Diseases Caused by Viruses

First Report of Colombian Datura Virus in *Brugmansia suaveolens* in Korea

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Brugmansia suaveolens, known as angel's trumpet, is a perennial ornamental shrub in the Solanaceae with large fragrant flowers. In June 2018, a leaf sample of *B. suaveolens* that showed virus-like symptoms including chlorotic spots, yellowing, and mottle on leaves was collected from a greenhouse in Seongnam, South Korea, for disease diagnosis. Disease incidence in the greenhouse was greater than 80% for about 2,000 *B. suaveolens* plants. To identify a causal virus, transmission electron microscopy (TEM) was used to analyze symptomatic leaf samples using leaf dips and thin section methods. Filamentous virus particles and pin-wheel structures were observed, indicating the presence of a potyvirus. To confirm the TEM results, a symptomatic leaf sample was further analyzed by reverse-transcription polymerase chain reaction (RT-PCR) using species-specific detection primers for three potyviruses that infect *Brugmansia* spp.: Colombian datura virus (CDV), *Brugmansia* mosaic virus, and *Brugmansia suaveolens* mottle virus (Lucinda et al. 2008; Park et al. 2014; Verma et al. 2014). The sample was positive only for CDV. CDV is transmitted by aphids in a nonpersistent manner and mechanical inoculation and can infect plants in the Solanaceae family including tomato and tobacco (Kahn and Bartels 1968; Schubert et al. 2006; Verhoeven et al. 1996) and has been designated a quarantine virus in Korea. Additional analysis

of 13 symptomatic *B. suaveolens* plants from the infected greenhouse found that all samples except one were infected with CDV. To isolate CDV from *B. suaveolens*, leaf extracts from symptomatic samples were mechanically inoculated on an assay host, *Nicotiana tabacum* cv. BY, via three single-lesion passages followed by propagation in *N. benthamiana*. For the bioassay of the CDV isolate (CDV-AT-Kr), sap from infected *N. benthamiana* was mechanically inoculated on 31 indicator plants, including *B. suaveolens*. CDV-AT-Kr induced chlorotic local lesions, necrotic local lesions, mottle, and/or mosaic systemically in 10 *Nicotiana* spp., and mottle and yellowing in tomato. On inoculated *B. suaveolens*, the mild mottle symptom was reproduced. No symptoms were observed in pepper or *Datura stramonium*. These results were confirmed by RT-PCR. To characterize CDV-AT-Kr genetically, the complete genome sequence of CDV-AT-Kr was obtained by RT-PCR using specific primers and deposited in GenBank (accession no. MW075268). The CDV-AT-Kr RNA consists of 9,620 nt, encoding a polyprotein of 3,076 aa. BLASTn analysis showed that CDV-AT-Kr had maximum nucleotide identities of 98.9% at the complete genome level with a CDV isolate (accession no. JQ801448) from *N. tabacum* in the United Kingdom. To our knowledge, this is the first report of CDV infection in *B. suaveolens* in Korea and the second report in the world of the complete genome sequence. Because *B. suaveolens* is cultivated by vegetative propagation, production and maintenance of virus-free, healthy *B. suaveolens* is needed. In addition, as new CDV hosts have been repeatedly reported (Pacífico et al. 2016; Salamon et al. 2015; Tomitaka et al. 2014; Verma et al. 2014), we are monitoring nationwide occurrence to prevent the spread of the virus to other crops.

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