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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



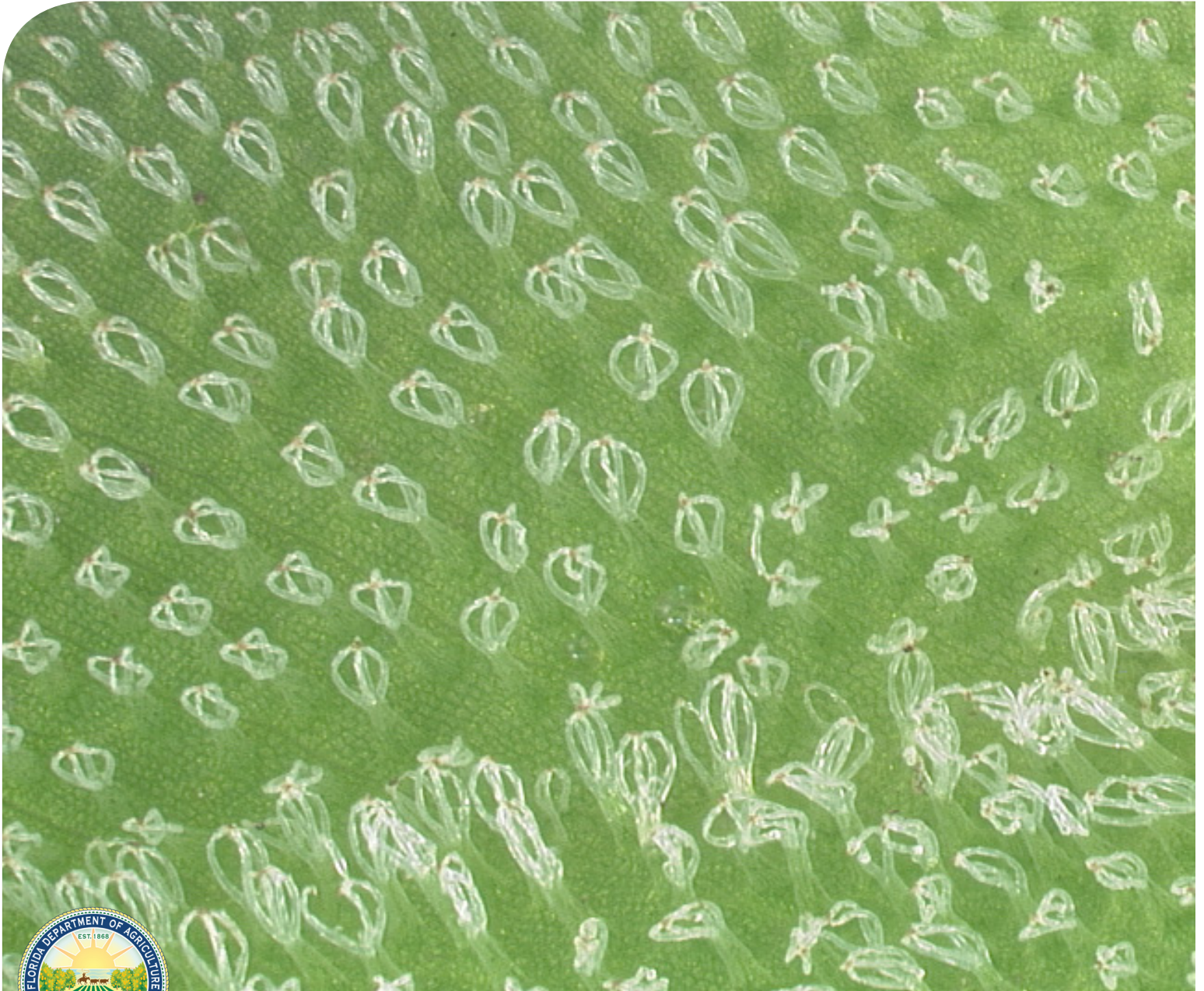
NEMATOLOGY

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



Phytophthora citrophthora empty sporangium after gamete discharge.
Photo by Hector Urbina, DPI.

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

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

Thank you,

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

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Cover Photo

Salvinia molesta (giant salvinia)
Photo by Patti Anderson, DPI



HIGHLIGHTS



1 *Lycium carolinianum* (Walter) Britton (Christmas berry, Carolina desertthorn), produces a bright red fruit that is usually ripe in December, hence the common name “Christmas berry.” Although some species in this family contain toxins, there are reports that the Christmas berry fruit is edible, and yet others claim the fruit causes vomiting. This species is closely related to the goji berry plant (*Solanum barbarum*), sold as a health food. Without doubt, this species is an excellent food for wildlife, including nectar-feeding insects and fruit-eating birds in winter as well as deer, raccoons and other wildlife, and makes a welcome addition to any coastal landscape.



1 - *Lycium carolinianum* (Christmas berry), flowers and fruit.
Photo by Roger Hammer, [Atlas of Florida Plants](#)

2 *Pentispa sallaei* (Baly), a leaf beetle, a new Continental USA record and new host record, found on *Malpighia emarginata*, Barbados cherry. This beetle seems to be common in Mexico but has not previously been recorded from the United States. It is not a pest in its native range, and there was no previously recorded host for this species.



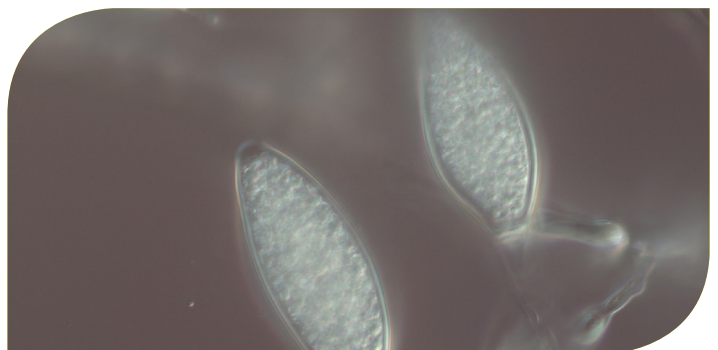
2 - *Pentispa sallaei* (Baly), a leaf beetle.
Photo by Kyle E. Schnepf, DPI

3 *Meloidogyne enterolobii* Yang and Eisenback, 1983 is a highly virulent pathogen of diverse economically important crops and nursery stock. Originally described from China, this species is now considered a threat to plant agriculture around the world, particularly because of its ability to overcome root-knot nematode resistance genes in many crops. A population of *M. enterolobii* was recently found infecting the roots of swiss chard (*Beta vulgaris*) in an organic garden in Alachua County.



3 - *Meloidogyne enterolobii* infected seedlings of *Psidium guajava* (guava).
Photo by Janete Brito, DPI

4 *Phytophthora citrophthora* (R.E. Sm. & E.H. Sm.) Leonian (*Phytophthora leaf spot*) new host record, was identified on *Rhododendron* plants grown in a nursery facility in Apopka, Florida, imported from Washington, D.C., originally submitted due to suspected infection by sudden oak death (SOD). *Phytophthora citrophthora* (Pythiales, Oomycetes) mimics symptoms of *P. ramorum* on *Rhododendron* plants, causing leaf tip scorching, dieback and defoliation.



4 - *Phytophthora citrophthora* mature sporangium with a single papilla.
Photo by Hector Urbina, DPI





BOTANY

Compiled by Patti J. Anderson, Ph.D.

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 14,000 plant specimens and 1,400 vials of seeds.

QUARTERLY ACTIVITY REPORT

	OCT - DEC	2019 - YEAR TO DATE
Samples Submitted by Other DPI Sections	1,393	6,403
Samples Submitted for Botanical Identification Only	193	1,023
Total Samples Submitted	1,586	7,426
Specimens Added to the Herbarium	241	709

Some of the samples submitted recently are described below.

1 *Lycium carolinianum* (Walter) Britton (Christmas berry, Carolina desertthorn), from a genus of about 90 species of often thorny shrubs from warm temperate regions, primarily the Americas, in the plant family Solanaceae. This species is a spiny, salt-tolerant, evergreen shrub to 3 m tall, found in coastal areas, including shell mounds and the edges of salt marshes and brackish swamps, from South Carolina to Florida and west to Texas and Mexico. In Florida, the shrub has been documented in most coastal counties from Bay County southward to Miami-Dade along the Gulf Coast and northward from Indian River to Duval County along the Atlantic. The sample submitted for identification this quarter is a new record for Flagler County. The clustered, fleshy, simple leaves of this species grow up to 2.5 cm in length, have entire margins and are linear to narrowly oblanceolate. The flowers, growing singly, have a calyx with four lobes and a blue to lavender (sometimes pale enough to appear white) corolla with four fused petals. The fruit is an ellipsoid berry that turns bright red when ripe, usually in December. Although some species in this family contain toxins, there are reports that the Christmas berry fruit is edible, and yet others claim the fruit causes vomiting. This species is closely related to the goji berry plant (*Solanum barbarum*), sold as a health food. Without doubt, this species is an excellent food for wildlife, including nectar-feeding insects and fruit-eating birds in winter as well as deer, raccoons and other wildlife, and makes a welcome addition to any coastal landscape. (Flagler County; B2019-908; Melanie Cain and Danielle Rigby; 24 October 2019.) (Godfrey



1 - *Lycium carolinianum* (Christmas berry), flowers and fruit.
Photo by Roger Hammer, [Atlas of Florida Plants](#)



2a - *Rhynchospora microcephala* (bunched beaksedge), achene.
Photo by Joshua Campbell, [Atlas of Florida Plants](#)

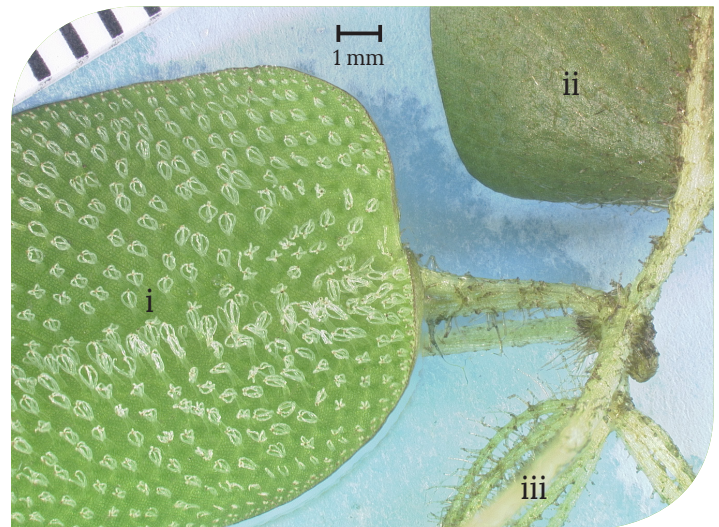


1988; Hammer 2004; Mabberley 2017; Wunderlin *et al.* 2019; <https://regionalconservation.org/beta/nfyn/plantdetail.asp?tx=Lycicar> [accessed 4 December 2019]; https://www.wildflower.org/plants/result.php?id_plant=lyca2 [accessed 2 December 2019].)

2 *Rhynchospora microcephala* (Britton) Britton ex Small (bunched beaksedge), from a genus of about 250 species, cosmopolitan in distribution, with the greatest diversity in tropical and sub-tropical regions, in the plant family Cyperaceae. *Rhynchospora microcephala* is native to Cuba and the East Coast of the United States from New Jersey, south to Florida and west to southern Mississippi, where it typically grows in mesic to wet pine flatwoods and savannas, ecotones in transition areas from sandhills to swamps or marshes, sandy shores of ponds and lakes and open roadsides, ditches and disturbed areas. In Florida, it is found nearly statewide, from the panhandle, down through the peninsula, and as far south as Collier County. It has never been collected from Miami-Dade or Monroe counties, but is known to occur south of Florida in Cuba. Plants are caespitose (forming dense tufts), perennial herbs ranging from 20-80 cm tall. The leaves are linear, averaging 1-3 mm wide. The inflorescence is composed of several widely spaced, globose to subhemispheric spikelet clusters averaging 0.5-1 cm wide. Each spikelet is one-fruited, with the achene (fruit) enclosed by several dark brown scales. The intricate microscopic details of the achene (most notably the achene body surface texture and perianth bristle number, type and length) are essential in the identification of most species of *Rhynchospora*. The achene body (excluding the tubercle (persistent style base) but including the well-defined stipe) is 1.3-1.6 mm long and 1 mm wide, lenticular, suborbicular and pale brown with a light center. The tubercle is subulate-attenuate (narrowly triangular, tapered), averaging 1 mm long. The six perianth bristles, which represent reduced or modified tepals, are retrorsely (directed downward) barbed, a character unique to this section of *Rhynchospora*. A common look-alike species, *Rhynchospora cephalantha*, differs primarily by having larger achenes (1.8-2.4 mm long and 1.5 mm wide) and larger spikelet clusters (1.5-5 cm wide). (Hillsborough County; B2019-1008; Lilliam Otero Pujol; 13 December 2019.) (Godfrey and Wooten 1981; Weakley 2015; Wunderlin and Hansen 2011; <http://florida.plantatlas.usf.edu/Plant.aspx?id=2952> [accessed 7 January 2020].) (Alexander de la Paz, DPI)



2b - *Rhynchospora microcephala* (bunched beaksedge), spikelet cluster (inflorescence).
Photo by Shirley Denton, [Atlas of Florida Plants](#)



3a - *Salvinia molesta* (giant salvinia), whorl of three leaves.
i. Floating leaf upper surface; ii. Floating leaf lower surface; iii. Submerged, root-like leaf
Photo by Patti Anderson, DPI



3b - *Salvinia molesta* (giant salvinia), leaves from a mature infestation.
Photo by Keith Bradley, [Atlas of Florida Plants](#)

3 *Salvinia molesta* (giant salvinia), from a genus of about 10 species of free-floating aquatic ferns from tropical and warm regions in the plant family Salviniaceae. *Salvinia molesta* is native to tropical and subtropical South America, but it has spread around the world in warm areas, including at least a few counties in each of the states in the southern rim of the United States from California to Virginia, except for New Mexico. Until this new county record, the species was known only from Escambia, Bay and Collier counties in Florida. This fern is not rooted, but floats in fresh water with an underwater rhizome (stem) holding whorls of three leaves at each node. Two of the leaves in the whorl are green, broadly ovate to oblong and float on the water surface. The third leaf remains underwater, has finely divided filament-like segments and is brown in color. This leaf resembles a cluster of roots more than a leaf on first sight.













The two green leaves in each whorl have distinctive hairs on the upper surface. These white trichomes are aligned in rows, with each tip divided into four branches that meet to form what has been described as an eggbeater, a kitchen whisk or an open-sided cage. Other species in this genus have leaves that may be covered with trichomes, but in those species, the hairs are not branched and then joined at the tips. These leaves are adapted to life in water, with the upper trichomes aiding in floatation and repelling water while the underwater leaf serves to stabilize the plant. The size and shape of this fern varies with the density of its population. Early in infestations when there are few plants, the upper leaves are flattened and small (10-15 mm across). As the infestation continues, the plants are crowded together until the leaves begin to fold along the midvein, grow up to 60 mm across and form mats so thick most leaves are no longer in direct contact with the water surface. The invading ferns spread vegetatively, rather than by spores, as the stem breaks apart, and buds are moved during flooding or when they are caught in boat propellers and other equipment. The plant has also spread when aquarium or pond ornamentals are discarded. Giant salvinia, a federal noxious weed, can clog waterways and damage native aquatic habitats. The sale of this aquatic plant is prohibited in Florida. (Marion County; B2019-993; Stephen Jenner; 27 November 2019.) (Dickinson and Royer 2014; Jacono *et al.* 2001; <https://www.fdacs.gov/Divisions-Offices/Plant-Industry/Bureaus-and-Services/Entomology-Nematology-Plant-Pathology/Botany/Noxious-Weeds/Salvinia-molesta> [accessed 24 January 2020]; (<http://www.iucngisd.org/gisd/species.php?sc=569> [accessed 24 January 2020]; <https://myfwc.com/wildlifehabitats/habitat/invasive-plants/weed-alerts/giant-salvinia/> [accessed 28 January 2020]; <https://plants.sc.egov.usda.gov/core/profile?symbol=SAMO5> [accessed 28 January 2020]; https://www.researchgate.net/publication/235125801_Salvinia_molesta_D_S_Mitchell_Giant_Salvinia_in_the_United_States_A_Review_of_Species_Ecology_and_Approaches_to_Management; [accessed 28 January 2020].)

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BOTANY IDENTIFICATION TABLE

The following table provides information about **new county** records submitted in the current volume's time period. 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.

NEW RECORD	COLLECTOR NAME	COUNTY	SAMPLE NUMBER	COLLECTION DATE	GENUS	SPECIES
	Jake M. Farnum	Monroe	B2019-873	10/16/2019	<i>Chamaesyce</i>	<i>lasiocarpa</i>
	James Wood	Marion	B2019-835	10/2/2019	<i>Firmiana</i>	<i>simplex</i>
	Kaitlyn Dietz, Lia Sansom, Zachary Frame	St. Johns	B2019-1009	12/17/2019	<i>Eugenia</i>	<i>axillaris</i>
	M. Janie Echols	Bradford	B2019-901	10/14/2019	<i>Dioscorea</i>	<i>bulbifera</i>
	Melanie Cain	Flagler	B2019-938	11/6/2019	<i>Crotalaria</i>	<i>spectabilis</i>
	Melanie Cain	St. Johns	B2019-890	10/18/2019	<i>Ipomoea</i>	<i>cordatotriloba</i>
	Melanie Cain, Danielle Rigby	Flagler	B2019-908	10/24/2019	<i>Lycium</i>	<i>carolinianum</i>
	Melanie Cain, Mark Laurint	St. Johns	B2019-1006	12/16/2019	<i>Ipomoea</i>	<i>indica</i>
	Nora V. Marquez	Lake	B2019-900	10/21/2019	<i>Euphorbia</i>	<i>heterophylla</i>
	Stephen Jenner	Marion	B2019-993	11/27/2019	<i>Salvinia</i>	<i>molesta</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

	OCT - DEC	2019 - YEAR TO DATE
Samples Submitted	1,490	6,902
Lots Identified	2,269	9,905
Specimens Identified	38,259	109,921



1 - *Neocalacarus mangiferae* Channabasavanna.
Photo by Samuel Bolton, DPI

1 *Neocalacarus mangiferae* Channabasavanna, an eriophyoid mite, a new Continental USA record. This mite, which originated in southern Asia, has spread into the Western Hemisphere through the trade of *Mangifera indica*, mango, its only known host. In addition to India, which is within its native host range, *Neocalacarus mangiferae* has also been recorded from Brazil and Puerto Rico. This mite causes no noticeable damage to its host. (Miami-Dade County; E2019-6316; Daniel Carrillo and Rita Duncan, both UF/ IFAS, Tropical Research and Education Center; 12 November 2019.) (Dr. Samuel Bolton.)



2 - *Pentispa sallaei* (Baly), a leaf beetle.
Photo by Kyle Schnepf, DPI

2 *Pentispa sallaei* (Baly), a leaf beetle, a new Continental USA record and new host record, found on *Malpighia emarginata*, Barbados cherry. This beetle seems to be common in Mexico but has not previously been recorded from the United States. It is not a pest in its native range, and there was no previously recorded host for this species. Adults were found feeding on leaves, and larvae caused moderate to severe damage by mining in leaves. (Broward County; E2019-6354; Pattanjaldal Bissoondial, USDA; 18 November 2019.) (Kyle Schnepf.)

3 *Aceria kuko* (Kishida), goji berry gall mite, a new Florida State record. This mite is a pest of goji berries, but there are also reports of this mite damaging sweet peppers. The mite causes small blisters on the leaves and damages young shoots of the plants, preventing flowers and fruits from forming. In recent years, goji berry mite has become invasive in Europe and North America through the spread of increasingly popular goji berry cultivation. The taxonomy of *Aceria* on *Lycium* needs revision, and it may be that many records of *Aceria kuko*, including the ones representing this new record, will be reassigned to *Aceria tjyingi* (Mason, 1973) or *A. kendalli* Baker, 1996. (Alachua County; E2019-5728; Robert Leahy, USDA/CAPS, and Jodi Hansen; 16 October 2019.) (Dr. Samuel Bolton.)



4 *Palpita freemanalis* Monroe, a crambid moth, a new Florida State record. *Palpita freemanalis* is native to the southeastern United States, and this find extends its range into Florida. It is the eighth species of *Palpita* Hübner recorded with certainty in the state. This species has two color variants: a gray-mottled spring form, which is hard to differentiate from related species without dissection, and a distinctive orange summer form (Munroe 1952). As far as is known, the larvae of most species of *Palpita* feed on foliage of species in the Oleaceae, such as olive, privet and ash. The host plants of *P. freemanalis* are unknown but presumably are in the same family. The Florida State Collection of Arthropods also has specimens of *P. freemanalis* from Levy County (Goethe State Forest) and Liberty County (Torreya State Park) that were not previously identified. (Alachua County; E2019-6606; James Hayden; 22 April 2017.) (Dr. James Hayden.)

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3 - Galls of *Aceria kuko* (Kishida).
Photo by Samuel Bolton, DPI



4 - *Palpita freemanalis*, a crambid moth.
Photo by James Hayden, 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>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Abby Bartlett	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Abby Bartlett	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	John Piontek	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Catherine White, Dyra Russell, Logan Cutts, Milton Lara	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Danielle Rigby, Melanie Cain, Karen Coffey	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Danielle Rigby, Melanie Cain, Karen Coffey	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	LeAnn West, Morgan Bruhn	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	LeAnn West, Morgan Bruhn	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Laura Ureta	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Melanie Cain	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	LeAnn West, Morgan Bruhn	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	LeAnn West	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Carlos Averhoff-Chirino, Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Justin Anto	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Carlos Averhoff-Chirino, Jeanie Frechette	REGULATORY SIGNIFICANT
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PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Abies fraseri</i>	Fraser's fir, southern balsam fir	<i>Fiorinia externa</i>	armored scale	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Acer palmatum</i>	Japanese maple	<i>Periphyllus californiensis</i>	maple aphid	Catherine White, Logan Cutts	REGULATORY SIGNIFICANT
<i>Acer palmatum</i>	Japanese maple	<i>Periphyllus</i> sp.	aphid	Lisa Tyler, Mark Laurint	REGULATORY SIGNIFICANT
<i>Cannabis sativa</i>	hemp	<i>Phenacoccus madeirensis</i>	mealybug	Anthony Puppelo, Jimmy Hernandez	NEW FLORIDA HOST RECORD
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Sam Hart	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Logan Cutts	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Catherine White	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Laura Ureta	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Catherine White, Dyrana Russell, Logan Cutts, Milton Lara	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Jeanie Frechette	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Laura Ureta	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Justin Anto	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Logan Cutts	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Capsicum annuum</i>	pepper	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Cinnamomum camphora</i>	camphortree	<i>Fiorinia proboscidea</i>	armored scale	Region 1 inspectors, Alex De La Paz, Darci Hames, Hector Urbina, Taylor Smith	NEW FLORIDA HOST RECORD
<i>Citrus limon</i>	lemon	<i>Euglossa dilemma</i>	green orchid bee	Miryam Briceno	NEW FLORIDA COUNTY RECORD
<i>Citrus sinensis</i>	sweet orange, navel orange	<i>Euxesta costalis</i>	picture-winged fly	David Brown	NEW FLORIDA COUNTY RECORD
<i>Citrus sinensis</i>	sweet orange, navel orange	<i>Marmara gulosa</i>	western citrus peel miner	Catherine White, Dyrana Russell	REGULATORY SIGNIFICANT
<i>Citrus sinensis</i>	sweet orange, navel orange	<i>Proba distanti</i>	plant bug	Diane McColl	NEW FLORIDA COUNTY RECORD
<i>Crataegus michauxii</i>		<i>Aphis eugeniae</i>	aphid	Lisa Tyler	NEW FLORIDA HOST RECORD
<i>Crotalaria juncea</i>	sun hemp	<i>Spissistilus festinus</i>	three-cornered alfalfhopper	Mary Sellers	NEW FLORIDA HOST RECORD
<i>Dichanthelium</i> sp.		<i>Antonina graminis</i>	rhodes grass mealybug	Eileen Buss	NEW FLORIDA HOST RECORD
<i>Dracaena deremensis</i>	dracaena	<i>Eleutherodactylus coqui</i>	common coqui	Logan Cutts	REGULATORY SIGNIFICANT
<i>Echeveria</i> sp.		<i>Vryburgia trionymoides</i>	mealybug	Lisa Tyler, Mark Laurint	REGULATORY SIGNIFICANT
<i>Echinodorus</i> sp.		<i>Harmalia anacharsis</i>	delphacid planthopper	Melanie Cain	REGULATORY SIGNIFICANT
<i>Echinodorus</i> sp.		<i>Harmalia anacharsis</i>	delphacid planthopper	Lisa Tyler, Mark Laurint	REGULATORY SIGNIFICANT
<i>Echinodorus</i> sp.		<i>Harmalia anacharsis</i>	delphacid planthopper	Sam Hart	REGULATORY SIGNIFICANT
<i>Echinodorus</i> sp.		<i>Harmalia anacharsis</i>	delphacid planthopper	Melanie Cain	REGULATORY SIGNIFICANT
<i>Eriobotrya japonica</i>	loquat, Japanese plum	<i>Leucophenga varia</i>	vinegar fly	David Brown	NEW FLORIDA COUNTY RECORD
<i>Eucalyptus</i> sp.		<i>Thaumastocoris peregrinus</i>	bronze bug	Michael Golub, Nichole Bushue, Phellicia Perez	REGULATORY SIGNIFICANT
<i>Eugenia uniflora</i>	Surinam cherry; Cayenne cherry	<i>Pseudocaecilius tahitiensis</i>	psocid	Dawn Cermak	NEW FLORIDA COUNTY RECORD
<i>Eupatorium compositifolium</i>	dogfennel; yankeeweed	<i>Cedusa carolinensis</i>	derbid planthopper	Training Class 91, Nichole Bushue	NEW FLORIDA COUNTY RECORD
<i>Eupatorium compositifolium</i>	dogfennel; yankeeweed	<i>Xyonyssius californicus</i>	seed bug	Training Class 91, Nichole Bushue	NEW FLORIDA COUNTY RECORD
<i>Fragaria x ananassa</i>	garden strawberry	<i>Chaetosiphon fragaefolii</i>	strawberry aphid	Logan Cutts	REGULATORY SIGNIFICANT



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Fragaria x ananassa</i>	garden strawberry	<i>Lygus elisus</i>	pale legume bug	Gustavo Sanchez	REGULATORY SIGNIFICANT
<i>Fragaria x ananassa</i>	garden strawberry	<i>Lygus hesperus</i>	western lygus bug	Catherine White, Logan Cutts	REGULATORY SIGNIFICANT
<i>Fragaria x ananassa</i>	garden strawberry	<i>Lygus hesperus</i>	western lygus bug	Catherine White	REGULATORY SIGNIFICANT
<i>Helianthus annuus</i>	sunflower	<i>Rhinacloa forticornis</i>	western plant bug	Michael Golub, Nichole Bushue, Phelicia Perez	REGULATORY SIGNIFICANT
<i>Indigofera hirsuta</i>	hairy indigo	<i>Metephestia simplicula</i>	pyralid moth	Training Class 91, Anna Gourlay, James Hayden, Larry (Mo) Violet, Stephen Jenner	NEW FLORIDA COUNTY RECORD
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Acyrtosiphon lactucaae</i>	lettuce aphid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Acyrtosiphon lactucaae</i>	lettuce aphid	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Catherine White, Logan Cutts	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera cockerelli</i>	potato psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Bactericera maculipennis</i>	psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Ceratagallia californica</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Ceratagallia californica</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Ceratagallia</i> sp.	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Delphacodes consimilis</i>	delphacid planthopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Catherine White, Dyra Russell, Logan Cutts, Milton Lara	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Deltocephalus fuscinosus</i>	leafhopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Catherine White, Dyra Russell, Logan Cutts, Milton Lara	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Sara White, Tavia Gordon	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Catherine White	REGULATORY SIGNIFICANT



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Lygus elisus</i>	pale legume bug	Antonio De Moraes	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Lygus elisus</i>	pale legume bug	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Lygus hesperus</i>	western lygus bug	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Antonio De Moraes	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Nothodelphax consimilis</i>	delphacid planthopper	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Pronotacantha annulata</i>	stilt bug	Catherine White	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Trioza bakeri</i>	psyllid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Lactuca sativa</i>	lettuce, romaine lettuce, leaf lettuce	<i>Wahlgreniella</i> sp.	aphid	Antonio De Moraes, Eric Dougherty	REGULATORY SIGNIFICANT
<i>Litchi chinensis</i>	litchi, leechee	<i>Thysanoforinia leei</i>	leei litchi scale	LeAnn West	NEW FLORIDA COUNTY RECORD, QUARANTINABLE PEST
<i>Litchi chinensis</i>	litchi, leechee	<i>Thysanoforinia leei</i>	leei litchi scale	Jennifer Serviss	NEW FLORIDA COUNTY RECORD, QUARANTINABLE PEST
<i>Litchi chinensis</i>	litchi, leechee	<i>Thysanoforinia leei</i>	leei litchi scale	Elizabeth Hoganson	NEW FLORIDA COUNTY RECORD, QUARANTINABLE PEST
<i>Ludwigia peruviana</i>	Peruvian primrose-willow	<i>Desmia ploralis</i>	mournful desmimoth	James Hayden	NEW FLORIDA COUNTY RECORD
<i>Lycium barbarum</i>	matrimonyvine	<i>Aceria kuko</i>	goji berry gall mite	Jodi Hansen, Robert Leahy	NEW FLORIDA STATE RECORD, QUARANTINABLE PEST
<i>Macroptilium atropurpureum</i>	purple bushbean	<i>Alydus pilosulus</i>	broadheaded bug	Alexander Tasi	NEW FLORIDA HOST RECORD
<i>Malpighia emarginata</i>	Barbados cherry, acerola	<i>Pentispa sallaei</i>	leaf beetle	Pattanjalidal Bissoondial	NEW USA CONTINENTAL RECORD
<i>Mangifera indica</i>	mango	<i>Hermetia sexmaculata</i>	soldier fly	Denise Zywica	NEW FLORIDA COUNTY RECORD
<i>Mangifera indica</i>	mango	<i>Neocalacarus mangiferae</i>	eriophyoid mite	Rita Duncan	NEW USA CONTINENTAL RECORD
<i>Momordica charantia</i>	balsam-pear; balsampear; cundeamor; bitter melon; papailla	<i>Diaphania indica</i>	exotic pumpkin caterpillar	Alexander Tasi	NEW FLORIDA HOST RECORD
<i>Ocotea coriacea</i>	lancewood	<i>Aleuroplatus vinsonioides</i>	whitefly	Jake Farnum	NEW FLORIDA COUNTY RECORD
<i>Picea glauca</i>	Alberta spruce	<i>Ceratagallia humilis</i> (complex)	leafhopper	Catherine White, Logan Cutts	REGULATORY SIGNIFICANT
<i>Pinus strobus</i>	eastern white pine	<i>Chionaspis pinifoliae</i>	pine needle scale	Lisa Tyler	REGULATORY SIGNIFICANT
<i>Pinus strobus</i>	eastern white pine	<i>Chionaspis pinifoliae</i>	pine needle scale	Lisa Tyler	REGULATORY SIGNIFICANT
<i>Pinus strobus</i>	eastern white pine	<i>Chionaspis pinifoliae</i>	pine needle scale	Justin Anto	REGULATORY SIGNIFICANT
<i>Portulaca oleracea</i>	purslane, little hogweed	<i>Empoasca</i> sp. nr. <i>eccla</i>	leafhopper	Logan Cutts	REGULATORY SIGNIFICANT
<i>Pseudotsuga menziesii</i>	Douglas fir	<i>Ceratagallia californica</i>	leafhopper	Logan Cutts	REGULATORY SIGNIFICANT
<i>Psidium cattleianum</i>	cattley guava; strawberry guava	<i>Asiomorpha coarctata</i>	tropical milliped	Thomas Wilson	NEW FLORIDA COUNTY RECORD
<i>Quercus</i> sp.	oak	<i>Eratoneura lunata</i>	leafhopper	Diane McColl	NEW FLORIDA COUNTY RECORD
<i>Quercus</i> sp.	oak	<i>Myopsocus antillarum</i>	psocid	Cecilia Carrero-Turnbull	NEW FLORIDA COUNTY RECORD



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Quercus virginiana</i>	live oak	<i>Tetranychus propetes</i>	spider mite	Brian Alford, Kelly Douglas, Sam Hart	QUARANTINABLE PEST
<i>Rosmarinus officinalis</i>	rosemary	<i>Eupteryx decemnotata</i>	ligurian leaf hopper	homeowner	REGULATORY SIGNIFICANT
<i>Schinus molle</i>	Peruvian peppertree; pirul; pirul tree	<i>Calophya schini</i>	jumping plant louse	Alina Lorenzo, Nichole Bushue	REGULATORY SIGNIFICANT
<i>Schinus molle</i>	Peruvian peppertree; pirul; pirul tree	<i>Calophya schini</i>	jumping plant louse	Alina Lorenzo, Gregg Farina, Karen Holton, Michael Golub, Nichole Bushue	REGULATORY SIGNIFICANT
<i>Schinus terebinthifolia</i>	Brazilian pepper tree; Florida holly; Christmas berry	<i>Paectes fuscescens</i>	elf moth	Alexander Tasi	NEW FLORIDA COUNTY RECORD
<i>Senna ligustrina</i>	privet wild sensitive plant	<i>Mitrapysylla albalineata</i>	psyllid	Jennifer Serviss	NEW FLORIDA COUNTY RECORD
<i>Spinacia oleracea</i>	spinach	<i>Liriomyza langei</i>	California pea leafminer	Logan Cutts	REGULATORY SIGNIFICANT
<i>Vaccinium</i> sp.		<i>Largus cinctus</i>	largid bug	Abby Bartlett, Mary Sellers	REGULATORY SIGNIFICANT
		<i>Acizzia</i> sp.	psyllid	Kenneth Branch, Robinson Lawrence	NEW FLORIDA COUNTY RECORD
		<i>Amphiareus obscuriceps</i>	minute pirate bug	Monica Triana	NEW FLORIDA COUNTY RECORD
		<i>Chlorotettix capensis</i>	leafhopper	Training Class 91, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Cistalia signoreti</i>	seed bug	Monica Triana	NEW FLORIDA COUNTY RECORD
		<i>Dioxya thomae</i>	fruit fly	Training Class 91, Anna Gourlay, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Euaresta bella</i>	fruit fly	Training Class 91, Anna Gourlay, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Eustictus mundus</i>	mirid bug	Training Class 91, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Fulvius brevicornis</i>	mirid plant bug	Mary Graham	NEW FLORIDA COUNTY RECORD
		<i>Gonopromiris mirificus</i>	plant bug	Kenneth Branch, Robinson Lawrence	NEW FLORIDA COUNTY RECORD
		<i>Graminella nigripennis</i>	leafhopper	Training Class 91, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Holcocranum saturejae</i>	cattail seed bug	Monica Triana	NEW FLORIDA COUNTY RECORD
		<i>Maruca vitrata</i>	bepod borer moth	Laura Gaudette	NEW FLORIDA COUNTY RECORD, QUARANTINABLE PEST
		<i>Meristopsis melanostepos</i>	delphacid planthopper	Julien Beuzelin	NEW FLORIDA COUNTY RECORD
		<i>Micronecta ludibunda</i>	water boatman	Julien Beuzelin	NEW FLORIDA COUNTY RECORD
		<i>Ochrimnus lineoloides</i>	seed bug	Training Class 91, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD
		<i>Palpada pusilla</i>	flower fly	Oscar Orta	NEW FLORIDA COUNTY RECORD
		<i>Palpita freemanalis</i>	crambid moth	James Hayden	NEW FLORIDA STATE RECORD
		<i>Paranoplium gracile</i>	longhorn beetle	Pest control operator	REGULATORY INCIDENT
		<i>Parthenicus psalliodes</i>	mirid plant bug	Training Class 91, Anna Gourlay, James Hayden, Larry (Mo) Violett, Elijah Talamas, Jade Allen, Susan Halbert	NEW FLORIDA COUNTY RECORD





NEMATOTOLOGY

Compiled by Janete A. Brito, Ph.D., and Sai Qiu, M.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

	OCT - DEC	2019 - YEAR TO DATE
Morphological Identifications	2,933	14,555
Molecular Identifications *	306	1,427
Total Identifications	3,239	15,982

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

Nematode of Special Interest

1 *Meloidogyne enterolobii* Yang and Eisenback, 1983, was detected on swiss chard (*Beta vulgaris*) roots. (Alachua County; N19-00308; Julieta Brambila; 18 March 2019).

Meloidogyne enterolobii Yang and Eisenback, 1983

(= *Meloidogyne mayaguensis* Rammah and Hirschmann, 1988) (Karssen *et al.* 2012) is a highly virulent pathogen of diverse economically important crops and nursery stock (Brito *et al.* 2008, 2010; Carneiro *et al.* 2001; Kiewnick *et al.* 2008; Onkendi and Moleleki 2013). Originally described from China (Yang and Eisenback 1983), the species is now considered a threat to plant agriculture around the world, particularly because of its ability to overcome root-knot nematode resistance genes in many crops (Brito *et al.* 2007; Carneiro *et al.* 2006; Cetintas *et al.* 2008; Fargette *et al.* 1996; Kiewnick *et al.* 2009). In 2008, *M. enterolobii* was placed on the European and Mediterranean Plant Protection Organization (EPPO) alert list for its potential to become a quarantine pathogen (Anonymous 2008). This nematode species is particularly threatening to the sweet potato, cotton, soybean and ornamental industries in the southern United States (Brito *et al.* 2002; Rutter *et al.* 2019; Ye *et al.* 2013). The first record of *M. enterolobii* in the continental United States came from Florida in 2001 (Brito *et al.* 2002), with further data confirming the discovery in 2004 (Brito *et al.* 2004).

In March 2019, a population of *M. enterolobii* was found infecting the roots of swiss chard (*Beta vulgaris*) in an organic garden in Alachua County. Additionally, this nematode species has been found infecting other vegetables, ornamental



1a -*Meloidogyne enterolobii* galls on *Clerodendrum ugandense* (Uganda glorybower) roots.
Photo by Janete Brito, DPI



1b -*Meloidogyne enterolobii* galls on *Petunia* sp. 'Tidal Wave Silver' roots.
Photo by Janete Brito, DPI



1c -*Meloidogyne enterolobii* infected seedlings of *Psidium guajava* (guava).
Photo by Janete Brito, DPI



plants, some fruit trees and weeds in Florida (Brito *et al.* 2008; 2010). *Meloidogyne enterolobii* is currently under quarantine regulations in three states (Arkansas, Louisiana and Mississippi). To avoid spreading the pest into new areas and nurseries, plant materials should be free of this nematode species.

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COLLECTORS

Collectors submitting five or more samples processed for nematological analysis during October - December 2019.

COLLECTOR NAME	SAMPLES PROCESSED
Alford, Brian	10
Anderson, Eddie	22
Bentley, Michael	8
Blanco, Rogelio	89
Boyar, Jillian	92
Burgos, Frank	265
Carbon, Peter	5
Clanton, Keith	112
Cutts, Logan	9
Davis, Bobby	46
Dougherty, Eric	14
Echols, Janie	14
Landress, Craig	14
Lara, Milton	6
McMahan, Michael	5
Rojas, Eric	139
Spriggs, Charles	160
Taylor, Donald	7
Wolfe, David	24

SAMPLES FOR MORPHOLOGICAL ANALYSIS

	OCT - DEC	2019 - YEAR TO DATE
Multistate Certification for National and International Export	1,413	7,581
California Certification	372	1,635
Pre-movement (Citrus Nursery Certification)	78	252
Site or Pit Approval (Citrus Nursery and Other Certifications)	22	174

OTHER PURPOSES

	OCT - DEC	2019 - YEAR TO DATE
Identifications (Other Organisms)	0	1
Nematology Investigation	0	0
Plant Problems	29	165
Intrastate Survey, Random	316	812
Total	2,230	10,620

SAMPLES FOR MOLECULAR ANALYSIS

	OCT - DEC	2019 - YEAR TO DATE
Regulatory Purposes	306	907
Other Purposes	0	0
Identifications	0	520
Surveys	0	0
Total	306	1,427





PLANT PATHOLOGY

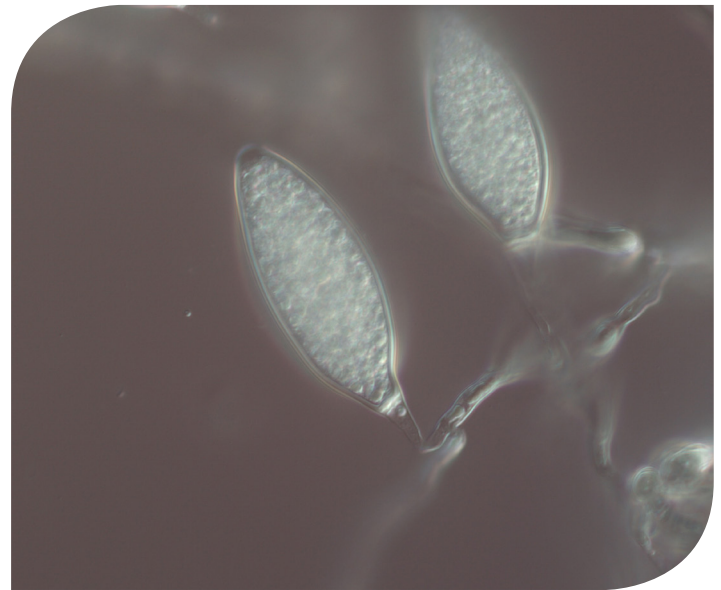
Compiled by Hector Urbina, Ph.D.; Jodi Hansen, M.S.; Taylor Smith, B.S.;
Kishore Dey, Ph.D.; Callie Jones, and Maria Velez Climent, M.S.

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.

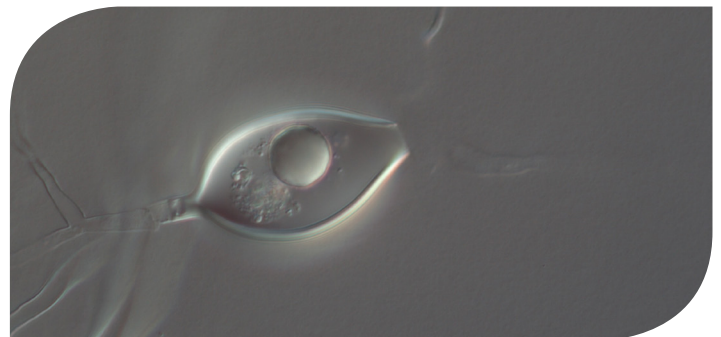
1 *Phytophthora citrophthora* (R.E. Sm. & E.H. Sm.)

Leonian (Phytophthora leaf spot), new host record, was identified on *Rhododendron* plants grown in a nursery facility in Apopka, Florida, imported from Washington, D.C., originally submitted due to a suspected infection by *Phytophthora ramorum* Werres, De Cock & Man in't Veld, causal agent of sudden oak death (SOD). *Phytophthora citrophthora* (Pythiales, Oomycetes) mimics symptoms of *P. ramorum* on *Rhododendron* plants, causing leaf tip scorching, dieback and defoliation. *Phytophthora citrophthora* is known to occur on *Rhododendron* plants within the continental United States in California, Maryland, Massachusetts, Minnesota and Oregon. In Florida, *P. citrophthora* has been reported on *Citrofortunella*, *Citrus*, *Cornus* and *Poncirus*. Initially, this *Rhododendron* sample was screened using quantitative polymerase chain reaction for the presence of *P. ramorum*—the results indicated the sample was negative for *P. ramorum* and an unknown *Phytophthora* species was present. Subsequently, fragments of symptomatic plant tissue were placed on amended corn meal agar plates for isolation and characterization of the unknown oomycete. Molecular identification was carried out by PCR amplification of the cytochrome c oxidase subunit 1 (*cox1*) locus, together with morphological characterization. This is the first report of *P. citrophthora* occurring on *Rhododendron* sp. in Florida (Orange County; 2019-101851; Jimmy Hernandez and Katherine Steinkamp; 16 October 2019).

2 *Puccinia paullula* Syd. & P. Syd. (**Philodendron rust fungus), new country record,** was identified on *Philodendron* (Araceae) plants grown in a nursery facility in Plantation, Florida. *Puccinia paullula* (Pucciniaceae, Basidiomycota) produces brown to chocolate colored powdery leaf lesions, up to 5 mm in diameter, occurring on both leaf surfaces of mostly mature leaves. *Puccinia paullula* is known to occur on Araceae plants in the genera *Alocasia* and *Monstera* in Australia, New Caledonia and New Guinea and on *Amorphophallus* in Malaysia and Philippines. In Florida, the rust fungus *Uromyces ari-triphylli* (Schwein.) Seeler (Pucciniaceae, Basidiomycota) is the only rust reported to occur on Araceae plants in the genera *Anubias*, *Syngonium*, *Xanthosoma* and *Zantedeschia*. It produces distinctive leaf lesions and urediniospores that differ from those of *P. paullula*. Species identification was accomplished by PCR amplification of the internal transcribed spacer (ITS) and large subunit (LSU) of ribosomal RNA genes in addition to morphological



1a - *Phytophthora citrophthora* mature sporangium with a single papilla.
Photo by Hector Urbina, DPI



1b - *Phytophthora citrophthora* empty sporangium after gamete discharge.
Photo by Hector Urbina, DPI



characterization. *Puccinia paullula* and its sister species *Puccinia raphidophorae* Syd. are easily recognized by the production of light-brown echinulate urediniospores and infection on Araceae plants; however, *P. raphidophorae* occurs only on *Raphidophora* plants while *P. paullula* has a broader host range. Preliminary molecular studies indicate that Araceae rusts form a species complex. This is the first host and country report of *P. paullula* occurring on *Philodendron* sp. (Broward County; 2019-101665; Nury Marrone; 9 October 2019.)

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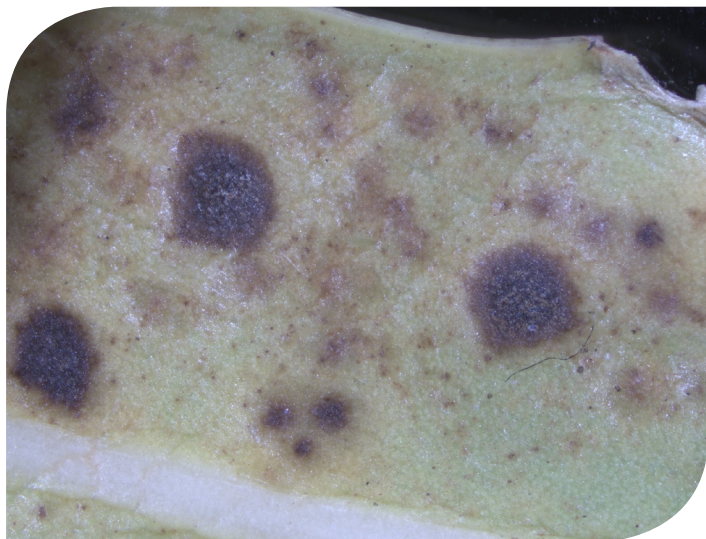
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Rust of Australia, <http://collections.daff.qld.gov.au/web/key/rustfungi/Media/Html/index.html> accessed 6 January 2020].

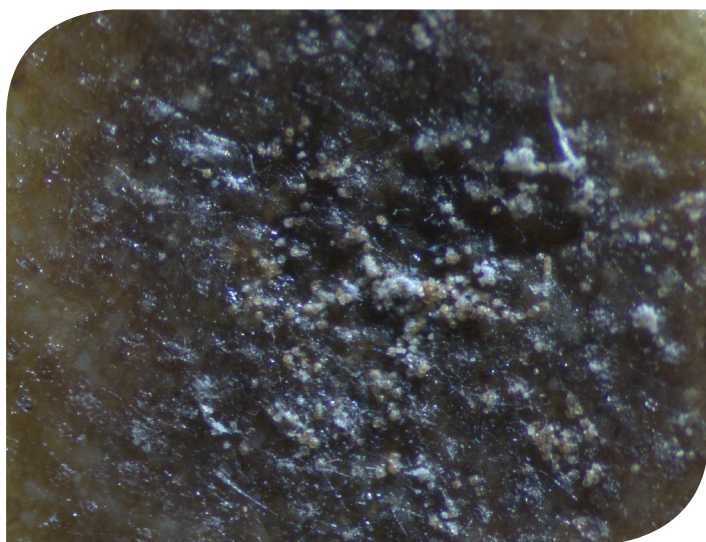
USDA-NPPLAP. 2019. PRAM qPCR protocol.

QUARTERLY ACTIVITY REPORT

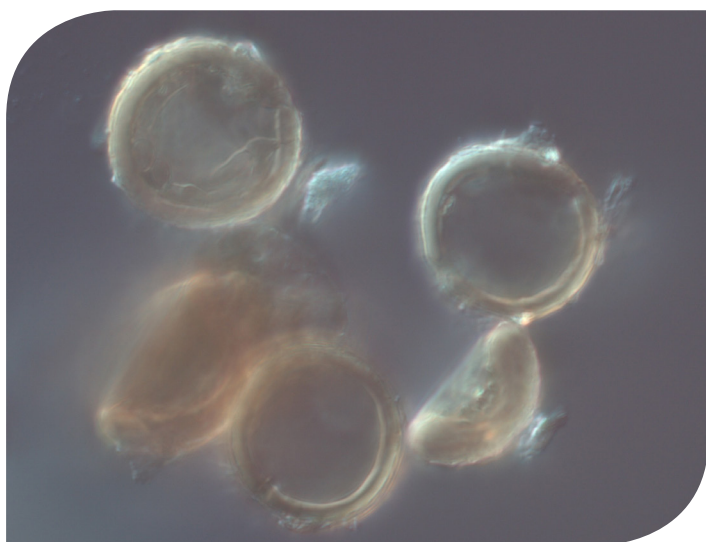
	OCT - DEC	2019 - YEAR TO DATE
Budwood Samples	0	0
Citrus Black Spot	62	318
Citrus Canker	69	385
Citrus Greening / HLB	1,227	2,606
Honeybees	1	3
Interdictions	65	148
Laurel Wilt	0	7
Pathology, General	497	2,349
Soil	37	212
Sudden Oak Death	14	16
Sweet Orange Scab-Like Disease	0	7
Texas Phoenix Palm Decline	13	125
Water	1	4
Miscellaneous	0	12
Totals	1,986	6,192



2a - Leaf lesions caused by *Puccinia paullula* on *Philodendron* plants. Photo by Hector Urbina, DPI



2b - Detail of leaf lesions caused by *Puccinia paullula* on *Philodendron* plants. Photo by Hector Urbina, DPI



2c - Urediniospores of *Puccinia paullula*. Photo by Hector Urbina, DPI



🔍 PLANT PATHOLOGY IDENTIFICATION TABLE

The following table provides information about samples identified between October-December 2019. 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>Anubias</i> sp.	anubias	<i>Myrothecium roridum</i>	fungus	nursery	102365	Hillsborough	Jose Llanos	11/26/2019	host
<i>Capsicum</i> sp.	pepper	<i>Tobamovirus tomato brown rugose fruit virus</i>	virus	community garden	102079	Alachua	Robert Leahy USDA-CAPS, Kelly Douglas, Kishore Dey, Sara Furgeson, Alex de la Paz, John Selph USDA-SITC	10/30/2019	host
<i>Ceratopteris thalictroides</i>	water fern, water sprite	<i>Corynespora cassiicola</i>	fungus	nursery	102358	Hillsborough	Jose Llanos	12/4/2019	host
<i>Dioscorea bulbifera</i>	air potato	<i>Lasiodiplodia</i> <i>cf.</i> <i>Theobromae</i>	fungus	school	102335	Lake	Owner	11/20/2019	host
<i>Gossypium</i> sp.	cotton	<i>Polerovirus Cotton leafroll dwarf virus</i>	virus	park	101688	Miami-Dade	Jake Farnum	10/4/2019	county
<i>Jasminum</i> sp.	jasmine	<i>Pelarspovirus Jasmine mosaic association virus</i>	virus	Sea World	101404	Orange	Kishore Dey	9/21/2019	county
<i>Jasminum</i> sp.	jasmine	<i>Pelarspovirus Jasmine virus H</i>	virus	Sea World	101404	Orange	Kishore Dey	9/21/2019	county
<i>Microsorium pteropus</i>	Java fern	<i>Verticillium epiphytum</i>	fungus	Petco	102175	Manatee	James Anderson	11/8/2019	host
<i>Ochna integerrima</i>	Vietnamese mickey mouse	<i>Cephaleuros virescens</i>	algae	nursery	102106	Sarasota	James Anderson	11/1/2019	host
<i>Philodendron</i> sp.	philodendron	<i>Puccinia paullula</i>	fungus	nursery	101665	Broward	Frank Burgos	10/7/2019	country
<i>Plumeria</i> sp.	plumeria	<i>Tobamovirus frangipani mosaic virus</i>	virus	Sea World	101409	Orange	Kishore Dey	9/21/2019	county
<i>Rhododendron</i> sp.	azalea	<i>Phytophthora citrophthora</i>	fungus	nursery	101851	Orange	Jimmy Hernandez, Katherine Steinkamp		
<i>Smallanthus uvedalia</i>	hairy leafcup	<i>Fusarium</i> sp.	fungus	park	102236	Flagler	Melanie Cain	11/14/2019	host
<i>Smallanthus uvedalia</i>	hairy leafcup	<i>Colletotrichum</i> sp.	fungus	park	102236	Flagler	Melanie Cain	11/14/2019	host
<i>Solanum lycopersicum</i>	tomato	<i>Tobamovirus tomato brown rugose fruit virus</i>	virus	community garden	101943	Alachua	Robert Leahy USDA-CAPS, Jodi Hansen	10/16/2019	state
<i>Solanum melongena</i>	eggplant	<i>Tobamovirus tomato brown rugose fruit virus</i>	virus	community garden	102081	Alachua	Robert Leahy USDA-CAPS, Kelly Douglas, Kishore Dey, Sara Furgeson, Alex De la Paz, John Selph USDA-SITC	10/30/2019	host
<i>Zamiaculcas zamifolia</i>	zz plant	<i>Colletotrichum orchidearum</i>	fungus	nursery	101978	Miami-Dade	Yenia Perez-Acevedo	10/23/2019	country





FROM THE EDITOR

By Patti J. Anderson, Ph.D.

Inquiring minds want to know... why Florida has so many invasive plant species.

Perhaps you've attended an invasive species collection day or seen advertisements for a round-up of plant invaders. If you haven't seen invasive species in your own yard or neighborhood, you might wonder what the fuss is about and ask yourself, "Aren't all plants good for the environment?"

It turns out that some plants growing away from their native habitats, where they face longtime predators and other pests, sometimes grow rampantly in new locations without their natural biological controls. These out of place plants can displace Florida native plants by shading them from sunlight or filling the available soil space.

The majority of invasive plant species were brought to the state as ornamentals, but they later escaped to cause major disturbances. Driving along Florida highways, you are likely to see Brazilian pepper (*Schinus terebinthifolia*), Australian pine (*Casuarina equisetifolia*) or Chinese privet (*Ligustrum sinense*) thriving along the roadsides. The common names of these plants echo their origins outside Florida, but it took years after they were introduced to discover the impacts they have on native plant communities. Why is Florida such a great host for misbehaving plants? Major factors include the state's welcoming climate with optimum growing conditions for a great number of plant species, its location as a major transportation hub for international travel by air and water, and even tropical storms and hurricanes can be blamed. People bring plants to the state or reproductive plant parts arrive as hitchhikers then grow without restraint.

What to do? Of course, it would be best to identify plants likely to become troublesome weeds before they establish themselves and cause environmental damage. Researchers



Ligustrum sinense, Chinese privet.
Photo from Shutterstock

and public garden staff can monitor new plant introductions, but many invasive plants have already escaped. For those species, we use chemical or mechanical tools, but these can disrupt natural systems, and sometimes no effective chemical treatment is available. Biological control by natural predators can be helpful, but the release of a plant pest requires extensive research to ensure the pest attacks only the invasive plant species and no others. Examples of success with such introductions in Florida include the air potato weevil and a parasite of the opuntia cactus moth.

You can also be on the lookout for any plants that seem to jump from one home landscape to another or pop up in natural areas where they have not been planted. Alert your local county extension office if you are concerned an exotic plant might become an invasive species.





TRI-OLGY

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

1-888-397-1517

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Division of Plant Industry
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