

Book Review

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Plant-Microbe Interactions – Volume 5

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The Plant-Microbe Interactions series has as its goal to chronicle the future research on microbial plant pathogens and symbionts and the responses that they elicit on their plant hosts. The research dealing with various aspects of plant-microbe interactions is of obvious importance since plant-microbe interactions, in the form of pathogenicity, beneficial symbioses, biocontrol, etc., greatly impact agriculture. The recent rapid increase in knowledge can be largely correlated with the application of modern molecular methods to the understanding of plant-microbe interactions.

The book is divided into nine chapters which are written by renowned specialists in plant-microbe interactions not only from the USA but also from European countries and Japan.

Chapter 1 by Yuan et al. discusses the organisation, regulation and functions of *Pseudomonas syringae* genes. The hrp genes of *Pseudomonas syringae* have central role in encoding the protein export system and in the induction of hypersensitive response and pathogenicity. Among the interesting recent discoveries is the fact that these genes encode for the synthesis of pili.

Chapter 2 by Smart et al. focuses on the oomycete pathogen *Phytophthora infestans*. This chapter illustrates several aspects of the biology of this important pathogen of potato and other species of *Solanum*, which have become clear as a result of recent application of molecular techniques.

Chapter 3 by Whitehead and Salmond discusses the interesting area of quorum sensing in plant-microbe interactions. This chapter concentrates on how diffusible signalling molecules, made by bacteria, can cause physiological changes in microbial population that consequently precipitate changes in the interaction between plant and microbe.

Chapter 4 by Meyer et al. presents a molecular overview of *Agrobacterium rhizogenes*, causative agent of hairy root disease. It is stressed that hairy root, in contrast with crown gall caused by *A. tumefaciens*, may not meet the criteria generally accepted for tumor tissues although some common aspects of hairy root and crown gall exist.

Chapter 5 by Wilson and Somerville describes the progress in understanding disease resistance pathways in *Arabidopsis* with particular focus on how the genome sequencing initiative and emerging technologies will impact the study of plant pathology.

Chapter 6 by T. L. Graham and M. Y. Graham presents some interesting ideas of how plant tissue is conditioned to respond to pathogen attack and how this potential is translated into a cascade of resistance responses. It is shown that the major hypersensitive response (HR), associated with local and systematic responses appear to be actively conditioned by processes involved in the HR cell death programme.

Chapter 7 by Robert-Baudouy et al. describes our current understanding of the regulation and function of pectic enzymes in the pathogen *Erwinia chrysanthemi*. This broad-host bacterial pathogen causing soft rot possesses at least 16 genes involved in producing enzymes that can degrade pectic polymers in plant cell walls. Regulation of pectinase synthesis in this soft rot bacterium seems to be a complex network involving multiple regulatory systems.

Chapter 8 by Ito and Shibuya discusses our current level of understanding with regards to the plant protein receptors (binding proteins) that may be involved in pathogen recognition. In comparison to animal systems, relatively little is known about the receptors that recognize pathogen signals (elicitors) and induce defense responses.

Chapter 9 by Lee et al. deals with an interesting endophyte of sugarcane, *Acetobacter diazotrophicus*. The endophytic colonisation of the interior of roots, stems, and leaves of sugarcane

plants by *A. diazotrophicus* represents a new kind of symbiosis between a diazotroph and a monocot. This association is most likely to be effective in terms of supplying of significant amounts of bacterially fixed N to benefit plant growth. The bacterium also shows significant plant-growth-promoting effects.

Volume 5 ranks among the books of the series that successfully meet its goal, i.e. contribute to the advancement of the science of plant-microbe interactions.

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