chicago botanic garden

Plant Evaluation Notes

Issue 50
2024

A Comparative Evaluation of Sweetshrubs *(Calycanthus)*

Jack E. Nicholson, Plant Evaluation Assistant

Calycanthus occidentalis

When choosing fragrant shrubs, lilacs, roses, or mock oranges immediately come to mind for northern gardeners, but perhaps the most delightful scent of all belongs to another, more obscure contender. The magnolia-like blossoms of sweetshrubs (*Calycanthus* spp.) offer an unusual fruity, spicy aroma. The eastern sweetshrub (*Calycanthus floridus*) was long cultivated in American gardens for its beauty and fragrance, but this classic has been reinvigorated through hybridization with the Chinese sweetshrub (*C. chinensis*) and western sweetshrub (*C. occidentalis*) to produce plants featuring larger, showier flowers with the same appealing scent.

Calycanthus belongs to Calycanthaceae, a small family containing the three sweetshrub species, the wintersweets (*Chimonanthus* spp.), and the idiot fruit (*Idiospermum australiense*), a rare tree native to Australia. Sweetshrubs and their relatives are in a larger clade known as magnoliids, which includes magnolias and other primitive flowering plants such as bay laurel, avocado, pawpaw, and cinnamon. Sweetshrub flowers resemble those of magnolias and, like them, possess spirally arranged, undifferentiated petals and sepals collectively referred to as tepals. Sweetshrubs and magnolias also share a reliance on beetles for pollination, having diverged from most other flowering plants (eudicots and monocots) in the early Cretaceous Period before the evolution of bees. The fragrance of *Calycanthus* flowers is thought to be an adaptation to attract beetles looking to feast on fermenting fruit.

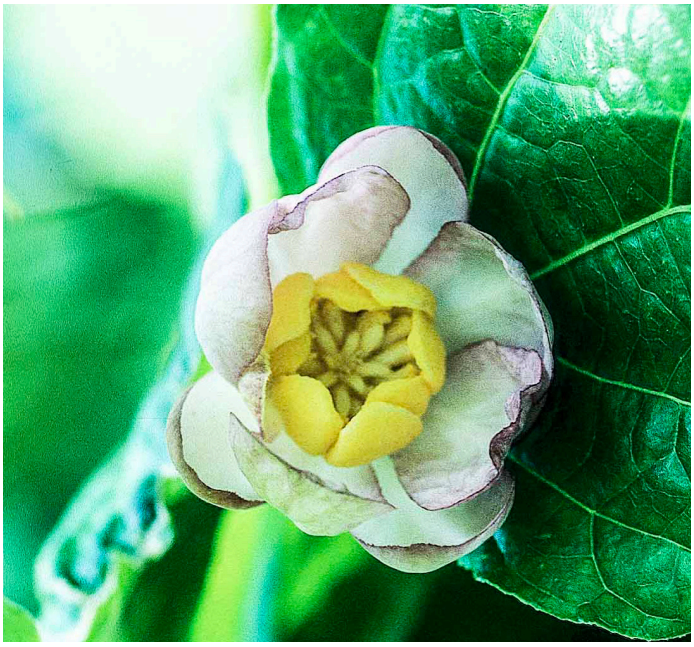
Sweetshrubs are medium- to large-sized deciduous, suckering shrubs generally reaching 6 to 12 feet tall and wide. Their leaves are simple, oppositely arranged, and ovate to elliptical in shape with entire margins. The axial surface has a rough texture and somewhat glossy appearance, Both the leaves and bark emit a spicy, camphor-like scent when crushed.

Flowers are borne singly in late spring on last year's growth and continue to bloom more sparingly on new growth through midsummer. The fruit is unusual but not particularly ornamental—an elliptical, 2- to 3-inch drooping capsule resembling a chrysalis or dried-up fig, which persists through winter and into the next season.

The eastern sweetshrub or Carolina allspice (*Calycanthus floridus*), native to the southeastern United States, produces the delectable, fruity fragrance from which sweetshrubs derive their common name. The aroma is perceived differently from person to person but is often likened to strawberry, banana, pineapple, melon, and bubblegum with hints of spice. The quality and intensity of fragrance varies between individual plants, with some specimens having little to no scent or even a disagreeable one. The flowers of eastern sweetshrub

Fruit of *Calycanthus floridus*

Purple foliage of *Calycanthus floridus* 'Burgundy Spice'. Interior foliage fades to green as summer progresses.



Calycanthus chinensis

measure 1½ to 2 inches in diameter, and are made up of narrow, brownish red tepals. Cultivars of eastern sweetshrub have been selected for consistent, pleasing fragrance among other ornamental traits such as purple foliage ('Burgundy Spice' and 'Purpureus') or yellowish green flowers ('Athens').

The other two species of sweetshrub are uncommon in cultivation but serve as parents for the more popular hybrids. The western sweetshrub or California allspice (*Calycanthus occidentalis*), native to central and northern California, is similar in appearance to the eastern sweetshrub, but its flowers are ruby red and give off the scent of wine or vinegar. The Chinese sweetshrub or Chinese wax shrub (*C. chinensis*) hails from southeastern China. It has bigger leaves and large, camellia-like flowers—up to 3 inches across—composed of broader white to light pink tepals surrounding a ring of waxy yellow inner tepals, which lack any fragrance. Due to its morphological and geographical disparity, it was formerly classified in its own genus as *Sinocalycanthus chinensis* but has since been shown to be closely related to the North American species.

Breeders have introduced selections combining the color and fragrance of the North American species with the larger flowers of the Asian species. The first interspecific hybrid was bred by Richard Hartlage, then a student at North Carolina State University (NCSU), when he crossed *Calycanthus floridus* with *C. chinensis* to produce *C.* ×*raulstonii*—initially considered an intergeneric hybrid dubbed ×*Sinocalycalycanthus raulstonii*. The original cultivar released from this cross, 'Hartlage Wine', bears his name. The nothospecific epithet *raulstonii* honors the late Dr. J. C. Raulston, former professor and arboretum director at NCSU. Dr. Tom Ranney, professor of horticultural science at NCSU, has continued breeding *Calycanthus*, producing 'Aphrodite', a hybrid between *C. occidentalis* and *C. chinensis*, and 'Venus', which has parentage from all three species.

Calycanthus floridus

Calycanthus ×*raulstonii* 'Hartlage Wine'

Calycanthus 'Venus'

Sweetshrubs are low-maintenance garden specimens capable of thriving in many situations. Sweetshrubs can grow in full sun to shade, with shaded plants having a taller, more open habit. In hotter climates, sweetshrubs do best sheltered from the afternoon sun. They prefer moist to medium, well-drained, loamy soil, and can tolerate clay soils but may struggle in sandy, nutrient-poor ones. Sweetshrubs have few pests and disease problems, as their aromatic foliage is unappetizing to herbivores. Pruning may be necessary to maintain symmetry and control size. Errant branches may be cut back any time of year, but waiting until blooming is complete will preserve more of the next year's flower buds produced on old wood. Suckers should also be pruned as they emerge unless spreading is desired, or they can be transplanted in fall or early spring to propagate a new plant. *Calycanthus floridus* is hardy in USDA Zones 4-9, and *C. occidentalis* and *C. chinensis* are hardy in Zones 6-9 and 6-8 respectively. Hybrid selections are intermediate in hardiness, rated for Zones 5-9. Sweetshrubs are ideal for use in hedges, foundation plantings, and mixed shrub borders. Site near a porch, patio, or walkway to best appreciate their delicious fragrance.

The Evaluation Study

The Chicago Botanic Garden (USDA Hardiness Zone 6a, AHS Heat Zone 5) evaluated 13 *Calycanthus* taxa—seven varieties of *C. floridus* and five hybrids—between 2018 and 2023. Most were evaluated for six years except for 'Burgundy Spice' and 'Dark Secret', which were added to the trial in 2020 and evaluated for four years. A newer introduction, SIMPLY SCENTSATIONAL® ['SMNCAF'], has only been in trial since 2022 and has not received a final rating.

Plants were grown side-by-side to compare their performance and ornamental qualities. The site received mostly full sun, but those on one side of the bed ('Aphrodite', 'Athens', 'Burgundy Spice', and ROY'S DARK RED™ ['KLMY']) received morning shade from nearby trees. The soil was clay-loam with a pH of 7.4. Although the site was typically well-drained, it occasionally retained excess moisture for short periods in all seasons. Maintenance practices were kept to a minimum to observe the shrubs' performance under natural conditions. Trial beds were irrigated with overhead sprinklers as needed, mulched with leaf mold once per summer, and weeded regularly. Plants were not pruned, deadheaded, fertilized, or treated for pests or diseases.

Calycanthus trial bed in fall color

Top-rated Sweetshrubs

Calycanthus 'Aphrodite' was the most vigorous selection in the trial, reaching 8 feet tall by 13 feet wide. Its large foliage and flowers—7½ inches and 4 inches respectively—lent it a bold, somewhat tropical flair. This cultivar was superior in terms of floral display, with the largest flowers and longest bloom period, flowering from early June to mid-August. Like the *C.* ×*raulstonii* cultivars, the blooms of 'Aphrodite' were less heavily scented than those of *C. floridus* cultivars but nonetheless pleasing and with far greater visual impact.

Calycanthus floridus 'Michael Lindsey' was an all-around improvement on the straight species. This selection immediately stood out among the other trial plants for its handsomely dark, glossy leaves. It grew more upright than other selections and was beaten only by 'Purpureus' in the density and uniformity of its habit. Its flowers were slightly larger and darker than the species, with a strong, pleasing aroma. The fall color display was among the best in the trial, with leaves turning golden yellow tinged with caramel.

Calycanthus floridus var. *glaucus* 'Purpureus' boasted not only a unique foliage color but had the best habit of all the sweetshrubs in the trial. 'Purpureus' suckered heavily, but the suckers emerged near the main plant to create a dense, uniform mound. The appearance and fragrance of the flowers was akin to other eastern sweetshrub cultivars. Spring leaves emerged with a slight bronze cast and faded to a typical green in the summer but maintained purple undersides throughout the growing season. The foliage appeared to glow with caramel tones when backlit; vantage points in the garden should be considered when siting this plant to take advantage of this feature. Fall color was not as showy as other selections—an inconsistent mix of yellows and greens.

Calycanthus 'Aphrodite'

Calycanthus floridus 'Michael Lindsey'

Calycanthus floridus var. *glaucus* 'Purpureus'

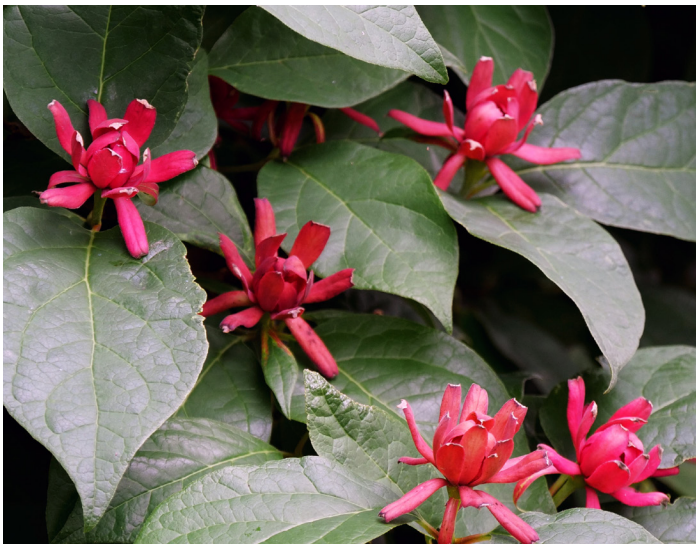
Calycanthus floridus 'Athens' displaying spotting on petals

Observations

The sweetshrubs generally performed well but encountered a few issues throughout the trial. The only casualty was one of three 'Athens' which had declined for unknown reasons—the remaining 'Athens' specimens were also generally less vigorous than other selections. Mild to severe interveinal chlorosis—up to 40%—of older foliage, in line with high pH-induced iron deficiency, was observed intermittently on all taxa throughout the evaluation period. Mild to moderate spotting on leaves and flowers was only a minor cosmetic issue on most taxa but detracted more significantly on the light-colored flowers of 'Venus' and 'Athens'. Sunscald affected plants growing in full sun with a 5-10% incidence on the uppermost foliage. Despite purported pest resistance, moderate deer browsing events (20% foliar and stem damage) were observed on 'Hartlage Wine' in 2018 and 2023 and minor chewing insect damage (likely Japanese beetles) was observed across various taxa. No winter injury was recorded at any point during the trial despite cold hardiness being a concern, as some of the species used in hybridization are rated to Zone 6 and the Chicago Botanic Garden was classified as Zone 5b prior to 2023.

One of sweetshrubs' assets is their relatively long flowering period. *Calycanthus floridus* cultivars began blooming in mid-May as the foliage was emerging, with flowers formed at each node along the branches. Individual blooms were long-lived, extending the main flowering period through mid-June, although by then the foliage had concealed many of the flowers on account of their proximity to the branches. Sporadic blooming on new growth occurred until mid-July. The hybrid taxa had similar flowering characteristics but began blooming in early June and continued until mid-July, apart from 'Aphrodite', which bloomed until mid-August. The hybrids had significantly showier floral displays than *C. floridus* cultivars, especially when viewed from afar, owing to their much larger flowers in brighter shades as well as longer peduncles that held blooms farther from the foliage. *Calycanthus floridus* set the most abundant fruit and its cultivars a moderate amount, while most or all the fruit failed to develop on the hybrids.

Calycanthus 'Aphrodite' in full bloom



Calycanthus floridus SIMPLY SCENSATIONAL® ['SMNCAF'] (courtesy of Spring Meadows Nursery)

With the olfactory subjectivity between each of our evaluators, it was difficult to assess the fragrance of every taxon, but some general conclusions were made. The fragrance of 'Aphrodite' and the *C.* ×*raulstonii* cultivars was akin to that of *C. floridus* but noticeably less intense. A few selections had distinctive scents— 'Venus' had strong notes of banana, 'Athens' tended toward melon, and 'Burgundy Spice' had a spicier, less fruity scent. SIMPLY SCENSATIONAL® ['SMNCAF'] had perhaps the strongest fragrance of all, likened by our evaluators to grape soda. Other factors affecting fragrance across all taxa were temperature and flower age. Aroma was perceived much more intensely during warmer weather, and flowers that were too new or too old had little to no fragrance. The camphor-like scent of the crushed leaves and stems did not vary between taxa.

Fall color of *Calycanthus floridus* 'Edith Wilder'

The sweetshrubs' fall color, peaking in late October, was showy enough to be considered an ornamental feature. The display on most taxa was good, though portions of the plants retained green coloration longer than others; only 'Edith Wilder' achieved a fully uniform yellow display. *Calycanthus floridus* and 'Michael Lindsey' followed with near complete color change and vibrant yellow and caramel tones. 'Burgundy Spice', with its dark foliage, produced a muddled but somewhat interesting combination of greens, yellows, and purples. The remaining *C. floridus* cultivars produced a less uniform mix of greens, yellows, and browns, but their fall display was an asset, nevertheless. 'Aphrodite' and the *C. ×raulstonii* cultivars had good coloration but, due to the larger size and thus greater wind resistance of their foliage, began dropping leaves before the full color transformation. Finally, 'Venus' remained green much longer than other taxa and did not achieve an attractive fall color display.

Most of the sweetshrubs had somewhat asymmetrical, irregular forms that tended to improve as the plants matured. Young plants produced tall, vertical stalks above the main portion of the plant, creating an uneven habit that would fill in as shoots branched out laterally in subsequent seasons. 'Purpureus' displayed by far the best habit in the trial, forming a uniform mass of dense foliage. 'Athens' and 'Michael Lindsey' also had superior habits compared to other *Calycanthus floridus* taxa. Among the hybrids, 'Dark Secret' and 'Solar Flare' had spindly, irregular forms resulting from their overall lack of vigor while 'Aphrodite' and 'Hartlage Wine' achieved fuller habits by comparison. 'Venus' was unusual in that its growth habit was symmetrical but less dense, creating an airy appearance. While the sweetshrubs were never pruned to observe their natural forms, some judicious pruning of errant branches would have been beneficial to all taxa except for 'Purpureus', whose excellent habit had no need for improvement.

Calycanthus floridus ROY'S DARK RED™ ['KLMY'] displaying an irregular habit typical of most taxa

All taxa except for 'Venus' were observed to sucker. *Calycanthus floridus*, 'Edith Wilder', 'Michael Lindsey', and ROY'S DARK RED™ ['KLMY'] exhibited the most aggressive suckering, with canes emerging several feet away and approaching the height of the main shrub, while other *C. floridus* cultivars suckered less vigorously. 'Aphrodite' and *C. ×raulstonii* cultivars had few suckers that only reached a few inches tall. After the sweetshrubs were removed in spring 2024, a multitude of suckers emerged from the remaining roots and stolons of various taxa, which were later chemically treated. This observation was valuable as persistent suckers will pose an issue if a gardener removes an established sweetshrub.

Suckers of *Calycanthus floridus* 'Michael Lindsey'

Habit of *Calycanthus floridus* var. *glaucus* 'Purpureus'

Summary

The Chicago Botanic Garden's evaluation of sweetshrubs encompassed the great bulk of taxa on the market, notably excepting *Calycanthus chinensis* and *C. occidentalis*. The virtues of this genus warrant greater use in landscapes than is seen today, and this trial provided insight into habit, flowering, fragrance, and fall color quality between taxa. No conclusive differences in pests, diseases, and other health issues were found between taxa, which included mild to moderate chlorosis in alkaline soils, mild to moderate leaf spot, and minor Japanese beetle damage. Concerns about cold hardiness in the Chicago area were unfounded, as *C. floridus* and hybrids proved to be hardy in at least the warmer end of Zone 5.

With consideration to their suckering habits, sweetshrubs are desirable additions to the garden, offering novelty with their uniquely scented blooms and multi-season interest with a prolonged flowering period and vibrant fall color. The top-rated sweetshrubs were each chosen for different reasons, exemplifying the versatility in this underutilized genus: 'Aphrodite' is a stately shrub with large, showy, and long-lasting flowers, 'Michael Lindsey' has attractive foliage in both summer and fall, an improved habit, and powerfully fragrant blooms, and 'Purpureus' offers a different foliage color as well as the best growth form among the sweetshrubs.

References and Citations

Christenhusz, Maarten J. M., et al. *Plants of the World*. Kew Publishing, 2017.

North Carolina Extension Gardener Plant Toolbox, N.C. Cooperative Extension [plants.ces.ncsu.edu]

Proctor, Michael, et al. *The Natural History of Pollination*. Timber Press, Inc., 1996.

Soltis, Douglas E., et al. *Phylogeny and Evolution of Angiosperms*. Sinauer Associates, Inc., 2005.

Special recognition to all the plant evaluators and photographers who contributed to this report: Patrick Dahl, Richard Hawke, Andrew Munoz, Jack Nicholson, Jim Ault, and Gavin Young.

Front cover: *Calycanthus* ×*raulstonii* 'Dark Secret'

Table 1: Observed plant traits and performance ratings

Overall Rating[1]	Year Planted	*Calycanthus*	Plant Height	Plant Width	Flower Color	Flower Size	Leaf Size (Length × Width)
★★★★	2018	'Aphrodite'	106 in.	159 in.	dark red, cream	3½-4 in.	7½ × 3½ in.
★★	2018	'Venus'	54 in.	90 in.	cream, dark red	2¾-3 in.	4¾ × 3 in.
★★★	2018	*floridus*	71 in	67 in.	maroon	1½-1¾ in.	4½ × 2 in.
★★	2018	*floridus* *'Athens'*	59 in.	86 in.	light yellowish green	1½-2 in.	4½ × 2 in.
★★★	2020	*floridus* 'Burgundy Spice'	50 in.	63 in.	maroon	1¾ in.	6 × 3½ in.
★★★	2018	*floridus* 'Edith Wilder'	61 in.	65 in.	maroon	1¾-2 in.	4½ × 3 in.
★★★	2018	*floridus* ROY'S DARK RED™ ['KLMY']	49 in.	75 in.	dark maroon	1½-2 in.	6 × 2¼ in.
★★★★	2018	*floridus* 'Michael Lindsey'	71 in.	81 in.	dark maroon	1½-2 in.	5 × 2½ in.
NR	2022	*floridus* SIMPLY SCENTSATIONAL® ['SMNCAF']	33 in.	29 in.	maroon	1½-1¾ in.	5 × 2½ in.
★★★★	2018	*floridus* var. *glaucus* 'Purpureus'	48 in.	88 in.	orangey-maroon	2 in.	5 × 2½ in.
★★	2020	×*raulstonii* 'Dark Secret'	75 in.	73 in.	dark burgundy, cream	2½-3 in.	7 × 4¾ in.
★★★	2018	×*raulstonii* 'Hartlage Wine'	96 in.	116 in.	burgundy-red, cream	2¼-3 in.	7 × 4½ in.
★★	2018	×*raulstonii* 'Solar Flare'	79 in.	86 in.	burgundy-puce, yellow	2¼-2½ in.	7¾ × 4¾ in.

[1] Overall Ratings: ★★★★ excellent, ★★★ good, ★★ fair, ★ poor

chicago botanic garden

1000 Lake Cook Road, Glencoe, Illinois 60022 U.S.A.
chicagobotanic.org (847) 835-5440

One of the treasures of the Forest Preserves of Cook County

RE24536