



Isolation and phylogenetic analysis of novel γ -gliadin genes in genus *Dasypyrum*

G.R. Li^{1*}, C. Liu^{1*}, E.N. Yang² and Z.J. Yang¹

¹School of Life Science and Technology,
University of Electronic Science and Technology of China, Chengdu, China
²Crop Research Institute, Sichuan Academy of Agricultural Science,
Chengdu, China

*These authors contributed equally to this study.
Corresponding author: Z.J. Yang
E-mail: yangzujun@uestc.edu.cn

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ABSTRACT. As the most ancient member of the wheat gluten family, the γ -gliadin genes are suitable for phylogenetic analysis among wheat and related species. Species in the grass genus *Dasypyrum* have been widely used for wheat cross breeding. However, the genomic relationships among *Dasypyrum* species have been little studied. We isolated 22 novel γ -gliadin gene sequences, among which 10 are putatively functional. The open reading frame lengths of these sequences range from 642 to 933 bp, and these putative proteins consist of five domains. Phylogenetic analyses showed that all *Dasypyrum* γ -gliadin gene sequences clustered in a large group; *D. villosum* and tetraploid *D. breviaristatum* γ -gliadin gene sequences clustered in a subgroup, while diploid *D. breviaristatum* γ -gliadin gene sequences clustered at the edge of the subgroup. All of the *Dasypyrum* γ -gliadin gene sequences were absent in three major T cell-stimulatory epitopes binding to HLA-DQ2/8 in celiac disease patients. Based on the phylogenetic analyses, we suggest that *D. villosum* and tetraploid *D. breviaristatum* evolved in parallel from a diploid ancestor *D. breviaristatum*.

Key words: *Dasypyrum*; γ -gliadin genes; Phylogenetic analysis