1031. RADERMACHERA SINICA

Bignoniaceae

Sandra Bell and Masumi Yamanaka

Summary. *Radermachera sinica* (Hance) Hemsl., is illustrated. Its history is described, and its survival and flowering in cultivation in London are recorded.

The Trumpet vine family, Bignoniaceae, includes many plants which are grown in tropical gardens for their large, often colourful flowers and striking foliage, while a peppering of other species, such as *Campsis grandiflora*, brings great joy to those who grow them in more temperate areas since they so often help create an impression of the tropics while they themselves are hardy or nearly so. *Radermachera sinica* is one member of the Bignoniaceae which has not yet gained great popularity, but the survival and subsequent flowering of two plants out of doors in London over the last 15 years may prompt a re-evaluation of its merits (Bell, 2018). *Radermachera sinica* has a number of vernacular names such as China Doll, Canton Lace and Serpent Tree which refer to the colour of the flowers, the intricate pattern of the leaves and the twisted, hanging seed capsules respectively.

The genus *Radermachera* consists of around 17 species. Distributed mainly in southeast Asia, from the Himalaya to Borneo, Java, Sumatra and the Phillipines; seven of them are found in China (Zhang & Thawatchai, 1998). It was named by Zollinger and Moritzi in 1855 for the Dutch colonial administrator and botanist Jacob Radermacher who suffered the great misfortune of being murdered during a mutiny at sea on his way home from Java on Christmas Eve 1783 at the age of just forty-two.

The first recorded collections of *Radermachera sinica* were likely to have been made in Guangzhou, China in 1879 when seeds were taken to the Hong Kong Botanical Gardens a few years after it opened. They germinated and grew well, flowering just two and a half years later when they had reached a height of over three metres. When he published his description in 1882,

Curtis's Botanical Magazine 2022 vol. 39 (3): pp. 443–453
© 2022 The Authors. *Curtis's Botanical Magazine*
published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.
This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

the diplomat and botanist, Henry Fletcher Hance (1827–1886) placed the new species in the genus *Stereospermum* (of which, following Bentham, he considered *Radermachera* merely a section).

In the original description Hance records that seeds were collected by Dr. C. Gerlach in Canton along the Lien-Chau River in January 1879, and flowered in Hong Kong on 28th June 1881. On a specimen at Kew (K000779219) the location of the fruit and seed is given as 'up the North River, Canton, 12/78; com. C. Ford'. A second, flowering specimen (K000779217), from the herbarium of Hong Kong Botanical Gardens, is dated 28th June 1881, 'cultivated from seed collected up the North River in December 1878', is probably the holotype: a third specimen (K000779218) of a leaf with a note 'wait for flower', also contains a flowering specimen from the herbarium of Hong Kong Botanical Gardens, dated June 1886 (POWO, 2022).

The prolific plant collector Augustine Henry also collected material of *Radermachera* in China, particularly at Mengzi in Yunnan and this was amongst over 15 000 specimens which he gave to Kew during his career. William Botting Hemsley was Keeper of the Kew Herbarium and worked closely with Henry; he published a description of Henry's *Radermachera* specimens from Mengzi as a new species, *R. pentandra*, accompanied by a lovely large flowing illustration in *Hooker's Icones Plantarum*, and at the same time published the combination *Radermachera sinica* (Hemsley, 1905), (Plate 1031).

Radermachera sinica has an extensive range in the wild growing in northern India, southern China, Taiwan and parts of South-East Asia where it is still being found in new areas. In its natural habitat it is a large forest tree reaching a height of 10 m and a trunk diameter of 1 m.

Two other species have been described, both of which are synonyms of *R. sinica*. *Radermachera tonkinensis* was described by Paul Dop from northern Vietnam, and distinguished from *R. sinica* by its more leathery, acuminate leaflets, larger white flowers and longer (to 4 cm long) calyx.

A third species, *Radermachera borii* C.E.C.Fisch. was described from specimens collected by N.L. Bor in the Naga hills in Assam

© 2022 The Authors. *Curtis's Botanical Magazine* published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.



Plate 1031 *Radermachera sinica* MASUMI YAMANAKA

in 1935. Three sheets at Kew are all labelled *Bor 2699* one from Kohima and two from Khonoma, all from 1800 m in altitude.

Cultivation. It is not as a large tree that it is usually cultivated; in Europe we know *Radermachera sinica* best as a potted houseplant grown for its glossy deep or light green foliage which always seems to exude an impression of good health. It has been subject to the vagaries of fashion and after some years of popularity in the 1980s, all but disappeared for about 20 years or so.

Now, like many other houseplants, it is back in fashion again and can be found readily online, in garden centres and in supermarkets. It may be produced as a cluster of plants closely potted to look like a single bushy specimen about 30 cm tall, as a small pot full of small seedlings or as a single larger plant up to 60 cm tall with partially exposed roots from which a lot of the compost has been removed to create a plant reminiscent of a strangler fig or mangrove. Each of these is a skilfully produced, highly artificial creation caused by the application of growth regulating chemical treatment during production. This shortens the internodes making the nodes crowded on the stems and dwarfs the foliage. Although the growth regulators concerned were developed for use in agriculture where they are routinely used on wheat or rice to reduce wind damage by making the stalks shorter and stronger, their use on nursery stock, especially in Holland, has become integral to the production of compact saleable plants of many kinds.

As a house or conservatory plant *Radermachera sinica* will prefer a cooler room to a hot one and thrives best in a well-lit position out of direct sunlight and away from any heat source. It has a lot of foliage which easily becomes desiccated and drops if it loses water more quickly than it can take it up, so it is best not to let the compost dry out completely between waterings; feeding with a houseplant fertiliser with alternate waterings is beneficial whenever it is in active growth. Whilst it thrives on being a little pot-bound it does need potting on at intervals and this is best done while the plants are growing. Loam based composts or those based on peat-substitutes being equally suitable. The dwarf habit can only be maintained indefinitely by the application of chemical growth regulators which are not

© 2022 The Authors. *Curtis's Botanical Magazine*
published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.



Fig. 1. Mature tree of *Radermachera sinica* flowering in Hackney, London. Photograph Sandra Bell.

© 2022 The Authors. *Curtis's Botanical Magazine* published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

available to the public in all parts of the world. In China they are sold frequently in small sachets but they are not registered for use by amateur gardeners in the UK.

Not all species of plant grown with regulators outgrow their influence when the treatment ceases but *R. sinica* most certainly does and after a year or so the transformation begins and is very enjoyable to watch. Each new internode grows a little longer and each pair of new leaves has a wider span. After two years a plant which was 30 cm tall may well be 1.5 m and growing. Once this stage is reached, I find that potted plants grow best standing outside except when frost is threatened when they are brought into an unheated porch.

Although *Radermachera sinica* has not been considered suitable for planting outside in northern Europe, it is grown in parts of the United States, Australia, New Zealand and Asia. In climates cooler than those where it originates it does not grow as quickly or as large as it would do in the wild but still flowers profusely.

A few other species of *Radermachera* are cultivated in subtropical climates (Barwick, 2004). *R. gigantea* (Blume) Miq. from Assam to Malaysia has large pinkish flowers; it forms a tree to 40 m tall, tolerant of strong wind. *R. hainanensis* Merrill from southern China, Cambodia, Laos and Thailand has golden-yellow flowers.

Propagation. The home grower may easily increase their stock by carefully dividing the multiple stems that normally comprise one potted houseplant, and it may also be propagated from cuttings or by seed.

Tip cuttings of about 15 cm long taken from non-flowering growth in September root readily with a little bottom heat especially if taken from the occasional shoot with three leaves at each node instead of the usual two. The fully grown foliage is unwieldy and best trimmed to two leaflets on each petiole. The new roots can be quite brittle and repay care when handling and potting.

Most commercially produced plants in Europe are grown from seeds which are sometimes available in the UK either online or from catalogues. Whilst they are not supposed to be

© 2022 The Authors. *Curtis's Botanical Magazine*
published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

difficult, I have not yet succeeded in germinating them or seeds from the tree growing in Hackney which are produced in great profusion.

In 2006 the landscape architect John Medhurst found and identified a plant of *Radermachera sinica* growing and flowering unprotected in Brixton, London. In 2017 another much larger one was found in Hackney, East London (Bell, 2018). Both had been bought as houseplants and planted outside after outgrowing their indoor accommodation surviving against all the odds. It is known that the Hackney tree had grown outside since the mid-1980s and has now reached a height of over 10 metres. It is a glorious sight in full flower throughout the summer and autumn. The white flowers are said to smell like carnations in the evening (Barwick, 2004), and in the morning to be filled with white, bubbly shaving foam-like liquid. The pollinators of



Fig. 2. Upper branches of a mature tree of *Radermachera sinica* flowering in Hackney, London. Photograph Sandra Bell.

© 2022 The Authors. *Curtis's Botanical Magazine* published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

this species do not seem to have been recorded, but a photograph on efloraofindia.com (2022) shows purple sunbirds (*Cinnyris asiaticus*) visiting the related *Radermachera xylocarpa* (Roxb.) Roxb. ex K.Schum. The white, long-tubed evening-scented flowers of *R. sinica*, however, would suggest moth or bat pollination.

Although the London microclimate is often favourable for growing plants that are not considered fully hardy elsewhere neither of these is in a sheltered position and the Hackney tree (Figs. 1, 2.) is particularly exposed being at the side of a busy road (Bell, 2018).

With this in mind, *Radermachera sinica* could have quite a future as an accent plant in bedding schemes, lifted for the winter in colder areas like many palms but left *in situ* in milder ones. It would also make a lovely addition to the many enclosed town gardens with a lush, sub-tropical foliage theme. Perhaps these two examples show that it is time to take advantage of the ready supply of Dutch produced radermacheras and grow them on for eventual planting out.

Radermachera sinica (Hance) Hemsl., Hooker's Icon. Pl. 28: t. 2728 (1905).

Stereospermum sinicum Hance, J. Bot. (British and Foreign) 20 (n.s. 11): 16 (1882). Type: In provincia Cantonensi, secus fluvium Lien-Chau, m, Januario 1879, fructiferum obvenit amico *Dri. C. Gerlach* (herb. propr. n. 20797). (syntypes: K).

Radermachera tonkinensis Dop, Bull. Mus. Natl. Hist. Nat. 32: 233 (1926). Type: Tonkin.: Kien Khé, Ban Phet (H. Bon, 2710, 2753, 2420) *Poilane 10859*. (syntypes: P).

Radermachera borii C.E.C.Fisch., Bull. Misc. Inform. Kew 1940: 197 (1940). Type: Assam. Naga Hills, Kohima and Khonoma, 6000 ft, *Bor 2699*. (syntypes: K).

Description. *Evergreen tree* to *c*. 10 m. *Leaves* opposite or in threes, shining green, triangular in outline, 3-pinnate, with around 4 main pairs of pinnae, rhachis *c*. 30 cm long: leaflets narrowly ovate, acuminate, the lateral to 4–7 × 2–3.5 cm, the terminal to 8.5 cm long. *Inflorescence* an erect, lax, few-flowered, terminal panicle, 25–35 cm long. Flowers white to pale yellow, carnation-scented in the evening; calyx 1.8–4 cm long, 5-lobed, with short obtuse teeth, c. 12mm long; corolla 8–13.5 (–15) cm long, tubular at the base for 4–8 cm, open at the apex with 5 rounded, crenulate lobes, 2–4 cm long, 3 cm wide; staminode 1; *stamens* 4, 2 long and 2 shorter, attached in the mouth of the corolla, each with a sharp point and a pair of declinate anthers. *Style* long, slender exserted;

© 2022 The Authors. *Curtis's Botanical Magazine*
published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

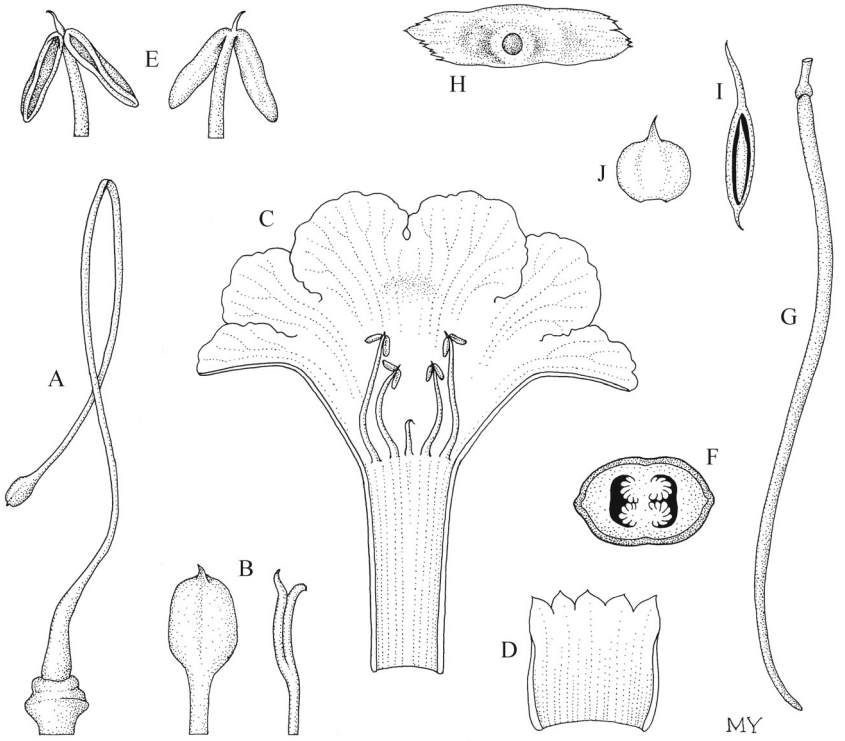


Fig. 3. **Radermachera sinica**. A, style and ovary, ×1; B, stigma, 2 views, ×3; C, corolla, opened out, ×1/2; D, calyx, opened out, 1/2; E, apex of stamens and anthers, 2 views, ×3; F, t/s ovary, ×6; G, capsule, ×1/5; H, seed, with wing, ×2; I, l/s seed with wing, ×6; J, ovule, ×6. The scales are for 110 mm line width. Drawn by Masumi Yamanaka from a specimen flowering in London.

stigma 2-lobed. *Capsule* linear, often twisted, pendulous, 35–85 cm long. 1–1.5 cm across. *Seeds* with flat, toothed wings, *c*. 2 cm long. (Fig. 3).

Distribution. NW India, Bhutan, Assam, N. Myanmar, Vietnam, south China, Taiwan,

Habitat. Forests, riverbanks and bushy slopes, 300–1800 m.

Flowering Time. May to September.

REFERENCES

Barwick, M. (2004). *Tropical and Subtropical Trees*. A Worldwide Encyclopaedic Guide, Thames and Hudson, London.

Bell, S. (2018). At Large in London. *The Plantsman* 17(2): 112–113.

efloraofindia.com (2022). (Accessed 29 June 2022).

Hemsley, W.B. (1905). *Radermachera pentandra*. *Hooker's Icones Plantarum* 28: pl. 2728.

© 2022 The Authors. *Curtis's Botanical Magazine* published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.

POWO (2022). Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; http://www.plantsoftheworldonline.org/ (Accessed 13 July 2022).
Zhang, Z. & Thawatchai, S. (1998). Bignoniaceae. In: Wu, Z. & Raven, P.H. (eds). *Flora of China*. Vol. 18. Science Press, Beijing & Missouri Botanical Garden Press, St Louis. pp. 213–225.

© 2022 The Authors. *Curtis's Botanical Magazine*
published by John Wiley & Sons Ltd on behalf of The Board of Trustees of the Royal Botanic Gardens, Kew.