

## DISEASE NOTE

**MIXED INFECTION BY *CUCUMBER MOSAIC VIRUS* AND *POTATO VIRUS X* IN POTATO WITH YELLOW MOSAIC IN INDIA**

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Recent surveys of potato (*Solanum tuberosum*) fields in northwestern India showed plants with yellow mosaic or flecking symptoms. Symptoms initially appeared as marginal foliar yellowing or chlorotic spots but later the whole leaf blade lamina turned yellow. To test the association of prevalent potato viruses such as *Potato virus X* (PVX), *Potato virus Y* (PVY<sup>O/C</sup> and PVY<sup>N</sup>), *Potato virus A* (PVA), *Potato virus S* (PVS), *Potato virus M* (PVM) and *Cucumber mosaic virus* (CMV) in symptomatic plants, double antibody sandwich-ELISA (DAS-ELISA) was performed using commercial polyclonal antisera (Agdia, USA). Testing of twenty samples revealed infection with PVX and CMV subgroup I. To confirm the occurrence of PVX and CMV, total RNA was extracted from symptomatic potato leaves using specific CMV (de Blas *et al.*, 1994) and potexvirus (van der Vlugt and Berendsen, 2002) primers. The expected amplicons of ca. 800 bp for 21PVX and ca. 540 bp for CMV were cloned and sequenced. PVX (GenBank accession No. KJ787641) and CMV (KJ620411) isolates Pot Ldh shared 92.5-97.1% and 91.5-93.4% nucleotide sequence identities with published sequences of PVX (AB056719, M72416 and AJ489260) and CMV Ib (JN054635, KJ874250 and AB046951) from India and other parts of world, respectively. This is the first report of mixed infection of potatoes by CMV and PVX in India. As the symptoms are similar to those caused by *Potato aucuba mosaic virus* (PAMV) (Loebenstein, 2001) accurate diagnosis of yellow mosaic disease will be needed to rely on serological or molecular assays.

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## DISEASE NOTE

**FIRST REPORT OF BACTERIAL GRAIN ROT CAUSED BY *BURKHOLDERIA PLANTARII* IN REPUBLIC OF KOREA**

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Rice panicles with symptoms of bacterial grain rot, i.e. grain abortion, discoloration of the hull and grain, were observed and collected in rice-growing fields of Suncheon-si (Republic of Korea) in September 2015. The lemma and the palea were disassembled from the discolored grains, the insides were rubbed and streaked onto King's medium B agar plates to obtain single colonies (Noh *et al.*, 2012). A PCR-based screening for *Burkholderia plantarii* was conducted for 66 isolates (Maeda *et al.*, 2006), and two isolates, GRBB 15061 (KACC 18964) and GRBB 15061-1 (KACC 18965) were selected. To confirm the identity of *B. plantarii*, 16S rRNA gene and two phylogenetic marker genes, *rpoD* and *gyrB*, were sequenced and subjected to a BLASTn analysis (Maeda *et al.*, 2006; Yamamoto *et al.*, 2000). The BLASTn results for the 16S rRNA gene sequences of the isolates GRBB 15061 and GRBB 15061-1 (GenBank accession Nos. KX638437 and KX638434, respectively) showed 100% homology with *B. plantarii* type strain (AB682220.1). The *rpoD* and *gyrB* gene sequences of the isolates GRBB 15061 and GRBB 15061-1 (KX638443 and KX638441 for *rpoD*; KX638428 and KX638431 for *gyrB*, respectively) showed 99.8% homology (AB190755.1) and 100% homology (AB190645.1) with *B. plantarii* type strain. For pathogenicity tests, each isolate of *B. plantarii* was inoculated into the stem by syringe at the tillering stage and onto the panicle by spraying at the heading stage separately; the inoculated rice stem developed sheath rot and the inoculated panicle developed grain rot. *B. plantarii* was re-isolated from the symptoms and re-identified, thus satisfying Koch's postulates. To our knowledge, this is the first report of the bacterial grain rot of rice caused by *B. plantarii* in the Republic of Korea.

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