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Nota di contenuto	Chapter 1. An overview of roles of enzymatic and non-enzymatic antioxidants in plant -- Chapter 2. Functional Characterization of the Antioxidant Enzymes in Plants Exposed to Environmental Stresses -- Chapter 3. Gene expression and role of antioxidant enzymes in crop plants under stress -- Chapter 4. Proteomic and Genomic Approaches for Antioxidant Enzymes-Mediated Defence Analyses in Higher Plants -- Chapter 5. Genetic Engineering Applications in Inducing Stress Tolerance in Plants through Antioxidants -- Chapter 6. Kinase mediated signaling cascades in plants abiotic stress physiology -- Chapter 7. Plant peroxidases: biomarkers of environmental stresses and signaling in plants -- Chapter 8. Molecular mechanisms of superoxide dismutase (SODs)-mediated defense in controlling oxidative stress in plants -- Chapter 9. Glutathione in higher plants: biosynthesis and physiological mechanisms during heat and drought-induced oxidative stress. Chapter 10. Role of Tocopherol in Conferring

Abiotic StressTolerance in Plants -- Chapter 11. Plant glutathione transferases and their role in the mitigation of abiotic stresses -- Chapter 12. Role of ascorbic acid in alleviating abiotic stress in crop plants -- Chapter 13. CRISPR/Cas Mediated Genome Editing Technologies in Plants for Stress Resilience -- Chapter 14. Decrypting drought stress tolerance of crop plants via photosynthesis and antioxidative defense mechanisms -- Chapter 15. Role of Brassinosteroids (BRs) in modulating antioxidative defense mechanism in plants growing under abiotic and biotic stress conditions -- Chapter 16. Selenium-mediated regulation of antioxidant defense system and improved heavy metals tolerance in plants -- Chapter 17. Antioxidant defense system in plants against biotic stress -- Chapter 18. Revisiting the crucial role of reactive oxygen species and antioxidant defense in plant under abiotic stress -- Chapter 19. Plant life under changing environment: An exertion of environmental factors in oxidative stress modulation -- Chapter 20. Beneficial role of phytochemicals in oxidative stress mitigation in plants.

Sommario/riassunto

This edited book highlights the molecular basis of various enzymatic and non-enzymatic antioxidants, defense mechanisms and adaptation strategies employed by plants to avoid the stressful conditions. Special focus is given to gene expression, omics and other latest technologies such as CRISPR-Cas mediated genome editing applications for defense related studies in plants. Environmental stresses such as drought, salinity or floods etc. induce the generation of reactive oxygen species (ROS) which causes severe damage to cell membrane integrity by accelerating lipid peroxidation. To counteract the detrimental effect of ROS, plants are inherited with an intricate and vibrant antioxidant defense system, comprised of enzymatic (catalase, peroxidase, superoxide dismutase, glutathione reductase, glutathione S-transferase, guaiacol peroxidase, monodehydroascorbate reductase, dehydroascorbate reductase etc.), and non-enzymatic (glutathione, ascorbate, -tocopherol, carotenoids, flavonoids etc.) antioxidants, which scavenge and/or reduce excess ROS and improve plant tolerance to various stresses. Stress tolerance in most crop plants is positively correlated with an efficient antioxidant system. Therefore, studying the efficiency of antioxidant defense systems in plants is necessary for facilitating the plant’s nature of adaptation against challenging environments. This book is of interest to teachers, researchers and academic experts. Also, the book serves as additional reading material for undergraduate and graduate students of biotechnology and molecular biology of plants.