Acceptability of Bedding Plants by the Leatherleaf Slug, Leidyula floridana (Mollusca: Gastropoda: Veronicellidae)

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Source: Florida Entomologist, 103(1) : 80-84

Published By: Florida Entomological Society

URL: https://doi.org/10.1653/024.103.0413

Acceptability of bedding plants by the leatherleaf slug, *Leidyula floridana* (Mollusca: Gastropoda: Veronicellidae)

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Abstract

Leidyula floridana (Leidy) (Gastropoda: Veronicellidae) has long been known to be a plant pest in the Caribbean region and southern Florida, though its range has expanded to include northern Florida, other Gulf Coast states, and Mexico. It is nocturnal, and often overlooked as a source of plant damage. Although polyphagous, it does not feed on all plants, and it is desirable to know what bedding plants will likely be damaged by this common herbivorous slug. To identify readily accepted bedding plants, I conducted a series of comparative trials of 7 d duration to assess the acceptance of 30 commonly grown bedding plants relative to French marigold, a plant that is commonly fed upon by slugs and snails. Several commonly grown bedding plants were shown to be very susceptible to feeding injury. In a second set of 7-d trials, I compared 14 plants from among those that were not readily accepted in the first set of trials to determine if they would remain poorly accepted when not provided with favored food. In the second set of trials, the levels of herbivory shown in the first trials were maintained, demonstrating that some bedding plants are not acceptable to *L. floridana* even when the slugs do not have access to acceptable food. Thus, a list of readily available bedding plants that resist herbivory by this slug has been determined, providing gardeners with slug-resistant choices. The most unacceptable species (damage rating = 1.00) were: lantana (*Lantana camara* L.; Verbenaceae), tickseed (*Coreopsis* spp.; Asteraceae), torenia (*Torenia fournieri* Linden ex E. Fourn.; Linderiaceae), angelonia (*Angelonia angustifolia* Benth.; Plantaginaceae), and snapdragon (*Antirrhinum majus* L.; Plantaginaceae). Additional plant species that were not very acceptable (damage rating of between 1.00 and 1.50) were blue daze (*Evolvulus glomeratus* Choisy; Convolvulaceae), dusty miller (*Centaurea cineraria* [L.] Jacq. ex Nym.; Asteraceae), viola (*Viola* hybrid; Violaceae), celosia (*Celosia argentea* L.; Amaranthaceae), and geranium (*Geranium* spp.; Geraniaceae). In contrast, plant species that seem to be at considerable risk of damage (damage rating 3 to 5) by *L. floridana* were: French marigold (*Tagetes patula* L.; Asteraceae), Madagascar periwinkle (*Catharanthus roseus* [L.] G. Don; Apocyanaceae), coleus (*Plectranthus scutellarioides* [L.] R. Br.; Laminaceae), petchoa (*Petunia* × *Calibrachoa*; Solanaceae), zinnia (*Zinnia elegans* Jacq.; Asteraceae), polka dot plant (*Hypoestes phyllostachya* Baker; Acanthaceae), chrysanthemum (*Chrysanthemum morifolium* Ramat; Solanaceae), petunia (*Petunia* spp.; Solanaceae), Stokes' aster (*Stokesia laevis* [Hill] Greene; Asteraceae), scarlet sage (*Salvia splendens* Sellow ex Nees; Lamiaceae), butter daisy (*Melampodium paludosum* Kunth; Asteraceae) and verbena (*Verbena* spp.; Geraniaceae). A few species were intermediate in susceptibility, namely: impatiens (*Impatiens hawkeri* W. Bull; Balsamaniaceae), wax begonia (*Begonia* × *Semperflorens* × *Cultorum*; Begoniaceae), sweet potato vine (*Ipomoea* spp.; Convolvulaceae), firecracker flower (*Crossandra infundibuliformis* [L.] Nees; Acanthceae), sweet William (*Dianthus barbatus* L.; Caryophyllaceae), pansy (*Viola* × *Wittrochinana*; Violaceae), purslane (*Portulaca oleraceae* L.; Portulacaceae), and alyssum (*Lobularia maritima* [L.] Desv.; Brasscaeae).

Key Words: flowers; annuals; slug-resistant plants

Resumen

Leidyula floridana (Leidy) (Gastropoda: Veronicellidae) ha sido por mucho tiempo conocida como una plaga de plantas en la región del Caribe y el sur de la Florida, aunque su área de distribución se ha expandido para incluir el norte de Florida, y otros Estados de la costa del Golfo y México. Es una plaga nocturna y a menudo, se pasa por alto como fuente de daño a las plantas. Aunque es polífaga, no se alimenta de todas las plantas, y es deseable saber qué plantas de lecho probablemente se dañarán por esta babosa herbívora común. Para identificar las plantas de lecho fácilmente aceptadas, se realizaron una serie de ensayos comparativos de 7 días de duración para evaluar la aceptación de 30 plantas de lecho comúnmente cultivadas en relación con la maravilla francesa, una planta sobre la cual las babosas y los caracoles comúnmente se alimenta. Se demostró que varias plantas de lecho comúnmente cultivadas son muy susceptibles a las lesiones por alimentación. En un segundo conjunto de ensayos de 7 días, se comparó 14 plantas entre las que no fueron aceptadas fácilmente en el primer conjunto de ensayos para determinar si seguirían siendo poco aceptadas cuando no se les proporciona la comida preferida. En el segundo conjunto de ensayos, se mantuvieron los niveles de herbivoría mostrados en los primeros ensayos, lo que demuestra que algunas plantas de lecho no son aceptables para *L. floridana*, incluso cuando las babosas no tienen acceso a alimentos aceptables. Por lo tanto, se ha determinado una lista de plantas de lecho disponibles que resisten la herbivoría por esta babosa, proporcionando a los jardineros opciones resistentes a la babosa. Las especies más inaceptables (índice de daño = 1.00) fueron: lantana (*Lantana camara* L.; Verbenaceae), coreopsis (*Coreopsis* spp.; Asteraceae), torenia (*Torenia fournieri* Linden ex E. Fourn.; Linderiaceae), angelonia (*Angelonia angustifolia* Benth.; Plantaginaceae) y boca de dragón (*Antirrhinum majus* L.; Plantaginaceae). Otras especies de plantas que no fueran muy aceptables (clasificación de daño entre 1.00 y 1.50) fueron hierba de sabana *(Evolvulus glomeratu*s Choisy; Convolvulaceae), cineraria (*Centaurea cineraria* [L.] Jacq. Ex Nym.; Asteraceae), violeta (híbrido *Viola*; Violaceae), celosia (*Celosia argentea* L.; Amaranthaceae) y geranio (*Geranium* spp.; Geraniaceae). En contraste, las especies de plantas que parecen estar en riesgo considerable de daño (clasificación de daño 3 a 5) por *L. floridana* fueron: caléndula francesa (*Tagetes patula* L.; Asteraceae), bígaro de Madagascar (*Catharanthus roseus* [L.] G. Don; Apocyanaceae), coleo (*Plectranthus scutellarioides* [L.] R. Br.; Laminaceae), petchoa (*Petunia* × *Calibrachoa*; Solanaceae), zinnia (*Zinnia elegans* Jacq.; Asteraceae), hoja de sangre (*Hypoestes phyllostachya* Baker; Acanthaceae), crisantemo (*Chrysanthemum morifolium* Ramat; Solanaceae), petunia (*Petunia* spp.; Solanaceae), áster de Stokes (*Stokesia laevis* [Hill] Greene; Asteraceae), salvia escarlata (*Salvia splendens* Sellow ex Nees; Lamiaceae), margarita de mantequilla (*Melampodium paludosum* Kunus;

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Asteraceae) y verbena (*Verbena* spp.; Geraniaceae). Algunas especies eran de susceptibilidad intermedia, como impatiens (*Impatiens hawkeri* W. Bull; Balsamaniaceae), begonia cerosa (*Begonia* × *Semperflorens* × *Cultorum*; Begoniaceae), batata (*Ipomoea* spp.; Convolvulaceae), flor de petardo (*Crossandra infundibuliformis* [L.] Nees; Acanthceae), clavel del poeta (*Dianthus barbatus* L.; Caryophyllaceae), pensamiento (*Viola* × *Wittrochinana*; Violaceae), verdolaga *(Portulaca oleraceae* L.; Portulacaceae) y aliso de mar (*Lobularia maritima* [L.] Desv.; Brasscaeae).

Palabras Clave: flores; anuales; plantas resistentes a las babosas

Leidyula floridana (Leidy) (Gastropoda: Veronicellidae), also known as Florida leatherleaf slug, was first described from southern Florida, but occurs widely in the Caribbean region, including Cuba, Haiti, Puerto Rico, Dominica, Bahamas, and Jamaica (Baker 1925; Maceira 2003; Rosenberg & Muratov 2006). Pilsbry (1948) concluded that its origin was Cuba, which is logical given its widespread distribution on that island and the tropical nature of the Veronicellidae. The range of *L. floridana* is expanding, and it is now found in northern Florida, Gulf Coast states (Louisiana and Texas), and northeastern Mexico (Hubricht 1985; Naranjo-Garcia et al. 2007).

Though the dietary habits of this slug are poorly known, *L. floridana* is polyphagous, feeding on plants of several families. Capinera and Guedes Rodriguez (2015) reported that this slug consumed measurable quantities of about 80% of the plant species provided, but clearly consumed more of some than others; only about 50% of the plants allowed significant slug growth to occur. *Leidyula floridana* is a large slug, often attaining > 10 g in weight and > 5 cm in length, so it is capable of a considerable amount of foliage consumption, perhaps 20 cm^2 per d (Capinera & Guedes Rodriguez 2015). It also is the most commonly observed slug in Florida, probably because it is so large. Nevertheless, slugs are predominantly nocturnal, so often are not observed. Slime trails found on sidewalks and vegetation are sometimes the only clues to indicate the cause of plant damage.

The technologies available for slug management have changed in recent yr. After many yr of depending nearly exclusively on highly toxic chemicals for protection of plants from terrestrial molluscs (usually metaldehyde products), less toxic materials, such as iron phosphate-, sodium ferric EDTA-, and sulfur-based baits are now available (Speiser & Kistler 2002; Hollingsworth & Armstrong 2003; Ciomperlik et al. 2013; Smith et al. 2013; Capinera 2018a, b). However, many gardeners prefer not to use pesticides of any type, so determination of host selection behavior could produce tangible benefits, perhaps allowing culture of bedding plants without concern about slugs. Here I report evaluation of the acceptance by *L. floridana* on the most commonly used bedding plants grown in Florida. The specific goals were to determine which plants were readily accepted, because use of these should be avoided, and which plants were not accepted, because use of these should be encouraged.

Materials and Methods

The slugs used in these studies came from a laboratory colony that has been maintained for about 5 yr. They were cultured in plastic boxes (TriState Plastics, Dixon, Kentucky, USA) measuring 28 × 18 × 10 cm (L, W, H) that contained about 5 cm of moist potting soil (Robin Hood garden soil, Hood Landscaping, Adel, Georgia, USA). Each box contained 20 to 30 slugs, and was maintained at 25.5 °C and 14:10 h (L:D) photoperiod. The boxes were not vented so humidity exceeded 90% RH. They were fed only romaine lettuce prior to evaluation.

Plant choice ('common garden') tests were conducted in 60 × 60 × 60 cm cages with fine nylon mesh sides, containing about 10 cm of moist soil in the cage bottom. Each cage was planted with 7 different bedding plants, and each plant was photographed prior to exposure to slugs. Plants were selected to be about 15 cm high, and to provide approximately equivalent amounts of foliage. After planting and watering, 20 slugs weighing 4 to 6 g each were introduced to each cage and allowed to feed for 7 d. Environmental conditions were the same as described for slug culture except that the RH was unregulated, falling to about 70% during the d but > 90% at night. After the 7 d period, the bedding plants were compared to their pre-treatment photographs and visual estimates of the levels of defoliation were categorized as 1 = 0 to 19%, 2 = 20 to 39%, 3 = 40 to 59%, 4 = 60 to 79%, and 5 = 80 to 100%. The plants were procured locally at a Lowe's Home Center in Gainesville, Florida, USA, thus representing the plant condition that gardeners might encounter when planting new garden beds. The plants mostly consisted of flowering annuals, though some are perennials that often are grown as annuals under local weather conditions.

Two series of plant choice trials were conducted. Trials 1 to 5 each consisted of 1 marigold plant and 1 plant of 6 other species (n = 7 plants per cage; n = 31 species evaluated). Except for marigold, each plant species was tested only in 1 trial. Marigold is readily accepted as a food plant by molluscs (Raut & Ghose 1983; Dickens et al. 2017; Wilen & Flint 2018), and was included in each trial to gauge the overall hunger of the slugs, assuring that herbivory pressure was comparable across trials. Trials 6 and 7 were conducted in the same manner, but the plant species were selected from those that previously had been shown to be not readily accepted. One plant species in each of the latter 2 'unacceptable' trials (sweet potato or purslane) was, in fact, selected because it displayed a modest level of acceptability. This was included for the same reason marigold was included in the first series, to gauge the willingness of the slugs to feed on acceptable food, though of course the expectations of ingestion were more limited.

Each trial (1–7) was conducted in 4 cages, but the trials were staggered over time so that each cage (replicate) contained plants that were of slightly different ages. The plant species and the distribution of plant choices are shown in Table 1. Plant damage ratings after 7 d were transformed to square root values and analyzed by 1-way analysis of variance (ANOVA) using GraphPad Prism (GraphPad Software, San Diego, California, USA). The mean values within each trial were compared using the Tukey-Kramer multiple comparison test.

The *Lissachatina fulica* (Bowditch) (Gastropoda: Achatinidae) growth study conducted by Dickens et al. (2017) overlapped, in part, with the choices displayed herein by *L. floridana*. The abilities of *L. fulica* and *L. floridana* to choose among some plants commonly grown in Florida was compared between these 2 studies using Spearman's correlation coefficient through application of GraphPad Prism.

Results

In the first series of evaluations, consisting of 5 trials to assess acceptance, *L. floridana* strongly discriminated among bedding plants (P < 0.001 in all cases), and most plants were readily categorized as acceptable or unacceptable (Table 1). The most unacceptable species (damage rating = 1.00) were: lantana (*Lantana camara* L.; Verbenaceae), tickseed (*Coreopsis* spp.; Asteraceae), torenia (*Torenia fournieri* Linden ex E. Fourn.; Linderiaceae), angelonia (*Angelonia angustifolia* Benth.; Plantaginaceae), and snapdragon (*Antirrhinum majus* L.; Plantaginaceae). Additional plant species that were not very acceptable

Table 1. Damage ratings of bedding plants provided to *Leidyula floridana* for 7 d in multiple choice ('common garden') tests. Ratings with a value of 1 experienced 0 to 19% consumption, whereas 5 experienced 80 to 100% leaf consumption (see Materials and Methods for details). Seven separate trials, each consisting of 7 plants, were conducted. Trials 1 to 5 were designed to identify preferred plants, whereas trials 6 and 7 were designed to assess nonpreferred plants. ANOVA statistics are found beneath each trial. Mean damage ratings followed by the same lower-case letter are not significantly different ($P > 0.05$) using the Tukey-Kramer multiple comparison test).

Trial	Common name	Scientific name	Plant family	Damage rating (± SE)
1	French marigold	*Tagetes patula*	Asteraceae	5.00 ± 0.00 a
	Madagascar periwinkle	*Cantharanthus roseus*	Apocynaceae	3.50 ± 0.28 ab
	coleus	*Plectranthus scutellarioides*	Lamiaceae	3.25 ± 0.48 ab
	impatiens	*Impatiens hawkeri*	Balsaminaceae	2.50 ± 0.28 bc
	wax begonia	*Begonia* × *Semperflorens* × *Cultorum*	Begoniaceae	1.75 ± 0.25 cd
	blue daze	*Evolvulus glomeratus*	Convolvulaceae	1.50 ± 0.29 cd
	penta	*Pentas lanceolata*	Rubiaceae	1.25 ± 0.25 d
Trial 1 statistics: $F = 20.69$; df = 6,21; $P = < 0.001$				
2	French marigold	*Tagetes patula*	Asteraceae	5.00 ± 0.00 a
	petchoa	*Petunia* × *Calibrachoa*	Solanaceae	5.00 ± 0.00 a
	zinnia	*Zinnia elegans*	Asteraceae	4.25 ± 0.25 a
	polka dot plant	*Hypoestes phyllostachya*	Acanthaceae	4.25 ± 0.25 a
	sweet potato vine	*Ipomoea* sp.	Convolulaceae	2.00 ± 0.41 b
	firecracker flower	*Crossandra infundibuliformis*	Acanthaceae	1.75 ± 0.25 bc
	lantana	*Lantana camara*	Verbenaceae	1.00 ± 0.00 c
Trial 2 statistics: $F = 55.88$; df = 6,21; $P = < 0.001$				
3	French marigold	*Tagetes patula*	Asteraceae	5.00 ± 0.00 a
	chrysanthemum	*Chrysanthemum morifolium*	Asteraceae	4.75 ± 0.25 a
	petunia	*Petunia* sp.	Solanaceae	4.25 ± 0.48 a
	sweet William	*Dianthus barbatus*	Caryophyllaceae	1.75 ± 0.25 b
	dusty miller	*Centaurea cineraria*	Asteraceae	1.50 ± 0.29 b
	tickseed	*Coreopsis* spp.	Asteraceae	1.00 ± 0.00 b
	torenia	*Torenia fournieri*	Linderniaceae	1.00 ± 0.00 b
Trial 3 statistics: $F = 53.33$; df = 6,21; $P = < 0.001$				
4	French marigold	*Tagetes patula*	Asteraceae	5.00 ± 0.00 a
	Stokes' aster	*Stokesia laevis*	Asteraceae	3.25 ± 0.48 b
	pansy	*Viola* × *Wittrochiana*	Violaceae	1.75 ± 0.25 c
	purslane	*Portulaca oleraceae*	Portulacaceae	1.75 ± 0.25 c
	viola	*Viola* (hybrid)	Violaceae	1.50 ± 0.29 c
	angelonia	*Angelonia angustifolia*	Plantaginaceae	1.00 ± 0.00 c
	snapdragon	*Antirrhinum majus*	Plantaginaceae	1.00 ± 0.00 c
Trial 4 statistics: $F = 263.60$; df = 6,21; $P = < 0.001$				
5	scarlet sage	*Salvia splendens*	Lamiaceae	5.00 ± 0.00 a
	French marigold	*Tagetes patula*	Asteraceae	4.75 ± 0.25 a
	butter daisy	*Melampodium paludosum*	Asteraceae	4.75 ± 0.25 a
	verbena	*Verbena* sp.	Verbenaceae	4.25 ± 0.48 a
	alyssum	*Lobularia maritima*	Brassicaceae	2.50 ± 0.29 b
	celosia	*Celosia argentea*	Amaranthaceae	1.25 ± 0.25 c
	geranium	*Geranium* sp.	Geraniaceae	1.25 ± 0.25 c
Trial 5 statistics: $F = 35.95$; df = 6,21; $P = < 0.001$				
6	sweet potato vine	*Ipomoea* sp.	Convolulaceae	2.75 ± 0.85 a
	penta	*Pentas lanceolata*	Rubiaceae	1.00 ± 0.00 b
	lantana	*Lantana camara*	Verbenaceae	1.00 ± 0.00 b
	sweet William	*Dianthus barbatus*	Caryophyllaceae	1.00 ± 0.00 b
	dusty miller	*Centaurea cineraria*	Asteraceae	1.00 ± 0.00 b
	tickseed	*Coreopsis* spp.	Asteraceae	1.00 ± 0.00 b
	torenia	*Torenia fournieri*	Linderniaceae	1.00 ± 0.00 b
Trial 6 statistics: $F = 5.16$; df = 6,21; $P = 0.002$				
7	purslane	*Portulaca oleraceae*	Portulacaceae	1.75 ± 0.48 a
	celosia	*Celosia argentea*	Amaranthaceae	1.50 ± 0.28 a
	angelonia	*Angelonia angustifolia*	Plantaginaceae	1.00 ± 0.00 a
	torenia	*Torenia fournieri*	Linderniaceae	1.00 ± 0.00 a
	wax begonia	*Begonia* × *Semperflorens* × *Cultorum*	Begoniaceae	1.00 ± 0.00 a
	lantana	*Lantana camara*	Verbenaceae	1.00 ± 0.00 a
	blue daze	*Evolvulus glomeratus*	Convolvulaceae	1.00 ± 0.00 a
Trial 7 statistics: $F = 2.28$; df = 6,21; $P = 0.074$				

(damage rating of between 1.00 and 1.50) were blue daze (*Evolvulus globeratus* Choisy; Convolvulaceae), penta (*Pentas lanceolata* [Forssk.] Deflers; Rubiaceae), dusty miller (*Centaurea cineraria* (L.) Jacq. ex Nym.; Asteraceae), viola (*Viola* spp.; Violaceae), celosia (*Celosia argentea* L.; Amaranthaceae), and geranium (*Geranium* spp.; Geraniaceae). Plant species that seem to be at considerable risk of damage (damage rating > 3) by *L. floridana* were: French marigold (*Tagetes patula* L.; Asteraceae), Madagascar periwinkle (*Catharanthus roseus* (L.) G. Don; Apocyanaceae), coleus (*Plectranthus scutellarioides* (L.) R. Br.; Laminaceae), petchoa (*Petunia* × *Calibrachoa*; Solanaceae), zinnia (*Zinnia elegans* Jacq.; Asteraceae), polka dot plant (*Hypoestes phyllostachya* Baker; Acanthaceae), chrysanthemum (*Chrysanthemum morifolium* Ramat; Solanaceae), petunia (*Petunia* spp.; Solanaceae), Stokes' aster (*Stokesia laevis* (Hill) Greene; Asteraceae), scarlet sage (*Salvia splendens* Sellow ex Nees; Lamiaceae), butter daisy (*Melampodium paludosum* Kunth; Asteraceae), and verbena (*Verbena* spp.; Geraniaceae). Examples of plant damage can be seen in Fig. 1, where after 2 d of feeding plant damage at the front of the image shows extensive French marigold damage (all leaves removed, though blossoms are present), whereas plant damage in the rear of the image shows lack of plant damage.

Not surprisingly, however, some plant species were somewhat intermediate in acceptance. Among those intermediate in acceptance were: impatiens (*Impatiens hawkeri* W. Bull; Balsamaniaceae), wax begonia (*Begonia* × S*emperflorens* × *Cultorum*; Begoniaceae), sweet potato vine (*Ipomoea* spp.; Convolvulaceae), firecracker flower (*Crossandra infundibuliformis* (L.) Nees; Acanthceae), sweet William (*Dianthus barbatus* L.; Caryophyllaceae), pansy (*Viola* × *Wittrochinana*; Violaceae), purslane (*Portulaca oleraceae* L.; Portulacaceae), and alyssum (*Lobularia maritima* (L.) Desv.; Brasscaeae).

Fig. 1. Examples of plant damage by *Leidyula floridana* can be seen after 2 d of plant feeding. At the front of the image, extensive French marigold damage (all leaves removed, though blossoms are present) is evident, whereas plant damage at the rear of the image to torenia shows lack of plant damage (lack of damage to both leaves and blossoms).

In the second series, consisting of 2 trials using plant species that had been shown to be relatively unacceptable, there were few differences in acceptance; nearly all were refused. Only sweet potato vine was consumed significantly more than other plant species, and the level of consumption was low to intermediate. Overall, plant species that were relatively unacceptable in the first series maintained their unacceptable status in the second series, despite the absence of plants on which to feed.

Discussion

Plant acceptance displayed by the slugs was quite consistent, so even though the number of replicates (4) is quite minimal, significant differences in feeding were readily apparent. Furthermore, plant species that were found to be unacceptable in the first series of trials maintained their lack of acceptability even when slugs (in the second series of trials) had very limited access to acceptable food. Thus, plant species that were evaluated and received a damage rating of '1' in the series 1 trials should be considered most unacceptable to *L. floridana*. The most unacceptable species were: lantana, tickseed, torenia, angelonia, and snapdragon. Additional plant species that were not very acceptable (damage rating of 1.00 to 1.50) were blue daze, penta, dusty miller, pansy, viola, celosia, and geranium. Thus, these plant species provide a dozen choices available to gardeners who maybe concerned about slug damage and wish to minimize the risk of plant injury. Plant species that seem to be at considerable risk of damage (damage rating > 3) by *L. floridana* were: French marigold, Madagascar periwinkle (often sold as 'Vinca'), coleus, petchoa, zinnia, polka dot plant, chrysanthemum, petunia, Stokes' aster, scarlet sage, butter daisy, and verbena. Unfortunately, these 'at risk' plants are among the most popular bedding plants currently used for gardens in Florida. French marigold often is considered to be resistant to insects and slugs, though it is susceptible to both forms of herbivores (Raut & Ghose 1983; Wilen & Flint 2018).

Dickens et al. (2017) conducted tests of ornamental plant suitability to the invasive giant African land snail, *L. fulica*, using plants recommended for the Miami region of Florida. They measured growth and survival of these snails fed 1 of 21 ornamental plants, and showed that plant species varied greatly in suitability and that, as would be expected of a polyphagous animal, there was not a strong affinity by the snails for a particular plant taxon. There was a statistically significant association of high growth rates and high levels of survival with annual plants, however, relative to perennial plants.

There also was overlap between the Dickens et al. (2017) growth study and the study reported herein, each consisting of 8 plant species. The species found in both studies were: French marigold, scarlet sage, purslane, zinnia, dusty miller, coleus, lantana, and snapdragon. If the final size of the *L. fulica* snails from the growth study is correlated with the acceptance evaluation from the *L. floridana* study, the relationship is positive and statistically significant (Spearman's r = 0.7765; P = 0.028). Thus, despite the use of different molluscs in the 2 studies, we might expect the slugs to thrive on the plants they most avidly accepted. This is the most common outcome when acceptance and suitability are assessed among polyphagous herbivores. Herbivores typically select not only what 'tastes good' but actually what 'is good' for growth and reproduction; this is a fundamental aspect of plant-herbivore co-

evolution. Importantly, it suggests that different polyphagous molluscs may respond to the same or similar stimuli, and that if additional assessments with other molluscs are performed, a pattern may emerge that will allow us to predict what plants might be more susceptible to damage from molluscs, many of which are newly invasive.

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