Diseases Caused by Bacteria and Phytoplasmas

First Report of Fire Blight of Apricot (*Prunus armeniaca*) Caused by *Erwinia amylovora* in Korea

M.-H. Lee,¹ S. H. Ji,² H. Ham,¹ H. G. Kong,¹ D. S. Park,¹ and Y. H. Lee^{1,†}

¹ Crop Protection Division, National Institute of Agricultural Sciences, Wanju 55365, Republic of Korea

² National Fusion Research Institute (NFRI) Plasma Technology Research Center, Gunsan-si 54004, Republic of Korea

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During a survey in May 2020, symptoms of blight were observed on apricot (*Prunus armeniaca*, cultivar undetermined) in an orchard (37°06′01.5″N, 127°57′44.9″E) in Chungju, South Korea, where fire blight of apple occurred. Three apricot trees in the apple orchard were heavily diseased and showed severe shoot blight and stem canker symptoms. Bacterial isolates were recovered on King's medium B from leaves and twigs that were surface sterilized with 70% alcohol. Colonies with uniform mucoid, smooth surfaces were collected. DNA from nine isolates did not yield an amplicon in a PCR assay for detection of *Erwinia pyrifoliae* using primer set CPS1/CPS2c (Kim et al. 2001). Each isolate was positive in PCR assays for *Erwinia amylovora* using primer sets A/B (Bereswill et al. 1992) and AJ75/76 (Llop et al. 2000) that target pEA29. Sequencing of the PCR products resulted in 99.9% (929 bp out of 930 bp) and 100% (747 bp out of 747 bp) identity with sequences of *E. amylovora* FB20 (GenBank: CP050240), respectively. Amplifications of the partial 16S rRNA (GenBank: LC557153) and *hrpN* (GenBank: LC575997) genes were performed, and the products were sequenced. The primers used to amplify 16S rRNA were 518F (5′-CCAGCAGCCGCGGTAATACG-3′) and 800R (5′-TACCAGGG-TATCTAATCC-3′), and those for the *hrpN* genes were HRPN1 (5′-ATGAGTCTGAATACAAG-3′) and HRPN3c (5′-GCTTGCCAAGTGC-CATA-3′). BLAST analyses showed 99.8% (1,439 bp out of 1,442 bp) and 100% (1,136 bp out of 1,136 bp) identities, respectively, to the sequences of *E. amylovora* FB20. The ability of the isolates to induce a hypersensitive

reaction on tobacco (*Nicotiana tabacum* cv. Xanthi) leaves was also evaluated. Bacterial suspensions (1.5×10^8 CFU) of two isolates were injected into tobacco leaves, and after 48 h, both isolates caused a hypersensitive response. To confirm pathogenicity of isolates, 3-mm-deep holes in five immature apricot (cv. Goldcot) and five immature apple (cv. Fuji) fruits were inoculated with 10 µl of bacterial suspension (1.5×10^8 CFU/ml). The inoculated fruits were placed in a humid plastic box. After 7 days at 27°C, severe necrosis and bacterial ooze were present at the inoculated sites in three repeated tests. No symptoms were observed on fruits inoculated with sterile water. To complete Koch's postulates, bacteria were reisolated from the inoculated apricot and apple fruits. PCR using the specific primer sets stated above confirmed the identity as *E. amylovora*. Thus, based on disease symptoms, sequences, and pathogenicity, the bacterium causing blight of apricot was identified as *E. amylovora*. Natural infections of *E. amylovora* on apricot trees have been reported in the Czech Republic and Hungary (Korba and Sillerova 2011; Végh and Palkovics 2013). Fire blight was observed in the Czech Republic on apricot trees near pear seedlings, which are highly susceptible to *E. amylovora* (Korba and Sillerova 2011). Natural infections of *E. amylovora* on Japanese plum planted adjacent to an apple orchard with severe fire blight have been reported in the United States (Mohan and Thomson 1996). Moreover, susceptibility to fire blight has been reported for apricot and Japanese plum cultivars (Mohan and Bijman 1999). To our knowledge, this is the first report of fire blight of apricot caused by *E. amylovora* in Korea. This report is important because it provides evidence that apricot may be an overlooked reservoir for *E. amylovora*, in addition to apple, pear, and other rosaceous plants, in Korea. An intensive survey for additional host plants for the fire blight pathogen will be continued in Korea.

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[†]Indicates the corresponding author.
E-mail: leeyhlee@korea.kr (Y. H. L.)