Sanitary status of stone fruit industry in the Mediterranean countries: Spain

Pallás V., Llácer G., Cambra M.

in

Di Terlizzi B. (ed.), Myrta A. (ed.), Savino V. (ed.).
Stone fruit viruses and certification in the Mediterranean countries: problems and prospects

Bari : CIHEAM
Options Méditerranéennes : Série B. Etudes et Recherches; n. 19

1998
pages 61-63

SPAIN

Vicente PALLÁS
Deptartamento de Mejora y
Patología Vegetal
CEBAS-CSIC
Murcia (Spain)

Gerardo LLÁCER
Mariano CAMBRA
IVIA, Valencia (Spain)

The total area of stone fruit trees in Spain is 764,000 ha and producing 1.5 million tons of fruit in 1994 (Anuario de Estadística Agraria, 1994). Very different viruses that can cause important losses affect some fruit trees. The diseases associated with these viruses show symptoms that can range from a slight disorder such as mosaic, shot-hole, and distortion of leaves to more serious disorders of canker, precocious flowering, alterations in ripening date, fruit abnormalities, and even tree death. The more common viruses affecting fruit trees in Spain are those belonging to the ilarvirus group (prunus necrotic ringspot, PNRSV; prune dwarf, PDV; and apple mosaic, ApMV), apple chlorotic leaf spot trichovirus (ACLSV) and plum pox potyvirus (PPV). So far, no nepoviruses have been detected, e,g. tomato ringspot, TomRSV; arabis mosaic; ArMV; raspberry ringspot, RRV as tested by ELISA, in peach, apricot, and almond plants.

A study was carried out in the Mediterranean Region of Valencia and Murcia by Llácer *et al.* (1986). They reported virus incidences in stone fruit trees of 72% PDV infection in native almond trees in the Valencia Region, and nearly 100% ACLSV infection in native peach trees in the Murcia district. PNRSV infection was low in apricot trees (3%) but significant in peach and plum trees (14% and 17%, respectively). In a more recent study (Dominguez *et al.*, 1998) the incidence of these viruses in apricot crop in the Murcia Region had increased significantly. A total of 450 trees corresponding to four different varieties were tested. About 30% of the apricot trees were affected by at least one virus. The levels of infection were 22.6% for ACLSV, 15.7% for ApMV, 10% for PNRSV, and 0.4% for PDV. Double infections were observed in 18% of the infected trees, the most common combination being ACLSV+PNRSV. Three virus infections were detected in 4% of the cases. The highest incidences were

observed in the varieties 'Real Fino' with 79% and 'Búlida' with 46%, the most important variety grown in the region. Also in this variety a significant influence of the rootstock (Pollizo plum) was observed. The higher infection level detected in apricot in this last study versus the one reported by Llácer *et al.* (1986) was probably due to the fact that the apricots from Murcia were grafted on apricot seedlings while apricot trees in the study of Dominguez *et al.* (1998) were grafted on apricot seedlings and Pollizo plum rootstocks. A low level of ilarvirus infections would be expected in seedlings.

The apricot samples described above were used also to study the incidence of the hop stunt viroid (HSVd) (Cañizares *et al.*, 1998). This study demonstrated that 81% (123 out 152) of apricots trees were infected with the viroid. HSVd was equally distributed in all the cultivars, Bulida, Mauricio, Valenciano, Pepito, and Real Fino, located in the five different surveyed areas of Murcia. It has also been shown that the incidence of HSVd in apricot trees is not influenced by the presence of other economically important plant viruses, i.e. PNRSV, ACLSV, PDV, and ApMV.

Another viroid, peach latent mosaic (PLMVd) was detected in a collection of peaches and nectarines from North America and Italy kept in the Valencia area (Badenes and Llácer, 1998). In 134 varieties assayed, 110 were infected by PLMVd (82%) and found in varieties mostly originating from North America.

The most important virus affecting stone fruit trees in Spain is PPV. This virus was detected for the first time in Spain in 1984 (Llácer *et al.*, 1985) in a new natural host *Prunus salicina* (Japanese plum) (Llácer and Cambra, 1986). PPV is present in most regions where stone-fruit cultivation is important. Surveys, nursery controls, and eradication programs to reduce the incidence of the disease were performed every year. About 1,150,000 samples had been analysed by ELISA (mostly using specific monoclonal antibodies) since 1985.

During 1988-1996, more than 660,000 trees were removed in the Valencia region at a cost of 605 million ESP. In the Murcia region 106,377 trees at a cost of more than 114 million ESP were destroyed during the same period (Dicenta *et al.*, 1997). The Aragón and Navarra regions (where 80% of the nursery plants are produced) are now considered free from PPV. Surveys and eradication programmes are applied every year in these regions.

Only the common PPV-D serotype had been found in Spain (827 PPV field infected samples were analysed from different regions and hosts, in the last two years). A continuous control using PPV positive samples was performed using specific PPV-M monoclonal antibodies (Boscia *et al.*, 1997) and sensitive variants of PCR using specific primers (Olmos *et al.*, 1997).

Finally, recent results obtained from random survey of almond trees in the Valencia region have confirmed that the most frequent virus in this crop was PDV (62%) followed by PNRSV (36%), ApMV (14%), and ACLSV (2%) (Llácer *et al.*, 1997). The HSVd viroid was

recently detected in almond trees in the Murcia region although no significant survey on the incidence in this crop was conducted (Astruc *et al.*, 1996; Cañizares *et al.*, 1999).

References

- ASTRUC, N., MARCOS, J.F., MACQUAIRE, G., CANDRESSE, T. and V. PALLÁS (1996). Studies on the diagnosis of hop stunt viroid in fruit trees: Identification of new hosts and application of a nucleic acid extraction procedure based on non-organic solvents. *European Journal of Plant Pathology,* 102: 837-846
- BADENES, M. and G. LLÁCER (1998). Occurrence of peach latent mosaic viroid in American peach and nectarine cultivars growing in Valencia, Spain. *Acta Horticulturae,* 472 (1): 565-571.
- BOSCIA, D., ZERAMDINI, H., CAMBRA, M., POTERE, O., GORRIS, M.T., MYRTA, A., DI TERLIZZI, B. and V. SAVINO (1997). Production and characterization of a monoclonal antibody specific to the M serotype of plum pox potyvirus. *European Journal of Plant Pathology,* 103: 477-480.
- CAÑIZARES, M.C. , MARCOS, J.F. and V. PALLÁS (1998). Studies on the incidence of hop stunt viroid in apricot trees (*Prunus armeniaca*) by using an easy and short extraction method to analyze a large number of samples. *Acta Horticulturae,* 472 (1): 581-587.
- CAÑIZARES, M.C. , MARCOS, J.F. and V. PALLÁS (1999). Molecular characterization of an almond isolate of hop stunt viroid (HSVd) and conditions for eliminating spurious hybridization in its diagnosis in almond samples. *European Journal of Plant Pathology* (in press).
- DICENTA, F., PEREZ-CAMPOY, P.J., MARTÍNEZ-GÓMEZ, P., GARCÍA-BRUNTON, J. and E. ABAD (1997). Natural spread of sharka disease in fruit tree orchads in Murcia (Spain). *In*: XI International Symposium on Apricot Culture. Veria Thessalonik, Greece.
- DOMÍNGUEZ, D., APARICIO, F., SÁNCHEZ-NAVARRO, J.A., CANO, A., GARCÍA-BRUNTON, J. and V. PALLÁS (1998). Studies on the incidence of ilarviruses and apple chlorotic leafspot virus (ACLSV) in apricot trees in the Murcia region (Spain) using serological and molecular hybridization methods. *Acta Horticulturae,* 472 (1): 203-211.
- LLÁCER, G., CAMBRA, M. and A. LAVIÑA (1985). Detection of plum pox virus in Spain. *Bulletin OEPP/EPPO Bulletin,*15: 325-329.
- LLÁCER, G. and M. CAMBRA (1986). Occurrence of plum pox virus in Spain in a new natural host: Prunus salicina Lindl (Japanese plum). *Plant Disease,* 70: 73 p.
- LLÁCER, G., CAMBRA, M., LAVIÑA, A. and J. ARAMBURU (1986). Viruses infecting stone fruit trees in Spain. *Acta Horticulturae,* 193: 95-99.
- LLÁCER, G., CAMBRA, M., CAMARASA, E. and M.T. GORRIS (1997). Viruses infecting almond trees in the region of Valencia, Spain. *Bulletin OEPP/EPPO Bulletin* 27: (in press).
- OLMOS, A., CAMBRA, M., DASÍ, M.A., CANDRESSE, T., ESTEBAN, O., GORRIS, M.T. and M. ASENSIO (1997). Simultaneous detection and typing of plum pox potyvirus (PPV) isolates by heminested-PCR and PCR-ELISA. *Journal of Virological Methods,* 68: 127-137.