



Enkianthus in cultivation

THOMAS CLARK, ERIC HSU and
KOEN CAMELBEKE provide an overview of
the cultivated species and detail the cultivars

ENKIANTHUS bring a welcome subtlety to the spring garden. Their small flowers and leaves contrast with those of their more blousy ericaceous brethren such as *Rhododendron*, and they demand less cultivation attention. The genus contains 12–17 species, augmented by several worthwhile cultivars.

Genus characteristics

The pendulous, umbel-like clusters or racemes of campanulate flowers resemble those of related genera such as *Gaultheria* and *Vaccinium*. However, the dry capsules, rather

than fleshy berries, and whorl-like arrangement of toothed leaves and branches, differentiate *Enkianthus*. They are deciduous shrubs or small trees and flowering occurs in early to late spring, April to June in the northern hemisphere.

The native range of the genus is east Asia, occupying a broad swathe from the eastern Himalayas to south-east Asia, and north into China and Japan. China is host to seven species, more than any other country, four of which are endemic (Ruizheng & Stevens 2005). These species are *E. chinensis*, *E. deflexus*, *E. pauciflorus*,

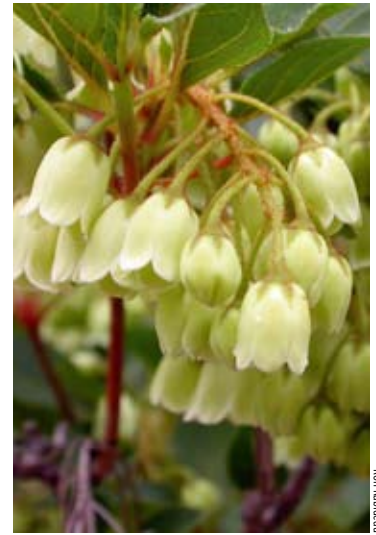
E. perulatus (syn. *E. taiwanianus*), *E. quinqueflorus*, *E. serotinus* and *E. serrulatus*. Three are native to Japan: *E. campanulatus*, *E. cernuus* and *E. perulatus*.

Taxonomic history

The genus was established in 1790 by João de Loureiro (1717–1791), a Portuguese Jesuit missionary, palaeontologist, physician and botanist who resided in Cochinchina (now Vietnam) for 30 years. Taking cues from the flowers, he created the genus name from the Greek words *enkyos*, pregnant, and *anthos*, flowers.



Philippe de Smedt



Ron Robinson

Enkianthus campanulatus flowering profusely in early May. It will eventually form a large shrub

Enkianthus campanulatus f. *albiflorus*



Philippe de Smedt

Enkianthus campanulatus var. *palibinii*

Morphological and phylogenetic analyses show that *Enkianthus* is a sister group to other ericaceous taxa, and is the only extant representative of subfamily *Enkianthoideae*, one of the two evolutionary lineages in the family (Anderberg 1993, Judd & Kron 1993, Kron & Chase 1993). Four sections are currently recognized within the genus: section *Andromedina* (*E. nudipes*, *E. subsessilis*); section *Enkiantella* (*E. chinensis*, *E. deflexus*, *E. pauciflorus*, *E. ruber*); section *Enkianthus* (*E. perulatus*, *E. quinqueflorus*, *E. serotinus*, *E. serrulatus*, *E. taiwanianus*, *E. tubulatus*); and

section *Meisteria* (*E. campanulatus*, *E. cernuus*) (Anderberg 1994). Less clear-cut, and still controversial, is the number of species in the genus. Nine species were recognized by Palibin (1889) while more recent treatments vary: 13 (Hsu 1982), 17 (Anderberg 1994), 15 (Kron *et al.* 2002), 12 (Ruizheng & Stevens 2005).

Species and cultivars

Enkianthus campanulatus (redvein enkianthus)

This is the most widely cultivated species, introduced to the UK from Japan by Charles Maries on behalf of Messrs Veitch nurseries. Of the endemic Japanese species it has the widest distribution, ranging from southern Hokkaido to Honshu and Shikoku, where it colonizes open mountainous slopes.

Its morphological variability is recognized in four varieties; var. *campanulatus*, var. *longilobus*, var. *palibinii* and var. *sikokianus*. The first three are largely distinguished by their corolla length (7–8mm in var. *campanulatus*, 8–9mm in var. *longilobus* and 5–6mm in var. *palibinii*) (Iwatsuki & Boufford 1993). Var. *campanulatus*

has pale yellow to reddish, striated flowers while those of var. *palibinii* are entirely red. A white-flowered variant has been accorded its own form, f. *albiflorus*. Iwatsuki & Boufford (1993) elevate var. *sikokianus* to species status, *E. sikokianus*, but in horticulture it is usually recognized at varietal level. It is easily differentiated from the other varieties in having longer racemes, up to 9cm, and 8–20 flowers per raceme instead of 10 or less (Iwatsuki & Boufford 1993).

In Europe and North America this species forms a medium to large shrub, although older plants can be considered small, multi-stemmed trees. A giant 47-year-old specimen at Polly Hill Arboretum, Massachusetts, measured 9.4m tall by 12.2m wide in 2010. The autumn foliage reliably provides a spectacular and vibrant display ranging from yellow to orange and crimson. Individual clones are variable in habit and vigour, but the natural shape of this species is generally upright and taller than wide in youth, but spreading with age.

The cultivars of *E. campanulatus* that the authors have been able ➤



Ron Bahlsheim



Philippe de Spaendonck



Ron Bahlsheim

Enkianthus campanulatus has yielded the most cultivars, with flowers in a range of colours. From left to right: 'Red Velvet', 'Green Shades' and 'Faser's Picotee'

to observe are discussed here. A comprehensive evaluation of the available ones would be invaluable for the horticulture industry.

Deep pink- and red-flowered cultivars

■ 'Akatsuki'

This cultivar produces mid-pink flowers, echoing its name which means dawn. It is one of several Japanese cultivars imported into North America within the last 10 years by Heritage Seedlings, Inc., Oregon.

■ 'Bruce Briggs'

This is one of the darkest red-flowered cultivars. It is a recent selection from Weston Nurseries, Massachusetts, named for a visionary Washington state nurseryman. It has been listed informally as Weston red or Weston red seedling.

■ 'Donardensis'

Its flowers are rimmed in deep red and twice as large as the typical species. It arose as a chance seedling at Slieve Donard Nursery, Northern Ireland, before 1940.

■ 'Hollandia'

This cultivar bears pale, creamy pink flowers with heavy rose-pink veining. It is frequently listed as 'Hollandia Red'.

■ 'Jan Iseli Pink' and 'Jan Iseli Red' The former produces dense clusters of round, cream-coloured flowers

etched with rose-pink veining, whereas the latter has rose-red flowers that are darker and with even darker venation than 'Showy Lantern'. These cultivars were introduced in 1990 and originated from a 1980s breeding program at Iseli Nursery, Oregon. They were named for the wife of the nursery's founder.

■ 'Miyama-beni'

This vigorous cultivar has rose-pink flowers. Like 'Akatsuki', it was imported from Japan by Heritage Seedlings, Inc.

■ 'Princeton Red Bells'

This is a distinctive cultivar with the darkest red flowers of any *E. campanulatus* cultivar. It was introduced in the late 1970s by Bill Flemer III of Princeton Nurseries, New Jersey.

■ 'Red Bells'

Do not confuse this with 'Princeton Red Bells'; it has unremarkable flowers typical of the species.

■ 'Red Velvet'

The rose pink flowers are similar to those of 'Miyama-beni' and 'Showy Lantern', but it has consistently good red autumn foliage.

■ 'Showy Lantern'

This densely-branched cultivar has slender, rich rose-pink flowers with darker veining and scarlet autumn foliage. Cappiello & Littlefield (1994) suggest that it is less cold-hardy than the species. It was named and introduced in the 1980s by the

late Ed Mezitt of Weston Nurseries.

White- and cream-flowered cultivars

Some clones of *E. campanulatus* f. *albiflorus* have pure white flowers with no hint of coloured veining and are particularly elegant.

■ 'Renoir'

This cultivar has creamy white flowers with subtly pink-tipped corolla lobes and no veining. It originated at the Arnold Arboretum, Massachusetts, where it had been grown from seed received in 1923 from University of Edinburgh, Scotland. It was named by assistant propagator Rob Nicholson in the early 1980s (Nicholson 1983). The original plant no longer grows at the Arnold Arboretum, having been deaccessioned in 1999.

■ 'Wallaby'

This cultivar bears creamy white flowers and is a dwarf, compact selection with deep scarlet autumn foliage. It is not a vigorous grower at Arboretum Wespelaar, Belgium.

Variiegated cultivars

■ 'Tokyo Masquerade'

This cultivar has medium green leaves that are irregularly edged in chartreuse green; the edge colour later fades to ivory white. 'Variegata' is probably a synonym, although other distinct variegated clones,



Philippe de Smedt/Herica

The autumn foliage of *Enkianthus campanulatus* on Mount Sanpokojin in northwest Honshu, Japan

including one with white speckled leaves, have been selected, as has a golden-leaved one.

Other cultivars

■ 'Faser's Picotee'

Creamy white flowers with contrasting pink-edged lobes distinguish this 2006 introduction from Rare Find Nursery, New Jersey. The promising seedling was named by the late nursery founder, Hank Schannen, for Mrs Faser, who distinguished it from a patch of volunteer seedlings.

■ 'Green Shades'

The small flowers of this cultivar are edged in pink and are greenish near the sepals, but it is rather inconspicuous from a distance.

■ 'Summer Hill'

Selected from a chance seedling, this

cultivar is noted for its larger leaves, strong upright growth, and white flowers marked with a rich rose-red band on the apical third of the corolla. The new stems emerge an attractive reddish colour. It was selected by Mike Johnson of Summer Hill Nursery, Connecticut.

We have traced the following cultivar names in nursery catalogues and inventories of various public gardens, although none of them have been observed by the authors: 'Chichibu-beni', 'Compactus', 'Fukurin-beni', 'Hiraethlyn', 'Howito', 'Iwa-shidare', 'Kisoji-no-haru', 'Kuchibeni-nishiki', 'Pagoda' (possibly a corruption of the common name, pagoda bush), 'Red Beauty', 'Ruby Glow', 'Shidare-beni', 'Sinsetsu',

'Venus', 'Vesta', 'Virgo', 'Victoria' and a weeping form. There are undoubtedly many other selections from various countries, Japan in particular, and some of which are gradually finding their way into North American and European gardens.

Enkianthus cernuus (nodding enkianthus)

Native to the mountainous parts of Honshu, Japan, *E. cernuus* is distinguished from *E. campanulatus* by its dissected calyx lobes, smaller stature (1.2–2.7m), smaller leaves (2–4 x 1–5cm) and smaller, white flowers (0.6cm long) borne fewer per cluster (5–12). At least one variety, *E. cernuus* var. *matsudae*, is distinguished by its narrower, lanceolate leaves, less pubescent leaf midribs, and narrower and red flowers. A second variety, *E. cernuus* var. *nipponicus*, cultivated in several US arboreta, is considered synonymous with *E. cernuus* by Ohwi (1965).

A colour form, *E. cernuus* f. *rubens*, notable for its dark red flowers, is the most widespread enkianthus in cultivation after *E. campanulatus* and *E. perulatus*. Its size and habit is more similar to *E. perulatus* and only the reddest forms of *E. campanulatus* rival its red flowers. The corolla of f. *rubens* is unique in that the widest point is near the middle and the distal ends of the petals curve inward, giving the flowers a rather globular shape, as opposed to the bell-shaped flowers characteristic of the genus. *Enkianthus cernuus* f. *rubens* is less hardy than the species, and most of the other species in the genus, in central Belgium. Cold winters have killed young plants of this forma and left older plants with major stem damage from frost. It therefore requires a protected site in such climates. Nevertheless, the performance of established plants has been mostly impressive. ➤



Ron Radtchen



Ron Radtchen



The narrow leaves of *Enkianthus cernuus* 'Yanagiba'

■ The cultivar 'Yanagiba' has small spherical flowers that are deep red. However, it is the narrow leaves giving a feathery effect that make 'Yanagiba' one of the most distinctive enkianthus; at first glance it has the appearance of a cut-leaf Japanese maple. Selected and named in Japan, it was introduced to North America by Brian Upchurch of Highland Creek Nursery, North Carolina, and Ted Stephens of Nurseries Caroliniana, South Carolina.

Enkianthus chinensis

A shrub or small tree between 2.5 and 8m tall, *E. chinensis* colonizes the forested and mountainous areas of central and southern China at 900–1,200m, exceptionally reaching 3,100m (Ruizheng & Stevens 2005). Slightly smaller than those of *E. deflexus*, the leaves are 1.5cm wide and 1.5–2.5cm long (Ruizheng & Stevens 2005). The flowers, striped with yellow, orange and red, are 7–10mm wide and the autumn colour is early and superb.

Enkianthus chinensis is rare in private gardens and only encountered infrequently in arboreta and botanic gardens. A plant acquired from Esveld nursery in the Netherlands is usually the last of the species to flower at Arboretum Wespelaar. At the University of British Columbia

Botanical Garden, *E. chinensis*, originally collected during the 1980 Sino-American Botanical Expedition (as SABE 1311), has prospered and flowers generously (Wharton *et al.* 2005)

Enkianthus deflexus

This species is widely distributed in forests at 1,000–3,300m in China, Bhutan, northeast India, Burma, Nepal and Sikkim. It forms a shrub or a small tree 1.5–5m tall and the leaves are 2.5–8 x 1.5–4.5cm (Stevens 1971). Bean (1973) stated that the flowers appear in June, but Ruizheng & Stevens (2005) note that flowering stretches from April to July.

One variety, *E. deflexus* var. *glabrescens*, has been described – it has leaves that are glabrous on both surfaces while in var. *deflexus* they are hairy on both surfaces. Plant hunter EH Wilson thought highly of *E. deflexus*, calling it 'one of the commonest and most beautiful shrubs in western Szech'uan' (Sargent 1988). Lancaster (1989) noted that the autumn colours were superb on the upper slopes of Emei Shan in Sichuan and that *E. deflexus* 'was the most brilliant of all'.

Enkianthus nudipes

A Japanese endemic restricted to central Honshu and Shikoku, *E. nudipes* colonizes open areas at 400–1,000m (Iwatsuki & Boufford 1993). It forms a shrub 1–2m tall, with leaves 1–2.5 x 0.5–1.5cm wide (Iwatsuki & Boufford 1993). Flowering occurs between mid May and mid June. The 4mm long, convallaria-like flowers are held on exceptionally long pedicels, giving an effect of delicate earrings.

Curiously, this species is poorly represented in gardens for unknown reasons. It deserves further introduction and evaluation, and the long pedicels may be imparted



The multicoloured flowers of *Enkianthus chinensis*

to other species through breeding.

Enkianthus perulatus (white enkianthus)

This species favours rocky slopes in southern Honshu, Shikoku and Kyushu in Japan, and in northern Taiwan on the margins of *Fagus hayatae* forest. It is readily identifiable in mid spring since the flowers appear before the leaves. Sir Rutherford Alcock, the first British diplomat in Japan, discovered this species in Nagasaki in 1859, but its introduction did not take place until ten years later by Messrs Standish (Bean 1973).

Enkianthus perulatus is the second most common species in cultivation. At a distance its flowers are of little consequence, but up close they are





Ron Heald

The autumn colour of *Enkianthus perulatus* 'J.L. Pennock' (above) and the flowers of the species (below)



Ron Heald

attractive and daintily elegant. The habit is variable, becoming either a loosely upright to rounded shrub or a tightly mounding, spreading shrub. The autumn colour is splendid and, at its best, is a brilliant red or a glowing yellowish orange. This excellent autumn colour and its adaptability to heavy pruning, even shearing, makes *E. perulatus* a logical substitute for *Euonymus alatus* in parts of northeast USA where the latter is invasive and threatens natural ecosystems.

■ 'J.L. Pennock'

The flowers of this cultivar are typical of the species, but the

autumn display is outstanding both in colour and in its exceptional longevity. The colour begins as deep purple two weeks before other individuals of the same species and consistently peaks as bright red. Rick Lewandowski and Paul Meyer selected and named this cultivar from a cultivated research collection at the Morris Arboretum of the University of Pennsylvania in the 1980s and patented it in 1994 (Lewandowski *et al.* 1994). The original plant is a compact shrub, broader than tall, and at more than 50 years is less than 3m in height. Dillard (2003) provides detailed propagation information. Two small specimens of 'J.L. Pennock' at Arboretum Wespelaar, given by the Morris Arboretum, are rated highly for their autumn colour.

■ 'Compactus'

This exceedingly compact cultivar has been in North American gardens for decades, but remains rare. It had a prominent presence at Larchmont, New York, the garden of the late plantsman Harold Epstein where it grew for more than 50 years and reached scarcely 0.6m tall. After

Epstein's death the 1m wide specimen was auctioned and transplanted to a private Connecticut garden. Another venerable specimen approaching 1m tall and 1.3m wide thrives at Wave Hill public garden, New York.

'Tsukumo' is another dwarf selection.

Enkianthus quinqueflorus

This deciduous species can be easily recognized by its 1cm wide, translucent, pearly pink flowers and prominently raised leaf veins. Reaching 1–2m in height, this species inhabits hillsides and mixed forests in south China and north Vietnam at 600–1,500m (Ruizheng & Stevens 2005). Indeed, plants were observed by one author (E Hsu) in dry, rocky terrain in Hong Kong.

Bean (1973) praised this species as 'unsurpassed among enkianthus in the size and beauty of the individual flowers and the clusters with their attendant pink bracts give a charming effect'. Symbolizing good fortune, large bunches of *E. quinqueflorus* were once harvested and forced for floral arrangements celebrating the Chinese New Year in late January or February (Metcalf 1942). It was a common practice in the Qing dynasty (1644–1912) to place the cut branches in temples as deity offerings (Abel 1818, Goody 1993). However, this practice ceased when the species was placed under protection in 1925 (Jarrett 1932).

Not surprisingly, its beauty, early discovery, and prominence in Chinese culture meant that it was the first *Enkianthus* species to be brought into cultivation in the West. It was introduced to North America in the early 19th century and by 1835 it was being successfully grown alongside camellias in the conservatory of Colonel TH Perkins near Boston, Massachusetts (Teschemacher 1835). Its lack of hardiness and need for glasshouse ➤

protection in frost-prone climates has prevented its widespread cultivation. However, hardiness trials could reveal hardier clones.

■ 'Pink Chandelier'

This cultivar was recently imported from Japan by Ted Stephens of Nurseries Caroliniana and has been propagated by semi-hardwood cuttings. A containerised plant has survived -10°C without damage (Stephens 2010). It flowers between mid March and early April. It is not clear how this cultivar differs from the species since published descriptions are not informative.

Enkianthus serrulatus

Like other Chinese species, *E. serrulatus* is a large shrub or small tree between 3 and 5m tall. It is native to mountainous forests at 800–1,800m in southeast and central China (Ruizheng & Stevens 2005). The elliptic leaves are 5–10 x 2–3cm and have finely toothed margins that differentiate *E. serrulatus* from other species. It has white flowers, similar to those of *E. perulatus* but larger.

Enkianthus serrulatus is rare in cultivation, although JC Raulston of North Carolina State University

Arboretum (now J.C. Raulston Arboretum) imported and distributed cuttings to various gardens and nurseries. Gossler *et al.* (2009) remark on its good performance under part-shade conditions, especially its healthy green foliage and good autumn colour.

Conservation

Ecological studies of *Enkianthus* are rare; therefore the conservation status of most species is not known. However, heavy grazing by Sika deer has affected populations of *E. campanulatus*, a species considered

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endangered in Japan (Yoshino *et al.* 2005). It is likely that Chinese species are suffering from deforestation and development.

Propagation

Fortunately, unlike other plants uncommon in cultivation, *Enkianthus* are not difficult to propagate from seed. Cuttings can be a bit more of a challenge.

The seed capsules are beige to dark brown, 6–19mm in diameter, and ripen in the autumn (September to October). Between three and five dust-like seeds are produced in each capsule. They do not require pre-germination treatment, prompting Dirr (2009) to liken them to sowing beans. The fine seeds can be germinated in the same manner as seeds of other ericaceous plants—surface sown on a free-draining compost or milled sphagnum moss. Supplementary light, although not essential, does promote good growth and stocky seedlings.

Cultivars or fine forms of any species should be propagated asexually. Cuttings taken in late spring or early summer and treated with rooting hormones root with good success. Some nurseries prefer to leave rooted cuttings undisturbed in rooting cells or trays in a cold frame or cold glasshouse over their first winter. These are then potted up before they resume growth the following spring. This is probably a

good protocol to follow. Propagation by cuttings has met with variable success at Arboretum Wespelaar, even when the cuttings are taken from young wood.

Tissue culture of *Enkianthus* in commercial quantities has so far been limited to *E. quinqueflorus*, with some success (Yang *et al.* 2009), and *E. campanulatus* ‘Showy Lantern’ (Rogers 1989).

Cultivation

Like other ericaceous genera, *Enkianthus* grow best in full sun or partial shade in moist, well-drained, acidic soils. Established plants can tolerate periodic drought, although may be sunburned when fully exposed. Where soil conditions are suitable they are readily transplanted as containerized specimens or field-grown, balled-and-burlapped plants.

In North America, *E. campanulatus* is the most adaptable species and is grown in much of the eastern third of the US and milder parts of the southeastern and maritime Canadian provinces. On the West Coast it is successfully grown from parts of British Columbia southward, primarily west of the Cascade Mountains, to northern California. Cultivation of any *Enkianthus* in the continental interior is greatly limited by low temperatures, dry climate or high soil pH. However, a few clones of *E. campanulatus* are hardy to USDA Zone 4 (-28°C to -34°C) as revealed by studies at the University of Maine (Cappiello & Littlefield 1994), and the existence of decades-old plants thriving at The Fells, a historic garden in central New Hampshire. *Enkianthus campanulatus* is widely cultivated in Europe, growing well where the soil pH allows ericaceous genera to prosper.

Enkianthus perulatus and *E. cernuus* are the only other species regularly cultivated in North America and

Europe. The latter is not as cold hardy as *E. campanulatus* and is slightly less common. Despite their ornamental merits, *E. deflexus*, *E. chinensis* and *E. serrulatus* are less common than the previous three. Wild origin seed of *E. chinensis* and *E. deflexus* has appeared recently in the RHS Rhododendron, Camellia and Magnolia Group seed list.

The remaining species are little known in cultivation, but worthy of introduction, if only for *ex situ* conservation and horticultural evaluation.

The genus does not suffer from the serious pests and diseases that plague *Rhododendron* and other, more commercial, ericaceous genera. In northeast USA *Enkianthus* also resist grazing by white-tailed deer. Arboretum Wespelaar in Belgium has reported scale insect, especially on *E. campanulatus* but fortunately it is not a common problem.

The future

Although the Japanese have made a concerted effort to select and name variants of their native species, no concentrated breeding program exists, despite the diversity and availability of germplasm available in private and public collections. Breeding efforts should focus on imparting greater hardiness to the showier, but tender, Chinese species such as *E. quinqueflorus*. Selection should also focus on expanding the flower colour range to deep yellows and oranges, and selecting clones for reliable autumn colour and compact habit.

THOMAS CLARK is Collections and Grounds Manager at Polly Hill Arboretum, Massachusetts
ERIC HSU is a Research Associate at Polly Hill Arboretum, Massachusetts
KOEN CAMELBEKE is Director of Arboretum Wespelaar, Belgium

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