First report of tobacco mosaic virus infecting *Houttuynia cordata* in Korea

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Houttuynia cordata (Family Saururaceae) is a perennial herbaceous plant that grows in wild locations in southern China, Japan, Korea, and Southeast Asia. It is commonly used as a Chinese herbal medicine which shows antiviral, antibacterial, and other anti-inflammatory effects, and is also cultivated as an ornamental in North America and Europe. In June 2018, virus-like symptom including clear mosaic and foliage discoloration were observed on the leaves of *H. cordata* at a farm in Gwanju, Korea. A total of 30 symptomatic leaf leaves were collected from different plants and analyzed by DAS-ELISA using polyclonal antibodies against cucumber green mottle mosaic virus, cucumber mosaic virus, pepper mottle virus, tobacco mosaic virus (TMV), tomato mosaic virus, and watermelon mosaic virus (Agdia, Elkhart, IN, U.S.A.). None of the samples reacted with any of these antisera, except that against TMV, which was detected in 50% of the samples tested. To further confirm TMV infection, RT-PCR was performed using TMV-specific primers designed from a highly conserved region of the coat protein (CP) gene 5'-ATGTCTTACAGTATCACTACTCC-3' and 5'-TCAAGTTGCAGGACCAGAGGT-3' (Choi et al. 2009). PCR products of the expected size (485 bp) were amplified, and then cloned and sequenced. BLAST analysis of the primer-trimmed resulting sequence (LC417448; 436 bp) showed 99% identity to the CP gene of several TMV isolates of *Solanum lycopersicum* (JX993906), *Nicotiana tabacum* (HE818443), *Solanum melongena* (GQ280795), *Solanum tuberosum* (AF318218), and *Nandina domestica* (LC417445).

A host range trial using infected *H. cordata* leaf sap obtained from single lesion inoculation revealed characteristic TMV symptoms on mechanically inoculated *N. rustica*, *N. benthamiana*, and *N. tabacum* cv. Samsun. Consistent with a previous study (Depta et al. 2018), the virus (named TMV-Hc) caused necrotic lesions on *N. rustica* at 5 days post inoculation (dpi), whereas, mild systemic mosaic was observed in *N. benthamiana* and *N. tabacum* at 10 to 14 dpi. Virus-free *H. cordata* inoculated mechanically by sap from local lesions on indicator plants, showed mild mosaic symptoms at 16 dpi. Symptomatic hosts tested positive for TMV by RT-PCR with the aforementioned primers. No other infections were detected in these plants. To our knowledge, this is the first report of TMV infection affecting quality of *H. cordata* in Korea.

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