



FDACS-P-00124

January-March 2021

Volume 60, 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



Florida Department of Agriculture and Consumer Services • Division of Plant Industry



Psyllid trap constructed using 3D printing technology, monitoring for potato psyllids in tomato field.
Photo by Lilliam Otero Pujol, FDACS-DPI

ABOUT TRI-LOGY

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-LOGY 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-LOGY

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

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

Copies of TRI-LOGY are kept on the FDACS website for two years. To obtain older copies, contact the FDACS-DPI Library at (352) 395-4722 or PlantIndustry@FDACS.gov.

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-LOGY. 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

TABLE OF CONTENTS

	HIGHLIGHTS	03
Noteworthy examples from the diagnostic groups throughout the ENPP Bureau.		
	BOTANY	04
Quarterly activity reports from Botany and selected plant identification samples.		
	ENTOMOLOGY	06
Quarterly activity reports from Entomology and samples reported as new introductions or interceptions.		
	NEMATOLOGY	11
Quarterly activity reports from Nematology and descriptions of nematodes of special interest.		
	PLANT PATHOLOGY	13
Quarterly activity reports from Plant Pathology and selected identified plant pest and disease samples.		
	FROM THE EDITOR	15
Articles of interest that vary in subject matter.		

Cover Photo

Trilium maculatum, spotted wakerobbin,
population found in Alachua County.
Photo by Alex de la Paz, FDACS-DPI



HIGHLIGHTS



1 *Cupaniopsis anacardioides* (A. Rich.) Radlk., carrotwood, is native to Australia, Melanesia, Micronesia and other Pacific Islands. This species has been documented in 16 Florida counties, but this is a new county record for Hendry County. This fast-growing, evergreen tree has smooth, gray outer bark, but the inner bark is often orange; hence, the common name “carrotwood.”



1 - *Cupaniopsis anacardioides*, carrotwood, mature fruit and leaves.
Photo from shutterstock

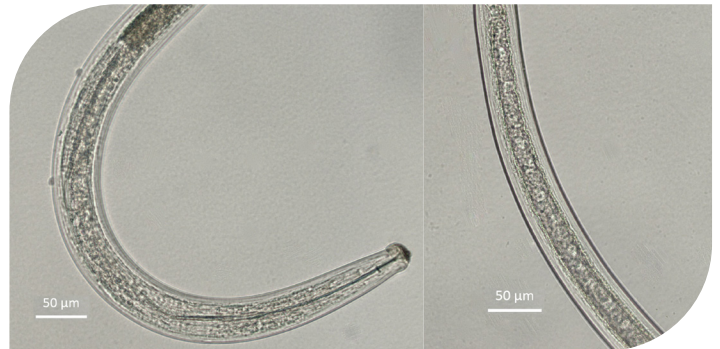
2 *Trichosiphonaphis polygonifoliae* (Shinji), an aphid, a new Western Hemisphere record. FDACS-DPI, in conjunction with the Cooperative Agricultural Pest Survey (CAPS) program, has designed a trap to monitor potato psyllids, *Bactericera cockerelli* (Šulc), a pest of regulatory significance in Florida. By using 3D printing technology, these traps are optimized for collecting psyllids. In one of the first samples from the new psyllid traps, two specimens of *T. polygonifoliae* were found.



2 - Trap for collecting psyllids.
Photo by Lilliam Otero Pujol, FDACS-DPI

3 The needle nematode, *Longidorus americanus* Handoo, Carta, Skantar, Ye, Robbins, Subbotin, Fraedrich & Cram, 2005 was found associated with slash pine (*Pinus elliotii* Engelm.) and water oak (*Quercus nigra* L.) trees, a new state record, in Gainesville, Florida.

4 *Phyllosticta capitalensis* Henn. (fruit spot) (Phyllostictaceae, Botryosphaerales, Ascomycota) was submitted on kumquat, *Citrus japonica* Thunb. (Rutaceae) (syn. *Fortunella japonica* (Thunb.) Swingle), a new host record, collected at a residential property.



3 - Photomicrographs of *Longidorus americanus*, a needle nematode, from Florida. Female anterior (left) and posterior (right) body.
Photo by Silvia Vau and Renato N. Inserra, FDACS-DPI



4 - *Phyllosticta capitalensis* fruit spots on *Citrus japonica* (*Fortunella japonica*).
Photo by Hector Urbina, FDACS-DPI





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 15,000 dried plant specimens and 1,400 vials of seeds.

QUARTERLY ACTIVITY REPORT

	JANUARY - MARCH	2021 - YEAR TO DATE
Samples Submitted by Other DPI Sections	1,041	1,041
Samples Submitted for Botanical Identification Only	71	71
Total Samples Submitted	1,112	1,112
Specimens Added to the Herbarium	297	297

Some of the samples submitted recently are described below.

1 *Cupaniopsis anacardioides* (A. Rich.) Radlk. (carrotwood), from a genus of about 60 species in the plant family Sapindaceae, native to Australia, Melanesia, Micronesia and other Pacific Islands. This species has already been documented in 16 other Florida counties, but this is a new county record for Hendry County. The species was introduced to Florida as an ornamental as early as 1955; by 1990, it was observed in both disturbed and natural communities, especially moist, coastal lowlands such as mangroves. *Cupaniopsis anacardioides* is now listed as a noxious weed by the state of Florida, and as a Category I invasive exotic by the Florida Invasive Species Council (formerly FLEPPC, Florida Exotic Pest Plant Council). Sale of this species is prohibited. This fast-growing, evergreen tree has smooth, gray outer bark, but the inner bark is often orange; hence, the common name "carrotwood." Individuals of this stately species can grow to a height of 10 m or more. The leaves of this tree are alternate and pinnately compound with four to 10 leaflets on short, swollen stalks (pulvinate petioles). The glossy, leathery leaflets are opposite to subopposite along the rachis and may be oblong, elliptic or obovate in outline. The leaflet margins have no teeth or lobes, but the rounded apex is sometimes notched. Seedling leaves are different. The first true leaves of seedlings may be pinnate compound or trifoliate (sometimes only two leaflets), with a few teeth along the margins. The inconspicuous flowers are about 1 cm wide, with five sepals and five greenish-white to yellow petals and are typically unisexual with either 6-10 stamens or a three-lobed stigma and three-carpellate ovary. Occasionally, trees will produce bisexual flowers with complete reproductive structures. Both staminate (pollen-



1a - *Cupaniopsis anacardioides*, carrotwood, immature fruit and leaves.
Photo by Patricia Howell, [Atlas of Florida Plants](#)



1b - *Cupaniopsis anacardioides*, carrotwood, mature fruit and leaves.
Photo from shutterstock



bearing) and carpellate (fruit-producing) flowers are borne in the same branched, often pendulous, inflorescences, 8-25 cm long, in the axil of leaves. The distinctive fruits are three-lobed or three-ridged, woody capsules; turning from green to orange-yellow when ripe; about 1.5 cm in diameter; splitting, to reveal three shiny, black seeds enclosed in a fleshy orange to red tissue called an aril. This tree has some use as lumber and in carving or wood-turning but was planted primarily as an ornamental or shade tree. (Hendry County; B2021-33; Mary Graham; 4 February 2021.) (Kaufman and Kaufman, 2007; Mabberley, 2017; Nelson, 2012; Wunderlin and Hansen, 2011; Wunderlin, *et al.*, 2017; http://bugwoodcloud.org/CDN/fleppc/plantlists/2019/2019_Plant_List_ABSOLUTE_FINAL.pdf [accessed 31 March 2021]; <https://selectree.calpoly.edu/tree-detail/cupaniopsis-anacardioides> [accessed 31 March 2021].)

2 *Trillium maculatum* Raf. (spotted wakerobin, mottled trillium), from a genus of about 50 species native to eastern North America (especially in southeastern Appalachians), western North America and eastern Asia, in the plant family Trilliaceae, following Weakley (2020), *Trillium maculatum* is found in Alabama, Florida, Georgia, and South Carolina, where it grows in rich mesic hardwood forests and floodplains, typically over calcareous materials such as coquina limestone ("marl") or on shell middens. In Florida, it has been documented from Alachua, Columbia, Jackson, Jefferson, Leon and Suwannee counties. The sample submitted for identification this reporting period was a photo from a population in Alachua County, the southernmost extent for this species. Plants are rhizomatous perennials growing up to 40 cm in height. The "leaves" are actually interpreted as bracts by some, but regardless of the morphological semantics, there is a single whorl of three sessile leaves (bracts) at the scape apex, held well above the ground, with the blade ovate-elliptic, the apex acute to acuminate and the surfaces mottled with two or three shades of green. The inflorescence is composed of a single terminal, sessile, erect flower. The flower is reported to have a faintly spicy and bananalike odor. There are three erect to spreading, green (often suffused or streaked with maroon-purple) sepals displayed above the leaves or bracts. The three petals are erect to slightly spreading, thick-textured, widest above the middle and maroon to purple. Six erect, maroon-purple stamens alternate in two whorls of three, with the

filaments much shorter than the anthers. The ovary is superior and is composed of three united carpels (tri-carpellate and tri-loculate) with three distinct, erect and divergent-recurved stigmas. If the flowers are successfully pollinated, the fruit will be a fleshy, berry-like capsule, dehiscent irregularly near the base to release many elliptic, brown seeds each bearing a large, white, myrmecochorous (ant dispersed) elaiosome (lipid-rich, fleshy structure), serving as a food reward for the ants. (Alachua County; submitted by the general public; 21 January 2021). (Case, 2002; Mabberley, 2017; Weakley, 2020).

REFERENCES

- Case, F.W., Jr. (2002).** *Trillium*. In: Flora of North America Editorial Committee, eds. 1993+. *Flora of North America North of Mexico* [Online]. 21+ vols. New York and Oxford. Vol. 26. <http://floranorthamerica.org/Trillium>. Accessed 6 April 2021.
- Kaufman, S.R. and Kaufman, W. (2007).** *Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species*. Stackpole Books. Mechanicsburg, Pennsylvania.
- Mabberley, D.J. (2017).** *Mabberley's plant-book: a portable dictionary of plants, their classification and uses* (4th edition). Cambridge University Press. New York, New York.
- Nelson, G. (2011).** *Trees of Florida: a reference and field guide*, 2nd edition. Pineapple Press, Sarasota, Florida.
- Weakley, A.S. (2020).** *Flora of the southeastern United States*. University of North Carolina Herbarium, North Carolina Botanical Garden. Chapel Hill, North Carolina.
- Wunderlin, R.P. and Hansen, B.F. (2011).** *Guide to the vascular plants of Florida*, 3rd edition. University Press of Florida, Gainesville, Florida.
- Wunderlin, R.P., Hansen, B.F. and Franck, A.R. (2017).** *Flora of Florida, Volume IV: Dicotyledons, Combretaceae through Amaranthaceae*. University Press of Florida, Gainesville, Florida.

🔍 BOTANY IDENTIFICATION TABLE

The following table provides information about **new county** records submitted in the current volume's time period. The table is organized by collector name. The full version with more complete data is downloadable as a [PDF](#) or an [Excel](#) spreadsheet organized by collector name, except new county records are listed first.

NEW RECORD	COLLECTOR NAME	COUNTY	SAMPLE NUMBER	COLLECTION DATE	PLANT NAME
🔍	Mary Graham	Hendry	B2021-33	02/04/2021	<i>Cupaniopsis anacardioides</i>





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.

QUARTERLY ACTIVITY REPORT

	JANUARY - MARCH	2021 - YEAR TO DATE
Samples Submitted	1,317	1,317
Lots Identified	1,793	1,793
Specimens Identified	24,875	24,875

1 *Trichosiphonaphis polygonifoliae* (Shinji), an aphid, a new Western Hemisphere record. FDACS-DPI, in conjunction with the CAPS program, has designed a trap to monitor potato psyllids, *Bactericera cockerelli* (Šulc), a pest of regulatory significance in Florida. By using 3D printing technology, these traps are optimized for collecting psyllids. By-catch is minimal in comparison to standard yellow sticky boards, but they do collect some other taxa, including aphids. Whenever a new surveillance method is deployed, some new records occur. In one of the first samples from the new psyllid traps, two specimens of *T. polygonifoliae* were found.

Trichosiphonaphis polygonifoliae is native to Asia but recently became established in Europe as well. No specimens were available at the USNM (United States National Museum; now National Museum of Natural History; Smithsonian Institution) for confirmation of the species, but Dr. Olivera Petrović-Obradović, University of Belgrade, Serbia, was able to confirm the identification based on European specimens. It is not clear how this aphid arrived in North America; however, a congener, *Trichosiphonaphis polygona* (van der Goot), has been in Florida since the 1930s.

The summer hosts of *T. polygonifoliae* are species of *Persicaria* and *Polygonum*, and the winter hosts are honeysuckles (*Lonicera* spp.). Both *Polygonum* and *Persicaria* grow in areas prone to flooding. After the initial find in the trap, a heavy infestation was found on *Persicaria* growing in a retention pond in Gainesville. Unchecked populations can damage the plants severely. The winter cycle, with overwintering eggs, on *Lonicera* is uncertain in Florida. Inspections of honeysuckle plants in autumn and spring did not reveal any colonies. Possible fall-migrant females were observed in the fall, but no males, necessary for the overwintering cycle. (Alachua County; E2020-4510; Robert Leahy, USDA/CAPS; 18 November 2020.) (Dr. Susan E. Halbert.)



1a - Psyllid trap from 3D printer used to monitor potato psyllids in tomato fields. The trap was designed by James Snyder, FDACS-DPI, based on a concept from early work by Dr. Dyrana Russell, FDACS-DPI. This trap preserves insects for DNA analysis and eliminates most of the by-catch and all the sticky mess associated with standard yellow sticky cards. Photo by Doug Restom-Gaskill, USDA/CAPS



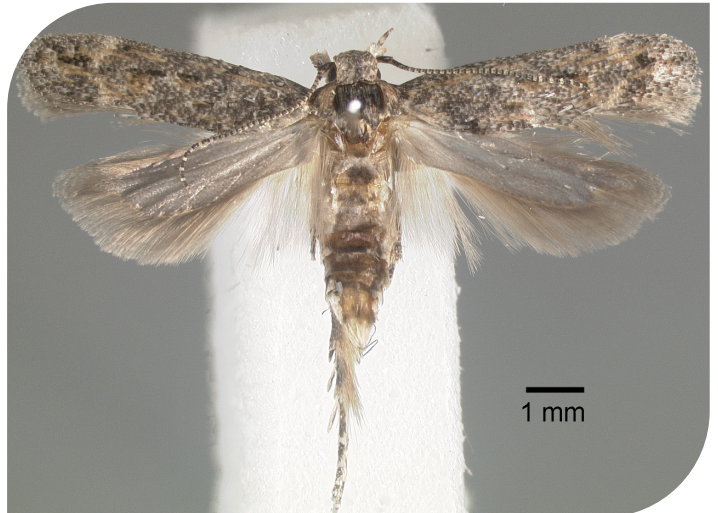
2 *Symmetrischema pallidochrella* (Chambers), a gelechiid moth, a new Florida State record. The moths in two samples collected on an island off Miami were reared out of *Physalis walteri* Nutt. (Walter's groundcherry). The larvae bore into the buds and fruits. This species is native to North America and is widely distributed in other states. It is related to other Solanaceae-feeding moths in the tribe Gnorimoschemini, some of which are pests. Diagnosis from related species requires dissection. (Miami-Dade County; E2019-546; Elizabeth Golden, DEP, and Jake Farnum, DPI/CAPS; 31 January 2019.) (Dr. Jean-François Landry, Canadian National Collection of Insects, Arachnids & Nematodes, Agriculture and Agri-Food Canada, and Dr. James E. Hayden, FDACS-DPI.



1b - *Trichosiphonaphis polygonifoliae* colony on *Persicaria*.
Photo by Lyle Buss, University of Florida.



1c - *Trichosiphonaphis polygonifoliae* on *Persicaria*, Close view.
Photo by Lyle Buss, University of Florida.



2 - *Symmetrischema pallidochrella* (Chambers), a gelechiid moth.
Photo by James Hayden, 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 that have no plant information included are organized by arthropod name.

PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Avicennia germinans</i>	black mangrove	<i>Leuronota maritima</i>	mangrove psyllid	Alexander Tasi	NEW FLORIDA COUNTY RECORD
<i>Bidens alba</i>	beggarticks, romerillo, Spanish needle	<i>Phenacoccus sisymbriifolium</i>	mealybug	Christina Pfeuffer, Karen Relish	NEW FLORIDA COUNTY RECORD
<i>Calophyllum</i> sp.		<i>Asiothrix antidesmae</i>	ixora whitefly	Lisa Charlton	NEW FLORIDA COUNTY RECORD; NEW FLORIDA HOST RECORD
<i>Calophyllum</i> sp.		<i>Asiothrix antidesmae</i>	ixora whitefly	Carlene Sargeant	NEW FLORIDA COUNTY RECORD
<i>Cannabis sativa</i>	hemp	<i>Philephedra tuberculosa</i>	soft scale	Natalie de la Gandara	NEW FLORIDA HOST RECORD
<i>Citrus limon</i>	lemon	<i>Phyllomydas quercus</i>	Mydas fly	Chad Colbert	NEW FLORIDA COUNTY RECORD
<i>Citrus sinensis</i>	sweet orange, navel orange	<i>Willowsia pyrrhopygia</i>	springtail	Connor Kuppe	NEW FLORIDA COUNTY RECORD
<i>Citrus</i> sp.		<i>Cydia marita</i>	tortricid moth	Krystal Ashman, Robert Leahy	NEW FLORIDA COUNTY RECORD
<i>Coccoloba uvifera</i>	seagrape	<i>Bleptina verticalis</i>	leaf-litter moth	Lane Southerland	NEW FLORIDA COUNTY RECORD
<i>Coccoloba uvifera</i>	seagrape	<i>Crociosema longipalpana</i>	litchi budworm	Mark Aubry	NEW FLORIDA COUNTY RECORD
<i>Crotalaria</i> sp.		<i>Hyalopsallus diaphanus</i>	plant bug	Prem Kumar	NEW FLORIDA COUNTY RECORD
<i>Eriobotrya japonica</i>	loquat, Japanese plum	<i>Dryadula</i> sp. cf. <i>visaliella</i>	dryadulid moth	Connor Kuppe	NEW FLORIDA COUNTY RECORD
<i>Eriobotrya japonica</i>	loquat, Japanese plum	<i>Protalebrella conica</i>	leafhopper	Connor Kuppe	NEW FLORIDA COUNTY RECORD
<i>Eriobotrya japonica</i>	loquat, Japanese plum	<i>Trichadenotecnum quaesitum</i>	psocid	Connor Kuppe	NEW FLORIDA COUNTY RECORD
<i>Ficus microcarpa</i>	Cuban laurel; Indian laurel; laurel fig; Chinese banyan; laurel rubber	<i>Proboscidotylus nigrosquamis</i>	plant bug	Alexander Tasi	NEW FLORIDA COUNTY RECORD
<i>Ixora</i> sp.		<i>Asiothrix antidesmae</i>	ixora whitefly	Connie Ferre	NEW FLORIDA COUNTY RECORD
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Eric Dougherty, Noah Kolander	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts, Dyrana Russell	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts, Dyrana Russell	REGULATORY SIGNIFICANT
<i>Magnolia grandiflora</i>	southern magnolia	<i>Monopis longella</i>	nest moth	Connor Kuppe	NEW FLORIDA COUNTY RECORD
<i>Murraya koenigii</i>	curryleaf tree	<i>Sophonia orientalis</i>	two-spotted leafhopper	John McVay, Paul Skelley, Susan Halbert	NEW FLORIDA COUNTY RECORD
<i>Pennisetum</i> sp.		<i>Rhopalosiphum padi</i>	bird cherry oat aphid	Eric Dougherty, Ethan Kelly, Noah Kolander	NEW FLORIDA HOST RECORD
<i>Phaseolus vulgaris</i>	snapbean, stringbean, pole bean, foot-long bean	<i>Megalurothrips usitatus</i>	Asian bean thrips	Craig Frey	NEW FLORIDA COUNTY RECORD
<i>Physalis walteri</i>	Walter's groundcherry; stellate haired physalis	<i>Symmetrischema pallidochrella</i>	gelechiid moth	Elizabeth Golden, Jake Farnum	NEW FLORIDA STATE RECORD
<i>Pinus taeda</i>	loblolly pine	<i>Ips avulsus</i>	small southern pine engraver	Jeffrey Eickwort	NEW FLORIDA COUNTY RECORD
<i>Polygonum</i> sp.		<i>Ferrisia dasylii</i>	mealybug	Susan Halbert	NEW FLORIDA HOST RECORD
<i>Populus</i> sp.		<i>Pemphigus populitransversus</i>	root aphid	Paul Skelley, You Li	NOTABLE FIND



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Psidium guajava</i>	common guava; apple guava	<i>Atractotomus miniatus</i>	mirid bug	Robert Longtin	NEW FLORIDA COUNTY RECORD
<i>Psidium guajava</i>	common guava; apple guava	<i>Euxesta punctipennis</i>	picture-winged fly	Robert Longtin	NEW FLORIDA COUNTY RECORD
<i>Rosmarinus officinalis</i>	rosemary	<i>Eupteryx decemnotata</i>	Ligurian leafhopper	Alina Lorenzo, Michael Golub	REGULATORY SIGNIFICANT
<i>Rosmarinus officinalis</i>	rosemary	<i>Oxychilus</i> sp.	snail	Alina Lorenzo, Michael Golub	REGULATORY SIGNIFICANT
<i>Schinus terebinthifolia</i>	Brazilian pepper tree; Florida holly; Christmas berry	<i>Ocyptamus cubanus</i>	flower fly	James Pernsteiner	NEW FLORIDA COUNTY RECORD
<i>Vigna luteola</i>	hairypod cowpea	<i>Frankliniella insularis</i>	blossom thrips	Craig Frey	NEW FLORIDA COUNTY RECORD
		<i>Acantholomidea porosa</i>	shield bug	Jay Martin	NEW FLORIDA COUNTY RECORD
		<i>Arorathrips mexicanus</i>	grass thrips	Scott Weihman	NEW FLORIDA COUNTY RECORD
		<i>Atractotomus miniatus</i>	mirid bug	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		<i>Camponotus variegatus</i>	carpenter ant	Lisa Charlton	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Greg Dunn	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Joe MacKenzie	NEW FLORIDA COUNTY RECORD
		<i>Dieuches armatipes</i>	African seed bug	homeowner	NEW FLORIDA COUNTY RECORD
		<i>Gymnandrosoma desotatum</i>	mangrove seed borer	Scott Weihman	NEW FLORIDA COUNTY RECORD
		<i>Halyomorpha halys</i>	brown marmorated stink bug	Craig Frey	NEW FLORIDA COUNTY RECORD
		<i>Halyomorpha halys</i>	brown marmorated stink bug	Craig Frey	NEW FLORIDA COUNTY RECORD
		<i>Ips avulsus</i>	small southern pine engraver	Colin Bogert	NEW FLORIDA COUNTY RECORD
		<i>Ips avulsus</i>	small southern pine engraver	Michael Klassen	NEW FLORIDA COUNTY RECORD
		<i>Ips avulsus</i>	small southern pine engraver	Jordan Warmke-Robitaille	NEW FLORIDA COUNTY RECORD
		<i>Ips avulsus</i>	small southern pine engraver	Thomas Moss	NEW FLORIDA COUNTY RECORD
		<i>Ips calligraphus</i>	sixspined ips	Jordan Warmke-Robitaille	NEW FLORIDA COUNTY RECORD
		<i>Ips calligraphus</i>	sixspined ips	Colin Bogert	NEW FLORIDA COUNTY RECORD
		<i>Ips calligraphus</i>	sixspined ips	Michael Klassen	NEW FLORIDA COUNTY RECORD
		<i>Ips calligraphus</i>	sixspined ips	Jordan Warmke-Robitaille	NEW FLORIDA COUNTY RECORD
		<i>Ips calligraphus</i>	sixspined ips	Thomas Moss	NEW FLORIDA COUNTY RECORD
		<i>Ips grandicollis</i>	eastern fivespined ips	Jordan Warmke-Robitaille	NEW FLORIDA COUNTY RECORD
		<i>Ips grandicollis</i>	eastern fivespined ips	Colin Bogert	NEW FLORIDA COUNTY RECORD
		<i>Ips grandicollis</i>	eastern fivespined ips	Michael Klassen	NEW FLORIDA COUNTY RECORD
		<i>Ips grandicollis</i>	eastern fivespined ips	Jordan Warmke-Robitaille	NEW FLORIDA COUNTY RECORD
		<i>Ips grandicollis</i>	eastern fivespined ips	Thomas Moss	NEW FLORIDA COUNTY RECORD
		<i>Megamelus scutellaris</i>	water hyacinth planthopper	James Bouie, Joseph Hanus	NEW FLORIDA COUNTY RECORD
		<i>Micrapate cristicauda</i>	bostrichid beetle	Janie Echols, Robert Leahy	NEW FLORIDA COUNTY RECORD
		<i>MitrapSYlla cubana</i>	psyllid	Scott Weihman	NEW FLORIDA COUNTY RECORD
		<i>MitrapSYlla cubana</i>	psyllid	Alexander Tasi	NEW FLORIDA COUNTY RECORD



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
		<i>Nesidiocoris tenuis</i>	tomato bug	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		<i>Scirtothrips citri</i>	thrips	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		<i>Sereda tautana</i>	speckled sereda	MonaLisa Payne	NEW FLORIDA COUNTY RECORD
		<i>Siskiwitia</i> n.sp.	cosmopterigid moth	Jake Farnum	NEW FLORIDA COUNTY RECORD
		<i>Sminthurus butcheri</i>	springtail	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		<i>Spodoptera androgea</i>	Androgea armyworm moth	Max Carfagno, Scott Weihman	NEW FLORIDA COUNTY RECORD
		<i>Telamona subfalcata</i>	treehopper	Alexander Tasi	NEW FLORIDA COUNTY RECORD
		<i>Thiotricha</i> n. sp.	gelechiid moth	Lilliam Otero Pujol	NEW TO SCIENCE RECORD
		<i>Trichosiphonaphis polygonifoliae</i>	aphid	Robert Leahy	NEW HEMISPHERE RECORD
		<i>Trypodendron scabricollis</i>	ambrosia beetle	Brian Alford	NEW FLORIDA COUNTY RECORD
		<i>Xyleborinus octiesdentatus</i>	ambrosia beetle	Janie Echols, Robert Leahy	NEW FLORIDA COUNTY RECORD
		<i>Xylosandrus germanus</i>	scolytid beetle	Colin Bogert	NEW FLORIDA COUNTY RECORD



NEMATOTOLOGY

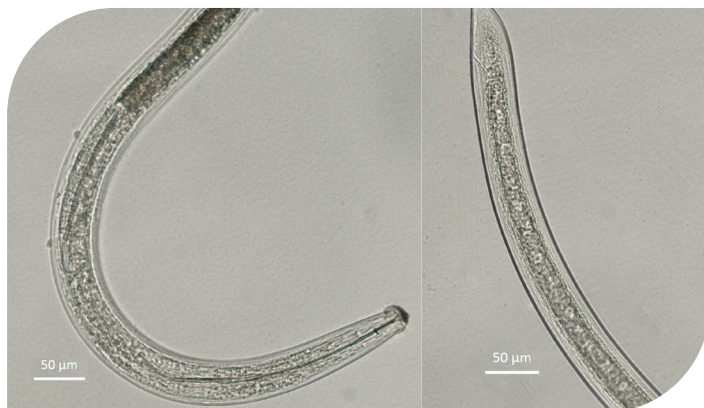
Compiled by Renato N. Inserra, Ph.D., Janete A. Brito, Ph.D., Silvia Vau, Ph.D. and Brian Alford, B.S.

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	2021 - YEAR TO DATE
Morphological Identifications	3,365	3,365
Molecular Identifications *	231	231
Total Identifications	3,596	3,596

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



1 - Photomicrographs of *Longidorus americanus*, a needle nematode, from Florida. Female anterior (left) and posterior (right) body. Photo by Silvia Vau and Renato N. Inserra, FDACS-DPI

Nematode of Special Interest

1 The needle nematode, *Longidorus americanus* Handoo, Carta, Skantar, Ye, Robbins, Subbotin, Fraedrich & Cram, 2005, was found associated with slash pine (*Pinus elliotii* Engelm.) and water oak (*Quercus nigra* L.), a new state record, in Gainesville, Florida (Alachua County; N19-00494; Brian Alford; May 2019).

A nematode survey was conducted in 2019 in a north-central Florida hardwood forest to obtain needle nematodes associated with oak trees, such as laurel oak (*Q. hemispherica* Willd.), live oak (*Q. virginiana* Mill.) and water oak (*Q. nigra*). The populations of needle nematodes found in the rhizosphere of these oaks were identified as *Longidorus longicaudatus* Siddiqi, 1961, a species reported on oak and other trees in Florida and the southeastern United States (Siddiqi, 1962; Esser, 1990). In a suburban Gainesville site where water oaks were mixed with slash pines, a few specimens of another needle nematode were associated with *L. longicaudatus*. Results of morphological and molecular analyses indicated that these specimens were representatives of the species *L. americanus*, a parasite of loblolly pine (*Pinus taeda* L.) in Georgia (Handoo et al. 2005; Fraedrich et al. 2005). The morphological and molecular (D2-D3 of 28S rRNA gene sequences) characters of the Florida specimens were like those from Georgia (Inserra et al., 2021), confirming that *L. americanus* occurs outside Georgia. However, the number of *L. americanus* detected

at the Florida site was very small, suggesting that this nematode was not feeding on oak roots. A few segments of slash pine (*Pinus elliotii* Engelm.) roots were found in the bulk of oak roots indicating that the few specimens of *L. americanus* might feed on them.

REFERENCES

- Esser, R.P. (1990). Nematode detection of special interest. *Triology*, Technical report 29 (9): 1-3. Gainesville, Florida, USA, Bureau of Nematology, Florida Department of Agriculture and Consumer Services.
- Fraedrich, S.W., Cram, M.M. and Zarnoch, S.J. (2005). The effect of fallow on *Longidorus americanus*, a nematode associated with stunting of loblolly pine seedlings in Georgia, USA. *Nematology* 7: 487-493.
- Handoo, Z.A., Carta, L.K., Skantar, A.M., Ye, W., Robbins, R.T., Subbotin, S.A., Fraedrich, S.W. and Cram, M.M. (2005). Morphological and molecular characterization of *Longidorus americanum* n. sp. (Nematoda; Longidoridae), a needle nematode parasitizing pine in Georgia. *Journal of Nematology* 37: 94-104.



Inserra, R.N., Troccoli, A., Vau, S. and Subbotin, S.A. (2021). Morphological and molecular characterization of populations of *Longidorus longicaudatus* Siddiqi, 1962 and *L. americanus* Handoo, Carta, Skantar, Ye, Robbins, Subbotin, Fraedrich and Cram, 2005 from Florida, USA. *Nematology* 23 (In press).

Siddiqi, M.R. (1962). Studies on the genus *Longidorus* Micoletzky 1922 (Nematoda: Dorylaimoidea) with description of three new species. *Proceedings of the Helminthological Society of Washington* 29: 177-188.

COLLECTORS

Collectors submitting five or more samples processed for nematological analysis during January-March 2021.

COLLECTOR NAME	SAMPLES PROCESSED
Alford, Brian	15
Anderson, James	10
Bartlett, Abby	22
Bentley, Michael	20
Blanco, Rogelio	233
Blaney, Richard	26
Brown, Lance	18
Burgos, Frank	197
Carbon, Peter	11
Clanton, Keith	71
Cutts, Logan	9
Desmarais, Sarah	38
Echols, Janie	14
Golden, Walter	17
Gonzalez, Kathy	10
Jenner, Stephen	10
Kelly, Ethan	10
Krueger, Scott	19
Landress, Craig	5
Lara, Milton	9
Laurint, Mark	8
Llanos, Jose	25
Marquez, Nora	59
Nolen, Ashley	21
Rojas, Eric	221
Smith, Lane	23
Spriggs, Charles	91
Steinkamp, Katherine	35
Warden, George	11
Youngblood, Susan	10

SAMPLES FOR MORPHOLOGICAL ANALYSIS

	JANUARY - MARCH	2021 - YEAR TO DATE
Multistate Certification for National and International Export	1,907	1,907
California Certification	444	444
Pre-movement (Citrus Nursery Certification)	78	78
Site or Pit Approval (Citrus Nursery and Other Certifications)	7	7

OTHER PURPOSES

	JANUARY - MARCH	2021 - YEAR TO DATE
Identifications (Other Organisms)	0	0
Nematology Investigation	0	0
Plant Problems	23	23
Intrastate Survey, Random	219	219
Total	242	242

SAMPLES FOR MOLECULAR ANALYSIS

	JANUARY - MARCH	2021 - YEAR TO DATE
Regulatory Purposes	231	231
Other Purposes	0	0
Identifications	0	0
Surveys	0	0
Total	231	231





PLANT PATHOLOGY

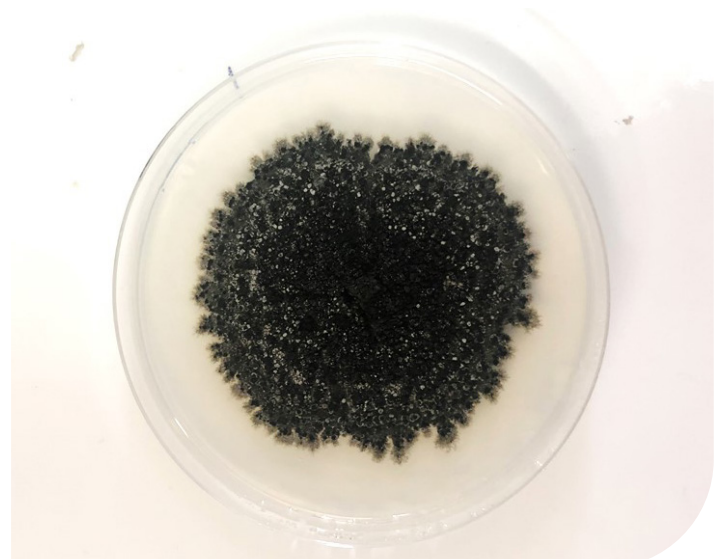
Compiled by Hector Urbina, Ph. D.; Jodi L. Hansen, M.S.; Taylor E. Smith, B.S.;
Kishore Dey, Ph.D.; Callie M. Jones, and Maria C. Velez Climent, M.S.

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 *Phyllosticta capitalensis* Henn. (fruit spot)
(Phyllostictaceae, Botryosphaerales, Ascomycota), was submitted on kumquat, *Citrus japonica* Thunb. (Rutaceae) (syn. *Fortunella japonica* (Thunb.) Swingle), **a new host record**, collected at a residential property. The genus *Phyllosticta* is comprised of several citrus pathogens and endophytes, including the pathogen *P. citricarpa*, the causal agent of citrus black spot (CBS). CBS is present in the following citrus-producing counties in Florida: Charlotte, Glades, Hendry, Lee and Polk. Counties positive for CBS are currently under quarantine and unable to export fruit to the European Union (EU), among other phytosanitary restrictions. Symptoms of the disease caused by *P. capitalensis* (formerly known as *Guignardia mangiferae*) are characterized by black spots on the peel of kumquat secondary to injuries caused by other agents (e.g., hail or birds). After several collections and incubations in moist chambers of symptomatic fruit, spore-producing reproductive structures (known as pycnidia) were not detected. Pycnidia and spores were abundant when the fungus was grown in pure culture on artificial media. *Phyllosticta capitalensis* has been reported as a pathogen on the Rutaceae genera *Citrus*, *Naringi* and *Zanthoxylum* in several countries, especially on sweet orange (*Citrus sinensis*) and grapefruit (*Citrus x paradisi*). (Sarasota County, 2020-105774; Prem Kumar; 27 October 2020).



1a - *Phyllosticta capitalensis* fruit spots on *Citrus japonica* (*Fortunella japonica*).
Photo by Hector Urbina, FDACS-DPI



1b - *Phyllosticta capitalensis* three-month-old culture with pycnidia (greyish structures) on potato dextrose agar.
Photo by Hector Urbina, FDACS-DPI



🔍 PLANT PATHOLOGY IDENTIFICATION TABLE

The following table provides information about samples identified between January-March 2021. 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>Alcea rosea</i>	hollyhock	<i>Begomovirus Sida golden mottle virus</i>	Sida golden mottle virus	residential	106061	Sarasota	Doug Restom Gaskill	12/15/2020	host
<i>Calamagrostis</i> sp.	reedgrass	<i>Puccinia coronata</i>	rust fungus	nursery	106694	Escambia	Eric Dougherty, Noah Kolander	3/5/2021	host
<i>Carica papaya</i>	papaya	<i>Nucleorhabdovirus Papaya Nucleorhabdovirus-1</i>	Papaya Nucleorhabdovirus-1	agricultural site	106365	Lee	Doug Restom Gaskill	1/28/2021	county
<i>Persea americana</i>	avocado	<i>Avsunviroid Avocado sunblotch viroid</i>	Avocado sunblotch viroid	residential	106672	Manatee	Juan Amador	3/2/2021	county
<i>Selenicereus undatus</i>	nightblooming cactus; pitaya	<i>Potexvirus Schlumbergera virus x</i>	Schlumbergera virus X	nursery	105792	Collier	Scott Krueger	11/5/2020	host
<i>Selenicereus undatus</i>	nightblooming cactus; pitaya	<i>Potexvirus Opuntia virus X</i>	Opuntia virus X	nursery	105792	Collier	Scott Krueger	11/5/2020	host
<i>Teramnus labialis</i>	blue wiss	<i>Begomovirus Cabbage leaf curl virus</i>	Cabbage leaf curl virus	agricultural site	106474	Monroe	Lilliam Pujol	2/11/2021	host

QUARTERLY ACTIVITY REPORT

	JANUARY - MARCH	2021 - YEAR TO DATE
Budwood Samples	0	0
Citrus black spot	75	75
Citrus canker	32	32
Citrus greening / HLB	567	567
Honeybees	0	0
Interdictions	18	18
Laurel wilt	2	2
Pathology, General	323	323
Soil	14	14
Sudden oak death	0	0
Sweet orange scab-like disease	0	0
Texas Phoenix palm decline	6	6
Water	0	0
Miscellaneous	1	1





FROM THE EDITOR

By Patti J. Anderson

Inquiring minds want to know...why are botanists taking photos of herbarium specimens?

FDACS-DPI is participating in a project to make museum collections available online and accessible to scientists and the public around the world. Photographs of our plant specimens are housed with the SouthEast Regional Network of Expertise and Collections (SERNEC), a consortium of 233 herbaria in 14 southeastern states. Collectively, these herbaria have contributed over 5.1 million images of specimens (See <https://serneportal.org/portal/>.)

The project was originally funded in 2014 by the National Science Foundation, and FDACS-DPI benefited from the grant through a collaboration with the University of Florida (UF). At that time, UF proposed to assist several smaller herbaria in their efforts to digitize collections. FDACS-DPI contributed about 13,000 images using equipment and work-study students from the university. After the funded project was complete, our collection continued to grow. As of 2021, we have accessioned over 15,000 specimens, with collection dates ranging from 1939 to March of this year. To continue contributing to the consortium, the Botany section is borrowing equipment and space from the Entomology section for a very low-cost extension of the digitizing project. We are grateful to our co-workers for their generosity and support in making this ongoing work possible.

The images provide invaluable information for research not just in systematics, but also biodiversity, evolution and ecology. For example, the spread of invasive plant species can be followed through time and space using collection data from specimen labels. Changes in average dates of flowering and fruiting can also be calculated from data included in label information. Because of the large number of specimens made available online, big data projects will be able to use this resource for research on changes over time to the flora of the Southeast and develop better predictive models based on changes to biodiversity in the past.

REFERENCES

<https://bigdata.sc.edu/event/tales-from-the-botanical-crypt-how-digitized-herbarium-collections-can-provide-new-avenues-for-salient-research/> [accessed 2021 April 9]

Yost, J.M., Pearson, K.D., Alexander, J., Gilbert, E., Hains, L.A., *et al.* (2020). The California Phenology Collections Network: Using Digital Images to Investigate Phenological Change in a Biodiversity Hotspot *Madroño* 66: 130-141. California Botanical Society. URL: <https://doi.org/10.3120/0024-9637-66.4.130>



Camera and copy stand for digitizing specimens.
Photo by Patti Anderson, FDACS-DPI



Photo result of digitizing specimens.
Photo by Patti Anderson and Alex de la Paz, FDACS-DPI





TRI-LOGY

[FDACS.gov/TRI-LOGY](https://fdacs.gov/TRI-LOGY)

1-888-397-1517

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