

Tentative Outline

Current Chemical Biology

Plant Stress and Defense Metabolites at the interface of plant-environment interactions

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• Scope of the Thematic Issue:

Increase in environmental stress due to climate change is likely to aggravate their detrimental effects on plant growth and development. The environmental stresses include biotic and abiotic factors like pests, diseases, pathogens and salt, drought, toxic metals, heat, cold etc. The combination of these stresses may become more lethal via cellular oxidative damage due to generation of reactive oxygen and nitrogen species which profoundly disrupt key metabolic processes including photosynthesis, primary and secondary metabolism, lipid and hormonal signaling.

In response to stress, plants have evolved some long term adaptations and short term stress avoidance and acclimation mechanism. These mechanisms include changes in root and shoot systems architecture, expression of stress responsive genes, plant growth regulators, osmolytes, ion transporters and several factors involved in the signaling processes. The recent evidences show roles of numerous secondary metabolites to serve a variety of cellular functions crucial for physiological processes under normal as well as stressful conditions. These chemical compounds play an important role in defense mechanism of plants against different environmental stresses. The metabolic adjustments in response to environmental stresses involve fine adjustments in amino acid, carbohydrate and amine metabolic pathways. The proper activation of early metabolic responses helps cells to restore energetic and chemical imbalances imposed by the stress and is crucial for acclimation and survival. Thus the present special issue will provide better understanding of interplay of plant stress and defence metabolites under environmental stress in plants.

Keywords: Biotic stress, abiotic stress, plant metabolites, metabolic adjustment, metabolic pathways, Plant-environment interaction, Plant Defense#

Sub-topics:

- Mechanism of biotic & abiotic stress tolerance in plants
- Role of Secondary metabolites in stress tolerance
- Plant- Environment interactions
- Plant-microbe interaction under stress tolerance
- Identification of stress responsive metabolites under environmental stress
- Role of metabolites in growth and stress tolerance

Tentative titles of the articles

- Diversity and distribution and role of antioxidants compounds accumulated in plants under environmental stress
- Regulation of metabolic regulators under biotic stress in plants
- Unraveling key metabolic regulators associated with abiotic stress tolerance in plants
- Role of phenolic compounds under combined biotic and abiotic stress in plants
- Targeting osmolytes for environmental stress tolerance in plants
- Antioxidant Defense in plants under biotic and abiotic stress

- Role of osmolytes in plants under changing environment
- Understanding metabolomics in revealing environmental stress tolerance in plants
- Role of signaling molecules in enhancing environmental stress tolerance in plants
- Regulation of plant hormones under abiotic/biotic stress in plants
- Variation in plant bioactive compounds under abiotic/biotic stress in plants
- Plant photosynthesis under changing environmental conditions
- Role of Reactive species of oxygen, nitrogen and Sulphur under stress in plants
- Modulation of metabolic pathways under biotic/abiotic stress in plants
- Biotic and abiotic elicitors- role in enhancement of secondary metabolites in plants
- Consequences of abiotic stress factors on metabolism of crops
- Biochemical responses of plants to individual and combined environmental stresses
- Regulation of stress responsive amino acids under environmental stress

Schedule:

- ✧ Thematic issue submission deadline:
December 2021

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