asia (China, Vietnam, Thailand) only
Distribution in Florida	Present throughout the state occurring on several hosts including citrus	Present in Charlotte, Collier, Glades, Hendry and Lee counties Quarantine in place	Not present in the state
Max temperature of growth in culture	30C (86F) - 36C (96.8F)	30C (86F) - 36C (96.8F)	30C (86F) -33C (91.4F) [Summer in Florida probably too hot for pathogen establishment]
Sexual state/sexual reproduction	Known/homothallic	Known/heterothallic	Unknown/heterothallic
Disease pattern	Mainly on fallen citrus fruit	Presence of infected fruit and leaves throughout the year [In Florida, Valencia oranges are more susceptible than Hamlin]	Presence of infected fruit and leaves throughout the year

🔍 PLANT PATHOLOGY IDENTIFICATION TABLE

The following table provides information about samples identified between January-March 2022 . The table is organized alphabetically by plant species, with new records listed on the right.

PLANT SPECIES	PLANT COMMON NAME	CAUSAL AGENT	DISEASE NAME	LOCATION TYPE	SPECIMEN NUMBER	COUNTY	COLLECTOR	DATE	NEW RECORDS
<i>Celtis laevigata</i>	sugarberry, southern hackberry	<i>Kretzschmaria deusta</i>	brittle cinder fungus	residence	P0895-12282021-03502	Alachua	Jeffrey Eickwort	12/28/21	host
<i>Citrus sp.</i>	citrus	<i>Phyllosticta citricarpa</i>	citrus black spot	grove	P0626-3302022	Collier	Juan Amador	3/29/22	expansion of CBS quarantine zone
<i>Guzmania sp.</i>	bromeliad	<i>Curvularia senegalensis</i>	leaf spot	nursery	P0104-01142022-00364	Miami-Dade	Circo Milian	1/12/22	host
<i>Malvaviscus penduliflorus</i>	sleeping hibiscus	<i>Cerotelium malvicola</i>	rust	park	P0096-01-01142022-00339	Volusia	Diane Mccoll	1/13/22	host
<i>Trachycarpus fortunei</i>	windmill palm	<i>Phytoplasma palmae</i>	Texas phoenix palm decline	residence	P0047-01-01122022-00211	Alachua	John McVay	1/10/22	host



NOTES FROM A GUEST

By Alex de la Paz

Inquiring minds want to know... what's up with our endangered Florida torrey?

In March, FDACS-DPI botanist Alex de la Paz joined Lilly Anderson-Messec, Director of North Florida Programs for the Florida Native Plant Society (FNPS) and the TorreyKeepers Project Coordinator, to survey for *Torrey taxifolia* Arn. on private land in Gadsden County. TorreyKeepers is a project of FNPS working with private landowners and other partner organizations to document trees, assist the Atlanta Botanical Garden (ABG) in preserving genetic lines and help owners with management of lands where *T. taxifolia* persists. The mission of the TorreyKeepers project is to assist in the recovery of *T. taxifolia* in its native range by conducting surveys of privately owned properties within its range to find previously unrecorded trees in support of the federal recovery plan. Newly discovered trees are given a permanent tag and identification number, and then data, DNA and cuttings are collected for research and ex-situ conservation at ABG. Canker samples are also collected from infected trees for research at the University of Florida Forest Pathology Lab.

This rare conifer is listed as both state and federally endangered and is considered nearly extinct in the wild because of habitat destruction within its small growing range, with the additional tragic impacts of a fungal blight caused by *Fusarium torreyae*. This species is endemic to rich, deciduous forests on mid-slopes of ravines in the Apalachicola River valley along the east side of the Apalachicola River in Florida and one adjacent county in southwest Georgia. *Torrey taxifolia* (Florida torrey), from a genus of six or seven species native to temperate regions of the Northern Hemisphere, in the plant family Taxaceae, is an evergreen conifer reaching a height of up to 18 m (ca. 60 ft) at maturity, but large, mature trees are rarely (if ever) seen in the wild anymore because they are killed by the fungal blight as saplings. The branches are whorled and spreading to slightly drooping. The needle-like leaves are stiff and sharply pointed at the tip and emit a foul odor when crushed. Trees are either male or female. Male trees have small, pale-yellow cones that open to release pollen into the wind. Female trees have cones consisting of a single seed enclosed by a dark green, leathery aril that splits open at maturity and releases the seed. Another rare conifer, *Taxus floridana* (Florida yew), grows in the same habitat and has a similar appearance, but the needles are soft to the touch, the branches do not grow in whorls and the arils surrounding the seeds are red and fleshy.

A day of field work in March provides the opportunity to appreciate Florida's natural beauty while collecting scientific data in support of conservation. For a botanist, the rich, sloping mesic hardwood forest with steep ravines and seepage



Torrey taxifolia, Florida torrey or stinking cedar, observed by Alex de la Paz.

Photo by Lilly Anderson-Messec, Florida Native Plant Society (FNPS)

streams in early spring is quite a special scene. The deciduous hardwood canopy was just beginning to put forth this year's leaves, and the groundcover was alive with grasses, sedges and spring wildflowers. In the home of the especially rare conifer that is sadly on the verge of extinction, Alex and Lily climbed up and down steep ravines and maneuvered through fallen trees and dense shrubs while searching for previously unknown *T. taxifolia* trees. Only short, resprouting shoots of trees top killed by the fungus are expected. When a tree is spotted, the following data are recorded: number of shoots, height of tallest shoot, presence/absence of canker damage and/or leaf spot, canopy cover percentage and slope aspect. All in all, 15 new trees were identified, and information about them was added to the survey. According to this botanist, there is something immeasurably satisfying about searching the forest for a particular treasure, and then finding it.





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1-888-397-1517

Florida Department of Agriculture and Consumer Services
Division of Plant Industry
1911 SW 34th St.
Gainesville, FL 32608-1201