

MESQUITE

Its Biology in Two Desert Ecosystems

B. B. SIMPSON



Dowden, Hutchinson
& Ross, Inc.

US/IBP SYNTHESIS SERIES | 4

MESQUITE

Its Biology in Two Desert Scrub Ecosystems

Edited by

B. B. Simpson

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Dowden, Hutchinson & Ross, Inc.
Stroudsburg Pennsylvania

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Library of Congress Catalog Card Number: 76-58889
ISBN: 0-87933-278-6

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79 78 77 1 2 3 4 5
Manufactured in the United States of America.

Library of Congress Cataloging in Publication Data

Main entry under title:

Mesquite, its biology in two desert scrub ecosystems.

(U.S./IBP synthesis series ; 4)

Bibliography: p.

Includes indexes.

1. Mesquite. 2. Desert ecology. 3. Botany—Arizona—Tucson region. 4. Botany—Argentine Republic—Andalgala region. I. Simpson, B. B. II. Series.

QK495.L52M47 583'.322 76-58889

ISBN 0-87933-278-6

Exclusive distributor: **Halsted Press**
A Division of John Wiley & Sons, Inc.
ISBN: 0-470-99109-7

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US/IBP SYNTHESIS SERIES

This volume is a contribution to the International Biological Program. The United States' effort was sponsored by the National Academy of Sciences through the National Committee for the IBP. The lead federal agency in providing support for IBP has been the National Science Foundation.

Views expressed in this volume do not necessarily represent those of the National Academy of Sciences or of the National Science Foundation.

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.

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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 performed 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

Willink gave generous and continuous help and advice. In Arizona, the University of Arizona Department of Biological Sciences provided laboratory space and equipment for several years. Drs. Charles Lowe, Charles Mason, and Tien Wei Yang provided assistance and encouragement.

Funding for the individual research projects was primarily provided by the National Science Foundation through the International Biological Program and included grants to Drs. Frank Blair, Tom Mabry, Andrew Moldenke, Harold Mooney, Gordon Orians, and Otto Solbrig as Principal Investigators. Support for the work summarized in Chapter 8 was provided independently by the National Science Foundation under grant SOC 75-13-628 to Richard Felger. Most of the research of the editor was funded by the Smithsonian Institution, Department of Botany.

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
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ACKNOWLEDGMENTS

Many persons have directly or indirectly helped in the preparation of this volume. The editor would like to thank M. J. Johnston for help throughout and especially E. L. Davis for typing and S. Yankowski for help in preparing the manuscript. In addition, the authors of the various chapters wish to extend their gratitude to the following people. The frontispiece for chapters 1 and 3 and Figure 1-8 were given by M. A. Mares. For Chapter 4, numerous specialists including D. Duckworth, W. D. Field, D. C. Ferguson, R. W. Hodges, D. R. Smith, E. L. Todd, and D. M. Weisman kindly identified insects collected on *Prosopis*. The authors of Chapter 5 would like to thank G. C. Eickworth, P. D. Hurd, W. E. LaVerge, T. B. Mitchell, J. S. Moure, L. S. Stange, R. R. Snelling, R. W. Thorp, T. H. Timberlake, and D. Urban for help in identification of insects. The illustration, Figure 7-1, was adapted from a photograph lent through the U.S. Fish and Wildlife Service and the photographer. The author of Chapter 8 thanks V. Bohrer, B. L. Fontana, R. I. Ford, V. Jones, D. S. Matson, E. Moser, M. B. Moser, G. P. Nabhan, S. Pablo, A. Russell, and W. H. Wooding for information and criticisms and R. I. Ford for access to the files and collections at the Ethnobotanical Laboratory of the Museum of Anthropology at the University of Michigan. The staff of the Centro Regional del Noreste of the Instituto Nacional de Antropología greatly facilitated investigations in northwestern Mexico. The illustrations used for Figures 8-1 and 8-6 were supplied by the Anthropological Archives of the Smithsonian Institution and Figure 8-3 was photographed by H. Teiwes working with the ethnographic project of B. Doelle. Figure 8-7 was drawn by C. Moser. Figure 10-3 was provided by C. E. Fisher. The many excellent drawings were executed by Biruta Ackerbergs and the graphs and maps by B. B. Simpson and S. Yankowski.

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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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