

# Preface

Viruses are submicroscopic, obligate intracellular parasites that infect all living organisms and exclusively live and multiply in their host cells. Since the discovery of the first virus tobacco mosaic virus in 1890s, over 5000 virus species have been documented in detail. Viral pathogens virtually infect all living organisms and cause significant losses including mortality, morbidity, and economic losses. In plants, viruses cause many economically important diseases in all parts of the world. Virus infection can reduce crop yields drastically and deteriorate crop quality. In some cases, viral pathogens become a limited factor to crop production. Genetic resistance is the most effective approach to the control of viral diseases. However, natural resistant resources are rare, and, if any, usually only confer resistance to a particular virus species or group of highly related species. Development of novel antiviral strategies relies on knowledge in plant virology research. In the past decade, various breakthroughs have led to the rapid advance of this subject.

This book is aimed to reviewing the advances of major aspects in plant virology. We were fortunately able to recruit over a dozen of international authorities to write this book. Topics covered in this book include RNA silencing and its suppression in plant virus infection (Chap. 1), virus replication mechanisms (Chap. 2), the association of cellular membranes with virus replication and movement (Chap. 3), plant genetic resistance to viruses (Chap. 4), viral cell-to-cell and long distance movement in plants (Chaps. 5 and 6), virus-induced ER stress (Chap. 7), virus diversity and evolution (Chap. 8), virus-vector interactions (Chap. 9), cross protection (Chap. 10), geminiviruses (Chap. 11), negative strand RNA viruses (Chap. 12), and viroids (Chap. 13). As next generation sequencing is revolutionizing the diagnosis of plant viral diseases, the last chapter of this book is specifically dedicated to this topic.

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