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Introduction

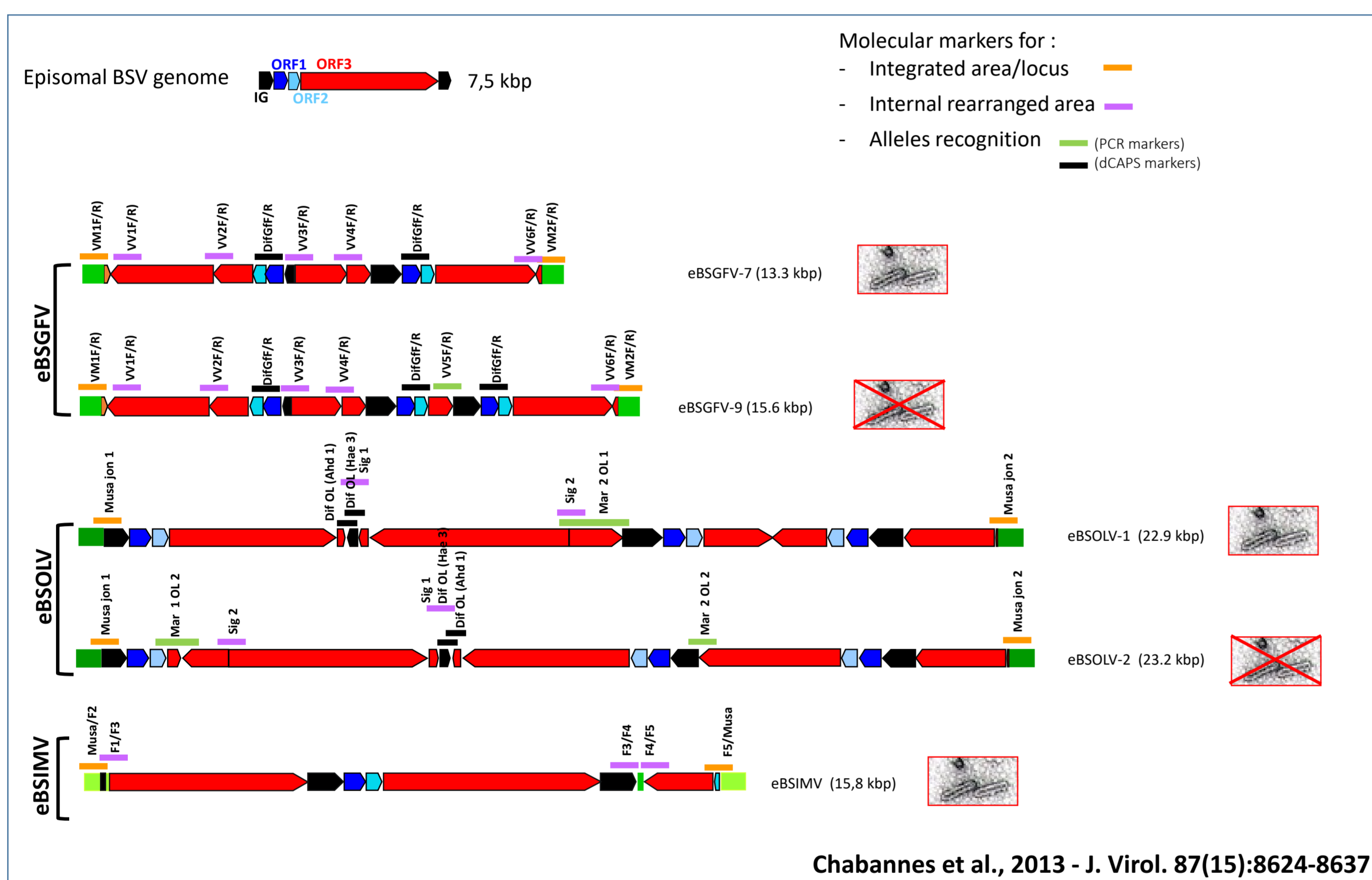
Infections of banana and plantain by banana streak viruses (BSV) can occur in the absence of vector-mediated transmission, through the activation of infective endogenous BSV sequences (eBSVs). Such eBSVs are present in the *Musa balbisiana* (B) genome. Once activated by biotic or abiotic stresses, these viral integrants cause spontaneous infection in both natural and synthetic interspecific hybrids harbouring one copy of the B genome. We realised an in depth characterisation of integrants present within the seedy *Musa balbisiana* Pisang klutuk wulung (PKW) genome for three BSV species ; Goldfinger (eBSGFV) -Imove (eBSIMV), and Obino l'Ewai (eBSOLV). Based on their sequences and their structures we developed several PCR and Derived Cleaved Amplified Polymorphic Sequences (deCAPS) specific markers for genotyping eBSVs.

Those markers enabled to propose a strategy for the distribution of germplasm containing eBSV alleles present in the B genome, while minimising any risks associated with the distribution of BSV to the recipient country. They were also used to genotype *M. balbisiana* germplasm, unveiling the presence of modified eBSV alleles in several accessions and finally were used as phylogenetic markers to shed light on *Musa* evolution. In collaboration with colleagues from CIRAD Guadeloupe, we obtained breeding improved *M. balbisiana* progenitors devoid of infectious eBSGFV and/or eBSOLV alleles through self-pollination and chromosome doubling of haploid lines. Finally we also produced triploid AAB (3x) plantain progeny without eBSV in collaboration with the Centre Africain de Recherche sur Bananiers et Plantains (CARBAP) in Cameroon by crossing a diploid AA parent (2x) with a tetraploid AAAB parent (4x).

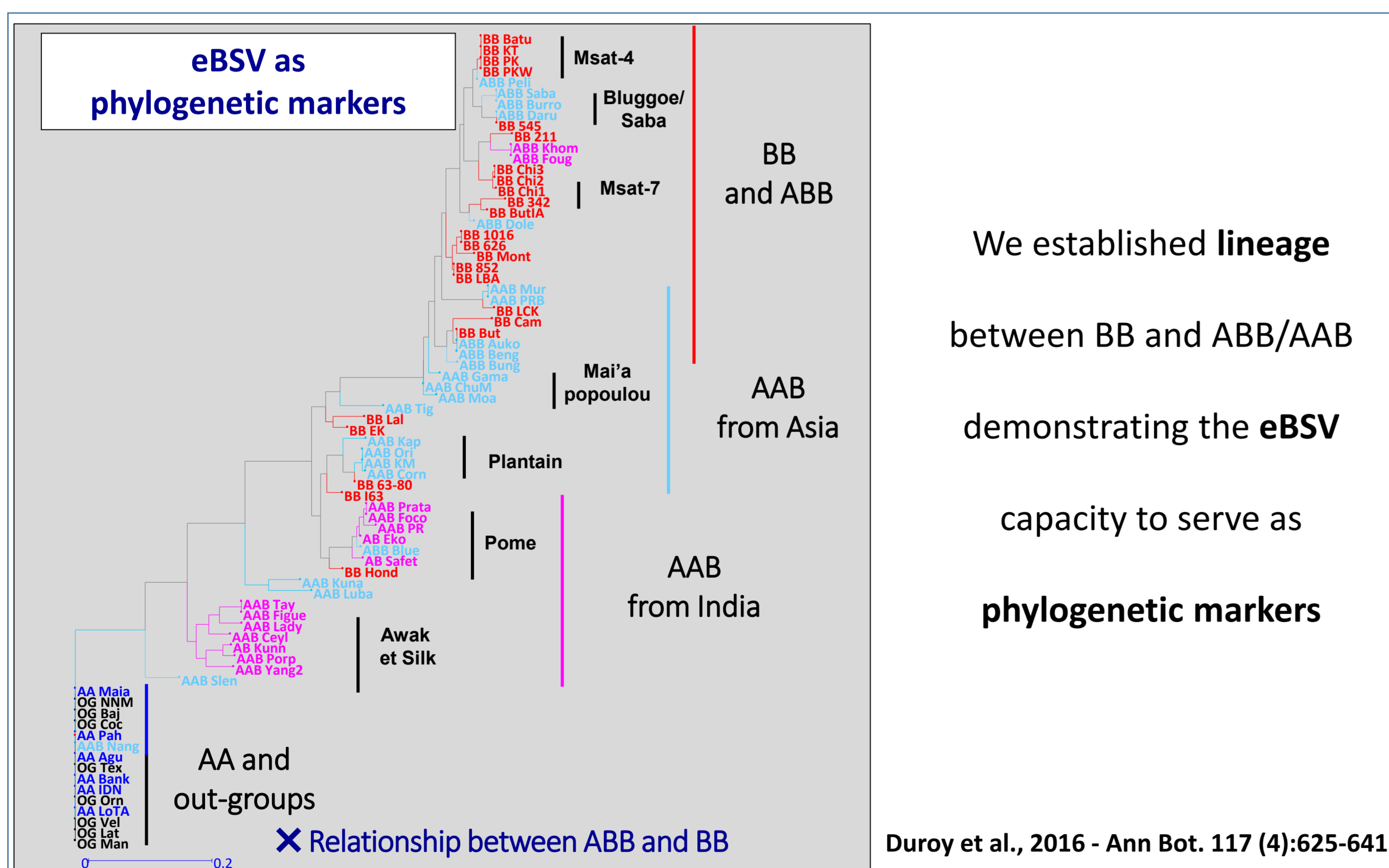
These results pave the way to the safe use of *M. balbisiana* in breeding programs, and open new perspectives for breeding improved banana and plantain hybrid varieties.

Results

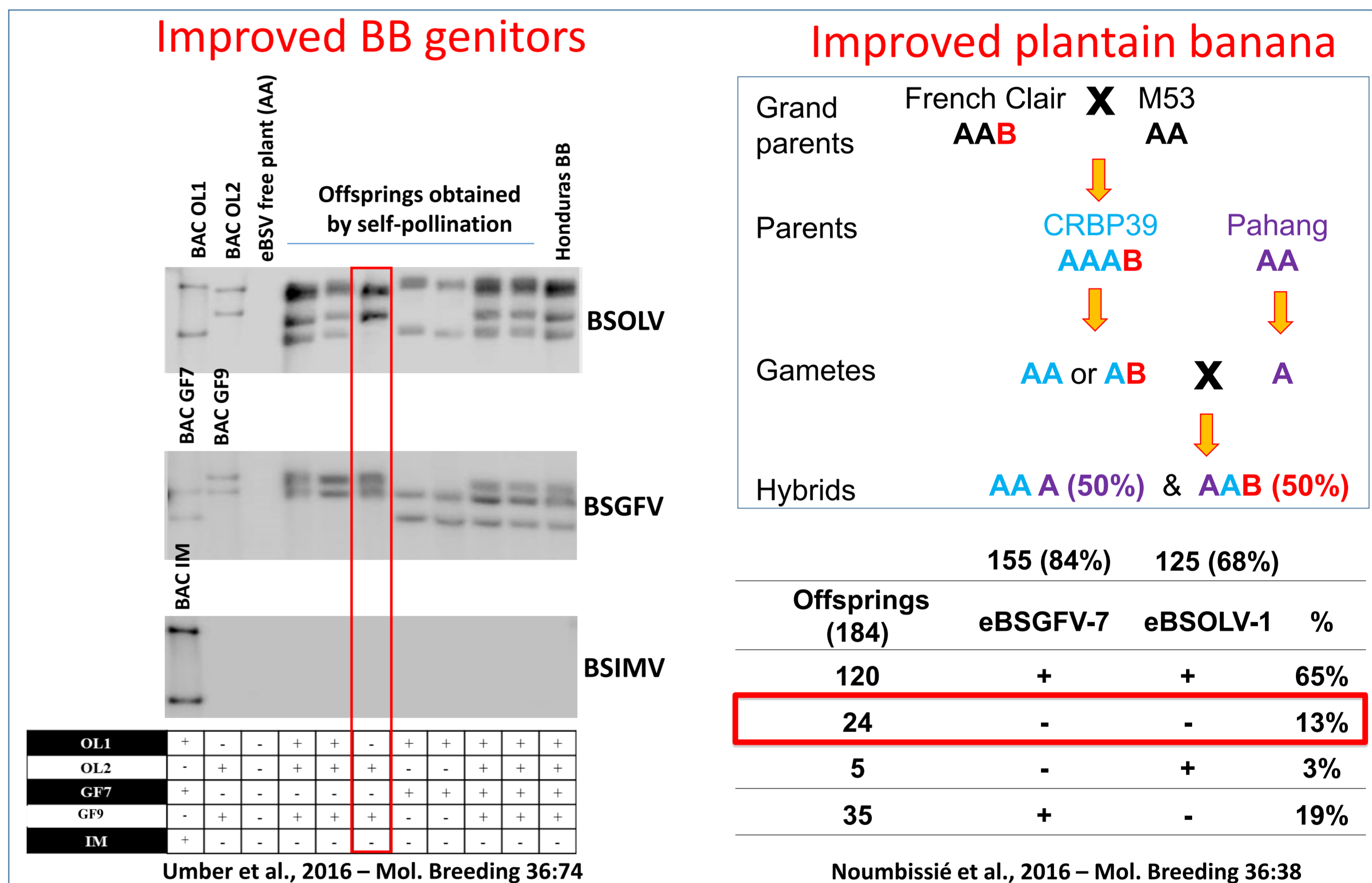
1) Molecular structure of eBSVs discovered in PKW genome and position of the different molecular markers developed



2) eBSV markers as a tool to shed light on *Musa* evolution



3) eBSV markers to assist the early selection of banana plants carrying non-infective eBSVs or eBSV-free banana plants



4) Decision tree for distributing germplasm with BSV and/or eBSV

