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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



Argemone mexicana, Mexican prickly poppy
Photo by Roger Hammer

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

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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

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Cover Photo

Calophya spondiadis Burckhardt & Mendez, *Spondias psyllid*.
Photo by David Ziesk, DPI



HIGHLIGHTS



1 *Viburnum obovatum* Walter (Walter's viburnum; small-leaf arrowwood). This species is a shrub or small tree, to 5 m tall, native to several states in the Southeast as far north as South Carolina, but it can be planted farther north, with USDA Zone 6 possible for some of its cultivars. This species is a wildlife friendly addition to a native plant garden.



1 - *Viburnum obovatum* Walter (Walter's viburnum) flowers.
Photo by Alan Cressler, [Wildflower Center Digital Library](#), Lady Bird Johnson
[Wildflower Center](#)

2 *Thelaxes suberi* (del Guercio), southern oak thelaxid, a new Western Hemisphere record. This aphid, reported originally as a regulatory incident, has been found to be established in Florida. It is specific to oaks.



2 - *Thelaxes suberi* (del Guercio) male.
Photo by Tavia Gordon, DPI

3 *Meloidogyne enterolobii* Yang and Eisenback, 1983, a new host record, was detected on Japanese blueberry tree (*Elaeocarpus decipiens*) roots in Brooksville. This nematode species is currently under quarantine regulations in three states (Arkansas, Louisiana and Mississippi) in the United States.



3 - *Meloidogyne enterolobii* root galling on infected *Elaeocarpus decipiens*, Japanese blueberry, roots.
Photo by Janete Brito, DPI

4 *Schlumbergera virus X* (SchVX) in *Opuntia cochenillifera* (cochineal cactus), a new Continental USA record, was collected from a nursery in Miami-Dade County. SchVX has been reported from *Schlumbergera bridgesii* (Christmas cactus) in Yugoslavia, *Hylocereus undatus* (dragon fruit, pitahaya) in Brazil, *Schlumbergera truncata* (Thanksgiving cactus) in Brazil and *O. ficus-indica* (prickly pear) in Mexico.



4 - *Opuntia cochenillifera* with chlorotic spot and yellow concentric rings.
Photo by Patricia Soria, 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 14,000 plant specimens and 1,400 vials of seeds.

QUARTERLY ACTIVITY REPORT

	JAN-MARCH	2020 - YEAR TO DATE
Samples Submitted by Other DPI Sections	1,138	1,138
Samples Submitted for Botanical Identification Only	159	159
Total Samples Submitted	1,297	1,297
Specimens Added to the Herbarium	226	226

Some of the samples submitted recently are described below.

1 *Argemone mexicana* L. (Mexican pricklypoppy), from a genus of about 32 species native to North America, the West Indies, Central America, South America and Hawaii, in the plant family Papaveraceae. This species, typically seen growing in open disturbed areas and sandy roadsides, is native to Florida, the West Indies and potentially Mexico and Central America. It has been introduced along the coast of the United States from New England to Texas, and in South America, Europe, Africa, Asia, Australia and the Pacific Islands. In Florida, it is found in the peninsula and central and western panhandle. The sample submitted for identification this quarter is a new record for Indian River County. Plants are annual herbs up to 1 m tall, flowering and fruiting in the spring through fall. The stems are erect, glabrous, glaucous and sparingly prickly or unarmed. Leaves are alternate, mostly clasping, pinnately lobed, and the margins are dentate with each tooth terminated by a prickle. The upper and lower leaf surfaces are glabrous, glaucous, often blotched with pale green, and sometimes sparingly prickly on the veins. Inflorescences are terminal and cymose with flowers solitary or few, conspicuous, subtended by one or two leaf-like bracts. Each flower consists of two or three sepals, each with a subterminal, hollow, terete, spine-tipped horn; two whorls of three, bright yellow, broadly obovate petals; and 30 to 50 stamens with yellow filaments. The superior ovary contains four to six united carpels. Fruits are oblong to broadly ellipsoid capsules, unarmed or with a few rigid prickles, dehiscent from the apex through four to six valves. Seeds are numerous, globose, arillate, minutely pitted



1 - *Argemone mexicana* L. (Mexican pricklypoppy) flower.
Photo by Roger Hammer, [Atlas of Florida Plants](#)



2 - *Viburnum obovatum* Walter (Walter's viburnum) flowers.
Photo by Alan Cressler, [Wildflower Center Digital Library](#), [Lady Bird Johnson Wildflower Center](#)



and about 2 mm long. Plants exude yellow sap when damaged. All parts of the plant have been used in traditional medicine across the world for the treatment of several ailments including tumors, skin diseases, inflammations, microbial infections and malaria. The seeds are reported to be toxic if ingested. This species is related to *Papaver somniferum*, the plant from which opium is derived, so it is no surprise it is pharmacologically significant as well. (Indian River County; B2020-26; Alexander Tasi; 24 January 2020.) (Correll and Correll 1982; Weakley 2015; Wunderlin and Hansen 2011; <http://florida.plantatlas.usf.edu/Plant.aspx?id=3632> [accessed 6 April 2020]).

2 *Viburnum obovatum* Walter (Walter's viburnum; small-leaf arrowwood), from a genus of approximately 180 species, native to temperate and warm regions, especially China and North America, in the plant family Adoxaceae (formerly placed in the Caprifoliaceae, known as the Honeysuckle Family). This species is a shrub or small tree, to 5 m tall, native to several states in the Southeast as far north as South Carolina, but it can be planted farther north, with USDA Zone 6 possible for some of its cultivars. Throughout the coastal plain in its native range, this viburnum is found in wetter areas, from swamps to floodplain forests. The bark of the trunk is usually gray to near black with shallow fissures. Leaves are primarily deciduous but can be evergreen in the southern end of its range. They are obovate (spatula-shaped), entire and glossy green above with coppery-brown glandular dots below. The leaves of this viburnum are distinctive from others in the genus because of their smaller size (2-5 cm long). They sometimes lead casual observers to mistake individuals of this species for *Ilex vomitoria*, the leaves of which are similar in size although the attachment is opposite for *Viburnum* species and alternate in the *Ilex* genus. The flowers are creamy white, with five-lobed corollas, born in flat clusters and flowering in early spring. Fruits are ellipsoid, 6-10 mm long, with a beak formed by the persistent calyx and ripening from red to black. This species is a wildlife friendly addition to a native plant garden, while denser or dwarf cultivars are preferred for more formal landscapes. Walter's viburnum has been documented throughout the state from Walton County in the panhandle to Monroe County in South Florida, but this is a new county record for St. Lucie. (St. Lucie County; B2020-104; Teresa Ortelli and Jeanie Frechette; 21 February 2020.) (Mabberley 2017; Nelson 2003; Wunderlin and Hansen 2011; <https://www.wildflower.org/> [accessed 6 April 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 by collection date in descending chronological order. 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
	Alexander Tasi	Indian River	B2020-26	3/13/2020	<i>Argemone mexicana</i>
	Gary R. Webb	Pasco	B2020-83	3/9/2020	<i>Bauhinia variegata</i>
	John S. Cassell	Marion	B2020-74	3/5/2020	<i>Bromelia pinguin</i>
	John S. Cassell	Alachua	B2020-62	2/28/2020	<i>Bromelia pinguin</i>
	John S. Cassell	Marion	B2020-76	2/25/2020	<i>Clerodendrum bungei</i>
	Nora V. Marquez	Citrus	B2020-39	2/21/2020	<i>Epipremnum pinnatum</i>
	John S. Cassell	Marion	B2020-75	2/19/2020	<i>Hedera helix</i>
	Melanie Cain	Flagler	B2020-22	2/18/2020	<i>Melilotus albus</i>
	Keith B. Clanton	Hardee	B2020-114	2/18/2020	<i>Parietaria praetermissa</i>
	Laura P. Ureta	Brevard	B2020-44	2/18/2020	<i>Parthenium hysterophorus</i>
	Melanie Cain	Putnam	B2020-36	2/14/2020	<i>Prunus angustifolia</i>
	Nora V. Marquez	Nassau	B2020-117	2/6/2020	<i>Raphanus raphanistrum</i>
	Melanie Cain	Flagler	B2020-31	2/5/2020	<i>Spermacoce remota</i>
	Alexander Tasi	Indian River	B2020-155	1/28/2020	<i>Stachys floridana</i>
	Nora V. Marquez	Lake	B2020-47	1/30/2020	<i>Syngonium angustatum</i>
	Elizabeth Hoganson	Osceola	B2020-128	1/29/2020	<i>Thunbergia alata</i>
	Teresa Ortelli and Jeanie P. Frechette	St. Lucie	B2020-104	1/24/2020	<i>Viburnum obovatum</i>
	John S. Cassell	Marion	B2020-107	1/22/2020	<i>Yucca aloifolia</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

	JAN - MARCH	2020 - YEAR TO DATE
Samples Submitted	1,266	1,266
Lots Identified	2,770	2,770
Specimens Identified	27,821	27,821

1 *Thelaxes suberi* (del Guercio), southern oak thelaxid, a new Western Hemisphere record. This aphid, reported originally as a regulatory incident, has been found to be established in Florida. In June 2019, it was found on a single potted plant at a nursery in Marion County. No other plants were infested and attempts to find the aphids at possible supplying nurseries also failed. In March 2020, a specimen was collected in a suction trap in Winter Haven, confirming establishment of the pest in Florida. There were subsequent collections in the same trap for the following two weeks, but to date, no more infested oaks have been found. This species is well-known in Europe but its pest status in North America is not yet known. It is a pest specific to oaks. (Marion County; E2019-3181; Tavia Gordon; 3 June 2019 and Polk County; E2020-1137; Kenneth Branch and Robinson Lawrence; 12 March 2020.) (Dr. Susan E. Halbert and Matthew R. Moore.)



1 - *Thelaxes suberi* (del Guercio).
Photo by Tavia Gordon, DPI

2 *Calophya spondiadis* Burckhardt & Mendez, spondias psyllid, a new Continental USA record. This species was collected in suction trap samples in Miami-Dade County in 2007 and 2013, but its identity and biology were unknown. In 2016, populations were found on *Spondias* in Mexico, and it was described as a new species. In 2017, Dr. Daniel Burckhardt, Naturhistorisches Museum Basel, reviewed our specimens and strongly suspected they were the new species from Mexican *Spondias*. In March 2020, a population was found on *Spondias purpurea* (Spanish plum, purple mombin) in Homestead, confirming the identity of the species in Florida. The species might become an intermittent pest on *Spondias*, which is grown as a specialty tropical fruit in South Florida, but it has been here since 2007 and only now was found in high numbers on a plant; its impact will probably be minimal. As far as anyone knows, it is specific to *Spondias*. (Miami-Dade County; E2007-8729; Gwen Myres; 16 November 2007 and Miami-Dade County; E2020-1141; Rita Duncan, UF/IFAS Tropical Research and Education Center; 18 March 2020) (Dr. Susan E. Halbert.)



2 - *Calophya spondiadis* Burckhardt & Mendez, *Spondias* psyllid, original Florida specimen.
Photo by David Ziesk, DPI



3 *Megalurothrips usitatus* (Bagnall), Asian bean thrips, a new Continental USA record. The Asian bean thrips is an important invasive pest native to Asian tropics. The species is distributed across Pakistan to Fiji and from Japan to Australia. In the Americas, it was recently reported from Cuba. The preferred host of Asian bean thrips is snap beans (*Phaseolus vulgaris*), but other reported hosts include peanuts, soybean, pigeon pea, black eye peas (cowpea), lima bean, other legumes and even potatoes. Damage is produced by direct feeding of larvae and adults on leaves and pods, and by oviposition on flowers and pods. This species does not transmit tospoviruses. In Taiwan, the damage produced by *M. usitatus*, in combination with other thrips species, can reduce bean production by 30 percent. (Miami-Dade County; E2020-881; crop scouts for a private company; 28 February 2020.) (Dr. Felipe Soto-Adames.)



3a - *Megalurothrips usitatus* female, Asian bean thrips.
Photo by Felipe N. Soto-Adames, DPI



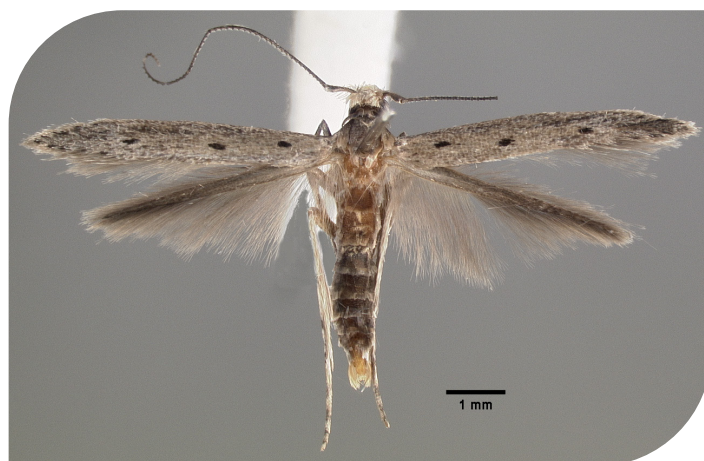
3b - *Megalurothrips usitatus* male, Asian bean thrips.
Photo by Felipe N. Soto-Adames, DPI

4 *Cyphoderus similis* Folsom, blind springtail, a new Florida State record. This species of blind springtail is distributed throughout Central America, South America and the Caribbean. In the United States, the species has been reported from California, Iowa, Louisiana, Massachusetts and New Jersey. *Cyphoderus similis* is part of a complex of three very similar (or identical) species (with *C. assimilis* and *C. javanus*) distributed throughout the world, except for temperate East Asia. The species is typically associated with ants, but is also commonly found in leaf litter in disturbed habitats. (Monroe County; E2020-583; Jake Farnum, CAPS; 2 January 2020.) (Dr. Felipe N. Soto-Adames.)



4 - *Cyphoderus similis*, blind springtail.
Photo by Felipe N. Soto-Adames, DPI

5 *Haplochrois* sp., an elachistid moth, a new Florida State record. This undetermined species may be related to *H. bipunctella* (Chambers), which occurs in Texas. It is a new state record for its subfamily, Parametriotinae (Elachistidae). The moths were collected with ultraviolet light and malaise traps on Big Pine Key, so the larvae are unknown; the larvae of congeners bore in shoots, twigs and seeds of various plants, such as croton and tea. (Monroe County; E2018-1830; Bradley Danner and Jake Farnum, CAPS; Elijah Talamas, James Hayden, Jason Stanley, Leroy Whilby and Paul Corogin; 13 April 2018.) (Dr. James E. Hayden.)



5 - *Haplochrois* sp., an elachistid moth.
Photo by James E. Hayden, DPI

6 *Tenthecoris tillandsiae* Henry, Spanish moss bug, a new Florida State record. This previously undescribed bug was collected in South Carolina in 2016 on Spanish moss (*Tillandsia usneoides*). Spanish moss is its only known host and damage seems to be minimal (Henry 2016). As Spanish moss is also widely distributed throughout Central America and South America, *Tenthecoris tillandsiae* is most likely adventive to the southern United States. In December 2019, a single male specimen was found on a sticky board in the Orlando area. After several searches of the area, there has yet to be a second specimen found in Florida. (Orange County; E2019-6878; Victor Zeno, USDA; 12 December 2019.) (Dr. Jade Allen.)

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6 - *Tenthecoris tillandsiae* Henry, Spanish moss bug, adult male, dorsal and lateral aspects.

Photo by Thomas J. Henry, USDA-ARS, USNM (Henry 2016, p. 368) (used by permission)



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>Acacia</i> sp.		<i>Acizzia</i> sp.	psyllid	Michael Golub, Phelicia Perez and detector dog	REGULATORY SIGNIFICANT
<i>Acer rubrum</i>	red maple	<i>Seira brasiliana</i>	springtail	Alexander Tasi	NEW FLORIDA COUNTY RECORD
<i>Cannabis sativa</i>	hemp	<i>Phorodon cannabis</i>	hemp aphid	Walter Golden	REGULATORY SIGNIFICANT
<i>Cannabis sativa</i>	hemp	<i>Phorodon cannabis</i>	hemp aphid	Mark Terrell	QUARANTINABLE PEST
<i>Carex striatula</i>	lined sedge	<i>Carolinaia caricis</i>	native sedge aphid	Alex de la Paz, Susan Halbert	NEW FLORIDA HOST RECORD
<i>Cestrum nocturnum</i>	night-blooming jasmine	<i>Lacinipolia parvula</i>	noctuid moth	Alexander Tasi	NEW FLORIDA HOST RECORD
<i>Citrus sinensis</i>	sweet orange, navel orange	<i>Hyalorista exuvialis</i>	pyraustine moth	Ruben Cliatt	NEW FLORIDA COUNTY RECORD
<i>Citrus</i> sp.	citrus	<i>Aleurodothrips fasciapennis</i>	thrips	Melanie Cain	NEW FLORIDA COUNTY RECORD
<i>Citrus</i> sp.	citrus	<i>Nipaecoccus viridis</i>	lebbeck mealybug	Lauren Diepenbrock	NEW FLORIDA COUNTY RECORD
<i>Citrus</i> sp.	citrus	<i>Peripsocus potosi</i>	psocid	Paula Alderman	NEW FLORIDA COUNTY RECORD
<i>Citrus x paradisi</i>	grapefruit	<i>Tenthecoris tillandsiae</i> Henry	Spanish moss bug	Victor Zeno	NEW FLORIDA STATE RECORD
<i>Citrus x tangelo</i>	Minneola tangelo, honeybell	<i>Nipaecoccus viridis</i>	lebbeck mealybug	Owner	NEW FLORIDA COUNTY RECORD
<i>Coccoloba uvifera</i>	seagrape	<i>Salina celebensis</i>	Sulawesi grass springtail	Scott Krueger	NEW FLORIDA COUNTY RECORD
<i>Coccoloba uvifera</i>	seagrape	<i>Seira brasiliana</i>	springtail	Scott Krueger	NEW FLORIDA COUNTY RECORD
<i>Commelina diffusa</i>	dayflower	<i>Pycnoderes</i> sp.	plant bug	Alexander Tasi	NEW FLORIDA COUNTY RECORD
<i>Dombeya</i> sp.		<i>Corythucha gossypii</i>	cotton lace bug	Scott Krueger	NEW FLORIDA HOST RECORD
<i>Echeveria</i> sp.		<i>Deroceras reticulatum</i>	gray garden slug	Mark Terrell	REGULATORY SIGNIFICANT
<i>Echeveria</i> sp.		<i>Otiorhynchus sulcatus</i>	black vine weevil	Mark Terrell	REGULATORY SIGNIFICANT
<i>Echinodorus</i> sp.		<i>Opiconsiva anacharsis</i>	delphacid planthopper	Justin Anto	REGULATORY SIGNIFICANT
<i>Eriobotrya japonica</i>	loquat, Japanese plum	<i>Mimorista</i> sp.	nomophiline moth	Clarisa Copeland	NEW FLORIDA COUNTY RECORD
<i>Hydrangea</i> sp.		<i>Deroceras reticulatum</i>	gray garden slug	Mark Terrell	REGULATORY SIGNIFICANT
<i>Hydrangea</i> sp.		<i>Otiorhynchus sulcatus</i>	black vine weevil	Mark Terrell	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>Lespedeza bicolor</i>	shrubby lespedeza	<i>Oligonychus perseae</i>	avocado mite	Justin Anto	NEW FLORIDA HOST RECORD
<i>Litchi chinensis</i>	litchi, leechiee	<i>Thysanoflorinia leei</i>	lychee leei scale	Carlene Sargeant	NEW FLORIDA COUNTY RECORD
<i>Milletia pinnata</i>	karum tree; poonga oil-tree; pongam	<i>Empoasca kraemeri</i>	typhlocybine leafhopper	Carlos Averhoff-Chirino	NEW FLORIDA HOST RECORD
<i>Parietaria floridana</i>	Florida pellitory	<i>Myzus fataunae</i>	pilea aphid	Sam Hart	NEW FLORIDA HOST RECORD
<i>Persea americana</i>	avocado; alligator pear; aguacate	<i>Euxesta costalis</i>	picture-winged fly	Alexander Chapman	NEW FLORIDA COUNTY RECORD
<i>Phaseolus vulgaris</i>	snapbean, stringbean, pole bean, foot-long bean	<i>Megalurothrips usitatus</i>	Asian bean thrips	crop scout	NEW US CONTINENTAL RECORD
<i>Phaseolus vulgaris</i>	snapbean, stringbean, pole bean, foot-long bean	<i>Megalurothrips usitatus</i>	Asian bean thrips	crop scout	NEW FLORIDA COUNTY RECORD
<i>Pilea cadierei</i>	aluminum-plant	<i>Myzus fataunae</i>	pilea aphid	Sam Hart	NEW FLORIDA COUNTY RECORD



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Quercus</i> sp.	oak	<i>Epiplatea erosa</i>	richardiid fly	Cecilia Carrero-Turnbull	NEW FLORIDA COUNTY RECORD
<i>Rivina humilis</i>	rouge plant	<i>Liriomyza schmidtii</i>	leaf miner	Jake Farnum	NEW FLORIDA HOST RECORD
<i>Solanum melongena</i>	eggplant	<i>Perillus bioculatus</i>	twospotted stink bug	Rusty Noah	NEW FLORIDA COUNTY RECORD
<i>Spondias purpurea</i>	Spanish plum, purple mombin	<i>Calophya spondiadis</i>	spondias psyllid	Rita Duncan	SIGNIFICANT FIND
<i>Tillandsia recurvata</i>	ballmoss	<i>Epidiaspis tillandsiae</i>	spanish moss scale	Lyle Buss	NEW FLORIDA COUNTY RECORD
<i>Verbesina virginica</i>	white crownbeard	<i>Asphondylia</i> sp.	gall midge	Melanie Cain	NEW FLORIDA COUNTY RECORD
		<i>Calophya spondiadis</i>	Spondias psyllid	Gwen Myers	NEW US CONTINENTAL RECORD
		<i>Cymodema breviceps</i>	seed bug	Monica Triana	NEW FLORIDA COUNTY RECORD
		<i>Cyphoderus similis</i>	blind springtail	Jake Farnum	NEW FLORIDA STATE RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jared Beauchamp	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Greg Staten	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jared Beauchamp	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jared Beauchamp	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	David Findley	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Ryan Hensel	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Matt Stevens	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jay Tucker	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Stan Shepard	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	David Findley	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jay Tucker	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Jay Tucker	NEW FLORIDA COUNTY RECORD
		<i>Dendroctonus frontalis</i>	southern pine beetle	Maria Wilson	NEW FLORIDA COUNTY RECORD
		<i>Haplochrois</i> sp.	elachistid moth	Bradley Danner, Elijah Talamas, Jake Farnum, James Hayden, Jason Stanley, Leroy Whilby, Paul Corogin	NEW FLORIDA STATE RECORD
		<i>Janseodes melanospila</i>	erebid moth	Alexander Tasi, Jake Farnum	SIGNIFICANT FIND
		<i>Parthenicus psalliodes</i>	mirid plant bug	Monica Triana	NEW FLORIDA COUNTY RECORD
		<i>Thelaxes suberi</i>	southern oak thelaxid	Tavia Gordon	NEW HEMISPHERE RECORD
		<i>Thelaxes suberi</i>	southern oak thelaxid	Kenneth Branch, Robinson Lawrence	NEW FLORIDA COUNTY RECORD
		<i>Tyttus parviceps</i>	mirid bug	Kenneth Branch, Robinson Lawrence	NEW FLORIDA COUNTY RECORD





NEMATOLOGY

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

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

	JAN - MARCH	2020 - YEAR TO DATE
Morphological Identifications	3,241	3,241
Molecular Identifications *	405	405
Total Identifications	3,646	3,646

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

Nematode of Special Interest

1 *Meloidogyne enterolobii* Yang and Eisenback, 1983, a new host record, was detected on Japanese blueberry tree (*Elaeocarpus decipiens*) roots in Brooksville. (Hernando County; N19-01242; Charles Spriggs, Larry Violett and Stephen Jenner; 30 October 2019).

In October 2019, a sample of soil and roots was collected from under an *Elaeocarpus decipiens* in Hernando County, Florida, and submitted for certification for *Meloidogyne enterolobii* (Yang and Eisenback, 1983) to the Florida Department of Agriculture and Consumer Services Division of Plant Industry in Gainesville, Florida (FDACS-DPI). This nematode species is currently under quarantine regulations in three states (Arkansas, Louisiana and Mississippi) in the United States. Nematodes were extracted from both soil and roots, and species identification was performed using FDACS-DPI's standard protocol for *M. enterolobii*. Results of the analysis allowed for positive identification of *M. enterolobii* in the sample. To determine whether *E. decipiens* is indeed a host of *M. enterolobii*, rather than weeds growing together in the pot with this evergreen, additional soil and root samples were collected directly from the rhizosphere of *E. decipiens*. Galls were observed on secondary and tertiary roots. Females were found inside of the galls, and egg masses were found outside them. Nematode



1a - *Elaeocarpus decipiens*, Japanese blueberry, in nursery containers.
Photo by Janete Brito, DPI



1b - *Meloidogyne enterolobii* root galling on infected *Elaeocarpus decipiens* roots.
Photo by Janete Brito, DPI



species were identified using molecular and isozyme analyses, body length of second-stage juveniles (J2) and morphology of the perineal patterns. DNA samples were screened for *M. enterolobii* as above. The COI-based qPCR assay was then repeated for positive samples, but with J2 extracted directly from roots. To confirm the results for *M. enterolobii* positive samples, we also performed the IGS2-based qPCR assay with the same conditions described above, except without a synthetic oligonucleotide positive control. Additionally, we obtained DNA from J2 individuals and used it to carry out conventional PCR and sequencing. Standard PCRs targeted COII using the primers COX2F/COX2R. Purified PCR products were sequenced bidirectionally on an Applied Biosystems SeqStudio platform with BigDye Terminator v. 3.1 cycle sequencing chemistry. Chromatograms were trimmed and assembled into sequence contigs in Sequencer 5.4.6. Newly generated sequences (MN842265–MN842267) were aligned in MEGA7 using the default settings of MUSCLE. The new sequences were compared to the corresponding GenBank COII “popset” (PopSet: 1005136704) previously generated and K2P neighbor-joining analysis with complete deletion of missing data. Additionally, SCAR PCRs using species-specific primers MK7-F/MK7-R were used to further confirm the identity of the nematode species. The COI-based qPCR assay yielded Ct values of 24.061–34.011 ($n=13$). The IGS2-based qPCR assay yielded Ct values of 23.789–24.975 ($n=3$). COII sequences were 100% matches to previously reported *M. enterolobii* data based on BLASTn searches and neighbor-joining analysis. The SCAR PCR was positive for *M. enterolobii*, yielding the predicted 520 bp product. Isozyme analysis (EST=VS1-S1; MDH=N1a) of females ($n=26$) were identical to earlier reports of this nematode species. Perineal patterns of females ($n=20$) and J2 body length ($n=18$) were consistent with the original description of *M. enterolobii*. Planting materials should be produced using both clean medium and pots to avoid disseminating this nematode species. To our knowledge this is the first report of *E. decipiens* as a host of *M. enterolobii* in Florida.

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COLLECTORS

Collectors submitting five or more samples processed for nematological analysis during January - March 2020.

COLLECTOR NAME	SAMPLES PROCESSED
Alford, Brian	6
Bentley, Michael	19
Blanco, Rogelio	209
Boyar, Jillian	168
Burgos, Frank	198
Carbon, Peter	10
Clanton, Keith	86
Cutts, Logan	10
Davis, Bobby	75
Dean, Randall	11
Landress, Craig	5
Nolen, Ashley	15
Paolillo, Ajia	6
Rojas, Eric	205
Smith, Larry	7
Spriggs, Charles	171
Wolfe, David	29

SAMPLES FOR MORPHOLOGICAL ANALYSIS

	JAN - MARCH	2020 - YEAR TO DATE
Multistate Certification for National and International Export	1,809	1,809
California Certification	425	425
Pre-movement (Citrus Nursery Certification)	76	76
Site or Pit Approval (Citrus Nursery and Other Certifications)	6	6

OTHER PURPOSES

	JAN - MARCH	2020 - YEAR TO DATE
Identifications (Other Organisms)	0	0
Nematology Investigation	0	0
Plant Problems	50	50
Intrastate Survey, Random	217	217
Total	267	267

SAMPLES FOR MOLECULAR ANALYSIS

	JAN - MARCH	2020 - YEAR TO DATE
Regulatory Purposes	405	405
Other Purposes	0	0
Identifications	0	0
Surveys	0	0
Total	405	405



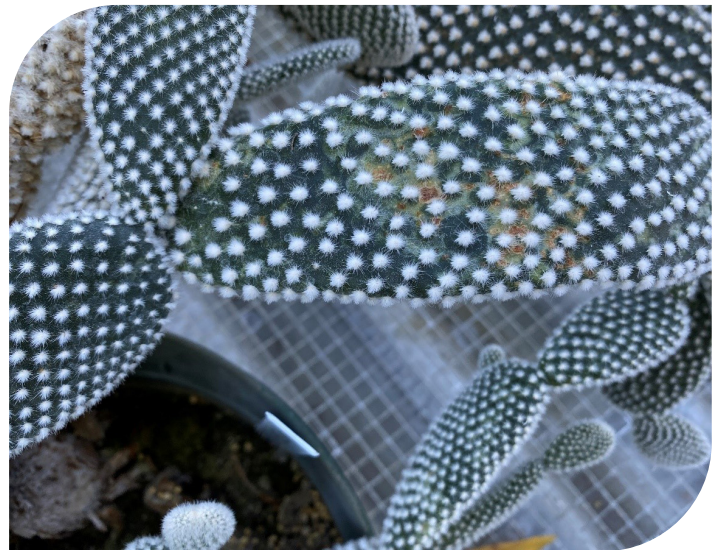


PLANT PATHOLOGY

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 Rattail cactus necrosis-associated virus (RCNaV) in *Opuntia microdasys* (bunny cactus), a new Continental USA record, collected from a greenhouse at the Division of Plant Industry (DPI) in Gainesville, Florida. RCNaV was first reported from *Aporcactus flagelliformis* (rattail cactus) in 2012 from South Korea, on the fruit of *O. albicarpab* (prickly pear) in 2016 from Mexico and from *Notocactus leninghausii f. cristatus* (golden ball cactus) in 2018 from South Korea. The necrotic symptoms present in the *O. microdasys* are typical symptoms of this virus. We have also identified this virus in cochineal cactus (*O. cochenillifera*); however, the symptoms presented as small chlorotic spots and yellow concentric rings in *O. cochenillifera* are not proven to be due to RCNaV, since our determination of this virus was found in association with three other viruses, *Schlumbergera virus X*, *Sammons opuntia virus* and *Cactus virus X*. The occurrence of multiple viruses in cactus plants is quite common, and the observed symptoms might result from multiple interactions and not any one individual virus. RCNaV is a member of the genus Tobamovirus (family *Virgaviridae*). The identification was based on molecular analysis using total RNA extracted from symptomatic leaves followed by PCR and DNA sequencing. Since opuntias are propagated vegetatively, and viruses in this genus are easily transmitted mechanically, it is possible this virus might become disseminated more widely during propagation or other cultural practices. (Alachua County; P2020-103373; Kishore Dey and Maria Velez-Climent; 6 March 2020.)



1 - *Opuntia microdasys* with necrotic spots.
Photo by Kishore Dey, DPI

2 *Schlumbergera virus X* (SchVX) in *Opuntia cochenillifera* (cochineal cactus), a new Continental USA record, was collected from a nursery in Miami-Dade County. SchVX has been reported from *Schlumbergera bridgesii* (Christmas cactus) in Yugoslavia, *Hylocereus undatus* (dragon fruit, pitahaya) in Brazil, *Schlumbergera truncata* (Thanksgiving cactus) in Brazil and *O. ficus-indica* (prickly pear) in Mexico. The *O. cochenillifera* plant infected with SchVX was found to be co-infected by *Sammons opuntia virus*, *Cactus virus X* and *Rattail cactus necrosis-associated virus*; therefore, the irregular chlorotic spot-like symptoms cannot be attributed to SchV infection alone. Such irregular chlorotic spots have been widely reported in cactus plants for both individual or mixed viral infection. The role of environmental conditions in symptom development is widely documented. SchV is a member of the genus *Potexvirus* (family *Alphaflexiviridae*) characterized by non-enveloped, long filamentous particles. The identification was based on



2 - *Opuntia cochenillifera* with chlorotic spot and yellow concentric rings.
Photo by Patricia Soria, DPI



a combination of techniques including electron microscopy using crude plant sap to visualize virus particles and molecular analysis using total RNA extracted from symptomatic leaves followed by PCR and DNA sequencing. Since *Opuntia* species are easily propagated by cuttings, and ScHV is known to be mechanically transmitted, the control of the virus requires strict sanitary practices. (Miami-Dade County; P2020-102471; Angel Colon-Riveria; 7 November 2019.)

QUARTERLY ACTIVITY REPORT

	JAN - MARCH	2020 - YEAR TO DATE
Budwood	0	0
Citrus Black Spot	200	200
Citrus Canker	88	88
Citrus Greening / HLB	35	35
Honeybees	1	1
Interdictions	16	16
Laurel Wilt	1	1
Pathology, General	805	805
Soil	50	50
Sudden Oak Death	1	1
Sweet Orange Scab-Like Disease	0	0
Texas Phoenix Palm Decline	19	19
Water	0	0
Miscellaneous	4	4
Totals	1,220	1,220



PLANT PATHOLOGY IDENTIFICATION TABLE

The following table provides information about samples identified between January - March 2020. 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>Citrus</i> spp.	citrus	<i>Gibberella intricans</i>	fungus	nursery	102457	Hillsborough	Ajia Paolillo	12/12/2019	host
<i>Curcubita okeechobeensis</i>	Okeechobee gourd	<i>Didymella bryoniae</i>	fungus	residence	103013	Palm Beach	owner	1/25/2020	host
<i>Gossypium</i> sp.	cotton	<i>Cotton leafroll dwarf virus</i>	virus	agricultural	102831	Indian River	Jake M. Farnum, and Alec D. Tasi	1/9/2020	county
<i>Hibiscus rosa-sinensis</i>	hibiscus	<i>Hibiscus chlorotic ringspot virus</i>	virus	residence	102521	Palm Beach	Clarence W. Parks	12/16/2019	county
<i>Hibiscus rosa-sinensis</i>	hibiscus	<i>Hibiscus chlorotic ringspot virus</i>	virus	theme park	102894	Orange	Kishore Dey	1/19/2020	county
<i>Hibiscus rosa-sinensis</i>	hibiscus	<i>Hibiscus latent Fort Pierce virus</i>	virus	residence	103023	Sarasota	Prem Kumar USDA	12/19/2019	county
<i>Hibiscus</i> sp.	hibiscus	<i>Hibiscus latent Fort Pierce virus</i>	virus	residence	103041	Indian River	Dagne A. Vazquez	2/4/2020	county
<i>Hylocereus</i> sp.	night blooming cactus	<i>Leptosphaeria</i> sp.	fungus	nursery	103070	Palm Beach	Riccardo G. Tordi	2/4/2020	host
<i>Ligustrum japonicum</i>	waxleaf privet, Japanese privet, ligustrum	<i>Pallidocercospora crystallina</i>	fungus	nursery	102505	Alachua	Sam E. Hart	12/18/2020	state
<i>Opuntia cochenillifera</i>	Cochineal cactus, nopal	<i>Schlumbergera virus X</i>	virus	nursery	102471	Miami-Dade	Angel Colon-Riveria	11/7/2020	country/continental USA and host
<i>Opuntia cochenillifera</i>	Cochineal cactus, nopal	<i>Rattail cactus necrosis-associated virus</i>	virus	nursery	102471	Miami-Dade	Angel Colon-Riveria	3/17/2020	host
<i>Opuntia cochenillifera</i>	Cochineal cactus, nopal	<i>Schlumbergera virus X</i>	virus	nursery	103372	Alachua	Kishore Dey, Maria Velez-Climent	3/6/2020	county
<i>Opuntia microdasys</i>	bunny ears cactus	<i>Rattail cactus necrosis-associated virus</i>	virus	DPI	103373	Alachua	Kishore Dey, Maria Velez-Climent	3/6/2020	country/continental USA and host
<i>Opuntia</i> sp.	opuntia	<i>Neoscytalidium dimidiatum</i>	fungus	nursery	102470	Miami-Dade	Angel Colon-Riveria	11/7/2019	host
<i>Persea americana</i>	avocado	<i>Avocado sunblotch viroid</i>	virus	residence	102923	Collier	Emily F. Safran	1/15/2020	county
<i>Phlebodium aureum</i>	golden polypody	<i>Neocordana musae</i>	fungus	nursery	102371	Orange	Kathy Gonzalez	12/5/2020	host
<i>Phaseolus vulgaris</i>	bean	<i>Cucurbit leaf crumple virus</i>	virus	residence	102196	Alachua	owner	11/12/2019	county





TRI-LOGY

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