

Contents

Part I Prerequisites for Host Plant Resistance Studies

Introduction	3
V. Selvanarayanan	
Germplasm Exploration and Collection	11
A. K. Chakravarthy and V. Selvanarayanan	
Comparison of Germplasm Evaluation Parameters	23
Jayalakshmi Narayan Hegde and Sandeep Singh	
Determining Relative Abundance and Distribution Patterns of Insect Pests	27
T. Prabhulinga and A. D. N. T. Kumar	
Mass Culturing of Phytophagous Insects for Host Plant Resistance Studies	33
K. Kumar and G. Dhakshinamoorthy	

Part II Instrumentation in Host Plant Resistance Studies

Laboratory Equipments Used for Host–Plant Resistance Studies	47
K. P. Kumar and Christine Ilemut	
Electroantennogram for Recording Olfactory Responses of an Insect to Plant Volatiles	53
T. N. Madhu and B. Doddabasappa	
Standardization of Feeding Tests in Phytophagous Insects to Host and Nonhost Plants	57
G. Basanagouda and K. R. M. Bhanu	

Wind Tunnel: A Tool to Test the Flight Response of Insects to Semiochemicals	65
S. Subhash and P. R. Shashank	
 Part III Techniques in Host Plant Resistance Studies	
Techniques for Determining the Brown Plant Hopper <i>Nilaparvata lugens</i> (Stål) Resistance in Rice in Vietnam	73
Huynh Thanh Loc and Nguyen Van Hoa	
Resistance Screening Techniques for Major Insect and Mite Pests in Vegetable Crops	83
R. Srinivasan and Mohamed Rakha	
Screening Pigeon Pea, <i>Cajanus cajan</i> (L.) Millsp., Against Major Insect Pests	97
K. S. Jagadish, Ranvir Singh, Pritha Ghosh, and Korrakot Domkak	
Screening Soybean, <i>Glycine max</i> L. Merri. Against Major Insect Pests	107
K. S. Jagadish, Dymtro Kravtsov, Ranvir Singh, and C. G. Arun Kumara	
Techniques for Determining Mechanisms of Resistance: Antixenosis for Feeding	125
L. Vijay Kumar, P. N. Guru, and B. S. Rajendra Prasad	
Techniques for Determining Mechanisms of Resistance: Antixenosis for Oviposition	133
K. R. Manikandan and A. Arasu	
Techniques for Determining Mechanisms of Resistance: Antibiosis	139
N. R. Prasanna Kumar and Thimmanna	
Techniques for Determining the Mechanisms of Resistance: Tolerance	145
G. P. Muthuraju and Yanal Ahmad Al Kudsi	
Techniques for Evaluation of Biophysical Factors of Resistance in Crop Plants	151
N. Muthukumaran and R. Promoth Kumar	
Techniques for the Evaluation of Biochemical Factors of Resistance in Crop Plants	161
K. Balaji and A. Thanga Hemavathy	

Techniques for Determining the Repellent and Antifeedant Activity to Phytophagous Insects	183
N. E. Thyagaraja and A. T. Rani	
Evaluation of Insect Resistance Using Tissue-Cultured Plants	187
Amalahyacinth and Chand Asaf	
Germplasm Screening and Evaluation Techniques Against Insect Pests	195
M. Saravanaraman and G. D. Prahalada	
Part IV Ecological and Climatographic Factors in Host Plant Resistance Studies	
Effects of Plant Phenological Factors on Insect Pest Infestation	233
Santosh Kulkarni, A. K. Chakravarthy, and Naveen Kumar	
Determining Stability of Insect-Resistant Plants in Varying Climatic Regimes	239
Subhash B. Kandakoor and V. Sridhar	
Role of Plant Volatiles, Pest-Resistant Varieties and Transgenics in Tri-trophic Interactions	245
Chacko Jobichen and V. Selvanarayanan	
Economic and Ecological Values of Resistant Plants	253
A. K. Chakravarthy, E. V. Jose Luis, S. Onkara Naik, and B. Rajkumar	
Part V Genetics, Plant Breeding and Molecular Tools in Host Plant Resistance Studies	
Molecular Marker-Assisted Selection of Plant Genes for Insect Resistance	267
Vasudev Kammar and K. S. Nitin	
<i>Agrobacterium</i>-Mediated Transformation for Insect-Resistant Plants	275
B. Sunil Kumar and C. Immanuel Selvaraj	
Breeding Procedures for Developing Insect-Resistant Crops	285
T. Sabesan and K. Saravanan	
Physical and Chemical Mutagenesis Methods for Development of Insect-Resistant Crop Varieties	295
K. Saravanan and T. Sabesan	