

Book Review

Saltmarsh Ecology

Steven P. Long and Christopher F. Mason

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160 pp.
Price R97,50 (paperback R47,70)

This series of tertiary level Biology books is aimed at advanced undergraduate students and specialists in other fields. As such, the book succeeds admirably and is clearly written and concise. However, it would have been an even more valuable contribution if some additional aspects had been included. At times, especially in the chapter on ecosystems, the writing tends to become bogged down in the details of particular research projects and fails to provide a clear conceptual framework. This however, is a minor criticism and only valid in certain sections.

The introduction includes an excellent definition of saltmarshes and an interesting representation of the number of tidal submergences per annum along a transect. Chapter two on saltmarsh formation, physiography and soils is wide-ranging and of a level sufficiently advanced to explain the processes leading to most observed phenomena. These two chapters lay a solid physical foundation for the biological discussions to follow.

Chapter three focuses on vascular and non-vascular saltmarsh flora, and provides an interesting account of plant species and population genetics. The authors conclude that 'presence is a result of tolerance rather than a requirement for high salinities' and 'much vegetational change is a response to physically driven changes in saltmarsh physiography and is not primarily the result of changes induced by the vegetation itself'. These generalizations on the topics of distribution and primary succession may be applied to estuarine faunal communities too and so provide a framework for hypothesis testing on saltmarshes.

The authors take the view in chapter four dealing with saltmarsh fauna that saltmarshes have 'low faunal diversity because, being transitional habitats . . . , they present difficult environments for colonization'. Further they suggest that reduced predation pressure in *Spartina* beds may account for the trend towards a higher biomass and lower species diversity in comparison to estuarine mudflats. The occurrence of diversity, its magnitude in different habitats, its measurement and in particular the identification of factors resulting in a particular value are controversial issues. The above oversimplifications may prove misleading to a reader without knowledge of this field. However, the chapter contains

excellent summaries of research work into the ecophysiology of saltmarsh fauna. It mentions, as an example, physiological hurdles facing aphids feeding on salt-loaded marsh plants. The section on food-webs overlooks the current swing towards the use of isotopic tracers for elucidating trophic relationships. In general, the chapter is strong on physiology, but lacks detail on community structure. The insight that 'unpredictable events, affecting recruitment, are probably the most important influence on the meiofaunal community, as indeed they are on the macrofauna' could have been emphasized and expanded upon, for example.

Chapter five on primary production, highlights some of the problems encountered in measuring net primary production in estuarine environments. It mentions techniques such as measuring carbon dioxide and wind speed gradients above the saltmarsh surface. The statement that 'the relationship between biomass and net primary production is complex and as yet largely unpredictable' is highly significant and one that should be impressed upon students of saltmarshes. This outstanding chapter serves to emphasize what I consider a deficiency of the book i.e. it lacks a detailed discussion of secondary production; its measurement, techniques and interpretation and a critical discussion of the many experimental results obtained. If the authors do not consider secondary productivity to be significant in a saltmarsh ecosystem they should defend this point of view.

The next chapter describing the saltmarsh ecosystem has an outstanding account of decomposition processes and the role of grazers in enhancing decomposition through stimulation of micro-organismic populations. Undoubtedly, this is the area of research which will lead to new insights into the functioning of the saltmarsh ecosystem. The section dealing with energy flow is, however, superficial, merely referring to previously published work, omitting any real synthesis. They take the position that, 'the chief role of these animals is in reworking sediments and promoting nutrient cycling and decomposition' and that energy flow through macrofaunal consumers is unimportant. In the discussion on the role of saltmarshes as net exporters/importers they illustrate the reigning controversy well and conclude that it is 'unwise to generalize about the rôle of saltmarshes' in this regard. The final chapter on saltmarsh conservation emphasizes their importance as bird-feeding and roosting sites. The conclusion is that 'the saltmarsh is a scarce resource and a dwindling and threatened one'.

The book, in general, is highly suitable for its intended readership. However, it would have been improved by a more in-depth discussion on faunal community structure and processes, a chapter on secondary productivity and some references to work in the Southern Hemisphere.

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