January 6, 2014

Thank you for your purchase of *OMICS: Applications in Crop Science* (Edited by Debmalya Barh).

The following preface is a revision to the preface in the first printing of this book:

Preface

The term *omics* is probably derived from the Sanskrit word *Om*, which depicts completeness. During the last two decades the term *omics* has been suffixed with several biological topics to provide complete information on the subject; for example genomics, proteomics, and so on. Although the cutting-edge technologies in this *omics* era that are applied to address various biomedical issues are well documented in several books and much literature, a limited number of books with limited information are available for important agricultural crops.

This book, *Omics Applications in Crop Science*, is an effort to fill the gap and to provide students and researchers in molecular plant biology and crop science with a comprehensive resource covering applications of various *omics* technologies such as genomics, transcriptomics, proteomics, metabolomics to important agronomic, horticultural, medicinal, plantation, fibre, forage, and bioenergy crops. Seventy-five experts from nine countries have combined and shared their practical experience with the latest advancements in the field in developing this unique book. Since the list of major crops is long, this book includes applications of omics technologies in the 16 most important crops. Further, important intellectual properties or patents specific to either technologies or crops are included as appropriate.

The book consists of 20 chapters, and in the first three chapters, omics approaches in the most important cereal crops, rice and maize, are covered. Chapter 1, by Dr. Somnath Roy and colleagues, describes omics-based approaches for rice improvement and Chapter 2, by Dr. Prashant Vikram et al., illustrates various practical omics approaches for drought tolerance in rice. Chapter 3, by Dr. Pawan Kumar Agrawal's group, explains how the omics-based

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strategies can be used for maize improvement. Chapter 4 is dedicated to pulses. Dr. Abhishek Bohra et al. have given a comprehensive account of omics and omics approaches used in improving chickpea, pigeonpea, cowpea, and lentil in this chapter. Under tuberous crops, the potato is selected for this book, and in Chapter 5, Dr. Elena Rakosy-Tican discusses genetic engineering and strategies in improving this important crop. The Brassicaceae family comprises some important vegetable crops. In Chapter 6, Dr. Xiaonan Li et al. demonstrate the omics and applications of various omics-based approaches in several *Brassica* species. Chapter 7, by Dr. Rachayya M. Devarumath and colleagues, describes how omics strategies can be useful in improving the most important industrial crop, sugarcane. Chapters 8 and 9 deal with fruit crop omics. While Chapter 8, by Dr. Md. Abdur Rahim and Dr. Livio Trainotti, deals with temperate fruits; Chapter 9, by Dr. Kundapura V. Ravishankar et al., provides an in-depth account of tropical fruit omics. Chapters 10 and 11 include omics of medicinal plants. In Chapter 10, Dr. Ashutosh K. Shukla and Dr. Suman P.S. Khanuja discuss the metabolomics of *Catharanthus roseus* and how the medicinally important alkaloids of the plant are produced under precise genomic regulation. Similarly, the omics of another important medicinal plant, *Withania somnifera*, has been documented by Dr. Neelam S. Sangwan and colleagues in Chapter 11. Chapter 12 is on floriculture: Dr. Rajesh Kumar Dubey's group discuss various genetic engineering approaches in improving ornamental and flowering plants.
In Chapter 13, Dr. Mainaak Mukhopadhyay and colleagues highlight the omics advances in tea, one of the most important beverage and plantation crops. In Chapter 14, Dr. Tianzhen Zhang's team focus on various omics strategies in improving the fiber qualities of cotton. Chapters 15 and 16 provide omics-related information on very important but neglected plants: forest trees and forage crops. Thanks to Dr. Mohammed Ellatifi for giving a very comprehensive account of forest tree omics and engineered forest trees for human benefit in Chapter 15. Similarly, credit must be given to Dr. Suresh Kumar and Dr. Vishnu Bhat for providing valuable information on the application of omics technologies in forage crop improvement in Chapter 16. In Chapter 17, Dr. Atul Grover and his team document a budding area in plant biotechnology with the title "Bioenergy Crops Enter the Omics Era." Chapter 18, by Dr. Dinesh K. Yadav and colleagues, gives a detailed account on how omics technologies are applicable in molecular farming, along with associated issues such as commercial aspects of molecular farming, clinical trials of plant-produced pharmaceuticals, and regulatory issues. A new term, *natural pesticidome*, has been coined and described by Dr. Daiane Hansen in Chapter 19, describing how they can be used to replace chemical pesticides for a green environment. The book is concluded with an important topic, intellectual property rights (IPR), in Chapter 20. This chapter presents basic as well as various practical IPR issues in plant biotechnology. Dr. Dinesh Yadav and colleagues also provide a long list of patented technologies and plant-specific patents in this chapter.

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I believe that this book and its rich content and coverage will be worthwhile to students and researchers in the field of cutting edge plant science. Your suggestions and comments to improve the next edition would be much appreciated.

Debmalya Barh
Editor

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