

Molecular Characterization, Recombination and Distribution of
Cabbage Leaf Curl Virus from Jamaica

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ABSTRACT

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At least two begomoviruses constitute cabbage leaf curl disease in Jamaica. Symptoms of this disease were first observed in 1994, and characterization began shortly thereafter in 1997. These geminiviruses were detected using DNA hybridization and polymerase chain reaction (PCR). Full-length recombinant DNA clones were also generated using PCR, and cloned into the pCR[®] 2.1-TOPO[®] vector for further manipulation. DNA sequence analysis indicated the begomoviruses were distinct. Therefore, the viruses causing leaf curl disease in cabbage in Jamaica were designated *Cabbage leaf curl virus* isolate from Jamaica (CaLCuV-[JM]) and *Cabbage leaf curl Jamaica virus* (CaLCuJV). The isolate CaLCuV-[JM] is identical to the isolate of *Cabbage leaf curl virus* from Florida which was first detected in 1992. The second virus, CaLCuJV was a recombinant virus with progenitor viruses CaLCuV-[JM], and most likely a weed virus *Macropitilium golden mosaic virus* isolate I from Jamaica (MaGMV-[JM1]). The region of recombination in the DNA-A consisted of approximately 623 nucleotides, spanning a region encoding the 5' portion of the *rep* gene, and the common region. The sequences of CaLCuV-[JM] and CaLCuJV were identical except for this region of 623 nucleotides. However, this region was 87% identical to MaGMV-[JM1]. In the DNA-B component, the divergent region was 180 nucleotides, a region encompassing the common region. The nucleotide sequence identity between CaLCuV-[JM] and CaLCuJV in this region was 56% while the CaLCuJV and MaGMV-[JM1] was 88%.

CaLCuJV were infectious in cauliflower as well.

These viruses were widely distributed throughout Jamaica in areas sampled and were detected in both single and mixed infections in Douglas Castle, Albion, Murray Mountain and Nine Miles in the parish of St. Ann. They were also found in Buckup, St. Elizabeth, Coral Gardens, St. James, and Crofts Hill and Mason River in Clarendon.

Keywords

Geminivirus, begomovirus, whitefly-transmitted virus, *Brassicaceae*, *Cabbage leaf curl virus*, *Macrotidium golden mosaic virus*, recombination, nucleotide sequence analysis.