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DETECTION OF *PEACH LATENT MOSAIC VIROID* IN STONE FRUITS FROM CHILE

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SUMMARY - A limited survey was carried out in Chile to check for the presence of *Peach latent mosaic* (PLMVd) and *Hop stunt* (HSVd) viroids in stone fruit orchards. A total of 36 stone fruit samples (12 peaches, 9 plums, 15 cherries) of different varieties were tested by dot-blot hybridisation for the presence of PLMVd and HSVd, from which 11 (6 peach and 5 plum) were positive for PLMVd. All samples were negative for HSVd. This is the first record of PLMVd in Chile and a more extended survey is needed to evaluate the incidence and impact of this pathogen in the local peach industry.

Key words: Chile, stone fruits, PLMVd, HSVd, molecular hybridisation

RESUME - Une enquête a été réalisée au Chili, sur une petite échelle, dans le but 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, 36 échantillons (12 pêchers, 9 pruniers et 15 cerisiers) de différentes variétés ont été testés en hybridation dot-blot afin de mettre en évidence le PLMVd et le HSVd et de ceux-ci, 11 se sont avérés positifs au PLMVd. Aucun des échantillons ne s'est révélé positif au HSVd. C'est là la première fois qu'on signale le PLMVd au Chili et de ce fait, une enquête de plus grande envergure serait nécessaire à l'avenir pour évaluer l'incidence de ce pathogène dans la culture locale du pêcher.

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

INTRODUCTION

Viroids are small, circular, single stranded RNA molecules that contain 246-371 nucleotides and possess no coat protein or mRNA activity (Hasimoto and Koganezawa, 1987). PLMVd and HSVd are reported in stone fruits and diagnosis is based on molecular methods.

PLMVd is generally latent in peach trees, i.e. up to several years before symptoms appear. Occasionally, mosaic, blotch, vein banding, or calico symptoms develop on leaves. Buds show necrosis, shoot development is delayed and branches may become necrotic and die off. Fruit symptoms consist of several small, circular, discolored areas on the fruit skin. The viroid is graft and possibly aphid transmitted (Desvignes, 1999).

HSVd occurs naturally in hops, cucumber, and several fruit crops such as citrus, and grapevine (Shikata, 1990). Among the stone fruit species peach, plum, apricot and almond are reported as natural hosts of the viroid (Sano *et al.*, 1989; Astruc *et al.*, 1996). The viroid may cause disease symptoms or latent infections (Duran-Villa *et al.*, 1988; Puchta *et al.*, 1989).

The stone fruit industry is very important in Chile, where peach and plum are the major crops. Stone fruit crops are situated mainly in the central part of the country and the industry has expanded significantly in the last decade.

There are many reports on virus diseases of stone fruits (Acuña, 1993; Herrera, 1998), but so far there was no survey on viroids. This study was aimed to investigate the presence of PLMVd and HSVd in stone fruits in Chile.

MATERIALS AND METHODS

Field surveys were carried out in the localities named Los Andes (Region V) and Rancagua (Region VI), respectively 66 and 80 km to the North or South Santiago. Thirty-four samples were collected from a nursery (Region VI) and two samples from commercial orchards (Region V): nr. 12 peach trees, nr.15 sweet cherry trees, 9 Japanese plum trees. Although a limited number of samples was collected, varieties were different.

Collected samples were tested by dot-blot hybridisation, for PLMVd (Shamloul *et al.*, 1995) and HSVd (Astruc *et al.*, 1996).

RESULTS AND DISCUSSION

Among 36 tested samples, 11 were found to be infected by PLMVd (Fig. 1). All samples tested for HSVd were negative. Viroid positive samples were four peaches and five plums (Table 1) from Rancagua and two peaches from Los Andes.

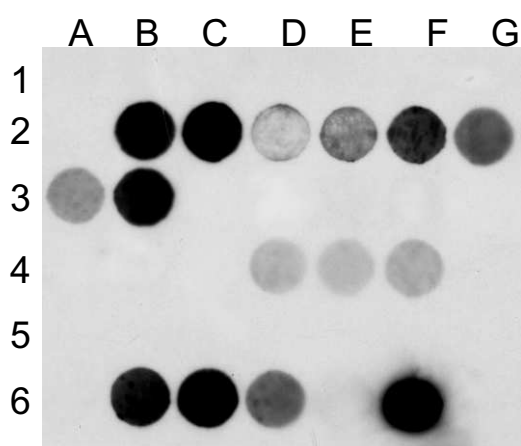


Fig.1. Dot-blot hybridization analysis of a digoxigenin-labeled PLMVd cRNA probe to total nucleic acids extracted from Chilean stone fruit samples. Positive samples were spotted in row 6, lanes B, C, D and F, whereas negative controls are in column E- row 6 and column G- row 6.

Table 1. Results of molecular hybridisation for PLMVd and HSVd

Species	Number of samples		Infection by viroids	
	Tested	Infected	PLMVd	HSVd
Peach	12	6	6	0
Plum	9	5	5	0
Sweet cherry	15	0	0	0
Total	36	11	11	0

This work represents the first record of PLMVd in Chile. Considering the economic impact of this pathogen on the industry in many countries, it is desirable to extend our surveys to the main peach-growing areas of the country to evaluate incidence and impact on fruit production.

Furthermore, a sanitary selection and eventual sanitation program for peach cultivars should be considered to release to local nurseries and fruit growers, propagation materials free of PLMVd.

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