

PREFACE

In the current context of global climate change, with erratic weather conditions (temperature, rainfall, humidity, particularly during critical plant growth periods) exposing plants to various abiotic stresses (such as drought, salinity, extreme temperatures, and flooding), it is crucial that we hasten efforts to clearly understand the biochemical, physiological, and molecular mechanisms underlying abiotic stress tolerance in plants. While several initiatives have begun in important research institutes at the global level, the speed at which abiotic stress-tolerant cultivars are being developed is not keeping pace with the ever-increasing pressure of abiotic stresses attributable to climate change. In addition, the complex genetic mechanisms involved in plant adaptation to abiotic stresses have been a major impediment for crop improvement using conventional plant breeding tools. Molecular biology advances have opened new vistas in understanding these complex mechanisms. Throughout this book, "Biochemical, Physiological, and Molecular Avenues for Combating Abiotic Stress in Plants," I have tried my best to include chapters describing the significance of abiotic stress in plants under the current climate change scenario and the prospective interventions being applied at the global level, utilizing current high-throughput technologies to crack the code of abiotic stress traits, and digging deep into the molecular mechanisms responsible for these complex traits in plants. This book is a tremendous, inclusive reference source for researchers, teachers, and graduate students involved in the study of abiotic stress tolerance in plants. This book uses plant molecular biology tools by revealing principles and applications of newly developed technologies and their application in the development of resilient, stress-resistant plants to combat abiotic stresses. The chapters are written by world-renowned researchers and academicians in the field of plant stress biology. I express sincere thanks and gratefulness to my revered authors, because without their untiring efforts, this project would not have been possible. I am also thankful to Elsevier for providing such an opportunity to complete this book. I am thankful to all my family members, especially my wife for her support during the language-editing process.

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