‘Bicentennial’ A new hybrid magnolia cultivar

The Australian Bicentennial Arboretum celebrated its twentieth year in 2008 with the arrival of a new hybrid magnolia, appropriately herein named ‘Bicentennial’. In this article, CHRIS CALLAGHAN suggests that the parentage of this new cultivar is probably the endangered *Magnolia sargentiana* from western China and *M. campbellii* subsp. *mollicomata* from Myanmar (Burma), S.E. Tibet and western China, where its range is not known to overlap with that of *M. sargentiana*.

This exquisite precocious magnolia, whose origins following extensive enquiries cannot be traced, was purchased in Tasmania in June of the same year, as an unknown *Magnolia* x *soulangeana* cultivar believed to have been imported from Victoria some years before. However this was no longer certain as the records relating to the plant no longer exist, the only clue to its identity being the letters M1 marked on the planter bag which was most probably used as a code for an unidentified spontaneous hybrid magnolia seedling. At the time of purchase the very large furry flower buds on the then dormant plant

indicated to me that it was unlikely to be in the lineage of *M.* × *soulangeana*. Abscission scars showed there had been five flowers the previous year at seven to eight years of age.

When three months after planting out, the flower buds had expanded sufficiently to split the perules and partially expose the inner pink tepals, it was considered that the plant might be *Magnolia* 'Caerhay's Belle' *(M. sargentiana* var. *robusta* × *M. sprengeri* var. *diva)*, due to the striking similarity to the expanding bud (minus juvenile leaves) of this cultivar shown in the colour photograph appearing as Plate 65 (incorrectly captioned plate 64) on page 210 of the joint 1998 IDS / Magnolia Society publication, *Magnolias and their Allies*.

After the first flowers had fully opened the last week of winter, a referral to the description of the above cultivar in various publications (Durio 1990, Callaway 1994, Spencer 1997, et al.) ruled out it being 'Caerhay's Belle' due in part to that plant's larger flower size, flower shape and its flowers being held erect, whereas the new plant, while having the initial four flowers held erect, had its subsequent flowers held horizontally or nodding. It now became obvious as these first flowers evolved into a definite cup-and-saucer effect that *M. campbellii* or its subspecies *mollicomata* were likely to be involved in its inheritance.

Later when referring to the drawings of Chinese magnolias in the recently available *Magnolias of China* (Liu Yu-Hu et al., 2004) it was noticed that the various *Magnolia* species exhibit a typical arrangement in the scars left by the abscising tepals at the base of the gynandrophore or cental axis of the flower. While the drawing for *M. campbellii* was inexplicably omitted, the illustrations of this species on the front jacket of *Trees & Shrubs Hardy in the British Isles* (Bean 1973), copied from J.D. Hooker's *Illustrations of Himalayan Plants* (1855), showed the same distinctive arrangement of the scars as that exhibited by the arboretum's plant, when each of the 13 flowers withered and discarded the tepals.

A study of the literature available (see references) and other plants in the arboretum's magnolia collection was undertaken in an attempt to determine the other contributing parent(s) or whether the plant was in fact an existing named cultivar.

As information became available, numerous species, varieties and cultivars were ruled in, then out, as possible candidates, based not only on their descriptions and/or illustrations, but also whether they had at some time been introduced to Australia or raised in this country.

Finally, the field was narrowed down to a handful of likely contenders. The New Zealand raised *Magnolia* 'Iolanthe' ['Mark Jury' × (*M.* × *soulangeana* 'Lennei')] was considered a possibility due to the shared tendency of having its flowers angled sideways on the branches as well as being reminiscent of the cup-and-saucer shape of *M. campbellii*, the former feature contributed by *M. sargentiana* var.

robusta and the latter feature by *M. campbellii* 'Lanarth', respectively the pollen and seed parents of 'Mark Jury' (Callaway 1994, Jury 1998). However 'Iolanthe' was ruled out for various reasons including its larger flower size (28cm *vs* 20 cm) and having 9 tepals *vs* 12 to 15 tepals for 'Bicentennial'.

Another two *Magnolia campbellii* hybrids listed in an Australian Nursery catalogue (Yamina Rare Plants 2004), that I considered might have been plants from which our hybrid originated, perhaps as a cutting (there is no evidence of it being a grafted plant), were also short-listed, namely *M. campbellii* × (*M.* × *soulangeana* 'Lennei') and *M.* 'First Flush', a cultivar of *M. campbellii* × (*M.* × *soulangeana* 'Amabalis'), neither of which I have seen.

Enquiries to a number of the main magnolia growers in Australia located in the Dandenong Ranges east of Melbourne, Victoria, ruled out the form of *M. campbellii* × (*M.* × *soulangeana* 'Lennei') grown in this country. Don Teese of Yamina Rare Plants commented that the flowers of this hybrid are not cup-and-saucer shaped and Ron Boekel, who considered the flowers of this hybrid to be goblet-shaped, confirmed this for the plants at Cascade Nursery.

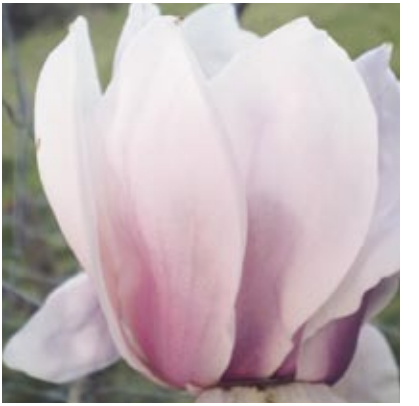
Unable to contact anyone familiar with 'First Flush' in Australia, I turned to New Zealand in my quest, as it had been bred there. While the plant of 'First Flush' listed as growing at Pukeiti Rhododendron Trust on Mount Taranake (Marion Mackay 1992) had apparently died (the head gardener of 20 years had no knowledge of it), Ian Baldick of the New Zealand Magnolia Society was able to check the flowers of this hybrid cultivar growing in his collection.

He advised that "the upright flowers didn't open flat but were a wide vase shape (not cup-and-saucer) when the 9 or 10 pointed tepals fell, and that the pink colouration at the base on the outside of the tepals carried a strip of pink in the centre through to the apex" (Ian Baldick, pers. comm.). Dorothy Callaway (1994) described 'First Flush' as having "white flowers flushed with pink on the lower half of the outside of the tepals".

These details ruled out the plant at the Australian Bicentennial Arboretum being either of the above hybrids and a brief description of the new hybrid follows.

The tree flowers progressively down the stem, the beautiful flowers opening upright or horizontal to semi-pendulous according to the winter alignment of the large 6cm densely furry ovoid flower buds.

After shedding their three protective layers of perules from the stout pedicels, the first four flowers opening near the top of the plant were upright, with the innermost four or five fleshy tepals arched over and hiding the gynandrophore (male and female flower parts), while the remaining (up to) 11 tepals spread out and down to form the distinctive cup-and-saucer effect for which *Magnolia campbellii* is renowned. (However Neil Treseder mentions it should be noted that the flowers of many trees of *M.campbellii (sensu stricto)* do not reflex the outer tepals, but maintain their tepals in the form of upright cups – J.RHS, 97:337/8, 1972.)



Top left Expanding flower bud showing pink tepals enclosed by glabrous spathaceous bracts and furry perules

Top right Later flowers exhibited little or no pink in the pointed tepals.

Bottom left Nodding flower near base of plant.

Middle right Vase-shaped flower on disintegrating saucer.

Bottom right Gynoecium column surrounded by 120 candy-striped stamens of the androecium.

photographs© Australian Bicentennial Arboretum

Claw-shaped base of fallen tepals and ***right***, scars on fruiting stem left by abscising tepals and stamens, with vegetative buds on either side.

Extending gynandrophore with new leaves from buds shown in previous photo and ***right***, vegetative bud with silky pubescence.

Typical shape of young leaf from above showing vein structure and ***right***, underside of leaf showing pubescence.

The hybrid's spoon-shaped tepals were coloured deep pink with darker veining on their outer side, paler within. A number of late winter gales in quick succession stripped the tepals from the central axis, leaving no opportunity to photograph these blooms. The remaining nine flowers took their chance to open over the following weeks of early spring when the arboretum is assailed by frequent south-westerly gales gusting to 100kph, an annual event at this time of the year, making necessary a protective enclosure.

These flowers were generally positioned horizontally to slightly nodding at the ends of the lateral branches, having expanded from goblet-shaped to cup-shaped, and coloured on the outer surface rose-pink at the base, fading to white

above and bisected with a broad or narrow pink strip reaching to the apex. These tepals were generally coloured white or flush pink on the inner surface.

The tepals are covered with minute silvery hairs as mentioned for *Magnolia campbellii* (Polunin & Stainton, 1999), and these are noticeable when they glisten in bright sunlight. The 20cm wide flowers are pleasantly fragrant, attracting numerous wasps, beetles and flies. Unfortunately despite all their efforts, the developing gynoecia aborted, since the female stigmas are usually receptive to pollination only on unopened flowers which must be entered by beetles crawling between the overlapping tepals or eating through them (Callaway, 1994, Gardiner, 1989). Unaware of this at the time, my attempts at hand-pollination were also doomed.

The dark green, semi-leathery obovate leaves are 15cm long by 10cm wide above the middle, broadly rounded and short pointed or occasionally notched at the apex, and with the tapered base often oblique. They are glabrous above and pubescent below, with appressed hairs adjacent to the generally glabrous mid-rib and the pronounced lateral veins. The branchlets are yellowish-green becoming reddish-brown then grey.

While there are some features of *the hybrid* that are common to both the closely related *Magnolia sargentiana* and *M. campbellii*, there are numerous features shared with only one or the other of these species.

A comparison of some prominent features of *M.* 'Bicentennial' with its putative parents is made in the accompanying chart, which indicates the hybrid's affinity to them.

Comparison of selected inherited morphological features of magnolia hybrid with putative parents.

FEATURE	*Magnolia sargentiana* (excl var. *robusta*)	*Magnolia campbellii* (incl subsp. *mollicomata*)	*Magnolia* hybrid 'Bicentennial'
Lateral veins to leaf	(7-)8-12 pairs	(8-)12-16 pairs	(7-)8-12 pairs
Leaf dimensions	L:10-20cm W:5-10cm	L:10.5-22(-30)cm W:5-10(-12)cm	L:(6-)7-15cm W:(3.75-)5.25-10cm
Leaf petiole length	(1.5-)2.5-4.5(-5)cm	(1-)1.8-2.5(-5)cm	1-2.5cm
Leaf pubescence abaxially	Densely pubescent (except glabrous midrib)	Glabrous, or with fine appressed hairs, especially along midrib and main veins	Pubescent; densely appressed hairs near glabrous midrib/lateral veins.
Pedicel (or flower stalk)	Minutely pubescent, long residual hairs at nodes	Usually glabrous (subsp. *mollicomata* usually sericeous)	Long residual hairs at nodes (fringed)

FEATURE	*Magnolia sargentiana* (excl var. *robusta*)	*Magnolia campbellii* (incl subsp. *mollicomata*)	*Magnolia* hybrid 'Bicentennial'
Flower bud dimensions (late winter)	L:3.5-4cm	L:3-4cm (subsp. *mollicomata* 6cm)[2]	L:(5-) 6 (-7)cm W:4 (-5)cm
Flower form	Open campanulate	Cup-shaped to often cup-and-saucer shaped. (subsp. *mollicomata* always cup and saucer shaped)	Initial 4 flowers cup-and-saucer shaped, subsequent 9 flowers cup-shaped.
Flower orientation	Horizontal or slightly nodding.	Erect.	Initial 4 flowers erect, subsequent 9 flowers held horizontal or angled.
Flower diameter	W:15-20cm	W:15-25(-30)cm	W:17.8-20cm
Number of tepals	(10-)11-13(-14)	12-15(-16)	(12-)14-15
Minute silver hairs on outer tepals	No (?)	Yes[5] (subsp. *mollicomata* similar?)	Yes
Tepal base narrows to claw	No	Yes	Yes
Scars arrangement from abscising tepals	3 similar concentric rings[3]	2 concentric rings, scars in the lower ring elongated horizontally[1]	As for *M. campbellii*
Gynoecia length at anthesis (flower in full bloom)	(1.8-)2.-2.5cm	2-3cm	2(-2.5) cm
Alignment of styles to gynandrophore	Forward with short incurved apex[3] (later recurved?)	Recurved[1]	Recurved
Colour of stamens filaments	Purplish	White with deep-pink centres abaxially[4] (both taxa) and white adaxially (for subsp. *mollicomata*)[6]	White with deep-pink centres abaxially and white adaxially
Age to flowering from seed	20-25 years (First flowered at Nymans, April 1932 from Wilson's 1908 seed).	(15-)20-25+ years (subsp. *mollicomata* 7-12 years)	7-8 years

References:

(numbers 1 to 6 refer to rarely mentioned/illustrated features listed in comparison chart)

[1]Bean (1973), Brickell (1999), Callaway (1994), Gardiner (1989); [2]Johnstone(1955), Krüssmann (1985); [3]Liu et al. (2004); [4]Mitchell (1986); [5]Polunin & Stainton (1999), Rehder & Wilson (1988), Spongberg (1998); [6]Treseder (1978).

It can be seen from the comparison chart that the hybrid is close to *Magnolia sargentiana* for six of the 17 listed features, to *M. campbellii* subsp. *mollicomata* for

three features, and to *M. campbellii* and its subsp. *mollicomata* for the remaining features common to them, while for flower orientation, individual flowers may be as for either putative parent. Interestingly, the flower buds of 'Bicentennial' are as large as those of *M. campbellii* subsp. *mollicomata,* yet produce a smaller sized flower of similar dimension to those of *M. sargentiana.*

Julian Williams of Caerhay's Garden in the UK notes that the size of magnolia flowers is probably determined by the seed parent (J.RHS, 91:284, 1966), hence the 18 to 20cm flower of the hybrid would derive from the 20cm flower of *M. sargentiana.* Then the fact of the hybrid's early flowering and its relatively large flower buds would indicate that *M. campbellii* subsp. *mollicomata* is the pollen parent.

While it has not been definitely established that *Magnolia sargentiana* and *M. campbellii* subsp. *mollicomata* are in fact the parents of 'Bicentennial', it seems reasonable in light of the above discussion that there is a strong possibility of this being the case.

If so, it is possibly the first occurring hybrid of *Magnolia sargentiana* since its discovery by Armand David (of *Davidia* fame) 140 years ago, and which Bean in his third volume of 1933 considered "at least as beautiful as *M. campbellii*" and Callaway (1994:150) thought it "perhaps second only to *Magnolia campbellii* in beauty." (There are numerous hybrid cultivars with *M. sargentiana* var. *robusta* as one parent).

Flowering as it does at the young age of seven to eight years compared to 20 years and upwards for both typical species of the putative parents, this hybrid's beauty can be appreciated relatively early instead of only being planted as an heirloom.

Whatever its lineage, there is no doubt that 'Bicentennial' is a beautiful and worthy addition to the world of magnolias or yulanias, a Chinese botanist, D.L. Fu, having reclassified, (*J. Wuhan Bot. Res.* 19:198, 2001), the temperate Asiatic *Magnolia* species of subgenus *Yulania* section *Yulania,* which includes *M. campbellii* and *M. sargentiana,* to the resurrected genus *Yulania* of 1839. (This reclassification has been accepted in *Flora of China* – Xia et al, 2008 wherein there are now no taxa known as magnolias native to China!).

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