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## Assessing the possibility of *Plum pox virus* detection in latently infected *Prunus* plants

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Early detection is a key element of any disease control strategy. This is particularly the case for diseases caused by viruses transmitted by vegetative propagation for which the sanitary control of planting material is essential. However, despite considerable improvements in the sensibility and specificity of the detection tools such as real-time PCR and other molecular-based techniques, the detection of recently, still latently (i.e., not yet infectious), infected plants remains a challenge. Indeed, during latency the virus is generally in a very low concentration and restricted to some parts of the infected plants and thus not easily accessible to sampling.

*Plum pox virus* (PPV, genus *Potyvirus*) is a quarantine virus responsible for sharka, one of the most serious diseases of stone fruit trees (genus *Prunus*). Transmitted by aphids in a non-persistent manner and by grafting, the virus may induce latent infections of some months up to several years during which the virus is not detectable in the aerial parts of the tree (Quiot et al., 1995). Despite the numerous available tools and protocols dedicated to sensitive PPV detection, especially on nursery and/or on dormant plants (Vidal et al., 2012), the control of the sanitary status of planting material is not always feasible or reliable. It is especially the case for recent infections as well as for plants grafted with dormant buds and commercialized before having experienced a first vegetative growth.

To improve this situation, we investigated the possibility of early PPV detection in roots of *Prunus* plants. In a first step, the sampling and detection protocols were optimized in the roots from symptomatic peach (*Prunus persicae*) plants inoculated experimentally. The optimized protocols were then applied to peach seedlings inoculated by viruliferous aphids. Four independent batches of 20 peach seedlings were sampled (roots and leaves) either at 3, 5, 7 or 18 days post inoculation (dpi). The sanitary status of each plant was checked at 18 dpi by ELISA performed on leaves. Under our experimental conditions, PPV was detected as soon as 5 dpi in the roots of asymptomatic peach seedlings which resulted negative in ELISA on leaves. At 5 dpi, PPV was detected in the roots of 55% of the infected plants. Two days later (7 dpi), the presence of virus in roots was detected in 100% of the PPV-infected plants among which 45% were still asymptomatic and negative in ELISA on leaves. Experiments are in progress to assess the feasibility, sensitivity and specificity of such a detection protocol in roots when applied to experimentally graft-inoculated nursery peach plants.

### Références :

- [1] Quiot et al., 1995. Behavior of two isolates of Plum pox virus inoculated on peach and apricot trees *Acta Horticulturae* 386:290-296.
- [2] Vidal et al., 2012. Estimation of the accuracy of two diagnostic methods for the detection of Plum pox virus in nursery blocks by latent class models *Plant pathology* 61:413-422.