

Genome Wide Identification and Characterization Cyclic Nucleotide-Gated ion Channel Gene Family in *Cajanus Cajan*

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Abstract—Calcium is one of the key important secondary messengers in signal transduction mechanism and the Ca signaling plays important role in varied aspects of growth, development, biotic and abiotic stress and hormone signaling in plants. Cyclic nucleotide-gated ion channel (CNGC) is one among the major potential pathways of Ca uptake in signal transduction. CNGCs have been shown to play crucial role in defense signaling and generating responses to biotic and abiotic stress. In this study, CNGC gene family has been identified from *Pigeonpea* genome and characterized. *Pigeonpea* CNGC family comprises 21 members which could be divided into four groups on the basis of sequence similarity and phylogeny. The identified CNGCs have been named following orthologous nomenclature with reference to *Arabidopsis* CNGCs. The in-silico characterization of *Pigeonpea* CNGCs was performed including subcellular localization, chromosomal locations, molecular weight, pI and post translational modifications. Further, the conserved domains, motifs of CNGC were identified and defined at sequence level as well as at three dimensional (3-D) structural levels. Gene structure CNGCs in *Pigeonpea* was also studied. The mRNA level evidences of CNGCs in *Pigeonpea* have been shown in the form Transcriptome Shotgun Assembly (TSA) contigs. This study gives a first detailed account of CNGCs genes family in *Pigeonpea*.

Keywords: *Pigeonpea*, CNGC, phylogenetic analysis, orthologous nomenclature, gene structure, expression.