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First Report of *Southern rice black streaked dwarf virus* in South Korea and Simultaneous Detection of RBSDV and SRBSDV

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[Introduction]

Southern rice black streaked dwarf virus (SRBSDV) is a novel virus treatening crop production in eastern Asia. SRBSDV was first discovered in China, in 2001. Since 2009, the viral disease has spread rapidly from south to north in the rice-growing areases of eastern Asia, including Vietnam, Chnia and Japan.

[Materials and Methods]

In 2016, 60 samples of rice (*Oryza sativa*) showing virus disease-like symptoms, such as dwarfing, striping, and yellowing, were collected from seven provinces in South Korea. Leaf tissues from all samples were pooled and subjected to total RNA extraction using a WizPrep™ plant mini kit (Wizbiosolutions, South Korea). A paired-end cDNA library was generated using a TruSeqRNA Sample Prep kit (Illumina, USA). Sequencing was carried out an Illumina HiSeq 2500 sequencer (Illumina, USA). Approximately 0.33 billion read swere *de novo* assembled with Trinity v2.1.1 (Zhao *et al*., 2015). Assembled contigs larger than 500 bp were analyzed using BLASTn and BLASTx searches. To identify individual samples infected with SRBSDV, the primer set SRBSDV 600F (5'-ACAATGATAAGAAATTCATCGAA-3') and SRBSDV 600R (5'-AATCTTTTGACCATGTTCTGAA-3') was designed from the contig sequence annotated as segment 10, which encodes the coat protein of SRBSDV. Total RNA was separately extracted from all 60 samples and amplified by RT-PCR.

[Results and Discussions]

Analysis results of assembled contigs seven contigs matched all segments, except for 1, 3, and 8, of the 10 segments of *Southern rice black streaked dwarf virus* (SRBSDV), a member of the genus *Fijivirus* (family *Reoviridae*) (Zhou *et al*., 2008). Among sixty samples, two collected one from Jeonnam and the other from Gyeongbuk provinces might be infected to SRBSDV. The nucleotide sequences of the 600bp RT-PCR product subjected to BLASTn search, it matched to the sequence of the contig and showed 99% similarity to the virus isolated from China. Three SRBSDV positive samples were further analyzed, resulting in positive to the other six segments. The seven contig sequences of SRBSDV were submitted to GenBank (Genbank accession no. MF356695~3556701). In this study, a duplex reverse transcription polymerse chain reaction (duplex RT-PCR) method was developed for the silmultaneous detection of RBSDV and SRBSDV. The duplex RT-PCR assay provided as a rapid tool for the detection and differention of *rice black streaked dwarf virus* (RBSDV) and SRBSDV. The duplex RT-PCR assay can be used in routine diagnostic of these two viruses in order to study the disease epidemiology in rice crops.

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