Wenbin Li et al., J Mol Genet Med 2018, Volume 12
DOI: 10.4172/1747-0862-C2-028

Genome-wide evaluation of loci and candidate genes underlying important traits in soybean (Glycine max (L.) Merr.)

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Disease resistance and seed quality are important traits for soybean breeding. Better understanding of the genetic architecture and genomic landscape of soybean germplasm with targeted traits is the precondition of molecular design breeding of soybean. Construction of a favorable data platform including phenotyping and genotyping pools and efficient analytical approaches were the fundamental tasks for molecular breeding work. Therefore, more than 500 diverse soybean accessions were sequenced using specific-locus amplified fragment sequencing (SLAF-seq) to establish a genotype database. In total, 64 141 single nucleotide polymorphisms (SNPs) with minor allele frequencies (MAFs) > 0.05 were found among the 512 tested accessions. The genotyped soybean germplasm has been phenotyped for some important soybean quality traits including soybean fatty acid components and seed vitamin E content under multi-environmental conditions. Resistance to different pathogens including resistance to soybean cyst nematode (SCN), soybean white mold (SWM), soybean root rot (SRR) and soybean mosaic virus (SMV) has also been phenotyped. A set of loci were found to be associated with the above traits by GWAS and some of them were confirmed by bi-parental mapping which has been used for molecular assisted selection breeding. A set of candidate genes for disease resistance that have been evaluated via sequence polymorphism and differential expression in special donors were cloned and were staged in functional genomics research.

Biography

Wenbin Li completed his PhD in Plant Genetics and Breeding in 1988 at Northeast Agricultural University of China. He is working at Soybean Research Institute of Northeast Agricultural University for more than 15 years as a Director and Professor. His major research areas are covered by soybean functional genomics, gene characteristics for agronomic important traits, and molecular breeding. He has published over 80 peer reviewed papers in numbers of international journals, such as *New Phytologist, The Plant Journal, TAG, BMC Genomics* and *Heredity.* Recently, he became a member of Executive Committee for World Soybean Association, and an Associate Editor of BMC Genomic.

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