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PEACH VIRUSES IN APULIA (SOUTH-EASTERN ITALY)

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SUMMARY - A survey was carried out in Apulian peach orchards to assess the presence and incidence of viruses. About 750 trees in 21 orchards were sampled and tested by ELISA for *Plum pox virus* (PPV), *Prunus necrotic ringspot virus* (PNRSV), *Prune dwarf virus* (PDV), *Apple mosaic virus* (ApMV) and *Apple chlorotic leaf spot virus* (ACLSV). Approximately one third (35 %) of the samples were infected with one or more viruses. The prevailing virus was ACLSV (42%), followed by PNRSV (28%), PDV (5%) and ApMV (1.5%). Mixed infections were about 22%. PPV was not detected in any of the samples. RT-PCR tests of a few trees with stem-pitting symptoms revealed the presence of Plum bark necrosis stem pitting associated virus (PBNSPaV).

Key words: diagnosis, ELISA, peach, viruses.

RESUME *- Une enquête a été menée dans les vergers de pêcher des Pouilles dans le but d'évaluer la présence et l'incidence des virus. Des échantillons ont été prélevés individuellement de 750 arbres dans 21 vergers et testés en ELISA pour détecter le Plum pox virus (PPV), le Prunus necrotic ringspot virus (PNRSV), le Prune dwarf virus (PDV), l'Apple mosaic virus (ApMV) et l'Apple chlorotic leaf spot virus (ACLSV). Un peu plus d'un tiers des échantillons (35%) étaient infectés par un ou plusieurs virus. Le virus prédominant était l'ACLSV (42%), suivi du PNRSV (28%), du PDV (5%) et de l'ApMV(1,5%). Les infections mixtes atteignaient environ 22%. Le PPV n'a été mis en évidence dans aucun des échantillons. Les tests RT-PCR, réalisés sur les échantillons provenant de quelques arbres montrant des symptôme de bois strié "stem pitting" ont permis de révéler la présence du Plum bark necrosis stem pitting associated virus (PBNSPaV).*

Mots-clés: *diagnostic, ELISA, pêcher, virus.*

INTRODUCTION

In Apulia region (South-Eastern Italy), peach (*Prunus persica*) acreage is 3,800 ha (Anonymous, 2000) ranking third among stone fruit crops after almond and cherry. The crop has expanded in the last decade, being concentrated in Foggia and Brindisi provinces. The peach industry is based mainly on small and medium-size specialised farms which grow a high number of varieties, among which the early maturing ones are of major importance.

Peach can be affected by many viruses and virus-like diseases (Németh, 1986). A previous survey in Apulia by Choueiri *et al*. (1993) has reported the graft-transmissible agents: ACLSV, ApMV, PDV, PNRSV and *Peach latent mosaic viroid* (PLMVd).

Since the beginning of the 1990s in Apulia, a monitoring program for PPV in stone fruits is done annually. In the frame of this program, considering the frequent introductions of peach varieties in the region, it was decided to extend the controls to other viruses for a certain number of representative peach samples.

MATERIALS AND METHODS

The sanitary survey started in the spring 2001 to assess the incidence of virus infections in this crop. Some 21 peach orchards were surveyed in the main peach-growing areas of Brindisi (Brindisi and Mesagne counties), Foggia (San Ferdinando di Puglia,Trinitapoli and Cerignola counties) and a few in Lecce province.

Leaf samples were collected randomly from 5% of the trees and from those showing leaf symptoms.. DAS-ELISA (Clark and Adams, 1977) was used for ACLSV and DASI-ELISA (Cambra *et al*., 1994) for PPV, PDV, PNRSV and ApMV.

For a few trees with stem-pitting symptoms, RT-PCR for PBNSPaV was carried out as described by Abou-Ghanem *et al*. (2001).

RESULTS AND DISCUSSION

Associating defined field syndromes with infection by specific viruses was made difficult due to the great variability of varietal responses and the frequent presence of mixed infections. However, primary symptoms of chlorotic mottling and reduced growth, were frequently associated with PDV and/or PNRSV infections. In many cases, lack of visible symptoms in infected trees i.e. trees positive for ACLSV, PNRSV and PDV, was encountered also.

From the 757 trees assayed, slightly more than one third (35 %) was positive for one or more viruses. The prevailing virus was ACLSV (42%), followed by PNRSV (28%), PDV (5.5%) and ApMV (1.5%). Mixed infections were about 22%. PPV was not detected in any of the tested samples.

In some orchards, several trees were showing gradual dieback, associated with gummosis phenomena and slight flattening of the main branches. After bark removal, the woody cylinder showed severe stem pits, associated sometime with necrosis. RT-PCR tests in those trees were positive for PBNSPaV (Amenduni *et al*., 2003).

Calico syndrome, affecting leaves, young branches and fruits, was observed in a couple of orchards in San Ferdinando di Puglia and Cerignola. ELISA results were negative, whereas molecular assays demonstrated that all sampled trees were infected from PLMVd (Di Serio *et al*., 2002).

Table1. Viruses detected by ELISA in Apulian peach orchards

Provinces	N° of trees infected/tested	% infection	Single infections				Mixed infections		
			PDV	PNRSV	ACLSV	ApMV	PDV + PNRSV	PNRSV + ApMV	ACLSV + PNRSV
Foggia	158/363	43.5	3	31	77	4	-	1	42
Brindisi	102/374	27.2	12	40	35	-	3	-	12
Lecce	11/20	55.0	-	7	3	-	-	-	1
Total	271/757	35.7	15	78	115	4	3	1	55
% infection			5.5	28.7	42.5	1.5	1.1	0.4	20.3

CONCLUSIONS

It was very important that PPV was not found, a pathogen for which the Apulia region expended a considerable time and effort on a monitoring program with particular reference to peach industry.

The results related to other viruses agreed with findings of Choueiri *et al*. (1993). Eventhough grafted plants of “certified” or “CAC” category for the majority of requested varieties are available, the common practice in the Apulia region is to field graft certified rootstock GF677 with varieties of unknown sanitary status. Unfortunately, our regional peach industry has not fully accepted the large efforts by the local institutions in the last decade for the sanitary improvement of peach germplasm. In addition, top-grafting of new varieties on existing trees contributes to worsening sanitary problems. This consideration is strongly supported by the presence of mixed infections, twice the incidence compared to the survey done ten years ago.

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