Cloning and Characterization of OSB2 Gene Controlling Anthocyanin Biosynthesis in Rice

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ABSTRACT

The OSB2 gene encodes myc transcription factor which regulates expression of several structural genes involved with anthocyanin biosynthesis in rice. In this study, the complete coding sequences (cds) of OSB2 genes were isolated from young leaves and developing seeds of rice by RT-PCR. Nucleotide sequencing analysis revealed that all 3 black rice varieties, Lerm-Poa, Hom-nin and Khum had a single open reading frame (ORF) of 1,356 bp which were 99% identity with OSB2 gene reported in GenBank (accession no. AB021080). These rice varieties also had OSB2 gene containing a single ORF of 1,101 bp with 99% identity with 1,356 bp fragments except the deletion of 2nd exon (255 bp deletion). The deduced amino acid sequences of the 1,356 and 1,101 bp ORFs consisted of 451 and 366 amino acid residues, respectively which showed 99% similarity to that of OSB2 gene (accession no. AB021080). The results suggested that the OSB2 genes from this study may have 2 forms. Alternatively, the 1,356 bp and 1,101 bp ORFs may be due to alternative splicing of mRNA transcribed from a single OSB2 gene in rice genomes of these black rice varieties. The cloned OSB2 genes will be further analyzed for structure and gene functions to understand the regulation of anthocyanin biosynthesis in colored rice.

Keywords: OSB2 gene, rice, anthocyanin