

A WORD OR TWO ABOUT GARDENING

Adding day time fragrance to your Miami-Dade landscape.

When selecting landscape plants it is logical to first consider factors such as local climate and soil conditions, plus size and exposure of the site, and not forgetting the time you are prepared to spend gardening. This done, you can evaluate plants based on their aesthetic qualities. In assessing landscape appeal the primary if not exclusive criteria will undoubtedly center on the plant's visual impact – color (leaf, flower, fruit, and bark), leaf texture and overall growth form. Selecting at least some plants based on their aromatic properties is in most instances an after thought.

There is a special delight in entering a garden and becoming vaguely aware of a pleasing fragrance and the satisfaction of finally discovering its' source. Such was the case returning home one evening in late spring many years ago (pre Hurricane Andrew) when a **pink shower tree** (*Cassia javanica*) was blooming in our front yard. There is scant mention of the mild sweet fragrance we detected in descriptions of *C. javanica* so its' presence came as an unexpected but pleasant surprise. A highly polymorphic species with several subspecies currently recognized, one of these **C. javanica subsp. nodosa** (formerly regarded as a distinct species) was described as having sweetly fragrant flowers. Alas our tree is no more, having succumbed to a swarm of chainsaws that buzzed through the neighborhood following Andrew. The purpose of this article is to expand enjoyment of local landscapes by engaging not only our eyes but our nose. Most fragrant flowers are found in 19 of the more than 700 plant families recognized by the USDA-GRIN. These include the familiar: **roses** (Rosaceae); **gardenias** (Rubiaceae); **jasmynes** (Oleaceae); **cestrums** (Solanaceae) and **frangipanis** (Apocynaceae), all of which are seen in Miami-Dade landscapes. There are also less familiar fragrant plants that are suited to local conditions, some of which are listed below.

It is instructive however to first realize how important fragrances are in the biology of plants. Just as the color and patterning of a flower did not evolve to please the human eye, floral scents were not intended as a source of aromatherapy. Both play vital roles in plant survival, specifically propagation, acting as cues to attract pollinators (usually insects). Depending on the plant species, floral scents can involve as few as 5 or 6 to more than 100 separate chemical compounds from the 1700 so far identified. Of these, **terpenes** (the largest and most diverse class of naturally occurring organic compounds) predominate. The basic structure of a terpene consists of multiple isoprene (iso-pentane) units. Iso-pentane is a 5-carbon hydrocarbon (it is released from plant leaves, and after methane is the second most common, naturally occurring, volatile compound found in the atmosphere).

Other fragrance chemicals are derived from **fatty acids** (including various aldehydes, ketones and esters) and a third group, referred to collectively as **phenylpropanoids**, from a common amino acid (**phenylalanine**). The above compounds contain carbon, hydrogen and oxygen atoms; a few, usually with unpleasant odors, also include nitrogen or sulfur. One of these nitrogenous

compounds (skatole) is responsible for the pungent odor of animal feces (it is a breakdown product of the amino acid tryptophan). At much lower concentrations skatole has a faintly pleasant odor and is a component of several floral fragrances including jasmine. Floral scents can be regarded as chemical fingerprints – it is believed that no two plant species emit the same quantitative and qualitative mix of chemicals, though since composition is influenced by environmental factors this is difficult to establish. The chemicals that comprise a fragrance are synthesized in specialized cells (osmophores) found on various flower structures, but mostly the petals. Fragrance intensity increases up to anthesis (flower is fully open) with a rapid decline post-pollination.

The intensity (and composition) of a **fragrance can also fluctuate over the course of a 24 h. day**, governed either by what has been termed an ‘internal clock’ (circadian rhythm) or influenced directly by exposure to light (diurnal). The former includes most flowers where peak fragrance emission occurs at night (e.g., those pollinated by hawk moths, bats and various beetles), and includes many tropical ornamental trees and shrubs grown in South Florida. Plants that release floral fragrances during the day are mostly pollinated by bees, and to a lesser extent butterflies with a few involving various smaller insects such as flies, wasps and thrips.

Bees remove nectar if present (for the sugars) and/or pollen (for the protein), using floral scents to locate suitable flowers. With limited ability to distinguish colors in the visible spectrum (restricted to white and pale pink, yellow and blue), bees are however able to discern ultra-violet radiation. This enables them to pinpoint the flowers center using nectar guides invisible to the human eye. *Rosa* spp., more so wild roses, have the typical fragrant, flat, open flowers, usually with large, white to pale pink or yellow petals, favored by bees. Open flowers of this type can attract other insects, though they may not be of importance as pollinators.

It should be noted that most wild roses are far more fragrant than modern cultivated roses. Indeed the rose was originally valued for its’ fragrance, the source of **attar of rose**, extracted mainly from petals of the **damask rose (*Rosa damascene*)**. Despite its’ expense and the advent of synthetic fragrances, this extract is still widely used in the perfume industry. The loss of fragrance seen in modern roses has also been commented on for cultivars of other popular flowering plants such as lilacs and carnations where the emphasis has also been on selecting for improved visual attributes such as flower longevity. Unfortunately there seems to be a negative link between enhancing a flower’s visual traits and retention of fragrance. An example concerns methyl jasmonate, an important component of many floral fragrances, but one that also promotes more rapid flower senescence.

To the human nose, bee and especially moth pollinated flowers release the most pleasing fragrances. **The remainder of the present article will review plants that are most fragrant during the day** (i.e., attract bees and/or butterflies or non-specific-pollinators). A second installment will describe flowers that are most fragrant during late evening/night. Apart from roses there are many other flowering trees and shrubs for use in Miami-Dade landscapes where fragrance release is principally, though not necessarily entirely during the day. If you can find an open sunny spot in the yard

with free draining soil, then **sweet acacia** (*Acacia farnesiana*) makes an attractive if thorny little tree with delicate, feathery foliage and small, sweetly fragrant, yellow, pom-pom like flowers. The tree is intolerant of wet sites, adapting well to poor rocky soil - it may be necessary to remove root suckers, especially when grown on local thin limestone soils. The **loquat** (*Eriobotrya japonica*), usually grown for fruit, is another small tree with fragrant flowers plus attractive foliage. Flowers appear mid December - mid February at which time the air is filled with their sweet spicy fragrance. Loquat should be fertilized lightly (too much nitrogen encourages fireblight) and once established require little to no water. The tree is easy to grow from seed; watch for seedlings which readily volunteer in the yard from fallen fruit.

Wrightia religiosa water jasmine is a less familiar shrub or small tree growing to at most 10' (locally) with the almost horizontal lateral branches creating an attractive layered appearance. Becoming deciduous during winter, water jasmine leafs out in spring at which time the branches are festooned with masses of pendant, tiny white flowers (resemble snowdrops familiar to northern gardeners). The flowers delicate appearance is matched by their soft fragrance. Amenable to use in a large tub or planter, it makes an ideal trouble free tree for a patio. Provide an evenly moist soil mix, keep mulched and water as needed during hot dry weather reducing water as leaves are lost during winter. If planted in the landscape on local Miami limestone enrich the soil with organic matter and correct trace element deficiencies with appropriate soil drenches and foliar sprays. In SE Asia water jasmine is frequently found in the vicinity of Buddhist temples, and the same is true of another but much larger tree.

Ceylon ironwood, Mesua ferrea is slow growing to more than 90' - since it is more suited to an evenly wet, tropical climate it is unlikely to reach half this size in our local wet/dry sub-tropical climate. The common name ironwood (as well as the specific epithet *ferrea*) refers to the trees extremely dense heartwood. This is a singularly attractive tree with an upright trunk and broadly conical canopy of handsome leaves that set the tree on fire when they first open pinkish red. Not to be outdone, the 3" flowers (likened to a fried egg) make their appearance late winter into spring with 4 large white to pale pink petals, the center filled with numerous bright yellow stamens. Flowers open 3-4 hours after midnight lasting only until the following sunset, but during that time emit a highly esteemed, sweet but not cloying fragrance. Flowers retain their fragrance long after being removed from the tree; traditionally used in India to scent stuffing for pillows and as a cosmetic. Not surprising based on the flower's structure (see above), Ceylon ironwood is highly attractive to bees.

Ceylon ironwood is not the only tree with fragrant flowers that resemble a fried egg. Often more of a large shrub, **Oncoba spinosa fried egg tree** is also sometimes referred to as the **snuff box tree** due to past use of the hard woody seed capsules as improvised snuff boxes. Spring into summer the tree is covered with many large white flowers (resembling *Rosa bracteata*, the McCartney rose), each lasting only a day but with a light, pleasant, melon-like fragrance. Unfortunately the tree is armed with fearsome 1½" spines; otherwise being highly drought tolerant, well adapted to local nutrient poor soils and apparently impervious to pests and disease, it would

probably be more popular. Avoid pruning during a growth flush as this encourages sprouting from the base of the trunk (*O. spinosa* often develops multiple stems). On bare limestone root suckers can be a problem.

The **elephant apple** *Dillenia indica* is an attractive potentially sizable tree that also produces flowers having large white petals, their centers filled with numerous golden yellow stamens. As with the previous two trees, flowers last only a day, but are esteemed for their fragrance, attracting various insects, especially bees. Pollen is released through pores present on the anthers of specialized stamens which vibrate in response to large solitary bees buzzing their wings as they visit the flowers. This is often referred to as buzz pollination, of which there are other examples scattered among a diverse number of plant families. The elephant apple tree makes a handsome shade tree for a big lot, developing an attractive rounded canopy of dark green prominently veined leaves. If there is a drawback it is the large messy fruits which develop a strong oniony odor.

Mention was made above of *Cassia javanica*, but the yellow flowering **Cassia fistula (golden shower tree)** which is more commonly seen locally, also produces mildly fragrant flowers. Both trees attract bees, but there is evidence that *Cassia* flowers are specifically adapted to buzz pollination by large carpenter bees (*Xylocopa* spp.). *Cassia* spp have pinnate leaves; leaflets of the golden shower are larger (up to 3-6") than the pink flowering cassias. Both are deciduous, tardily so for *C. fistula*, leaf drop being completed as the tree flowers in early summer. There are two other fragrant flowering trees in the Fabaceae that are worth mentioning, each with fragrant orchid-like flowers. The **Hong Kong orchid tree** *Bauhinia x blakeana* is a familiar sight in Miami-Dade, recommended not only because it is a sterile hybrid (therefore not weedy like its two progenitors) but is also regarded as the showiest of the orchid trees. The flowers attract both bees and butterflies and offer a delicate fragrance as an additional bonus.

Less familiar, **Intsia bijuga (Ipil or Moluccan ironwood)** is a slow growing tree, native from the western Pacific into SE Asia, that is suited to both limestone and coastal sites (salt tolerant and reportedly highly resistant to wind damage). A potentially large, buttressed tree, it is very variable as to size (from 25 – 80'), developing a broad crown of pinnate leaves with large, bright green, coriaceous leaflets. The inflorescence consists of a dense rounded raceme of unusual orchid-like flowers; each consists of four light green sepals, a single large white to pale violet petal, three prominently exerted fertile red stamens and several shorter infertile stamens (staminodes). The flowers are far more fragrant than the above orchid tree, and produce copious nectar attracting various insect visitors and birds. The hard, termite and rot resistant wood is highly valued as timber, resulting in the wholesale depletion of native stands of the tree. Quite fast growing at first, growth slows and ipil can be allowed to develop into a small to medium size shade/flowering tree.

Viburnums are familiar to most Florida gardeners, more so in central and northern parts of the state. In Miami-Dade ***Viburnum odoratissimum* (sweet viburnum)** and *V. suspensum* (Sandankwa viburnum) are sometimes seen. While neither species has especially showy flowers, those of sweet viburnum (as the name suggests) emit a pleasantly sweet fragrance as they open in spring. Sweet viburnum is a potentially

large shrub (to 20', can be trained as a small tree) that needs routine pruning to remain within bounds and retain a more compact appearance. Best if grown in part shade, sweet viburnum is moderately drought tolerant – on Miami-Dade limestone nutritional deficiencies may develop.

Far more familiar in Miami-Dade **yellow elder *Tecoma stans*** is a somewhat leggy shrub blooming mainly late summer into fall with masses of trumpet shaped, bright yellow, candy scented flowers. The fragrance is not pervasive, but becomes quite evident close up to the flowers. A variety of insects are attracted to the flowers especially bees, and the odd hawk moth towards evening. It is worth removing the prodigious number of seed pods to avoid having to pull up the many seedling volunteers that invariably appear in areas adjacent to where the yellow elder is growing. Unless regularly pruned it will appear untidy – the related ***T. castanifolia* (chestnut leaved trumpet tree)** has a more upright growth habit, and is easier to train as a small tree. Both are drought tolerant and require full sun and are well adapted to Miami-Dade limestone. The cultivar ***T. stans* 'Gold Star'** has a more extended flowering season (early summer to well into fall) and is locally available.

The **forest elder *Nuxia floribunda***, quite unrelated to yellow elder, is rare in local landscapes, most specimens being grown by tropical flowering tree enthusiasts. ***Nuxia* spp** are tropical relatives of the butterfly bush (*Buddleja* spp.), found mostly in southern and east Africa and range from large trees to shrubs. Forest elder is occasionally available from local specialist nurseries; potentially a large tree, in cultivation it forms a small shade tree (9 – 15') with large rounded panicles of miniature, white, sweetly fragrant flowers. Provide enriched soil and light shade – drought tolerance is poor, though trees survive in Los Angeles (with irrigation). Non-invasive roots make it suited to planting near driveways, and it is a good subject for use in a large planter.

Dais cotonifolia* pom pom tree** is a small tree, also from southern Africa and suited to growing in a large planter. The sweetly fragrant, pink, pom-pom like flowers attract numerous butterflies, though reportedly lose much of their appeal after rain. Like the pom-pom tree ***Phaleria clerodendron is another small tree in the Thymeleaceae, but from Australia where it is commonly known as **scented Daphne**. Both trees require moist soil though the latter prefers partial shade compared to full sun for *D. cotonifolia*. Scented Daphne produces clusters of small white tubular flowers, with a sweet coconut like fragrance, borne directly on the trunk or large limbs (cauliflorous).

With the possible exception of sweet acacia, the shrubs and trees discussed so far are not solely valued for their fragrance; they possess other landscape attributes as least as significant. In the case of the **Chinese perfume tree (*Aglaia odorata*)** fragrance is the one feature that has made this an increasingly popular landscape/container plant in Europe and N. America (in SE Asia and southern China it is used as a hedge and for medicinal purposes). In the same family (Meliaceae) as mahogany and the neem tree, *A. odorata* grows slowly to at most 15' as a small tree or much branched shrub. It produces axillary thyrses of tiny yellow flowers; these are at most of passing visual interest but their soft lemony fragrance more than compensate. Even dried, flowers will retain their fragrance for an extended period.

If planted in the landscape provide evenly moist, enriched, but free draining soil, and some afternoon shade. If grown in a container use an unglazed clay pot to help prevent the soil from becoming excessively wet (especially in summer).

The **sweet almond bush** (*Aloysia virgata*) is another shrub that is largely grown for its highly fragrant flowers. Redolent with the smell of honey and almonds, slender lax panicles of tiny white flowers are produced several times a year and attract both bees and butterflies. Found in Argentina, limited experience in Miami-Dade suggests sweet almond bush will succeed in Miami-Dade provided it is grown in free draining soil. It should be pruned after flowering – this will prevent the bush from sprawling and encourage repeat blooming.

There are several vines with flowers that are fragrant during the day. These include **bridal bouquet** or **coralita blanca** (*Poranopsis paniculata*) an extremely vigorous, woody, twining vine with panicles of small, white, honey scented flowers. Somewhat unremarkable for much of the year, its worth is obvious once flowering occurs in late fall/winter (it is also known as the Christmas vine). Flowering is intermittent, for several days at a time, but spectacular as all the flowers in a panicle open at once. Use a large trellis or pergola as a support keeping the vine away from trees and the stems off the ground – they readily root. Prune lateral shoots back to within two buds of main stems – does not respond well if main stems are heavily cut back.

The popular **bower vine**, *Pandorea jasminoides* is a moderately vigorous, twining vine growing to 15 – 25'. It has attractive shiny mid green compound leaves, but is grown for the profusion of fragrant, bell shaped flowers (white with the throat streaked pink). Bower vine is often confused with the closely related *Podranea ricasoliana* (**pink trumpet vine**), a sprawling, scandent climber (does not twine). Flowers have a candy-like fragrance, pale pink petals, with deeper purplish pink veins in the throat. More vigorous than bower vine it can, given a suitable environment, rapidly grow out of control – stems that touch the ground readily take root. Pink trumpet vine is also more drought tolerant but highly susceptible to soil nematode damage (risk less on Miami limestone).

Odontadenia macrantha is related to yellow allamanda, but has far more fragrant flowers. It grows as a large woody vine with deep yellow to apricot funnellform flowers with an orangey throat. Although often slow to establish, its ultimate size necessitates a sturdy support; soil should be evenly moist, though watering should be reduced during winter. Cuttings appear difficult to root, though more success has been claimed by air layering mature stems.

We are especially fortunate in Miami-Dade to be able to choose from an array of tropical plants with especially inviting fragrances. In the next article we will venture out into the moonlight to enjoy some night time fragrances and discover that a scented garden can be more than a literary cliché, more than a favorite venue for the protagonists in a romance novel.