

Pugnaire, F.I., Valladares, F. (ed.): **Handbook of Functional Plant Ecology**. – Marcel Dekker, New York – Basel 1999. ISBN 0-8247-1950-6. 901 pp., USD 250.00.

Functional plant ecology has a central role in our efforts to understand the community and ecosystem structure and dynamics, and has attracted the interest of ecologists trying to interpret patterns of adaptive specialization in plants. The editors of this book—plant ecologists from the Spanish Council for Scientific Research, working in the Arid Zones Experimental Station, Almeria (F.I.P.), and in the Centre of Environmental Sciences, Madrid (F.V.)—succeeded in assembling experienced specialists to prepare contributions to this book. So, 45 scientists from 11 countries (Australia, France, Germany, New Zealand, Portugal, Republic of Panama, Spain, The Netherlands, UK, USA, and Venezuela) have prepared 24 comprehensive review articles.

The book opens with a paper dealing with the methods used in comparative functional ecology (development of functional ecology, screening, broad-scale comparisons, functional laws). The other articles have been arranged into five parts. Part I—The Role of Structure and Growth Form in Plant Performance—summarises, in four papers, recent information on structural aspects of growth and evolution on canopy and plant levels (poikilohydrous way of life in autotrophs such as unicellular algae, lichens, mosses, and resurrection plants, water uptake and transport, desiccation tolerance, inherent variation in traits of relative growth rate, architecture of plant crowns and light capture, modelling growth, nitrogen use efficiency, root system functioning, symbioses, *etc.*). The three chapters of Part II—Physiological Ecology—deal with the performance of plants in their natural environment, and various plant responses to habitat characteristics (water relations in plant parts, hydraulic architecture and water movement, cohesion-tension theory, water stress, wilting and waterlogging, plant response to spatial and temporal heterogeneity in light environments, nutrient uptake, use, and loss, plant adaptation to nutrient-poor and nutrient-rich environments, *etc.*). Six articles of Part III—Habitats and Plant Distribution—is devoted mainly to plant adaptation to extreme environments, *e.g.*, arid zones, tropics, Mediterranean-type, and high-latitude ecosystems (leaf performance, nutrient regulation on plant and ecosystem levels, plant survival under water stress, species- and life-form diversity in tropical forests, species interactions and plants responses in Arctic ecosystems, photosynthetic performance, growth and water relations in Antarctica, *etc.*). Part IV presents, in 6 chapters, community ecology (plant reproduction and establishment, mating systems and pollination, sexual expression, seedling ecology, dormancy and germination, facilitation in plant communities, mycorrhizae, plant interactions, plant–plant and plant–herbivore interactions, conceptual models of competition in communities, *etc.*). Part V is called New Approaches. This is the common aim of the 4 papers of this part: resistance to air pollutants, modelling of leaf, plant, and canopy photosynthesis, remote sensing of environment as a multidimensional mapping tool, linking remote sensing to production models, generalization and sampling problems, strategy schemes in plant ecology, *etc.*

In conclusion, I should mention that the *Handbook of Functional Plant Ecology* does not cover the ecology of temperate ecosystems, which is dealt with in numerous books and review articles. Naturally, this does not reduce scientific value of this book.

The book is well edited, and produced in good standards of Marcel Dekker publications. Every paper is accompanied by extensive bibliography (together over 2700 references). The volume is accompanied with a detailed subject and plant index. I am convinced that the book will find numerous readers especially among ecologists, botanists, plant biologists, physiologists and geneticists, foresters, and evolutionary biologists.

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