
Contents

PART I

GREEN APPROACH TO PEST AND DISEASE CONTROL

1 Pests of Agricultural Crops and Control Measures, 1

Barbara Sawicka, PhD and Chukwuebuka Egbuna, BSc, MSc

2 Plant Diseases, Pathogens and Diagnosis, 17

Barbara Sawicka, PhD, Chukwuebuka Egbuna, BSc, MSc, Ashish Kumar Nayak, PhD and Smriti Kala, PhD

3 Pesticides, History, and Classification, 29

Yusuf Abubakar, Habibu Tijjani, PhD, Chukwuebuka Egbuna, BSc, MSc, Charles Oluwaseun Adetunji, PhD, Smriti Kala, PhD, Toskë L. Kryeziu, Jonathan C. Ifemeje, PhD and Kingsley C. Patrick-Iwuanyanwu, PhD

4 Biopesticides, Safety Issues and Market Trends, 43

Chukwuebuka Egbuna, BSc, MSc, Barbara Sawicka, PhD, Habibu Tijjani, PhD, Toskë L. Kryeziu, Jonathan C. Ifemeje, PhD, Dominika Skiba, PhD and Colin B. Lukong, PhD

5 Natural Compounds Against Plant Pests and Pathogens, 55

Agnieszka Jamiolkowska, PhD and Marek Kopacki, PhD

6 Phytochemicals of Plant-Derived Essential Oils: A Novel Green Approach Against Pests, 65

Arvind Saroj, PhD, Olumayowa Vincent Oriyomi, MSc, Ashish Kumar Nayak, PhD and S. Zafar Haider, PhD

7 Semiochemicals: A Green Approach to Pest and Disease Control, 81

Shahira M. Ezzat, PhD, Jaison Jeevanandam, PhD, Chukwuebuka Egbuna, BSc, MSc, Rana M. Merghany, Muhammad Akram, PhD, Muhammad Daniyal, Jaweria Nisar and Aamir Sharif

8 Fungistatic Properties of Lectin-Containing Extracts of Medicinal Plants, 91

Sergey V. Pospelov, PhD, Anna D. Pospelova, PhD, Valentina V. Onipko, Doctor of Sc. and Maxim V. Semenko

PART II

BIOLOGICAL CONTROL MEASURES

9 Biological Control of Weeds by Allelopathic Compounds From Different Plants: A BioHerbicide Approach, 107

Mohammad Mehdizadeh, PhD and Waseem Mushtaq, PhD

10 Microbial Control of Pests and Weeds, 119

Deepa Verma, MSc, B.ED, M.A, M.PHIL, MBA, PhD, Temitope Banjo, PhD, Madhvi Chawan, MSc, Nikhil Teli, MSc, PhD and Rohan Gavankar, MSc, B.ED, PhD

- 11 Biological Control of Plant Pests by Endophytic Microorganisms, 127**
Alloysius Chibuike Ogodo, BSc, MSc, PhD

PART III

TECHNIQUES, BIOTECHNOLOGICAL AND COMPUTATIONAL APPROACH

- 12 Techniques for the Detection, Identification, and Diagnosis of Agricultural Pathogens and Diseases, 135**

*Ajay Kumar Gautam, PhD and
Shashank Kumar, PhD, MSc, BSc*

- 13 Nucleic Acid–Based Methods in the Detection of Foodborne Pathogens, 143**

*Hakiye Asian, PhD, Ayten Ekinci, PhD and
Imran Asian, Assoc. Prof.*

- 14 Plant Biotechnology in Food Security, 163**

*Barbara Sawicka, PhD, Krishnan
Umachandran, BE, MS, MBA, PhD,
Dominika Skiba, PhD and
Parisa Ziarati, PhD*

- 15 Homemade Preparations of Natural Biopesticides and Applications, 179**

*Charles Oluwaseun Adetunji, PhD,
Chukwuebuka Egbuna, BSc, MSc,
Habibu Tijjani, PhD, Dickson Adom, PhD,
Laith Khalil Tawfeeq Al-Ani and
Kingsley C. Patrick-Iwuanyanwu, PhD*

- 16 The Use of Vermiwash and Vermicompost Extract in Plant Disease and Pest Control, 187**

*Intan Soraya Che Sulaiman, BSc, MSc, PhD
and Azham Mohamad, BSc, MS*

- 17 Genetic Modification as a Control Mechanism to Plant Pest Attack, 203**

*Onyeka Kingsley Nwosu, BSc, MSc, PGDE and
Kingsley Ikechukwu Ubaoji, PhD*

- 18 Biopesticides: Formulations and Delivery Techniques, 209**

*Smriti Kala, PhD, Nisha Sogan, PhD, Amrisha
Agarwal, S.N. Naik, P.K. Patanjali and
Jitendra Kumar*

- 19 Safe Storage and Preservation Techniques in Commercialized Agriculture, 221**

*Narashans Alok Sagar, PhD and Sunil Pareek,
PhD*

- 20 Advances in Application of ICT in Crop Pest and Disease Management, 235**

Chandan Kumar Panda, PhD

- 21 Applications of Computational Methods in Plant Pathology, 243**

*Keshavi Nalla, Seshu Vardhan Pothabathula,
PhD and Shashank Kumar, PhD, MSc, BSc*

INDEX, 251