Special Issue

Physiological and Molecular Mechanisms of Stress Tolerance in Rice

Message from the Guest Editors

Rice, as a staple food for more than half of the world's population, faces increasing production challenges due to various environmental stresses, including drought, salinity, heat, and flooding. Understanding the physiological and molecular mechanisms that underpin rice stress tolerance is pivotal for developing resilient rice varieties to meet global food security needs. Recent advances in genomics, proteomics, and metabolomics have provided novel insights into stress-responsive pathways, enabling the identification of key regulatory genes, proteins, and metabolites that contribute to stress adaptation. This Special Issue focuses on uncovering and integrating physiological, molecular, and genetic strategies to enhance rice stress tolerance. Topics include, but are not limited to, ion transport mechanisms, oxidative stress regulation, hormonal signaling, and transcriptional networks under stress conditions. Contributions exploring the application of stress tolerance mechanisms in breeding programs or biotechnological approaches are particularly welcome.

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