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DISEASE NOTE

# First report of cucumber mosaic virus isolated from *Zinnia elegans* in Korea

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*Zinnia elegans* (Asteraceae), is used as an ornamental plant because of the various flower colors and shapes. We collected *Z. elegans* showing mosaic symptoms from roadside flowerbeds in Chuncheon, Korea. Many viruses including tomato spotted wilt virus (Bakardjieva et al. 1998) have been reported to infect *Z. elegans*. Seven genus-specific primer sets for ilarviruses, potyviruses, fabaviruses, tospoviruses, potexviruses, tobamoviruses and cucumoviruses were used in RT-PCR to detect plant viruses. PCR products were amplified only with the cucumovirus-specific primers (Choi et al. 1999) and cucumber mosaic virus (CMV) was identified by sequencing of these amplicons. Our results confirm that *Z. elegans* is naturally infected with CMV, as previously reported in other countries (e.g. Shahmohammadi et al. 2015). We named the CMV isolated from *Z. elegans* as CMV-Ze (GenBank accession Nos. LC390004, LC390005, LC390006). Analysis of 2b and CP sequences showed that CMV-Ze shared 99.1% and 99.08% amino acid sequence identity with 2b and CP of CMV-RP15 (KC527699) and CMV-China99/90 (AY611027). Phylogenetic analysis of CPs supports that CMV-Ze is a member of CMV subgroup I. Mechanical inoculation to herbaceous host plants induced mosaic and malformation in upper leaves of *N. benthamiana*, *N. tabacum* cv. Xanthi nc, *N. rustica* and *N. glutinosa* by 14 days post inoculation (dpi); necrotic local lesion in *Chenopodium quinoa* and *C. amaranticolor*; systemic veinal chlorosis in *Cucurbita pepo*; and chlorotic spots on upper leaves of *Cucumis sativus* by 14 dpi. CMV-Ze was confirmed to reinfect *Z. elegans* resulting in mosaic symptoms on upper leaves by 15 dpi. These results demonstrate that CMV-Ze has broad host range similar to that reported for other CMV isolates from ornamental plants (Samuitienė and Navalinskienė 2008). To our knowledge, this is the first report of CMV isolated from *Z. elegans* in Korea.

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**Electronic supplementary material** The online version of this article (https://doi.org/10.1007/s42161-020-00532-3) contains supplementary material, which is available to authorized users.

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