



In 2013 Julian Harber and David Bouffard (back row, third from right) travelled to Xiao Xue Shan in north-west Yunnan to meet with Japanese and Chinese botanists.

## A *Berberis* journey

JULIAN HARBER

In 1991 my partner Jill Liddington and I moved to Foster Clough, a tiny hamlet above the Calder Valley in the Pennines in West Yorkshire.

This was the first house I had lived in since childhood with a substantial garden and I was keen to do something with it. I had many years' experience of growing vegetables having cultivated an allotment near our old house, but growing plants would be a new challenge. Particularly since the elevation of Foster Clough is almost 300 m (900 ft)—most people in the UK don't live as high as this—and the Pennines get a lot of wind and rain so the garden, particularly the long garden at the back of the house, was very exposed. Having done some research it was clear that what was needed here was a windbreak in front of the 200-yard fence (a little less than 200 m) that separates the garden from the field above us. But that field was grazed by either sheep or cattle—so a windbreak that could withstand gales and not be eaten by hungry animals.

*Ilex* and yew (*Taxus baccata*) were definitely out, the former because it was deliberately introduced in our area around the fifteenth century as a winter feed for cattle, the latter because it is poisonous. However, looking at the rather unsuccessful gardening of previous owners it appeared that there were two shrubs along the fence that thrived—both large *Berberis*, one evergreen, one deciduous. Their spines were clearly a deterrent to sheep and cows.



Left, *Berberis ilicifolia* from Argentina in flower at Foster Clough during a cold snap in February 2021.

Opposite, *Berberis grodtmanniana* growing in Qiaojia Xian, north-east Yunnan.

Apart from recognising the shrubs from their spines I knew almost nothing else about *Berberis* except they seemed to be a common garden plant and a number of these were different from the two we had inherited. And at that point I made a decision that would eventually change my life—I would plant a windbreak with as many different *Berberis* as possible. But how different? Very soon I was plunged into a world of cultivars, garden hybrids and species. Within six months or so of starting I took the decision to concentrate on species,



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most other plants being dug up and donated to friends and neighbours.

I should at this stage perhaps say something about my natural history family heritage. My mother (born in 1915) excelled in botany at her school in Birmingham, but after the sudden death of her father she was taken out of school and was forced to train as a secretary. However, she never lost her love of wild flowers and eventually married my father—an insurance agent whose passion was ornithology. For my brothers and I, many of our days-out at weekends and all our family holidays were extended nature walks (though in the male-dominated 1950s birds were of course always the priority). I still have my mother's copy of *Illustrations of the British Flora* with the line drawings of the flowers she had collected neatly coloured in.

But back to *Berberis*—how to get hold of species? There was not much being offered by plant sellers (mostly garden centres) within a reasonable radius, so then I turned to the Royal Horticultural Society's *Plantfinder*—a bulky annual book listing where to buy thousands of plants of all kinds from all over the country. Plenty of *Berberis* species listed there, but when I ordered various of them, I found most didn't look like the ones in the Royal Botanic Gardens, Kew (which I visited for the first time since childhood) or the Royal Botanic Garden, Edinburgh (which I had never previously visited). Research eventually showed that this was for three interrelated reasons. First that *Berberis* (especially deciduous species) are difficult to propagate and so nurserymen generally produce them from the seed of cultivated plants. Secondly that in

the UK, at least, *Berberis* is subject to rampant hybridisation, and thirdly many plants purporting to be of a particular species are descendants of ones whose seeds were collected in the wild a century or so ago and thus can be the result not of one but of successive hybridisations.

In 1997 Jill's sister Ruth was living in Thimphu where her then husband was working on a project for the Bhutanese government. They were allowed a certain number of visitors a year (visits by tourists to the country were and still are strictly controlled). Because of our work Jill and I could only take our slot at the end of the July when as a prelude to the monsoon season the high peaks of the Himalayas were perpetually obscured. But it was my first opportunity to see *Berberis* growing in the wild. To start with I thought there were a multiple number of different species in the Thimphu area from the evergreen Section Wallichianae, but soon realised they were all *Berberis praecipua* whose leaf size, shape and margin was very varied. An important lesson learnt. I particularly admired the huge *B. cooperi* growing in yak pastures above the town.

China is host to more *Berberis* species than any other country and happily my interest happened to coincide with a second wave of foreigners (both botanists and seed hunters) being allowed to collect there following the gradual opening up of the country (including Tibet) from the mid-1980s onwards (the first wave began in the late nineteenth century and largely concluded in the early 1930s with the Japanese invasion and civil war). British collectors were after seeds of plants that would sell and that did not include *Berberis*, but they

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*Berberis gaoshanensis* was found near Zhujie Temple at Daocheng Xian in Sichuan.

often collected *Berberis* all the same. So, I was able to obtain seed cheaply or was just sent it for free (thank you in particular Bleddyn Wyn Jones of Crŷg Farm Plants in North Wales!).

Not all the seeds germinated. But how to identify those that did? (most of the seed hunters simply recorded them as 'sp.'). The key source I had already found out was Ahrendt's *Berberis and Mahonia* published in 1961. It is largely unobtainable, so after a photocopy I had started to fall apart, as a long shot I contacted the publishers—the Linnean Society of London. Yes, they had one copy left—but had no idea what to charge me. Could I suggest a price?

Ahrendt's work—for all its faults—helped me identify some of my growing plants, as did further trips to Kew and Edinburgh. Drawing on what I could remember from my childhood, I gradually improved my skill at understanding botanic descriptions as well as finding out what 'Type' meant. But reading through Leslie Landrum's excellent 1999 article revising the *Berberis* of Chile and adjacent southern Argentina, which he kindly sent me, I was baffled by his

frequent use of '!'—it was only later I learnt it meant 'I have seen this specimen'. As I slowly identified some at least of my growing living collection and made more and more contacts I discovered some of the developments post Ahrendt—not just Landrum's work but an earlier work on Sect. *Wallichianae* by David Chamberlain & Chi Ming Hu. In 2002 a contact in Washington State sent me various articles from Chinese botanical journals publishing new *Berberis* species. Equally importantly he alerted me to the multi-volume *Flora of China* (FOC) project—though he noted that this had not yet reached *Berberidaceae*.

An internet search showed that the FOC could be accessed online and so every so often I investigated whether it had reached *Berberis*. I cannot remember exactly when I found it had, but it was sometime in early 2006. There I discovered that it was the practice of the FOC to start with a draft of a particular family or genus and invite comments from specialists in the field. The initial draft of the entry for *Berberis* turned out to be an English translation of that authored by Jun Sheng Ying in the Chinese version of the *Flora of China* published in 2001. Though there was much that was new to me in this draft I could see there were problems with it. These included omitting not just various species listed by Ahrendt as being found in China but also some of the new species in the recently published Chinese articles in my possession. So, though my job in adult education was pretty time-consuming I found the time to periodically email my suggestions on to the FOC. The protocol of the FOC stated that 'All treatments are revisions produced jointly by one or more Chinese and non-Chinese co-authors' and my emails went the non-Chinese author Anthony Brach at Harvard. In March 2006 some 40 or so corrections/additions later I received an email from Anthony enquiring if I was interested in taking over from him as the non-Chinese author.

What me? Someone without even a school qualification in botany? Over a weekend I paced around the house until I thought why not give it a try? So, I emailed Anthony back. I can't find this email but I can remember as well as listing my deficiencies—including my complete lack of any relevant qualifications—I mentioned two pluses; first my living *Berberis* collection and secondly that I was due to retire at the end of the year and so after that I would be able to give a lot of time to the project.

I heard nothing for a few days during which I am sure there was some internal FOC consultation as to whether this was a good idea. Then I got an acceptance email followed by one from Mike Gilbert at Kew welcoming me on board and inviting me to the herbarium. A new phase in my life had begun.

Though I knew what a herbarium was I had never been to one, nor did I know how they work. I was bowled over by my induction. I was particularly fascinated by the labels in which successive researchers put their identifications with even the same person changing their minds over time. Later that year my work took me to a meeting in Edinburgh and I took advantage of this to make a brief visit to the herbarium there.

Just before Christmas 2006 Jill and I left the UK for an extended break to mark my retirement (it included getting married in my brother Guy's back garden in Australia). Returning home towards the end of February I plunged into my new life. As part of my self-education I acquired a botanical dictionary. I was not completely joking when I told friends that every time I looked up the meaning of a particular term I had to look up a whole lot of other terms to understand the explanation given.

In May 2007 thanks to funding from the Royal Horticultural Society I was able to visit the Beijing and Kunming herbaria. As a FOC co-author I was well looked after. In December I was invited to visit the Harvard herbaria and had a similar reception. Anthony Brach was brilliant in locating and photocopying articles in their library (articles completely inaccessible for someone working at home more than 200 miles from any large botany library). One result of this was my discovery of the work of the key predecessor of Ahrendt, the German horticulturist turned botanist Camillo Schneider. Gradually I came to recognise his excellence as a taxonomist and how much Ahrendt owed to him. Another member of staff, Chinese flora specialist David Boufford, took me under his wing. It was the start of an enduring friendship.

During my time as foreign co-author I was put in contact with two other *Berberis* researchers Bhaskar Adhikari from Nepal engaged in a PhD at Royal Botanic Garden, Edinburgh on the *Berberis* of that country and Chih Chieh Yu from Taiwan researching *Berberis* there at the National Taiwan University under the direction of Kuo Fang Chung. Chih Chieh had been recruited for the Taiwanese project not just because of his botanic excellence but also because of his formidable mountain hiking skills. Both became firm friends and over the years I have exchanged hundreds of emails with them.

As a foreign co-author I was hoping for a fruitful dialogue with my Chinese counterpart. It was not to be. But rather than go into detail of what is now past history I simply reproduce what was subsequently reported when *Berberis* appeared in volume 19 of the FOC in 2011.



*Berberis mekongensis* was found at high altitude on Beima Shan in north-west Yunnan.

'This treatment of *Berberis* was written solely by the Chinese author, Ying Junsheng. The non-Chinese co-author of the genus was to be Julian Harber (Mytholmroyd, West Yorkshire, U.K.), and the Berberidaceae were to be included in *Flora of China* Volume 7 (2008), but two months before that volume was sent to the printer, Ying rejected Harber's revision, with the result that the Berberidaceae were postponed until the present volume. The treatment provided here is an edited version of the English manuscript provided by Ying and is essentially a translation of his earlier treatment in FRPS (29: 54–214. 2001).....Harber is currently preparing a thorough revision of Chinese *Berberis*, expanded from the joint treatment that was intended to appear in the *Flora of China*; it will include all taxa known to occur in China, will account for all names based on Chinese material, and will be published by Missouri Botanical Garden Press.'

The idea of such a revision was the brainchild of the foreign co-editor of the whole FOC project (and then director of Missouri Botanical Garden) Peter Raven. As it took shape, I decided I would include reporting the location of all type specimens, lectotypifying where necessary. Later I expanded its coverage to include Vietnam, a country whose *Berberis* had been overlooked by both Schneider and Ahrendt. I had no idea this would take 10 years to complete and further year for it to be published.

In the early months I was on steep learning curve. In particular I had to come to grips with the rules of typification as laid down in successive versions of the International Code of Nomenclature for algae, fungi, and plants (thank you Nick Turland for your patient mentoring).

In February 2009 I made my first visit to a continental European herbarium in this case, Paris.

The contrast between it and the previous ones I had visited in China, the US and the UK was stark. As I had been forewarned the search rooms were essentially those of a nineteenth-century institution frozen in time (and not just in time—they had no heating and in February gloves and a hat were needed to keep warm). Specimens were kept in bundles in decaying leather covers bound together by buckles, all stored in rickety metal cupboards. From their dusty state and the lack of comments on the sheets it appeared that apart from a visit by Chi Ming Hu in 1982 to look at sect. *Wallichianae* species nobody had used the Asian *Berberis* collection since Schneider before WWI. As I went through the folders putting on a trolley specimens I could identify as types, but not identified as such, the pile grew and grew. A highlight of my visit was when Pete Lowry, assigned to look after me, took me to see the type of *Berberis chinensis* in the Lamarck herbarium. (Since then the Paris herbarium has of course been completely modernised.) It was followed by visits to many other European herbaria.

In the Autumn of 2008 Allen Coombes, then at the Hillier Arboretum in Hampshire (UK), alerted me to the recently established Chinese Virtual



Herbarium (aka CVH), which aimed to make available images online of botanic specimens held by various leading Chinese herbaria. Over the years it went through successive re-vamps and improvements as more and more herbaria came on board and at a certain point I realised I could expand my project by attempting to map every species by 县 – Xian (usually translated as county). It would prove to be a mammoth exercise. To assist in this in autumn 2010 I enrolled on a Mandarin course at a local school. More than ten years later I am still struggling with the language, but it has enabled me to read the transcriptions of collection details on CVH (the handwriting on the sheets is another matter).

This explosion in botanic specimens online was by no means limited to China and so soon I found myself able to view and download images of *Berberis* specimens from herbaria in Taiwan, the US and across Europe. For herbaria without an online presence I was kindly sent images first as CDs and subsequently as compressed files via email.

The one skill I was nervous of acquiring was flower dissections (dissecting fruit is much easier). Such dissections can be crucial since flower structure is one of the key ways (and sometimes the only way) of identifying particular *Berberis* species especially those from the Hengduan Mountain area of SW China. In the early days I relied on Bhaskar Adhikari to do this for me (he has surgeon's fingers whilst mine are more like a farm labourer's) but eventually I knew I had to take the plunge. I was rescued by my living collections which allowed me to practice and practice until I was confident to tackle herbarium specimens (though only those with ample floral material!).

In late 2012 David Boufford encouraged me to apply to the National Geographical Society (NGS) for funds to collect *Berberis* in Tibet with him accompanying me to make general collections. My application was accepted and in August 2013 we set off from Kunming on an expedition organised by the Kunming Institute of Botany who had arranged the special permission foreigners needed to enter Tibet. In three days we were at the Yunnan Tibetan frontier where we were refused entry. The whole of east Tibet we were told had been declared a military zone (it appears no foreign botanists have been allowed to collect in Tibet since). I was devastated but David suggested we change the focus of collecting to neighbouring Tibetan speaking areas of Yunnan and Sichuan. I crossed my fingers and hoped the funders would be sympathetic (they were). Under David's tutelage I learnt the best way to collect specimens in the field and to prepare them for overnight drying in the hotels we stayed in. I marvelled at his meticulous recording system for what we collected. By the end of the expedition I had made some 102 separate collections. There was enough evidence for me to subsequently publish 13 new species.

Because we never got to Tibet there was unspent money from my NGS grant. In late 2013 Chih Chieh Yu emailed me to say he was proposing to explore a remote part of Taiwan to look for the little known *Berberis aristatoserrulata* and



The type plant of *Berberis tianshuiensis* near Tianchi Lake in north-west Yunnan seen in 2013.

*Berberis brevisepala* whose types were collected by the Japanese ethnographer Mori in 1910 in an area where it appeared no botanists had collected since. This of course would be on foot with everything having to be carried. I emailed Chih Chieh to enquire whether I could join the expedition should the NGS allow me to spend the remainder of their grant in this way. He said yes and so did the NGS. In preparation for the expedition I spent weeks practicing on the steepest slope I could find nearest to our house and then climbing Snowdon in North Wales carrying a full pack. You can read a full account of the expedition in an article I wrote for the 2014 *IDS Yearbook*. This notes we found a new *Berberis* species but couldn't publish it because the plants were sterile. Happily though, we were to subsequently root a cutting we made and once it flowered, we were able to publish it as *Berberis morii*.

This brought the total of new species I had published (either individually or as a co-author) to eight. My monograph *The Berberis of China and Vietnam A Revision* published in May 2020 added another 71 (see review p. 197).

I suspect readers have been asking themselves what Jill was doing while all this was going on. For this see <http://www.jliddington.org.uk/>

What of the future of my *Berberis* journey? In my monograph I suggest that there are still further new species to discover and indeed I have new ones that are publishable from my participation in an expedition to Qinghai and north Sichuan with Dave Boufford, Bruce Bartholomew, Jim Shevock, Guo Jianling, Yue Jipei, and Li Qinin in 2018. And my research on CVH and elsewhere has



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Above, left, *Berberis morii* and right, *Berberis polyantha*, Jinsha Jiang, Baiyu Xian in Sichuan.

enabled me to identify specimens of other possible new species that need further investigation.

But perhaps the most exciting development is that Chih Chieh Yu is now working at the Xishuangbanna Botanic Garden in south Yunnan and through molecular analysis hopes to map the evolution of *Berberis* in China with a particular emphasis on deciduous species. His work is likely to provide an essential companion to my monograph. In May 2020 I was supposed to be on an expedition with him in Guizhou, Chongqing and elsewhere, but instead due to the coronavirus pandemic found myself stranded at home. I was able to be in email correspondence with him on this expedition and on a subsequent one he made last autumn to Yunnan, Sichuan, Gansu and Qinghai. It boosted my morale to try to identify the species in the photographs he sent and to make suggestions as to the areas he might visit. At the time of writing it looks as if his collections may result in at least another eight new species.

So via email my *Berberis* journey continues. But of course I am not alone in being unable to visit herbaria or to collect in the field. Many herbaria remain closed or are only open to staff on a limited rota basis. From numerous sources I am told that in much of the globe botanic expeditions have been put on hold with no timetable for their resumption.

When things will return to 'normal' and what that 'normal' will look like is at the moment anyone's guess.