

Plant Genomics

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Development of molecular markers in order to assess the α -gliadin immunogenic content of an international spelt collection

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Gluten is the water insoluble protein fraction found in the flour of several cereals such as wheat and spelt. Its ingestion is responsible of celiac disease (CD) in genetically predisposed individuals (1-2% of the human population). Alpha-gliadins are a class of proteins of the gluten fraction playing an important role in this pathogenesis with 4 main toxic epitopes recognized by the immune system. In each α -gliadin, the number of toxic epitopes ranges from 0 to 6 since one of them can be duplicated and mutations can alter their composition. Less attention has been paid to spelt than wheat breeding and a high genetic diversity is still held in spelt germplasm collections. A collection of more than 250 spelt accessions from all over the world, including landraces, cultivars and breeding materials was assembled to carry out a genetic diversity study based on their immunogenic profile. Expressed α -gliadins were sequenced and high variations in the epitope composition and occurrence were observed depending on both the accession and the genome (A, B or D) they were expressed from. Thus, we developed PCR markers which specifically target genome-specific motifs. Since the epitope mutated forms lower or suppress the α -gliadin immunogenicity, we are currently developing molecular markers targeting some epitope variants. This will help to investigate the immunogenic content of all the accessions gathered in the spelt collection. This could enable us to highlight toxicity differences among the accessions and thus would be useful in breeding programs to develop safer varieties for CD patients.

Biography

Benjamin Dubois has completed his Bio-Engineering studies in Gembloux Agro-Bio Tech, Belgium. He is currently working on a research project at the Walloon Agricultural Research Center, Belgium since 2014. In parallel, he is pursuing his PhD at the Université Catholique de Louvain, Belgium.

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