



Adams J. 2009. *Species Richness – Patterns in the Diversity of Life*. xxii + 386 pp. Springer Verlag. ISBN 978-3-540-74277-7 (hardcover). EUR 139.05.

The spatial patterns and controls on biodiversity are a compelling scientific issue; mapping and understanding latitudinal gradients in species richness and biodiversity 'hotspots' is a major topic of biodiversity studies; the subject of plant diversity – climate interaction is of major importance for land management practices; extinctions in the past may offer insight into what may occur in the future under climate change and habitat loss. For those who are interested in these items, this book offers a comprehensible overview of the ecology and biogeography of species richness. It examines the state of current understanding of species richness patterns and their explanations and deals with diversification and extinction, the conservation of species richness, and the difficulties of assessing how many species remain to be discovered. Major trends in species richness are described, along with uncertainties in current knowledge. The various possible explanations for past and present species patterns are discussed and explained. The implications of global climate change and habitat loss are considered, along with current strategies for preserving what we have.

Prefacing with the aims of the book, Chapter 1 opens with setting the stage, formulating the scope of the book and the basic concepts, followed by basal patterns and explanations. The second chapter dives into latitudinal gradients, describing major features of the striking gradients in species richness, exceptions to the rule, explanations, major theories and test implications. The following chapter plumbs the depth of time, including the nature of the fossil record, broad timescale diversity patterns, ecosystem changes during mass extinctions and glaciations and their influence on species richness. Several paragraphs are devoted to the impact of ice ages, also focussing on tropical rainforests. Chapter 4 considers hotspots and local scale patterns in species richness, also in relation to island biogeography and long term stability. Although the Amazon basin is taken as an example of a tropical hotspot, a special intermezzo is devoted to the diversity of dipterocarps. Chapter 5 is an account of the human impact on species richness in history and prehistory, with interesting discussions on waves of extinctions and the coincidence with human arrival. Chapter 6 looks at the limitations and uncertainties on current estimates of richness, the last frontiers of species diversity and the process of identifying new life forms. It is interesting for taxonomists to learn an ecologist's view on the topic and our trade. Although (evolutionary) history is a topic in the former chapter, here any reference to phylogenetic diversity is conspicuously missing. The last two chapters cover current habitat and global change, including the greenhouse effect, and the race to preserve what we still have, including parks, gene banks and laws.

All in all, this book is most informative with many references to tropical biodiversity.

M.C. Roos

Cappers RTJ, Neef R, Bekker RM. 2010. *Digital Atlas of Economic Plants*. Groningen Archaeological Studies 9, Vol. 1: v + 527 pp.; Vol. 2A & 2B: v + 1508 pp., more than 10 000 colour pictures. Barkhuis Publishing & Groningen University Library, Groningen, The Netherlands. ISBN 978-90-77922-59-0. Price: EUR 325.

The Digital Atlas of Economic Plants, published both as a three-volume book and as website, contains information on more than 3 953 plant species with economic value as food, spice, medicine, stimulant, poison, fibre, tannin and construction material. The first volume consists of an introduction, a comprehensively illustrated glossary in English, German and Dutch, followed by an index of scientific, pharmaceutical and vernacular names, the latter in eleven languages, including Chinese and Arabic, both in their own script as in transliteration. The Volumes 2A and 2B contain the photographs of economic plants, arranged in family, in alphabetic order. The focus of the images is on fruits and seeds, but for quite a number of species other plant parts of economic importance are displayed, such as roots, stems and leaves. Images of wood and flowers are generally lacking. Even though wood is their commercial product, important timber families like *Dipterocarpaceae* and *Meliaceae* are only represented by their fruits and seeds. Similarly, on the *Hyacinthaceae* pages we find only images of bulbs, which might be useful for traders, but not for gardeners. Most seeds and fruits are photographed from different angles. The scale of each object differs, but they always come with a scale bar. There is no distinction between wild and cultivated species. The temperate parts of Asia are best represented with 1 568 taxa (48 %), followed by Europe (31 %), Africa (29 %), tropical Asia (24 %), North America (20 %), South America (16 %), Australasia (10 %) and the Pacific (2 %).

Use descriptions are limited to 12 categories (food, food additive, medicine, bee plant, fuel, etc.), represented by symbols without further details. For plant families, the authors followed the recent phylogenetic classification of flowering plants (the APG-system). The family indices are provided in Volume 2A and 2B. They used the database of the USDA Germplasm Resources Information Network (GRIN) as a reference for the scientific names of plant species. Unfortunately, this information is not always accurate, specifically for lesser known species from tropical Africa and South America. A few species are wrongly identified, such as the white flower on page 419, which represents the African *Costus dubius* instead of the South American *C. spiralis*. And the round fruit on page 1403 (nr. 18467) is not *Solanum melongena* but *S. macrocarpon*.

These are, however, just minor flaws. The beautiful images in this Atlas are a feast for the eye, both for specialists and non-specialists. The Atlas and the website are very suitable for educational purposes. Their visual content and the original presentation of plant parts used in daily life will appeal to students and school children. Some images will make you smile, such as the dog chew device made of *Luffa aegyptiaca* fibre or the obscure Pakistani cosmetics made of *Phyllanthus emblica*. The numerous indices and the detailed images of plant fragments as they are found in herbal medicines makes this Atlas very useful for pharmacologists, ethnobotanists and people working with natural products. Ethnologists, museums and handicraft lovers will also be fascinated by these books, as it displays interesting jewellery and crafts made from seeds, fibres and fruits.

Purchase of the book grants access to the protected parts of the website (<http://www.plantenatlas.eu>), which contains all images in the book on a large scale. Here you can search for plant images using different keys (scientific name, pharmaceutical name, vernacular name, taxonomy, use, geographical location and measurement). Keys can also be combined, so you can search for all seeds of African poisons or all fibre-yielding plants in the *Malvaceae* family. This book is a must for any herbarium, museum or research institute with an interest in economic plants.

T. VAN ANDEL

Corlett RT. 2009. *The Ecology of Tropical East Asia*. 272 pp., 40 line & 70 b/w halftone illus. Oxford University Press. ISBN 978-0-19-953246-9 (paperback). Price: GBP 29.95. ISBN 978-0-19-953245-2 (hardcover). Price: GBP 65.

The prospects of biodiversity in Tropical East Asia are rather gloomy. The area houses one billion people and faces massive human impact from its rising population and rapid economic growth. It has already lost more than two-thirds of its forest cover and has very high rates of deforestation and logging. Another harsh problem is that the flora and fauna have suffered dearly from a burgeoning trade in wildlife products, threatening many species as a direct consequence of human exploitation. Nevertheless, the region comprises global hotspots, still supporting an estimated 15–25 % of global terrestrial biodiversity, which makes it a key area for conservation and sustainable development. In order to be able to take effective and efficient actions in this respect, a sufficient understanding of the ecological patterns and processes in the region is a prerequisite. However, information is currently scattered among a large number of elusive publications in several different languages. And standard textbooks, like Whitmore's Tropical rain forests of the Far East, are already 25 or more years old.

The Ecology of Tropical East Asia describes the terrestrial ecology of the entire East Asian tropics and subtropics, from southern China to western Indonesia. It explores the elements that foster the region's richness of plant and animal species and the ecosystems they inhabit, as well as the various threats facing the survival of biodiversity and the options for conservation, including deforestation, hunting, climate change, logging and resource extraction. It synthesises literature, and summarizes the background knowledge and context of the region's ecology, aiming to be a text book for senior undergraduate and graduate level students and a reference book for professional ecologists, conservationists, and interested amateurs. The first chapter summarizes the environmental history, at a geological as well as an human time scale, including climate and land use. The second chapter deals with the present physical geography of climate and soils, presents an overview of 25 main natural and agricultural vegetation cq. habitat types and ends with a discussion of vegetative and reproductive phenological phenomena. The third chapter is an account on biogeography, dealing with biogeographical regions, transitions to adjacent regions (Palaeartic and East Malesia), species richness and spatial biodiversity patterns, and subdivision of the region. A large part is devoted to island biogeography and qualitative descriptions of the various archipelagos in the region. No attention is paid however to phylogeny and historical biogeography, taxon patterns, quantitative spatial analyses, nor to hotspots. A much more complete view, including notes on phylogeny and community assembly, is presented in the fourth chapter on the Ecology of Plants. It treats the various biological phenomena of establishment, growth, survival and reproduction of trees from seed to the next generation seed. Additional brief accounts deal with other typical life forms. Chapter 5 is on the Ecology

of Animals, focussing on foods and feeding. A large part concerns the various ways plants provide food for animals: e.g. different types of herbivory, nectar and fruit eaters. Chapter 6 deals with energy and nutrients, the latter of course often in reference to plant life. The last two chapters are devoted to the biodiversity crisis, i.e. threats to Biodiversity and conservation: Saving All the Species. Setting the stage by a warning about the degree of accuracy of figures in this context, the threats are positioned as they should be within the total biological and societal context of sustainability and subsequently 13 major threats are discussed separately. Conservation issues discussed include financial aspects, protection measurement, human usage, global threats, and restoration and regeneration, all in all providing a nice overview of these aspects, with the conclusion that high human population densities, continued population growth, rural poverty, corruption, and globalized markets will present obstacles for conservation but that the chief aim for conservationists should be to safeguard existing protected areas from further degradation.

One final remark. Plants and animals figure throughout the book, but the lemma 'fungi' does not appear in the index; the only related lemmas being fungal pathogens and mycorrhizae, especially in the context of the ecology of trees and the take up of nutrients. This may reflect the state of our knowledge, but it would have been appropriate in the context of this book that more attention was paid to this major clade, or at least this serious knowledge gap. Nonetheless, it gives a good introduction to tropical biodiversity from an ecological point of view.

M.C. Roos

Gillman M. 2009. *An Introduction to Mathematical Models in Ecology and Evolution – Time and Space*. 2nd edition. 168 pp. Wiley & Sons / Blackwell. ISBN 978-1-4051-7515-9 (softcover). Price: GBP 29.95. ISBN 978-1-4051-9489-1 (hardcover). Price: GBP 75.

Many books on ecological modelling rely on very complex mathematics, resulting in students and researchers shying away from investigating the potential uses of ecological models and their methods of construction. This book assumes only basic mathematical knowledge while covering a wide variety of methods; the text uses case studies to show how a relatively small set of techniques of model construction can be used in a wide range of important applications. Understanding of the text only requires familiarity with the basics of manipulation of algebraic equations, logarithms and powers, differentiation, variance and standard error, and significance and hypothesis testing.

The book introduces the key methods and underlying concepts of mathematical models mainly in ecology but also evolution. It is intended to serve the needs of a broad range of undergraduate and postgraduate ecology and evolution students who need to access the mathematical and statistical modelling literature essential to their subjects.

The introduction highlights the definition of a model, stresses the importance of understanding the overlap of mathematical modelling and statistical analysis, and pays special attention to the basics of regression. Chapters 2–4 (Simple models of temporal change, Stochastic models, and Modelling structured populations) offer an incisive description of exponential growth from discrete and continuous, to stochastic and structured populations, emphasizing the many commonalities of the exponential behaviour in ecological and evolutionary dynamics. Interestingly, a special paragraph is devoted to the temporal dynamics of clades by analyzing the growth in numbers of lineages. Density dependence and the onset of chaos in simple populations is described in Chapter 5 (Regulation in temporal

models), leading to interacting populations and harvesting models in the next chapter (Modelling interactions). Finally, Chapters 7 and 8 (Community models and Spatial models) give rather brief insights into multiple interacting populations and spatial models. Unfortunately no attention is paid to species distribution models.

This book is especially suitable to undergraduates and graduates interested in an introduction to modelling.

M.C. ROOS

Kraft GT. 2009. *Algae of Australia. Marine benthic algae of Lord Howe Island and the southern Great Barrier Reef, 2. Brown Algae*. 370 pp., 107 figures, 11 colour plates. ABRS, Canberra; CSIRO Publishing, Collinwood, Victoria. ISBN 978-06-43097-37-7. Price: AUD 140.

A new volume in the beautiful 'Algae of Australia' series has appeared. It is the second volume in a subseries on Lord Howe Island and the southern Great Barrier Reef. The marine flora and fauna around these islands is tropical and data on marine benthic algae from tropical parts of Australia are much welcomed because these organisms are still largely unexplored. Brown algae in tropical areas are usually less diverse than green and red algae, but they can be dominant in biomass in some areas.

Gerald Kraft's book gives data and photographs on 125 species in 41 genera, which is just a bit less than the 135 species in also 41 genera in the earlier published Green Algae volume. Nevertheless, the present volume is a few pages ticker, mainly because of a longer appendix on new taxa, contributions and lectotypification. New is the chapter on rare and doubtful records and the discussion on *Sargassum* taxa that have been recorded from Lord Howe Island by earlier authors. The most puzzling of these is *Sargassum howeanum*, which has been recorded in 1933 and 1963 as being large and dominant algae, but of which no specimens matching them in size or habit have been collected subsequently, although some smaller specimens are recorded from more recent dates. The texts in the appendix include a Latin description, which is a translation of a description that is not exactly the same as the (usually more elaborate) descriptions given in the systematically arranged treatment of the sampled specimens. Also elaborate data on the type of each taxon are provided, as well as a short etymology.

The data for each species or infraspecific taxon include nomenclatural information with correct name, authors, and publication data, info about types and synonyms, an elaborate description, data on distribution in the world and especially on Lord Howe Island and the southern Great Barrier Reef. Of these two archipelagos all specimens that have been collected and examined are recorded. This is followed by an (usually short) list of additional specimens that were examined in relation to the taxon in question as well as notes on earlier work and on further details on characterization and identification of the taxon.

In most cases only recent samples, collected by the author, his students and some of his colleagues in the two archipelagos are discussed, while reference to earlier publications by A.H.S. Lucas, or to the herbarium collections in the National Herbarium of Victoria in Melbourne (especially the Sonder collection) is limited or at least difficult to be found. According to the introduction of the earlier Green Algae volume, the available voucher collections have been studied, but only a few samples collected by A.B. Cribb (now in the Queensland Herbarium in Brisbane) are recorded, and there is a discussion on a number of *Sargassum* species and some samples (10 species) from the NSW herbarium listed as "rare or doubtful records".

An erratum for figure 73 in the Green Algae volume is added.

'Figures' and 'colour plates' in the two published volumes consist of a number of photographs (often more than 10 in one figure or plate) and this figure 73 was to illustrate *Halimeda gracilis*, but accidentally the figure 72 (of *H. micronésica* and *H. discoidea*) was used – now the correct original figure is provided.

An advantage of the present volume is that occasionally (orders *Cutleriales* and *Dictyotales*) drawings of mainly anatomical sections are added to the rich amount of available photographs. Drawings often set a new light on details in characterization of taxa that otherwise are difficult to identify. The author as well as the editors of the series can be proud about the results of painstaking detailed work on tropical seaweeds. Do not forget to purchase!

W.F. PRUD'HOMME VAN REINE

McCarthy PM (ed). 2009. *Lichens V. Flora of Australia Volume 57*. 708 pp. CSIRO Publishing, Melbourne / Australian Biological Resources Study (ABRS), Canberra. ISBN 978-06-43096-64-6 (hardback) Price: AUD 180. ISBN 978-06-43096-65-3 (paperback) Price: AUD 140.

This beautifully executed book is the fifth volume of the Flora of Australia documenting lichens in the six Australian States, the Northern Territory, and the Australian Capital Territory. In this volume, the emphasis is on several species-rich and ecologically significant families that colonise the bark of trees and shrubs in monsoon vine forest and in coastal and montane rainforest across northern Australia, viz. *Graphidaceae*, *Phyllopsoraceae*, *Pyrenulaceae*, *Thelotrema* and *Trypetheliaceae*. In addition, treatments are provided for prominent, mainly tropical and subtropical genera such as *Dirinaria*, *Letrouitia*, *Pyxine* and *Strigula*, as well as the more widely distributed *Buellia* s.str., *Lepraria*, *Ramboldia* and *Tephromela*. The volume also includes lichens that are primarily associated with cool-temperate and montane habitats in south-eastern Australia, for example *Nephroma*, *Peltigera*, *Thelocarpon* and *Umbilicaria*.

The scientific content is highly valuable, with full descriptions, bibliographic citations, and detailed information on synonymy, chemistry, and habitat for each species, supplemented by distribution maps. Complete or partial accounts of 21 families are provided, including 78 genera and 654 species and infraspecific taxa. One genus (*Schizotrema*, *Thelotrema*) and 27 species are described as new to science, and 35 new combinations are made. The book is beautifully illustrated with 64 colour illustrations and 183 plates of high-quality black-and-white photos and line-art. The Appendix includes new taxa, combinations and lectotypifications; abbreviations and contractions; and publication dates for the previous volumes. An index of scientific names, in which accepted names and synonyms are clearly distinguished, completes the book.

An enormous amount of work has gone into researching and compiling this volume, for which the authors deserve due credit. Due to the wealth of information contained in this book, it is highly recommended for libraries as reference material, as well as to professional and amateur lichenologists and mycologists in general, regardless of their geographic location.

J. GEML

McPherson S. 2009. *Pitcher Plants of the Old World*, 2 volumes, 1399 pp., numerous photographs. Redfern Natural History Productions (<http://www.redfernnaturalhistory.com>). ISBN 978-09-55891-82-3 (Volume I). ISBN 978-09-55891-83-0 (Volume II). Price: GBP 34.99 per volume.

Contents of Volume I: Introduction, including an essay on Darwin's findings and conclusions; Carnivorous plants of the world, including an introduction to all genera; The pitcher plants

of the old world; Trapping processes; Infauna and mutualism; *Nepenthes*, after an extensive introduction, specific sections on Borneo; Peninsular Malaysia and Indochina.

Volume II continues with: *Nepenthes* species in the Philippines; Sumatra and Java; Sulawesi; New Guinea and the Malukus, Outlying areas; Hybrids; *Cephalotus*; Habitat loss and the threat of extinction; Cultivation and horticulture; Appendices.

Following a treatment of the Pitcher Plants of the Americas in 2006, these two volumes present the most complete and synoptic overview ever compiled on the topic of the Pitcher Plants of the remaining part of the tropics. The informative text is illuminated with numerous fabulous colour photographs of (almost) all taxa taken in the wild (many of which photographed for the first time in their natural habitat). The clear distribution maps make it a must for every interested hobbyist and professional scholar.

Clearly, the interest for these plants and their carnivorous habit has increased considerably in the last decade. The author has collected an enormous amount of information, to a substantial extent based on his own observations, an amazing feat when we realize that he has started this project only in 2006. His treatment includes 120 different species, whereas for years the total number of species recognized was around 80. He predicts that also for the coming years several new species per year will be discovered. In addition, it is very interesting to learn about the historical development of the interpretation of the morphological structures involved in the carnivorous habit, e.g., the differences between the ideas of Erasmus Darwin (1789 *The botanic garden*) and the still valid findings of Charles Darwin dating back some 140 years (1865, *The movements and habits of climbing plants*; 1875, *Insectivorous plants*).

I compliment the author for this unparalleled publication, which naturally is highly recommended.

A. VOGEL