

DISEASE NOTE

FIRST REPORT OF *CITRUS TRISTEZA VIRUS* IN *CITRUS CHANGSHANENSIS* cv. HUYOU IN ZHEJIANG, CHINA

X.F. Cheng¹, J.X. Wu², X.Y. Ma³, H.F. Fu⁴ and X.Y. Wu³

¹ College of Life and Environmental Science, Hangzhou Normal University, Hangzhou 310036, China

² Institute of Biotechnology, Zhejiang University, Hangzhou 310029, China

³ College of Agricultural and Food Science, Zhejiang Agricultural and Forestry University, Linan 311300, China

⁴ Plant Protection and Quarantine Station of Changshan, Changshan 324200, China

Citrus changshanensis cv. Huyou is one of the major citrus cultivars in eastern China. More than 90% of Huyou trees are grown on trifoliolate orange (*Poncirus trifoliata*), a rootstock with high degree of resistance to *Citrus tristeza virus* (CTV) (Garnsey *et al.*, 1987). A new disease characterized leaf yellowing and decrease of marketable fruit production has emerged in many cv. Huyou orchards of Zhejiang province. Twenty-five symptomatic and 11 symptomless leaf samples were collected in April 2010 and February 2011 from seven different cv. Huyou orchards. Samples were tested by TAS-ELISA using CTV-specific commercial kits (Agdia, USA). Twenty-one of the 25 symptomatic samples reacted positively whereas no reaction was obtained from symptomless leaves. Total RNA was extracted from the leaves of a citrus accession denoted CS-7, reverse transcribed using primer CP3, then PCR-amplified with the degenerate primer pairs CP1 and CP3 (Gillings *et al.*, 1993), and primers CTCpol and CTCpo2 (Kim *et al.*, 2000) specific for CTV major and minor coat proteins, respectively. Two PCR fragments of 670 and 750 bp were obtained for the major and minor protein, respectively. Three independent clones were sequenced for each fragment, and representative sequences were deposited in GenBank under accession Nos HQ634290 and HQ634291. BLASTn search and phylogenetic analysis indicated that CTV isolate CS-7 is closely related to several CTV isolates from New Zealand that overcome trifoliolate orange resistance (Harper *et al.*, 2010). The emergence of a trifoliolate orange resistance-breaking CTV isolate in this region may cause serious damage to cv. Huyou. To our knowledge this is the first report of CTV in cv. Huyou in Zhejiang.

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Corresponding author: X.Y. Wu

Fax: +86. 571. 63741276

E-mail: wxy5551@126.com

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DISEASE NOTE

FIRST REPORT OF *CITRUS TRISTEZA VIRUS* ASSOCIATED WITH STEM-PITTING OF *CITRUS DECUMANA* IN INDIA

C.R. Adkar-Purushothama^{1*}, M.Y. Sreenivasa², M.N. Nagendra Prasad³, P.K. Maheshwara⁴ and G.R. Janardhana¹

¹ Molecular Phytodiagnostic Laboratory, Department of Studies in Botany, University of Mysore, Mysore 570 006, India

² Department of Studies in Microbiology, University of Mysore, Mysore 570 006, India

³ Department of Biotechnology, Sri Jayachamarajendra College of Engineering, Mysore 570006, India

⁴ Department of Microbiology, Yuvaraja's College, University of Mysore, Mysore 570 005, India

* Present address: Laboratory of Plant Pathology, Faculty of Agriculture and Life Sciences, Hirosaki University, Hirosaki, Japan.

Citrus tristeza virus (CTV), genus *Closterovirus*, family *Closteroviridae*, occurs in all citrus-growing regions of the world. According to the virus strain, infection results in a variety of symptoms, such as stem pitting, seedling yellows, vein clearing, decline and, ultimately, tree death. Recently, a stem pitting condition on the scion was observed in *Citrus decumana*, a species grown in south eastern Asia for fruit production and as a traditional medicinal plant. Leaf samples were collected from symptomatic trees in the Kodagu region of Karnataka (India) were analyzed for the presence of CTV. Total nucleic acids were extracted from leaf tissues according to Adkar-Purushothama *et al.* (2007) and analyzed by RT-PCR as described previously (Huang *et al.*, 2004). The expected 672 bp product was amplified from all symptomatic samples. Two amplicons were cloned and shown to have identical sequences that were deposited in GenBank under the accession No. HM853684. Nucleotide sequence analysis indicated 91-99% identity of the CTV isolate from *C. decumana* and other isolates from various citrus species from north eastern India (accession Nos. DQ272579, GQ475549 and GQ272579). To the best of our knowledge, this is the first report of CTV infection to *C. decumana* in India.

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Corresponding author: G.R. Janardhana

Fax: +91.821.2419759

E-mail: grjbelur@gmail.com

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