

Plant Hunting for the 21st Century

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The Southern landscape is a landscape dominated by exotic woody species, mainly in the small tree, shrub, and vine category. Plants from Asia, Mexico, the Old World, and other distant lands create the character of our urban landscapes. Opportunities for the introduction of new plants still exist. Many exciting species, forms, and varieties have yet to find a spot in the mix of landscape plant materials used in Southern U.S. landscapes.

INTRODUCTION

Can you imagine a Southern U.S. landscape without exotic plants? First, eliminate all the old-time harbingers of spring: shrubby flowering quinces, forsythias, bridal wreaths, and flowering almonds. They all trace their ancestry back to Asia. They are durable, showy, long-lived landscape plants that continue to make their mark simply because people plant them and like them. In the evergreen category, the ligustrums remain as Robinson originally described, "the meanest of all mean shrubs." Waxleafs and privets have easily escaped landscapes and found their way to the fence rows and back corners of every nook and cranny of the southern forest. Can you think of a world without the Japanese honeysuckle, *Lonicera japonica*? What about nandinas? They are as tough as they come and are prospering on their own in many a sunlit woodland pocket, self-seeding and spreading quietly and slowly, without much fanfare or applause.

The rose of Sharon, *Hibiscus syriacus*, is really not from Syria as Linnaeus believed, but evolved instead in China and India. *Euonymus* may get a bad word or two from horticulturists "in-the-know", but it's still an Asian species that won't go away — one that remains a mainstay in the trade in spite of pest problems and overuse. The Japanese and Chinese wisterias have left the urban landscapes to become a part of our natural forest, more common in fact than the better behaved native wisterias of the Southern U.S. Asian abelias, particularly the *Abelia xgrandiflora* cultivars, remain one of the most common shrubs in the south and finds a sunny spot to its liking almost anywhere from Texas to the U.S. East Coast. The indica and kurume azalea world can be seen on every main or side street in every urban landscape of the Southern U.S. — millions of plants if a count were to be made. There are many, many other Asian woody species that take their place in the woody plant inventory of small trees, shrubs, vines, and ground covers of the South.

Why so many exotics and so few natives in Southern landscapes? One might think that the root cause of the dominance of exotic plants might simply be snobbery. After all, the history of settlement in North America involved an unwillingness to give up the landscapes of the "Old World". In fact, in the 1850s, Downing wrote of Americans unwilling to appreciate or plant the local flora, instead going to great lengths to secure the plants of the Old World, many somewhat temperamental, for their new home in America. The plant explorations in the 18th and 19th centuries retrieved

many choice plants from China, with a surge around the turn of this century, and these were quickly brought into the landscape trade. While the trendy tendency to “exotic” plantings may play a part in the mix of natives vs. exotic species utilized, most of the reason for Asian plant domination can be attributed to the landscape merits of the plants involved. Toughness of character, bloom show, habit, and form, and ease of propagation, care, and culture are the major factors that have led to the dominance of Asian plants in the landscapes of the Southern U.S.

Are all the glory days of plant hunting over? Have all the landscape-worthy species been found, collected, and planted in the New World? The answer is simply no. While some might argue that all the great collections are behind us, there are still species to be introduced and tested and, most important, there are still varieties, selections, and forms to be evaluated and crosses to be tried. Hunting plants is a lifestyle. Strengthening the argument for more woody plant evaluation in the South, one must note that many if not most of the early Asian introductions were made into the prestigious botanical gardens and arboretums of the North. Many species perhaps more adapted to southern climes were lost. The encouraging news is that the evaluation of species, forms, and varieties in the arboreta, botanical gardens, and private gardens of the South is escalating with all kinds of promising landscape candidates emerging.

HUNTING PLANTS IN FOREIGN LANDS

Plant hunting in foreign lands requires planning depending on the country involved. Besides the usual passport/visa details, there are plant importation procedures to be followed for the successful introduction of horticultural germplasm into the U.S. (White and Waterworth, 1996). There are all kinds of private/academic programs that are successfully introducing nonrestricted plants into the U.S. Strategies to retrieve the special plants and provenances of the flora of distant lands are certainly going to intensify as economic and societal dictums allow.

In a trip to China in 1997, the author took these notes at the Yunnan Academy of Forestry Sciences (contact person: Jiaqing Yin, VP Senior Engineer, Heilongtan, Kunming, China 650204 – please note: spelling as per Yin’s unpublished notes and plant labels): “Incredible collection of magnolias and conifers and others. So many other species I wish I could get my hands on but they are under lock and key. However, I retrieved a species list (unpublished manuscript) and contacts for the future. Standout specimens included a strange weeping *Sophora* spp., *Michelia chinensis*, *M. platypetala*, and a recently discovered yet-to-be-named species of *Michelia*; *Manglietiastrum* spp.; *Parakmeria yunnanensis*; *Keteleeria evelyniana*, *K. davidiana* (syn. *K. calcarea*), *K. fortunei*, and *Keteleeria* unknown species; *Abies delavayi*, *A. smithii*, and *A. georgei*; *Pseudotsuga sinensis*, *P. forrestii*; *Tsuga dumosa*; *Picea crassifolia*, *P. likiangensis*; *Larix principis-rupprechtii*; *Pseudolarix amabilis* (syn. *P. kaempferi*); *Pinus yunnanensis*; *Taiwania cryptomerioides* (syn. *T. flousiana*); *Cryptomeria japonica* var. *sinensis* (syn. *C. fortunei*); *Thuja orientalis* (syn. *Platyclusus orientalis*); *Calocedrus macrolepis*; *Juniperus formosana* and *J. monosperma*; *Nageia wallichiana* (syn. *Podocarpus wallichiana*); *Cephalotaxus sinensis*, *C. oliveri*; *Taxus yunnanensis*, *T. chinensis*, *T. mairei*; *Amentotaxus yunnanensis* and *A. argotaenia*. The Magnoliaceae is at its finest here; in the Manglietias, I found *M. grandis*, *M. yunnanensis*, *M. hookeri*, *M. crassipes*, *M. megaphylla*, *M. moto*, *M. forrestii*, *M. insignis*, *M. glauca*, *Manglietia* spp. (to be

named), *M. tenuipes*, *M. duclouxii*, and finally *M. fordiana*. I still remain dazzled by the diversity, yet unsure of whether we are looking at synonymy or stretched taxonomic gymnastics. In the magnolia world, I found plants listed as *Magnolia maudiana*, *Parakmeria yunnanensis* (syn. *M. yunnanensis*), *M. odoratissima*, *M. megaphylla*, *M. henryi*, *M. delavayi* (and a red-flowering form; saw a photograph; plant was not in bloom), *M. officinalis*, *M. sicholaiik*, *M. amoena*, and *M. liliiflora*. Others of interest: 13 species of *Cinnamomum*, *Phoebe sheareri*, and *P. zhennan*; five species of *Mahonia*, *Holboellia fargesii*, and *H. latifolia*, and five species of *Pittosporum*.

At the Kunming Botanical Garden we received the grand tour via Guan Kaiyun (Director, Senior Research Fellow, Kunming Botanical Garden, the Chinese Academy of Sciences, Heilongtan, Kunming, Yunnan 650204, China) and Shi-qiong Wang (Kunming Institute of Botany, Heilongtan, Kunming 650204, Yunnan, P.R. China). At the Kunming Botanical Garden, the magnolia family collection is in a walled garden and included a cornucopia of species and forms that I have not seen reported. The genus *Magnolia* was represented by very healthy specimens of *M. amoena*, *M. campbellii*, *M. coco*, *M. cylindrica*, *M. delavayi*, *M. denudata*, *M. grandiflora* (U.S.), *M. kobus*, *M. liliiflora*, *M. officinalis*, *M. officinalis* var. *biloba*, *M. rostrata*, *M. sargentiana*, *M. shangpaenis*, *M. sieboldii*, *M. x soulangiana*, *M. sprengeri*, *M. tripetala*, *M. wilsonii*, and *M. zenii*. *Manglietia chingii*, *M. crassipes*, *M. duclouxii*, *M. fordiana*, *M. glauca*, *M. grandis*, *M. insignis*, *M. wangii* round out the manglietias — all strong candidates for our area of the South. *Manglietiastrum sinicum* was new to me and looked exciting. *Michelia*, the banana shrub, typified in our area by *M. figo* and *M. x foggii* is another favorite in the SFA Mast Arboretum; *Michelia* species represented at the Kunming Botanical Garden included *M. champaca*, *M. chapensis*, *M. chingii*, *M. doltsopa*, *M. fallax*, *M. figo*, *M. floribunda*, *M. foveolata*, *M. hedyosperma*, *M. macclurei*, *M. martinii*, *M. maudiae*, *M. platypetala*, *M. skinneriana*, *M. sphaerantha*, *M. velutina*, *M. siensis* (syn. *M. wilsonii*), and *M. yunnanensis*. A *Paramichelia baillonii* was reported to be a new species find in the Yunnan. *Parakmeria lotungensis*, *P. nitida*, and *P. yunnanensis* should have fine potential in the South — with only the first being tested in the U.S. to my knowledge. *Tsoongiodendron odorum* rounds out the last of the Magnoliaceae that impressed me.

In the Illiciaceae, I came across eight species that made my heart race, including *Illicium simonsii* (note: now in the U.S.) and *I. verum*. Readers wishing the entire expedition diary should contact the author. There are many other exciting opportunities for plant introductions and plant improvements. The following are a few:

Abelia. A common, durable generally pest-free landscape plant with many attributes of bloom, foliage, and form. Clarke Abel gets the credit for the first abelia out of China in 1817: the deciduous, somewhat open shrub *Abelia chinensis*. The species languished and was underutilized until Robert Fortune reintroduced living plants, and a new species, *A. uniflora*, in 1844. About the same time, *A. floribunda* was introduced out of Mexico, a tender species sporting spectacular red flowers. Crosses of *A. chinensis* and *A. uniflora*, the product of which is *A. x grandiflora* are not mentioned in the literature until the early 1900s. There are nine other species of *Abelia* listed in the Royal Horticultural Society Dictionary of Gardening, most of which are rarely seen. Other sources list six more. Open-pollinated *A. chinensis* (somewhat irregular form, deciduous with outstanding fragrant bloom show), most likely crosses with taxa in the

A. ×grandiflora group (good form, evergreen with a less-than-striking blooms), are in the evaluation stage as the result of work by Michael Dirr in Georgia. The first year of evaluation at the SFA Mast Arboretum indicates some excellent plants in the offing. Future work should consider crosses of *A. floribunda* with *A. chinensis* or *A. ×grandiflora* cultivars; the combination might create some exciting results.

***Illicium*.** The anise trees of American and Asian origin offer all kinds of exciting possibilities with several species just now reaching the United States. We have long been enamored with the anise shrubs/trees in the SFA Mast Arboretum. In our opinion, *I. floridanum* (the Florida Anise) and *I. parviflorum* (small anise tree) have been underutilized in our stretch of the South for years. The cultivar picture is improving (Michael Dirr lists seven cultivar but more exist in the underworld of *Illicium* aficionados). More recently, the Asian species are just now finding their spot in the gardens of the South. Three or four cultivar of *I. anisatum*, the star anise, exist and a relatively new species, *I. henryi*, the Chinese anise tree, was introduced by Bob McCartney from a source in England in 1971. The latter is proving to be an outstanding species for the South, a durable evergreen large shrub, dense in foliage with showy pinkish-white flowers.

We are currently testing *I. henryi* in “full sun” and the results are promising, if careful attention is paid to moisture in the establishment years. *Illicium mexicanum* has received some fanfare in the trade, but the SFA Mast Arboretum has had poor results, except with one plant that has done well in a partly shaded location. The most exciting part of the *Illicium* picture is that many species (in China) remain uncollected, or are just now entering the trade. Zhang et. al. (1999) list 10 species still unknown in the U.S. *Illicium simsonii* is a recent entrant into the U.S. (to a botanical garden on the U.S. West Coast). It is reported to sport large, yellowish flowers; this is an anise tree with outstanding potential in the South. *Illicium verum* is described by the Royal Horticulture Society as a small tree to 7.5 m (25 ft) with yellowish flowers. There are many others that have not yet been tested in the South.

***Loropetalum*.** Few Chinese woody plants have surged to the head of the pack as quickly as the Chinese fringe flower, *L. chinense*. The advent of sizzling hot pink blooms and burgundy foliage forms in the early 1990s (red-flowered forms) has an interesting history but has nonetheless resulted in a plethora of cultivars and forms. Michael Dirr lists 19 cultivars and the list continues to expand. ‘Burgundy’ remains a winner; ‘Zhuzhou Fuchsia’ appears to be more upright; ‘Ruby’ is performing well in the SFA Mast Arboretum, but it’s too early to know if this is a true dwarf. The Arboretum will be planting 23 clones in Fall 1999. With care and culture characteristics similar to the witch hazels, the Chinese fringe flower is destined to expand its home all across the Southern U.S.

***Styrax*.** The styraxes or snowbells of Asia remain under exploited in our section of the Southern U.S. and there are all kinds of opportunities to expand the cultivar picture. Three species and their cultivars dominate the trade: *S. americanus* (our native with no major cultivars – two forms), *S. japonicus* (many cultivars), and *S. obassia*. There are over 100 species of *Styrax* in the world and the opportunities for selection are enormous. In the *S. japonicus* world, there are white-flowering forms, weeping forms, and pink-flowering forms. Most promising are the pink weepers, which are not in our collection but which we want to obtain. J.C. Raulston’s most

significant introduction, *S. japonicus* 'Sohuksan' (currently sold as 'Emerald Pagoda'), is a step apart from others of the same species and sports bigger leaves and flowers. It's proving to be an outstanding small tree in our garden; however, questions about chilling requirement remain (late foliation, blind buds, tufted appearance early in the season after mild winters). We have six other species and several taxa in the Arboretum in early stages of evaluation. Again, opportunities for selection abound.

Closely related, *Sinojackia rehderiana* is proving to be a winner. While it needs a common name a little more appealing than "jack tree", it's proving to be an easily propagated, fast growing snowbell-like tree for the South. Introduced into the U.S. in 1930, it has yet to achieve the notoriety it deserves. Less vigorous, the smaller-leaved *S. xylocarpa* appears less adapted to our region.

Others With Promise for Improvement. There remain opportunities everywhere for improving the nature and quality of "our" Asian landscape plants. For instance, *Campsis grandiflora*, the Chinese trumpet creeper offers a very showy, large bloom. The cross with the native *C. radicans* results in a robust hybrid with dark orange blooms, often referred to as a "Madame Galen" type, which is actually a specific cultivar of the cross. Because *C. grandiflora* has self-fertility problems, the transfusion of other *C. grandiflora* clones into the mix might allow greater diversity in flower color and flower size. That is already happening with recent introductions into the trade. *Cephalotaxus harringtonia*, the Japanese plum yew, and other *Taxus* species, offer opportunities for exploration. The maples of China, Japan, and Korea all deserve more intense evaluation in the south. There are many obtuse recent introductions that deserve attention:

- *Celtis sinensis* 'Emerald Cascade' — a one-of-a-kind geotropically challenged weeping Chinese hackberry;
- *Euscaphis japonica* — the Korean sweetheart tree with a brilliant red fruit display in the fall;
- *Persea thunbergii* (syn. *Machilus thunbergii*) — a broad-leaved evergreen tree with flowers that never distract;
- *Cinnamomum chekiangenses* — a hardy 9 m (30 ft) camphor tree in our arboretum;
- *Phoebe chekiangensis* — a broadleaved evergreen now at 6 m (20 ft) in our arboretum and still growing;
- *Emmenopterys henryi* — flowering "for-the-first-time" events in the U.S. now;
- *Daphniphyllum himalense* var. *macropodum* — the ultimate "I-need-a-common-name" round, green meatball with bold glossy foliage.

The list could go on.

CONCLUSIONS

Plant hunting and the transfusion of plants into the Western world have a relatively recent history — three centuries for the bulk of the introductions. While the great plant introductions have left us with an undeniable exotic influence, there remains much to be done. The long-term nature of woody plant evaluation makes the point that arboretums, botanical gardens, public gardens, and plant enthusiasts in the Southern U.S. can drive the landscape picture of the future!

LITERATURE CITED

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Plant Breeding Efforts in *Stokesia*, *Cercis*, and *Buddleja* at North Carolina State University

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INTRODUCTION

Breeding and genetic studies of various herbaceous perennial and woody ornamentals have been initiated by the author at North Carolina State University. These efforts, in conjunction with ongoing efforts by Dr. T. Ranney in the development of pest-resistant ornamental taxa, and the continuing commitment to new plant acquisition and testing by the J.C. Raulston Arboretum (JCRA), under the direction of Dr. Robert Lyons, reflect the department's commitment to the development of new cultivars for the nursery industry.

The author has initiated breeding efforts in various ornamental taxa based on available genetic resources currently available in the JCRA, and based on discussions with colleagues and nurserymen. In this report I will discuss the current efforts in *Stokesia*, *Cercis*, and *Buddleja* breeding. In addition to development of new ornamental cultivars, the research program will also focus on other related objectives including studies of reproductive biology, genetic diversity, propagation, and inheritance of important traits in these genera.

***Stokesia*.** *Stokesia laevis* (Hill) E. Greene (Stokes aster) is a herbaceous perennial native to the Southeastern U.S. Its range is quite restricted, with scattered populations found primarily in Mississippi, Alabama, Florida, Louisiana, and Georgia. Historically, Stokes aster has enjoyed moderate popularity in the perennials industry. Renewed interest in this plant has been fueled by the discovery in central Georgia of a population of Stokes aster demonstrating unique architecture. This population, now lost due to agricultural use of the site, was discovered in Colquitt County, GA, near the town of Omega by Ron Dieterman of the Atlanta Botanical Garden. Plants in this population showed tall, upright flowering scape architecture, unlike the shorter, non-upright scapes typical of the species. Selections from this population have given rise to the cultivar 'Omega Skyrocket'. 'Omega Skyrocket' has lavender-blue flower color typical of the species.

Our initial breeding objectives have focused on incorporating the novel upright scape architecture into a broader range of flower colors. Accordingly, we have hybridized 'Omega Skyrocket' with cultivars 'Alba', 'Mary Gregory', and 'Purple