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Front cover: The flowers of *Stewartia ovata* forma *grandiflora*, accession number 18244-B, received from T. G. Harbison of Highlands, North Carolina, in 1925. This specimen is unusual in producing five-petaled flowers with either purple or nearly white anther filaments, and occasionally chimeric flowers with both. Photograph by Peter Del Tredici

Inside covers: A photo gallery of plants to be offered on September 18, at the Arboretum's 25th fall plant sale. See list of photographers on page 32.

Back cover: The graceful fruit of the longstalk holly, *Ilex pedunculosa*. Photograph by Ethan W. Johnson.

Against All Odds: Growing *Franklinia* in Boston

Peter Del Tredici

The year 2005 gives the Arboretum an excuse to celebrate two of its most historically significant plants: it marks the centennial of the *Franklinia alatamaha* located along Chinese Path, on the southwest slope of Bussey Hill. Two specimens, growing side by side, were propagated in 1905 as cuttings from a tree received by the Arboretum in 1884. Since then, the plants have become giant shrubs that sprawl across the landscape, taking root wherever their branches touched the ground. This "self-layering" habit of *Franklinia* is an important part of its growth strategy and gives the plants an air of dynamism that suggests they will have moved to a completely different part of the Arboretum by the time of their next centennial.

The larger of the two plants (#2428-3-B) is now 21 feet (6.3m) tall by 53 feet (16m) wide and has eight more-or-less vertical "trunks" greater than 5 inches (12cm) in diameter (the largest is 7 inches, or 18cm). The smaller plant (#2428-3-A) is also 21 feet tall but just 30 feet (9m) wide, and has six stems larger than 5 inches in diameter. In the ranks of monumental trees, these are not

Franklinia alatamaha, *# 2428-3-B, at the Arnold Arboretum.*

The spectacular flower of Franklinia.

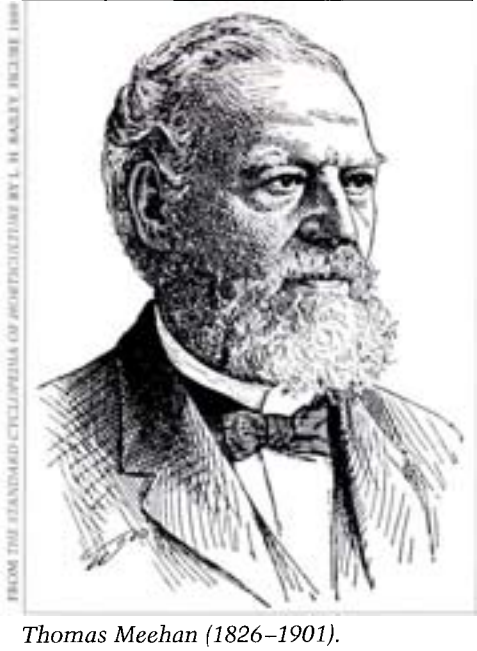
impressive dimensions, but they are enough to place them among the largest *Franklinias* anywhere in the world. More important, they are the oldest *Franklinias* of known, documented lineage. To put it another way, we know where the plants came from and when, which is more than most people can say about their *Franklinias*.

The title of "oldest documented *Franklinia*" was bestowed on the Arboretum's plants in 2000 after a two-year survey of cultivated *Franklinias* throughout the world that was conducted by Historic Bartram's Garden in Philadelphia.[1] To appreciate the significance of this finding, we must review the plant's colorful history. The species was discovered in southeast Georgia, along the Altamaha River near Fort Barrington, on October 1, 1765, by John Bartram and his son William. The plant was not in flower at the time, so its identity remained uncertain. William returned to the area in 1773 and produced a beautiful illustration of the plant in flower that he ranked as being "of the first order for beauty and fragrance." In 1776, William was able to collect seed from the plants, which he took back to Philadelphia. Several other collectors later visited the Bartram's *Franklinia* site along the Altamaha River, the last being the English nurseryman John Lyon in 1803.[2] Since then, no one has reported finding *Franklinia* growing in the wild.[3]

The species was first described and given the name *Franklinia alatamaha* in 1785 by William's cousin Humphry Marshall in his groundbreaking book, *Arbustum Americanum: The American Grove.* William's own description of his encounter with *Franklinia* in the wild did not appear until 1791, when he published *Travels* after a long series of delays. Unfortunately Bartram's very American name did not take hold in Europe, where botanists chose to refer to *Franklinia* as *Gordonia pubescens*.[4] This name stuck until 1889, when Sargent changed it to *Gordonia altamaha*.[5] It wasn't until after 1925 that Humphry Marshall's original name for the plant, *Franklinia alatamaha*, was widely recognized by botanists as legitimate.[6]

William sowed the Franklinia seed he had collected shortly after his return to Philadelphia in January 1777, and they germinated soon after. The resulting plants produced their first flowers four years later, in 1781, and their first seed in 1782.[7] On August 16, 1783, William wrote to Linnaeus that he had raised a total of five *Franklinia* seedlings—two he sent to France and two he planted in his own garden, which were currently flowering and "full of seed nearly ripe."[8]

In November 1831, William Wynne, the foreman at Bartram's Garden, reported that one of the original seedlings was fifty feet tall,[9] and in 1832, the botanist Constantine Rafinesque visited the garden and described a specimen that was "nearly 40 feet high."[10] In 1846, D. J. Browne noted a *Franklinia* in Bartram's garden that was "fifty-two feet in height, with a trunk three feet and nine inches in circumference [which equals a diameter of 14 inches]."[11] Seven years later, Thomas Meehan measured one of Bartram's *Franklinias* at "about thirty feet high [with] a diameter of from



Thomas Meehan (1826–1901).

The Arboretum's original accession card for the Franklinia alatamaha *(received as* Gordonia pubescens*) from Thomas Meehan in December 1884*

This drawing appears in The Standard Cyclopedia of Horticulture, *rev. ed., 1916, with this caption: "A tender tree bound in branches of hemlock. The protected tree is a specimen of gordonia* [Franklinia] *about 10 feet high, at Arnold Arboretum, Boston."*

nine to twelve inches." He went on to note that "the finest specimen lately blew off in a gale,"[12] a statement that clearly indicates that only one of Bartram's original seedlings—the smaller of the two—was alive in 1853.

The last measurement of the original trees was in 1890, by Joseph Meehan, Thomas' younger brother, who reported in *Garden and Forest:*

> This tree was supposed to be dead, and in fact it did die to the ground, but on a recent visit to it I observed a sucker of several feet in length from a portion of the stump beneath the ground.

In this same article, Meehan reported the existence of a 25-foot-tall specimen of *Franklinia* growing in the garden of William De Hart in Philadelphia that was "raised by layering a branch of the original tree in Bartram's Garden."[13] Unfortunately this tree no longer exists.

The two plants that grew in Bartram's garden were a ready source of *Franklinia* seed—indeed, the only source—and they were distributed by William and later by his nephew, Robert Carr.[14] As *Franklinia* became more common in the Philadelphia area, a number of local nurseries began propagating it. Foremost among the early propagators was Thomas Meehan, who had immigrated to the United States in 1848 and worked as the gardener at Bartram's Garden before establishing his own nursery in Germantown in 1853.[15] In that same year, Meehan published *The American Handbook of Ornamental Trees* in which he described the cultivation and propagation of *Franklinia:* "It seems to thrive best in a light rich loam, contiguous to moisture; and may be propagated by either seeds or layers."[16] During the 1870s and 80s, the Arboretum's first director, C. S. Sargent, worked closely with Meehan to save Bartram's house and what was left of the garden from destruction, a goal that was accomplished in 1891 when the property officially became part of the Philadelphia park system.[17]

C. E. Faxon's illustration of Franklinia alatamaha *(Tab XXII) from volume one of* Silva of North America *by C. S. Sargent (1890).*

It was therefore appropriate that Thomas Meehan should have donated a *Franklinia* plant to the Arnold Arboretum. It was accessioned under #2428 as *Gordonia pubescens* in December 1884. Meehan's donation was most likely propagated from a specimen of *Franklinia* growing in his nursery in Germantown, just outside Philadelphia. Sargent mentions this tree in the *Franklinia* entry of the first volume of *Silva of North America* where he published a beautiful illustration of it.[18] The specific technique that was probably used to propagate this plant was described by Thomas Meehan's younger brother Joseph in *Garden and Forest*: "The tree can be

Franklinia's *fall foliage.*

increased by layering. If good soil be placed about it, and the layer not disturbed for two years, a strong, well-rooted plant results."[19]

Franklinia at the Arnold Arboretum

In 1889, Sargent announced in the pages of *Garden and Forest* that:

> *Gordonia pubescens* has flowered this year at the Arnold Arboretum, growing in the open ground. The plant was bent over and covered with soil last winter. Though not hardy at Boston, it might do well when trained against a sheltering wall. A few of its beautiful flowers would well repay a little trouble and care.[20]

The following year, in the September 24, 1890, issue of *Garden and Forest*, the Arboretum's dendrologist, J. G. Jack, reported that *Franklinia* was again flowering at the Arboretum, and in 1893 he elaborated on the technique used to protect the plant in winter:

> [A]t the Arboretum, after growing in its present position for about eight years, it is a several-stemmed shrub eight or ten feet high. Moreover, it is necessary every autumn here to bend its stems over, to as near the ground as possible, and protect them from the rigors of winter with leaves, soil or other protecting material. After pegging the branches down, the best protection is afforded by putting dry leaves over and among them, and then covering the whole with soil thrown up in the form of a little mound, so as to shed the rains. It might pass the winters without such protection if planted in the shelter of some warm walls. In any case, it is well worth any extra care bestowed upon it . . . It may be propagated by layers or cuttings.[21]

Jack's reference to the propagation of *Franklinia* by cuttings was later corroborated by Sargent, also in the pages of *Garden and Forest*, where he noted:

> Two or three plants of *Gordonia altamaha* are now in flower in the Arnold Arboretum. The plants are only about three feet high and are from cuttings taken in July, 1891. They have stood out two winters without protection and nothing but the new growth was killed.[22]

Indeed, a check of the Arboretum's records shows that cuttings from #2428 were taken in July 1891 and given a new accession number, 2428-1. And it's a good thing, too, because the original plant from Meehan died in 1896. Cuttings from #2428-1 were successfully rooted in July 1900, on July 5, 1905, and finally in 1908. The plants from both the 1905 and 1908 cuttings were given the accession number 2428-3. Two of the plants from this third-generation accession of *Franklinia* are still growing on Bussey Hill, one hundred and twenty-one years after their arrival at the Arnold.

The decision to plant *Franklinia* on the southwest slope of Bussey Hill was based on the knowledge—gained from experience—that this was one of the best locations for growing plants in the Arboretum's 260 acres. Over the years, this area (now known as "Chinese Path") has consistently provided Arboretum staff with a perfect location for growing plants whose hardiness is either marginal or unknown. The soil, which is deep and relatively free of stones, provides an excellent balance of moisture retention and drainage, and the mid-slope location gives protection from both the cold winter winds and the unpredictable frosts of spring and fall.

The Arboretum's early experiments with cultivating *Franklinia* were primarily focused on

its hardiness. From the perspective of 120 years' hindsight, however, the plant's susceptibility to disease—especially from the wilt-causing fungus *Phytophthora cinnamoni*—appears to be a more critical problem. This pathogen is particularly troublesome in heavy, wet soils, but even where drainage is not an issue, *Franklinia* has the well-deserved reputation of being difficult to keep alive—a "miffy" plant, to use an English horticultural term. A second factor that makes *Franklinia* tricky to grow is its requirement for acid soil—with a pH between 5 and 6—an observation that was not documented until 1927.[23]

This reconstruction of *Franklinia's* long history at the Arboretum makes it obvious that much of the horticultural knowledge that we take for granted today exists only because of the work of persistent staff members constantly pushing the limits of what they could cultivate. The *Franklinia* growing today on Bussey Hill are a living legacy to the untiring efforts of John Bartram and his son William, Thomas Meehan, Charles Sargent, and John Jack. Indeed, on a crisp fall day in October, a knowledgeable visitor to the Arboretum can sense the presence of these men amidst the stunning display of pure white flowers and rich crimson foliage. They were able to accomplish great things because they believed in the importance of their work and stuck with it through all kinds of adversity. Without their concerted efforts, *Franklinia* might never have survived into the twenty-first century, let alone come into flower on Bussey Hill in the year 2005.

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Acknowledgments

The author would especially like to thank Joel T. Fry, Curator of Historic Collections at Bartram's Garden, for directing him to the articles in *Garden and Forest* describing the Arnold Arboretum's efforts at cultivating *Franklinia.*

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A SILVER ANNIVERSARY
The Fall Plant Distribution and Sale, 1980–2005

In 1980 the flyer for the Fall Plant Distribution and Sale —the Arboretum's first—noted that many of the species being offered were rarely seen even in the botanical gardens of North America. Members were encouraged to take their time and browse carefully, "so that you don't overlook those rare gems seldom found in private gardens." That advice is just as apt today, as many of these unusual plants remain hard to find.

In honor of the sale's silver anniversary, *Arnoldia* asked notable plant people to contribute comments on their favorites from the list of plants at this year's sale. Photographs of many of the plants to be offered are displayed on the inside front covers as well as on this page.

Clockwise from the top: **Magnolia stellata** *'Centennial', a selection that commemorates the Arboretum's 1982 centennial;* **Kolkwitzia amabilis** *'Pink Cloud', a beautybush cultivar known for abundant, clear pink flowers;* **Vitex rotundifolia**, *a low, spreading, salt-tolerant shrub with silver-blue foliage;* **Abies nordmanniana**, *a handsome fir that will develop a broad crown;* **Kalmia latifolia** *'Raspberry Glow', a mountain laurel that produces deep burgundy buds and raspberry-pink flowers.*

The Dove Tree: A Long Journey West

Richard Schulhof

RICHARD SCHULHOF

An outstanding specimen of Davidia involucrata *var.* vilmoriniana, *in all liklihood the oldest in North America, accession #5159, resides on Bussey Hill's Chinese Path.*

Whether for a plant collector or a gardener with a taste for the remarkable, there is much to recommend in a tree that combines a curious beauty with a storied past. For those interested in the history of plant introduction, few species conjure more images of turn-of-the-century exploration than the famed dove tree *(Davidia involucrata)*. And for horticulturists, the first encounter with the dove tree is often like one's first taste of champagne, initially peculiar to the palate but greatly prized by the end of the glass.

It was like that for me. The occasion was a student field trip on a blustery spring day in Boston, Massachusetts; the location was the Arnold Arboretum. After a long search for the tree, we were a little disappointed with our first glimpse of a specimen that was surprisingly inconspicuous from a distance—the many white, fluttering bracts might have been mistaken for leaves with a pale underside. Closer examination, however, revealed inflorescences of exquisite complexity. Uneven pairs of improbable greenish-white bracts ("doves") hung dramatically from malt-ball-sized globes of a wonderful chocolate brown. With my hand lens I made out scores of small male flowers covering these balls like the florets of a dandelion; near the center stood the single female flower. I had never seen anything quite like it.

But the experience was especially memorable because we believed the tree before us was not just any dove tree but a historic specimen grown from seed collected by Ernest H. Wilson, the celebrated plant explorer most closely associated with the Arnold Arboretum. Ironically, however, the tree in question—the Arboretum's best specimen—results not from a Wilson expedition but from that of an earlier plant explorer, French missionary Père Paul Guillaume Farges.

I was familiar with the story of Wilson and the dove tree, having recently read Stephanne B. Sutton's marvelous biography of the Arboretum's founding director, Charles Sargent. In 1869, the species was first discovered by French missionary Père Armand David in Sichuan Province, near the Tibetan border. Described and named after its discoverer in 1871, the *Davidia* was subsequently sighted by Augustine Henry, an English physician with a great passion for botany then stationed in China. In 1893, he wrote enthusiastically, "Davidia is worth any amount of money. I saw only one tree of it, but doubtless there are others in the district . . . Davidia is wonderful."

Sir Harry Veitch of the prominent Veitch Nursery in Chelsea, England, read Henry's encomium and resolved to be the first to offer the heralded new species commercially. He hired Wilson, then a twenty-two-year-old horticulturist, to travel to China, giving him clear instructions: "The object of the journey is to collect a quantity of seeds of a plant *(Davidia)* . . . This is the object—do not dissipate time, energy or money

on anything else." Beginning in the spring of 1900, Wilson, working from a map provided by Henry, searched a large area of central China only to discover that the one tree of known location had been cut for lumber. Undeterred, he eventually found several fruiting trees, and he sent hundreds of seeds back to England. The first plant came into bloom at the Veitch Nursery in 1911. However, unbeknown to both Wilson and Veitch, Père Farges had in 1897 sent 37 seeds to the arboretum of Maurice de Vilmorin in Les Barres, France. In 1899, one of those seeds germinated and the resulting tree bloomed in 1906. So even though Wilson could claim responsibility for broadly distributing the dove tree, thanks to the large quantities of seed he had gathered, the credit for introducing the first specimen to the west belonged to Farges. Smarting from the loss of greater glory, Wilson wrote, "After my successful introduction of *Davidia* in 1901, and its free germination in 1902, I had yet one little cup of bitterness to drain."

It is from the one plant germinated from Farges' seed that the outstanding specimen at the Arnold Arboretum (accession #5159*A) originated. The plant, a rooted layer, was obtained by Charles Sargent and planted at the Arboretum in 1904. Injured by severe cold early in life, the tree resprouted from its base to form the multi-stemmed specimen we know today. When it bloomed for the first time in 1931, then Arboretum director Oakes Ames, writing in the Arboretum's *Bulletin for Popular Information*, declared that the specimen was notable more for its botanical novelty than for its beauty:

> We are told that in its native land, when laden from top to bottom with enormous white floral bracts, some of them attaining a length of eight inches or more, D. involucrata presents a wonderful aspect. But from an aesthetic point of view it has little to recommend it. Its claim to a place in the garden rests on the bizarre form rather than the beauty of the inflorescence.

If he could see the fully mature specimen of today, Oakes Ames might very well revise his opinion. Now over 30 feet in height, the tree in bloom is without question an outstanding feature of the Arboretum's spring landscape (remember, though, the dove tree is an alternate-year bloomer). You can usually find it in full

The distinctive bark of the dove tree

flower on or about Lilac Sunday, perched on the west-facing slope of Bussey Hill along Chinese Path near several other spectacular specimens of similar vintage. Interestingly, a few feet away grows a dove tree that originated from the seed collected by Wilson for the Veitch Nursery and sent to the Arboretum as a sapling in 1911. A somber reminder of failed expectations, the Wilson specimen (accession #14473*A) resides in the shade of stewartias and has never attained the physical prominence of its nearby neighbor. Like most dove trees in cultivation, both specimens are of the botanical variety *Davidia involucrata* var. *vilmoriniana*, which differs from the species in having smooth rather than felted leaves.

Still rare in gardens, *Davidia* is unrivaled among hardy trees for historical, botanical, and horticultural distinction. More than a one-season ornament, it offers attractive mottled, reddish-gray bark along with three- to five-inch leaves that are a bright green and usually free of pests or disease. The large round fruits, roughly one-and-one-half inches in diameter, dangle singly and often persist into the winter. Although once established it is hardy to USDA zone 6, young plantings may require some protection in extreme winters. Please note that if you plant a seedling from the Arboretum plant sale, you will wait up to ten years before seeing a bloom. Yet according to E. H. Wilson, the flowers of "the most interesting and beautiful of all trees of the north temperate flora" are well worth the wait.

Richard Schulhof is deputy director of the Arnold Arboretum.

Ilex pedunculosa: The Longstalk Holly

Phyllis Andersen

In the fall of 1892, during his first plant collecting trip to Japan, Charles Sprague Sargent admired a distinctive holly growing along the Nagasendo Highway, the famous mountain road connecting Kyoto to Edo (now Tokyo). He found the plant growing both in the wild and in the gardens of local inns, sometimes as a shrub only two to three feet high and sometimes as a well-formed tree as tall as twenty to thirty feet, with a narrow, round-headed top. Its oval leaves were a lustrous, dark green. But its most distinctive feature was its long flower stems, or peduncles, which in the early fall drooped under the weight of bright red fruit, not unlike the stems of fruiting cherry trees.

The plant that had so impressed Sargent was *Ilex pedunculosa,* the longstalk holly, first described for publication by the Dutch botanist Friedrich Anton Wilhelm Miquel in 1868. Its affinity with the hollies of New England made it of particular interest to Sargent, who was committed to researching the similarities between the floras of eastern Asia and eastern North America. The plant's appeal was further enhanced by Sargent's desire to add plants of significant ornamental value to the Arnold Arboretum's collection. Later Sargent hired the British plant explorer E. H. Wilson to further pursue the study of Asian flora, and in 1907 Wilson sent seeds of *I. pedunculosa* from China back to Boston.

With lustrous leaves, bright red fruit, and dependable hardiness throughout zone 5, the longstalk holly is a broadleaf evergreen that few in New England can rival

E. H. Wilson photographed this 25-foot-tall longstalk holly in China, 1909. In cultivation the plant attains little more than half that height

The first plants propagated from this seed were set out on the Arboretum's Hickory Path, where their ornamental qualities and hardiness were evaluated for many years. Having performed well at that site, they were moved in 1970 to an area near the Arboretum's administration building, where they still form a distinctive part of the setting.

The evergreen leaves of *Ilex pedunculosa* are oval in shape, one to three inches long and three-fourths to one-and-one-quarter inch wide. They lack the spines so characteristic of the American holly *(I. opaca)* and the European holly *(I. aquifolium)*. Several writers have noted the leaves' resemblance to those of mountain laurel *(Kalmia latifolia)*; Sargent, on the other hand, compared them to those of "our wild cherry." In the Boston area, the plant produces inconspicuous white flowers in mid June. The bright red berries, or drupes, as they are called, are often as large as those of *I. aquifolium*, nearly one inch long and one-quarter inch in diameter. They appear in early fall and persist on the plant throughout the season if not eaten by the birds.

The branching pattern of the longstalk holly is generally upright, becoming more open as the plant matures. While plants in the wild can attain up to 30 feet in height, they are smaller in cultivation, reaching at most 15 feet. Like all hollies, *Ilex pedunculosa* prefers a well-drained, slightly acidic soil and thrives in partial shade. It has few disease or pest problems. In common with other hollies, it is dioecious, having male and female reproductive structures on separate plants; for a good fruiting display on female plants, grow a small male plant in the same general area. (A ratio of one male to up to six females is recommended.)

Having observed that in Japan *Ilex pedunculosa* was found at high elevations that were subject to "excessive winter cold," Sargent hoped that the plant would thrive in New England, where the traditional English and American hollies are prone to winter injury. His hopes were fulfilled: *I. pedunculosa* is dependably hardy through USDA zone 5 and has survived severe winters at the Arnold Arboretum better than many other broadleaved evergreens.

Phyllis Andersen is a landscape historian and instructor in the Landscape Institute of the Arnold Arboretum. She was the director of the Arboretum's Institute for Cultural Landscape Studies.

'Yoshino': An Outstanding Cultivar of the Japanese Cedar

Kim E. Tripp

Hundreds of exceptional conifers exist, but one among them stands out: a plant that combines great beauty and diversity of form with ease of propagation and tough adaptability. I refer to *Cryptomeria japonica*, or Japanese cedar.

Japanese cedar is a monotypic genus native to Japan and southern China. In Japan, it has been grown and selected for hundreds of years as an important forestry crop, a valuable ornamental, and a bonsai subject. Revered plantings of Japanese cedar, or *sugi*, surround several of the oldest monastery temples. Many of them are over 300 years old and reach well over 100 feet in height, with trunk diameters of 10 feet. But these massive trees bear little resemblance to the average Japanese cedar on this continent. Nor are these venerable specimens similar to the Japanese cedars often seen languishing in established landscapes. In North America the oldest specimens are usually seedlings that have aged into thinning, gangly individuals. They do not represent the handsome forms now available, and unfortunately, they have given Japanese cedar an undeserved reputation for tattiness.

The "classic" Japanese cedar, *Cryptomeria japonica* var. *japonica*, takes on a loosely conical, semiformal shape and can reach heights of 50 to 80 feet. The short, flexible, somewhat incurved needles give the foliage a soft, refined appearance and an easily handled texture. (Most people begin unconsciously stroking the branches of Japanese cedar within minutes of standing next to it.) As it matures, *C. japonica* var. *japonica* and related types (including 'Yoshino') resemble tightly knit, forest-green clouds billowing up from the ground. However, this characteristic varies greatly among its many cultivars, which differ so much from one to another that they hardly seem to be the same species.

Japanese cedar is hardy throughout zones 6 to 9—even in mountainous areas and hot regions of the eastern coastal plain and piedmont. It prefers a rich, deep, acidic soil, but it has performed well in many soil types throughout the country. One of its great attributes is its range of adaptability, extending from the cool, moist Northwest to the hot, wet Southeast. It prefers higher soil moisture than many other conifers and suffers during extended dry periods. Its root system is a vigorous, fibrous mass, and even large trees transplant readily with minimal browning and dieback if adequate water is regularly provided following transplanting.

Like almost all conifers, Japanese cedar needs full sun for rapid growth, but it also grows well in partial shade. Deep or constant shade, however, will lead to thinning and interior dieback. Avoid planting Japanese cedars in exceptionally windy sites, too, especially in borderline cold-hardiness areas where excessive winter bronzing may be a problem. Partial shade will minimize winter bronzing.

Japanese cedar is a problem-free plant with one exception: Stressed plants can be susceptible to the fungus *Phyllosticta aurea* (redfire). It causes foliage to die and branches to turn a bright reddish brown. It generally attacks older foliage on individual branches first, then—in severe cases—progresses throughout the tree until only the actively growing tips remain green. However, susceptibility is highly variable among cultivars, and 'Yoshino' is one of the most resistant.

Cold can be another of Japanese cedar's adversaries. From time to time, late spring freezes—or fall freezes on actively growing, unhardened imported plants—will kill the soft tip growth of the branches. Happily, this is never serious because it has a wonderful ability to regrow after dieback or cutback. (I have seen a 4-foot-tall plant of 'Benjamin Franklin' reduced to 4 inches by a large mower twice in three months; the unrepentant operator of the mower dubbed

it "the bionic plant.") Frost or freeze damage to soft tip growth is easily differentiated from the symptoms of redfire fungus. Redfire usually progresses from older to younger tissue along a branch and up the tree. Insects are seldom a problem. Since bagworms, which plague Leyland cypress in some areas, are not normally a pest of *Cryptomeria*, the full-size forms of Japanese cedar make an excellent alternative to Leyland cypress.

Almost all forms of Japanese cedar can be propagated easily from cuttings, which are best taken from November through February but will root at almost any time of year if mature, hardened wood is available. Full-size cultivars like 'Yoshino' will usually root even if no visible mature wood is available (albeit more slowly), but avoid cutting during active flushes of growth. Wound cuttings minimally and treat them with moderate concentration of rooting hormones and place them under mist. (In winter, bottom heat can help.) As one might expect in a hydrophilic plant, it roots faster at higher mist frequencies than those used for other conifers.

The cultivar 'Yoshino' is a full-sized form that will reach 50 feet quite rapidly and retain a uniform, informally pyramidal habit with the type species' cloudlike silhouette. It is the most reliably cold-hardy cultivar and the best choice for zone 6 gardens. A beauty as a specimen, in numbers it will also rapidly make a handsome screen. 'Yoshino' has been used to create a lush background to the waterfall and mountain paths of Tenshin-en, the Japanese garden at Boston's Museum of Fine Arts.

Cryptomeria japonica *growing in a nursery in Maryland.*

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Microbiota decussata: A Versatile Conifer

Nancy Rose

Microbiota decussata is an elegant, low-growing evergreen shrub that is finding its way into more gardens every year. Its combination of graceful form, attractive foliage, cold hardiness, and landscape value earned it a 1998 Cary Award, which annually honors outstanding woody plants for New England gardens. *Microbiota decussata* has gained favor well beyond New England, however, and gardeners in many states may find it an excellent addition to their landscapes.

This unique conifer has a remote and limited native range: the Sikhote Alin mountain range in the southeastern leg of Siberia, bordering the Sea of Japan. It is often found growing above the treeline, frequently in association with *Pinus pumila,* a shrubby pine species, and in shrubland areas in the upper mountain valleys of the region. The species was first recorded by botanist I. K. Shishkin in 1921, in the mountains northeast of Vladivostok, and named by botanist V. L. Komarov in 1923.

Despite being discovered and named over 80 years ago, *Microbiota decussata* is often described in garden catalogs as "new" or "recently discovered." This claim is actually not so far off, since there was a significant lag between the plant's discovery and its introduction to gardeners in North America. The species was not mentioned in *Hortus Third,* the 1976 edition of the venerable tome that lists cultivated plants of the U.S. and Canada. It has slowly become more available in the nursery trade over the past 20 years, however, and is clearly now here to stay.

Microbiota decussata is the lone species in its genus, but it is not without relatives. It belongs to the cypress family, a wide-ranging group of coniferous trees and shrubs that includes well-known evergreen genera like *Juniperus, Thuja* (arborvitae), and *Chamaecyparis* (false cypress). Taxonomically, *M. decussata* is perhaps most similar to *Platycladus orientalis* (oriental arborvitae), but the two are different enough to maintain their separate designations.

With a height at maturity averaging only ten to eighteen inches in most landscape plantings, the plant's low, widespreading form resembles that of spreading junipers. (Interestingly, native Siberian specimens with heights ranging from eight inches to over three feet have been reported, indicating that it may be possible to select shorter or taller types from wild populations.) Many long stems radiate horizontally from the plant's crown, creating a spread that can reach ten feet or more. As these main stems grow outward, numerous gently arching secondary branches rise from them, developing first near the center of the plant. Since all of *Microbiota decussata's* branch tips nod downward, the result is a wonderfully graceful, softly layered appearance. The nodding branch tips are characteristic of the species and make it easy to differentiate it from spreading junipers, whose branch tips tend to flare upward

The individual branchlets of *Microbiota decussata* are arranged in lacy, fernlike sprays, much like those of arborvitae; no doubt this accounts for another common name for the plant, "Russian arborvitae." The branchlets are covered with closely pressed, scale-like needles arranged in opposite pairs. The pairs emerge at 90-degree angles from each other, resulting in a neatly layered, four-ranked arrangement termed *decussate*—hence the plant's specific epithet *decussata.* The individual needles are tiny (one-eighth inch or less), with convex outer surfaces, a triangular shape, and tips that feel slightly sharp when you run a finger down the branchlet backwards, from tip to base.

The foliage can safely be described as a pleasant bright green during the growing season but describing its winter color is a highly subjective exercise. Those who don't like the plant use terms like "dull brown" or "dirty purplish

Microbiota decussata *has a natural affinity for rocks*

brown" while those who find it appealing describe the color as anything from "magnificent copper" to "rich bronze" or "burgundy purple." Beauty (and color descriptions) are clearly in the eye of the beholder. Plants grown where they are shaded during the winter show less bronzing than those in full sun. Some plants seem to green up more quickly than others in the spring; perhaps in the future nursery growers should select for this trait in new cultivars.

Being a conifer, *Microbiota decussata* does of course bear cones, but they are so small as to be hardly noticeable. Male and female cones occur on the same plant—in other words, it is monoecious. The male cones are the smaller, about one-sixteenth to one-eighth inch long; they release pollen in the spring. Female cones, about one-eighth inch long, consist of a single naked seed held within two to four leathery scales; the seeds mature in late summer or early autumn.

It is a very cold hardy plant, surviving through USDA zone 3 (average annual minimum temperature minus 30 degrees to minus 40 degrees F). In fact, it seems to prefer cooler climates and may fail to thrive in areas warmer than USDA zone 6. Excellent soil drainage is a must, but as long as the site is well drained the plant can adapt to a range of soil types and pH levels. It grows well in evenly moist soil, but once established it also tolerates drier conditions. An inch or two of organic mulch—wood chips, shredded bark, or pine needles—applied in a wide circle around the plant will help keep the root zone cool and moist. So far *M. decussata* has not shown susceptibility to *Phomopsis* tip blight, a common disease problem for some of the spreading junipers, and appears to be free of other major disease or insect problems.

When *Microbiota decussata* started to become available in nurseries it was often touted as extremely shade tolerant. This was seen as a great advantage over spreading junipers, which grow poorly and exhibit thinning foliage in shade. More experience with *M. decussata* has led to modified recommendations, however. It too is prone to limited growth and thinner foliage when grown in dense, full shade, so the better choice seems to be partial shade or full sun exposure. In regions with hot summers this Siberian native appears to benefit from partial shade, especially in the afternoon.

Microbiota decussata is usually sold in containers at nurseries and garden centers, but is also available from a number of mail order garden catalogs. While it can be grown from seed, most commercial propagation is by rooted stem cuttings.

This is a plant with multiple uses in the landscape. Because of its low height and wide spread, it makes an ideal evergreen groundcover, its ferny, layered foliage creating a three-dimensional effect that is lacking in many groundcovers. It has a natural affinity for rocks, whether sweeping around the base of a well-placed decorative boulder or spilling over the top of a stone retaining wall. Attractive alone, it also combines well with small deciduous shrubs, herbaceous perennials, and other conifers. Even its bronze winter color shows to advantage when contrasted with the dark green foliage of evergreens, the colorful fruit of shrubs like *Ilex verticillata* 'Red Sprite', or the light tones of ornamental grasses.

For a note about the author, see page 25.

Chionanthus retusus: The Chinese Fringetree

Peter Del Tredici & Jianhua Li

An eighteen-year-old specimen of Chionanthus retusus *growing at the Arnold Arboretum. Note the single-stemmed growth habit that has developed without pruning.*

Handsome is a word often used to describe the Chinese fringetree *(Chionanthus retusus).* When planted in the open, this species develops into an elegant small tree, twenty to thirty feet high with approximately the same spread. A century-old specimen at the Arnold Arboretum is about twenty feet tall by thirty feet wide, and when in bloom from late May through mid June is totally covered with showy, white flowers. It is no exaggeration to say that this tree is capable of putting on one of the Arboretum's best floral displays. The blue-purple fruit, which matures from late September to October, provides a second season of interest. Chinese fringetree is more tree-like and graceful than its straggly American cousin, *C. virginicus,* and is not nearly so late to leaf out in the spring.

The species has a broad distribution in Asia, where it shows considerable variation in its growth habit. In cultivation at the Arnold, some specimens are multistemmed, while others—especially those raised from Korean seed—are distinctly single-stemmed. The plant seems to have broad ecological adaptability, growing equally well in the warm, dry climate of southern California (USDA zone 9) and the cold, moist climates of New England (USDA zone 5).

When young, the Chinese fringetree's bark is a pale buff color, peeling off in papery strips. On mature trees, the bark is tight, with distinct ridges and furrows. The lustrous leaves are elliptic to ovate in shape, three to eight inches long and one-and-one-half to four inches wide. The white flowers, each with four strap-like petals, are about an inch across and give off a delicate fragrance. They are produced at the ends of the branches and completely hide the foliage when the tree is in bloom. In New England the fall color, being pale yellow, is hardly spectacular; in warm climates, there is no fall color to speak of and green leaves stay on the tree through December. It is adaptable in its environmental responses, being tolerant of full sun to partial shade, moderate summer drought, and a wide range of soil con-

The showy flowers and blue-purple fruit of Chionanthus retusus.

ditions. It is generally not bothered by insect pests or diseases.

The Chinese fringetree belongs to the genus *Chionanthus*, which was described by Carl Linnaeus in his *Genera Plantarum* (1737, 1754). The name was based on the American fringetree, which had been introduced to Europe before 1736. Like the Chinese fringetree, *Chionanthus virginicus* produces a profusion of showy, white flowers in spring, which explains Linnaeus' choice of name for the genus (*chion* = snow; *anthos* = flower).

The taxonomic history of the genus is also interesting. In 1788, Swartz described a small, evergreen, Jamaican tree with small corolla lobes, naming it *Thouinia* to commemorate the French gardener André Thouin (1747–1824). However, Linnaeus had already used this name in 1781. Accordingly, Swartz gave his new genus a different name, *Linociera*, in honor of a sixteenth-century French physician, Geoffrey Linocier. Between 1791 to 1976 many species of *Linociera* were described from both the old world and the new. In 1976, William Stearn proposed the union of *Linociera* and *Chionanthus*. The difficulty of distinguishing species of *Loniciera* and *Chionanthus* had been recognized as long ago as 1860 by George Thwaites, who suggested the two genera be merged but did not present a formal proposal. Thus, prior to 1976 botanists generally referred deciduous species with big flowers (corolla 1.5 to 4 cm) to *Chionanthus* and evergreen species with small flowers (corolla less than 1 cm) to *Linociera*. However, a small-flowered Ecuadorian species *(L. pubescens)* is a deciduous tree while a deciduous Florida species *(C. pygmaeus)* has small flowers. Other morphological traits overlap between *Chionanthus* and *Linociera*, and no clear-cut differences separate the two. Therefore, Stearn's proposal to unite them has been widely accepted in the botanical community. The combined group is referred to as *Chionanthus* because this name was published earlier than *Linociera*. The union has led to the transfer of numerous species from *Linociera* to *Chionanthus* even though genetic studies have not been performed to determine the evolutionary relationships of deciduous and evergreen species. Modern DNA research will surely help clarify the taxonomy of *Chionanthus* and *Linociera*.

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Beach Plum: A Shrub for Low-Maintenance Landscapes

Richard H. Uva and Thomas H. Whitlow

Beach plum *(Prunus maritima)*, a shrub native to the Atlantic coast, is familiar to beachgoers from southern Maine through Maryland, where populations can be found on and near the coastal dunes. Since colonial times its fruits have been collected in the wild for preserves and jelly and were reportedly used even earlier by Native Americans. Nowadays, although beach plum is occasionally found in the nursery trade, it is rarely grown in cultivation. Demand is increasing for native species that can thrive in low-maintenance, poor-nutrient landscapes—reclamation sites, roadsides, sand dunes in need of stabilization—and beach plum is an excellent candidate to fill that need. By virtue of its showy spring flower display and colorful fruits, beach plum also warrants increased use in more intensively managed ornamental landscapes.

Prunus maritima.

Beach plums have extensive root systems, no doubt an adaptation to a habitat that is characterized by high winds, blowing sand, unstable substrates, wind-borne salt, and soil that is low in nutrients and water-holding capacity. It should be noted that beach plum's distribution is not limited to sandy soils, however; it also thrives under cultivation on moist, rich soil as long as it has good drainage and full sun. Today, jelly production from wild-growing shrubs is a small but thriving cottage industry in the Northeast, and farmers are beginning to plant beach plum to make fruit more readily available.

The horticultural literature of the 1940s mentions several cultivars of beach plum that had been selected for fruit production at that time, but we have been unable to locate specimens. (If a reader knows of any still existing, we would appreciate hearing about it.) More recently, the Cape May (New Jersey) Plant Materials Center of the Natural Resources Conservation Service (NRCS) has released a selection known as 'Ocean View'; it was developed for stabilizing coastal sand dunes, but could be used in any sunny, well-drained location. The information below has been adapted from NRCS' "Notice of Release of 'Ocean View'."

A New Cultivar of Beach Plum

'Ocean View' is a cross of four wild-growing strains from Delaware, New Jersey, and Massachusetts that were selected for their exceptional seedling vigor, foliage abundance, disease and insect resistance, leaf retention, fruit production, and cold tolerance. It has been field-tested on sandy coastal sites from North Carolina to Maine and is recommended for use within zones 5b to 8b.

This new cultivar is an upright, densely branched shrub with pale green foliage. Its alternate, serrated leaves are elliptical to ovate

Beach plum on Cape Cod, Massachusetts.

in shape and range from about 1.5 to 2.5 inches in length and half that in width. In early spring, before the leaf buds unfold, clusters of snowy-white blooms emerge to cover the crown of the shrub, creating a frothy splash in the otherwise gray landscape. The individual flowers, only about one-quarter to three-quarters of an inch in diameter, take on a pink hue before dropping off to be replaced by the emerging leaves. The round fruits ripen to a bright red in late August or early September.

'Ocean View' seedlings should be planted at a depth of approximately two inches above the root collar on stable sand dunes and no deeper than the root collar on inland soils. Fertilization helps with good establishment and vigorous plant growth. Recommended spacing of plants varies with intended use: to provide a dense barrier of protective vegetation, seedlings should be placed about four to six feet apart, and when used inland for residential areas or wildlife plots, about six to eight feet apart.

The availability of this new cultivar gives gardeners in the Northeast an opportunity to enjoy a bit of native beach vegetation in their backyards without adding to their list of maintenance tasks. And if you don't care to use the fruit yourself for jelly, wildlife will appreciate it.

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For information on beach plum fruit crop development please visit our website: www.beachplum.cornell.edu See also *Arnoldia* 62 4, "Taming the Wild Beach Plum" by R. H. Uva.

Dr. Uva and Professor Whitlow have collaborated on the development of beach plum as a fruit crop for several years at Cornell University.

Calycanthus chinensis: The Chinese Sweetshrub

Jianhua Li & Peter Del Tredici

The pendant flowers of Calycanthus chinensis *have an unusual, waxy texture.*

Calycanthus chinensis is a beautiful deciduous shrub with a narrow geographic distribution in Zhejiang Province, China. It grows up to ten feet tall with a broad profile. The leaves are oppositely arranged with short petioles and are glossy green with a touch of roughness on the upper surface. In the Boston area its nodding flowers appear in mid to late spring. Appearances notwithstanding, the sepals and petals are not differentiated (therefore termed *tepals*): the outer tepals are a silky white with a tinge of pink and a diameter of two to three inches, while the inner tepals are a waxy pale yellow to white with maroon markings. Unlike the native *Calycanthus floridus* the flowers are not fragrant and are pollinated by small beetles.

Tepals and stamens occupy the rim of a deep floral cup; the ovaries are attached to the side of the cup. The fruits, top-shaped with many seeds, overwinter on the shrub. In its natural habitat, it grows underneath a canopy and therefore is best cultivated in partial shade with wind protection and good soil moisture. In 1998 Michael Dirr described it as "a unique plant but doubtfully as worthy as *Calycanthus floridus.*" Opinions may vary as to the species' comparative garden worthiness, but where evolutionary and taxonomic histories are concerned, *C. chinensis* definitely provokes more interest. As a practical matter, the species is rare in the wild and needs our help to survive.

Calycanthus chinensis belongs to Calycanthaceae, which includes two genera and about ten species.[1] *Chimonanthus* (wintersweet) is the other genus; it differs from *Calycanthus* in

In this closeup of a Calycanthus chinensis *flower, the inner and outer whorls of tepals are clearly visible.*

The flowers of our native eastern sweetshrub differ from those of their Chinese relative both in form and fragrance.

many features, including morphology, wood anatomy, pollen, and embryology. Species of *Chimonanthus* are literally called "waxy prunus" in Chinese because it blooms in winter with waxy yellow flowers that resemble cherries. *C. chinensis* was first described as a species of *Calycanthus*[2] and was later recognized as a separate genus, *Sinocalycanthus*.[3] Morphologically, this species differs from other species of *Calycanthus* in its white flowers and dimorphic (two forms), broadly ovate tepals. Therefore, many authors recognize this species as a separate genus from *Calycanthus*.[4] However, we prefer to treat this plant as a species of *Calycanthus* for the following reasons.

First, it is rare that species of different genera hybridize successfully, but *Calycanthus chinensis* has been successfully crossed with *C. floridus* and *C. occidentalis*.[5] Second, differences in DNA sequences are few among *C. floridus*, *C. occidentalis*, and *C. chinensis*.[6] Third, this treatment shows *Calycanthus'* disjunct distribution in eastern Asia and North America. And a final consideration—hardly a serious one—is the tongue twisting required to pronounce the long hybrid name *Sinocalycanthus*.

When *Calycanthus chinensis* was first introduced into cultivation in North America in the early 1980s, its hardiness was unknown.[7] But experience at the Arnold Arboretum has shown the plant to be fully hardy in USDA zone 6, having survived temperatures of minus 10 degrees F in 2003. The plants being offered for sale were raised from seeds produced by plants growing outdoors at the Arnold Arboretum since 1998. The parent plants were raised from seeds collected at the Nanjing Botanical Garden in 1994.

Endnotes

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Rhus trilobata: Worthy Plant Seeks Worthy Name

Nancy Rose

Saddled with common names like skunkbush, stinking sumac, and ill-scented sumac, *Rhus trilobata* is clearly a shrub in need of a good public relations agent. Those unflattering names refer to the strong scent its foliage and stems emit when crushed. Ignore the unappealing monikers, and you will find that its ornamental and environmental assets are more than sufficient to make *R. trilobata* a valuable landscape plant.

Rhus trilobata has a wide native range in western North America, reaching from the Canadian province of Saskatchewan south to Texas and Mexico but skipping the moist coastal areas of the Pacific Northwest. It grows in many ecological regions, from the Great Plains grasslands to mountain shrubland, chapparal, and forest areas, and is found in association with numerous species of deciduous and evergreen trees and shrubs as well as with grasses and forbs.

Within its native range this deciduous shrub can grow from two to twelve feet tall, with four to six feet being typical in most landscape settings; its height is determined in part

A lemonade-like drink can be made from the attractive red fruits.

by moisture availability. Its form ranges from irregularly upright to mounded, with numerous slender, branched stems rising upward from the crown. These flexible young stems have been used in basketry by Native Americans, accounting for one of the plant's lesser-known common names: basketbush. Shoots also emerge from the extensive system of woody rhizomes that spread laterally below ground, creating a dense thicket that in width can equal two or more times the plant's height. A taproot together with a large mass of more shallow fibrous roots anchor the shrub.

The leaves of *Rhus trilobata*, compound and alternately arranged on the branches, consist of three subsessile (nearly stalkless) leaflets that are generally ovate or rhomboidal in shape. The terminal leaflet is the largest, with a length of one to two-and-one-half inches; it is often distinctly three-lobed (hence the specific epithet *trilobata*) but at times displays only shallow or negligible lobing. Its leaf margins are coarsely toothed, most teeth being rounded although some are slightly pointed. Leaf surfaces, while variably pubescent on young leaves, usually become smooth and slightly glossy as the foliage matures. Medium to dark green in summer, the leaves often develop excellent fall foliage color that ranges from yellow to orange, red, and reddish purple.

New leaves are downy, usually becoming smooth and glossy with maturity. In fall the green gives way to yellows, orange, reds, and reddish purple.

In spring *Rhus trilobata* blooms before its foliage appears, the flowers emerging from short, catkin-like spikes borne at the branch tips. Individual flowers may be unisexual or bisexual, with both types occurring on most plants. Only about one-eighth inch long, they are light yellow or greenish yellow and have five petals. The fruit is a red, subglobose (not perfectly round) drupe about one-quarter inch long, slightly hairy and a bit sticky on the surface and containing a single dark brown nutlet. Mature fruits have a tart taste; a tangy lemonade-like drink can be made by steeping them in water. The fruits, leaves, stems, and roots of *R. trilobata* have been used for various culinary, medicinal, and other utilitarian purposes by native cultures in the western United States.

Six naturally occurring varieties of *Rhus trilobata* are recognized: var. *anisophylla*, var. *pilosissima*, var. *quinata*, var. *racemulosa*, var. *simplicifolia*, and var. *trilobata*. *R. trilobata* var. *trilobata*—so named to indicate that it displays the species' typical morphology—covers the entire native range. The other varieties vary in such features as height, growth habit, leaf size and form, and fruit pubescence. Where the

ranges of these varieties overlap, plants often show intermediate morphological characteristics.

Rhus trilobata looks very much like its more widely available cousin, *R. aromatica*. The resemblance is close enough that skunkbush was previously listed in taxonomic references as a variety (*R. aromatica* var. *trilobata*) rather than as a separate species. Morphological differences between the two are few. *R. trilobata's* leaves, flowers, and fruits are generally smaller and its terminal leaflets more distinctly lobed than those of *R. aromatica*, but these features show enough variability to make them unreliable as diagnostic tools. It is in geographic distribution that the two species show clear differences, with *R. trilobata* occupying a western range while *R. aromatica* is found east of the Great Plains. A corresponding difference is found in their environmental adaptations: *R. trilobata* tolerates fairly dry, alkaline soils while *R. aromatica* prefers moist, slightly acidic sites. The leaves of both species emit a distinct odor when crushed, but the somewhat less pungent scent of *R. aromatica* earned it the common name "fragrant sumac" while *R. trilobata* is stuck with its less-than-flattering nicknames.

As its wide natural range might indicate, *Rhus trilobata* is an adaptable plant. It grows well in somewhat alkaline soils but also appears to tolerate neutral to slightly acidic soils. Most references list it as winter hardy to USDA zone 4 (average annual minimum temperature minus 20 to minus 30 degrees F), but the hardiness of individual plants is likely to vary depending on seed provenance. It thrives in either full sun or partial shade, but fall foliage color is usually better in full sun.

Because it is well adapted to drier climatic conditions, *Rhus trilobata* is an excellent choice for xeriscaping. Annual precipitation in most of its range averages just 10 to 20 inches; by contrast, the average is 42.5 inches in Boston and 29.4 inches in Minneapolis-St. Paul. In USDA regional evaluations, a seed-grown selection of *R. trilobata* from Bighorn County, Wyoming, fared best at evaluation sites with drier climatic conditions. Specimens failed to thrive and/or showed higher incidence of fungal leaf spots in sites with poorly drained soils, higher rainfall, and higher humidity.

Rhus trilobata can be propagated in several ways. One of the simplest is by root (rhizome) cuttings. In spring, sections of rhizome can be dug up, cut into sections, and potted or planted in a propagation bed. Alternatively, softwood stem cuttings taken in early to mid summer can be rooted in a peat-perlite medium under mist. For seed propagation, the fleshy pulp should first be removed from the seeds of ripe fruits. The seeds (nutlets) have a very hard coat that must be cracked by mechanical or chemical scarification, after which they can be planted directly in a seedbed. Plants of *R. trilobata* can most easily be found in nurseries in western states, but several mail-order garden catalogs offer container-grown plants for sale.

This sumac can be used effectively in several ways. Its dense network of roots and rhizomes makes it an ideal plant for holding soil on steep slopes, banks, and terraces. It also works well in large-scale mass plantings since its suckering habit allows it to fill an area quickly. Its ability to tolerate drought and grow in rocky or gravelly soil makes it a good choice for dry, difficult sites. New England gardeners should not be put off by *Rhus trilobata's* affinity for arid soils, however. As long as it is planted on a sunny, well-drained site where flooding is not a problem, it will do well in those hilly or rocky areas that are common in the Northeast but less than ideal for more common garden shrubs. Once established, *R. trilobata* requires little maintenance; pruning to control height and improve appearance can be done as needed. With its attractive spring flowers, colorful fruit, and bright fall color, *R. trilobata* is a worthy addition to native plant displays, naturalized gardens, commercial properties, and other sites in need of a tough, adaptable shrub.

Nancy Rose is a horticulturist and educator with the University of Minnesota Extension Service. She has been growing and evaluating woody ornamental plants for many years, most recently at the University of Minnesota Landscape Arboretum and previously at the Morton Arboretum near Chicago. She is also a garden writer and photographer, writing a gardening column for the *Minneapolis Star-Tribune* and writing and editing for several gardening magazines. Nancy is co-author of the books *Shrubs and Small Trees for Cold Climates* and *The Right Tree Handbook*.

Demystifying Daphnes

Bob Hyland

I have been a fan of shrubby daphnes for a long time despite their reputation as persnickety and unpredictable garden plants. I love to drink in their heady fragrance when they are in bloom. My first encounter with the genus was with *Daphne odora* (winter daphne)—to be exact, a handsome cultivar called 'Aureomarginata'. It's a deliciously sweet-smelling shrub, very reminiscent to me of jasmine. Its leathery leaves are evergreen, a deep, shiny green edged with yellow. The almost white flowers are an attractive reddish purple on the outside.

Daphne odora is hardy to USDA zones 7 to 9. With careful siting, a little extra winter protection, and some tender loving care, I was able to coax it into overwintering in my garden in Wilmington, Delaware. Later, in my San Francisco garden, the generally frost-free, Mediterranean climate made the job much easier; in fact, some of my snobbier gardening friends considered it a bit pedestrian.

Daphne serves as both the common name and genus epithet of some fifty species of deciduous, semi-evergreen, or evergreen shrubs native to Eurasia (Europe, N.Africa, and temperate and subtropical Asia). The genus is a member of Thymelaeaceae (mezereum family), which includes about forty genera of deciduous and evergreen trees and shrubs native to temperate and tropical regions of both hemispheres. Other lesser-known cultivated ornamental plants in this family include *Dirca* and *Edgeworthia.*

The plant's name may have come from the nymph of classical Greek mythology. As the story is told, Daphne was loved and relentlessly pursued by Apollo, the god of prophecy, music, medicine, and poetry, whose advances she tried to thwart. After praying for help to Gaia, goddess of the earth, she was changed into a laurel tree and evaded her pursuer. It is more likely, however, that the name comes from an Indo-European word meaning "odor." The root and bark of *Daphne* are said to have been used for toothaches, skin diseases, and even cancer, which seems odd since all parts of the plant are poisonous.

In the Northeast several *Daphne* species are hardy and have long been cultivated for their handsome foliage and intoxicating fragrance. Daphne flowers are tubular and flare at the mouth into four spreading lobes. They appear on small to mid-sized shrubs that make superb garden plants. Their dense, broad, mounded form is particularly well suited to small, intimate gardens where they can be viewed closeup, but daphnes have a place in any landscape. They combine nicely with many perennials that tolerate sun or partial shade. Good bedfellows include low-growing thymes and sedums, variegated hakone grass (*Hakonocloa macra* 'Aureola'), sedges (*Carex*), hostas, coral bells *(Heuchera),* and hardy geraniums. Most of their alleged unpredictability can be overcome with careful placement in the garden and good culture. I heartily agree with Michael Dirr and other daphne-philes—a single flowering season would justify their use.

Growing Daphnes

Daphnes are widely thought to be unpredictable and subject to dying for no apparent reason: many a gardening friend has told me not to get too attached to one. It is true that daphnes dislike extremes of moisture or temperature. Their root systems are picky, preferring not to sit in water or to dry out. Moist but well-drained, humus-rich soil is ideal, and mulching helps keep roots cool in summer. Some English garden books suggest that daphnes do best in limestone soils, but this has not been my own experience. I recommend acidic to slightly alkaline soils. At the Arnold Arboretum, several *Daphne* species grow well in acid soils of pH 4.5 to 5.

Generally speaking, you can plant daphnes in full sun to partial shade, but the foliage, particularly on the variegated leaves, does not like to bake in hot summer sun—afternoon shade is ideal. Daphnes also do not take kindly to trans-

The variegated leaves of Daphne x burkwoodii *'Carol Mackie'.*

planting once established in the garden; it is best to plant container-grown stock in a permanent location. Keep pruning to a minimum, with judicious deadheading and light tip pruning. Do not try to rejuvenate plants by cutting back hard—this can easily sound the death knell.

Besides this basic knowledge, all that's needed for successful daphne culture is planning ahead and some extra tender loving care. Find just the right spot, take the time to prepare and amend the soil, monitor moisture levels, provide a winter mulch over the roots, and daphnes will generally flourish and bloom for many years.

The Arnold Arboretum will offer the following three dazzling daphnes at their fall 2005 plant sale.

Daphne x *burkwoodii* 'Carol Mackie'

This is one of the most striking of all daphnes—for that matter, of all variegated shrubs. A genetic mutation, or sport, of hybrid *Daphne* x *burkwoodii* (*D. cneorum* x *D. caucasica*), this cultivar was discovered and originally propagated by Carol Mackie in her Far Hills, New Jersey, garden in 1962. Carol Mackie was a passionate gardener and a very active member and officer of the Garden Club of Short Hills and the Garden Club of America. She developed a deep interest in unusual plants and a very keen eye for the rare and unusual.

Her namesake cultivar is highly prized for its small, intensely green leaves that are handsomely edged in a creamy white to golden yellow. In May and June in New England, the foliage is enhanced by rose-pink buds that unfold to star-shaped, richly fragrant, pale pink flowers borne in dense, terminal umbels, two inches in diameter. Individual flowers are about a half-inch in diameter and are followed by small, red, drupelike fruits.

'Carol Mackie' matures into a dense, mounded shrub that ultimately reaches three to four feet in height and width. It exhibits a tough constitution and is hardy to USDA zones 4 to 8; it was once listed as a "Top Ten" ornamental plant in Vermont. According to Michael Dirr in the fifth edition of his *Manual of Woody Landscape Plants, Daphne* x *burkwoodii* 'Carol Mackie' survived minus 30 degrees F without injury in the University of Maine's display gardens. In

more southerly parts of its hardiness range, the plant remains evergreen through winter.

Tom Ward, co-director of living collections at the Arboretum, holds *D.* x *burkwoodii* 'Carol Mackie' in high esteem. He reports that it has performed well both at the Arboretum and in his own New England garden. If you've had the same success with 'Carol Mackie', you might try a newer cultivar, 'Briggs Moonlight'. Introduced by Briggs Nursery, Elma, Washington, it offers the reverse leaf variegation of 'Carol Mackie', with creamy yellow centers and narrow, dark green margins.

Daphne genkwa (Lilac Daphne)

Daphne genkwa hails from China; it was introduced into cultivation in the United States in 1843. An open, deciduous shrub with erect, slender, sparsely branched stems, it is a gem in the spring garden. Axillary clusters of two to seven lovely, one-fourth-to-three-fourths-inch diameter, lilac-colored flowers bloom during May on naked stems of the previous year's growth, just before and while new foliage is beginning to emerge. Floral fragrance is very subtle to nonexistent. Dry, ovoid fruits develop after flowering; they are grayish white and nothing to write home about.


TOM WARD

Daphne genkwa.

Mid-green, one- to three-inch-long leaves, lance-shaped to ovate, are arranged oppositely (occasionally alternately) on stems. This is unusual among daphne species, which normally sport alternately arranged leaves. Leaves are softly silky when first unfurling.

Daphne genkwa is hardy to USDA zones 5 to 7 and generally matures to three to four feet in height and width. Currently no specimens of *D. genkwa* are planted out in the Arboretum's living collections, but one—descendant of wild-collected plants from the former Czech Republic—is growing in the nursery. The Arboretum's plant records also indicate that wild-collected seed of *D. genkwa* from China was received from E. H. Wilson in 1907.


RICHIE STEFFEN, ELIZABETH C. MILLER BOTANICAL GARDEN

Daphne *x* transatlantica *'Summer Ice'.*

Daphne x *transatlantica* 'Summer Ice'

Daphne x *transatlantica* is a newly found hybrid, the result of a naturally occurring cross between *D. collina* and *D. caucasica* (caucasian daphne). It combines the small stature and strong fragrance of *D. collina* with the fragrance and long blooming period of *D. caucasica. D.* x *transatlantica* is a compact, semi-evergreen, mounded shrub that blooms continuously in New England from May to frost with small, delightfully fragrant, white flowers. The late Jim Cross, founder of Environmentals Nursery in Cutchogue, Long Island, is responsible for introducing this hybrid into the nursery trade. He originally sold it as a form of *D. caucasica,* but molecular studies later proved it to be a hybrid that has been named *D.* x *transatlantica.*

The cultivar 'Summer Ice' grows into a well-behaved, domed shrub that reaches three to four feet in height and width. The delicately variegated leaves sport fine, creamy white edges—similar to but more demure than *D. burkwoodii* 'Carol Mackie'. Its spicy white flowers are borne abundantly at the ends of branches in late spring, followed by sporadic summer bloom and a strong fall show. 'Summer Ice' is hardy to zone 5.

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Numbers in parentheses refer to issues, those in ***boldface*** *to illustrations of the entries.*

On the inside front cover, clockwise from top left: Magnolia virginiana *'Moonglow', courtesy of Broken Arrow Nursery;* Betula alleghaniensis, *photo by Peter Del Tredici;* Viburnum dilatatum *'Erie', courtesy of Spring Meadow Nursery; the habit of* Betula alleghaniensis, *photo by Peter Del Tredici.*

On the inside back cover, clockwise from top left: Syringa vulgaris *'Krasavitsa Moskvy', photo by John H. Alexander III,* Poncirus trifoliata, *the hardy orange tree, and* Kalmia latifolia *'Comet', both by Peter Del Tredici;* Callicarpa dichotoma *'Issai', courtesy of Spring Meadow Nursery.*