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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

***Oplismenus burmannii*, Burmann's basketgrass.**
Photo by Mark Garland, Atlas of Florida Plants

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

Thank you,

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

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

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Photo by Kyle Schnepp, FDACS-DPI

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2 *Dolichothrips indicus* (Hood), Indian macaranga thrips, a new Continental USA record and new host record. This species is probably native to India, but it is now found in Barbados, Brazil, French Polynesia, Hawaii, Japan, New Caledonia and Taiwan. *Dolichothrips indicus* feeds on many plants, but this is the first record from the genus *Tibouchina*.

3 *Ulmus parvifolia* Jacq., Chinese elm. In 2019, samples of soil and roots were collected from containerized *Ulmus parvifolia* cvs. Allee and Drake in Lake County, Florida, and submitted for nematode certification. Initially, nematodes were extracted from soil and roots, and species identification was performed. The nematodes *Meloidogyne arenaria*, *M. enterolobii* and *M. javanica* were found. This is the first report of Chinese elm as host of these three species in Florida.

4 *Rhizobium rhizogenes* (Riker et al. 1930) Young et al. 2001 (crown gall), a new host record, was submitted on *Forestieria segregata,* Florida swampprivet, from a state park. *Forestiera* plants with galls have been submitted to the lab before; however, this is the first time the presence of the gall-forming bacteria has been confirmed. The submission of young galls for analysis was key to recovering the pathogen in culture. Symptoms of crown gall caused by *R. rhizogenes* on *Forestieria* usually appear as small galls located on the terminal end of branches.

1 – *Oplismenus burmannii*, Burmann's basketgrass, close view of flower.
Photo by Mark Garland, Atlas of Florida Plants

2 – *Dolichothrips indicus*, Indian macaranga thrips, adult female.
Photo by Felipe Soto-Adames, FDACS-DPI

3 – *Ulmus parvifolia*, Chinese elm, roots with galls from nematode.
Photo by Janete Brito, FDACS-DPI

4 – *Rhizobium rhizogenes* (crown gall) symptoms on *Forestiera segregata*, Florida swampprivet. Small galls on branch tips.
Photo by Hector Urbina, FDACS-DPI

BOTANY

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

This section identifies plants for the Division of Plant Industry, as well as for other governmental agencies and private individuals. The Botany Section maintains a reference herbarium with over 15,000 plant specimens and 1,400 vials of seeds.

QUARTERLY ACTIVITY REPORT

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Samples Submitted by Other DPI Sections	822	**4,214**
Samples Submitted for Botanical Identification Only	61	**476**
Total Samples Submitted	833	**4,690**
Specimens Added to the Herbarium	197	**780**

Some of the samples submitted recently are described below.

1 ***Oplismenus burmannii*** **(Retz.) P. Beauv. (Burmann's basketgrass, zacatillo),** from a genus of 11 tropical and warm region species in the plant family, Gramineae/Poaceae. This weedy, annual grass has glabrous, prostrate culms to 60 cm long. This grass typically produces new roots at nodes where the culm is in contact with the soil. The leaves are lanceolate to ovate with undulating margins and a ciliate ligule. Leaves may be as long as 9 cm and up to 20 mm wide. This species can be identified by its minute whitish, antrorsely (pointing upward) scabrous awns. Other species of *Oplismenus* in North America have smooth, yellow to reddish awns and are perennials. This specimen adds another county to the list of known sites in which this pan-tropical, non-native grass is found. It usually grows in shady locations, but mats of this species can be found growing in sunny lawns. (Collier County; B2020-418; Scott Krueger; 29 September 2020.) (Davis, *et al.*, 2006; Hall, 2019; Mabberley, 2017; Peterson *et al.*, 1999; https://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=106060 [accessed 29 December 2020].)

2 ***Synsepalum dulcificum*** **(Schumach. & Thonn.) Daniell (miracle fruit)**, from a genus of about 37 species native to tropical Africa, in the plant family Sapotaceae. *Synsepalum dulcificum* is an evergreen shrub or small tree, usually no more than 7 m tall in its native habitat and almost always shorter in cultivation. It is native to warm and wet forests and lowlands of tropical West Africa and has been introduced for cultivation throughout tropical and subtropical regions of the world. The leaves are alternate and obovate-lanceolate with entire margins, growing clustered at the end of the branchlets. The

1a - *Oplismenus burmannii* (Retz.) P. Beauv., Burmann's basketgrass, close view of flower.
Photo by Mark Garland, Atlas of Florida Plants

1b - *Oplismenus burmannii* (Retz.) P. Beauv., Burmann's basketgrass.
Photo by Mark Garland, Atlas of Florida Plants

flowers are bisexual, small and borne solitary or clustered in the leaf axils. Each flower consists of four to five sepals, four to five petals, five stamens and a superior ovary with a simple style and inconspicuous stigma. The fruit is a finely pubescent, ovoid to oblong, red berry 2-2.5 cm long and 1 cm wide with one large seed surrounded by a thin layer of fleshy pulp.

The miracle fruit was first documented by French explorer Chevalier des Marchais in 1725 while on an excursion to West Africa. In 1827, it was given the name *Bumelia dulcifica* Schumach. & Thonn., now considered a synonym of the accepted name *Synsepalum dulcificum* (Schumach. & Thonn.) Daniell, published in 1852. This species was introduced to the United States by the late Dr. David Fairchild, who made a total of four introductions in Miami, Florida, consisting of both plants and seeds, between 1929 and 1939. Unfortunately, many of the early introductions planted in the alkaline, limestone-based soils of Miami died quickly, because this species prefers acidic soils. William Francis Whitman, Jr., is credited with being the first to successfully grow the plant in the United States in 1952 after planting seeds in peat moss-filled containers, then moving them to acidic sandy soils, where they reached a height of 7 feet. Miracle fruit has not yet been documented to escape from cultivation in Florida, although Whitman, (1994) states, "Seeds, distributed by birds and children, germinated freely on a volunteer basis in the acid soil wherever conditions were favorable." This species has been documented in cultivation from Brevard, Hendry, Highlands, Indian River, Lee, Leon, Manatee, Miami-Dade and Sarasota counties in Florida, mostly in botanical gardens, greenhouses and residential landscapes. The sample submitted for identification this reporting period was collected from a cultivated plant with mature fruit, growing in a residential landscape in Avon Park.

The common name "miracle fruit" is based on the peculiar nature of the fruit to make sour foods taste sweet, if it is consumed beforehand. This interesting sensation is caused by miraculin, a glycosylated protein, acting on the sweet taste receptors of the tongue. This chemical binds to the receptors and converts sour stimuli to sweet, with the effect lasting up to one hour, although the intensity declines over time. The fruit is also a rich source of vitamin C, leucine, flavonols and anthocyanins. For centuries, indigenous peoples of tropical West Africa have used this species as a food and a medicine. In the United States, most of the focus has been on miraculin's potential as a natural food sweetener with the ability to make unsweetened foods seem sweet, without the usual caloric cost, which could help diabetics and others avoid excessive sugar intake. (Highlands County; B2020-470; Clarisa M. Copeland; 17 December 2020.) (Xingwei, *et al*., 2016; http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:789924-1 [accessed 29 December 2020]; https://www.growables.org/information/TropicalFruit/MiracleFruitArcRFC.htm [accessed 29 December 2020].)

2 - ***Synsepalum dulcificum*, miracle fruit, leaves and flower.**
Photo from Shutterstock

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Xingwei, C., Abdullah, T. L., Taheri, S., Abdullah, N. A., and Hassan, S. A. (2016). Flower Ontogenesis and Fruit Development of *Synsepalum dulcificum*. *HortScience*, 51: 697-702. doi:10.21273/hortsci.51.6.697.

BOTANY IDENTIFICATION TABLE

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

NEW RECORD	COLLECTOR NAME	COUNTY	SAMPLE NUMBER	COLLECTION DATE	PLANT NAME
	Scott D. Krueger	Collier	B2020-418	9/29/2020	*Oplismenus burmannii*

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

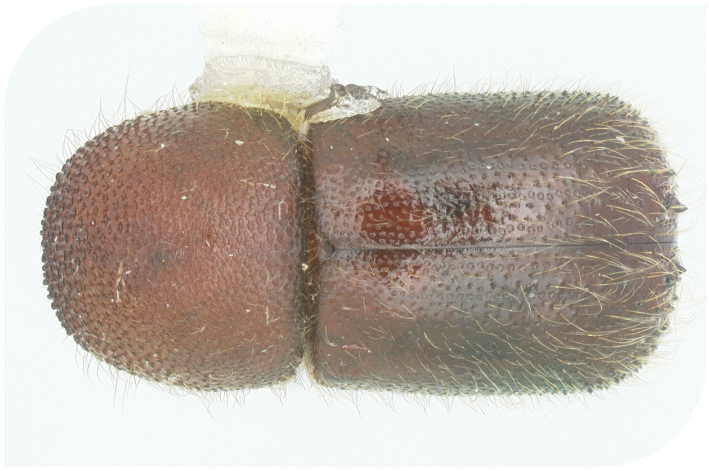
	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Samples Submitted	1,115	**4,960**
Lots Identified	1,473	**10,304**
Specimens Identified	19,275	**86,015**

1 *Dolichothrips indicus* (Hood), Indian macaranga thrips, a new Continental USA record and new host record. This is the first record for *Dolichothrips indicus* in the continental United States. This species is probably native to India, but it is now found in Barbados, Brazil, French Polynesia, Hawaii, Japan, New Caledonia and Taiwan. *Dolichothrips indicus* feeds on many plants, but this is the first record from the genus *Tibouchina* in the plant family Melastomataceae. Other plant hosts previously recorded in the literature include avocado, mango, cotton and members of the genera *Acalypha, Ailanthus*, *Cassia*, *Diospyros, Hibiscus*, *Macaranga*, *Mallotus*, *Melastoma and Murraya*. Despite the wide range of hosts, this thrips is not a plant pest; rather, it appears to be a pollinator. (Lake County; E2020-4837; Mary Sellers; 13 December 2020.) (Dr. Felipe Soto-Adames.)

2 *Emargo* sp., a figitid wasp, a new Continental USA record. This genus is pantropical. These wasps are thought to be parasitoids of fly larvae hiding in ant nests. The center of diversity appears to be East Africa with a spectacular radiation in Madagascar. *Emargo* appears to be quite rare everywhere on Earth, except Madagascar. (Palm Beach County; E2020-4646; Jake Farnum; 15 July 2019.) (Dr. Matthew L. Buffington, USDA, Systematic Entomology Laboratory, Beltsville, MD.)

3 *Ambrosiodmus lewisi* Blandford, an ambrosia beetle, a new Florida State record. *Ambrosiodmus lewisi* is an Asian ambrosia beetle new to Florida, also found in Alabama and Pennsylvania. This species is not collected often and is characterized by its large size (3.6–4.0 mm). In North America, these beetles have been trapped in Lindgren funnels or reared from *Quercus velutina*. Although it is rarely collected, *A. lewisi* could be established in the eastern United States. This species is economically important in certain areas of its native range in Southeast Asia (Hoebeke, 1991). (Jackson County; E2020-4696; Robert Leahy, USDA; 1 December 2020.) (Krystal Ashman.)

1 - *Dolichothrips indicus*, Indian macaranga thrips, adult female.
Photo by Felipe Soto-Adames, FDACS-DPI



3 - *Ambrosiodmus lewisi* Blandford, ambrosia beetle.
Photo by Kyle Schnepp, FDACS-DPI

REFERENCES

Hoebeke, R. E. (1991). An Asian ambrosia beetle, *Ambrosiodmus lewisi,* new to North America (Coleoptera: Scolytidae). *Proceedings of the Entomological Society of Washington* 93: 420–424.

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
Abies fraseri	Fraser's fir, southern balsam fir	*Cuerna striata*	sharpshooter	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Juan Aleman-Martinez, Rosie Dulzaides	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Juan Aleman-Martinez, Rosie Dulzaides	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Milton Lara	REGULATORY SIGNIFICANT
Abies fraseri	Fraser's fir, southern balsam fir	*Fiorinia externa*	armored scale	Tavia Gordon	REGULATORY SIGNIFICANT
Acer negundo	boxelder	*Salina tristani*	Tristan's green grass springtail	Julieta Brambila	NEW FLORIDA COUNTY RECORD
Aristida purpurascens	arrowfeather threeawn	*Antoninoides nortoni*	mealybug	Kyle Schnepp	NEW FLORIDA HOST RECORD
Canna sp.		*Sitobion avenae*	English grain aphid	Nina Klinedinst and Beverly Colmant	NEW FLORIDA HOST RECORD
Cannabis sativa	hemp	*Ceroplastes rusci*	fig wax scale	Sara Harper	NEW FLORIDA HOST RECORD
Cannabis sativa	hemp	*Corythucha gossypii*	cotton lace bug	Sallie Simmons	NEW FLORIDA HOST RECORD
Cannabis sativa	hemp	*Halticus brachtatus*	garden fleahopper	Sam Hart	NEW FLORIDA HOST RECORD
Cannabis sativa	hemp	*Phenacoccus madeirensis*	Madeira mealybug	Lance Osborne, Muhammad Z. 'Zee' Ahmed, Gabrielle Ouwinga, Lily Deeter	NEW FLORIDA HOST RECORD
Capsicum annuum	pepper	*Bactericera cockerelli*	potato psyllid	Alexander Tasi	REGULATORY SIGNIFICANT
Capsicum annuum	pepper	*Bactericera cockerelli*	potato psyllid	Logan Cutts, Dyrana Russell	REGULATORY SIGNIFICANT
Capsicum annuum	pepper	*Euxesta eluta*	corn silk fly	Sara Furgeson	NEW FLORIDA COUNTY RECORD
Chrysopsis scabrella	coastalplain goldenaster	*Eriococcus euphorbiae*	eriococcid	Gabrielle Ouwinga, Kyle Schnepp, Lily Deeter, Alex de la Paz	NEW FLORIDA HOST RECORD
Coccoloba uvifera	seagrape	*Metalectra nigrior*	fungus moth	Charles King	NEW FLORIDA COUNTY RECORD
Cola sp.		*Balanogastris kolae*	kolnut weevil	Gregg Farina & K-9	REGULATORY SIGNIFICANT
Euphorbia hyssopifolia	hyssopleaf sandmat	*Phenacoccus solani*	solanum mealybug	Karen Relish	NEW FLORIDA HOST RECORD
Ixora sp.		*Asiothrixus antidesmae*	ixora whitefly	Carol Wyatt-Evens	NEW FLORIDA COUNTY RECORD; QUARANTINABLE PEST
Lactuca sativa	lettuce, romaine lettuce, leaf lettuce	*Nasonovia ribisnigri*	currant-lettuce aphid	Logan Cutts, Dyrana Russell	REGULATORY SIGNIFICANT
Liatris tenuifolia	shortleaf gayfeather	*Rhizaspidiotus dearnessi*	dearness scale	Gabrielle Ouwinga, Kyle Schnepp, Lily Deeter, Alex de la Paz	NEW FLORIDA COUNTY RECORD; NEW FLORIDA HOST RECORD
Litchi chinensis	litchi, leechee	*Adraneothrips* sp.	thrips	Samuel Bolton, Matt Brodie, Jake Farnum	NEW FLORIDA COUNTY RECORD

PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
Litchi chinensis	litchi, leechee	*Thysanofiorinia leei*	leei litchi scale	Juan Amador	NEW FLORIDA COUNTY RECORD
Malus sp.		*Vanduzea segmentata*	treehopper	Sam Hart	NEW FLORIDA HOST RECORD
Mangifera indica	mango	*Cyphomyia marginata*	soldier fly	Robert Rocky	NEW FLORIDA COUNTY RECORD
Musa sp.		*Pseudococcus n.*sp.	mealybug	Dawn Cermak, Alexander Tasi	REGULATORY SIGNIFICANT
Ocimum sp.		*Calcomyza hyptidis*	leaf miner	Patti Anderson	NEW FLORIDA COUNTY RECORD
Phaseolus vulgaris	snapbean, stringbean, pole bean, foot-long bean	*Megalurothrips usitatus*	Asian bean thrips	Craig Frey	NEW FLORIDA COUNTY RECORD
Platanus occidentalis	sycamore	*Lepidocyrtus* sp.	springtail	Julieta Brambila	NEW TO SCIENCE RECORD
Portulaca pilosa	pink purslane	*Hypogeococcus pungens*	mealybug	Muhammad Z. 'Zee' Ahmed, Gabrielle Ouwinga, Lily Deeter	NEW FLORIDA COUNTY RECORD
Pseudotsuga menziesii	Douglas fir	*Fiorinia externa*	armored scale	Mary Sellers	REGULATORY SIGNIFICANT
Sansevieria sp.		*Taeniothrips eucharii*	oriental lily flower thrips	Employee	NEW FLORIDA COUNTY RECORD
Setaria parviflora	yellow bristlegrass	*Aspidiella sacchari*	sugarcane scale	Kyle Schnepp	NEW FLORIDA HOST RECORD
Solanum lycopersicum	garden tomato, tomate, jitomate	*Polyamia obtecta*	leafhopper	Robert Leahy	NEW FLORIDA COUNTY RECORD
Tibouchina sp.		*Dolichothrips indicus*	Indian macarangthrips	Mary Sellers	NEW USA CONTINENTAL RECORD
		Ambrosiodmus lewisi	ambrosibeetle	Robert Leahy	NEW FLORIDA STATE RECORD
		Calx cubensis	common cuban calx	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		Clerada apicicornis	blood-feeding lygaeid bug	Vince Golia	NEW FLORIDA COUNTY RECORD
		Corixidea major	jumping ground bug	Julien Beuzelin	NEW FLORIDA COUNTY RECORD
		Cryphula trimaculata	dirt-colored seedbug	Felipe Soto-Adames, Julieta Brambila	NEW FLORIDA COUNTY RECORD
		Emargo sp.	parasitic wasp	Jake Farnum	NEW USA CONTINENTAL RECORD
		Macrochlamys indica	horntail snail	Scott Krueger	NEW FLORIDA COUNTY RECORD
		Macrochlamys indica	horntail snail	Nichole Bushue & K-9	NEW FLORIDA COUNTY RECORD
		Mitrapsylla cubana	psyllid	Robert Leahy	NEW FLORIDA COUNTY RECORD
		Mitrapsylla cubana	psyllid	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		Rheumatobates minutus	water strider	Alexander Tasi	NEW FLORIDA COUNTY RECORD
		Salina tristani	Tristan's green grass springtail	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		Seira brasiliana	Brazilian seira	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		Semium hirtum	plant bug	Kenneth Branch, Robinson Lawrence, James Bouie	NEW FLORIDA COUNTY RECORD
		Thione championi	beetle	Douglas Restom-Gaskill	NEW FLORIDA COUNTY RECORD
		Toxophora amphitea	bee fly	Jeanie Frechette	NEW FLORIDA COUNTY RECORD
		Xyleborinus octiesdentatus	ambrosia beetle	Mary Jane Echols	NEW FLORIDA COUNTY RECORD
		Xyleborinus octiesdentatus	ambrosia beetle	Robert Leahy	NEW FLORIDA COUNTY RECORD

NEMATOLOGY

Compiled by Janete A. Brito, Ph.D., Matthew R. Moore, M.S., Xue Ruimin, B.S.,
Cheryl G. Roberts, B.S., and Lynn A. Combee, B.S.

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

QUARTERLY ACTIVITY REPORT

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Morphological Identifications	2,708	**12,479**
Molecular Identifications *	115	**997**
Total Identifications	2,823	**13,476**

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

Nematode of Special Interest

1 In 2019, samples of soil and roots were collected from containerized *Ulmus parvifolia* cvs. Jacq. Allee and Drake in Lake County, Florida, and submitted for nematode certification. Initially, nematodes were extracted from soil and roots, and species identification was performed using FDACS-DPI's standard protocol for identifying *Meloidogyne enterolobii* Yang and Eisenback, 1981, a COI-based qPCR assay (Kiewnick, *et al*., 2015; Braun-Kiewnick, *et al.,* 2016) with slight modifications (Moore, *et al.,* 2020). Initial results revealed the presence of *M. enterolobii* in some, but not all, soil samples collected from *U. parvifolia*. To determine whether *U. parvifolia*, rather than weeds growing together in the pots with these elms, is indeed a host of *Meloidogyne* species including *M. enterolobii,* additional soil and root samples ($n = 3$) were collected directly from the rhizosphere of *U. parvifolia*. These samples were designated as N20-110, N20-113 (both from *U. parvifolia* cv. Allee) and N20-115 (from *U. parvifolia* cv. Drake). Round galls, resembling those commonly induced by *M. enterolobii*, were observed on secondary and tertiary roots of *U. parvifolia* cv. Allee in one of the samples; whereas, in the other *U. parvifolia* samples, the root galls were less rounded and more like those induced by other *Meloidogyne* spp. *Meloidogyne* species were identified using isozyme analyses, two qPCR assays, morphology of the perineal patterns and concatenated NADH5/COXII sequences. Samples N20-110-2B, N20-110-3B and N20-110-6B were positively identified as *M. enterolobii* from both qPCR assays. COXII sequences from the N20-110 samples were 100 percent BLASTn matches to previously published *M. enterolobii* data. Sequences from the isolates N20-115-1A, N20-115-6A, N20-115-10A, N20-115-16B, N20-113-1B, N20-113-14B and N20-113-18B were 100 percent matches to *M.*

1a - *Ulmus parvifolia* Jacq, Chinese elm cultivars Allee and Drake.
Containerized plants in a nursery.
Photo by Janete Brito, FDACS-DPI

1b - *Ulmus parvifolia* Jacq., Chinese elm 'Allee' with root galling (arrow) induced by *M. enterolobii*.
Photo by Janete Brito, FDACS-DPI

javanica (Janssen, *et al.,* 2016). Isolates N20-115-1B, N20-115-2B and N20-115-3B were 100 percent matches to *M. arenaria*. Isozyme analyses (esterase and malate dehydrogenase) and morphology of perineal patterns were consistent with those reported for *M. enterolobii* (VS1-S1; N1a) isolated singly from *U. parvifolia* cv. Allee (N20-110). *Meloidogyne javanica* (J3; N1) was also found singly on this same cultivar (N20-113), and both *M. arenaria* (A2; N1) and *M. javanica* (J3; N1) were identified as mixed species infecting *U. parvifolia* cv. Drake (N20-115). To our knowledge, this is the first report of Chinese elm as host of *M. arenaria*, *M. enterolobii* and *M. javanica* in Florida.

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Moore, M.R., Brito, J.A., Qiu, S., Roberts, C.G., and Combee, L.A. (2020). First report of *Meloidogyne enterolobii* infecting Japanese blueberry tree (*Elaeocarpus decipiens*) in Florida, USA. *Journal of Nematology* 52: 1-3. DOI: https://doi.org/10.21307/jofnem-2020-005.

COLLECTORS

Collectors submitting five or more samples processed for nematological analysis during October-December 2020.

COLLECTOR NAME	SAMPLES PROCESSED
Alford, Brian	**7**
Anderson, James	**9**
Andrews, Ethan	**5**
Bentley, Michael	**11**
Blanco, Rogelio	**165**
Boyar, Jillian	**136**
Burgos, Frank	**206**
Carbon, Peter	**6**
Clanton, Keith	**142**
Cutts, Logan	**10**
Dean, Randall	**6**
Landress, Craig	**12**
Lebron-Rivera, Karen	**6**
Rojas, Eric	**87**
Spriggs, Charles	**130**
Steinkamp, Katherine	**3**
Taylor, Donald	**10**
Terrell, Mark	**38**
Ureta-Cooper, Laura	**6**
Violet, Larry	**8**
Webb, Gary	**7**
Yates, Johnny	**9**
Youngblood, Susan	**14**
Yu, Wangze	**15**

SAMPLES FOR MORPHOLOGICAL ANALYSIS

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Multistate Certification for National and International Export	1,436	**6,769**
California Certification	352	**1,815**
Pre-movement (Citrus Nursery Certification)	92	**244**
Site or Pit Approval (Citrus Nursery and Other Certifications)	36	**155**

OTHER PURPOSES

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Identifications (Other Organisms)	0	**0**
Nematology Investigation	0	**0**
Plant Problems	31	**161**
Intrastate Survey, Random	227	**779**
Total	2,174	**9,923**

SAMPLES FOR MOLECULAR ANALYSIS

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Regulatory Purposes	115	**997**
Other Purposes	0	**0**
Identifications	0	**0**
Surveys	0	**0**
Total	115	**2,589**

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 ***Rhizobium rhizogenes*** **(Riker et al. 1930) Young et al. 2001 (crown gall), a new host record,** was submitted on *Forestieria segregata,* Florida swampprivet, from a state park. Crown galls are cancer-like tumors on plant crowns, roots or branches. Symptoms of crown gall caused by *R. rhizogenes* (formerly known as *Agrobacterium tumefaciens*) on *Forestieria* usually appear as small galls located on the terminal end of branches. *Forestiera* plants with galls have been submitted to the lab before; however, this is the first time the presence of the gall-forming bacteria has been confirmed. The submission of young galls for analysis was key to recovering the pathogen in culture.

When plants in a nursery are infected with crown gall, DPI imposes an automatic quarantine because the disease can become a serious problem quickly. Galls can interrupt nutrient and water flow, leading to symptoms of wilting and yellowing. In general, when large galls encircle the main stem of young trees, the disease can be fatal. The disease caused by this bacterium is incurable. *Rhizobium rhizogenes* spreads easily on unsanitized tools and affects the health of plants. Pruners should be sanitized after pruning symptomatic plants to prevent possible transfer of the disease to other hosts in the landscape. If a gall is noticed on a newly installed landscape plant, the plant and its surrounding soil should be removed and discarded. (Miami-Dade County; P-103548; Jake M. Farnum, USDA/CAPS, and Alex Stauber, Florida State Parks; 18 March 2020).

1 - *Rhizobium rhizogenes* (Riker et al. 1930) Young et al. 2001 (crown gall) symptoms on *Forestiera segregata*, Florida swampprivet. Small galls on branch tips.
Photo by Hector Urbina, FDACS-DPI

PLANT PATHOLOGY IDENTIFICATION TABLE

The following table provides information about samples identified between October - December 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
Dischidia pectinoides	dischidia; ant plant	*Tospovirus Tomato spotted wilt virus*	tomato spotted wilt tospovirus	nursery	105413	Lake	Mary C. Sellers	9/21/2020	host
Forestiera segregata	Florida swampprivet	*Rhizobium radiobacter*	crown gall	agricultural survey site	103548	Miami-Dade	Jake M. Farnum	3/18/2020	host
Genipa clusiifolia	seven-year apple	*Septophoma chromolaenae*	fungus	nursery	104592	Miami-Dade	Suhayla E. Carrasquilla	7/8/2020	county, host
Hemianthus callitrichoides	dwarf baby tears	*Athelia rolfsii*	southern blight	nursery	105494	Hillsborough	Jose L. Llano	9/30/2020	host
Hibiscus rosa-sinensis	hibiscus	*Cilevirus CiLV-C2H*	hibiscus-infecting cilevirus	residential	105326	Sarasota	Juan Amador	9/9/2020	county
Hydrangea sp.	hydrangea	*Carlavirus Hydrangea chlorotic mottle virus*	hydrangea chlorotic mottle virus	nursery	105785	Martin	Leann M. West, Cheryl A. Jones, Matt M. Miller, Charles Gonzales	11/9/2020	state
Jasminum sambac	Arabian jasmine	*Pelarspovirus Jasmine virus H*	virus	residential	105764	Miami-Dade	Nora Garcia	10/30/2020	county
Orthosiphon aristatus	cat's-whiskers; Java tea	*Cucumovirus cucumber mosiac virus*	cucumber mosiac virus	residence	105424	Alachua	Maria C. Velez-Climent	9/23/2020	host
Psidium cattleianum	cattley guava; strawberry guava	*Nemania abortiva*	wood-decay fungus	roadside	105558	Palm Beach	Sydney Jimenez	10/6/2020	host
Smilax sp.	greenbriar	*Dichorhavirus orchid fleck virus*	orchid fleck virus	business landscape	105490	Alachua	Kishore Dey, Maria C. Velez-Climent	8/18/2020	host
Spinach oleracea	spinach	*Pythium aphanidermatum*	root and crown rot	nursery	105633	Palm Beach	nursery employee	10/20/2020	host

QUARTERLY ACTIVITY REPORT

	OCTOBER - DECEMBER	2020 - YEAR TO DATE
Budwood	0	**0**
Citrus black spot	26	**374**
Citrus canker	38	**303**
Citrus greening / HLB	3,627	**8,587**
Honeybees	0	**3**
Interdictions	9	**89**
Laurel wilt	1	**4**
Pathology, general	702	**3,027**
Soil	8	**90**
Sudden oak death	0	**1**
Sweet orange scab-like disease	2	**2**
Texas phoenix palm decline	4	**44**
Water	0	**0**
Totals	4,418	**12,530**

FROM THE EDITOR

By Patti J. Anderson

Inquiring minds want to know…about the Division of Plant Industry Herbarium.

On December 1, 2020, the DPI herbarium (internationally recognized by the acronym PIHG) added accession number 15,000. Each mounted plant specimen is given an accession number as it is added to the herbarium collection. This milestone marks an increasing rate of acquisition for the herbarium. Accession number 10,000 was added on January 9, 2008. Dates of accession were not recorded on early data systems, but the herbarium was established in 1964.

You might be interested in a bit of DPI herbarium history. The Botany Section is much younger than the division as a whole. In the early 1960s, Dr. Kenneth R. Langdon, a DPI nematologist who had expert knowledge of native and cultivated plants, began to receive more and more questions concerning botany, and in 1963, he was put in charge of a new Office of Systematic Botany. In 1964, Dr. Langdon established the DPI Herbarium to provide specimens for use in identifying and verifying plant samples. Plant identifications are the primary service provided by the Botany Section. The botanists identify or verify scientific names of plant specimens for the Entomology, Plant Pathology and Nematology sections as well as plant samples sent directly to the Botany Section from DPI, other agencies and the general public. To assist in these identifications, the botanists collect native and cultivated plants for the DPI herbarium. It took the herbarium 44 years to go from zero to 10,000 specimens; then 12 years to reach 15,000 specimens. We look forward to expanding the collection in the future while maintaining its quality and usefulness.

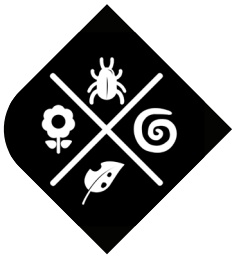
Dr. Langdon retired in 1991 and Dr. Nancy C. Coile took his place. Dr. Coile retired in 2002 and was followed by Mr. Mark Garland. Dr. Richard Weaver took over the section in 2004 and then retired in 2010. Both Dr. Langdon and Dr. Weaver are now deceased. Today, the Botany Section is headed by Dr. Patti Anderson who assumed this position in 2010.

***Chrysopsis gossypina* Accession # 15,000**
Photo by Alex de la Paz, FDACS-DPI

***Lobelia glandulosa* Accession # 10,000**
Photo by Jeffrey Lotz, FDACS-DPI

***Torreya taxifolia*, an endangered species, Accession # 169**
Photo by Georgeanne Paris, FDACS-DPI

Botanist Alex de la Paz adding Accession #15,000 to the herbarium shelves
Photo by Patti Anderson, FDACS-DPI



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