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Special Issue on

Genomics and Molecular Biology Applications for Climate Smart Crop Improvement

CALL FOR PAPERS

Grain yields of world's staple food crop are estimated to reduce significantly as a result of changing climate including increase in temperature and the losses are variable over space and time. The current average global temperature increment rate of 0.1°C per decade may reach up to 4°C by end of 21st century. Uncertain precipitation rates have resulted in increased drought and flooding in recent years. In spite of numerous water resources management programs, the crop yield is being severely affected. In a nutshell, drought stress, high temperatures during growth stages of plants, and multitude of biotic stresses are the principal factors hampering grain yields of staple cereal crops. The rate of yield potential increase for the most important cereals rice and wheat is almost half that required to meet global demand by 2050. In view of this changing climate scenario, the Food and Agriculture Organization (FAO) has launched 'Climate Smart Agriculture' initiative aiming towards diversification of cropping systems and crop varieties. Meeting food demands of burgeoning global population against the effects of climate change and slow yield gain would require a multifaceted approach involving novel crop improvement methods, diversification of breeding germplasm pool, and deployment of plant genomics applications.

Wild relatives, landraces, and traditional cultivars of crop species have been evolved in specific environments under peculiar set of climatic conditions and hence represent invaluable sources for germplasm enhancement. These germplasms are adapted to varying topography and climates, rendering them as reservoir of useful genes for stress tolerance/wide adaptation. Such resources are seldom used in varietal improvement due to several bottlenecks (e.g., linkage drags). Genomics and molecular biology tools can be deployed in effectively tackling such bottlenecks and to ensure fast track-precision breeding. Next-generation sequencing paved the way for low cost high throughput genotyping which acts as foundation stone for genomics applications. One of the fascinating examples is identification of rare alleles which is quite efficient through NGS based genotyping. There are other such applications that have potential in germplasm enhancement/ crop improvement. These approaches are being followed in leading crop breeding institutes globally. This special issue will focus on genomics applications in crop breeding addressing "genomics and molecular biology applications for climate smart crop breeding." Genomics assisted crop breeding.

Potential topics include but are not limited to the following:

- Diversity, linkage mapping, and GWAS
- Genomics application in prebreeding of crop plants
- Genomic selection for multiple traits towards varietal improvement
- Genomics applications in crop improvement
- Understanding the molecular mechanism of signal perception and response to abiotic stresses of crop plants
- Functional genomics applications in crop improvement
- Molecular breeding approaches for improving the crop abiotic stress tolerance

Authors can submit their manuscripts through the Manuscript Tracking System at http://mts.hindawi.com/submit/journals/bmri/genomics/gacs/.

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