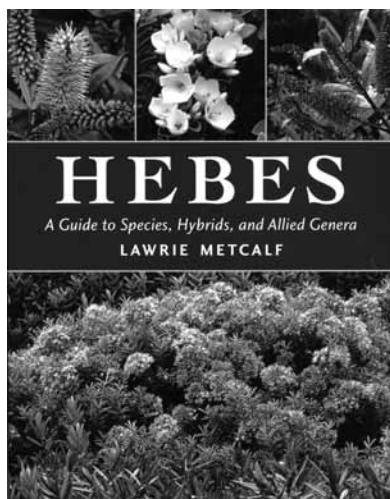


Book Reviews

Hebes, A Guide to Species, Hybrids, and Allied Genera

By Lawrie Metcalf, published by Timber Press Inc, The Haseltine Building, 133 SW Second Avenue, Suite 450, Portland, Oregon, USA, 2006, 260 pages, ISBN-13: 978-0-88192-773-3, ISBN-10: 0-88192-773-2.



I bought my first hebe in 1980, and my interest soon spread to other New Zealand plants. So I soon bought a second hand copy of Lawrie Metcalf's *The Cultivation of New Zealand Trees and Shrubs* (republished in 2000 as *New Zealand Trees and Shrubs*). This has been a constant companion, with its mixture of horticulture and botany, presented in a clear, thoughtful and comprehensive way. There was the pleasure of anticipation when I heard that Lawrie was proposing to write a book on growing hebes, the first by a New Zealander.

The book describes more than 365 species, subspecies, varieties and hybrids of *Hebe* and related species. It is illustrated with 135 colour photographs and 17 line drawings. In Chapter 1, Hebes in New Zealand, Lawrie sets the scene. He points out the premier place that hebes have in their native land, both in the gardens and countryside. They even have their own society. *Hebe* is the largest genus of flowering plants in New Zealand, with more than 100 species – although various parts have been separated into *Parahebe*, *Chionohebe*, and controversially into

Heliohebe and *Leonohebe*. The author shows how New Zealand's climate plays its part – subtropical in the far north through to temperate in the far south. It is surrounded by oceans which give a much more even climate than experienced in the UK. In the section 'Where Hebes are Found' Lawrie points out that hebes are found in all environments throughout their native land, from seaside to mountainside. But in very few places will there be a great variety of hebes, as most hebes are local in their distribution. Indeed he states that '...it is amazing how far one may travel in New Zealand without observing a single hebe in the wild'.

Lawrie looks at each habitat in turn describing its characteristic hebes. Thus *Hebe elliptica* is found growing on the coasts of the South Island. The large river valleys within mountain ranges have *Hebe odora* and *Hebe subalpina*. In alpine grasslands the whipcord hebes grow; while *Hebe vernicosa* occurs in the forests of the Nelson area, and the grey-leaved *Hebe pinguifolia* is an inhabitant of the dry mountain ranges to the north-east of the South Island.

Next he describes the features of *Hebe*: the variation in size, the arrangement of leaves, the prominent terminal leaf bud, and the presence or absence of a gap (sinus) at the base of the leaf bud. Some drawings to illustrate these points would have been useful. The related genera of *Heliohebe*, *Heohebe*, *Parahebe* and *Chionohebe* are described. This is followed by sections on the discovery of hebes, early breeding of hebes, and finally the classification of *Hebe* into ten informal groups.

Chapter 2 is entitled 'Hebes Around the World'. Here a number of Hebe Society members give their assessment of hebe growing in the UK, North America, Europe and Australia. Tony Hayter looks at hebe growing in the UK, where hardiness, the Hebe Society and the plethora of new hebe cultivars are mentioned. Neil Bell and

Tom Saucedo look at hebes in North America. Hebes can only be grown in gardens in California or the Pacific Northwest, and do particularly well near the coast. Elsewhere it is either too hot in summer or too cold in winter, or both; there hebes are being sold as pot plants. Claudio Cervelli describes hebe production and use in a wide variety of climates in Europe. Melanie Kinsey says that hebes have been grown in Australia for many years, especially in Victoria and New South Wales. They are much used for landscaping and warrant their own section in many nurseries.

Chapter 3 deals with the cultivation of hebes. You would regard growing hebes in their native land as easy, but Lawrie points out the traps for the unwary. Hebes bought as a tight ball, if left to their own devices, become leggy, so they do need regular pruning and dead-heading. Hardiness is rarely an issue in New Zealand, as its winters are relatively mild, compared to the UK. They appreciate good drainage and a top-dressing of mulch, and do well in either sun or semi-shade. Hebes grown in containers need good drainage, feeding with a slow-release fertiliser, and a yearly potting on, or root pruning. Those grown in open ground require much less attention, but watering might be necessary in dry periods. Any fertiliser should be applied to the surface then worked into the soil, so that it is available to the plant.

Chapter 4 covers the propagation of hebes. They grow readily from seed, but as hebes so easily cross-pollinate the result may not match expectations. Semi-hardwood cuttings are best taken in early autumn, preferably from the sides of the plant. Lawrie then discusses the rooting of whipcord hebes and growing hebes as standards.

Chapter 5 deals with growing hebes in different situations in the garden. He considers how the habitat that a hebe grows in shapes its character, e.g., *Hebe odora* grows well in wet soils, but has to withstand high moisture loss due to

strong winds, and *Hebe pinguifolia* has waxy glaucous leaves to cope with dry conditions. The author shows which hebes are suitable for hedges, rock gardens, ground cover, dry places, shady places, coastal areas, and damp conditions.

Chapter 6 is about the pests and other problems, and how to deal with them. Fortunately hebes don't have too many problems; the key is to have healthy hebes. Insect pests include aphids, spittlebugs, leaf-rolling caterpillars and the Hebe gallery fly – the last one occurs just in New Zealand. Next come the fungal diseases, downy mildew, fusarium wilt, phytophthora root rot, and septoria leaf spot – Lawrie outlines the methods of controlling these. Lastly he lists the physical problems that can affect hebes; drought, frost damage, poor flowering, wind scorch and rabbits etc. Drought is more of a problem for plants in containers, so vigilance is needed. To prevent frost damage mulching and a protective cloth help. Lastly, poor flowering is a more complex problem with a number of possible causes.

Chapter 7 is the largest and deals with *Hebe* species and associated cultivars. The species are arranged alphabetically, which makes finding a hebe very easy. However this arrangement does not group related species, which makes comparisons more difficult. The description of each hebe starts with its particular characteristics, and its relationship to other hebes, and may include notes on the various forms available, the plant's history, and its habitat. Each entry concludes with a detailed description and notes on its distribution. One that caught my eye was *Hebe* 'Swamp', the temporary (or tag) name for a species that grows in the Hikurangi Swamp near Whangarei, in the North Island. It has affinities with *Hebe bishopiana* and *Hebe stricta*, with mauve flowers.

Chapter 8 covers *Hebe* hybrids and cultivars not directly assigned to a species, and each is briefly described. Most of these plants will be known to regular readers of *Hebe News*, but a number will not, as the book includes cultivars from New Zealand and Australia. For instance *Hebe* 'Flame' has an

intriguing name; it's similar to *Hebe* 'Carnea'.

Chapter 9 covers the *Hebe* relatives: *Heliohebe* (the paniculate hebes, *Heliohebe hulkeana*, *H. lavaudiana*, *H. raoulii* and *H. pentasepala*, and their hybrids *Heliohebe* 'Fairfieldii' and *H.* 'Hagley Park'), \times *Heohebe* (crosses between *Hebe* and *Heliohebe*), *Parahebe* and *Chionohebe*. The book concludes with a glossary and index.

This book is a worthwhile addition to those already published on hebes. The range of topics covered is wide. The text is clear and comprehensive, the photographs good and useful. I will be sure to keep it within easy reach.

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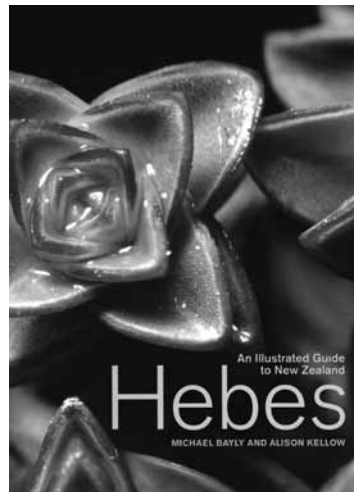
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We thank Tony Hayter for his permission to reproduce a version of his review originally published in *Hebe News*, 2006, Vol. 21, No. 3.

Lawrie's book was also reviewed in *The Plantsman* (published by the RHS), Vol. 3, Part 3, in September 2006.

An Illustrated Guide to New Zealand Hebes

By Michael Bayly and Alison Kellow, published by Te Papa Press, PO Box 467, Wellington, New Zealand, 2006, 388 pages, 28.5 x 20.5 cm, ISBN-13: 978-0-909010-12-6, ISBN-10: 0-909010-12-9.



The September 2002 issue of *Hebe News* carried an article by Mike Bayly describing current research into the genus *Hebe*. This research

aimed to deliver a range of scientific papers, an interactive computer-based key for the identification of species, and an illustrated guide.

The guide covers the identification, classification and biology of *Hebe* and the closely related genus *Leonohebe*. It describes 88 species of naturally occurring *Hebe* and five of *Leonohebe* (*L. cheesemani*, *L. ciliolata*, *L. cupressoides*, *L. tetrasticha* and *L. tumida*), but no horticultural forms. Each plant is illustrated with between six and 13 colour photographs; these show the whole plant, branchlet, leaf bud, leaf, inflorescence, flower and capsule. The authors describe each plant in detail including: habit, branches, leaf bud, leaves, inflorescences, bracts, flowers, pedicels, calyx, stamens, ovaries, capsules and seeds. The distribution and habitat are then given, followed by notes on its relationship with other hebes. Finally the etymology (origin of the name) is described.

The book is in three parts: A – general chapters, B – identification, description and nomenclature of each plant, and C – appendices, glossary, references and an index.

In the Introduction the authors point out that *Hebe* is New Zealand's largest genus, and is particularly conspicuous in the subalpine and alpine regions. Hebes occupy a wide range of habitats, from the coasts to the mountaintops, and have a wide range of forms, from whipcords with tiny leaves to large-leaved shrubs. Many of the species are similar in appearance, and can be variable in form, which has given hebes a reputation as a difficult group to study. It was thought that hybridisation between species is common, but the authors point out that this has been exaggerated, so that with care, and the use of a hand lens, most plants can be identified.

The last complete survey of *Hebe* was in the *Flora of New Zealand, Volume 1*, 1961. Research since that time has described further species, revealed possible new taxa, and raised questions about the limits of known species. The research project was planned to try to resolve these questions, to

undertake a biosystematic revision of the genus, and to look at the evolution of the species. However in 1993 the paniculate group (*Hebe hulkeana*, *H. laudiana*, and *H. raoulii*) was given generic status as *Heliohebe* and is not included in the book, which is a shortcoming. Eleven species have been described since publication of the *Flora*, eight species are reinstated (they were not regarded as such in the *Flora*), and five hebes previously classified as species have been discarded.

The second chapter covers the classification and evolution of *Hebe* and *Leonohebe*. Previously *Hebe* had been placed in Scrophulariaceae, the antirrhinum family; but recently the Angiosperm Phylogeny Group regard it as a member of the Plantaginaceae, the plantain family. The history of the discovery, description and classification of *Hebe* species is given. From 1984 various authors have classified *Hebe* based on evolution, at first using the form of each species and latterly DNA derived data. This supports the idea that *Hebe* is derived from *Veronica*; relationships within *Parahebe* and *Chionohebe* are complex, with most hebes descending from a common ancestor, although *Hebe macrantha* is less closely related. The supposedly close relationship of *Hebe odora* and the whipcord hebes is not supported, and the whipcords fall into several groupings. The classification and naming of species included in *Veronica* and *Hebe* is in a state of flux, so further research is needed to resolve these problems. The classification of species within *Hebe* is based on the *Flora*, although a number of changes have been made based on recent but incomplete research.

The third chapter describes distribution, habitats and biogeographic history of *Hebe*, which occurs throughout New Zealand and its outlying islands. It is found in most habitats (coastal, near-coast forests, lowland wetland, riverside, cloud forest, beech forest, lakeshores, subalpine scrub, grassland and rocky areas in subalpine to alpine regions), although it is thinly distributed in

forests. The number of species in each area varies widely throughout New Zealand, with the maximum number of species (25) in mountains at the borders of Nelson, Marlborough and Canterbury. Here there is a wide range of habitats. Research shows that *Hebe* arrived in New Zealand 1.5–5.5 million years ago, probably in an alpine region; it formed new species in this region and this was followed by a spread to lowland areas. Hebes are able to colonise over long distances, and one species (*Hebe elliptica*) extends to the Falkland Islands. The limited changes in DNA confirm the recent origin of *Hebe*, but more research is needed to pin down exact relationships within *Hebe*.

Phil Garnock-Jones has contributed the fourth chapter, which examines the structure of *Hebe* species. Hebes form an extensive system of fibrous roots, which might explain why they rapidly exhaust the compost in pots. Many hebes have a bushy habit, due to branching of the stems. These often have noticeable nodes, i.e., where leaves have been attached. Leaves have a decussate configuration; where opposite pairs of leaves are at right angles to their neighbours. A large leaf bud is a common feature. The leaf sinus, the gap between the bases of the terminal pair of leaves, can be useful in identification, although it can be present or absent within one species, e.g., *Hebe pinguifolia*. Flowers are usually found as a simple lateral raceme. Other features he discusses are: hairs, calices, corollas, androecium, pollen, gynoecium, seeds, seedlings, juvenile forms, and flower development.

Ken Markham has written the fifth chapter on flavonoids (leaf pigments) in *Hebe*. Over 80 flavonoids have been found in *Hebe*, and each species has its own (occasionally well-defined) flavonoid profile, giving it the characteristics of a fingerprint. The profile varies within each species, but this is much less than that displayed between species. This analytical method has been used to explore the relationships between species, and can be used to define hybrids and their parentage.

Chromosomes are the topic covered by the authors in the sixth chapter, where there is a comprehensive compendium of chromosome numbers for *Hebe*. The variation of these throughout the genus is examined, and work to unravel the ancestry of hebes is mentioned.

In the seventh chapter Phil Garnock-Jones considers the reproductive biology of *Hebe*. Some aspects have been studied, e.g., maintenance of gynodioecy (some flowers having male and female reproductive organs, while others have just female organs), breeding systems for *Hebe stricta*, *H. subalpina* and *H. strictissima*, and seed shape. However we have little knowledge of the breeding systems of most species, their pollinators and development of flowers. *Hebe* flowers are structurally similar, although there is a great diversity in size and detail, but all lack the nectar guides of *Parahebe*. The dominant flower colour is white, although some species have strong colours, e.g., magenta in *Hebe speciosa*. Most hebes flower in spring or early summer, with individual flowers lasting from 2–5 weeks in *Hebe strictissima* and 2–3 days in *H. pinguifolia*. Pollinators are a wide range of insects, although *H. speciosa* is visited by birds.

In the eighth chapter Peter de Lange describes the conservation status of *Hebe*. Peter and co-workers have developed a system to classify the conservation status of New Zealand native plants; this distinguishes between plants that are under threat from human activities, and those that are local or uncommon. *Hebe* is the largest genus in New Zealand, but few are greatly at risk. 'Acutely Threatened' is the highest risk category and this contains nine species of *Hebe* and one of *Leonohebe*. Plants in this category are considered management priorities. This category is further divided into three, with the highest risk being 'Nationally Critical', in which are included *Hebe brevircemosa* and *H. societatis*. The former is an island endemic and the latter has apparently very local distribution in peninsular (between alpine and

subalpine) grassland. Peter then outlines the risks facing hebes, many of which are of very limited distribution.

The final chapter in Part A is on cultivation. There is a summary of cultivation requirements, a list of books on hebes, a mention of the Hebe Society and a photograph of hebes for sale at a New Zealand garden centre.

Part B, the largest section of the book, starts with a chapter on Material and Methods. Plants were studied in the field, and as herbarium specimens and cultivated plants (of known origin). The authors have arranged the species into groups similar to those in the *Flora*, although with significant differences. Within each group similar species are placed together. Next there is a list of the characteristics. These are used to describe each species and are: habit and form, branches, leaves, juvenile leaves, inflorescences, flowers, pedicels, corolla, stamens, nectarial disc, ovary and style, capsules and seeds.

Taxonomic Treatment gives a synopsis of the eleven groups (nine for *Hebe*, two for *Leonohebe*) used for identification. Each group is colour coded, and the distinguishing features listed. In describing these groups I have given some of the more well known examples in each.

The first group described are the 'flagriformes' (whipcords). There is a key to the hebes in this group, and then each plant is portrayed with a page of text and a page of illustrations. There are nine species including *Hebe armstrongii*, *H. hectorii* and *H. ochracea*.

The second group is the 'Connatae' (pairs of leaves are connate, joined at base). This group has seven species including *Hebe epacridea* and *H. haastii*.

The third group is the 'Subcarnosae' (somewhat fleshy), which has dull, grey-green, waxy, often fleshy leaves and usually no sinus. This group has seven species including *Hebe buechananii*, *H. gibbsii* and *H. pimeleoides*.

The fourth group is the 'Occlusae' (closed, i.e., no sinus), which has

glossy or dull, but not usually glaucous, leaves (except in *Hebe albicans*, *H. glaucophylla* and *H. topiaria*). There are 31 species, and these include *Hebe albicans*, *H. macrocarpa* and *H. stricta*. Here *Hebe recurva* has been included with *H. albicans*, as recent research has shown that the latter is very variable and no clear grounds could be found to separate them.

The fifth group is the 'Buxifoliatae' (box-leaved, a former name for *Hebe odora*). The leaf sinus is shield shaped, each flower is directly attached, i.e., no flower stalk). There are four species, and these include *Hebe odora* and *H. pauciramosa*.

The sixth group is the 'Small-leaved Apertae' (conspicuous leaf sinus). The sinus is narrow; the leaves are less than 4 cm long. There are 20 species and these include *Hebe diosmifolia*, *H. elliptica* and *H. venustula*.

The seventh group is the 'Large-leaved Apertae' (conspicuous leaf sinus). The sinus is narrow; the leaves are greater than 4 cm long. There are eight species and these include *Hebe salicifolia* and *H. speciosa*.

The eighth group is the 'Grandiflorae' (large flowers). The leaves have noticeable teeth. There is one species, *Hebe macrantha*.

The ninth group is the 'Pauciflorae' (few flowers). This is a low-growing subshrub with leaves narrowing to a conspicuous leaf stalk (petiole). There is one species, *Hebe pauciflora*.

The tenth group is *Leonohebe* section *Leonohebe* (semi-whipcords). The plants are low-growing subshrubs, with leaves overlapping the stems. There are four species and these include *Leonohebe cheesemanii* and *L. tetrasticha*. These were formerly included in *Hebe*.

The eleventh group is *Leonohebe* section *Aromaticae*. A bushy shrub, with glaucous leaves widely spaced. There is one species, *Leonohebe cupressoides*, which was formerly included in *Hebe*.

A chapter on nomenclature follows. It considers the naming at all

levels, from the genera *Hebe* and *Leonohebe*, through species to possible wild hybrids to horticultural forms. Finally there is a list of common and Maori names.

Part C, Indices, has an appendix which lists informal hebe names used by Audrey Eagle in her books, and by A. P. Druce in two checklists. The second and third appendices describe the variation in some characteristics of *Hebe hectorii* and *H. lycopodioides*. The fourth appendix illustrates the considerable variation in the size and shape of the leaf outlines of 40 *Hebe* species. The fifth appendix lists the sources of the plant specimens used in the photographs of hebes and leonohebes. The book ends with a list of references, a glossary and an index.

This is an excellent book. The authors have succeeded in presenting a huge quantity of data which shows the current understanding of *Hebe* and *Leonohebe*. The language used is of necessity technical, but the glossary helps the attempts of an amateur botanist like me to understand it. The quality of the text, layout and photographs throughout is very high.

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