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Book review

Seeds of New Zealand gymnosperms & dicotyledons by C. J. Webb and M. J. A. Simpson. Manuka Press, Christchurch, New Zealand. 2001. Hardcover. 428 p. ISBN 0-9583299-3-1. Price NZ$90.

As the title indicates, this book is an identification guide for seeds of native New Zealand gymnosperms and dicotyledons. It treats the seeds of more than 1000 species in 255 genera and 94 families. Each species is described individually except for those in a few genera in which seeds are not distinctive enough to be discriminated at the species level. Although the title refers to seeds, the book actually treats both seeds and other persistent portions of fruits or diaspores, such as cypselas (Asteraceae) or the hard endocarps found in many genera (e.g., *Cyathodes*, *Elaeocarpus*, *Myoporum*).

The book begins with a short introduction which provides a very brief overview of some basic aspects of seed morphology and biology. The chief value of this section is that it points out areas for future research. For example, morphological features of seeds and diaspores are often suggestive of ecological functions related to dispersal, germination, or longevity; these functions have been studied for few New Zealand species. In addition, the authors found that patterns revealed by the morphology of seeds or their associated persistent structures suggest that the current taxonomic treatments for some plant groups should be re-examined (e.g., *Olearia* and *Helichrysum*).

The primary function of this book is to aid in seed identification, and this is where its strength lies. The core of the book is 359 pages of keys, descriptions of taxa, and illustrations, all focusing exclusively on seeds and associated persistent structures. The section begins with a general key to nine major groups of seeds or related structures. Each of these groups is described and provided with a key that allows seeds to be identified to genus. From this starting point, one moves to the main body of the book, where families, and the genera within them, are ordered alphabetically. Each family and genus is provided with a description of its persistent reproductive structures. Within each genus there are keys to the species, followed by species descriptions and geographic ranges. Users who work their way through the keys and descriptions will be grateful for the inclusion of a very helpful glossary that not only provides definitions of several hundred terms, but also illustrates seed shapes, embryo configurations, testa patterns, and even colours.

One of the great strengths of the book is its illustrations. There are 1750 illustrations, covering 1058 species. Of the 165 plates, 155 consist of black and white photographs, 8 of colour photographs, and 2 of line drawings. More colour plates would have been nice, but probably not worth the expense. Many of the species have been illustrated at more than one scale, to show both the entire seed and the fine-scale texture of the seed coat. Thus, illustrations range from 1× to 600×, with those at magnifications greater than about 15× represented by scanning electron photomicrographs. Species within a genus are typically grouped on the same plate and illustrated at consistent scales to facilitate comparisons. While this is generally helpful, it does mean that within genera in which seed size varies significantly, illustrations of the smallest species are sometimes frustratingly minute.

Even though the treatment presented here is extremely thorough and comprehensive, the authors acknowledge that it will often be impossible to identify species on the basis of seed characters alone. Hence they advise users to be realistic and cautious in their expectations. In spite of this natural limitation, this book will be indispensable for any scientist who is faced with the difficult task of identifying seeds collected from seed traps, animals' gut contents, or palaeontological studies. In fact, it is likely to be so useful that it will soon

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create pressure for the production of complementary volumes dealing with the native monocots and with alien species that have become established in the wild. Having such a comprehensive set of references for seed identification would surely spawn increased research in many fields. In the meantime, the present volume represents a huge first step, and it should serve as both a model and an inspiration for future, companion volumes.

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