



First report of a cucumber mosaic virus (CMV) subgroup II isolate infecting pea in Pakistan

Muhammad Ahsan¹ · Muhammad Ashfaq¹

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Pea (*Pisum sativum* L., family Fabaceae) is an important vegetable crop cultivated worldwide for its high protein and nutrient contents (Kakar et al. 2002). Cucumber mosaic virus (CMV) has a wide host range and is a major constraint to the successful production of pea. In March 2017, during a visit to PMAS-Arid Agriculture University research farm in Rawalpindi (Pakistan), 15 pea leaf samples showing mosaic and leaf chlorosis symptoms along with two healthy leaf samples were collected and screened for CMV subgroup I and II using monoclonal antibodies in a TAS-ELISA assay (Agdia Inc., Elkhart, IN). Five samples were positive for CMV subgroup II only, while none reacted to CMV subgroup I antibodies. To confirm the presence of CMV subgroup II, total RNA was isolated from five ELISA positive samples using TRIzol Reagent (Life Technologies, Carlsbad, CA) and subjected to RT-PCR using primers CMVCP-1 and CMVCP-5 (Chen 2003). The amplified DNA fragments (ca. 1100 bp) were purified using GeneJET Gel Extraction Kit (Thermo Scientific, USA) and directly sequenced in both directions (Macrogen, Korea) for the characterization of 950 nucleotides

(nt), including the full-length coat protein cistron and 290 nt of the 3' untranslated region of RNA3. The nucleotide sequence of one isolate (AARP) was deposited in GenBank (MF100856), as the sequence of the five isolates from Pakistani peas was identical. BLASTn revealed 97–99% nucleotide sequence identity of CMV isolate AARP with CMV subgroup II isolates from USA (AF127976), Japan (AB006813), UK (Z12818), Germany (KX525738), China (EF202597) and India (HE583224). To the best of our knowledge, this is the first report of CMV subgroup II infecting pea in Pakistan.

References

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✉ Muhammad Ashfaq
mashfaq1642@gmail.com

¹ Plant Virology Laboratory, Department of Plant Pathology, PMAS Arid Agriculture University, Rawalpindi, Pakistan