Contents

Part I In Vitro Regeneration

1 Plant Tissue Culture: A Journey from Research to Commercialization ............................................................. 3
   Mohammad Anis and Naseem Ahmad

2 Selection of Elites and In Vitro Propagation of Selected High-Value Himalayan Medicinal Herbs for Sustainable Utilization and Conservation ................................................................. 15
   Shyamal K. Nandi, Lok Man S. Palni, Hemant Pandey, Bhuwan Chandra, and Mohammad Nadeem

3 In Vitro Approaches for Conservation and Sustainable Utilization of Podophyllum hexandrum and Picrorhiza kurroa: Endangered Medicinal Herbs of Western Himalaya ......................... 45
   Nisha Dhiman, Vanita Patial, and Amita Bhattacharya

4 Effect of Plant Growth Regulators and Additives on Indirect Organogenesis of Simarouba glauca DC ....................................................... 71
   A.R. Lavanya, M. Muthukumar, S. Muthukrishnan, V. Kumaresan, T. Senthil Kumar, M. Vijaya Venkatesh, and M.V. Rao

5 Biotechnological Applications for Characterisation, Mass Production and Improvement of a Nonconventional Tree Legume [Parkia timoriana (DC.) Merr.] .................................................. 83
   Robert Thangjam

6 A to Z on Banana Micropropagation and Field Practices ................................. 101
   Norzulaani Khalid and Boon Chin Tan

7 In Vitro Plant Regeneration in Dainty Spur [Rhinacanthus nasutus (L.) Kurz.] by Organogenesis ......................... 119
   T. Gouthaman, T. Senthil Kumar, A.S. Rao, and M.V. Rao

8 Application of Tissue Culture for Laburnum anagyroides Medik. Propagation .................................................. 135
   S.N. Timofeeva, L.A. Elkonin, O.I. Yudakova, and V.S. Tynov
9 Recent Advances in Asteraceae Tissue Culture ........................................ 161
Jyothi Abraham and T. Dennis Thomas

Part II Tree Biotechnology

10 Plant Tissue Culture Approach for Cloning and Conservation of Some Important RET Medicinal Plants ............................................. 199

11 Biotechnological Approaches for the Improvement of Eucalyptus ................................................................. 219
Diwakar Aggarwal, M. Sudhakara Reddy, and Anil Kumar

12 Biotechnology of Tropical Tree Crops .............................................................. 245
Yan Hong, Somika Bhatnagar, and Smitha Chandrasekharan

Part III Genetic Engineering

13 In Vitro Regeneration of Salt-Tolerant Plants ........................................ 299
Remya Mohanraj

14 Plant Tissue Culture for In Vitro Mutagenesis, Large-Scale Propagation, and Genetic Transformation ................................................... 309
Pratibha Misra and Syed Saema

15 Genetic Engineering for Insect Resistance in Economically Important Vegetable Crops ................................................................. 343
D.K. Srivastava, P. Kumar, S. Sharma, A. Gaur, and G. Gambhir

16 RNA Interference (RNAi) and Its Role in Crop Improvement: A Review ................................................................. 379
Amanpreet Kaur, Anil Kumar, and M. Sudhakara Reddy

17 In Vitro Selection of Disease-Resistant Plants ........................................ 395
Srinath Rao and H. Sandhya

18 Role of Rol Genes: Potential Route to Manipulate Plants for Genetic Improvement ................................................................. 419
Sana Khan, Syed Saema, Suchitra Banerjee, and Laiq ur Rahman

Part IV Crop Improvement

19 Synthesis of Silver Nanoparticles from Plants and Their Applications ................................................................. 449
Asra Parveen and Srinath Rao

20 Biotechnological Approaches for the Improvement and Conservation of Alnus glutinosa (L.) Gaertner ........................................ 467
Mª del Carmen San José, Laura V. Janeiro, Mª Teresa Martínez, Silvia Valladares, Mª José Cernadas, Raquel Montenegro, and Elena Corredoira
## Contents

21 Isolated Microspore Culture and Its Applications in Plant Breeding and Genetics ................................................................. 487
   Mehran E. Shariatpanahi and Behzad Ahmadi

22 Indirect Somatic Embryogenesis and Plantlet Development from Mature Seed Embryo Explants of *Bambusa arundinacea* (Retz.) Wild ........................................................................................................ 509
   P. Venkatachalam and K. Kalaiarasi

### Part V Plant Conservation

23 Micropropagation Technology and Its Applications for Crop Improvement ................................................................. 523
   Mohamed A. El-Esawi

24 Improvement of Green Leafy Vegetables: The Role of Plant Tissue Culture and Biotechnology .............................................. 547
   Sandopu Sravan Kumar, M.C. Aruna, and Parvatam Giridhar

25 Nonzygotic Embryogenesis for Plant Development ......................... 583
   Mohamed A. El-Esawi

26 Somatic Hybridization and Microspore Culture in *Brassica* Improvement ........................................................................ 599
   Mohamed A. El-Esawi

Index ................................................................................................................. 611
Plant Tissue Culture: Propagation, Conservation and Crop Improvement
Anis, M.; Ahmad, N. (Eds.)
2016, XVII, 621 p. 79 illus., 66 illus. in color., Hardcover