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Life Strategies of Succulents in Deserts with Special Reference to the Namib Desert . D.J. von Willem, B.M. Eller, M.J.A. Werger, E. Brinckmann, and H.-H. Ihlenfeldt. 1992. Cambridge University Press, Cambridge. 340 pp., i-xix. ISBN 0-521-24468-4. (part of the series "Cambridge Studies in Ecology")—The authors of this book have assembled impressive amounts of data, numerous anecdotal accounts, and an impressive array of related information into a valuable and delightful treatise on the biology of a fascinating group of plants in southwestern Africa. Many of their findings can be applied to succulents throughout the world, yet few places on earth match the Namib Desert region for its climate, diversity, and astonishing variety of succulents in the flora. As a result, some of the results obtained by Prof. von Willert et al. are most likely unique to the succulent flora of this region.

In the preface, the authors state five goals in assembling the book: 1) to review their past research on the ecophysiology of succulents, 2) to review various aspects of the field of ecophysiology for non-ecophysicologists, 3) to introduce a new definition of "succulence" and to emphasize plant function in the concept of "life strategy" of a succulent, 4) to encourage research on unresolved problems in understanding the ecophysiology of succulents, and 5) to stimulate interest by non-ecophysicologists and non-botanists in these intriguing plants. To accomplish these goals, the book is divided into five sections. In Chapter 1, "The Succulent," the authors present a new definition of succulent (I agree that their proposed term "succophyte" holds little promise for gaining wide acceptance) which, unfortunately, suffers from problems of imprecise, relative terms, and thus may prove to be no more useful than past definitions. Structural features and ecological factors characteristic of succulents are also reviewed in this chapter.

Chapter 2, "Climate and Vegetation of Deserts," presents a very general overview of the global and more local environmental factors that interact to create and characterize a desert. Basic principles of microclimatology are reviewed, as are the types of plants which characterize deserts. Included in the latter are life cycle characteristics, photosynthetic pathways, aspects of population biology, reproductive ecology, and the influence of immigration and biotic and abiotic factors on floristic composition of various deserts.

The authors then focus their attention on "The Namib Desert" (Chapter 3), covering much of the material in Chapter 2, but in much greater detail. Chapter 4, "Physiological Implications," constitutes the heart of the book. Here Prof. von Willert and his colleagues, after a slow start discussing at length basic concepts of microclimatology and energy budgets of plant parts, share with the reader their voluminous sets of data and keen insights on water relations, transpiration, CO₂ exchange, photosynthetic pathways, and ecophysiological responses of the Namib succulents to changes in environmental factors, including drought. Heavy emphasis is placed on the importance of climatological events such as "bergwind," warm, desiccating winds descending from coastal mountain ranges to the ocean, and heavy fogs rolling inland from the ocean. In several thought-provoking and undoubtedly contentious discussions, Prof. von Willert and colleagues down-play the ecophysiological significance of CAM and, instead, extol the wondrous virtues of succulence.

The authors close the book with chapter 5, "Life Strategies of Succulents," in a seemingly protracted discussion of the interplay of "utilizable" water and biomass, life history, phenology, and ecophysiology of the diverse array of succulent types in the Namib Desert. This treatise culminates in a taxonomic key of Namibian succulents.

Although Chapters 1 through 3 provide general overviews of succulents, deserts, and ecophysiology useful to newcomers in this field of study, fulfilling goal number 2 of the authors, the strength of the book lies in Chapter 4. There is something here for everybody. It is difficult to read this chapter without occasionally running off to the nearest student or colleague with whom to share a fascinating succulent vignette. The data are impressive. The interpretations are well-founded. Some discussions and ideas are bold and in need of further research. There can be no doubt that the authors have succeeded in fulfilling goals number 1 and 4 in this chapter. Goal number 3 is met in Chapters 1 and 5.

The book is amazingly free of typographical errors; in fact, I could only locate one! The authors, however, display a penchant for using bizarre words, for example, "gulp" (usually "burst" is more accepted), "calcrete," "mesoclimate," "epithem," "habitus," "hapaxanthous," "pavciannuals," and "aestatiphorism." Although the entire book was very well written and assembled, it would have been improved by a glossary, a more detailed index, and, more importantly, more liberal citations. The authors often mentioned ideas, concepts, species, and results from other studies without citing them. In this regard, the authors also occasionally interpreted their findings without adequately supporting their interpretation with arguments and/or previous relevant studies.

The above criticisms are minor. The book was a delight to read. The authors succeeded in all goals, especially number 5. Who wouldn't be fascinated by hydathodes that might act like stomata in absorbing condensed fog water? Or plants that live a year without water by shifting around their internal water? Or subterranean plants with "windows" on their leaf tips which poke through the soil and let sunlight inside their leaves? Or succulents that undergo "reverse transpiration"?

Prof. von Willert and his colleagues have succeeded in producing a landmark treatise on the ecophysiology of succulents in the Namib Desert, and, furthermore, they have succeeded in conveying to the reader an appreciation for and enrichment in knowledge about these captivating and beautiful plants.

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