

P020

## Genomic and evolutionary analysis with gluten proteins of major food crops in the *Triticeae* tribe

Sang Heon Kim, and Yong Weon Seo\*

*Department of Biosystems and Biotechnology, College of Life Science and Biotechnology, Korea University,  
Anam-ro 145, Seongbuk-gu, Seoul 02841, Korea*

### Abstract

Prolamins are the main seed storage proteins in cereals. Gluten proteins seem to be prolamins because their primary structure have the meaningful quantity of proline and glutamine amino acid residues. Gluten proteins are found in crops such as wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), and rye (*Secale cereale*) which are major food crops in the *Triticeae* tribe. Glutenin and gliadin, hordein, and secalin are typical gluten proteins found in wheat, barley, and rye, respectively. Gluten affect grain quality so that many researches, such as isolation or characterization of their genes, have been carried out. To improve the quality of grains in the *Triticeae* tribe, it is necessary to understand the relationship within their gluten proteins and their evolutionary changes. The sequences of nucleotides and amino acids of gluten protein including glutenins, gliadins, hordeins, and secalins were retrieved from NCBI (<https://www.ncbi.nlm.nih.gov/>) and Uniprot (<http://www.uniprot.org/>). The sequence analysis and the phylogenetic analysis of gluten proteins were performed with various website tools. The results demonstrated that gluten proteins were grouped with their homology and were mostly corresponded with the previous reports. However, some genes were moved, duplicated, or disappeared as evolutionary process. The obtained data will encourage the breeding programs of wheat, barley, rye, and other crops in the *Triticeae* tribe.

Keywords: wheat, barley, rye, gluten, prolamin

Acknowledgement: This work was carried out with the support of “Cooperative Research Program for Agriculture Science & Technology Development (Project No. PJ01103501)” Rural Development Administration. Republic of Korea.

Corresponding author\*

Yong Weon Seo

Address: Department of Biosystems and Biotechnology, Korea University, Anam-ro 145, Seongbuk-gu, Seoul, Korea

Tel: +82-2-3290-3005

E-mail: seoag@korea.ac.kr