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Molecular Cloning of Soybean Genes Encoding an Allergenic Protein, P34 and Development of Molecular Marker

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Even though soybean is a valuable crop for the supplement of edible vegetable oil and protein, the allergenic effect of soybean proteins limits its extensive usage in a wide range of processed foods. P34, a member of the papain superfamily, has been known as a dominant allergen in soybean and considered as a major target for developing low-allergenic soybean. Previously, two P34 null soybean accessions were identified by an extensive screening of soybean germplasm and it has been suggested that four amino acid substitutions might cause unstable P34 protein accumulation in these null accessions. In order to understand the regulatory mechanism of P34 stability in a molecular level, we cloned both genomic and cDNA clones from Clark and PI567476, P34 null accession, as well as two Korean soybean cultivars, Jinpum2 and Gaechuk1, and analyzed their sequences. Here we report that two different types of genomic clones with and without introns exist in soybean genomes and the only one type of genomic copy containing intron is used as a template for transcription. More interestingly, we identified single nucleotide substitution in P34 genomic clone from PI567476 accession compared to those of other accessions. Based on this single nucleotide polymorphism (SNP), we are developing molecular markers. This work was supported by BK21 program and grants from EBNCRC and the Basic Research Program of the KOSEF (No. R01-2006-000-10035-0).
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Production of low amylose wheat by haploid breeding

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Granule bound starch synthase (GBSS) gene, which is responsible for amylose synthesis in endosperm tissue, is located at the *waxy* (*Wx*) locus. Recently, wheat cultivars lacked the null alleles for GBSS isoforms and the wheat accessions with muations at the *Wx* loci are being used in a breeding program to develop partially waxy wheats because pasting properties of modified starches from partial waxy whetas a greater paste consistency than those of normal wheats. Noodles prepared from partial waxy wheats generally have softer texture and shorter cooking time than noodles from wild type wheats. Eighty double haploid wheat lines were produced from Keumkang, wild type, and Shinmichal, waxy type, and evaluated by PCR amplification with GBSS specific primer. Twenty-nine wheat lines (36.3%) showed single null in GBSS and amylose content of these lines was 25.3-27.8%, which was similar to that of wild type wheat lines (28.7%). Twenty-seven wheat lines (33.8%) showed double null and amylose content was 16.4-19.2%, which was lower than single null wheat lines. Amylose content of wild type (28.7%) and waxy wheat lines (7.8%) was similar to that of Keumkang (28.8%) and Shinmichal (6.9%).
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