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# PRESENCE OF PEACH LATENT MOSAIC AND HOP STUNT VIROID IN LEBANON

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**SUMMARY** - A survey was carried out in Lebanon to check the presence of *Peach latent mosaic viroid* (PLMVd) and *Hop stunt viroid* (HSVd) in stone fruit orchards. A total of 180 stone fruit samples (50 peaches and 130 apricots) of different varieties were tested by dot-blot hybridisation for the presence of PLMVd and HSVd. PLMVd was detected in 17 samples belonging to native and international peach varieties (Babcock, Chikhani, Springtime, Nectarose, Dixired) collected from Mount Lebanon, North Lebanon and Békaa Valley. HSVd was found in 36 samples all belonging to native apricot varieties (Baiadi, Sindiani, Dehabi and Ajami) collected from Northern area of the Békaa Valley.

**Key words:** Lebanon, stone fruits, PLMVd, HSVd, molecular hybridisation

**RESUME** - Une enquête a été menée au Liban en vue de vérifier la présence du *Peach latent mosaic viroid* (PLMVd) et du *Hop stunt viroid* (HSVd) dans les vergers d'espèces fruitières à noyau. Au total, 180 échantillons (50 pêchers et 130 abricotiers) de différentes variétés ont été testés par hybridation dot-blot afin d'évaluer la présence du PLMVd et du HSVd. Le PLMVd a été détecté dans 17 échantillons appartenant à des variétés de pêcher locales et internationales (Bab cock, Chikhani, Springtime, Nectarose, Dixired) et prélevés au Mont Liban, dans le Nord du Liban, dans la vallée de la Bekaa, alors que le HSVd a été mis en évidence dans 36 échantillons appartenant tous à des variétés locales d'abricotier (Baiadi, Sindiani, Dehabi et Ajami), prélevés dans le nord de la Vallée de la Bekaa.

**Mots-clés:** Liban, espèces fruitières à noyau, PLMVd, HSVd, hybridation moléculaire

## INTRODUCTION

Stone fruits are among the main fruit crops cultivated in Lebanon. They cover about 23,000 ha (Anonymous, 2000), distributed in many regions, in particular in Bekaa Valley. Peach and apricot two of the main crops, are grown on 2,800 ha and 5,500 ha respectively.

Except for a preliminary survey that was conducted previously (Jawhar *et al.*, 1996) little is known about the sanitary status of the Lebanese stone fruit industry. Investigations had been recently undertaken to assess the sanitary conditions of the local stone fruit industry, and the presence of the main stone fruit viruses and viroids.

Whereas the incidence of stone fruit viruses in Lebanon is the object of another paper in this volume, we report here results of investigations to assess the presence of *Peach latent mosaic viroid* (PLMVd) and *Hop stunt viroid* (HSVd).

Peach latent mosaic disease, first recorded from France (Desvignes, 1976; 1980), is caused by PLMVd (336 nt) and is generally latent in peach trees for 5-7 years before symptoms appear (Flores and Liàcer, 1988; Flores *et al.*, 1990). Occasionally, symptoms appear on leaves (mosaic, blotch, vein banding or calico), buds (necrosis) and fruits (discoloured areas on fruit skin).

Hop stunt viroid as its name indicates, was first described as the causal agent of the stunt disease of hops in Japan, but since then it has been found in several fruit trees (Shikata, 1990); these plants either showed specific disorders or symptomless. The same viroid was proved to induce cachexia disease in citrus (Diener *et al.*, 1988; Semancik *et al.*, 1988; Levy and Hadidi, 1993) and dapple fruit of plums and peaches (Sano *et al.*, 1989). This viroid is also reported to infect apricot, almond and pomegranate (Astruc *et al.*, 1996; Kofalvi *et al.*, 1997; Cañizares *et al.*, 1998; 1999).

## MATERIALS AND METHODS

Field surveys were carried out in the main peach and apricot growing areas of Lebanon to assess the presence and the distribution of viroids in the Lebanese commercial orchards. Field inspections for the observation of the diseases were made during summer 2000 for peach and 2001 for apricot. Typical PLMVd symptoms (irregularly shaped fruits, bright yellow and calico) were observed on some peaches.

Samples were randomly collected from commercial orchards from three different Lebanese regions (Mount Lebanon, Békaa Valley and North Lebanon) and included the most important international and native varieties. A total of 50 peach and 130 apricot samples were tested for viroids by dot blot hybridisation using an SP6 and T7 RNA polymerase-generated full-length cRNA Digoxygenine labeled probes (Shamloul *et al.*, 1995; Astruc *et al.*, 1996).

## RESULTS AND DISCUSSION

PLMVd was detected in 17 samples belonging to native and international peach varieties (Bab cock, Chikhani, Springtime, Nectarose, Dixered) collected from Mount Lebanon, North Lebanon and Békaa Valley. HSVd was found in 36 samples, all in native apricot varieties (Baiadi, Sindiani, Dehabi and Aajami) collected from northern area of Békaa Valley.

Results of the present survey provide the first report of the presence of PLMVd and HSVd in Lebanese peach and apricot germplasm. These viroids were recently reported also in neighboring countries, i.e. Syria (Ismaeil *et al.*, 2001) and Jordan (Al Rwahnih *et al.*, 2001).

In conclusion, the presence of PLMVd represents a serious threat for the Lebanese stone fruit industry and infected trees constitute dangerous inoculum if used as propagating material source. Although HSVd has been detected only in apricot trees, in which it is reported to be latent (Astruc *et al.*, 1996), the demonstration of its presence in Lebanon should prompt control measures to be taken to prevent further spread.

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