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ELISA DETECTION OF CITRUS PSOROSIS VIRUS (CPsV) IN THE EASTERN MEDITERRANEAN REGION OF TURKEY

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SUMMARY - A survey for CPsV was carried out in the Eastern Mediterranean region of Turkey using a commercial kit. Samples collected from trees showing psorosis-like symptoms in the field were analysed by DAS-ELISA in June and September. Compared to June higher number of CPsV-positive trees were detected in September.

Key words: Citrus, ELISA, psorosis, virus, Turkey

RESUME - *Une enquête sur la présence du CPsV a été conduite sur la partie Est Méditerranéenne de la Turquie, ceci à travers l'utilisation d'un kit commercial.*
Les échantillons ont été récoltés en plein champ en Juin et Septembre sur des arbres montrant des symptômes typiques de Psorose, puis analysés par DAS - ELISA. En comparaison avec le mois de juin, un nombre important d'arbres positifs au CPsV a été détecté en Septembre.

Mots clés : *Agrumes, psorose, virus, ELISA, Turquie*

INTRODUCTION

Citriculture in Turkey, economically suffers from the diseases mainly induced by viral agents. In this respect, a total of 15 viruses, viroids and virus-like organisms were detected in citrus groves, the most widespread being psorosis virus (CPsV), followed by *Spiroplasma citri* (agent of stubborn disease), cachexia viroid (CCaVd) and exocortis viroid (CEVd). Psorosis is also the most severely recognized virus within the Mediterranean basin (Roistacher, 1991). However, citrus tristeza virus (CTV) is still present in the country as a potential threat (Tunar & Yılmaz, 1997).

The diagnosis of psorosis complex (psorosis A & B with ringspot) is based on symptomatology and biological indexing to pineapple or sweet orange seedlings. Visual observations in the field may fail, as it always happens**,** due to the symptomless presence of the virus in plants. Biological indexing is expensive and time-consuming. Finally, the urgent need for a rapid and sensitive and easier diagnostic technique was felt in order to face the disastrous effects of the virus and advance suggestions for control (Yılmaz, 1997). To this end, polyclonal antibodies were successfully used in DAS-ELISA against CPsV (Garcia *et al.*, 1997).

Monoclonal antibodies produced by the University of Bari (Djelouah *et al*., 2000) were distributed as a kit from Agritest, Italy (Potere *et al*., 1999). This kit was supplied through MNCC co-ordination for evaluating its efficiency in the serological detection of CPsV in the network member countries. In this paper, the application of ELISA test in trees showing psorosis-like symptoms in the Eastern Mediterranean Region is reported.

MATERIALS AND METHODS

Spring flush growths from trees showing psorosis-like symptoms (bark scaling, mottling, etc.) were collected considering the 4 different orientations. A number of plants belonging to 5 different species

of citrus were sampled and DAS-ELISA procedure was followed for each step as recommended by the manufacturer.

Samples were collected twice, in June and September, respectively, in order to check the efficiency of the kit with respect to the temperature effect. The results were evaluated by reading the absorbance values for each sample in duplicate wells of the plate.

RESULTS AND DISCUSSION

Positive results were recorded in both tests (Table 1). However, a higher number of infected plants were detected in the samples taken in September. From the samples of June, a total of 7 positive results were obtained concerning 3 Navels, 3 Valencias and 1 lemon (Kütdiken). The tests readings were twice higher than the negative controls. Trees showing typical symptoms of psorosis did not give even a low reaction in readings of June, since they were recognised as positive in the second test. As it is shown in table 1, the second test gave twice more positive responses to CPsV.

Although for the samples collected in June, the reading missed most positives, they were still detectable in lower numbers. However, it is advisable to test samples from the fall flushes for a more complete detection so as to read a higher number of positive results compared to the negative ones. Trees which resulted ELISA-negative should be biological indexed to confirm the absence of infection, even if showing psorosis-like symptoms in the field. This in order to exclude the presence of psorosis virus in trees infected by other agents (i.e. concave gum, cristacortis, infectious variegation)

Table 1. Results of CPsV detection using ELISA kit of Agritest, Italy

Species	N. samples		N. infected		Infection rate (%)	
	June	*Sept.*	*June*	*Sept.*	*June*	*Sept.*
Orange						
Navel	13	6	3	6	23	100
Shamouti	5	4	0	0	0	0
Valencia	6	7	3	5	50	71,4
Hamlin	0	1	0	0	0	0
Lime						
Mexican	0	3	0	0	0	0
Grapefruit						
Star ruby	2	7	0	2	0	28,5
Lemon						
Kütdiken	8	5	1	1	12,5	20
Interdonato	1	1	0	0	0	0
Tangelo						
Minneola	2	2	0	0	0	0
TOTAL	**37**	**36**	**7**	**14**	**18,9**	**38,9**

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