

# Preface

Virus and viroid diseases have become increasingly important constraints to sustainable crop production in the tropical countries. The climatic changes that are occurring throughout the world have impact on plants, vectors, and viruses causing increasing instability within virus–host ecosystems. Some of the threatening and economically important virus diseases in tropical zone which affect the food production are tungro, yellow mottle, and hoja blanca in rice; mosaic in sugarcane, mosaic in cassava; tristeza in citrus; swollen shoot in cacao; sterility mosaic in pigeonpea; rosette, clump, and bud necrosis in peanut; necrosis in sunflower and legumes, vegetables, and ornamental crops; yellow mosaic in legumes; leaf curl in cotton and tomato; and ring spot in papaya. Key factors for emergence of new plant virus and virus-like diseases include the intensification of agricultural trade (globalization), changes in cropping systems (crop diversification), and climate change.

Largest group of plant viruses exist in the family *Potyviridae* followed by *Geminiviridae* and *Bunyaviridae*. In tropical countries, whitefly transmitted begomoviruses are responsible for heavy crop losses in cassava, cotton, tobacco, tomato, potato, pepper, squash, okra. etc. The tospoviruses and ilarviruses are wide spread in tropics and affect several important field, horticultural and ornamental crops resulting in serious economic damage in crops like groundnut, sunflower, onion, watermelon, and vegetables like tomato, chillies, and potatoes. Divergence exists in the type of vectors and their population from country to country, for example Hemipterans (aphids, whiteflies, leafhoppers, mealybugs, and others) are the major vectors of plant virus and virus like diseases, comprising more than 80 % of insect-transmitted viruses which represents close to 400 virus species within 39 different genera.

The primary aim of this book is to provide to readers with latest information on different virus and viroid diseases of crops in tropical countries. This volume comprises of five chapters that give an overview of the progress made on virus and viroid diseases of crops of tropics. The first chapter deals with general information on tropics and climate, tropical countries and tropical agriculture; second chapter provides information on viruses, viroids, phytoplasma, and other subviral agents; third chapter on impact of virus and viroid disease on tropical crops; the fourth chapter on various modes of transmission of virus and virus-like agents. Various

methods for detection and diagnosis of viruses and viroid disease of tropical crops are extensively reviewed in the fifth chapter.

Since the inception of plant virology, phytoplasma is dealt along with plant viruses, hence a few pages were devoted in this book for providing background information about phytoplasma for traditional scientists/researchers. Even though the attempt is only to include the examples from tropical zone but it was not possible to confine to tropical examples as successful research outcomes are there from temperate zone; hence, some examples from temperate zone were also referred. If any omissions have occurred inadvertently in seeking permissions for figures and tables, it may please be condoned.

It is hoped that the information provided in this volume on various aspects of virus and viroid diseases of tropical crops would be useful to research scientists, seed companies, quarantine personnel, and institutions of both research and teaching.

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