



# First report of turnip mosaic virus infecting *Perilla frutescens* in Korea

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*Perilla frutescens* (wild sesame) is a member of the family Lamiaceae. It is used as an edible oilseed crop in Korea. Although *P. frutescens* is cultivated commonly in Korea, little is known about the viruses that infect this species (Cho et al. 2005). During a survey in May 2016, virus-like symptoms were observed on 70–80% of *P. frutescens* plants on a farm located in Chuncheon, Korea. Symptoms included mild mosaic and yellowing symptoms. To identify the causative virus, total RNA was extracted from the leaves of affected *P. frutescens* and seven genus-specific primer sets for *Ilarvirus*, *Potyvirus*, *Fabavirus*, *Tospovirus*, *Potexvirus*, *Tobamovirus* and *Cucumovirus* detection were used for RT-PCR. A positive result was only obtained with the *Potyvirus* specific primers (Zheng et al. 2008). *Nicotiana benthamiana* and *N. tabacum* cv. Xanthi nc were mechanically inoculated from affected *P. frutescens* and observed for symptoms. Necrotic local lesions were induced on the inoculated leaves of *N. tabacum* cv. Xanthi nc, suggesting turnip mosaic virus (TuMV) infection. To confirm the presence of TuMV and determine the full-length sequence of this isolate, we designed six pairs of primers targeting conserved regions of the TuMV genome. Using these primers, we determined the complete sequence of an isolate of TuMV named TuMV-KPF (GenBank accession No. LC413507). Four indicator plant species (five plants each) were mechanically inoculated with TuMV-KPF to examine

the biological properties: systemic mosaic symptoms were induced on *N. benthamiana* and *Raphanus sativus*; *N. tabacum* cv. Xanthi nc showed necrotic spots on inoculated leaves while four plants of *Brassica rapa subsp. pekinensis* did not show symptoms, but one developed necrosis. BLASTn analysis indicated that TuMV-KPF had 99.31% and 99.25% nucleotide identity with radish isolates TuMV-CCLB (KR153038) and TuMV-TANX2 (EU734433), respectively. Furthermore, phylogenetic analysis revealed that TuMV-KPF belongs to the basal-BR group of strains that comprise of brassica and non-brassica infecting isolates from Eurasia (Ohshima et al. 2002). To our knowledge, this is the first report of TuMV infection in *P. frutescens* in Korea or elsewhere.

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