Muriel Wilson's Bamboo

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Introduction

About the only thing everyone agrees upon about this bamboo is that it is one of the most attractive hardy bamboos ever brought into cultivation, with arching culms and cascades of pea-green foliage. Everything else – which genus, which species, how to spell the species name, exactly where it came from, whether it was flowering, who really named it, and how long its flowering cycle is, could be argued about at length. It is not possible to come up with answers to all these questions, but it is possible to look at what facts there are, to sort out the facts from the assumptions, and to see what further work is required. Most people are probably familiar with the history of this bamboo but to recap, I will give the story so far.

The collection of Muriel's bamboo

Muriel's bamboo was collected in Hupeh province of China, almost certainly as a cutting, in May 1907. The famous British plant collector Ernest H. Wilson, who brought us so many of our garden plants, was on his third plant collecting expedition in China, this time working for the Arnold Arboretum, which required scientific herbarium collections as well as live plants. He had been persuaded to leave Kew in December 1906 on this 2½ year trip against the wishes of his wife Nellie, who had delivered a baby girl, Muriel Primrose, at their house in Gloucester Road, Kew, in the spring. No doubt they were on his mind the following May when Wilson was in western Hupeh. He was on a six week round-trip from the port of Yichang on the Yangtze River, which took him to the borders of Hupeh with Sichuan and Shaanxi Provinces. It was probably near Muriel's first birthday when he found a beautiful bamboo, and he must have been homesick as it was an extremely hard trip. The countryside was poverty-stricken and food was almost unobtainable (Briggs, 1993), despite the botanical wealth all around him. In this area he discovered for the west the Kiwi fruit, *Actinidia deliciosa,* and he collected seed of the Handkerchief Tree, *Davidia involucrata.* He had competed with a French missionary, Père Farges, to introduce this tree to the west, and this rivalry was to continue even after his death, with respect to the bamboo he had just collected.

Rhizomes of the bamboo were shipped back to the Arnold Arboretum, and one plant was sent to Kew in 1913. It was named here as *Arundinaria murielae* by George Sykes Gamble of the Indian Forest Service (1920), with a description of the plants growing at Kew, but citing Wilson's herbarium collection made in China as the type. E. H. Wilson specifically asked for it to be named after his daughter, Muriel. Cultural notes were added by Kew horticulturalist W. J. Bean. The flowers could not be described as it was not to start flowering at Kew until 1988, 81 years after it had been collected.

The taxonomic treatment of Muriel's bamboo

Fifteen years before the collection of Muriel's bamboo, the French missionary Père Farges had made a dried collection of a bamboo in flower, not in Hupeh Province, but in neighbouring Sichuan. Because of its distinctive one-sided racemes enclosed in spathes, it was described as a new genus, *Fargesia,* by the French taxonomist Franchet (1893). The species name given was *spathacea.* Plants from Sichuan were almost certainly not brought back for cultivation.

Fargesia was recognised as a valid genus by many authorities, including E.G. Camus (1913) and Nakai (1925), but nothing was known about the bamboos in this genus except for

the dried collection made by Farges. One of the few people who have not recognized *Fargesia* was Gamble. He put all bamboos with spathed flowers into a section of *Arundinaria* (1896). In this way he was not recognizing either *Fargesia* or *Thamnocalamus,* the latter being a genus described by the Indian Army officer General Sir William Munro, for Himalayan bamboos with spathed panicles, rather than the spathed unilateral racemes of *Fargesia*.

When Nakai in Japan received from Kew a cutting of the now much-travelled *Arundinaria murielae,* as well as *Arundinaria nitida,* he realised that these so-called Chinese Arundinarias were not *Arundinaria* at all, as they had more branches. He decided, possibly rather tongue in cheek, to give them a new genus of their own, *Sinarundinaria,* in 1935, with a very sketchy description based upon the young plants he had received. He assumed that they had monopodial rhizomes, possibly because Gamble had put them in *Arundinaria,* rather than *Thamnocalamus* or *Fargesia*. It should be remembered that Nakai himself recognized the genus *Fargesia,* and he may have not realized that Gamble considered *Thamnocalamus* to be a synonym of *Arundinaria.*

The cat was put among the pigeons when Muriel's bamboo started to flower in Europe in the 1970s. The flowers were unilateral racemes enclosed in spathes, very similar to those of *Fargesia spathacea.* To some bamboo taxonomists, this was no problem, and the new combinations *Fargesia nitida* and *Fargesia murielae* were duly made. *Sinarundinaria* was soon listed as a synonym of *Fargesia,* (Keng, 1983).

In the USA however, different developments ensued. Thomas Soderstrom of the Smithsonian Institution received in early 1979 some flowers of Muriel's bamboo from a Danish bamboo grown in Germany by Max Riedelsheimer, and, excited by this discovery, he quickly wrote an article in the American horticultural magazine Garden (Soderstrom, 1979a), in which he made some rather far-reaching decisions. These were uncharacteristic of his normal painstaking approach. It may well be that he did not think he was making serious taxonomic decisions at the time, as he was writing in a popular magazine, and he did state in his article that we would have to await the flowering of *Arundinaria nitida* to know the exact relationships of all these bamboos. However, he stated that the flowers of Muriel's bamboo had 'all the characteristics' of the genus *Thamnocalamus*, and also that they 'matched' the flowers of two other species, *Arundinaria sparsiflora* and *Fargesia spathacea,* with which he considered Muriel's bamboo to be synonymous. He also gave the wrong year of collection: 1910 instead of 1907.

In this way, he was deciding to sink the genus *Fargesia* into *Thamnocalamus,* and also, simultaneously, to sink Muriel's bamboo into *spathacea,* the first of these species to have been named. No doubt Wilson would have turned in his grave at the bamboo named after his daughter being considered just the same as one collected by his rival plant collector Père Farges. Anyway Soderstrom followed up on his decisions by validly publishing the new combination, *Thamnocalamus spathaceus,* in a more appropriate scientific journal (Soderstrom, 1979b), and attempted to sink the name *murielae* for ever.

However, in neither the article nor the formal publication did he justify his decisions in any detail. When a genus or species is relegated to synonymy, or for that matter, a new taxon is named, the soundness of the taxonomic decision can usually be judged by whether or not it is thoroughly argued. A satisfactory treatment usually considers the characteristics of several related genera or species and includes a key or a table of characteristics. It also includes a list of the collections examined, so that others can judge whether sufficient material was available for a decision to be made. As Soejatmi Dransfield has pointed out (1992), the transfer of species to another genus or their inclusion in synonymy without the provision of extensive justification merely adds to the confusion so prevalent in bamboo taxonomy. As Soderstrom's papers did not justify his decisions, it is surprising that his fairly radical treatment was given so much credence. As it was, he had changed his mind within a few years, and had himself

formally given recognition to *Fargesia* as well as *Thamnocalamus* by 1986 (at the International Grass Symposium, Soderstrom & Ellis, 1988).

Soderstrom's treatment of Muriel's bamboo was picked up by all those who were undertaking reviews of the bamboos at the time (Clayton & Renvoize, 1986; Chao & Renvoize, 1989), although it was generally made clear that such treatments were rather tentative. There had been no in-depth revisions of the bamboos concerned for so long, and much of the new Chinese literature was rather brief and confused many taxonomists. Any justifications for taxonomic decisions were in Chinese, with the briefest of summaries in English, although good Latin descriptions were often given. Essentially, in the absence of any better straws to cling to, Soderstrom's decisions were followed by many other taxonomists. Soderstrom himself approved of many new Chinese genera, and together with McClure had prepared a new genus, *Adinocalamus*, which would have consisted of the species now placed in *Drepanostachyum* and *Himalayacalamus,* if Keng had not beaten them by the publication of his new genera. It is highly unfortunate that he started to become ill in 1981, as his illness and untimely death left a great vacuum in bamboo taxonomy. Fortunately this is now being filled by a growing cadre of Chinese taxonomists, who are much more familiar with the living plants than any western taxonomist can ever hope to be.

Thus we saw the apparent demise of the names *Fargesia* and *murielae*, but like the man said, reports of their death were greatly exaggerated, and while the *Thamnocalamus spathaceus* labels went up in western botanic gardens around the world, in horticultural circles and in many Chinese institutions the name *Fargesia murielae* became ever more widely used.

The appropriate genus for Muriel's bamboo

The investigations that I undertook into vegetative prophylls and branch sheathing in the Sino-Himalayan bamboos (Stapleton, 1991) convinced me that *Thamnocalamus* and *Fargesia* were different genera, as *Fargesia,* like *Yushania* and *Himalayacalamus,* has a more advanced branching system than *Thamnocalamus*. The well-known differences in inflorescence structure backed up these findings. However, one problem that I faced was that there was also a group of species which fitted neither *Thamnocalamus* nor *Fargesia*. There were also several new genera described by Keng which were based on little-known type species, and some were given inadequate descriptions. Sorting out whether these genera, such as *Butania* and *Burmabambus,* were truly new genera, and dealing with the species which did not fit into any published genera took some time. The new genus *Borinda* has now been published (Stapleton, 1994), and in the paper I discuss the characteristics of the genera *Thamnocalamus, Fargesia,* and *Borinda* in greater depth than is appropriate here. I hope that the generic situation will now become a little clearer, but we may still have some way to go.

The flowering of the type species of *Sinarundinaria, S. nitida,* is the important milestone that everyone was waiting for, including Soderstrom, although he was not to live to see it. The flowers give us an opportunity to evaluate the genera *Thamnocalamus, Fargesia,* and *Sinarundinaria* more satisfactorily. It now seems clear that *Fargesia* and *Sinarundinaria* are synonymous, as the type species of both genera have dense unilateral sheathed racemes. The question is whether *Fargesia* will be recognized as a separate genus, distinct from *Thamnocalamus* and *Yushania,* by those who were proponents of *Sinarundinaria,* such as Professor C S Chao. It will be interesting to see who, if anyone, takes the decisive step of publishing the new combination, *Thamnocalamus nitidus,* which has not been validated so far.

The flowering of *Fargesia nitida* also gives us a selection of flowers from the genus, so that we can consider the status of the various species of *Fargesia* more satisfactorily.

The appropriate species name for Muriel's bamboo

According to Index Kewensis, the main record-keepers of international plant nomenclature, 88 bamboo species have been placed in the genus *Fargesia,* 84 of these by T.P. Yi. This is partly the result of incorporation of other genera into *Fargesia,* as we see the combinations *Fargesia racemosa* and *Fargesia falcata* in the list, as well as bamboos which may belong in other genera such as *Himalayacalamus* and *Borinda.* However, many of those remaining are good species, and give an indication that the genus may turn out to have a substantial number of species, even if several of them are removed or relegated to synonymy. This does not seem to be the kind of situation where we can assume that because two bamboo collections were made within 150 miles of each other, or probably flowered at roughly the same time, they must be the same species.

Looking at the scanty Chinese material we have at Kew, the immediate and pressing need is for more fieldwork and for more collections to be made if anyone here is to be in a position to claim any authority on such a question. Only then will we be able to say how much variation there is within the species, and how different plants have to be before we can decide that they represent different species. As Max Riedelsheimer has pointed out, horticulturalists are in a good position to see the variation in a species once they have raised seedlings, and they can help taxonomists with limited herbarium collections to determine the species boundaries. Those raising seedlings of Muriel's bamboo will be able to see some variation. However, they probably will not live long enough to see the variation in flowers, unless science makes great leaps forward next century, as this bamboo may not flower for another 80-100 years.

As far as the western herbarium collections go there is certainly not sufficient material to be able to state categorically whether *Fargesia spathacea* and Muriel's bamboo are one and the same species or not. I have compared the material presently available at Kew in great detail, and I have found several differences between the collections of Muriel's bamboo and those of *F. spathacea.* If we had in the herbarium a representative sample of the two species, say 5-10 different plants of each, then we could start to say more decisively whether there were two species or not. We have two collections of *spathacea*, one being the type without culm sheaths or well preserved leaves, and the other just a few inflorescences without any leaves or culm sheaths, collected by Chu & Chao in 1976 in Sichuan. In their opinion it is from the species *spathacea*. The collections of Muriel's bamboo are obviously much better, but they still all come from one or possibly a few clones collected by Wilson, probably all from the same location and effectively just one collection. Although most taxonomy is far removed from the rigours of statistical analysis, we are still trying to demonstrate a significant difference between two populations, which always requires a reasonable sample size.

The more substantial differences that I can see between the collections are three-fold. Firstly the type collection of *Fargesia spathacea* has very few sheaths at the points of branching within the inflorescence, where the pedicels of the spikelets leave the rhachis of the raceme. There are 0-3 in the racemes of the type, and in those of Chu & Chao's collection, while the collections of Muriel's bamboo have usually about 5 basal spikelets subtended by sheaths, and I have seen as many as 11 out of 12 spikelets subtended by a substantial sheath. Soderstrom himself observed and illustrated these sheaths (1979a), stating that they subtended all spikelets.

Secondly, the branchlets of the type collection of *Fargesia spathacea* are solid, as are those of Chu & Chao's collection, while similarly-sized branchlets of Muriel's bamboo are nearly always hollow. This might seem a trivial difference, until one appreciates that both the charm of Muriel's bamboo, and its popular American name 'Umbrella Bamboo', rely upon the pendulous nature of the culms and branches. A bamboo with solid or thicker-walled culms and branches would look more like *Fargesia nitida,* known instead as Fountain Bamboo, as it is more erect.

The third difference lies in the spathes enclosing the flowers in both species, which have cilia of up to 0.5mm on one edge in the type collection of *spathacea*, while those of the cultivated clone of Muriel's bamboo have cilia which are less than 0.03mm long. As spathes reflect characteristics of the culm sheaths, it would seem likely that the culm sheaths of *spathacea* would also have much longer cilia on the edge than those of Muriel's bamboo, although Chu & Chao's collection seems to have spathes with glabrous margins.

One species or two: Conclusions and guesswork

The conclusions of this brief comparison are that the flowers of the two bamboos known as *spathacea* and Muriel's bamboo are very similar. However, as the rhizomes, culms and culm sheaths of *spathacea* are not known at all, and the leaves are not well known either, it is not possible to state whether they represent the same species or not. Basically we just do not know enough about these bamboos to make sound decisions on their status. If only one bamboo had been given a name, there would not be sufficient evidence to name a second species. However, if (as is the case) two species have been named, there would not seem to be enough information to show that they are synonymous either. Under the Scottish legal system the verdict would be 'not proven'.

If I were to let my imagination take over and start making wild guesses, I would say that *F. spathacea* could easily turn out to be a more erect species than Muriel's bamboo, with longer cilia on more symmetrical culm sheaths, and possibly also smaller leaves with shorter apices, and smaller stature, associated with a higher altitude habitat.

If these guesses were incorrect, and the bamboo collected by Farges turns out to be so close to Muriel's bamboo that they should be placed in the same species, then it would seem desirable for our cultivated bamboo to keep the reference to Muriel at an appropriate level. For *Sinarundinaria murielae* to have changed overnight to *Thamnocalamus spathaceus* with the total loss of all reference to Muriel caused great confusion in the horticultural world. Actions such as these can make taxonomists very unpopular indeed. We owe a debt of gratitude to E.H. Wilson for bringing this bamboo into cultivation, as well as all the other garden plants for which he endured hardship and sometimes risked his life. We should adhere to his request that this plant is named after his daughter, and try to maintain reference to her at an appropriate taxonomic level. It may be that the name *murielae* should persist as a varietal name or as a subspecies name if there is a geographical area covered by this bamboo. If that is not justified then it could at least be called *Fargesia spathacea* cv. Murielae. We will only know what to call it when the bamboos of Hupeh and Sichuan have been thoroughly documented. Meanwhile I think we should adhere to the name *Fargesia murielae* until it is proven to be incorrect. If we assume the synonymy and call it *F. spathacea* we may be referring to the wrong species altogether. If we continue to call it *F. murielae* we can never be wrong. Whatever future investigations show, we will still be referring to the correct species, although we may be using a synonym.

One guess that has been made in some quarters is that the Danish plants might have been *Fargesia spathacea* grown from different plants introduced independently to Muriel's bamboo, and not Muriel's bamboo at all. Soderstrom considered this a possibility (Soderstrom, 1981), but his observation on bracts subtending spikelets (1979a) seems to make this rather unlikely, however, as they clearly differ from those of the type collection of *Fargesia spathacea*. Although the Danish plants were apparently smaller than normal Muriel's bamboo, they were reported to have produced some full-sized offspring (Renvoize, 1991). Similarly some full-stature Muriel's bamboo has recently produced dwarf offspring. It is perfectly likely that Wilson brought back several plants for the Arnold Arboretum. He collected lily bulbs by the thousand, and is unlikely to have restricted himself to a single bamboo rhizome. Although

only one plant was sent to Kew, different plants are quite likely to have been distributed from the Arnold Arboretum to other institutions.

As the years passed and larger plants of Muriel's bamboo failed to flower, Soderstrom became steadily more convinced that the Danish plants were what he called *Thamnocalamus spathaceus,* while all the other plants of Muriel's bamboo represented a separate species. He noted the similarity in branching between Muriel's bamboo and the species then known as *Sinarundinaria nitida* (Soderstrom, 1984), and consequently suggested that the best name for Muriel's bamboo would be *Sinarundinaria murielae.* However the only reason for this was the disparity in time of flowering, and if he had lived to see the flowering of the remainder of the cultivated plants I am sure he would have considered them all to represent the same species.

As the flowering cycle of this bamboo is so long, a few years does not make a great deal of difference. If the dwarfed plants were under some sort of physiological or viral stress which caused their diminished stature, then slightly earlier flowering could be expected. This is a commonly observed phenomenon in Himalayan bamboos, environmental stress often triggering the onset of flowering a few years early, while improvement of conditions by watering and fertilising can delay flowering, reduce its intensity or occasionally prevent it altogether.

Therefore it looks very much as though all the Muriel's bamboo cultivated in the west is likely to flower quite imminently. As all the flowering plants seen so far have died after flowering, it would seem prudent for those cultivating this bamboo for sale to make the most of the new generation of seedlings as they become available, phasing out production of stock from their apparently doomed parents. In this way, they might prevent bamboos from earning a bad reputation, just when they have received such positive coverage in the horticultural press, and they also may reduce the number of irate customers returning with a pot of very expensive brown pea sticks instead of the green bamboos they purchased.

Nomenclature: *murielae* or *murieliae*

This is still not the last aspect of the problem as there has been some dispute as to whether *murielae* or *murieliae* is the more correct spelling. According to the Code of Botanical Nomenclature (Greuter et al., 1994), the endings of names are to be standardised, and *murielae* should be changed to *murieliae*. On the other hand, an expert on the Latin language, Professor William Stearn, says that as female given names took the possessive ending -ae in Roman times, rather than the ending -iae given to female surnames, this practice should be followed when using Latin for botanical purposes, and *murielae* should stand (pers. comm.).

The pragmatic view expressed by Nicolson (1974) is that it is too complicated to have to distinguish between given names and surnames, so they should all be spelt the same way, with the ending -iae for a female name. He points out that non-western names often do not conform to our western distinction between given names and surnames, and this seems to make a lot of sense. As the surname in Latin was just an honorific form of the given name anyway, made honorific by adding the -i-, it seems to me that there is little reason for drawing a great distinction. As it is such an honour to name a species after someone, why not use an honorific spelling of their name? The consensus of opinion as expressed in the Code of Botanical Nomenclature now seems to be that names such as *murielae* should be changed to include an extra letter -i-. This is largely so that authors and editors do not have to spend time hunting out personal details of people whose names are adopted as species names. I conclude by giving a nomenclatural treatment of these two taxa, in which I treat the name *murielae* as an orthographic error to be corrected to *murieliae* under paragraph 60.11 of the Botanical Code.

1. Fargesia murieliae (Gamble) Yi, J. Bamboo Res. 2(1): 39 (1983).

Type: China, Hupeh Prov., Fang-hsien, *Wilson,*1462 (holo. K).
Syn.: *Arundinaria murieliae* Gamble, Kew Bull. of Misc. Inform. (10): 344 (1920); *Sinarundinaria murieliae* (Gamble) Nakai, J. Jap. Bot. 11(1): 1 (1935); *Thamnocalamus spathaceus* (Gamble) Soderstrom, Brittonia 31(4): 495 (1979) *pro parte*; *Arundinaria spathacea* (Gamble) McClintock, Garden (London) 105 (12): 502 (1980) *pro parte*; *Thamnocalamus murieliae* (Gamble) Demoly, Bull. Ass. Parcs. Bot. France 13: 9–11 (1990).

2. Fargesia spathacea Franchet, Bull. Mens. Soc. Linn. Paris 2: 1067 (1893).

Type: China, Sichuan Province, Tchen-Keou-Tin, *Farges*, 567 (holo. P; iso. K,E,US).
Syn.: *Thamnocalamus spathaceus* (Gamble) Soderstrom, Brittonia 31(4): 495 (1979); *Arundinaria spathacea* (Gamble) McClintock, Garden (London) 105 (12): 502 (1980).

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References

Briggs, R. W. (1993). 'Chinese' Wilson: A life of Ernest H. Wilson. HMSO, London.

Camus, E. G.(1913). *Les Bambusées*. Paris, Lechevalier.

Chao, C. S. & Renvoize, S. A. (1989). A revision of the species described under *Arundinaria* (Gramineae) in Southeast Asia and Africa. *Kew Bull.* 44 (2): 349–367.

Clayton, W. D. & Renvoize, S. A. (1986). *Genera Graminum: Grasses of the World.* Royal Botanic Gardens, Kew.

Dransfield, S. (1992). A new species of *Racemobambos* (Gramineae: Bambusoideae) from Sulawesi with notes on generic delimitation. *Kew Bull.* 47 (4): 707–711.

Franchet, M. A. (1893). *Fargesia,* nouveau genre de Bambusées de la Chine. *Bull. Mens. Soc. Linn. Paris* 2: 1067–1069.

Gamble, J. S. (1896). The Bambuseae of British India. *Ann. Roy. Bot. Gard. (Calcutta)* 7(1): 1–133.

Gamble J. S. (1920). In: Anon., *Decades Kewenses: Plantarum novarum in Herbario Horti Regii conservatarum*, *Kew Bull. of Misc. Inform.* (10): 335–345.

Greuter W. et al., (1994). International Code of Botanical Nomenclature. Koeltz Scientific Books.

Keng, P. C. (1983). A revision of genera of bamboos from the world III. *J. Bamboo Res.* 2(1): 11–27.

Nakai, T. (1925). Two new genera of *Bambusaceae,* with special remarks on the related genera growing in East Asia. *J. Arnold. Arbor.* 6: 145–155.

Nicolson, D. H. (1974). Orthography of names and epithets. *Taxon* 23: 549–561.
Renvoize, S. A. (1991). *Thamnocalamus spathaceus* and its hundred year flowering cycle. *Kew Magazine* 8(4): 185–194.
Soderstrom, T. R. (1979a). The bamboozling *Thamnocalamus*. *Garden* 3(4): 22–27.
Soderstrom, T. R. (1979b). Another name for the umbrella bamboo. *Brittonia* 31(4): 495.
Soderstrom, T. R. (1981). Letter to David McClintock, Feb. 10th 1982.
Soderstrom, T. R. (1984). Letter to Mrs Hermine Stover, August 14th, 1984.
Soderstrom, T. R. & Ellis, R. P. (1988). The position of bamboo genera and allies in a system of grass classification. In: Soderstrom, T. R. et al. (eds.) *Grass Systematics and Evolution*: pp 225–238. Smithsonian Institution Press.
Stapleton, C. M. A. (1991). A morphological investigation of some Himalayan bamboos with an enumeration of taxa in Nepal and Bhutan. Unpublished Ph D thesis, University of Aberdeen.
Stapleton, C. M. A. (1994). The bamboos of Nepal and Bhutan Part II: *Arundinaria, Thamnocalamus, Borinda,* and *Yushania* (Gramineae: Poaceae, Bambusoideae). *Edinb. J. Bot.* 51(2): 275–295.