ABSTRACT

Genetic diversity and phylogenetic relationships among eight geminiviruses isolated from Jamaica and an isolate from Mexico were studied using non-radioactive geminiviral DNA probes, polymerase chain reaction with degenerate primers for geminiviral DNA, along with nucleotide and derived amino acid sequencing. Hybridization signals were observed in 73% of the 46 crops and 81% of the 64 weed samples. PCR-amplified products for DNA-A and DNA-B were generated from 80% of plant samples which hybridized with the geminiviral DNA probes. Nucleotide identity of the common regions of DNA-A and DNA-B, and partial nucleotide and derived amino acid sequences of the AC1, AV1, BC1, and BV1 ORFs confirmed the presence of bipartite geminiviruses in *Phaseolus vulgaris* (BGMV-JA1), *Phaseolus lunatus* (BGMV-JA2), *Lycopersicon esculentum* (TGV-JA), *Capsicum chinense* (TGV-JA), *Sida* spp. (SidGMV-JA1), *Macroptilium lathyroides* (MacGMV-JA3), and *Wissadula amplissima* (WGMV-JA1). Nucleotide sequence analysis of the common region of DNA-A and the AC1 and AV1 ORFs also indicate that geminiviral DNA is associated with *Carica papaya* (PaGV), *Capsicum annuum* (BGMV-JA3), *Cleome spinosa* (BGMV-JA4), *Sida* sp. (SidGMV-MX) and two additional geminiviruses associated with *Macroptilium lathyroides* (MacGMV-JA1 and MacGMV-JA2).

Nucleotide sequence alignment of the common region and the N-terminal region of the AC1 ORF were used to determine phylogenetic relationships of the new geminivirus isolates with other Western Hemisphere geminiviruses. A

previous geminivirus isolate from *P. vulgaris* (BGMV-JA) and an isolate from *P. lunatus* (BGMV-JA2) were placed in BGMV type II cluster. Sida golden mosaic geminivirus (SidGMV-JA1), Mactroptilium golden mosaic geminivirus (MacGMV-JA1), were most closely related to potato yellow mosaic geminivirus (PYMV). Tomatoes and peppers were shown to be host for the same geminivirus, TGV-JA. The geminiviruses associated with *W. amplissima* (WGMV) and *C. papaya* (PaGV) were closely related to each other and distinct from other Western Hemisphere geminiviruses. A second geminivirus associated with *M. lathyroides* (MacGMV-JA3) was closely related to another geminivirus also infecting *M. lathyroides* from Central America. These results indicate that crop-infecting and weed-infecting geminiviruses from Jamaica are distinct, highly diverse, and had several geographical origins.