

PaLCuCNV和TYLCCNV复合侵染引起更严重的番茄黄化曲叶病

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The More Severe Tomato Yellow Leaf Curl Disease is Caused by Co-infection of PaLCuCNV and TYLCCNV

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摘要 从四川攀枝花市田间采集36份表现严重矮化、黄化和曲叶症状的番茄病株样本, 利用双生病毒简并引物PA/PB从所有样本中均扩增得到约500 bp的片段, 经全序列测定及分析, 检测出中国番木瓜曲叶病毒 (*Papaya leaf curl China virus*, PaLCuCNV) 和中国番茄黄化曲叶病毒 (*Tomato yellow leaf curl China virus*, TYLCCNV), 这两种双生病毒的复合侵染率达97.2%。系统进化分析表明, 这两种双生病毒分别与已报道的PaLCuCNV河南番茄分离物 (PaLCuCNV-[HeNZMI]) 及TYLCCNV云南元谋烟草分离物 (TYLCCNV-[Y295]) 的核苷酸序列相似性最高, 分别为99.1%和97.9%。检测发现, 所有分离物均伴随有卫星DNA β分子, 全序列测定表明所得9个DNA β分子均为TYLCCNV的卫星TYLCCNB, 且与其四川番茄分离物 (TYLCCNB-[SC65]) 的核苷酸序列相似性最高, 为87.7% ~ 94.5%。本文首次报道PaLCuCNV与TYLCCNV/TYLCCNB病害复合体复合侵染番茄引起更严重的番茄黄化曲叶病。

关键词: 番茄 中国番木瓜曲叶病毒 中国番茄黄化曲叶病毒 全序列 复合侵染 卫星DNA β分子

Abstract: Thirty-six tomato samples with severe stunting, yellowing and leaf-curling symptoms were collected in Panzhihua, Sichuan Province. Fragments of about 500 bp were amplified from all samples using the begomoviruses degenerate primers PA and PB. The complete genome sequence analysis showed that the diseased tomato samples were infected by *Papaya leaf curl China virus* (PaLCuCNV) and *Tomato yellow leaf curl China virus* (TYLCCNV) and 97.2% samples were infected with both viruses. Sequence analysis showed that PaLCuCNV had the highest sequence identity (99.1%) with PaLCuCNV-[HeNZMI] isolated from tomato in Henan, and TYLCCNV shared the highest sequence identity (97.9%) with TYLCCNV-[Y295] isolated from tobacco in Yuanmou, Yunnan. In addition, all isolates were found to be associated with DNA β molecules. Nine complete DNA β sequences were determined and showed the highest sequence identity with DNA β of TYLCCNV (TYLCCNB-[SC65]), being ranged from 87.7% to 94.5%. This is the first report that tomato yellow leaf curl disease was caused by the co-infection of PaLCuCNV and TYLCCNV/TYLCCNB.

Keywords: tomato, *Papaya leaf curl China virus*, *Tomato yellow leaf curl China virus*, full length DNA sequences, co-infection, satellite DNA β

收稿日期: 2013-08-05; 出版日期: 2014-01-10

引用本文:  
熊艳, 周常勇, 李茵等. PaLCuCNV和TYLCCNV复合侵染引起更严重的番茄黄化曲叶病[J]. 园艺学报, 2014, V41(2): 268-276

Xiong-Yan, ZHOU Chang-Yong, LI Yin etc. The More Severe Tomato Yellow Leaf Curl Disease is Caused by Co-infection of PaLCuCNV and TYLCCNV[J]. ACTA HORTICULTURAE SINICA, 2014, V41(2): 268-276

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