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Vegetation of Southern Africa

Edited by R. M. COWLING

D. M. RICHARDSON

and S. M. PIERCE

University of Capetown

Foreword by B. J. HUNTLEY,

Chief Director, National Botanical Institute, South Africa

This impressive work is the first comprehensive account of the vegetation of southern Africa. The region contains a remarkable juxtaposition of different ecosystems, yet it forms a cohesive ecological unit with exceptionally high endemism.

The book is divided into three major parts: Part 1 provides the physiographic, climatic, biogeographic and historical background essential for understanding contemporary vegetation patterns and processes. Part 2 includes systematic descriptions of the characteristics and determinants of major vegetation units (the major terrestrial biomes, coastal vegetation, freshwater wetlands and marine vegetation). Part 3 elaborates on selected ecological themes of particular importance including grazing, fire, alien plant invasions, conservation and human use of plants. These are discussed in the context of prevailing paradigms in the international literature.

Contents: Foreword B. J. Huntley; Preface; Contributors; PART I. PHYSIOGRAPHY AND HISTORY: Introduction;

1. Evolution of landscapes; 2. Climate; 3. Phytogeography, flora and endemism; 4. Vegetation history L. Scott; PART 2. BIOMES: Introduction; 5. Categorization of biomes; 6. Fynbos; 7. Succulent karoo; 8. Nama-karoo; 9. Desert; 10. Grassland; 11. Savanna R. J. Scholes; 12. Forest; 13. Coastal vegetation; 14. Freshwater wetlands; 15. Marine vegetation; PART 3. ECOLOGICAL THEMES: Introduction; 16. Plant form and function; 17. Herbivory; 18. Fire W. J. Bond; 19. Species diversity at the regional scale; 20. Human use of plants; 21. Human impacts on vegetation; 22. Alien plant invasions; 23. Conservation; Glossary; Index.

1996 246 x 189 mm 768 pp. 134 line diagrams
123 half-tones 106 tables
0 521 57142 1 Hardback c. £70.00

Terrestrial Orchids

From Seed to Mycotrophic Plant

HANNE N. RASMUSSEN

Danish Institute of Plant and Soil Science

The orchids have great appeal, yet they are amongst the most vulnerable species and little is known about their reproduction in nature. This book provides a detailed survey of terrestrial orchid biology from seed dispersal to established plant using the comparison of field and culture experiments. The unusual role of fungal mycorrhiza in supplying energy to orchids is evaluated in terms of physiology and its impact on orchid

evolution. The book shows that an understanding of germination, life history and seasonal phenology of orchids in natural habitats is essential for successful culture methods and propagation techniques. The final chapter systematically reviews the life history, endophytes, role of mycorrhiza and successful propagation of thirty-six genera of orchids and their species.

A stimulating book for physiological botanists and essential reading for those involved in orchid horticulture.

Contents: Introduction; 1. Properties of 'dust' seeds; 2. Seed development; 3. Seed survival; 4. Requirements for germination; 5. Fungi; 6. Germination processes; 7. Underground organs; 8. Orchid mycorrhiza; 9. Abiotic factors in growth and development; 10. Life history and phenology; 11. Propagation; 12. Effects of orchid mycorrhiza; 13. Description of genera; Literature; Appendix A. Media; Appendix B. Names and synonyms.

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Now in paperback

The Botany of Mangroves

P. B. TOMLINSON

Harvard University

Mangroves are remarkable tropical plants that grow with their roots partly or wholly submerged in sea water; they form tidal forests in the tropics. These forests, referred to as 'mangal', straddle the abrupt interface between sea and land. They are economically important because they are a source of timber (used mainly as firewood), essentially grown out of sea water. Mangroves also protect shorelines from wave damage and provide a nursery for many commercial fishes. To the scientist they offer an interesting opportunity to study organisms that adapt to both marine and terrestrial environments.

The Botany of Mangroves is a concise, descriptive overview of mangrove plants, with emphasis on the biology of individual species. Now available in paperback for the first time, this book will be valuable to all those with an interest in these fascinating plants.

Contents: Preface; Acknowledgements; SECTION A. GENERAL ACCOUNT: 1. Ecology; 2. Floristics; 3. Biogeography; 4. Shoot systems; 5. Root systems; 6. Water relations and salt balance; 7. Flowering; 8. Seedlings and seeds; 9. Utilization and exploitation; SECTION B. DETAILED DESCRIPTIONS BY FAMILY; References; Index.

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Wind and Trees

Edited by M. P. COUTTS

Forestry Authority, Northern Research Station, Roslin

and J. GRACE

University of Edinburgh

Winds over topography and inside forests produce mechanical reactions in trees, and eventually failure in stems and roots when stressed by storms. The mechanics of these reactions and the physiological responses to wind in leaves, stems and root systems, and the important ecological consequences of wind-throw are described. Management techniques of forests in windy climates are detailed, including the use of models predicting risk of wind damage.

It is clear that the whole field of wind effects on trees has benefitted from recent multi-disciplinary research, and significant advances in knowledge of most parts of the subject have been made in the last decade. This book brings the up-to-date theories, methodologies and results together, and gives the reader a sense of coherence in this complex but fascinating fields.

Contents: PART I. AIRFLOW OVER TOPOGRAPHY AND IN FORESTS: PART II. MECHANICS OF TREES UNDER WIND LOADING: PART III. TREE PHYSIOLOGICAL RESPONSES: PART IV. IMPACTS OF WIND ON FORESTS AND ECOLOGY: PART V. RISK ASSESSMENT AND MANAGEMENT RESPONSE:

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The Anther

Form, Function and Phylogeny

Edited by WILLIAM G. D'ARCY

Missouri Botanical Garden

and RICHARD C. KEATING

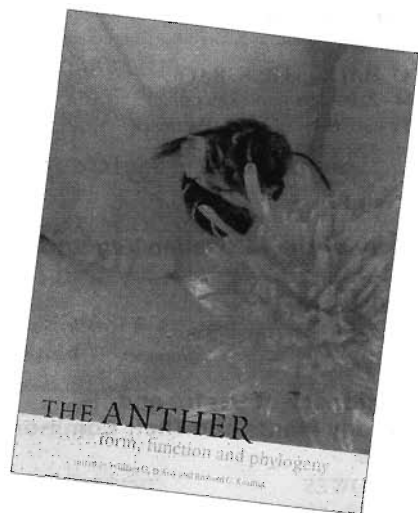
Missouri Botanical Garden

Despite its significance in the reproductive cycle of flowering plants, and its importance in helping to interpret plant evolution, the stamen, and its fertile, pollen bearing part, the anther, have received relatively little scientific attention. To help begin to address this shortcoming the contributions in this volume give an indication of the kinds of studies now being undertaken with a view to stimulating further work on this neglected plant organ.

Contents: Preface; About anthers and stamens and what they do; The fossil history of stamens; The origin and early evolution of angiosperm stamens; Diversity and evolutionary trends in angiosperm anthers; Are stamens and carpels homologous?; Temporal control points in anther differentiation: implications for anther evolution; Diversity of endothelial patterns in the angiosperms; The oxalate package or so-called resorption tissue in some bee-pollinated angiosperms; Anther adaptations

for animal pollination; Anther differentiation in the Asclepiadaceae: form and function; Stamen development in legumes with emphasis on porate stamens of Cassieae; Anther investigations: a review of methods; A bibliography of stamen morphology and anatomy; Index.

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Lichen Biology

Edited by THOMAS H. NASH
Arizona State University

Lichens were the first organisms to be recognised as symbionts, combining fungi and algae in an intimate biological union. They remain the best known example of this phenomenon, occurring in every pioneer terrestrial habitat, and have become the best studied. This volume provides an up-to-date account of these fascinating organisms.

Contents: Preface; 1. Introduction; 2. Photobionts; 3. Mycobionts; 4. Thallus morphology and anatomy; 5. Morphogenesis; 6. Photosynthesis, respiration, productivity and growth; 7. Nitrogen, its metabolism and potential contribution to ecosystems; 8. Nutrients, elemental accumulation and mineral cycling; 9. Biochemistry and secondary metabolites; 10. The lichen as an individual, and its population ecology; 11. Lichen biogeography; 12. Systematics, phylogeny and classification; 13. Lichens as indicators of air pollution; References; Index.

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