

Evolution of DNA-Binding With-One-Finger Transcriptional Factor Family in Diploid Cotton *Gossypium raimondii*

Authors : Waqas Shafqat Chattha, Muhammad Iqbal, Amir Shakeel

Abstract : Transcriptional factors are proteins that play a vital role in regulating the transcription of target genes in different biological processes and are being widely studied in different plant species. In the current era of genomics, plant genomes sequencing has directed to the genome-wide identification, analyses and categorization of diverse transcription factor families and hence provide key insights into their structural as well as functional diversity. The DNA-binding with One Finger (DOF) proteins belongs to C2-C2-type zinc finger protein family. DOF proteins are plant-specific transcription factors implicated in diverse functions including seed maturation and germination, phytohormone signalling, light-mediated gene regulation, cotton-fiber elongation and responses of the plant to biotic as well as abiotic stresses. In this context, a genome-wide in-silico analysis of DOF TF family in diploid cotton species i.e. *Gossypium raimondii* has enabled us to identify 55 non-redundant genes encoding DOF proteins renamed as GrDofs (*Gossypium raimondii* Dof). Gene distribution studies have shown that all of the GrDof genes are unevenly distributed across 12 out of 13 *G. raimondii* chromosomes. The gene structure analysis illustrated that 34 out of 55 GrDof genes are intron-less while remaining 21 genes have a single intron. Protein sequence-based phylogenetic analysis of putative 55 GrDOFs has divided these proteins into 5 major groups with various paralogous gene pairs. Molecular evolutionary studies aided with the conserved domain as well as gene structure analysis suggested that segmental duplications were the principal contributors for the expansion of Dof genes in *G. raimondii*.

Keywords : diploid cotton , *G. raimondii*, phylogenetic analysis, transcription factor

Conference Title : ICBPG 2019 : International Conference on Bioinformatics and Population Genomics

Conference Location : Toronto, Canada

Conference Dates : July 18-19, 2019