Activation of infectious endogenous Banana streak viruses in banana interspecific varieties under field conditions in Guadeloupe

Guillaume Fort[1], Kaïssa Plaisir Pineau[1], Chantal Guiougou[1], Gersende Pressat[1], Frédéric Lambert[1], Marie Umber[2] , Cécile Dubois[3], Frédéric Salmon[1], Pierre-Yves Teycheney[1]

[1]CIRAD, UMR AGAP, F-97130 Capesterre Belle-Eau, Guadeloupe, France
[2]INRA, UR ASTRO, Domaine de Duclos, F-97170 Petit-Bourg, Guadeloupe, France
[3]CIRAD, UMR AGAP, F-34380 Montpellier, France

teycheney@cirad.fr

Several species of Banana streak virus (BSV; family *Caulimoviridae*, genus *Badnavirus*) occur in banana (*Musa* spp). They cause a wide range of symptoms on the leaves, pseudostem and fruits of infected plants, although the impact of infections on yield and fruit quality has never been properly assessed. BSVs are naturally transmitted by mealybugs. However, infections can also occur spontaneously in interspecific varieties following stress-induced activation of infectious endogenous BSV sequences (eBSVs) integrated in B (*Musa balbisiana*) genomes.

A 484 plants experimental plot using a random block design was set up in Guadeloupe in order to study the kinetics and impact of BSV infections resulting from the activation of infectious eBSVs in two triploid interspecific plantain varieties : French Clair (AAB genotype), and Pelipita (ABB genotype). Both varieties harbor similar infectious endogenous sequences of *Banana streak OL virus* (BSOLV) and *Banana streak GF virus* (BSGFV). Planting material was multiplied either by cell culture (vitroplants) or by a corm splitting technique (PIF). Activation of infectious eBSOLV and eBSGFV sequences was monitored every three months by immunocapture-PCR indexing [1, 2] of all the plants of the plot.

Data gathered over a 15 months period showed that activation of infectious eBSGFVs occured in both varieties, although activation rates were significantly higher in French Clair. Activation of infectious eBSOLVs occurred only in French Clair, at a much lower rate. These results suggest that infectious eBSGFVs and eBSOLVs are more prone to activation by abiotic stresses under field conditions in French Clair than in Pelipita, pointing to a role of plant genetic background in the activation process. They also suggest that in French Clair, infectious eBSGFVs are more prone to activation than infectious eBSOLVs, confirming previous observations made in cell culture and pointing to differential activation potentials among infectious eBSVs [3]. Our data also showed that activation of eBSGFVs in French Clair was higher in plants originating from PIF than in plants originating from vitroplants.

No significant impact of BSOLV and BSGFV infection on plant growth and fruit production was observed, and none of the infected plant did express BSV symptoms.

Keywords: plantain; *Banana streak virus*; eBSVs; risk assessment

Reference:

[1] Le Provost G., Iskra-Caruana M.-L., Acina I., Teycheney, P.-Y. (2006). *J. Virol. Meth*. 137: 7-13.
[2] Umber M., Pichaut J.P., Laboureau N., Janzac B., Farinas B., Plaisir Pineau K., Pressat G., Baurens F.-C., Chabannes M., Duroy P.-O., Guiougiou C., Delos J.-M., Jenny C., Iskra-Caruana M.L., Salmon F., Teycheney P.Y. (2016) *Mol. breeding,* 36: 1-11.
[3] Côte F, Galzi S., Folliot M., Lamagnère Y., Teycheney P.-Y., Iskra-Caruana M.-L. (2010). *Mol. Plant Pathol.* 11: 137–144