

METHODS IN MOLECULAR BIOLOGY™

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Phytoplasma

Methods and Protocols

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Preface

Phytoplasmas are a group of bacteria that lack a cell wall and can not as yet be grown in axenic culture. They are capable of causing severe diseases in a wide range of plant species, and are vectored between plants by insect vectors (mainly leafhoppers) in which the bacteria can also multiply. The aim of this book is to present a range of important protocols that can form the basis for anyone intending to develop a research programme on phytoplasmas or intending to set up a diagnostics facility for identifying the presence of these pathogens in plants or their insect vectors.

Following an introductory chapter on the importance of phytoplasma diseases, a number of protocols for maintaining collections of plants and insects and for transferring phytoplasmas between plant species by insects, grafting or dodder are presented. This is followed by methods for detection and diagnosis, ranging from microscopy-based methods through PCR and real-time PCR to field-based detection methods. Techniques are also included for separating and classifying the phytoplasmas into their different taxonomic groups and sub-groups, as well as methods that have been developed for proteomics analyses. The final chapters cover the methods for separating phytoplasma genomic and plasmid DNA from plant DNA for whole genome sequencing, along with methods for mapping phytoplasma genomes. The target audience is primarily plant pathologists and molecular biologists, including scientists in developing countries where phytoplasmas are often a serious and devastating problem of crop plants.

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Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>xi</i>
1 The Phytoplasmas: An Introduction	1
<i>Matt Dickinson, Melanie Tuffen, and Jennifer Hodgetts</i>	
2 Techniques for the Maintenance and Propagation of Phytoplasmas in Glasshouse Collections of <i>Catharanthus roseus</i>	15
<i>Jennifer Hodgetts, David Crossley, and Matt Dickinson</i>	
3 Micropropagation and Maintenance of Phytoplasmas in Tissue Culture	33
<i>Assunta Bertaccini, Samanta Paltrinieri, Marta Martini, Mara Tedeschi, and Nicoletta Contaldo</i>	
4 Dodder Transmission of Phytoplasmas	41
<i>Jaroslava Příbylová and Josef Špak</i>	
5 Insect Maintenance and Transmission	47
<i>Heather Kingdom</i>	
6 Capturing Insect Vectors of Phytoplasmas.	61
<i>Phyllis Weintraub and Jürgen Gross</i>	
7 Insect Vector Transmission Assays.	73
<i>Domenico Bosco and Rosemarie Tedeschi</i>	
8 Molecular Identification of Phytoplasma Vector Species	87
<i>Sabrina Bertin and Domenico Bosco</i>	
9 Dienes' Staining and Light Microscopy for Phytoplasma Visualization	109
<i>Rita Musetti</i>	
10 DAPI Staining and Fluorescence Microscopy Techniques for Phytoplasmas.	115
<i>Nancy M. Andrade and Nolberto L. Arismendi</i>	
11 Visualization of Phytoplasmas Using Electron Microscopy	123
<i>B. Jean Devonshire</i>	
12 Automated DNA Extraction for Large Numbers of Plant Samples	139
<i>Nataša Mehle, Petra Nikolić, Matevž Rupar, Jana Boben, Maja Ravnikar, and Marina Dermastia</i>	
13 DNA Extraction from Arborescent Monocots and How to Deal with Other Challenging Hosts	147
<i>Nigel A. Harrison, Robert E. Davis, and Ericka E. Helmick</i>	
14 Nested PCR and RFLP Analysis Based on the 16S rRNA Gene.	159
<i>Bojan Duduk, Samanta Paltrinieri, Ing-Ming Lee, and Assunta Bertaccini</i>	
15 PCR and RFLP Analyses Based on the Ribosomal Protein Operon	173
<i>Marta Martini and Ing-Ming Lee</i>	

16	<i>Tuf</i> and <i>secY</i> PCR Amplification and Genotyping of Phytoplasmas	189
	<i>Xavier Foissac, Jean-Luc Danet, Sylvie Malembic-Maher, Pascal Salar, Dana Šafářová, Pavla Válová, and Milan Navrátil</i>	
17	PCR Analysis of Phytoplasmas Based on the <i>secA</i> Gene.	205
	<i>Matt Dickinson and Jennifer Hodgetts</i>	
18	Single-Strand Conformation Polymorphism Analysis for Differentiating Phytoplasma Strains	217
	<i>Martina Šeruga Musić and Dijana Škorić</i>	
19	Microarrays for Universal Detection and Identification of Phytoplasmas	223
	<i>Mogens Nicolaisen, Henriette Nyskjold, and Assunta Bertaccini</i>	
20	T-RFLP for Detection and Identification of Phytoplasmas in Plants	233
	<i>Jennifer Hodgetts and Matt Dickinson</i>	
21	Real-Time PCR for Universal Phytoplasma Detection and Quantification	245
	<i>Nynne Meyn Christensen, Henriette Nyskjold, and Mogens Nicolaisen</i>	
22	A Real-Time PCR Detection System for the Bois Noir and Flavescence Dorée Phytoplasmas and Quantification of the Target DNA	253
	<i>Nataša Mehle, Nina Prezelj, Matjaž Hren, Jana Boben, Kristina Gruden, Maja Ravnikar, and Marina Dermastia</i>	
23	Real-Time PCR for Specific Detection of Three Phytoplasmas from the Apple Proliferation Group	269
	<i>Nataša Mehle, Petra Nikolić, Kristina Gruden, Maja Ravnikar, and Marina Dermastia</i>	
24	Reverse Transcription-PCR for Phytoplasma Detection Utilizing Crude Sap Extractions	283
	<i>Paolo Margaria and Sabrina Palmano</i>	
25	In-Field Diagnostics Using Loop-Mediated Isothermal Amplification	291
	<i>Jenny Tomlinson</i>	
26	DNA Bar-Coding for Phytoplasma Identification	301
	<i>Olga Makarova, Nicoletta Contaldo, Samanta Paltrinieri, Assunta Bertaccini, Henriette Nyskjold, and Mogens Nicolaisen</i>	
27	Phylogenetic Analyses of Phytoplasmas Based on Whole-Genome Comparison	319
	<i>Hiromi Nishida</i>	
28	The <i>iPhyClassifier</i> , an Interactive Online Tool for Phytoplasma Classification and Taxonomic Assignment.	329
	<i>Yan Zhao, Wei Wei, Ing-Ming Lee, Jonathan Shao, Xiaobing Suo, and Robert E. Davis</i>	
29	Phytoplasma Proteomic Analysis.	339
	<i>Xianling Ji and Yingping Gai</i>	
30	Preparation of Phytoplasma Membrane Recombinant Proteins	351
	<i>Luciana Galetto, Majid Siampour, and Cristina Marzachi</i>	
31	Phytoplasma Plasmid DNA Extraction	371
	<i>Mark T. Andersen and Lia W. Liefting</i>	

32	Cesium Chloride-Bisbenzimidide Gradients for Separation of Phytoplasma and Plant DNA	381
	<i>Lucy T.T. Tran-Nguyen and Bernd Schneider</i>	
33	Pulsed-Field Gel Electrophoresis for Isolation of Full-Length Phytoplasma Chromosomes from Plants	395
	<i>Carmine Marcone</i>	
34	Mapping the Phytoplasma Chromosome	405
	<i>Sylvie Malembic-Maher and Patricia Carle</i>	
	<i>Index</i>	417

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