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MESQUITE

Its Biology in Two Desert Ecosystems

B. B. SIMPSON

Dowden, Hutchinson & Ross, Inc.

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Its Biology in Two Desert Scrub Ecosystems

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to the memory of

ARTURO BURKART
1906–1975

FOREWORD

This book is one of a series of volumes reporting results of research by U.S. scientists participating in the International Biological Program (IBP). As one of the fifty-eight nations taking part in the IBP during the period of July 1967 to June 1974, the United States organized a number of large, multidisciplinary studies pertinent to the central IBP theme of "the biological basis of productivity and human welfare."

These multidisciplinary studies (Integrated Research Programs) directed toward an understanding of the structure and function of major ecological or human systems have been a distinctive feature of the U.S. participation in the IBP. Many of the detailed investigations that represent individual contributions to the overall objectives of each Integrated Research Program have been published in the journal literature. The main purpose of this series of books is to accomplish a synthesis of the many contributions for each principal program and thus answer the larger questions pertinent to the structure and function of the major systems that have been studied.

PREFACE

Few plant genera of the New World deserts have received as much attention as *Prosopis.* This special interest is due, in part, to the fact that several species of *Prosopis* are serious rangeland pests in both North and South America. However, in addition to their importance in modern man's economy, trees of *Prosopis* play a major role in the functioning of New World warm desert ecosystems. From 1971 to 1975, the Origin and Structure of Ecosystems Project of the International Biological Program carried out research on convergent evolution in warm desert scrub ecosystems. Two disjunct American sites were chosen for intensive study: one in the Sonoran Desert near Tucson, Arizona, U.S.A., and the other in the Monte Desert near Andalgalá, Catamarca, Argentina. During the period of this study, it was apparent that species of two genera dominated both study areas. One, *Larrea,* is the genus of creosotebushes, overwhelmingly dominant in New World deserts in terms of numbers of individuals and geographical area covered. The second, *Prosopis,* contains the mesquites and algarrobos. Although individuals of *Prosopis* are much less abundant than those of *Larrea,* mesquite can be considered dominant in terms of its influence on the biota of these warm desert ecosystems. Throughout the study of convergence, therefore, much of the work perforce centered around species of these two genera.

In this volume, contributions of twenty-two scientists come together to produce a picture not only of the role of mesquite in the lives of the modern biotas as well as past and present human cultures around the study areas, but also of the physiological, morphological, and genetic mechanisms present in species of *Prosopis* that allow these taxa to survive under arid and semi-arid conditions. A comparable synthesis with *Larrea* as the focal point has also been prepared (Mabry et al., 1977).

For each chapter, a coordinator, the first author listed, collated the contributions of the chapter authors, who are listed alphabetically. Within each chapter, when applicable, footnotes designate the authors of particular sections. For these sections, the order of the authorship was agreed upon by the authors themselves.

In addition to the authors, however, this synthesis reflects the help and support of many other individuals and of several institutions. In Argentina, the Instituto Miguel Lillo in Tucuman provided indispensable facilities. Drs. Marta Grassi, Peter Seeligman, Lionel Stange, Federico Vervoorst, and Abram

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The critical reviews of the manuscript by Drs. James Brown, Herbert Hull, Paul Martin, and Talmar Peacock led to substantial improvement in the text for which the authors and editor are grateful.

The impetus the Origin and Structure of Ecosystems program provided the scientists involved, many of whom were students at the time of these studies, has led to continuing research in a wide spectrum of fields. We have all benefited from the exchange of ideas that took place during this collaborative effort.

B. B. Simpson
Smithsonian Institution

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FIGURE 1-1. *An aerial view of the Bolsón de Pipanaco near Andalgalá, Catamarca, Argentina. Trees of* Prosopis *(many of the large dark spots) follow the washes winding across the desert.*

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