

DISEASE NOTE

CHARACTERIZATION OF *CUCUMBER MOSAIC VIRUS* ISOLATES FROM *VALERIANA JATAMANSI*, A MEDICINAL HERB IN INDIA

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Valeriana jatamansi is a highly threatened and important medicinal herb that grows at an altitude of 1200-3000 metres above sea level in the Himalayan region. During 2012-2013, *V. jatamansi* plants displaying interveinal chlorosis were collected from three different sites including Bir-Billing (Kangra district), Ghatasni (Mandi district), and the herbal garden of CSIR-IHBT, Palampur (Kangra district). Leaf samples were analyzed by RT-PCR for *Cucumber mosaic virus* (CMV) infection using detection primers (De Blas *et al.*, 1994), followed by primers designed to amplify the full-length coat protein (CP) and movement protein (MP) genes (Kumari *et al.*, 2013). Symptomatic samples of Bir-Billing (B), Ghatasni (G) and the herbal garden (P) were infected with distinct CMV isolates. CMV-B shared 97.4% (CP) and 98.2% (MP) nucleotide sequence identity with the respective genes of strain Q (subgroup II) while CMV-G and P isolates shared 95.4-95.5% (CP) and 96.2-96.7% (MP) identity with the respective genes of CMV strain Fny (subgroup I). Sequences were submitted to EMBL database as accession Nos. HG425124, and HG955232-HG955236. Phylogenetic analysis clustered CMV subgroup I isolates from *V. jatamansi* along with subgroup IA members, including isolates from India and China, suggesting their Asian origin. To our knowledge, this is the first characterization of CMV isolates from *V. jatamansi*.

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FIRST REPORT OF *POTATO LEAF ROLL VIRUS* IN TREE TOMATO IN ECUADOR

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Tree tomato (*Solanum betaceum*), family Solanaceae, is an economically important fruit crop in Ecuador, where it is grown on 5,964 ha with a yearly production of 14,695 tonnes (General System Coordination of National Information, MAGAP, 2012). In September 2015, different commercial tree tomato fields in the Pichincha province showed mosaic and curling of the leaves, as well as stunted growth. Based on symptomatology, infection by *Potato leaf roll virus* (PLRV, genus *Polerovirus*, family *Luteoviridae*) was suspected. The presence of this virus was ascertained in five of the eight tree tomato samples screened by DAS-ELISA with a commercial kit (Agdia, USA) and by RT-PCR using PLRV primers (Singh *et al.*, 1995). The resulting (*ca.* 330 bp) amplicons were purified, custom-sequenced (Macrogen, South Korea) and the sequences were deposited in GenBank as accession Nos. KU258499-KU258503. Sequence analysis (BioEdit v. 2.7.7.05) showed a maximum identity of 99.6% and 100% at the nucleotide and amino acid levels, respectively. A phylogenetic tree constructed using MEGA version 4.1 revealed two clades with the Ecuadorian CMV isolates clustered in clade 1 together with isolates from Colombia (JF939832 and HQ396183), Peru (AF453392), Cuba (S77421), India (AF539791), China (KC456052 and KR051194), New Zealand (GU002343) and Australia (D13953), whereas isolates from Argentina (AF220151), Germany (JQ346191), and the USA (KP090166) formed clade 2. Isolates from Iran (EU450876) and Brazil (AF453406) gave rise to clade 3. Based on our findings, the infected crop was eliminated to eradicate the infection. To the best of our knowledge, this is the first report of PLRV on tree tomato in Ecuador.

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