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“Filling gaps and removing traps
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Screening Sweetpotato Crop Wild Relatives for Sweetpotato Virus Disease Resistance

BETTINA HEIDER¹, SEGUNDO FUENTES², JAN KREUZE²

¹*International Potato Centre (CIP), Genetics, Genomics and Crop Improvement, Peru*

²*International Potato Centre (CIP), Crop and Systems Science Division, Peru*

Abstract

Sweetpotato Virus Disease (SPVD) is a major constraint to sweetpotato production worldwide and particularly in sub-Saharan Africa. SPVD is caused by the synergistic interaction of the whitefly-borne Sweetpotato Chlorotic Stunt Virus (SPCSV) and the aphid-borne Sweetpotato Feathery Mottle Virus (SPFMV). Approaches to control SPVD are limited to phytosanitary measures and the use of virus-free planting material. Due to the lack of extreme natural resistance to SPVD in the sweetpotato genepool, crop wild relatives are a potential alternative source of resistance genes. However, no resistance could be found in species of the *Ipomoea* series *Batatas* (Choisy) D.F. Austin complex, the group of crop wild relatives most closely related to sweetpotato. To evaluate sweetpotato crop wild relatives for resistance to SPCSV and SPFMV 53 accessions of nine species belonging to the *I. batatas* complex were subjected to repetitive cycles of grafting with infected stem cuttings and subsequent enzyme-linked immunosorbent assay (ELISA) screenings. Resistance of accessions that remained negative to SPFMV or SPCSV was finally validated by grafting plant material on indicator plants (*I. setosa*) followed by ELISA analysis. Two *Ipomoea cordatotriloba* accessions (CIP 460296 and CIP 460164) were identified showing stable resistance to SPCSV and one *Ipomoea tiliacea* accession with resistance to SPFMV (CIP 460531) was found. No resistance to both viruses was detected. These findings demonstrate that sweetpotato crop wild relatives are a potential sources of true and durable resistance to SPVD useful for sweetpotato pre-breeding initiatives. Since crossing barriers of species of the *Batatas* complex with sweetpotato exist further research is required to explore pre-breeding approaches such as the use of bridge species.

Keywords: *Ipomoea* series *Batatas*, pre-breeding, sweetpotato chlorotic stunt virus, sweetpotato feathery mottle virus, sweetpotato virus disease