



# TRI-OLGY

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

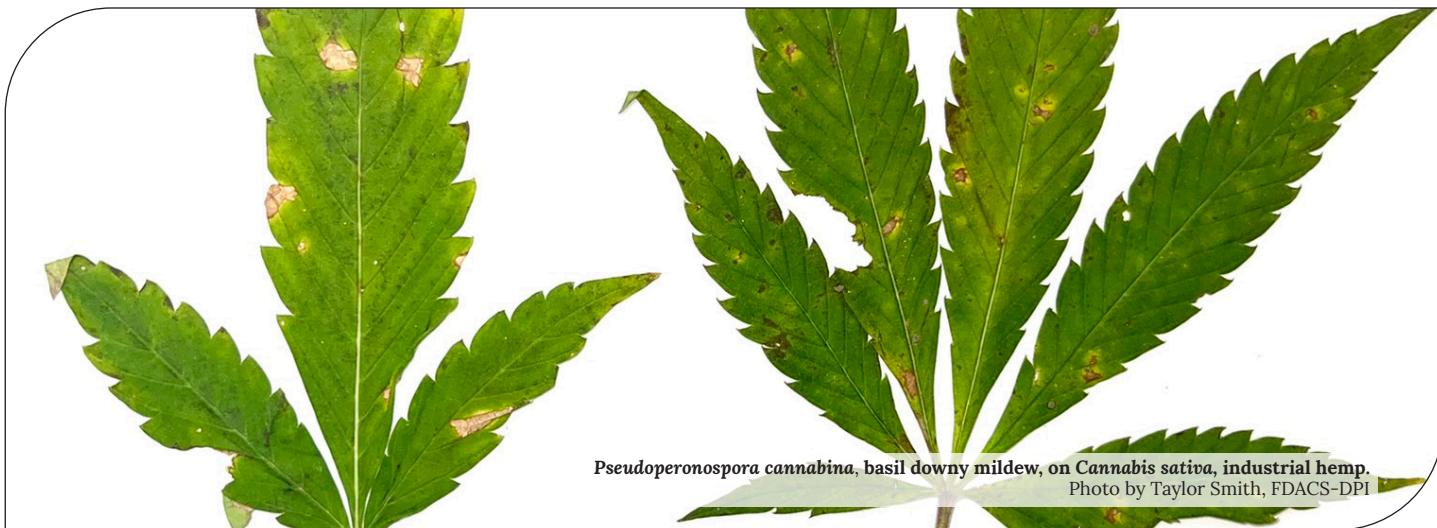
Providing certification programs and  
diagnoses of plant problems



## PLANT PATHOLOGY

Offering plant disease diagnoses  
and information





## 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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## ACKNOWLEDGEMENTS

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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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Cover Photo

*Aleuroglandulus subtilis*, a whitefly, adults, nymphs and eggs.  
Photo by Erin Powell, FDACS-DPI





## HIGHLIGHTS

**1 *Eichhornia crassipes* (Mart.) Solms (common water hyacinth), a new Florida County record.** This species is native to the Amazon Basin in northern South America from Venezuela to Brazil but has been naturalized throughout the tropics and subtropics and even some warm temperate areas. It is among the worst aquatic weeds.

**2 *Aleuroglandulus subtilis* Bondar, a whitefly, a new Florida County record.** A heavy infestation of *Aleuroglandulus subtilis* was found on *Xanthosoma sagittifolium* (arrowleaf elephant ear) in a residential area of Pasco County.

**3 *Paratylenchus aquaticus* Merny, 1966**, the pin nematode, was detected in the rhizosphere of *Stenotaphrum secundatum* (Walter) Kuntze (St. Augustine grass) and *Zoysia* sp. (Zoysia grass), a new Florida County record for Collier County. Pin nematodes (*Paratylenchus* spp.) are commonly associated with turf grasses in Florida lawns. The potential damaging effects of *P. aquaticus* infestation on turf grasses have not yet been assessed.

**4 *Pseudoperonospora cannabina* (G.H. Otth) Curzi (basil downy mildew), a new Florida State record,** was found on outdoor grown *Cannabis sativa* L. (industrial hemp variety Maverick) at a farm in Hendry County.



1 - *Eichhornia crassipes*, common water hyacinth, stranded by low water levels.  
Photo by Michael Meads, [Atlas of Florida Plants](#)



2 - *Aleuroglandulus subtilis*, a whitefly, adults, nymphs and eggs.  
Photo by Erin Powell, FDACS-DPI



3 - *Paratylenchus aquaticus* from Florida.  
Photo by Silvia Vau, FDACS-DPI



4 - *Pseudoperonospora cannabina*, basil downy mildew, on *Cannabis sativa*, industrial hemp, showing advanced symptoms.  
Photo by Taylor Smith, 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 16,000 plants and 1,400 vials of seeds.

### QUARTERLY ACTIVITY REPORT

	JULY - SEPTEMBER	2022 - YEAR TO DATE
Samples Submitted by Other DPI Sections	1,028	3,566
Samples Submitted for Botanical Identification Only	169	772
Total Samples Submitted	1,397	4,538
Specimens Added to the Herbarium	330	995

Some of the samples submitted recently are described below.

**1 *Eichhornia crassipes* (Mart.) Solms (common water hyacinth)** from a genus of seven, mainly tropical, species, in the plant family Pontederiaceae; however, recent work suggests the species should be included in the genus *Pontederia*. This species is native to the Amazon Basin in northern South America from Venezuela to Brazil but has become naturalized throughout the tropics and subtropics and even some warm temperate areas. In the United States, it has been reported from New York to Florida, throughout the Southeast to Texas and in several western counties scattered from Arizona to Washington. Water hyacinth was introduced to the United States in 1884 at the Cotton States Exposition as an aquatic ornamental and forage crop, then to Florida soon afterward. Since that introduction, the plant has been documented in 45 Florida counties from Escambia to Miami-Dade where it is found clogging ponds, lakes, streams and sloughs with dense mats of floating vegetation. This sample is a new record for Nassau County. Although the plants are usually free-floating, they can become stranded in mud and continue to grow during times of lowered water levels.

This species produces leaves in circular clusters (rosettes) at the base of the plant with little or no stem between the roots and leaves. The individual rosettes are connected by very short, horizontal stems called stolons or runners, adding to their ability to form mats. Long, dark, feathery roots hang from the rosettes and stolons. The leaf petioles are usually short, bulbous and spongy (acting as flotation devices) or tall and slender, ranging from 3-30 cm long. The leaf blades range from



1a - *Eichhornia crassipes*, common water hyacinth, flowers.  
Photo from Shutterstock



1b - *Eichhornia crassipes*, common water hyacinth, roots, longitudinally sliced petiole, petiole cross-section and leaf.  
Photo by Jeffrey Lotz, FDACS-DPI



kidney shaped to almost round in outline. They are leathery, glabrous and glossy with numerous closely spaced veins. The inflorescence is a spike, up to 15 cm long, rising above the foliage, with four to 15 spirally arranged flowers. The showy lavender to blue (rarely pink) flowers have six fused tepals (three petal-like sepals and three petals). The uppermost of these is striking with a darker blue or purplish splotch surrounding a bright yellow spot. Each flower has six stamens. The fruit is a capsule (10-15 mm long) with hundreds of tiny (about 1 mm long), ribbed seeds. The plant can reproduce both by seeds and vegetatively as the runners grow across the water surface and produce new rosettes. (Nassau County; 09122022-08267; Lisa Tyler; 9 September 2022.) (Mabberley, 2017; ; Simberloff, et al., 1997; Wunderlin and Hansen, 2011; [Eichhornia crassipes - Species Page - ISB: Atlas of Florida Plants \(usf.edu\)](#) [accessed 11 October 2022]; [Eichhornia crassipes \(Waterhyacinth\) : USDA ARS](#) [accessed 11 October 2022]; [http://floranorthamerica.org/Eichhornia\\_crassipes](http://floranorthamerica.org/Eichhornia_crassipes) [accessed 12 October 2022]; [USDA Plants Database](#) [accessed 11 October 2022].)

**2** *Cyperus rotundus* L. (**purple nutsedge**), from a genus of 600-700 species of tropical and warm temperate areas around the world, in the plant family Cyperaceae. This species is native to tropical and subtropical regions of the Old World, principally Africa and Eurasia, but has spread to become one of the world's worst weeds. This weed has been reported in more than 90 countries, infesting at least 52 different crops worldwide. It can be found in a wide variety of habitats including cultivated fields, gardens, waste areas, roadsides, pastures, lawns, fields, river and stream shores, irrigation channels and other disturbed areas. Plants are perennial herbs with underground stolons bearing tubers capable of vegetative reproduction, making them very difficult to control once established. The three-angled stems grow from swollen bases up to 60 cm in height. The leaves are linear, with a distinct midvein, and are arranged in three ranks along the stem. The inflorescence is a terminal, open umbel subtended by several leafy bracts. The umbel is composed of spikes that in turn are composed of spikelets. The spikelets are linear and compressed, with purple to reddish brown floral scales arranged in two ranks along the rachilla, each subtending a single flower. The flowers are wind pollinated and eventually give rise to small, black, ellipsoid, 3-angled achenes (indehiscent, single-seeded, dry fruits). The sample submitted for identification this reporting period is a new county record for Brevard County. (Brevard County; B2022-633; Chase Groninger; 17 July 2022.) (Holm, et al., 1977; Tucker, et al., 2002; Weakley, 2022; Wunderlin and Hansen, 2011.)



2 - *Cyperus rotundus*, purple nutsedge.  
Photo by Bob Upcavage, [Atlas of Florida Plants](#)

## REFERENCES

- Holm, L.G., Plucknett D.L., Pancho J.V. and Herberger, J.P. (1977).** *The world's worst weeds: distribution and biology.* University Press of Hawaii, Honolulu, Hawaii.
- Mabberley, D.J. (2017).** *Mabberley's plant-book: a portable dictionary of plants, their classification and uses* (4th edition). Cambridge University Press, New York, New York.
- Simberloff, D., Schmitz, D.C., Brown, T.C. and Wilson, E.O. (1997).** *Strangers in paradise: impact and management of nonindigenous species in Florida.* Island Press, Washington, DC.
- Tucker, G.C., Marcks, B.G. and Carter, J.R. (2002).** *Cyperus.* In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America north of Mexico [Online]. 22+ vols. New York and Oxford. Vol. 23. <http://floranorthamerica.org/Cyperus> [accessed 13 October 2022].
- Weakley, A.S. and Southeastern Flora Team (2022).** *Flora of the southeastern United States.* University of North Carolina Herbarium, North Carolina Botanical Garden, Chapel Hill, North Carolina.
- Wunderlin, R.P. and Hansen, B.F. (2011).** *Guide to the vascular plants of Florida,* 3rd edition. University Press of Florida, Gainesville, Florida.



## ⊕ BOTANY IDENTIFICATION TABLE

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

COLLECTOR NAME	COLLECTOR 2	LIST NUMBER	RECEIVED DATE	PLANT NAME	COUNTY
Alexa Barrios		8269	9/14/2022	<i>Dioscorea bulbifera</i>	Dixie
Alexa Barrios		8412	9/15/2022	<i>Dioscorea bulbifera</i>	Taylor
Alexa Barrios	Kelly Douglas	8387	9/14/2022	<i>Euphorbia cyathophora</i>	Columbia
Alexa Barrios	Kelly Douglas	8390	9/14/2022	<i>Ipomoea quamoclit</i>	Suwannee
Alexa Barrios	Kelly Douglas	8391	9/14/2022	<i>Sesbania herbacea</i>	Suwannee
Austin Hawes		8721	9/27/2022	<i>Fatoua villosa</i>	Bay
Austin Hawes		8346	9/15/2022	<i>Solanum viarum</i>	Walton
Chase Groninger		6648	7/22/2022	<i>Asclepias perennis</i>	Brevard
Chase Groninger		6548	7/19/2022	<i>Cyperus rotundus</i>	Brevard
Chase Groninger		6646	7/22/2022	<i>Platanthera flava</i>	Brevard
Colton Striker		8388	9/16/2022	<i>Syngonium podophyllum</i>	Polk
David Brown		8305	9/14/2022	<i>Cenchrus echinatus</i>	Putnam
Deann Hansen		6130	7/6/2022	<i>Asclepias curtissii</i>	Volusia
Deann Hansen		6563	7/20/2022	<i>Carya glabra</i>	Putnam
Deann Hansen		7150	8/9/2022	<i>Crotalaria lanceolata</i>	Flagler
Deann Hansen		8724	9/27/2022	<i>Indigofera hirsuta</i>	Flagler
Deann Hansen		7917	9/2/2022	<i>Mitracarpus hirtus</i>	Volusia
Deann Hansen		8725	9/27/2022	<i>Rhynchosia minima</i>	Flagler
Deann Hansen		6030	7/1/2022	<i>Silphium compositum</i>	Volusia
Deann Hansen		6301	7/14/2022	<i>Vitex trifoliata</i>	Flagler
Diane McColl		6371	7/14/2022	<i>Ricinus communis</i>	Flagler
Ethan Kelly		7011	8/3/2022	<i>Aralia spinosa</i>	Santa Rosa
Ethan Kelly		7291	8/11/2022	<i>Clerodendrum bungei</i>	Okloosa
Ethan Kelly		7232	8/10/2022	<i>Desmodium paniculatum</i>	Santa Rosa
Ethan Kelly		8406	9/16/2022	<i>Laportea aestuans</i>	Santa Rosa
Ethan Kelly		7013	8/3/2022	<i>Mikania scandens</i>	Santa Rosa
Ethan Kelly		7292	8/11/2022	<i>Mirabilis jalapa</i>	Okloosa
Ethan Kelly		7234	8/10/2022	<i>Tradescantia ohiensis</i>	Santa Rosa
Jennifer Hesse		8304	9/14/2022	<i>Clerodendrum indicum</i>	Flagler
Jennifer Hesse		8746	9/27/2022	<i>Smilax bona-nox</i>	Seminole
Jennifer Hesse		7084	8/8/2022	<i>Smilax tamnoides</i>	Flagler
Lisa Tyler		8267	9/13/2022	<i>Eichhornia crassipes</i>	Nassau
Nora Marquez	Stephen Jenner	7690	8/24/2022	<i>Commelinia benghalensis</i>	Sumter
Rachel Conklin		7697	8/24/2022	<i>Mirabilis jalapa</i>	Volusia
Rachel Conklin		8116	9/8/2022	<i>Sarcostemma clausum</i>	Volusia
Shanelle Mulrooney		6450	7/15/2022	<i>Senna alata</i>	Pasco





## 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.

	JULY - SEPTEMBER	2022 - YEAR TO DATE
Samples Submitted	1,187	<b>4,298</b>
Lots Identified	1,774	<b>6,227</b>

**1 Aleuroglandulus subtilis Bondar, a whitefly, a new Florida County record.** A heavy infestation of *Aleuroglandulus subtilis* was found on *Xanthosoma sagittifolium* (arrowleaf elephant ear) in a residential area of Pasco County. Originally described from Brazil, this neotropical whitefly has been known from Florida since the 1920s; however, it is rarely submitted for identification. In Florida, it is most frequently found on aroids (Araceae) including *Xanthosoma sagittifolium*, *Alocasia macrorrhizos* and *Caladium bicolor*, but it is recorded on at least nine additional plant host families across its distribution range. At high densities, this species can become a pest. The pupae (4<sup>th</sup> instar nymphs) of this species are easily distinguished by the two curved pairs of wide glassy wax tubes that project from the dorsum. (Pasco County; E4028-01-08152022-07421; Erin Powell; 15 August 2022.) (Dr. Erin C. Powell.)



1 - *Aleuroglandulus subtilis*, a whitefly, late pupae (4<sup>th</sup> instar nymph) showing the characteristic glassy wax tubes.  
Photo by Erin Powell, FDACS-DPI

**2 Nipaecoccus viridis (Newstead), lebbeck mealybug, a new Florida Host record and new Florida County record.** Although well known as a citrus pest, this Old-World species has spread to various hosts across plant families including blueberries (*Vaccinium* sp.), *Gardenia* (Gardenia sp.), firespike (*Odontonema* sp.), hemp (*Cannabis sativa* L.) and now, for the first time in Florida, cotton (*Gossypium* sp.). This severe infestation was found in a college campus garden in Pinellas County. Infestations of lebbeck mealybug are characterized by clusters of spherical white to yellow wax containing purple bodies and eggs, bleeding red when crushed. Keep an eye out for this quarantinable pest, as it has shown a propensity to spread since its proliferation in Florida in 2019 with little host preference. (Pasco County; E4169-08242022-07722; Douglas Restom-Gaskill; 19 August 2022.) (Lily A. Deeter.)



2 - *Nipaecoccus viridis* (Newstead), lebbeck mealybug, infestation on cotton leaf.  
Photo by Erin Powell, FDACS-DPI



## 🔍 ENTOMOLOGY SPECIMEN REPORT

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

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

PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Achillea</i> sp.	yarrow	<i>Phenacoccus sisymbriifolium</i>	mealybug	Mary Sellers	New Florida host record
<i>Adenium obesum</i>	desert rose	<i>Pseudaulacaspis pentagona</i>	white peach scale	Victoria Benjamin, Chase Groninger	New Florida host record
<i>Amaranthus hybridus</i>	green amaranth, pigweed, slim amaranth, smooth pigweed	<i>Micrutalis calva</i>	treehopper	Alexander Tasi	New Florida host record
<i>Asplenium erosum</i>	eared spleenwort	<i>Ceroplastes rubens</i>	red wax scale	Leicet Diaz Varona, Chantelle Viloria, Juan Aleman Martinez	New Florida host record
<i>Bidens alba</i>	beggarticks, romerillo	<i>Dysmicoccus brevipes</i>	pineapple mealybug	Trudi Deuel	First in County
<i>Bidens alba</i>	beggarticks, romerillo	<i>Phenacoccus sisymbriifolium</i>	mealybug	Trudi Deuel	First in County
<i>Brassica rapa</i>	napa cabbage	<i>Lygus elisus</i>	pale legume bug	Ryan Brown	Regulatory significant
<i>Capsicum annuum</i>	pepper	<i>Bactericera cockerelli</i>	potato psyllid	Logan Cutts	Regulatory significant
<i>Celtis laevigata</i>	hackberry	<i>Ceroplastes ceriferus</i>	Indian wax scale	Trudi Deuel	New Florida host record
<i>Cichorium endivia</i>	endive	<i>Frankliniella brunneri</i>	thrips	Ryan Brown	Regulatory significant
<i>Citrus</i> sp.	citrus	<i>Fiorinia proboscidaria</i>	snout scale	Edgardo Luiggi	First in County
<i>Coccoclopa uvifera</i>	seagrape	<i>Hemeroblemma opigena</i>	erebid moth	Cristina Urbina	First in County
<i>Cordia sebestena</i>	Geiger tree, orange Geiger tree, largeleaf Geiger tree, scarlet cordia	<i>Physonota calochroma</i>	Geiger tree tortoise beetle	Chase Groninger, Victoria Benjamin	First in County
<i>Cupaniopsis anacardiooides</i>	carrotwood	<i>Petrusa epilepsis</i>	seagrape flatid planthopper	Miguel Hernandez	New Florida host record
<i>Cynodon</i> sp.	Bermuda grass	<i>Brevennia rehi</i>	tuttle mealybug	Nursery Employee	First in County
<i>Dracaena sanderiana</i>	Belgian evergreen, lucky bamboo	<i>Lepidosaphes chinensis</i>	armored scale	Luz Salinas, Shannan Webb	Regulatory significant
<i>Dypsis lutescens</i>	areca palm, yellow butterfly palm, golden cane palm, Madagascar palm	<i>Aspidiella sacchari</i>	sugarcane scale	Leicet Diaz Varona	New Florida host record
<i>Gossypium</i> sp.	cotton	<i>Nipaecoccus viridis</i>	lebbeck mealybug	Douglas Restom-Gaskill	New Florida host record; First in County
Gramineae	grass	<i>Antonina graminis</i>	Rhodes grass mealybug	Kyle Schnepp	First in County
Gramineae	grass	<i>Odonaspis ruthae</i>	Bermuda grass scale	Lily Deeter, Kyle Schnepp, Paul Skelley, Trudi Deuel	First in County
<i>Hibiscus syriacus</i>	rose of Sharon, althaea	<i>Pectinophora gossypiella</i>	pink bollworm moth	Kevin Cloonan	Quarantine pest; Regulatory significant
<i>Hoya</i> sp.	hoya	<i>Thrips parvispinus</i>	thrips	Mary Sellers	First in County
<i>Hypericum tetrapetalum</i>	four-petal St. John's wort	<i>Icerya purchasi</i>	cottony cushion scale	Kyle Schnepp, Alex de la Paz, Lily Deeter	New Florida host record
<i>Jatropha integerrima</i>	peregrina	<i>Coccus capparidis</i>	capparis soft scale	Caleb Poock	First in County
<i>Justicia brandegeana</i>	shrimp plant, false hops, Mexican shrimp plant	<i>Paracoccus marginatus</i>	papaya mealybug	Colton Striker	New Florida host record
<i>Lactuca sativa</i>	red leaf lettuce	<i>Ceratagallia longula</i>	leafhopper	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Hyadaphis foeniculi</i>	honeysuckle aphid	Logan Cutts	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Liriomyza langei</i>	California pea leafminer	Logan Cutts	Regulatory significant



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Lactuca sativa</i>	red leaf lettuce	<i>Liriomyza langei</i>	California pea leafminer	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Liriomyza langei</i>	California pea leafminer	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Lygus elisus</i>	pale legume bug	Logan Cutts	Regulatory significant
<i>Lactuca sativa</i>	lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Ryan Brown	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts	Regulatory significant
<i>Lactuca sativa</i>	romaine lettuce	<i>Nasonovia ribisnigri</i>	currant-lettuce aphid	Logan Cutts	Regulatory significant
<i>Microsorum sp.</i>	serpent fern; wart fern	<i>Rhipiphorothrips pulchellus</i>	thrips	Colton Striker	Regulatory significant
<i>Microsorum sp.</i>	serpent fern; wart fern	<i>Rhipiphorothrips pulchellus</i>	thrips	Alexander Tasi, Noemi Negron	Regulatory significant
<i>Morus rubra</i>	red mulberry	<i>Pulvinaria psidii</i>	green shield scale	Austin Hawes	First in County; New Florida Host Record
<i>Muhlenbergia capillaris</i>	hairawn muhly	<i>Stemmatomerinx acircula</i>	mealybug	Lily Deeter	First in County
<i>Nepenthes sp.</i>	pitcher plant	<i>Chrysomphalus aonidum</i>	Florida red scale	Howard Wallace	New Florida host record
<i>Persea americana</i>	avocado	<i>Acutaspis albopicta</i>	albopicta scale	Ryan Brown	Regulatory significant
<i>Persea americana</i>	avocado	<i>Davidsonaspis aguacatae</i>	armored scale	Ryan Brown	Regulatory significant
<i>Persea americana</i>	avocado	<i>Davidsonaspis aguacatae</i>	armored scale	Ryan Brown	Regulatory significant
<i>Persicaria glabra</i>	smartweed	<i>Hemiberlesia lataniae</i>	latania scale	Susan Halbert	New Florida host record
<i>Persicaria odorata</i>	Vietnamese cilantro	<i>Paracoccus marginatus</i>	papaya mealybug	Susan Halbert	New Florida host record
<i>Persicaria odorata</i>	Vietnamese cilantro	<i>Phenacoccus madeirensis</i>	Madeira mealybug	Susan Halbert	New Florida host record
<i>Persicaria odorata</i>	Vietnamese cilantro	<i>Pseudococcus sorghiellus</i>	trochanter mealybug	Susan Halbert	New Florida host record
<i>Physalis philadelphica</i>	Mexican groundcherry	<i>Bactericera cockerelli</i>	potato psyllid	Logan Cutts	Regulatory significant
<i>Physalis philadelphica</i>	Mexican groundcherry	<i>Bactericera cockerelli</i>	potato psyllid	Alexander Tasi, Noemi Negron	Regulatory significant
<i>Physalis philadelphica</i>	Mexican groundcherry	<i>Euschistus biformis</i>	stink bug	Alexander Tasi, Noemi Negron	Regulatory significant
<i>Pilea microphylla</i>	artillery plant	<i>Nipaecoccus viridis</i>	Lebbeck mealybug	Lauren Diepenbrock	New Florida host record
<i>Pinus elliottii</i>	slash pine	<i>Oracella acuta</i>	loblolly mealybug	Scott Weihman	First in County
<i>Pinus elliottii</i>	slash pine	<i>Pseudophilippia quaintancii</i>	woolly pine scale	Scott Weihman	First in County
<i>Pittosporum sp.</i>	pittosporum	<i>Cacopsylla tobirae</i>	pittosporum psyllid	Kenneth Ellis	Regulatory significant
<i>Pittosporum tobira</i>	pittosporum	<i>Cacopsylla tobirae</i>	pittosporum psyllid	Employee	Quarantine pest
<i>Puya mirabilis</i>	puya bromeliad	<i>Palmicultor lumpurensis</i>	mealybug	Erin Powell, Trudi Deuel, Lily Deeter	New Florida host record
<i>Raphanus sativus</i>	radish	<i>Liriomyza langei</i>	California pea leafminer	Jakira Davis, Eric Dougherty	Regulatory significant
<i>Rubus sp.</i>	raspberry	<i>Amphorophora sp.</i>	aphid	Alexander Tasi	Regulatory significant
<i>Smilax auriculata</i>	earleaf greenbrier	<i>Ferrisia gilli</i>	Gill's mealybug	Erin Powell	New Florida Host Record
<i>Smilax sp.</i>	smilax	<i>Melanaspis smilacis</i>	smilax scale	Kyle Schnepf	First in County
<i>Sporolobus indicus</i>	smut grass	<i>Neomegamelanus spartini</i>	delphacid planthopper	Alexander Tasi	First in County
<i>Thalia geniculata</i>	bent alligatorflag	<i>Namacus annulicornis</i>	coreid bug	Jeanie Frechette, Teresa Ortelli	First in County
<i>Tibouchina aspera</i>	tibouchina	<i>Dolichothrips indicus</i>	thrips	Alexandra Revynthi	First in County
<i>Triadica sebifera</i>	Chinese tallow tree	<i>Ceroplastes rusci</i>	fig wax scale	Alyssa Lucas	New Florida Host Record



PLANT SPECIES	PLANT COMMON NAME	ARTHROPOD GENUS AND SPECIES	ARTHROPOD COMMON NAME	COLLECTOR	RECORD
<i>Turnera ulmifolia</i>	yellow alder, ramgoat dashalong, buttercup bush, Brazilian buttercup	<i>Corythaica carinata</i>	lace bug	Stephen Bonstedt	First in County
<i>Xanthosoma sagittifolium</i>	malanga, elephant's ear, arrowleaf elephant ear, tannia, yautia	<i>Aleuroglandulus subtilis</i>	whitefly	Erin Powell	First in County
		<i>Acrolophus walsinghami</i>	tribble moth	James Hayden and James T. Brown	First in County
		<i>Aneurus leptocerus</i>	flat bug	Douglas Restom-Gaskill	First in County
		<i>Curtara insularis</i>	ringspot leafhopper	Krystal Ashman and Robert Leahy	First in County
		<i>Elaphothrips tuberculatus</i>	thrips	Douglas Restom-Gaskill	First in County
		<i>Emesopsis nubilus</i>	assassin bug	Monica Triana	First in County
		<i>Empicoris rubromaculatus</i>	assassin bug	Robert Leahy, Krystal Ashman	First in County
		<i>Enzytatus modestus</i>	tomato bug	Krystal Ashman and Robert Leahy	First in County
		<i>Glycaspis brimblecombei</i>	red gum lerp psyllid	Scott Weihman	First in County
		<i>Heteropsylla quassiae</i>	legume psyllid	Douglas Restom-Gaskill	First in County
		<i>Opsiplanon luella</i>	achilid planthopper	Monica Triana	First in County
		<i>Pareuidella triloba</i>	delphacid planthopper	Douglas Restom-Gaskill	First in County
		<i>Perigenes similis</i>	rhyparochromid seed bug	Monica Triana	First in County
		<i>Scaphytopius frontalis</i>	leafhopper	Krystal Ashman and Robert Leahy	First in County
		<i>Sinomegoura citricola</i>	aphid	Scott Weihman	First in County
		<i>Sophonia orientalis</i>	two spot leafhopper	Krystal Ashman and Robert Leahy	First in County
		<i>Sophonia orientalis</i>	two spot leafhopper	Robert Leahy, Krystal Ashman	First in County
		<i>Stenopoda cinerea</i>	assassin bug	Catherine Turner	First in County
		<i>Stobaera tricarinata</i>	delphacid planthopper	Robert Leahy, Krystal Ashman	First in County
		<i>Xestocephalus subtessellatus</i>	leafhopper	Douglas Restom-Gaskill	First in County





## NEMATOLOGY

Compiled by Renato N. Inserra, Ph.D.; Sergio Álvarez-Ortega, Ph.D.; Jason D. Stanley, M.S.; Silvia Vau, Ph.D.; Janete Brito, Ph.D. and Lucas Dombeck, 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

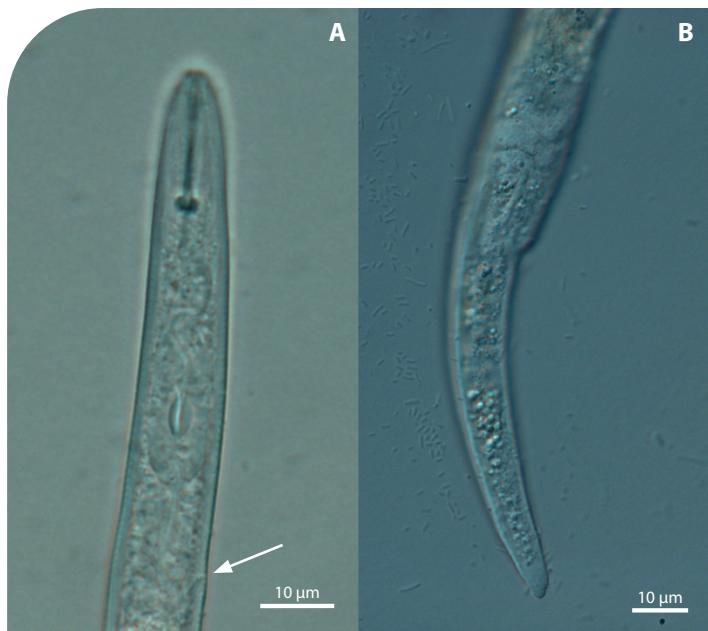
	JULY - SEPTEMBER	2022 - YEAR TO DATE
Morphological Identifications	3,692	<b>10,803</b>
Molecular Identifications *	295	<b>1,636</b>
Total Identifications	3,987	<b>12,439</b>

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

### Nematode of Special Interest

**1** The pin nematode, *Paratylenchus aquaticus* Merny, 1966, was detected in the rhizosphere of *Stenotaphrum secundatum* (Walter) Kuntze (St. Augustine grass) and *Zoysia* sp. (Zoysia grass), a new Florida County record, in Felda, Florida. (Collier County; 02172022-01298 and 01312; Jason Stanley; 17 February 2022.)

Pin nematodes (*Paratylenchus* spp.) are commonly associated with turf grasses in Florida lawns. Christie (1959) observed symptoms of root parasitization of St. Augustine grass caused by these nematodes in a lawn in Leesburg. In 1973, Esser recorded a population of pin nematodes identified as *Paratylenchus aquaticus* Merny, 1966, from samples of mixed grasses collected in Silver Springs; however, this report cannot be confirmed because morphological data are not available. During a nematode survey in a sod farm in Felda, pin nematodes were detected in root samples from St. Augustine and Zoysia grasses. Another population having similar morphological characteristics was found infesting St. Augustine grass in a sod farm located in Okeechobee, Florida. The morphology and morphometrics of these two populations matched those of the original population of *P. aquaticus* described by Merny (1966) from the Ivory Coast. Studies conducted by Van den Berg, et al. (2014) show *P. aquaticus* is a complex species consisting of populations differing morphologically and molecularly. Morphological and phylogenetic analyses using D2-D3 of the 28SrRNA, ITS rRNA and COI gene sequences are in progress to clarify the taxonomic status of these Florida populations of *P. aquaticus*. Biological observations of Florida *P. aquaticus* suggest this species has endoparasitic migratory habits. The frequent detection of *P. aquaticus* in the roots of St. Augustine grass indicates this species has been spread in Florida with



1 - *Paratylenchus aquaticus* from Florida. Anterior (A) and posterior body (B) of female. Excretory pore arrowed.  
Photo Silvia Vau and Scott Burton, FDACS-DPI



nematode-infested fresh sod cuts. We cannot exclude the possibility that the pin nematodes detected by Christie in St. Augustine grass roots were *P. aquaticus*. The potential damaging effects of *P. aquaticus* infestation on turf grasses have not been assessed.

## REFERENCES

- Christie, J.R. (1959).** *Plant nematodes: their bionomics and control.* Agricultural Experiment Station, University of Florida, Gainesville.
- Merny, G. (1966).** Nématodes d'Afrique tropicale: un nouveau *Paratylenchus* (Criconematidae), deux nouveaux *Longidorus* et observations sur *Longidorus laevicapitatus* Williams, 1959 (Dorylaimidae). *Nematologica* 12: 385-395.
- Van den Berg, E, Tiedt, L.R. and Subbotin, S.A. (2014).** Morphological and molecular characterisation of several *Paratylenchus* Micoletzky, 1922 (Tylenchida: Paratylenchidae) species from South Africa and USA, together with some taxonomic notes. *Nematology* 16: 323-358.

## SAMPLES FOR MORPHOLOGICAL ANALYSIS Certifications, Regulatory and Other Purposes

	JULY - OCTOBER	2022 - YEAR TO DATE
Total	2,892	8,630

## SAMPLES FOR MOLECULAR ANALYSIS Certifications, Regulatory and Other Purposes

	JULY - OCTOBER	2022 - YEAR TO DATE
Total	295	1,636





## PLANT PATHOLOGY

Compiled by Hector Urbina, Ph.D.; Jodi Hansen, M.S. and Taylor Smith, B.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 *Pseudoperonospora cannabina* (G.H. Otth) Curzi (basil downy mildew), a new Florida State record**, was found on outdoor grown *Cannabis sativa* L. (industrial hemp variety Maverick) at a farm in Hendry County. Submitted foliar samples showed a progression of symptoms beginning with the adaxial surface displaying widespread, vein delimited, angular, yellow lesions and the abaxial surface showing copious, dark sporulation. Symptoms advanced to lesion necrosis and leaf senescence. (Hendry County; 06032022-05043; Grower; 3 June 2022.)



1a - *Pseudoperonospora cannabina*, basil downy mildew, on *Cannabis sativa*, industrial hemp.  
Photo by Taylor Smith, FDACS-DPI



1b - *Pseudoperonospora cannabina*, basil downy mildew, on *Cannabis sativa*, industrial hemp, showing advanced symptoms.  
Photo by Taylor Smith, FDACS-DPI



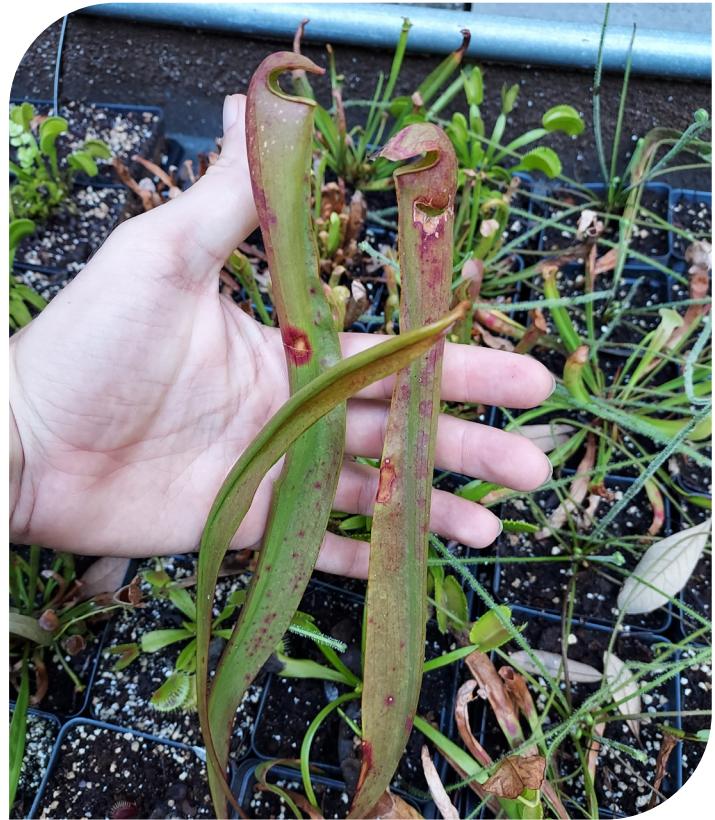
1c - *Pseudoperonospora cannabina*, basil downy mildew, dark sporulation on abaxial surface of leaf.  
Photo by Hector Urbina, FDACS-DPI



**2** *Calonectria amazonica* L. Lombard & Crous (**leaf spot**), a new Florida Host record, was detected on *Sarracenia* sp. (pitcher plant) at a residence in Hillsborough County. Pitcher plants, usually found growing in nutrient-poor bog soils, are carnivorous. Flies are attracted to the plant's hollow leaves called pitchers. Inside the pitchers, bacterial enzymes digest the flies. Digested flies serve as a major source of nitrogen for the plant. Disease symptoms present first on the tops of the pitchers as red, circular, less than 1 mm leaf spots. As the disease progresses, the spots expand, becoming more irregular in outline and developing tan centers. Eventually the entire pitcher becomes blighted from lesion expansion. (Hillsborough County; 08172022-07499; Howard Wallace; 17 August 2022.) (<https://www.sciencedirect.com/science/article/pii/S0166061616300185> [accessed 2022 October 17].)

#### QUARTERLY ACTIVITY REPORT

	JULY - SEPTEMBER	2022 - YEAR TO DATE
Citrus black spot	1	<b>53</b>
Citrus canker	109	<b>214</b>
Citrus greening / HLB	24	<b>132</b>
HLB Certification for out-of-state shipping	0	<b>4,412</b>
Import inspections	5	<b>10</b>
Interdictions	8	<b>41</b>
Palm phytoplasma	0	<b>11</b>
Pathology, General	409	<b>1,516</b>
Soil	42	<b>142</b>
Totals	598	<b>6,531</b>



2a - *Calonectria amazonica*, leaf spot, on *Sarracenia* sp. (pitcher plant).  
Photo by homeowner



2b - *Calonectria amazonica*, leaf spot, on *Sarracenia* sp. (pitcher plant) with blighted pitchers.  
Photo by homeowner



## ⊕ PLANT PATHOLOGY IDENTIFICATION TABLE

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

PLANT SPECIES	PLANT COMMON NAME	CAUSAL AGENT	DISEASE NAME	LOCATION TYPE	SPECIMEN NUMBER	COUNTY	COLLECTOR	DATE	NEW RECORDS
<i>Acer rubrum</i>	red maple	<i>Rhizoctonia theobromae</i>	wilt	nursery	08302022-07892	Lake	Grower	8/10/22	Florida state record
<i>Arachis glabrata</i>	perennial peanut	<i>Puccinia arachidis</i>	rust	residence	08292022-07835	Collier	Scott Krueger	8/26/22	Florida host record
<i>Aralia spinosa</i>	angelica tree, devil's walking stick	<i>Cystidiodontia</i> sp.	relampago blight	natural area at springs	06072022-05146	Suwannee	Jeffrey Eickwort	6/7/22	Florida host record
<i>Cannabis sativa</i>	industrial hemp	<i>Pseudoperonospora canabina</i>	downy mildew	farm	06032022-05043	Hendry	Grower	6/3/22	Florida state record
<i>Clusia</i> sp.	autograph tree, pitch apple, balsam fig	<i>Cephaleuros virescens</i>	algal leaf spot	business landscape	09022022-08055	Broward	Cristina Urbina	8/22/22	Florida host record
<i>Sarracenia</i> sp.	pitcher plant	<i>Calonectria amazonica</i>	leaf spot	residence	08172022-07499	Hillsborough	Howard Wallace	8/17/22	Florida host record
<i>Spathoglottis plicata</i>	Philippine ground orchid	<i>Sclerotium rolfsii</i>	southern blight	nursery	08252022-07776	Broward	Luz Salinas	8/24/22	Florida host record
<i>Triadica sebifera</i>	Chinese tallow tree	<i>Podosphaera</i> sp.	powdery mildew	DPI greenhouse	08172022-07501	Alachua	Alyssa Lucas, Ben Davis	8/17/22	new taxonomic discovery, probably undescribed species of <i>Podosphaera</i>
X <i>Cupressocyparis leylandii</i>	Leyland cypress	<i>Pythium oligandrum</i>	root rot	nursery	09012022-07998	Alachua	Sam Hart	9/1/22	Florida host record





## FROM THE EDITOR

By Patti Anderson

### Inquiring minds want to know...

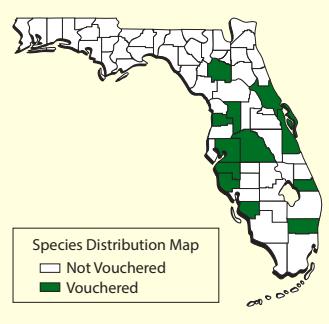
What are those interesting branches of the citrus family tree?

Of course, everyone knows the famous Florida orange so often found in fruit bowls and juice glasses. Less well known are several members of the orange family (Rutaceae), noteworthy for their ornamental value or their invasive potential, and sadly, sometimes both. Many plants originally introduced as ornamentals have become serious pest plants in natural areas. In addition to the fairly common orange jasmine (*Murraya paniculata*), three less well-known species in this family have become naturalized (growing without human assistance) in at least a few Florida counties. These species include *Atalantia buxifolia*, *Glycosmis parviflora* and *Triphasia trifolia*, described below. The maps, provided by the [Atlas of Florida Plants](#) indicate the counties (in green) in which the species has been documented with a voucher specimen stored in a Florida or out-of-state herbarium.

#### ***Atalantia buxifolia* (Poir.) Oliv.**

**ex Benth.** (previously known as *Severinia buxifolia*), Chinese box-orange, box orange or boxthorn, is native to tropical and temperate areas of Asia. In Florida, this species is scattered through several mainly central peninsular counties, but it is not considered to be an invasive plant. This shrub

grows to about 2.5 m tall with spines (to 4 cm long) along the branches. The simple, leathery leaves have a short petiole (1-7 mm) and oval to almost round blades, dotted with oil glands. The leaf tip is rounded with a small notch at the apex (called retuse or emarginate). The inflorescence consists of one to several flowers with five white petals and 10 stamens. The ripe fruit is blue-black, spherical and about 1 cm in diameter. ([Atalantia buxifolia in Flora of China @ efloras.org](#) [accessed 21 October 2022].)



*Murraya paniculata*, orange jasmine.  
Photo by Joel Timyan, [Atlas of Florida Plants](#)



*Atalantia buxifolia*, Chinese boxorange, leaves and fruit.  
Photo from NCSC Herbarium, Citrus ID, USDA APHIS PPQ, Bugwood.org

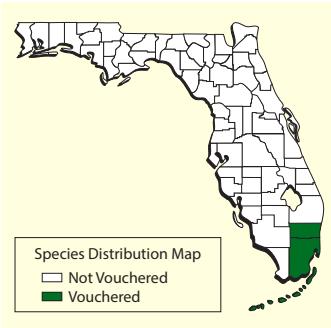


*Atalantia buxifolia*, Chinese boxorange, leaves and flower.  
Photo by Keith Bradley, [Atlas of Florida Plants](#)



### ***Glycosmis parviflora* (Sims)**

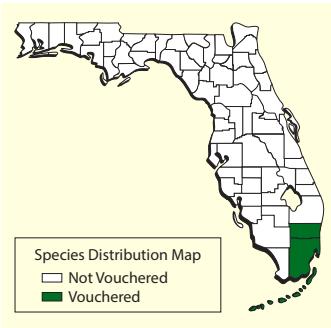
**Little** (previously known as *Limonia parviflora*), flower axistree, is native to Asia, but has occasionally escaped from cultivation into disturbed hammocks of South Florida. This species can be a shrub or small tree, 1-3 m tall. The leaves are compound, usually with three or five leaflets, but sometimes only one. The elliptic, oblong or lanceolate leaflet blades have entire (smooth, not toothed) margins. Inflorescences are clusters of small flowers about 4 mm long with white or pinkish-white petals. The ripe fruit is a red berry, about 1-1.5 cm in diameter, with one to three seeds. ([Glycosmis parviflora in Flora of China @ efloras.org](https://www.efloras.org/florataxon.aspx?lang=&科名=芸香科&属名=Glycosmis&种名=Glycosmis%20parviflora) [accessed 18 October 2022].)



*Glycosmis parviflora*, flower axistree, flowers, fruit and leaf.  
Photos by Keith Bradley, Atlas of Florida Plants

### ***Triphasia trifolia* (Burm.f.)**

**P.Wilson** (formerly known as *Limonia trifolia*) is native to Southeast Asia, Malaysia and Christmas Islands. In Florida, it can be found in Broward and Miami-Dade counties as well as the Florida Keys. This small tree or shrub is noted for having pairs of thorns in the axils of its tri-foliate (bearing three leaflets) leaves and the terminal leaflet being much longer than the two lateral ones. The leaves are glabrous, with pellucid dots (translucent) similar to the dots seen on the more familiar leaves of *Citrus* species. Unlike many *Citrus* species, the petioles of the leaves are not winged with expanded leaf tissue. The fragrant flowers have three white petals. The fruits are oblong to globose, 1-2 cm long, and mature to a reddish-orange or crimson color. This species has been found to be invasive in some places and should be planted with caution in Florida. ([Triphasia trifolia \(limeberry\) \(cabi.org\)](https://www.cabi.org/isc/diseases/record/1000000000000000000) [accessed 17 October 2022]; [Triphasia trifolia - UF/IFAS Assessment - University of Florida, Institute of Food and Agricultural Sciences \(ufl.edu\)](https://edis.ifas.ufl.edu/EP001) [accessed 21 October 2022].)



*Triphasia trifolia*, limeberry, leaves with fruit.  
Photo by Keith Bradley, Atlas of Florida Plants



*Triphasia trifolia*, limeberry, branches, leaves with thorns.  
Photo from Shutterstock



*Triphasia trifolia*, limeberry, branches, leaves with thorns.  
Photo from Shutterstock





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