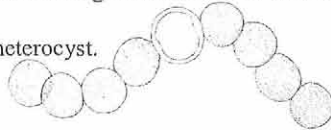


It was a treat to have guidance, both in the field and later in the laboratory, where with help we delved deeper into the detail of the specimens we had collected. Books, microscopes, advice and laboratory equipment were freely available and I for one came away from the workshop satisfied with my first effort in keying out a lichen.

Lichens are curious 'creatures'. Made up of a fungus and an alga they are brilliantly adapted to occupy and live in places where little else can. Securing nitrogen is essential to all plants, and some lichens, through a complex but brilliant relationship with cyanobacteria (blue green algae), are able to fix their own. Without needing the complex structures of vascular plants, lichens are superbly adapted as colonisers, playing a key role in the establishment of new vegetative cover. A principal player in fixing nitrogen in lichens is the cyanobacterium, *Nostoc* and so it was particularly interesting when David Galloway pointed out some 'free living' *Nostoc* in the field. In the laboratory we could clearly see its bead like structure and the large nitrogen fixing cells, heterocysts, where inert atmospheric nitrogen is converted into soluble ammonium.

Fig. Cyanobacterium *Nostoc* with heterocyst.



For convenience, lichens are grouped morphologically: fruticose lichens are branch-like e.g. *Usnea*, *Thamnolia*, *Cladonia* and the ubiquitous *Cladia aggregata*; crustose lichens include rock and bark-hugging varieties e.g. *Placopsis* and *Lecanora*, while foliose lichens are the leafy lichens e.g. *Pseudocyphellaria crocata*, *Umbilicaria* and *Sticta*.

Excellent reference books on Lichens are available (at 20% discount to Botanical Society members), from Manaaki Whenua Press, (contact details p 16 this issue)

Thanks to Jennifer, Alli and David for an excellent workshop, and to the Botany Department for the use of their facilities. - *Robyn Bridges*

Fig. *Cladia aggregata*, a common fruticose lichen



REVIEWS

Books

Botanica's Trees & Shrubs: Illustrated A - Z of over 8500 plants.

Valda Paddison and Geoff Bryant, Chief consultants.

Random House, Auckland. 2001. 928 pp plus 515 MB CD Rom.

Advised of this book by a local fellow botanist, I was told it was not to be missed, on special at The Warehouse and substantially reduced, to a mere \$35 (from \$99.95). I immediately 'phoned to be told it was sold out but, days later, another fellow local botanist told me her husband's persistence had won through and she had bought four copies at this price. I managed to talk her out of one, at the going rate and with an undertaking to review it for the Bot. Soc's newsletter. So:

This is a very impressive book by any standard. The "credits" page lists seven consultants (the chief consultant is best known as author of "The Gardener's Encyclopaedia of New Zealand's Native Plants"), 14 writers and 31 photographers (among whom Craig Potton is best known to me).

The book has a large format, and comes in a very stout box equipped with a handle (probably necessary to manage its 4.2 kg weight!). Arranged alphabetically by genus, most of the 8500+ woody plants (excluding climbers) in the main body of the book are illustrated with generally high quality colour prints that range from brilliant double-page spreads (introducing each new letter) to the size of large postage stamps. There is a paragraph to characterise each genus in relation to its size, general features, distribution, and aspects of cultivation, followed by a selection of species, with brief descriptions of natural range, habit, floral features and hardiness. The selections have been based on significance for horticulture, forestry, fruit or other products, plus evolutionary curiosity, with emphasis on temperate regions. So, not surprising, *Rhododendron*, including hybrids, takes the prize (165 entries), followed by *Eucalyptus* (122), *Grevillea* (90), *Acacia* (75), *Quercus* (72), *Pinus* (71), *Acer* (62), *Prunus* (60), *Rosa* and *Salix* (56) and *Viburnum* (49), with our largest woody *Hebe*, next with 38 entries. *Leptospermum* (24) and most of our other indigenous woody genera, including the native podocarps, also fare quite well.

Indeed, this book seems tailored mainly for a kiwi readership, with eight photos of manuka and cultivars, plus a full-page map of New Zealand. This shows generalised outlines of the four "hardiness zones" recognised here (of the 12 total for the world), and based on assumed low-temperature tolerance ("hardiness class") of the particular species. There is a huge wealth of information here and the book certainly passes the test of being up-to-date, with an entry for wollemi pine (*Wollemi nobilis*), the "green dinosaur" member of the Araucariaceae which was discovered only recently (1994) in Wollemi National Park, New South Wales.

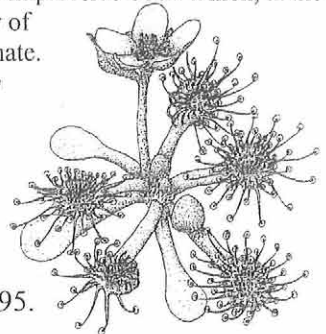
There is a diverse introductory chapter, "Versatile trees and shrubs," with sections on definitions, plant classification, geography and habitats, human uses, and growing trees and shrubs. Here a New Zealand flavour becomes more apparent. It's great to think we can justify a book of this magnitude. The last sections of the book contains a glossary and index but, in addition, a 112 page "Reference Table" with up to nine items of information documented for each of the species and cultivars from the main section of the book. It's clearly encyclopaedic in its presentation.

And the CD Rom is a story in itself. User friendly, with a very helpful "Search" function, it complements the hard copy in valuable and interesting ways. There are "Hardness Zone" maps for Australia, Canada/US and UK/Ireland here, as well as a "Plant Chooser" option which allows plant selection for one's garden on the basis of five combined factors: height, hardiness, evergreen/deciduous, cultivation (soil) preferences, and "uses" in the garden. There's also a "Garden Journal" for recording the details and fate of each woody plant you introduce to your garden, as well as a "Link to Web sites" which seems to provide for almost endless browsing.

Some mistakes or at least disagreements are virtually inevitable in a work of such magnitude but they appear to be surprisingly few. Among the native beeches though, most readers would, I hope, dispute that either red beech (*Nothofagus fusca*) or hard beech (*N. truncata*) are deciduous, as claimed (both usually retain their leaves for 13-14 months), or that they have the same low-temperature tolerance ("hardiness class"), based either on their natural or "managed" distributions. Neither could "*Nothofagus truncata* in the wild" be photographed in the "Paringa district" of the South Island, as claimed, nor *Muehlenbeckia axillaris* ever reach 1.2 m tall even in the most favourable of garden sites. These are but slight blemishes in a really impressive book which, at the price I and some others paid for it, must rank as "the buy of the century." I hope many other plant fans were as fortunate.

Alan Mark, Botany Department, Otago University

Fig. *Drosera spatulata*



Salmon, B. 2001.

Carnivorous plants of New Zealand. 303 pp.

P/back. Ecosphere Publications, Auckland. \$67.95.

Mention carnivorous plants and I think most people will let their minds wander into the jungles of the Amazon, Triffids or the realms of science fiction. So I was somewhat surprised to find a book of this size devoted to the carnivorous plants of quiet, little New Zealand. There are only twelve species here, seven in *Drosera* and five in *Utricularia*, of which only two, one from each genus, are endemic.

According to the cover, Salmon has been fascinated by these plants since childhood and this fascination is evident in his book. All aspects of the plants' ecology are covered; habitat, dispersal, distribution, etc., together with descriptions of their intriguing trapping mechanisms. These are followed by detailed descriptions and drawings of each species together with distribution maps. After each genus is a photographic essay, one hundred and twenty-one excellent photographs in total, depicting the plants in detail and in habitat. The final chapters consider their cultivation and where to find them in the wild.

Utricularia dichotoma is the only bladderwort down this way and can be found in the peat bogs on the Central Otago ranges. Its small size possibly means that it is often overlooked. Three sundews are found around Dunedin. *Drosera arcturi* is also found in the mountains of Central Otago and around Waipori, as is *D. binata*, which I have found on Swampy. The small *D. spatulata* reaches its eastern limits also in the hill bogs around Dunedin.

Carnivorous plants have long fascinated the curious and this book will go a long way towards satisfying that curiosity for our New Zealand carnivorous flora. One small question goes unanswered. *D. spatulata* is here referred to as *D. spatulata*. This is Labillardière's original name but *spathulata* has since taken over. However, *spatulata* should have precedence. I have not found it so named anywhere else so an explanation would have been helpful. At \$67.95 this book is expensive but of good quality and I