

First report of *Tomato yellow leaf curl China virus* with DNA β infecting *Datura stramonium* in China

M. Ding^A, Y. Q. Luo^A, J. H. Dong^A, Q. Fang^A and Z. K. Zhang^{A,B}

^AInstitute of Biotechnology and Genetic Resources, Yunnan Academy of Agricultural Sciences, Kunming 650223, China.

^BCorresponding author. Email: zhongkai99@sina.com

Abstract. *Tomato yellow leaf curl China virus*, associated with a satellite DNA β , has been detected in *Datura stramonium* (jimsonweed) with leaf curl disease for the first time in China.

A virus isolate (YN72) was collected from *Datura stramonium* (jimsonweed) showing chlorotic and leaf curl symptoms (Fig. 1) from Binchuan in the Yunnan province of China in July 2005. The isolate gave a positive reaction with antiserum to *African cassava mosaic virus* using DAS-ELISA (AGDIA, Elkhart, IN). Total DNA was extracted and tested for the presence of geminiviral DNA using polymerase chain reaction (PCR) with the begomovirus-specific degenerate primer pair PA/PB (Deng *et al.* 1994). PCR products of the expected size (~500 bp) were obtained, cloned into pGEM-T Easy (Promega, Madison, WI), and sequenced (GenBank Accession EF011561). Nucleotide sequence comparison showed 99% identity with *Malvastrum yellow vein Yunnan virus* (isolate Y160) (GenBank Accession AJ971500). The remaining DNA-A sequence of YN72 was amplified by PCR using the primers of Dong *et al.* (2007). The complete DNA-A sequence of YN72 was determined to be 2739 nucleotides (GenBank Accession EF011559). Comparisons with viral sequences available at the GenBank-EMBL databases using BLASTN showed that DNA-A of YN72 is closely related to *Tomato yellow leaf curl China virus*-(Y43) with 96.7% nucleotide sequence identity.



Fig. 1. Typical symptoms of *Datura stramonium* infected with *Tomato yellow leaf curl China virus* (TYLCCNV) isolate jimsonweed-BC in China.

To test whether a satellite molecule was associated with this isolate, a universal primer pair specific for DNA β was used to amplify the putative DNA (Bridson *et al.* 2002). Using this primer set, an amplification product of ~1300 bp was obtained. Sequence analysis revealed that this DNA β of YN72 was 1335 nucleotides long (GenBank Accession EF011560) and most closely related to the DNA β associated with *Tomato yellow leaf curl China virus*-(Y254) (GenBank Accession AJ971332; 98% nucleotide sequence identity).

To our knowledge, this is the first report of a begomovirus, which has DNA A along with a satellite DNA β , being associated with leaf curl disease on *Datura stramonium* in China.

Acknowledgements

This work was funded by the National Natural Science Foundation of China (Grant No.30360005) and the Natural Science Foundation of Yunnan Province, China (Grant No. 2005C0064M, 2005C0012Z).

References

- Bridson RW, Bull SE, Mansoor S, Amin I, Markham PG (2002) Universal primers for the PCR-mediated amplification of DNA β ; a molecule associated with some monopartite begomoviruses. *Molecular Biotechnology* **20**, 315–318. doi: 10.1385/MB:20:3:315
- Deng D, McGrath PF, Robinson DJ, Harrison BD (1994) Detection and differentiation of whitefly-transmitted geminiviruses in plants and vector insects by the polymerase chain reaction with degenerate primers. *The Annals of Applied Biology* **125**, 327–336.
- Dong JH, Luo YQ, Ding M, Zhang ZK, Yang CK (2007) First report of *Tomato yellow leaf curl China virus* infecting kidney bean in China. *Plant Pathology* **56**, 342. doi: 10.1111/j.1365-3059.2007.01472.x

Manuscript received 12 October 2006, accepted 10 April 2007