EDITORIAL

Genes, Genomes and Germplasm for Climate-Smart Agriculture-Part-II

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This thematic issue of Current Genomics on "Genes, Genomes, and Germplasm for Climate-Smart Agriculture-Part-II" is the second in the planned series of three issues comprehensively dealing with recent developments in research topics relevant to climate-resilient agriculture to achieve Sustainable Development Goal 2 (SDG2) by 2030. While Part -I of this special issue consisted of five review articles, the current issue (Part-II) includes four review articles. This on-going series is an honour recognizing the significant research contribution of Prof. K.C Bansal towards ththematic topic. The immense contributions of his group are briefly described in the Part-I editorial. Further, his efforts towards executing the largescale germplasm characterization (2011-2016) conserved in the Indian National Gene Bank for biotic stress resistance are noteworthy. His group evaluated the entire wheat collection of about 22000 accessions across different disease hotspots in the country, and identified new sources of resistance to different biotic stresses such as rusts and spot blotch disease [1] and powdery mildew disease [2]. The findings of these studies have global significance and warrant germplasm exchange across the globe to ensure global food and nutritional security by the use of valuable accessions conserved in the Gene banks. In this context, all the four review articles included in the Part-II of this thematic issue deals with four important facets of climate-resilient crop development, *i.e.*, photobiotechnology for climate-smart crops, a roadmap for millet improvement and utility, CRISPR-mediated virus resistance in crops, and molecular insight into the potassium use efficiency.

Light and mineral nutrients are the key inputs for crop growth. In addition to its role as input for photosynthesis, light is also a key regulator of plant development. Therefore, light and mineral nutrient play important role in determining climate resilience, crops quality and productivity. Sharma *et al.* [3] reviewed the molecular mechanisms of action of photoreceptors *viz*, Phototropin (PHOT), Phytochrome (PHY), Cryptochrome (CRY), and UVR8. They also highlighted the importance of PHOT-regulated signalling components and strategic use of artificial illumination for imparting climate resilience to crops. The second review article by Lhamo *et al.* [4] comprehensively described the current understanding of gene families, functional genomics and genome-wide analysis of K^+ transporter. This review discussed the role of various gene family members of K^+ transporters in K^+ uptake and translocation, and their tissue specific role. Further, this review emphasized analysis of K^+ channels in polyploids specifically *Camelina sativa*, and suggested strategies to improve K^+ utilization efficiency (KUE) for sustainable biofuel production in marginal lands.

Plant viruses are becoming an increasing menace due to global climate change. Genetic host plant resistance is the best strategy to manage viral diseases in crops. Natural sources of resistance to viral disease are limited in different crops. CRISPR-Cas9 based genomic interventions are proving an effective method to manage both DNA and RNA viruses in plants. These aspects of CRISPR mediated induced resistance to plant viruses and its application in molecular breeding of crops is reviewed by Vidya *et al.* [5]. Millets were important components of human nutrition. Due to the popularization and easy availability of rice, wheat and maize, consumption of millets has decreased. Millets are climate resilient cereals and reintroduction and popularization of millets are important for food security in future climate change scenario. Dhaka *et al.* [6] in their review article, put forth the various health-promoting properties of millets, advances in genomics of millets, future direction for genetic improvement of millets and the road map for commercialization of these nutri-cereals.

We duly acknowledge all the above leading contributors and their respective team members of this thematic issue on "Genes, Genomes, and Germplasm for Climate-Smart Agriculture; Part-II" for reciprocating our invitation and contributing the reviews on time. We appreciate the support of members of the Editorial Board and our reviewers for all their assistance and immense contribution. We thank the Editorial Support provided by Ms. Ambreen Irshad and Ms. Iqra Shafi and their team members at Bentham Science Publication for publishing this thematic issue. Stay tuned for few more interesting reviews on various aspects of crop improvement in the last issue (Part-III) of this series in an upcoming issue.

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