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## Cloning and characterization of high molecular weight glutenin genes from *Triticum astivum* cultivar dacke to develop wheat like rice

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Gluten is a main seed storage protein in wheat, which is absent in rice. It is very important for the bread making process as it gives elasticity and extensibility to dough. The present study was initiated to produce transgenic rice expressing High Molecular Weight (HMW) glutenin genes to produce wheat –like rice. Genomic DNA was isolated from wheat leaves of *Triticum astivum* cultivar dacke. PCR was performed using HMW glutenin specific primers. Purified amplified fragments were cloned into pGEM®-T Easy Vector and sequenced. Five putative clones were identified and sequence analysis of the clones revealed the presence of functional and pseudogenes. The pseudogene had C to T transition in the repetitive central domain. The length of nucleotide sequence of functional gene was 2445bp encoding 815aa residues. The molecular weight of the deduced mature protein was 88KDa. This gene contained four cysteine residues that could provide intermolecular disulfide bonds to form protein polymers. The presence of glutamine residues (34%) has a very high capacity to form both intra- and intermolecular hydrogen bonds that could provide the elasticity for dough through formation of intermolecular hydrogen bonds. Repetitive central domain of the functional gene contains 44 tripeptides (GQQ), 6 hexapeptides (PGQGQQ) and a single nanopeptide (GYYPTSLQQ). BLASTn analysis of functional HMW glutenin gene showed a high degree of homology to a previously published *Triticum astivum* HMW glutenin subunit Ax2* gene (M22208.2). Molecular phylogenetic analysis using the maximum parsimony method indicated that the cloned functional HMW glutenin gene (Accession number KJ939340) is closely related to Ax type subunit. Currently, work is underway to transfer the functional HMW glutenin gene to rice to generate transgenic rice plants.

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