Lerner, H.R. (ed.): **Plant Responses to Environmental Stresses. From Phytohormones to Genome Reorganization.** - Marcel Dekker, New York - Basel 1999. 730 pp. USD 195.00. ISBN 0-8247-0044-9.

With a wide variety of habitats, plants are exposed to a plethora of environmental stresses. Such stresses have created a strong selective pressure resulting in the molecular, biochemical, and physiological adaptations that have enabled their survival under such conditions. This book, which addresses the responses of plants to environmental stresses ranging from molecular genetics of stress perception and response to the whole plant physiology, contains 30 chapters arranged into two parts. Part I mostly deals with general concepts, and Part II focuses on the responses of plants to particular stresses. Topics have been chosen to provide reader with an integrated matrix of different types of stresses and of plant responses encountered in nature. They are written by experts who have contributed to the development of their field in recent years.

In Part I, after erudite presentation of the subject in the Introduction, the second chapter points out to individuality of each plant. The third chapter gives an example of using suspension-cultured plant cells for studying adaptation to herbicide. The following chapters (4 to 10) describe our present knowledge of the regulatory control of differentially expressed genes in response to environmental changes. The fourth chapter concentrates on the control of transcription, the fifth chapter on adaptive mutations in bacteria, the sixth chapter on genomic rearrangement in cyanobacteria, the seventh chapter on genetic and epigenetic instability of tissue cultures, the eighth chapter on heritable changes induced in flax, the ninth chapter on the role of repetitive DNA, and the tenth chapter on plant evolution. The chapter eleven deals with a secondary oxidative stress generated by many different environmental stresses, and the chapter twelve discusses the possible role of alternative respiration which

could provide reducing power to counteract the increase in active oxygen species. The general role of phytohormones in plant responses to stresses is the main item of chapter thirteen. The chapter fourteen focuses on regulation of gene expression by abscisic acid. It is important to take into account that above ground and below ground plant parts simultaneously face two different environments, and the chapter fifteen tries to elucidate the role of abscisic acid as root-to-shoot signal. In Part II, the chapter sixteen deals with metabolic effects of phosphate deficiency, and the chapter eighteen with the effects of environmental factors on mineral nutrition. The responses of plants to oxygen deficit (hypoxia or anoxia) are surveyed in the chapters seventeen and twenty. The chapter nineteen pays attention to cell wall in responses of plants not only to flooding, but also to water deficit. The chapter twenty one concentrates on adaptations of the photosynthetic apparatus to stress conditions. The chapter twenty two describes the effects of soil impedance. The influence of temperature extremes and the evolution of induced tolerance are items of the chapter twenty three. The role of glutamate decarboxylase-calmodulin complex is discussed in the chapter twenty four. The chapters twenty five and six are concentrated on plant desiccation including ecological implications and evolutionary aspects. The chapter twenty seven deals with *Rhizobium*-legume symbiosis. The last three chapters are devoted to biotic stresses and plant defenses against pathogens and beetles.

The book is concisely written, beautifully illustrated by many figures and tables, and offers to readers over 3 800 references to obtain further information. It certainly will be very useful to everybody interesting in stress physiology.

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