Evergreen magnolias growing at UBC Botanical Garden, Vancouver, Canada: a progress report

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Dick Figlar (Figlar, 2005) recently published a comprehensive review of Asiatic evergreen magnolias, which outlined the recent advances in our understanding of these ancient and ornamental plants. He is a world authority on the taxonomy of the Magnoliaceae and past president of the Magnolia Society International. He proposed that I write an account of progress on the introduction and growth of some of the many evergreen magnolias that have arrived at the University of British Columbia Botanical Garden from China and northern Vietnam (Figure 1) in the last two decades. I hope that this paper will allow a more informed comparison between the behavior of plants growing at UBC with those growing under the more rigorous conditions of eastern North America and western Europe.

The UBC Botanical Garden is located on Point Grey at the western tip of the city of Vancouver, atop 328ft (100m) cliffs that overlook the Strait of Georgia. The relatively benign microclimate of the garden is due in part to this body of water, which separates the BC mainland from Vancouver Island and the greater Pacific Ocean beyond. We have been growing deciduous magnolias successfully for nearly 30 years in the David C. Lam Asian Garden. Some individuals of *Magnolia campbellii*, *M. campbellii* subsp. *mollicomata* and *M. sargentiana* var. *robusta* have grown to nearly 66ft (20m) and are covered with blooms nearly every spring. This paper is restricted to evergreen magnolias, an intriguing group of species from China and northern Vietnam that have become established in the Asian Garden over the last 18 years.

The works of Figlar and Nooteboom (2004), Kumar (2006), Liu (2004), and Nooteboom (2000), plus the phylogenetic advances reported by Azuma et al. (1999; 2001) and Kim et al. (2001) have provided greater taxonomic precision and clarified our understanding of the relationships between *Magnolia* taxa. I am surprised that the Flora of China project has so far not responded to these fresh interpretations. My field work in the People's Republic of China has helped me to understand the variation within species, especially those with extensive natural geographic distributions.

The magnolia collections in the Asian Garden at UBC Botanical Garden are being specifically assembled to contain only accessions of known wild origin. These are to be supported with accurate field data and herbarium, DNA, and digital (photographic) vouchers. Our research mission demands this level of documentation, but we still grow a number of undocumented specimens that were planted in the for-

Peter Wharton; inset, Tom Hudson

Figure 1. Five Finger Peak, Ban Khoang, Lao Cai province, northern Vietnam. The rich broad-leaved evergreen subtropical and temperate montane cloud forest of this region are home to *Magnolia fulva* (inset) and at least 14 other magnolia taxa.

mative days of the garden, and will remain until replacements of known provenance become available. It is important to note that these specimens have provided vital information regarding adaptability and horticultural potential. The acquisition of wild germplasm is our greatest challenge and remains a slow process as we meet the numerous and largely necessary requirements of international regulatory policies and phytosanitary regulations.

In recent years there has been an intense debate regarding the classification of the Magnoliaceae. The original 11 genera defined by James E. Dandy of the British Museum of Natural History were based solely on morphological observations. His reliance on applying strong taxonomic emphasis to three rather weak characters—axillary flowers, minor variations in fruit dehiscence, and a stipulate gynoecium—were understandable in the absence of other modern investigative options. He did not observe "living" characters, such as precocious flowering and proleptic/sylleptic branching (Figlar, 2000), and this, combined with no access to DNA sequencing, prevented him from making a more accurate classification. Contemporary re-

searchers have now placed the former genus *Michelia* into the subgenus *Yulania* (Figlar, 2000, Figlar and Nooteboom, 2004). These are evergreen members of the well known deciduous section *Yulania*, which includes *Magnolia campbellii* and *M. sargentiana*. For a full discussion of more recent research, readers are directed to the paper by Figlar and Nooteboom (2004). The following discussion follows the order used by Dick Figlar (2005).

Section Michelia

Many species in this section are known to be tough and adaptable in the Pacific Northwest. Members of the section are easily identified by their characteristic retention of only the current year's leaves. We have observed that taxa whose natural range is in southeastern China show better cold hardiness than those with more western or southwestern distributions.

Magnolia cathcartii (Alcimandra cathcartii)

This new introduction from subsection *Maingola* is represented in the garden by HWJ 9953, a Dan Hinkley collection from the Tram Ton Pass, near Phan Si Pan Mountain, in northwestern Vietnam, at the southern edge of its distribution. This came to us as *Magnolia cavaleriei* and first flowered in spring 2006. The blooms developed at the end of elongate shoots. First-time flowers are notorious for being undersized and malformed, so we will have to wait for future flowers to see their potential. Phan Si Pan, a peak of 10,308ft (3,142m) overlooking the resort town of Sapa, is very rich in magnolias, with perhaps 20 taxa on this mountain alone. Phan Si Pan is part of the Hoang Lien Son mountain range, which crosses the border between southern Yunnan and northern Vietnam before extending southeastwards to Sapa and Van Ban. It is a region where the Sino-Japanese, Yunnan-Himalayan and Indo-Malayan floras mingle, amongst local and endemic Vietnamese floristic elements. Other exciting introductions from this region are likely in the future.

Magnolia doltsopa (Michelia doltsopa)

We received our first plants of this species from Sean Hogan and Rodger Warner (Portland, OR) during 1995, with the now invalid name *Magnolia opipara*. This species was distributed in the early 1990s by Piroche Plants (Pitt Meadows, B.C.), though it has been in general cultivation in North America, especially coastal California for many years. We initially chose a bright, sheltered site in the Asian Garden, where it thrived, but subsequently it had to be moved to a shadier location, where it unfortunately is not doing as well. In the Pacific Northwest, our warming climate could favor this species, particularly on naturally moist sites. The extensive range of this taxon throughout the eastern Himalayas into southwestern China certainly indicates the possibility of more cold hardy and garden-adaptable provenances.

Magnolia ernestii (Michelia wilsonii)

Our plants came to us from Sean Hogan in 1995. The species has also been distributed by Piroche Plants. Many have noted the toughness, vigor and adaptability of this species, and this certainly applies to our plants. A 66ft (20m) tree in the wild, it forms scattered populations along the southern and western fringes of the Red Basin of Sichuan and adjoining areas of Chongqing municipal region, Hunan and Guizhou. Our plants are now nearly 52ft (16m) tall, growing amongst vigorous *Thuja plicata* (western redcedar) and *Tsuga heterophylla* (western hemlock). The annual growth rate of this species is impressive, with up to 24in (60cm) growth recorded in some years. In the coastal Pacific Northwest region, on sites that are naturally moist throughout the year, this species could become a giant. Between 2004 and 2006 these trees produced a profusion of small [3in (8cm) across] white flowers, with not a hint of the commonly reported yellow coloration. The flowers are clustered along main laterals in late April. Although the flowers are borne high in the crown, a perceptible sweet scent can be detected some distance away. With us, it is a first rate plant, and we wait with excitement for the larger, yellow flowered forms that are reported in the wild. I recently saw the related *Magnolia chapensis* used as a street tree in some of the smaller cities of southern Sichuan.

Magnolia floribunda (Michelia floribunda)

We received a plant of this from Dan Hinkley in 2004 (number DJHC 548), which he collected from northwest Yunnan in 1996. It was only recently planted in the Asian Garden, but is already showing the vigor of *M. ernestii*. In early November 2006 temperatures dipped to 16°F (–9°C) accompanied by 23in (60cm) of heavy, wet snow. Our specimen was unaffected. The younger leaves and shoots are covered in fine seriaceous hairs, which give this plant a very elegant appearance. We wait with anticipation for the flowers, which are silvery white, with a custardy-honey like fragrance. *Magnolia floribunda* has a remarkable natural distribution, from western Hubei, through Sichuan, Yunnan, parts of Myanmar (Burma) and northern Vietnam. In the mountain forests of Phan Si Pan at 7,218ft (2,200m), I have seen fine 72ft (22m) trees of the southern geographical variant, *M. floribunda* var. *tonkinensis*. In this area near Sapa, many trees start flowering in early November, which to me is quite unusual. In the same vicinity, Tom Hudson (owner of Tregrehan House, Cornwall, U.K., a garden noted for its collection of rare woody plants from wild origin) has also collected this species, under his number TH 1707.

Magnolia foveolata (Michelia foveolata)

Of the evergreen species new to cultivation in the Asian Garden, this is my favorite. (Figure 2) Its foliage looks fantastic next to several young *Rhododendron sinogrande* with their "pachydermal" foliage. It appears to be completely hardy at UBCBG and will, I expect, be favored over *Magnolia grandiflora*, once it becomes better known to growers. Our plant came to us from the Hogan/Warner connection in 1998, but sadly without collection data. Ideally we should replace it with wild documented plants from different sources across its natural range. Our plant has substantial,

glossy, leathery, lanceolate leaves, which can be over 12in (30cm) long. The stems and both sides of mature leaves are covered in conspicuous silvery pubescence, while the buds have light coppery silky hairs. As Figlar (2005) points out, the extensive natural distribution of this species in China, from western Hubei, southern Hunan to Jiangxi, southwards across parts of Guizhou and Yunnan and into northern Vietnam, indicates considerable variation in hardiness. The morphological variability also appears extensive and bodes well for future ornamental selections. The plant we grow approaches the expression of var. *cinerascens*, as the silvery hairs retained on the adaxial leaf surfaces are poorly developed, giving the foliage a very dark appearance. The 3 to 4in flowers are borne on axillary shoots and range from butter to pale yellow to white or greenish white. Steve Hootman, co-director of the Rhododendron Species Foundation Botanical Garden, Federal Way, Washington, U.S.A. recently saw a very fine yellow flowered individual of this species in northeastern Vietnam. I wait with bated breath for our plant to flower.

Magnolia martinii (Michelia martinii)

This is another "tough customer" with an extensive range from southern Henan and western Hubei, southwards across central and southern Sichuan to northeastern Yunnan. I recently saw this species on the celebrated Emei Shan (Mt. Omei), and was much impressed by the vigor and delightful poise of its small finger-sized glossy lance-shaped leaves. The promise of pale- to butter-yellow flowers certainly gives this plant an allure. We have two plants that are growing well, despite being transplanted as quite large trees. One is now reestablished in a protected, but well-lit site. The other is recovering after being side-swiped by a huge, wind-thrown, dying western hemlock. Such are the perils of growing magnolias in a forest garden! Despite a number of very dry summers recently and little supplemental irrigation, they are thriving.

Magnolia maudiae (Michelia maudiae)

In Vancouver and the Pacific Northwest, this species has perhaps had the most immediate impact on horticulture. It was Sean Hogan who first understood its potential for a community street planting in Portland. It caused a local sensation when the trees started flowering in 1997, creating a spectacular display that immediately caught the attention of the local media. In addition, the whole neighborhood was blanketed with an intense heady fragrance. Hogan (pers. comm. 2006) described the flowers, "...[they] look like a pile of white tissues and have a heady lily fragrance you can smell a block away." Our plants are derived from my collection (PW 126) made close to the Dayao Shan, Guangxi, China, in 2001, from maturing coppiced trees in degraded woodland. This is a very widespread species ranging across most of the southern and central provinces of China, from coastal Zhejiang to Guizhou in the west. At the time, I was searching for the endemic *M. figo* var. *crassipes*, which is notable for its beautiful purple flowers. I did not find it, but seeing *Magnolia maudiae* in the wild was compensation enough. Three plants derived from this collection were set out in the Asian Garden. All are conspicuous

Steve Hootman

Figure 2. *Magnolia foveolata* is found in northern Vietnam and southern China. This pale yellow form was photographed in Ha Giang province in Vietnam.

for their glabrous, bluish green leaves and were completely unaffected by our early November freeze [16°F (–9°C)] in 2006.

These young Guangxi plants produce normal and numerous axillary flower buds, clustered along the outer branchlets. In Vancouver they open sequentially during late April to early May, which is much later than cultivated plants (from Piroche Plants, B.C.) that can be plagued by early frosts, as they are in the eastern U.S.A. In the wild, this species can attain 66ft (20m) in moist, deep bottomland soils. Given similar soils and time, such dimensions should be possible in cultivation, certainly in areas such as southern coastal Oregon. The wide geographical distribution of this species also suggests a broad spectrum of regional and genotypic variation and considerable potential for breeding and selection.

Section Manglietia

This rather distinctive group of largely evergreen magnolias, formerly grouped in the genus *Manglietia*, is now placed in *Magnolia*. The close relationship with the deciduous section *Rhytidospermum* (subsection *Rhytidospermum*) is at first glance surprising, as they are evergreen (except for *M. decidua*), yet the production of false whorls or early spring flushing is typical of their deciduous relatives, such as *Magnolia officinalis* (see Figure 3). (Figlar, 2005). Figlar and Nooteboom (2004) provide a thorough analysis of the section *Manglietia* and the rationale for placing it within the genus *Magnolia*.

Magnolia chevalieri

We have been growing the same Dan Hinkley collection (HWJ 99621) as Figlar mentions in his account (Figlar, 2005), but with greater success. The difference is that this collection over-winters successfully at UBC, and the plants are vigorous trees, now just over 10ft (3m) high. Their narrow, glossy, dark green leaves are arranged in false whorls, a characteristic feature of this section. The 2003–2005 winters in Vancouver were very mild, but the minor leaf bronzing after the early November 2006 frost in the Asian Garden gives us some grounds for optimism. This is a taxon recorded from northern Vietnam south to the Dalat region and westwards into Laos. I believe that it may occur in neighboring border regions of Yunnan, though it is presently unrecorded there.

Magnolia conifera var. *chingii*

This is another species that came to us without background information in 1998 from Piroche Plants. Sean Hogan (Grimshaw, in press) reports that some seed batches received by Piroche Plants in the 1990s from Nanjing Botanical Garden as *Manglietia chingii* (now *Magnolia conifera* var. *chingii* (Dandy) V. S. Kumar) are in fact a "congested" form of *Magnolia insignis*.

Our plant (var. *chingii*) has performed well, after a slow start, and is now a tight-crowned, thriving specimen of just over 16ft (5m). Extension growth in this species

Figure 3. *Magnolia officinalis*. A well-known deciduous member of the section *Rhytidospermum*.

often develops false whorls of leaves with leafless internodes. In the fall, a small proportion of the previous year's leaves are shed, often turning a respectable orange-yellow. The net effect is to create a rather sparse appearance during the winter. We eagerly await the small, but interesting white flowers, which are produced on long peduncles. The specific epithet, *conifera*, relates to the fruiting body of this species, but it could also describe the neat, symmetrical habit of this species. A semi-sheltered, well drained, yet year-round moist site seems to suit this species well. It is a native across southern China from Guangdong to Guangxi and southern Yunnan into northern Vietnam. The variety *chingii* appears to have a more eastern distribution in Guangdong and Guangxi (Kumar, 2006).

Magnolia fordiana (*Manglietia fordiana*) and *M. yuyuanensis* (*Manglietia yuyuanensis*)

We have grown *M. fordiana* for many years. It is derived from a wild seed collection made by Peter Bristol, Lawrence Lee, and myself in 1988 near the Huangshan, in southern Anhui province. This collection has been rather disappointing with its weak, unattractive growth habit, rather chlorotic foliage and propensity to snow breakage. This species has an extensive range across southern China, from Fujian westwards to Yunnan.

These comments do not apply to the closely related *Magnolia yuyuanensis* (Figure 4), sometimes regarded as a variety or subspecies of *M. fordiana*. Originally described

from southern Zhejiang province, the range of *M. yuyuanensis* extends southwards through Fujian, Jiangxi, and Anhui to northern Guangdong and southern Hunan. It is an eastern, more cold hardy expression of *M. fordiana*. This species has recently been delineated by V. S. Kumar of the Botanical Survey of India (Kumar 2006) on the basis of clear morphological differences, including glabrous, yellowish-brown (vs. reddish brown) twigs, and leaf apices that are caudate-acuminate (vs. acute). In the Asian Garden, *M. yuyuanensis* has developed into a fine tree with a lovely, tapered ovoid crown, delicate, pleated leaves and attractive, sweetbay-sized, flowers. It has flowered profusely each July, beginning in 2003, but the fragrance is disappointing. The creamy-white tepals contrast beautifully with the basal plum-purple stamens. Each flower only lasts about 36 hours before turning brown and collapsing. Despite this, they are produced in good numbers, sequentially, over a period of several weeks, providing an exotic visual effect in the garden. I am impressed at the snow shedding qualities of this species and the strong branch attachments to the main stem—all traits that give this species a robust constitution. We received plants of this species in 1989 from J. C. Raulston, under the name *Manglietia yunnanensis*, which is clearly a misreading of the original Chinese place name in Zhejiang, from which the specific name is derived.

Magnolia insignis (Manglietia insignis)

This species is now becoming well known in cultivation, due to its adaptable nature and spectacular creamy white through pink to scarlet flowers (3–5in/8–13cm), which are produced even on young plants. In the wild it has an enormous distribution throughout southern China and bordering regions. In western areas of the Fraser Valley and much of Vancouver it thrives, growing into an open branched tree with dark green, coriaceous leaves. The popularity of this species locally is due in part to the active distribution of plants in the mid-1990s by Piroche Plants. In addition, a former employee of that nursery, Bruce Rutherford, was responsible for selecting a particularly good red flowered form that is currently being used by several North American magnolia hybridizers. Our plant is derived from Piroche, but there is no field data, so we await collections of documented material. This widespread species ranges from southern central China across Yunnan and northern Vietnam, the border areas of Myanmar (Burma) to northeast India, and west to Nepal. This extensive natural distribution has already provided western growers with a good number of hardy regional forms. Like so many magnolias, year-round moisture promotes the best growth. Our plant is now 22ft (7m) high, growing vigorously and flowering well beside a stream, despite considerable competition from neighbouring cultivated Asian species and native *Acer macrophyllum* (big-leaved maple).

Magnolia aff. *conifera*

We received a plant from Sean Hogan in 1995 under the name *Manglietia aromatica* (now *Magnolia aromatica*). The true form of this species is now a rare and highly endangered tree in southern China, growing to an imposing 115ft (35m). It has al-

Daniel Mosquin

Figure 4. *Magnolia yuyuanensis*. The flowers of this species appear in early June and though lasting only a few days, they are borne sequentially over several weeks.

ways been greatly valued for its fine timber, which, sadly, has resulted in intense exploitation. The natural distribution is now reduced to scattered trees or groves in parts of southwest Guangxi, Guizhou and southeast Yunnan. There is some hope that this species spills over into the trans-border forests of northeastern Vietnam. Our tree has displayed good cold hardiness having been undamaged by the frost in early November 2006. It is now 18ft (5.5m) high and growing vigorously, despite being in a shady protected site, close to towering conifers. The leaves are coriaceous, narrowly oblancelate to oblong, attractively arranged along branches in a narrowly tiered, branched crown. Our tree sheds heavy wet snow in a similar manner to *Magnolia yuyuanensis*.

I was perplexed at the hardiness of our plant, which in the wild has such a southern distribution in China. I described our plant to Dick Figlar, who coincidently had just received a plant from Josh McCullough of Cistus Nursery (Portland, OR) under *Magnolia aromatica*. This plant did not agree with published descriptions of this taxon. The key characters of *M. aromatica* are the totally glabrous twigs, except the buds, which are covered with white adpressed, villose hairs. The plant from Cistus Nursery and our specimen in the Asian Garden have a similar morphology, red brown pubescence on the buds and also on the last two or three branch internodes. *Magnolia aromatica* is one of the few in section *Manglietia* without rufous hairs. As the specific name implies it is also a highly aromatic, yet when the leaves and stems of the Cistus and UBC plants are torn or crushed the fragrance is weak compared to most Magnoliaceae.

This interesting, hardy magnolia has much in common with *Magnolia conifera* var. *chingii*, but is distinct from our specimen in the Asian Garden described here. Figlar feels that this could be a new taxon, as species within this section "show great uniformity in both vegetative and floral morphology" (pers. comm. 2007). For the moment we consider it to be close to *Magnolia conifera*.

Section Gwillimia

Magnolia delavayi

We received our first wild collected seed of *M. delavayi* (Figure 5) in the 1980s, and the seedlings were unfortunately badly damaged by 9°F (–13°C) temperatures. The November 2006 cold snap and heavy wet snow scorched our plants so badly that they may not recover. This has dampened my optimism for this quite exceptional species because in the wild it is a great survivor, often occurring in crevices on karst (limestone) ridges in its native range of southwestern Guizhou, southwestern Sichuan, Yunnan and northern Vietnam. Our recently killed plants were derived from seed collections made by Peter and Kenneth Cox, Peter Hutchinson and Steve Hootman (their number CCHH 8026) made at low elevation 6,135ft (1,870m) from the hot, dry, Nujiang (Salween) Valley in Yunnan. The paddle shaped leaves have an attractive, almost bluish-pewter hue that contrasts well with the ephemeral nine-tepaled, creamy white flowers (8–9in/20–23cm) in diameter when opened flat. The three outer tepals reflex downwards and initially have a curious greenish pallor, which quickly turns buff brown as they age over 24 hours. The flowers on our plants do not seem to have a strong fragrance. Hopefully, this is a characteristic that develops with age. We may not match the specimen at Yufeng Temple in Lijiang, Yunnan (claimed to be 700 to 800 years old), but if we can obtain hardier material from other provenances, we may eventually see this species growing to maturity in coastal areas of Vancouver and southern Vancouver Island.

Section Gynopodium

We grow two species in this section, *Magnolia lotungensis* and *M. yunnanensis*, all of which are glabrous, which is a key character of this section. These two species were planted out in the Asian Garden in the mid-1990s in very protected sites, anticipating they would be quite tender. In retrospect, sunnier, more open sites perhaps would have benefited them. John Grimshaw (in press) rightly points out that many evergreen species have a juvenile stage in the shade of the forest understory, before assuming dominance as an emergent in the forest canopy. We may, in fact be following a "natural script." In the past, members of this section have been placed in the genus *Parakmeria*; this naming persists in China.

Magnolia lotungensis (Parakmeria lotungensis)

Figlar has reported (Figlar, 2005) that *Magnolia lotungensis* (back cover) is a hexaploid species and is genetically very different from *M. nitida* (diploid), a species that was associated with this plant for many years. The genetic robustness of this species perhaps explains its superiority in our collections, compared with *M. nit-*

Figure 5. *Magnolia delavayi*. Although there are strong morphological similarities to *Magnolia grandiflora*, it lies in a different section, *Gwillimia*.

ida, which we introduced as seed from Caerhays Castle, Cornwall, U.K. in the early 1980s. Plants derived from this introduction failed at UBC when temperatures dropped to as low as 9°F (–13°C). In the Asian Garden, specimens of *M. lotungensis* derived from Piroche Plants in the 1990s have grown vigorously and continue to thrive even on dry sites amongst large conifers. They are neat upright trees with small glossy elliptic to ovate-lanceolate leaves that often emerge bright red. Some individuals can have the appearance of varnished red candle-wax or lipstick, sometimes maroon or just plain bright green. These 'hot reds' have obvious commercial appeal, and some individuals retain this coloration year round, especially when successive pulses of new growth occur in moist locations during the summer. Several of our trees are now over 16ft (5m) high and are forming a range of crown profiles, from tight pillars to open-branched, tiered crowns. This is certainly a tough species having suffered no damage after both the 9°F (–13°C) frosts in the 1980s and the events of early November 2006. This is a large forest tree up to 98ft (30m) (Wuyishan, Fujian) with a natural distribution through southeastern subtropical China, notably on the island of Hainan, and appears to have very good frost tolerance in these locations. The flowers of this species are small and rather disappointing, though selection could probably change this situation.

Magnolia yunnanensis (Parakmeria yunnanensis)

This species is larger than *M. lotungensis*, with larger, broader leaves and lovely, substantial flowers. This is a fine tree [to nearly 131ft (40m) tall], that ranges through southeastern Yunnan, northern Guangxi and southeastern Guizhou at 4,593–4,921ft (1,400–1,500m) elevation. I think that it occurs in northern Vietnam, though it has

not been recorded there. With us, it appears to have surprising cold hardiness, with no damage recorded since it was planted out in 1996. Our original plant, from Sean Hogan, has grown to over 13ft (4m) high in a very shaded site. In May, the unfurling leaves 3–6×2–2.4in (7–15×5–6cm) in length) are spectacular, often a subtle blend of intense bronzy orange to crimson. The fragrant flowers are very beautiful (we wait in anticipation), consisting of 12 tepals in four whorls, varying from creamy white (often with the outer tepals stained red) to good clear yellows. This is a species that has considerable potential in the Pacific Northwest, especially if superior flower forms are introduced. I look forward to further introductions of this species with good field documentation.

Concluding Comments

The recent introductions of evergreen magnolias from southern China and northern Vietnam have given horticulturists a fresh palette of ornamental species, some of which have shown surprisingly good cold hardiness here. A major challenge for many species is sudden cold, often with heavy wet snow, a common winter event in the Pacific Northwest. Branch and crown form, strength of branch and stem attachments, branch flexibility, and the snow shedding attributes of leaves are all factors that influence survival and attractiveness under this threat. A number of other species not represented in UBC's collections have been introduced into cultivation in the west. Some are subtropical in origin and doubtfully winter hardy, but there are a number of highly ornamental taxa that would be well worth trialing here, including *Magnolia chapensis, M. dianica, M. macclurei,* and *M. crassipes (Manglietia pachyphylla).*

Scientifically meaningful collections require that all species that are introduced and propagated have complete and accurate documentation from wild seed collections. Anyone who has traveled recently in the field in southern China and particularly, in northern Vietnam, cannot fail to have noticed the pace of forest destruction and degradation. Those evergreen magnolias that are already in cultivation with information on nativity are immensely valuable. Efforts to conserve magnolias in the wild (in situ) are vital and deserve to be enthusiastically supported by institutions that have a specific interest in these plants. UBC Botanical Garden is actively working with a number of international, governmental and non-governmental bodies, such as Botanical Garden Conservation International, in concert with Chinese botanical institutions to carry forward this important work.

There are distinct challenges for botanical institutions introducing and carrying out research on rare and imperiled magnolia species. As an institution we have to work within the existing regulations of the international Convention on Biological Diversity, respect the laws of host nations and observe Canada's plant protection regulations. We have begun a series of new initiatives to facilitate this kind of research and look forward to the day when we can demonstrate more fully the remarkable diversity of this ancient lineage of flowering plants.

References

Azuma, H., Thien, L.B. and Kawano, S. 1999. "Molecular phylogeny of *Magnolia* (Magnoliaceae) inferred from cpDNA sequences and evolutionary divergence of floral scents." *Journal of Plant Research* 112: 291–306.

Azuma, H., Garcia-Franco, J.G., Rico-Gray, V. and Thien, L.B. 2001. "Molecular phylogeny of Magnoliaceae: the biogeography of tropical and temperate disjunctions." *American Journal of Botany* 88: 2275-2285.

Figlar, R.B. 2000. "Proleptic branch initiation in Michelia and *Magnolia* subgenus *Yulania* provides basis for combinations in subfamily Magnolioideae." In Proceedings of the international symposium on the family Magnoliaceae. Edited by Yu-hu Liu et al. Beijing: Science Press. pp. 14-25.

Figlar, R.B. 2005. "Variety in evergreen magnolias II." *Magnolia* 40: 1-17.

Figlar, R.B. and Nooteboom, H.P. 2004. Notes on Magnoliacaeae IV. Blumea 49: 87-100.

Grimshaw, J.M. (in press). *New Trees*. Kington UK: International Dendrology Society,

Kim, S., Park, C.-W., Kim, Y.-D. and Suh, Y. 2001. "Phylogenetic relationships in family Magnoliaceae inferred from ndhF sequences." *American Journal of Botany* 88: 717-728.

Kumar, V.S. 2006. "New combinations and new names in Asian Magnoliaceae." *Kew Bulletin* 61: 183-186.

Liu, Yu-Hu. Editor. 2004. *Magnolias of China*. Beijing: Science Press.

Nooteboom, H.P. 2000. "Different looks at the classification of Magnoliaceae." In Proceedings of the international symposium on the family Magnoliaceae. Edited by Yu-hu Liu et al., Beijing. Science Press. pp. 26-37.

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