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Plant–Animal Interactions in  
Mediterranean-Type Ecosystems

edited by

Margarita Arianoutsou and R. H. Groves

# Tasks for vegetation science 31

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**M. ARIANOUTSOU and R.H. GROVES**



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## Preface

The Sixth International Conference on Mediterranean Climate ecosystems was held at Maleme (Crete), Greece, from September 23 to September 27, 1991. This conference had as its theme 'Plant-Animal Interactions in Mediterranean-type Ecosystems'. Most of the papers presented to that meeting have already been published (see Thanos, C.A. ed., 1992, Proceedings of the VI International Conference on Mediterranean Climate Ecosystems, Athens, 389 pp.). These 57 papers were all necessarily short. But the theme of plant-animal interactions was considered by the Organizing Committee to be so important to a fundamental understanding of the ecology of Mediterranean-climate ecosystems and to an enhanced management of those systems that various international research scientists were invited to prepare longer contributions on major aspects of the overall theme. The Book that follows represents the result of those invitations. All five regions of Mediterranean climate are represented – Chile, California, southern Australia and the Cape Province of South Africa, as well as the Mediterranean Basin itself.

Previous International Conferences on Mediterranean-type Ecosystems have had as their themes Convergence of Ecosystems and Biota (Chile, 1971), Fire and Fuel Management (California, 1977), Soil and Nutrients (South Africa, 1980), Resilience (Western Australia, 1984) and Time Scales and Water Stress (France, 1987). Already, planning for the next such Conference, to be held in Chile in 1994, is under way. The International Society of Mediterranean Ecologists (ISOMED) is an active one; these Conferences are organized under its *aegis*. It has been my privilege to be president of ISOMED for the period between the Fifth and the Sixth conferences. I congratulate the Organizing Committee for ensuring the undoubted success of the Sixth Conference at Crete, and especially Dr Margarita Arianoutsou for her role as Chairperson of that Committee. Further, I anticipate with pleasure the return of the next Conference to South America and to Chile, a country in which I have lived and worked.

*Montpellier, February 1993*

*Francesco di Castri*

## Introduction

The Volume that follows comprises invited contributions on major aspects of Plant–Animal Interactions in Mediterranean Type Ecosystems, which was the subject of the Sixth International Conference on Mediterranean Climate Ecosystems, held in Crete (Greece), from September 23 to 27, 1991. The subject of plant–animal interactions was considered fundamental to the process of understanding the structure and the function of the Mediterranean type ecosystems and to their rational management. An attempt to present major new contributions on the issues of the overall theme of the Conference, beyond those already published in the Book of Proceedings (Thanos C.A. ed., 1992), seems warranted; that attempt follows.

All five regions of the world with a Mediterranean climate are represented: the Mediterranean Basin *sensu lato*, California, Chile, South Africa, Australia. Not all of the chapters have adopted the format of a review paper, although this was the original idea. Some contributors present recent research data, which they try to incorporate into general patterns, while others perform “challenging” interpretations to long established perspectives, calling for criticism.

The book is divided into six parts. In the first section, **Historical introduction**, the author tackles plant–animal interactions as described in the voluminous works of the founding parents of modern Biology, Aristotle and Theophrastus, the great philosophers of Greek Classical Antiquity. Besides the obvious tribute paid to the Conference location, this chapter reveals the important scientific accomplishments made by the two men during the era of 384–286 BC. **Community structure** includes chapters on the patterns of species richness and diversity of plants as they influence animal communities. As it is evident from almost all the chapters in this second section, plants that live in characteristic Mediterranean climates and that have evolved morphological and physiological adaptations, create the habitats to which the animals respond. The responses of animals to the high levels of temporal and spatial heterogeneity of these habitats are usually shown by a multiplicity of adaptations of the different groups of animals. The range of plant–animal interactions is enlarged by the innumerable soil microhabitats, caused either by the soil *per se* and/or by its invisible inhabitants. This is the subject of the third section presented under the title **Triangular relationships**. Plant morphology, habitat structure and seasonal fluctuations of available resources define species richness and structure in animal communities. The latter, in consequence, shape the form and sometimes the function and the vigour of the former. This is mostly accomplished through their feeding processes, **Herbivory**, which comprises the fourth part of the book. It is evident that no one book dealing with plant–animal interactions would be complete unless some information is presented on the important functions of the plants which are mostly animal-mediated, namely **Pollination** and **Seed dispersal**. These two subjects, forming the fifth and the last sections of the book respectively, reveal some of the peculiarities of the Mediterranean environment through the various pollination syndromes observed in plants of the Mediterranean Basin and those of the Cape fynbos as well as the specific mode of plant dispersal, myrmecochory, observed in the Cape flora.

These six sections on plant–animal interactions reflect the major trends in the direction of research. It is clear, however, that they do not cover the potential range of such kinds of relationships. Community structure of soil fauna, rodents and other mammals as affected by plant community structure, fire (and its direct or indirect effects on this bilateral relation), nutrient cycling and land use, are other issues that attract the attention of ISOMED scientists. These considerations become increasingly important in the light of increasing pressure on Mediterranean ecosystems, arising from recent economic development.

It is our wish that this volume will stimulate new and interesting research on the ecology of Mediterranean climate ecosystems. It is also our hope that the results of the research, which is either currently evolving or is scheduled for the future, will reinforce the movement for the greater conservation of these ecosystems, which have been one of the places for the origin of culture and science as we now know them.