

A Plantsman's Observations on the Genus Hydrangea

The hydrangea family, Hydrangeaceae, is a respectable conglomeration of shrubs, vines and herbaceous perennials resulting from a recent extraction from a behemoth institution known as the Saxifragaceae. The herbaceous components, in the respective genera of *Cardiandra* and *Deinante* proffer ornamental species for cultivation although it is the woody taxa of shrubs and lianas of this family, in the genera *Hydrangea*, *Deutzia*, *Philadelphus*, *Platycrater* and *Schizophragma*, that are by far the most familiar.

Other than the exceptions of *Hydrangea paniculata* and *H. quercifolia*, the prototypical hydrangea inflorescence is a corymb; a rounded disc of numerous small, fertile flowers that possess insignificant sepals and four or five small often white, pink or blue petals. This cluster of 'utility' is surrounded by the advertising agency of sterile florets, or ray flowers, that provide the stuff of ornament. The ovaries are, as a rule, inferior (i.e., enclosed in the receptacle), while the dehiscent capsules, sometimes in the shape of a Grecian water jar, gave rise to the genus name; *hydro*, water and *angeion*, a vessel. The foliage is, without exception, arranged in pairs.

This floral strategy of sacrificing the fertility of a few flowers to provoke a bit of curiosity by commuting pollinators has co-evolved in other non-related groups, most notably in the genus *Viburnum*. Thus, it would not come as a complete surprise to those who have grown a double-file viburnum, *Viburnum plicatum*, that the second Asiatic hydrangea to be noted by Western botanists (in Japan, in 1777) was named *Viburnum serratum*. That nascent nomenclatural error commemorates what would become a long and complicated excursion into a field plethoric with taxonomic landmines.

The first hydrangea described from Asia, also in 1777 by Thunberg while in Japan, was actually a 'mophead' or *Hortensia* cultivar, with the bulk of its fertile flowers clustered into heads of embellished yet mostly sterile florets (see under *H. macrophylla* for the convoluted genesis of *Hortensia*). Having

never encountered such a lovely creature before, it is understandable that Thunberg christened this *Viburnum macrophyllum*. It is important to note that this type of hydrangea flower mutation is different from a doubling or trebling of the sepal numbers in each ray flower, which results in rose-like florets surrounding the central core of usually fertile florets.

I consider that the confusing taxonomy of the hydrangeas that exists to this day can be ascribed to a quartet of unfortunate circumstances. First, much of the first named material, including Thunberg's *Viburnum macrophyllum*, was based on clonal selections with no botanical standing. Second, many *Hydrangea* species have immense geographical ranges and the natural, often significant variation found within each taxon was always problematic, even in the relatively few cases when live material was readily accessible for study. Remote and politically insular hotspots of *Hydrangea* speciation (i.e., Japan and China), have not until recently offered much useful data. Third, although Elizabeth McClintock's highly regarded monograph (McClintock, 1957) remains the most comprehensive to date, it is fair to point out that many of her astute observations were made in spite of a paucity of oven-dried herbarium specimens. The fourth contributors to the confusion have been nurserymen and lay authors, in the midst of whom I find myself, who have simply taken matters into their own hands, laying low in great sweeps the systematists' attempts to provide a robust grip on the genus.

In this paper, I will attempt to place my personal observations of species in the wild and those of known provenance that I have grown within the broader academic context provided by McClintock. I have purposely avoided the 'minefield' of the complex of *H. macrophylla* and *H. serrata* cultivars, but I have discussed forms of numerous species, which I feel are important. I leave the taxonomy to my more academic brethren hoping that they can solve the riddles of this remarkable genus of plants, many of which are not at all well known to horticulturists

Section Hydrangea

This section contains the deciduous members of the genus, including the vines, and distinguishes them from the much lesser known, evergreen and primarily southern hemispheran taxa, which are placed in Section Cornidia. Both sections are divided further into subsections.

Subsection 1 Americanae

The two North American species of *Hydrangea* have achieved more than a modicum of acceptance in Western horticulture. They were recognized by native Americans for their curative properties and used by the Cherokees and early American settlers for the treatment of calculus. They contain the cyanogenic glycoside, hydrangin, although ingestion of raw hydrangea vegetation does not seem to result in the typical clinical signs of cyanide poisoning.

Hydrangea arborescens L. occurs along the eastern coast of the USA from Florida to New York and west/southwest to Iowa and Louisiana, and is often found growing under exceptionally shaded conditions. It is a deciduous shrub rising to 3m (10 feet) in height carrying ovate, smart, green leaves of a papery texture. The mostly fertile, dingy white flowers of the northern populations are hardly awe-inspiring in their pure state, but at least two selections have considerable hardiness as well as frilly heads of sterile flowers. *Hydrangea arborescens* ‘Grandiflora’ and the more compact *H. arborescens* ‘Annabelle’ each begin flowering in June with tasteful tones of lime green, ripening to pure white, and changing later to verdant tones. The former was the first hydrangea that I grew as a young gardener in Michigan’s frigid USDA Zone 4 interior, where its somewhat sloppy growth was overlooked through my innocent eyes of ignorance. The somewhat stronger stemmed, later blossoming ‘Annabelle’, with flower heads to 30cm (12 inches) across, was selected at the University of Illinois by J.C. McDaniel. It has justifiably superseded ‘Grandiflora’ in commerce, though I still find both exceptional contributors to my mixed borders in USDA Zone 8.

In the southern Appalachians, the brilliant white indumentum on the foliage undersurface of *H. arborescens* subsp. *radiata* (Walter) McClintock (Figure 1) makes up for its lackluster floral display. It looks best growing atop embankments or retaining walls. It remains one of my favorite hydrangeas and deserves much greater recognition.

Hydrangea arborescens subsp. *discolor* (Ser.) McClintock is poorly represented in cultivation. It is best known as its cultivar ‘Sterilis’, which has frosty heads comprised of mostly sterile florets. In June of 2003, I observed populations of this taxon at 2000-3500’ in elevation near Asheville, N.C. together with numerous individuals of *H. arborescens* subsp. *arborescens*, i.e.

without the grayish tomentum found on *H. arborescens* subsp. *discolor*. Sterile florets may or may not be present.

The oak-leaf hydrangea, *Hydrangea quercifolia* Bartram had a prolonged rise to favor among North American horticulturists in those USDA Zone 5-9 landscapes where it can be grown. Dr. Michael Dirr is probably responsible for much of this interest, due to his selection work at the University of Georgia. Though one of only two *Hydrangea* species that possess flowers born in panicles rather than corymbs, it is the foliage of *H. quercifolia* that sets it aside. Very leathery in texture, the boldly lobed and jagged-edged leaves to 20cm (8 inches) in length do indeed resemble those of a red oak and develop intense and prolonged tones of glossy burgundy in autumn. I have seen this Gulf State native growing in Mississippi in semi-shaded sites with more than adequate water, though in cultivation it appears to tolerate a great deal of drought when established. Though Dirr recommends always providing this species some protection from full sun, this does not seem necessary in the Pacific Northwest where it becomes annoyingly rangy if grown in too much shade, with leaves that fail to develop autumn tones or abscise uniformly.

Subsection 2 Asperae

The subsection *Asperae* has outstanding ornamental potential, but it contains many barriers and pitfalls in proper classification.

Hydrangea sikokiana Maxim. (Figure 2) is shockingly scarce in cultivation considering its clearly handsome foliage and large white lacecaps to 30cm (12 inches) across. I first observed it in the autumn of 1997 while in the moist, cool highlands of Central Honshu on the Kii Peninsula with colleagues Bleddyn and Sue Wynn-Jones and Darrell Probst, the *Epimedium* specialist. It was on that particular day that I became aware of the enormous diversity of the *Hydrangeaceae* on the Japanese archipelago. I could count no fewer than eight hydrangea species or their close relatives without altering my position. Among the group, growing on the shore of a rapidly moving mountain stream was a tall shrub with large felted, light textured, jagged edged leaves that appeared superficially similar to those of *H. quercifolia*. As we had spent longer a week on Shikoku Island specifically searching for this species without success, and were nearing the end of a second rainy, cool autumn day, I was certain I had found what we sought. The moment of

recognition was accompanied by that rarified charge of electricity that such experiences are known to bring. From seed collected at that time, we were able to re-introduce *H. sikokiana* into cultivation in North America and Europe, but we have received few reports as to how it has fared. It is proving to be a distinctive, mid to late summer blossoming addition to our cool, shaded woodland.

Hydrangea involucrata Sieb. (Figure 3) was not among the species that we saw on the Kii Peninsula on that particular day, although I had encountered it on numerous occasions during prior travels in Japan, most notably in 1995 along the coastal forests of the Chiba Peninsula south of Tokyo. As its specific epithet implies, *H. involucrata* sets itself aside from all other species in Section *Hydrangea* by possessing involucral bracts that enclose its plump, rounded flower buds before opening. The bracts dehisce as the flattened corymbs of lavender blue fertile flowers, surrounded by creamy white ray flowers, open. The ovate foliage to 13cm (5 inches) in length is held along stems to 3m (10 feet) in height. There are several forms in cultivation that possess an aberrant doubling of the sepals in the ray flowers, in particular the lovely cultivar ‘Hortensis’, which also surrenders a greater number of its fertile florets to the cause of ornament.

Hydrangea involucrata hybridizes readily with *H. aspera* D. Don, a complex taxon found in the eastern Himalaya and the mountains of western China south to Taiwan, Java and Sumatra. Following McClintock, I have grouped numerous closely related species as subspecies under this umbrella. I do this with a certain degree of discomfort because those I have observed in their wild state appear unquestionably distinct from one another.

Hydrangea aspera subsp. *strigosa* (Rehder) McClintock will be the first hydrangea encountered by anyone traveling to many areas of Asia, where it occurs at lower elevations in mountain valleys. I have seen it in eastern Nepal at elevations of 1800m, in Vietnam at 1550m and in Sichuan Province at 950m. It is easily recognized by its very narrow foliage with strigose hairs on the undersurface and a very late blossoming habit; in fact, I have often seen it still in blossom in October. Use of the strigose hairs alone as a diagnostic tool is problematic. In 1998, I established cuttings from a specimen collected on the lower slopes of Mt. Emei clinging precariously to a small plot of ground between an asphalt highway and a steep cliff to a river below (collection number: DJHC 98464). This plant’s globose heads were nearly

entirely comprised of ray flowers. Michael Haworth-Booth reported that Ernest Wilson collected a similar type from Emei in the early years of the 20th century (Wilson's number 4902), but it has apparently been lost to cultivation. We have introduced this plant to cultivation under the clonal name of 'Elegant Sound Pavilion' (Figure 4) to commemorate the Buddhist temple near the collection site. The plant was still intact and in good health when I visited Emei in 2000.

Hydrangea aspera, as most know it in cultivation, is from the higher elevation taxon known as *H. villosa* Rehd. (or *H. aspera* subsp. *villosa* Hort), but which was reduced to synonymy by McClintock under subsp. *aspera*. There are few more beautiful deciduous shrubs than this, with its velvety villose leaves borne along stems up to 3m (10 feet). In July and August, the plant seems to be smothered with 25cm (10-inch) lacecaps of lavender-purple fertile florets surrounded by creamy white ray flowers. By late summer, the woodland floor beneath the plant is covered with a beguiling purple snow as the petals dehisce. My collection of this form (number: DJHC 636) from the Wolong area of Sichuan, at 3000m, has proved to be a sensational plant in our garden with cymes to 30cm (12 inches) across. In 1998, I collected DJHC 98443 from a similar elevation on Emei Shan and described it as possessing ovate, villose foliage to 20 cm (8 inches) in length and 18cm (7 inches) wide.

Though McClintock chose to reduce *H. sargentiana* to a subspecies of *H. aspera*, Rehder gave it species rank. It was introduced from western Hubei Province by Ernest Wilson in 1908, but I have not visited this area of China and am unable to confirm if subsequent collections have been made. It differs from *H. aspera* in what has been well described as a moss-like coating of hairs on its young stems, as well as large, ovate, substantive leaves of deep green covered with a seductive indumentum. The cymes, produced in mid to late summer are large and flattened. The purple fertile flowers are surrounded by sterile flowers with somewhat concave sepals of cream. I have raised this species from seed collected under cultivation and have seen little variation amongst the progeny, except for a nicely golden variegated seedling, which we have named 'Binti Jua' (daughter of sunshine). It is a beautiful addition to the garden but requires proper pruning of the young plant to produce its fullest potential.

On moderate to high elevations in Taiwan, the Wynn-Joneses and I have

collected seed from *H. kawakamii* Hayata (like *H. villosa*, reduced to synonymy by McClintock under the subsp. *aspera*), which impressed us in both foliage and flowers. One particular specimen at 2395m had felted foliage to 25cm (10inches) long and 20cm (8 inches) wide while the cymes to 40cm (15 inches) across were held atop sturdy stems to 6m (20 feet) in height. It does not come as surprise to find that Haworth-Booth described this subspecies as the most spectacularly fine member of this subsection. However, it has suffered from untimely cold spells in USDA Zone 8 and overhead protection should be considered in colder microclimates.

It was not until the autumn of 2000, while north of Boaxing in Sichuan Province at elevations of 2010m, that I finally encountered a misunderstood taxon known as *H. aspera* subsp. *robusta* (Hook. f. & Thoms.) McClintock (*H. longipes* Franch). While hiking through a damp wood in a mostly degraded agricultural area, I found three specimens of a startling hydrangea with colossal foliage carried on 30cm (12-inch) petioles. The cordate leaf blade was 30cm (12 inches) long and 32cm (13 inches) wide. In the autumn of 2002 in eastern Nepal, the Wynn-Joneses, J. Kincaid and I found this same taxon, though at elevations of 2655m. Bleddyn Wynn-Jones reports this plant to be common at similar elevations in Sikkim. There is some confusion caused by Bean (1973), who recognized the name *H. longipes* but distinguished it from the closely related *H. robusta*, which he admits never to have seen in leaf.

Subsection 3 Calyptranthe

This subsection, containing some of the deciduous climbing hydrangeas, appears taxonomically straightforward, although I have found several pitfalls. The members are well known, if perhaps not well named, by the horticultural community at large and are amenable to deep shade in USDA Zones 5-10, where they will climb and use aerial roots to adhere to any compatible substrate. The subsection is segregated from other hydrangeas by the unique abscission of the corona (flower petals) in one bonnet-like structure.

I have observed *Hydrangea anomala* D. Don subsp. *anomala* and *H. anomala* subsp. *petiolaris* (Siebold & Zuccarini) McClintock (back cover) in numerous localities, collected seed and grown the resulting seedlings, and I feel quite satisfied with McClintock's reduction of *H. petiolaris* to subspecies rank. The differences that distinguish the two subspecies (fewer stamens, a slightly more

domed inflorescence and more coarsely toothed leaves in *H. anomala* subsp. *anomala*) do not seem sufficient to justify separating them as distinct species especially when one considers the breadth of their geographical range.

H. anomala subsp. *petiolaris* is the more northerly of the two and is presumed to be the more hardy. Most climbing hydrangeas grown in North America and Europe are given this name, whether it has been legitimately applied or not. This taxon occurs from Sakhalin in N.E Russia through the Japanese archipelago extending southward to Taiwan. It is commonly encountered on Ulleong Island (Korea), Cheiju Island (Korea), the central highlands of Hokkaido, throughout Honshu, Kyushu, Shikoku and Yakushima as well as the North-Central Alps of Taiwan. In 1993, I found it on Ulleong Island, off the eastern coast of Korea, co-mingling with its near look-alike and close relative *Schizophragma hydrangeoides*, whereas in Taiwan it sprawled over stumps and up trees amidst the stems of *S. integrifolia*. On more than one occasion, I have admired the shine of this vine's golden autumn foliage as it emerges through the fog climbing high into the overstory on virtually every available tree trunk.

A well grown specimen of this hydrangea in blossom in June is hard to improve upon, with its shag of lacey white heads held amidst glossy, deep green foliage. To my knowledge, no selections have been made based on floral attributes, but I have seen a small non-blossoming specimen in a garden in the U.K. that is reportedly a cutting from a pink flowered selection from France. The amount of red pigment in the leaf blade leads me to believe that eventually this will indeed produce pinkish flowers, and recently it did. This is not the case in regard to variegated foliage, because after years in cultivation there has been no departure from the norm in two nearly identical golden variegated sports, which occurred spontaneously at virtually the same time on both coasts of North America. *Hydrangea anomala* subsp. *petiolaris* 'Mirranda' and 'Firefly' each possess orbicular foliage nearly identically emargined with yellow. Though their entrance into commerce caused excitement, we have thus far been disappointed by their lack of vigor in the garden.

In 1922, Monsieur Henri Cayeux exhibited in Paris a cross he had created between *H. anomala* subsp. *petiolaris* and *H. macrophylla* var. *rosea* Hort, which showed intermediate traits between the two. All plants of *Hydrangea* × *hortentioris* were reportedly destroyed during the bombardment of Le Havre

during the end of WWII.

Cheiju-do (Quelpart Island) is a large volcanic outcrop approximately 50 nautical miles from the southern tip of the Korean Peninsula. It boasts a large inventory of endemic species in addition to sharing a number of species with the Japanese Archipelago that lies directly to the south. Geologically, this location seems a somewhat bizarre mongrel between tropical Fiji and the Salisbury Plain of England, with tidy rock walls surrounding mossy green pastures and numerous volcanic cones that rise from the flattened landscape like druid mounds. Among the endemics that grow here, *Hydrangea quelpartensis*, a deciduous climbing species, is frequently found clambering up the oaks and pines in the dry woodlands of the volcanic slopes. I do not believe it to have any botanical standing despite the fact that I have collected seed under this name while on Cheiju-do and purchased plants under this name while in Europe. The claim that it possesses foliage one quarter the size of *H. anomala* subsp. *petiolaris* can be attributed entirely, it seems, to juvenility. I find it important to raise this rather esoteric fact because of my culpability in distributing a deciduous self-clinging vine for several years under the name of *Schizophragma hydrangeoides* 'Brookside Littleleaf'. I received it under this name from J.C. Raulston of North Carolina, who in turn had received it from Brookside Gardens in Maryland. After numerous years of climbing a tree in the garden, by which time it proved itself quite capable of producing entirely normal sized leaves, it blossomed, authenticating itself as *H. anomala*.

Hydrangea anomala subsp. *anomala* appears virtually identical to *H. anomala* subsp. *petiolaris*, at least superficially and to my eyes. It too is quite commonly encountered in the mountains of western China and the eastern Himalaya. I have collected seed of this species above 2300m in central and eastern Nepal, at 2860m in Sichuan and at 2700m on the Cangshan in Yunnan. The latter collection, made in 2000 under the number DJHC 00-0455, came from an individual that I noted as having very lustrous foliage and cymes to 25cm (10 inches) across. The resultant seedlings have not yet flowered. Finally now afforded numerous collections of this continental counterpart, with known provenance, a comparative evaluation of the differences exhibited in cultivation is underway, though it will be many years before data is forthcoming.

Subsection 4 Petalanthé

This subsection of wholly Asian species is characterized by the position of the ovary (half superior) as well as the fact that the seeds are not winged or nearly so. Ostensibly, it is an assemblage of vastly under-known but rather remarkable species. I feel that it is taxonomically complex, riddled with nomenclatural anomalies and represented in the West mostly by dried herbarium specimens.

The Kei Peninsula is a large landmass that juts into the Pacific Ocean, with Osaka on its upper northwest corner and Nagoya to the upper northeast. We centered our activities from the centrally positioned city of Hashimoto and explored the large mountain range rising to the southeast.

It was here on our first day that we encountered *Hydrangea birta* (Thunb.) Siebold a species virtually unknown in western cultivation. The rounded leaves of this species, to 8cm (3 inches), are very distinct in possessing an extremely dentate leaf margin. It grew in great abundance here in moderate shade beneath a canopy of deciduous and evergreen trees at approximately 1000m elevation. In May, profuse terminal flowers of light blue are formed in compact corymbs to 8cm (3inches) across atop 1.25m (4-foot) stems, lacking the expanded sepals on sterile florets that we have come to associate with the hydrangeas as a whole. Though I already possess plants of this species, raised from seed provided by the Tsukuba Botanic Garden in Japan, this was my first encounter with it in the wild and I found it a handsome shrub that certainly deserves more evaluation for use in Northwest gardens. It is not held in very high esteem in most literature.

In this area, we found what I have come finally to regard as *Hydrangea scandens* Ser., another rare species that certainly deserves more recognition than it currently enjoys in the West. It has a wide range throughout east Asia and the nomenclature compressed into this variability is in a constant state of fusion and fission. We had already collected seed of this species on Shikoku Island, where we found it common as an understory shrub in a wide range of elevations. The foliage is quite narrow, to less than one inch, with serrations present on the leaf margin along the terminal quarter of its total length of 10cm (4 inches). In full sun situations, the foliage had transformed to lovely tints of burgundy in good complement to its characteristic brownish purple stems. This species has already flowered in my woodland at Heronswood,