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Two new *Pepper mild mottle virus* (PMMoV) isolates collected in Korea showed different patterns of 126 kDa subcellular localization and seed transmission rate

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As trading of agricultural products with neighboring countries has increased new plant diseases have been reported in Korea. Specifically, virus-contaminated imported seeds have damaged vegetable and fruit production. Little seed is now produced in Korea, and it is therefore very important to ensure that imported seed is not a source of new viruses. In order to investigate seed transmitted viruses we surveyed pepper fields nationwide and detected *Pepper mild mottle virus* (PMMoV) in the main pepper production regions of Sangcheng and Jeongsong. We have generated full length clones of two isolates, named Sangcheong 47 (S-47, KX399390) and Jeongsong 76 (J-76, KX399389) respectively, in a T7 promoter-driven vector; sequencing revealed that these isolates shared ~99% nucleotide and amino acid identity, and are closely related to Japanese and Chinese isolates at the nucleotide level. Amino acid sequence comparisons revealed 99.73, 99.81, 98.44, and 100% identity in ORF1, ORF2, MP, and CP, respectively, between S-47 and J-76. Both isolates induced severe symptoms in *Nicotiana benthamiana*, but mild symptoms in *Capsicum annuum*. Each ORF was expressed as a GFP fusion from a binary vector, and no differences in subcellular localization were detected except for the 126 kDa proteins; the J-76 126 kDa clearly formed intracellular aggregates not observed with S-47 126 kDa protein. In addition, seed transmission rates from J-76 and S-47 infected *Capsicum annuum* showed 66% and 34% germinated plants from 500 harvested seeds respectively. Despite indistinguishable symptoms, J-76 showed a two times higher seed transmission rate that may result from some of the substitutions (S-47>J-76) of R(142)K, D(583)N, and V(931)I in 126 kDa and K(134)R, V(192)A, N(226)D, L(250)S in MP function with respect to S-47 and J-76.

Biography

Hyoun Sub Lim was trained for his PhD in University of Illinois at Urbana-Champaign and he continued Postdoctoral studies in University of California at Berkeley. His researches have mainly focused on plant viral movement in plant cell for more than 20 years and more than fifty published papers proved his field in Plant Virology. Currently he is Professor in Chungnam National University, Korea and has worked for an Editorial Board Member of Plant Pathology journal.

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