Is it Magnolia sieboldii or M. sinensis? It depends on the floral internode

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When I first became interested in magnolias back in the early 1970's, one of the high points in my life, horticulturally speaking, was seeing *Magnolia sieboldii* for the first time at the garden of Mr. and Mrs. Raymond Hartz of Bernardsville, NJ. Ray and Betty Hartz had assembled a world class magnolia collection which included nearly every species of magnolia that could be grown in this part of the county (see Vol. X(1), 1974), even including what was thought to have been a mature *Magnolia campbellii* (This was later proven to be *M. sprengeri* 'Diva.'). I was particularly impressed with *M. sieboldii* with its elegant, pure white, nodding flowers offset by vivid rosy-red stamens. No other magnolia flower, outside of Section Oyama, looked at all like it. The next fall I went back to collect seeds, hopeful that I too would soon be able to adorn my yard with this enchanting species.

A few year later, at our garden in Pomona, New York, our seedlings of the Ray Hartz *M. sieboldii* bloomed. By that time, I was becoming well acquainted with the other species of Section Oyama; *M. globosa*, *M. wilsonii*, and *M. sinensis*. The former two species are easily separated from *M. sieboldii* based on dense rufous pubescence (*M. globosa*), elliptic leaves (*M. wilsonii*) and general lack of hardiness. Yet the case for differentiating *M. sinensis* didn't seem to be as clear cut. Having observed *M. sinensis* in other gardens and in photographs, I came to the conclusion that the only way for me to tell the difference between *M. sieboldii* and *M. sinensis* was by the label on the plant or the caption on the picture. Others agreed with me. However, a casual check of the prevailing literature at that time (Johnstone 1955, Treseder 1978) indicated that the flowers of *M. sinensis* were pendent while those *of M. sieboldii* were nodding. Those authors described other differences as well, such as the "fawn colored" bark and the "usually" larger leaves of *M. sinensis* (the word usually can be undependable in taxonomy as can bark color

since ecology influences it), but the pendent vs. nodding flower position seemed to be a powerful differential character. I accepted it.

But the story is far from over. At the 1981 Magnolia Society meeting at the Arnold Arboretum, Ferris Miller distributed seeds of *M. sieboldii* that had been collected in the wild in Korea. These Korean plants were said to have lighter colored stamens than typical *M. sieboldii*, which seemed interesting, so I took a few seeds to try. These grew to flowering size plants in about 3 years, and the stamens were indeed lighter—a pale pink/purple—but not as pale as I had expected. Since they contrasted nicely with the rosy-red stemens on the Hartz seedling *M. sieboldii*, I planted one of the Korean seedlings close to the Hartz seedling; so close, in fact, that their branches intertwined. One day while studying the flowers amidst the commingling branches of these two taxa, I was surprised to notice that the flowers of the Korean seedling *M. sieboldii* were fully pendent as had been indicated for *M. sinensis*! But I was certain that this plant was true *M. sieboldii* since the seeds were collected in the wild in Korea. How could this be explained?

This led to more observation of my two Oyama taxa and an expanded review of the published literature on the two species. Almost immediately I found another significant difference between my two plants. On the top of the peduncle (flower stalk) of the Hartz seedling is a conspicuous "node" about 12 mm long which goes from a bract scar up to the base of the flower (tepals). In contrast, flower stalks of the Korean seedling showed a much smaller node (about 2 mm long) to occasionally no such node at all. This structure, which I will refer to as the *floral internode*,[1] is formed by the scar of a spathaceous bract that had formerly enclosed the flower bud. It turns out that most of the published literature on these species does describe this floral internode and that plants with the longer floral internodes are, in fact, *M. sinensis*, while plants with short to absent floral internodes are *M. sieboldii*. In addition, more recent accounts (Spongberg 1976, Chen & Nooteboom 1993, Callaway 1994) indicate that flower position—pendent or nodding—is not a consistent character within either species.

In as early as 1927, Millais describes *M. sinensis* (as *M.*

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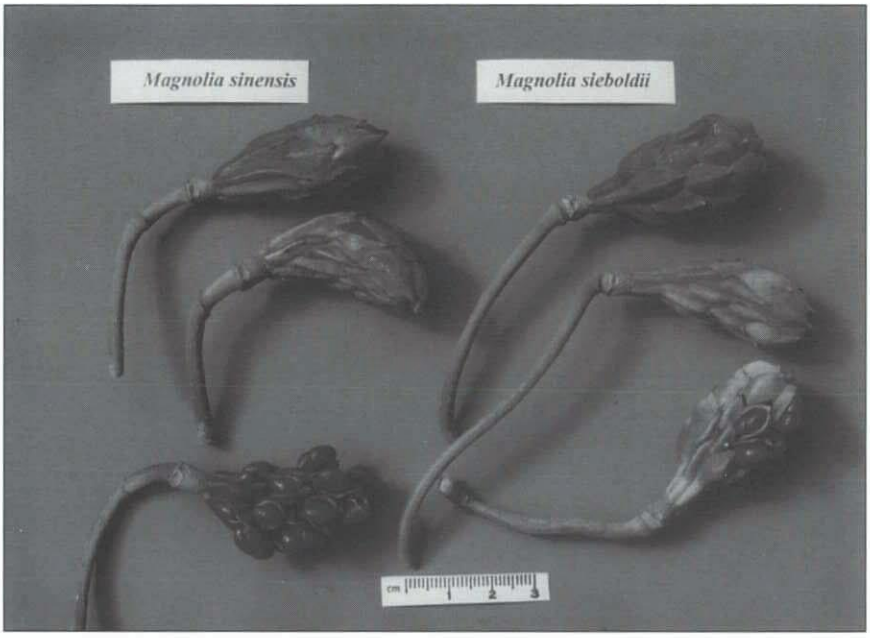
[1]Note on terminology: In the past, most authors have referred to this floral internode as the "pedicle" or "pedicel." Moreover, the term pedicel has sometimes been used synonymously with peduncle since both terms refer to the stem of a flower. To prevent further confusion, the paper will avoid the use of the terms pedicle and pedicel in favor of the term "floral internode."



Note the long floral internode of Magnolia sinensis (*left*) *vs. the short, almost unnoticeable floral internode of* M. sieboldii (*right*).

nicholsoniana at that time) as having a "scar of a bract 6 to 8 mm below the sepals." Johnstone (1955) mentions the floral internode (as pedicle) to be 12 mm for *M. sinensis* and refers to a "small node close below the scars of the perianth" for *M. sieboldii*. He also mentions that in *M. sieboldii* the bract (which causes the scar resulting in the floral internode) is sometimes missing or "is attached so close to the base of the flower that it is difficult to discern a pedicle." On the other hand, Spongberg (1976) does not mention the floral internode in his monograph, but an illustration in the work clearly shows the lack of a floral internode for *M. sieboldii*. Callaway (1994) mentions that *M. sieboldii* has "shorter internodes just below the flower than other species in this section [Oyama]." Recently, Liang and Nooteboom (1993) quantified floral internode sizes of 0 to 2.8 mm long for *M. sieboldii* and 13 to 17 mm long for *sinensis*. These floral internode dimensions are very similar to my observations which were 1 to 3 mm long (Korean seedling *M. sieboldii*) and 9 to 15 mm long (Hartz seedling). So, I am now convinced that my Hartz seedlings, along with the original Ray Hartz plants, are actually *M. sinensis*.

Floral Internode Length

Literature Review

	M. sinensis	*M. sieboldii*
Millais (1927)	6 to 8 mm	"short"
Johnstone (1955)	12 mm	"close"
Treseder (1978)	—	"very short"
Nooteboom (1993)	13 to 17 mm	0 to 2.8 mm
Callaway (1994)	—	"shorter"
Figlar (1997)	9 to 15 mm	1 to 3 mm

All the other differential characters mentioned in the literature appear to be inconsistent or unreliable. The following is a summary and discussion of the more widely published differential characters supposedly separating *M. sinensis* and *M. sieboldii*:

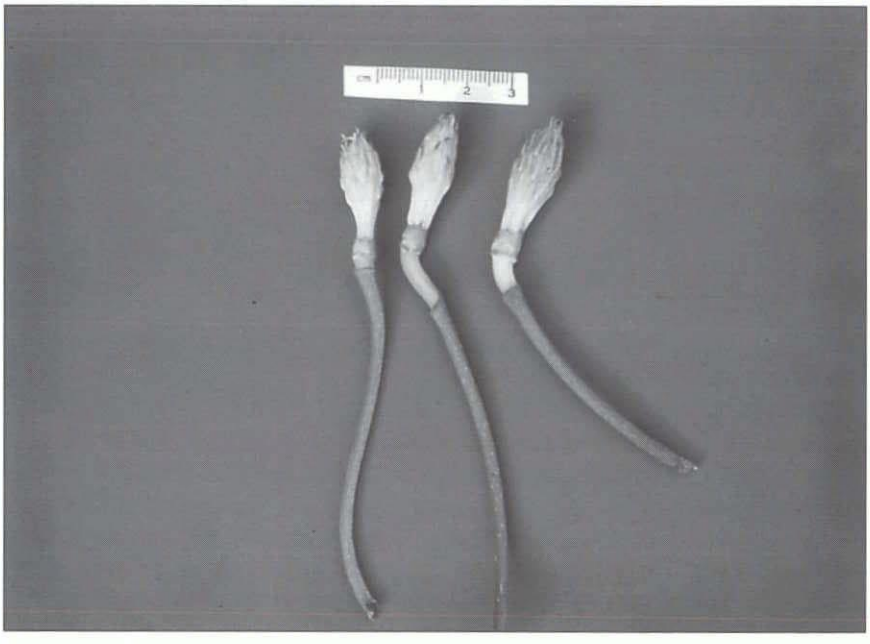
Flowers nodding (*M. sieboldii*) vs. pendent (*M. sinensis*)

My field studies indicate that flowers of both species are more likely to be held pendent if their "supporting" peduncle is longer and more slender. This can vary from tree to tree within either species, and cn be induced by ecological factors, i.e., shade grown plants generally have longer, more slender flower stalks. Evidently, Johnstone (and later reiterated by Treseder) based his finds on the tendencies of his own particular plant(s). A few authors indicate that the flowers of *M. sinensis* are slightly larger than those of *M. sieboldii*. My observations showed the opposite. Again, this is probably an inconsistent trait with minor variations within both taxa.

Twigs grayish brown (*M. sieboldii*) vs. fawn-gray (*M. sinensis*)

Johnstone seemed preoccupied with contrasting the characters of *M. sinensis with M. wilsonii*. This is not too surprising since these two taxa are both native to the same region of China and (he thought) shared the same pendulous flowering habit. This probably accounts for his emphasis on *M. sinensis* twig coloration. However, the variously described colors of the branchlets from light fawn (*M. sinensis*) to light brown (*M. sieboldii*) are essentially the same color—tan—which, of course, can be influenced by ecological factors as well. Sometimes it is stated that one or the other taxon has pubescent twigs. Both *M. sieboldii* and *M. sinensis* have pubescence on young twigs.

*Above: Flower from original Ray Hartz "*M. sieboldii*" showing telltale long floral internode, indicating that this is actually* M. sinensis.
Below: Immature fruit of M. sieboldii (*left*) *and* M. sinensis (*center & right*)
Note the length of the floral internodes.



Stipule scars mostly < half the length of the petiole (*M. sieboldii*) vs. scars mostly > half the length of the petiole (*M. sinensis*)

My observations show that for either species, leaves from sunny locations are prone to longer (as a % of the petiole length) stipule scars, while leaves produced in shady environments generally result in shorter stipule scars. Nevertheless, our *M. sinensis* (Hartz seedling) did show a tendency to have more of the > half petiole length scars than *our M. sieboldii*, but because the character is easily influenced by ecological factors, it is not a realistic differential character. Additionally, some authors have indicated that *M. sinensis* has slightly larger leaves with more rounded apices. Again, both taxa have quite a bit of leaf size variation, even on the same tree. The same goes for the pinteness of the leaf apex.

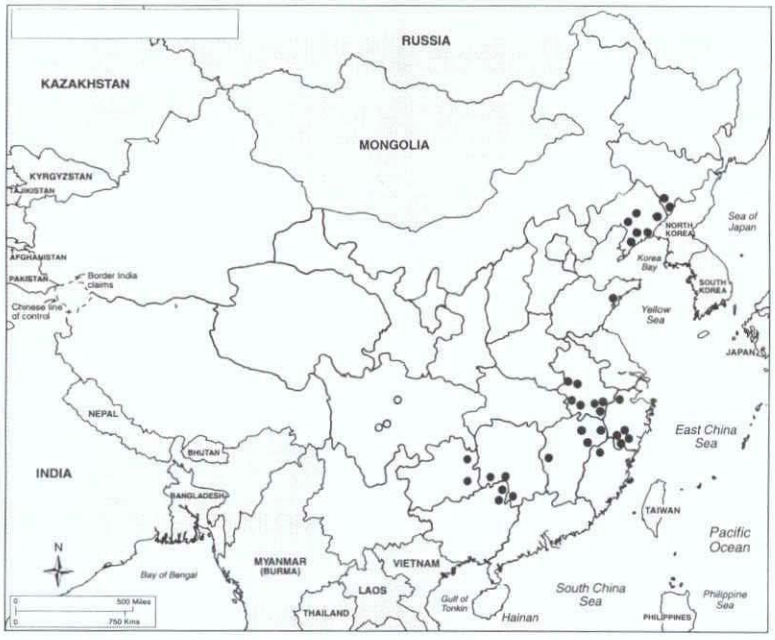
In full bloom outer three tepals reflexed (*M. sieboldii*) vs. not reflexed(?) (*M. sinensis*)

Treseder (1978) and Ueda (1980) indicated that in *M. sieboldii* the outer three tepals usually reflex when the flower opens but nowhere in the literature is this trait (or the lack of it) mentioned for *M. sinensis*. This reflex is quite evident in our Korean *M. sieboldii* plant, where virtually all blooms show the reflex. Our observations of the Hartz seedling, however, show the same reflex, but it appears to occur on a smaller percentage of the blooms. Yet as the flowers age (after one or two days) more flowers begin to display the reflex. Although, in my observations the reflex is more pronounced in *M. sieboldii*, it does occur in both species, so the tepal reflex should not be considered a reliable differential character.

Hairs on lower leaf blades straight (*M. sieboldii*) vs. undulating hair (*M. sinensis*)

Spongberg (1975), Ueda (1980) and Callaway (1994) all report the presence of undulating or crisped hairs on the undersurface of the leaves of *M. sinensis* as opposed to straight hairs for *M. sieboldii*. In my observations using a 10× power handheld lens, I did not see any crisped hairs on the leaf backs of the Hartz seedling nor on any leaf samples of *M. sinensis* that I obtained from others. In fact, in both taxa I found essentially the same hair shape (straight to slightly undulating) and hair color (presence of both clear and rufous pigments). Although this seems somewhat puzzling, it is likely that this is just another example of an inconsistent character that occurs in some plants of *M. sinensis* and not in others. Until more light can be shed on this issue (study of wild *in situ* plants), provisionally this character should not be considered reliable.

There are a few more such differential characters mentioned in



Distribution in China of Magnolia sinensis (*open circles*) *and* M. sieboldii (*filled circles*). [*Adapted from* China Plant Red Data – Rare and Endangered Plants, *Vol 1, Fu Li-kuo (ed.), Science Press, Beijing, 1992*]

the literature, but none is worth mentioning here.

An end result of this analysis is that a consistent and reliable differential character for separating *M. sinensis* from *M. sieboldii* has been highlighted, and that this character—the length of the floral internode—is conspicuous, and is easy for anyone to recognize on flowering and/or fruiting plants. I hope that it can be a useful tool in helping to sort out any unidentified or mislabeled plants that may be in cultivation.

Another, perhaps contentious outcome of this study, is that it appears to lend support to Spongberg's view (1975) which treats *M. sinensis* as a subspecies or variety of *M. sieboldii*. Although the floral internode character is quite distinct for each taxon, it is still a relatively minor difference, morphologically speaking. Some argue that since *M. sinensis*, which is endemic to a small area of central Sichuan Province, is about 350 miles from nearest population of *M. sieboldii* in Guizhou Provice, that this degree of disjunction supports species status for *M. sinensis*. it can be pointed out, however, that there are other fairly large gaps between populations of *M. sieboldii* (see map). Even here in North America there is a 750

mile gap between populatons of *M. macrophylla* in Louisiana and *M. macrophylla* var. *dealbata* in Mexico.

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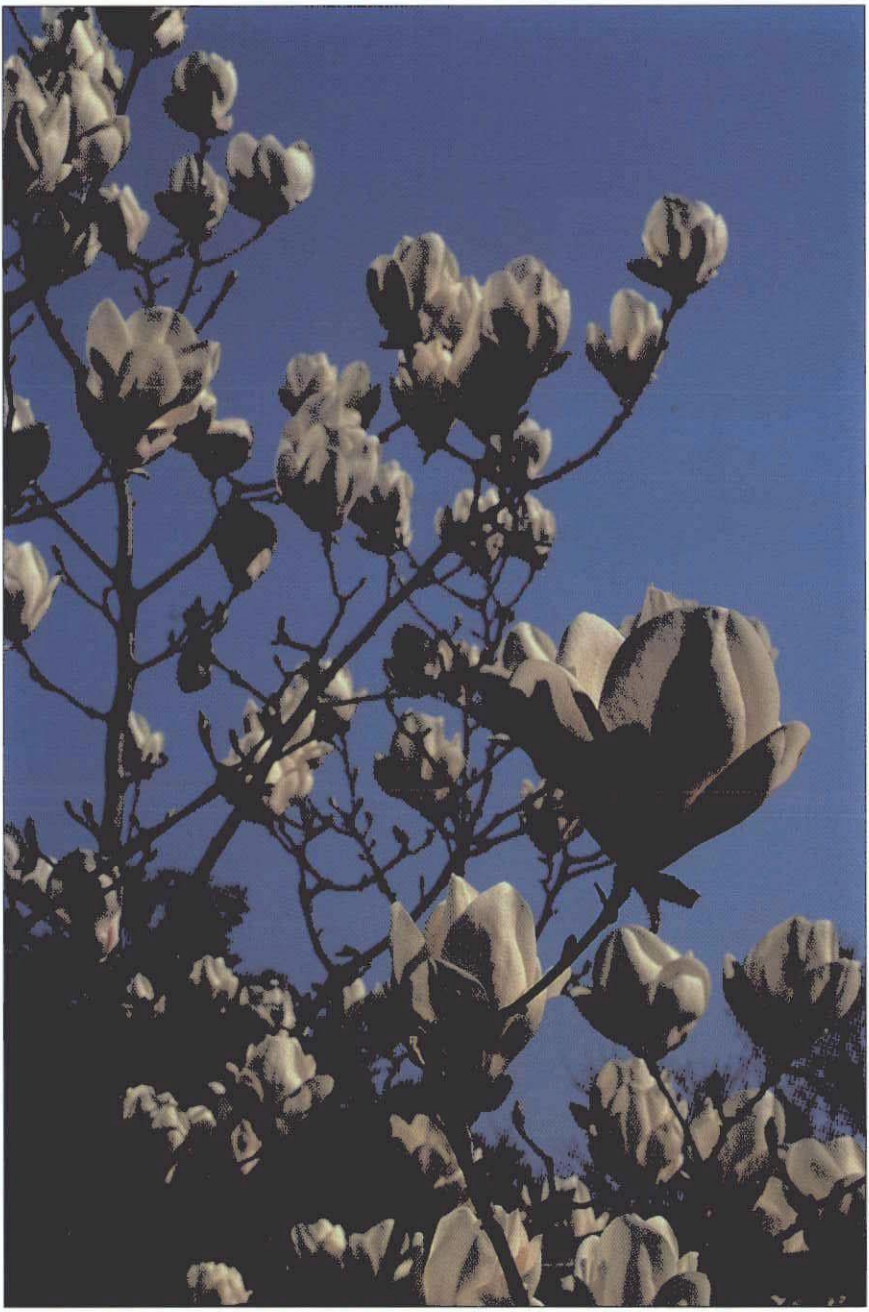

Magnolia x soulangiana *'Lennei Alba' at Chollipo Arboretum.*