

Preface

There is rapidly increasing appreciation of the community consequences of trait-mediated indirect effects in various ecosystems. Nevertheless, we know little about the underlying mechanisms. This book highlights the plant trait responses to herbivores as the mechanistic basis of plant-mediated indirect effects that are ubiquitous in terrestrial systems. Recent development of research on plant-herbivore interactions has revealed that herbivore-induced trait modification, such as defensive chemicals, nutritional status, and subsequent growth, is very common and widespread in terrestrial plants. Modification of plants in ways other than the simple removal of tissue can have complex impacts on not only other herbivores but also higher trophic levels through bottom-up cascades. Thus, the structure and biodiversity of plant-based terrestrial communities can be strongly influenced by the herbivore-initiated interaction linkages. This book represents the first major synthesis to integrate information on how trait-mediated indirect effects structure ecological communities through changes in plant traits in terrestrial systems.

This book is based on a symposium entitled "The impact of trait-mediated indirect effects of plants on the structure of herbivorous insect communities," which was held in Brisbane, Australia, at the International Congress of Entomology in August 2004. The symposium brought together a collection of contributors well qualified to evaluate and expand our understanding of how trait-mediated indirect effects of terrestrial plants structure ecological communities from the bottom up. We also invited authors who did not attend the conference to submit chapters in their fields of expertise in order to offer a broader view of the field. We have asked all contributors to review thoroughly the literature in their area, and to discuss their own research, with an emphasis on the novel insights gained through an understanding of plant-trait mediation of interactions as they influence ecological communities. This volume comprises an introduction and 15 chapters by international experts in this emerging field

of plant-mediated indirect interactions. A majority of the chapters focus on plant-insect interactions because they are among the richest contributors to interaction biodiversity, and because the diverse array of herbivore feeding strategies induces many well-understood plant responses. It also includes work on ungulates, birds, and endophytic and mycorrhizal fungi. Thus, this book provides a comprehensive overview of the impact of herbivore-induced indirect effects on the ecology and evolution of plant-herbivore interactions, community organization, and biodiversity. There are contributions from Argentina, Britain, Germany, Japan, Spain, the Netherlands, and the United States. All of the contributors have achieved excellent work in this field, and have established outstanding reputations in the academic community. Hence, this provides a truly international view of ecological interactions and community ecology that increases the exposure of new concepts on community ecology and biodiversity. This book provides current syntheses of this emerging field and a guide for future research for professional biologists, graduate students, and advanced undergraduates in the various fields of ecology, evolution, botany, entomology, mycology, mammalogy, biochemistry, biological control, conservation biology, and biodiversity. It is also relevant to the scientists interested in plant-herbivore interactions in the basic and applied aspects of agriculture, forestry, and horticulture.

Finally, we thank the authors for their hard work and keeping up with the exacting schedule for preparation and submission of their chapters. In particular, we greatly appreciated their dealing with the numerous bothersome requests from the editors for clarification of their written texts. We would like to thank the many ecologists who helped improve the quality by critically reviewing the chapters. It has been a pleasure to work with Cambridge University Press, and we particularly thank Dominic Lewis, Ward Cooper, Wendy Phillips, and Emma Pearce for their assistance with the production of this volume. It has been extremely exciting for us to be involved in production of a book in such an emerging, important research area.

Takayuki Ohgushi
Timothy P. Craig
Peter W. Price
July 2006