

ABSTRACT

Molecular Characterisation and Phylogeny of Geminiviruses Infecting the Weeds
Macroptilium lathyroides and *Rhynchosia minima* in Jamaica

Icolyn I. Amarakoon

Geminiviruses have emerged to be the most destructive group of plant DNA viruses in the tropical and subtropical regions of the world. *Macroptilium lathyroides* and *Rhynchosia minima* are perennial legume weeds found commonly in Jamaica and the Caribbean region. The geminivirus found infecting the legume weed *M. lathyroides* in Jamaica is Macroptilium yellow mosaic virus – Jamaica strain (MaYMV-[JM]) which is a strain of the *Macroptilium yellow mosaic virus* – Cuba (MaYMV-[CU]). Infectious DNA-A and DNA-B clones were isolated from field-infected plants and sequenced. The host range of this virus included its natural host *M. lathyroides*, *Nicotiana benthamiana* and crops such as the red kidney bean, and Scotch Bonnet pepper. This virus was not infectious in cabbage.

R. minima was found to be the natural host of at least two begomoviruses. Firstly, cabbage leaf curl virus - rhynchosia strain (CaLCuV-[rhyn]), which is likely a strain of *Cabbage leaf curl virus* from Jamaica (CaLCuV-[JM]). CaLCuV-[rhyn] clones were infectious in *N. benthamiana* and red kidney bean, but not in cabbage. The second virus isolated from *R. minima* was provisionally named

Rhynchosia mosaic Jamaica virus (RhMJV) a distinct and previously unreported begomovirus. Nucleotide sequence analysis revealed that the 5' terminus of the Rep (from nucleotide position 1930) to the 3' end of intergenic region (nt position 33) was similar to several viruses from Jamaica and Cuba, whilst the remainder of the genome was similar (90%) to CaLCuV-[JM]. This suggests that a significant recombination event may have occurred between CaLCuV-[rhyn] and an unknown source, most likely *Tomato mosaic Havana virus* (ToMHV-[JM]) or *Tobacco leaf curl Cuba virus* (TbLCCUV) to generate this new virus. These results have added new insights into the diversification of geminiviruses through the contemporary evolutionary processes such as recombination, occurring with viruses like the CaLCuV in mixed infections.

Keywords: Begomovirus, recombination, macroptilium, rhynchosia, cabbage leaf curl virus.