

# First Report of *Cassava common mosaic virus* and Cassava frogskin-associated virus Infecting Cassava in Argentina

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Cassava (*Manihot esculenta* Crantz) is the third most important source of calories for human nutrition in the world. In Argentina, cassava is largely produced in the northeastern region, with Misiones Province accounting for the majority of the production for industrial purposes while in Corrientes and Formosa provinces, cassava is primarily grown for direct human consumption. Since cassava is vegetatively propagated, it is prone to buildup of virus infections, which are associated with severe root and leaf symptoms ([Carvajal-Yepes et al. 2014](#)) and significant yield reductions. Recent field surveys in Argentina have identified the presence of severe leaf mosaic symptoms in local cassava varieties while historical virus indexing records of cassava plantlets maintained in vitro at the International Center for Tropical Agriculture (CIAT) indicate the presence of *Cassava common mosaic virus* (CsCMV; genus *Potexvirus*) in Argentinian accessions collected in 1993. To confirm the current presence of CsCMV in Argentina, a total of 19 samples were collected in 2012 and 2014 from the fields in Corrientes (Corrientes), El Colorado (Formosa), and Puerto Rico (Misiones), and assayed for CsCMV and other viruses reported in the Americas ([Carvajal-Yepes et al. 2014](#)). These plants showed virus-like symptoms including leaf mosaic and leaf deformation. Plate trapped antigen (PTA)-ELISA tests (antiserum kindly provided by Dr. Eliezer Rodrigues Souto, Universidade Estadual de Maringá, Brazil) readily detected CsCMV in 16 out of the 19 samples. Negative samples could be explained by low virus titers and/or the specificity of the antiserum used. Mechanical transmissions to experimental hosts induced the formation of characteristic symptoms previously described for CsCMV including systemic mild mosaic in *Nicotiana benthamiana* and *N. occidentalis* and local chlorotic lesions in *Chenopodium quinoa* and *C. amaranticolor*.

RT-PCR ([Calvert et al. 2008](#); [Gibbs et al. 1998](#)) confirmed the presence of CsCMV in the originally collected cassava samples and detected a mixed infection with Cassava frogskin-associated virus (CsFSaV; tentative genus *Oryzavirus*) in one plant. PCR products from three independent CsCMV-positive samples were cloned into plasmid vectors and sequenced using standard procedures. Sequence analysis of the replicase region of CsCMV obtained using universal potexvirus primers (GenBank Accession No. KP025969) showed a nucleotide identity of 87 and 92% with two Brazilian isolates sequences available in GenBank (U23414 and JF913280, respectively). For CsFSaV, sequence analysis of a conserved region (958 bp) of the segment 4 encoding the replicase gene (KJ742699) detected a nucleotide identity of 88 to 99% with Colombian and Brazilian isolates ([Calvert et al. 2008](#); [De Souza et al. 2014](#)). Symptoms caused by CsCMV in single infection can reduce yields significantly and although no obvious difference in symptoms was observed in the mixed infected plant detected in this study, the inadvertent accumulation and propagation of additional virus infections could dramatically affect the growing cassava industry in Argentina as it has been occurring in other countries ([Carvajal-Yepes et al. 2014](#)).

**References:**

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