

Trees of Interest at The Holden Arboretum[®]

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The Holden Arboretum, begun in 1931, comprises 3400 acres. Of these, approximately 600 acres are occupied by woody plant collections and gardens. The remaining acreage consists of woodlands and managed meadows and includes two areas, Little Mountain and Stebbins Gulch, which have been designated as National Natural Landmarks. Holden's Mission Statement, revised in 2001, addresses both our horticultural and natural resources: "The Holden Arboretum connects people with nature for inspiration and enjoyment, fosters learning, and promotes conservation."

In the mission statement, nature refers to living things, with a focus on plants both in cultivation and in the wild. One of the methods by which we will achieve our mission is through "Acquiring, displaying, and maintaining documented horticultural collections." Holden's horticultural collections consist of over 6000 different kinds of plants, 4400 of these being woody plants. A listing of the plants in our collection can be accessed from Holden's web site (<www.holdenarb.org>).

The following discussion highlights a short list of trees in the collections of The Holden Arboretum that have caught my attention because of one or more unique features. Some of these distinctions provide a cultural advantage or ornamental enhancement that may justify selecting them in preference to a species or cultivar in common use.

Alnus japonica, Japanese alder, is a native of eastern Asia. It is an ultimately large tree with attractive, glossy lance-shaped leaves. One particular accession, grown from seed collected at 44° N latitude in the Russian Far East in 1997 (Chicago Botanic Garden, RUFÉ -67), bears glistening red male catkins, which provide considerable winter interest. There is another accession of the species at Holden, from seeds collected in Hokkaido (Japan), which bears green catkins. The symbiotic association of alder roots with nitrogen-fixing bacteria should justify considering alders for wider use in landscapes, as sustainable landscape choices are given more emphasis.

Another accession of interest was also obtained from the Chicago Botanic Garden, in 1987. These were two seedlings of English oak, *Quercus robur*. In this case it is not the species that is interesting, but the provenance. The seedlings were grown from seeds collected from a native forest in the Main Botanical Garden of the Russian Federation, outside of Moscow. This is at or near the northeast corner of the natural range of English oaks. Think of *Q. robur*, as we know it in cultivation in the eastern U.S.A. Its leaves do not change color in the fall, remaining green until they are killed by frost, then remain attached to the tree until the following spring. This is an indication that these individuals are not well adapted to the climate and seasons of the eastern U.S.A., and considering that most of the trees in the eastern U.S.A. likely originated from Western Europe, that is not surprising. In contrast, the trees originating from near Moscow turn yellow in the fall and drop their leaves, as our native oaks do. This indicates that these oaks are better adapted to our "continental" climate, which should be reflected in greater cold hardiness and longer life. Time will tell.

Katsura tree, *Cercidiphyllum japonicum*, is a tree that is normally very upright in habit in youth, eventually forming a spreading crown. In the courtyard of the



Figure 1. Semi-pendent form of *Cercidiphyllum japonicum* in the courtyard of the visitor's center at Holden.

visitors' center at Holden there is a tree, obtained as a 15 ft tall specimen from Herman Losely and Son, Inc., in 1979 that is now 30 ft tall and has a gracefully semi-pendent form (Fig. 1). One offspring grafted from this tree is showing a similar habit. I would appreciate receiving considered opinions about the uniqueness and desirability of this clone.

Stands of diminutive mature golden rain tree, *Koelreuteria paniculata*, growing in sand on the coast of South Korea, have given rise to trees in cultivation that remain shorter and with broader crowns in proportion to their height. There is such a specimen in a parking lot at The Holden Arboretum that at 20 years of age is 16 ft tall, and a number of trees of this origin are at the Morris Arboretum in Pennsylvania. I am surprised that there is not a cultivar selected from this strain that is commercially available for use under power lines and in landscapes with restricted dimensions. Seedlings of this ecotype will begin to flower at 2 ft in height in the nursery.

Michelia figo, or banana shrub, is frequently seen in landscapes from Zone 8 south. This magnolia relative is an evergreen shrub with small leaves that bear rather small cream-colored flowers, often with a maroon edge to the tepals, that are redolent of banana oil. The late Philip J. Savage of Bloomfield Hills, Michigan, was convinced that plants of the genus *Michelia* were even more closely related to magnolias than taxonomists thought, perhaps so close that they belong within the genus *Magnolia*. This conviction led him to attempt to cross *M. figo* with *Magnolia* 'Miss Honeybee', a selection of the yellow cucumbertree, *M. acuminata* var. *subcordata*. The result was a tree that strongly favors the cucumbertree parent, but with smaller, dark green leaves and rusty red buds that remind one of the banana shrub. The habit of this hybrid is upright and narrow. The flowers are somewhat smaller than those of the magnolia parent but of similar shape and color, and appear in June. The banana oil fragrance is present as well. This hybrid is not a traffic-stopping flowering tree, but is a curious and charming specimen that would fit well into a formal landscape. Our specimen is grafted onto a *Magnolia acuminata* seedling, but there is a good chance that it will root from cuttings, as does *M. figo*.

I was aware of a hybrid between our native tulip tree, *Liriodendron tulipifera*, and *L. chinense* growing in the Arnold Arboretum that had been produced by Dr. Clifford Parks of the University of North Carolina. This hybrid was described as vigorous, so much so that Dr. Parks was producing hybrids for evaluation as a biomass crop. Tulip tree is a component of the forests at Holden, and I became interested in producing hybrids using native individuals with the goal of maximizing winter hardiness in the hybrids. *Liriodendron chinense* is rated as hardy in Zone 6 or 7. In 1999 I contacted Dr. Parks, who kindly provided pollen from four individual *L. chinense* plants. Crosses were made onto two tulip trees at Holden, and resulted in the emergence of over 50 seedlings in 2000. In the first year, the tallest seedlings reached 15 inches tall. In September of 2004 the tallest seedling at Holden is 16 ft in height. One notable characteristic of the hybrids is a plum purple coloration of the expanding leaves, inherited from the Chinese parent. This summer, because of abundant rain, coloration at the ends of shoots continued into August. In January of 2003, two of the hybrids planted in a colder microclimate at the arboretum experienced -18°F without injury.

In 2002, 30 of the *Liriodendron* hybrids were distributed to urban foresters for planting in five communities in northeast Ohio. Growth of these trees will be tracked to get a more complete record of the performance of these hybrids.

Corylus fargesii was grown from seeds collected in China's southern Gansu Province by members of the North American China Plant Exploration Consortium (NACPEC) in 1997. A good common name for this species would be the paper bark hazel, for its exfoliating bark that peels from the main stem in substantial patches. The bark is red on small stems, becoming coppery to blonde on larger stems, revealing a red underside when it peels, and often revealing apple-green new bark underneath. In bark effect it is somewhat similar to river birch, but superior. *Corylus fargesii* forms a single stem tree to 50 ft or more in height. Its leaves are smaller and less coarse than those of *C. colurna*, and it provides more color interest. In the wild it occurs near streams in areas subject to flooding, and it has demonstrated vigor in the clay soils of the arboretum.

In the fall of 1984 Holden Arboretum staff collected seeds from native trees of yellow buckeye, *Aesculus flava* in a park in Vinton County in southern Ohio. Nine

seedlings from this collection were planted at various locations in the arboretum. One of the plants, installed near Holden's Wildflower Garden, was more compact and branching in habit and bore darker green leaves than the rest. When this plant began to flower, we were surprised because, while each of the other seedlings bore the pale yellow blooms of *A. flava*, the flowers of this specimen were reddish. Additional study has convinced us that this plant is a hybrid of *A. flava* with red buckeye, *A. pavia*, the name for which is *A. ×hybrida*. But how could this happen? Red buckeye is not native to Ohio. How did a grain of *A. pavia* pollen get to a flower of *A. flava*? In a paper (Pamphilis and Wyatt, 1989) that discusses a zone of natural *Aesculus* hybrids in the southeastern U.S.A., the authors theorize that pollen can be transferred from the flowers of one species to another by migrating hummingbirds, even when the ranges of the two species do not overlap.

Reddish flowered individuals attributed to *A. flava* have been found on several occasions, and a name, var. *virginica*, was published for these. In *A Natural History of Trees* (Peattie, 1966), D. C. Peattie states that this form was first discovered in West Virginia by George Washington, who planted several specimens at Mount Vernon. On a spring visit to Mount Vernon a few years ago, I observed trees 30 to 40 feet in height labeled *A. octandra* (synonymous with *flava*) var. *virginica*, the flowers of which were very similar to those of the tree at Holden.

The color of the flowers of our *A. ×hybrida* can vary, appearing reddish one year, and more orange in another. An asset of this plant is that its leaves are free of leaf blotch and scorch, remaining clean and dark green into the fall. Although in flower it is not as showy as *A. ×carnea*, its appearance the rest of the season is much more acceptable.

LITERATURE CITED

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