

CONTENTS

Contributors	xi
Preface	xv
1. Vegetable Crops in the Mediterranean Basin with an Overview of Virus Resistance	1
Michel Pitrat	
I. Some Economic Data	3
II. Center of Origin and Biological Data	4
III. Conclusions	20
References	22
2. Major Tomato Viruses in the Mediterranean Basin	31
Inge M. Hanssen and Moshe Lapidot	
I. Introduction	32
II. <i>Tomato Yellow Leaf Curl Virus</i> —A Limiting Factor in Tomato Production	33
III. <i>Torrado virus</i> , a Recently Described Viral Genus Infecting Tomato Crops	39
IV. <i>Tomato Infectious Chlorosis</i> and <i>Tomato Chlorosis Criniviruses</i> —From the New World to the Mediterranean Basin	41
V. <i>Pepino Mosaic Virus</i> , a Tomato Virus with a Rapidly Increasing Incidence in the Mediterranean Basin	44
VI. <i>Tomato Spotted Wilt Virus</i> and Other Tospoviruses: Is Tomato Production in the Mediterranean Basin Threatened by Newly Emerging Tospoviruses?	47
VII. <i>Cucumber Mosaic Virus</i> , an Old Virus That Still Causes Outbreaks in Tomato Crops Worldwide	50
VIII. Is <i>Pelargonium Zonate Spot Virus</i> Emerging in the Mediterranean Basin?	53
IX. Concluding Remarks	56
References	56

3. Viruses of Cucurbit Crops in the Mediterranean Region: An Ever-Changing Picture	67
Hervé Lecoq and Cécile Desbiez	
I. Introduction	68
II. Aphid-Borne Viruses	70
III. Whitefly-Borne Viruses	94
IV. Other Viruses	103
V. Concluding Remarks	112
References	114
4. Viruses of Pepper Crops in the Mediterranean Basin: A Remarkable Stasis	127
Benoît Moury and Eric Verdin	
I. Introduction	128
II. Aphid-Transmitted Viruses	129
III. Thrips-Transmitted Tospoviruses	139
IV. Whitefly-Transmitted Viruses	143
V. Tobamoviruses	144
VI. Other Viruses	148
VII. Conclusion	150
Acknowledgments	152
References	152
5. Viruses of the Genus <i>Allium</i> in the Mediterranean Region	163
Nikolaos I. Katis, Varvara I. Maliogka, and Chrysostomos I. Dovas	
I. Importance of <i>Allium</i> Crops and Their History	164
II. Production of <i>Alliums</i> in the Mediterranean Countries	165
III. The Main Viruses Infecting <i>Allium</i> spp.	165
IV. Control Measures of <i>Allium</i> Viruses	196
V. Future Developments and Perspectives	199
References	199
6. Viruses of Potato	209
Gad Loebenstein and Victor Gaba	
I. Introduction	210
II. The Main Viruses	212
III. <i>Potato Spindle Tuber Viroid</i> : Genus <i>Pospiviroid</i>	232
References	235

7. Virus Diseases in Lettuce in the Mediterranean Basin 247

Aranzazu Moreno and Alberto Fereres

I. Introduction	249
II. Alfalfa Mosaic Virus (<i>Bromoviridae</i> , <i>Alfamovirus</i>)	250
III. Beet Western Yellows Virus (<i>Luteoviridae</i> , <i>Polerovirus</i>)	253
IV. Broad Bean Wilt Virus (<i>Comoviridae</i> , <i>Fabavirus</i>)	258
V. Cucumber Mosaic Virus (<i>Bromoviridae</i> , <i>Cucumovirus</i>)	260
VI. Lettuce Big-Vein Disease: Lettuce Big-Vein Associated Virus (<i>Varicosavirus</i>) and Mirafiori Lettuce Big-Vein Virus (<i>Ophiovirus</i>)	263
VII. Lettuce Mosaic Virus (<i>Potyviridae</i> , <i>Potyvirus</i>)	267
VIII. Tomato Spotted Wilt Virus (<i>Bunyaviridae</i> , <i>Tospovirus</i>)	271
IX. Turnip Mosaic Virus (<i>Potyviridae</i> , <i>Potyvirus</i>)	274
X. Lettuce Necrotic Yellows Virus (<i>Rhabdoviridae</i> , <i>Cytorhabdovirus</i>)	277
XI. Conclusions	277
References	278

8. Viruses in Artichoke 289

Donato Gallitelli, Tiziana Mascia, and Giovanni P. Martelli

I. Introduction	290
II. Viruses with Isometric Particles	291
III. Viruses with Filamentous Particles	300
IV. Viruses with Rigid Rod-Shaped Particles	307
V. Viruses with Enveloped Particles	308
VI. Diagnosis	309
VII. Production of Virus-Free Plants	311
VIII. Concluding Remarks	315
References	315

9. Viruses in Sweetpotato 325

Gad Loebenstein

I. Introduction	326
II. The Viruses	326
III. Control	337
IV. Concluding Remarks	338
References	339

10. Viruses of Asparagus 345

Laura Tomassoli, Antonio Tiberini, and Heinrich-Josef Vetten

I. Introduction	346
II. <i>Asparagus Virus 1</i>	347

III. <i>Asparagus Virus 2</i>	352
IV. Minor Viruses	357
V. Control Methods: Present and Future	360
References	361
11. Virus Diseases of Peas, Beans, and Faba Bean in the Mediterranean Region	367
Khaled Makkouk, Hanu Pappu, and Safaa G. Kumari	
I. Introduction	368
II. Importance	368
III. Production	369
IV. The Main Virus Diseases	369
V. Concluding Remarks	392
References	393
12. Tospoviruses in the Mediterranean Area	403
Massimo Turina, Luciana Tavella, and Marina Ciuffo	
I. Introduction	404
II. Recent Advances in Tospovirus Research	406
III. Tospovirus Diagnosis	408
IV. Thrips Vectors of Tospovirus in the Mediterranean Basin	409
V. Tospovirus Species Affecting Vegetable Crops in the Mediterranean Basin	412
VI. Epidemiology and Control Measures for Tospoviruses	418
VII. Potential Future Threats of Tospoviruses to Vegetable Crops in the Mediterranean Basin	423
VIII. Conclusions	424
Acknowledgments	425
References	425
13. Cucumber Mosaic Virus	439
Mireille Jacquemond	
I. Introduction	440
II. Genome Organization and Expression	441
III. The Virus Cycle	443
IV. Dissemination in Nature	450
V. Host Response	454
VI. CMV in the Mediterranean Basin	469
VII. Virus Diversity and Evolution	472
VIII. Virus and Host Fitness	487
IX. Concluding Remarks	489
Acknowledgment	491
References	491

14. Pepino Mosaic Virus and Tomato Torrado Virus: Two Emerging Viruses Affecting Tomato Crops in the Mediterranean Basin	505
Pedro Gómez, Raquel N. Sempere, and Miguel A. Aranda	
I. Introduction	506
II. Pepino Mosaic Virus	508
III. Torradoviruses	522
IV. Some Conclusions and Many Hypotheses	525
Acknowledgments	526
References	527
15. Control Methods of Virus Diseases in the Mediterranean Basin	533
Yehezkel Antignus	
I. Introduction	534
II. Phytosanitation: A General Tool to Combat Virus Diseases	534
III. Management of Soil-Borne Viruses	535
IV. Management of Air-Borne Viruses	537
References	548
<i>Index</i>	555
<i>Color plate section at the end of the book</i>	