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ELISA DETECTION OF CITRUS INFECTIOUS VARIEGATION VIRUS (CVV) IN THE EASTERN MEDITERRANEAN REGION OF TURKEY

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SUMMARY - A field survey was conducted in different citrus growing areas of Turkey for the detection of CVV using the ELISA kit from UCP, Morocco. Results of biological indexing and of field symptoms do not correlate with those of serological detection. The low virus titre or possible degradation in the plant tissues could be the reason.

Key words: Citrus, citrus infectious variegation virus, ELISA, Turkey

RESUME *- Une enquête a été réalisée dans différentes zones agrumicoles de la Turquie, afin de détecter le CVV à travers l'utilisation d'un Kit ELISA fourni par l'UCP Maroc. Les résultats de l'indexage biologique et des symptômes au champ ne sont pas corrélés avec ceux de l'indexage biologique. La basse concentration du virus ou la possible dégradation pourrait en être la raison.*

Mots-clés*: Agrumes, Virus de la panachure infectieuse des agrumes, ELISA, Turquie*

INTRODUCTION

The disease called citrus infectious variegation was probably the first virus disease which has been mechanically transmitted from citrus to citrus and to herbaceous hosts (Trabut, 1913; Fawcett, 1936).

It has been reported from Australia, USA and the Mediterranean countries (Roistacher, 1991). Citrus infectious variegation ilarvirus (CVV) has spherical particles, variable in size. It is serologically related to other ilaviruses: citrus leaf rugose, asparagus viruses II-P and II-S, elm mottle virus and tulare apple mosaic virus (Uyeda & Mink, 1983). Typical symptoms of the virus infection is leaf chlorotic mottling and puckering in Eureka lemon, Etrog citron and grapefruit. Leaf distortion, epinasty, chlorotic mottle and leaf pattern can easily be observed in lemon, sweet and sour oranges. In the herbaceous hosts, necrotic and chlorotic spots are observed; in cowpea, spots can also be reddish; systemic reaction, vein clearing and yellow vein banding appear on red kidney bean 10-20 days after inoculation (Roistacher, 1991).

MATERIALS AND METHODS

A total of 54 samples were tested in the region from the province of Içel (Badras, Bekirde, Yenice, Tarsus, Çeşmeli, Huzurkent, Adanalioğlu, Ataş) and Hatay (Dörtyol). Field samples were collected from the young spring flush growth, following 4 different directions of a tree. Several citrus varieties of lemon (Kütdiken, Interdonato), orange (Washington navel, Jaffa), clementine and grapefruit (Star Ruby, Marsh Seedless), showing the typical symptoms of leaf curling, were sampled. Herbaceous indicators (i.e. *Vigna unguiculata*, *Petunia hybrida*, *Chenopodium quinoa, Phaseolus vulgaris cv.* Red Kidney), grown in the plant virology greenhouse, were used in the test (Roistacher, 1991). Those indicators were inoculated with the field samples which were suspected to be infected with either CVV or crinkly leaf.

ELISA procedure was applied as described for CVV by Davino *et al*. (1984). The kit was kindly supplied by the “Direction des Domaines Agricoles, Unité de Contrôle des Plants-UCP,” Rabat, Morocco and each sample was tested in duplicate wells.

RESULTS AND CONCLUSION

As reported in table 1, 14 out of 54 tested plants were ELISA-positive (26%) as follows: 5 Kütdiken lemons, 5 Minneola tangelos, 2 sour orange woody indicators and 2 herbaceous indicators (*P. hybrida* and *C. quinoa)*. Samples were considered positive when readings were twice more than the healthy control. Nevertheless, no correlation was observed between ELISA results and field symptoms.

These results can be apparently attributed to different factors (warm temperatures during sampling, young flushes used as samples, the low virus titer etc.). It is well known that CVV-like symptoms may also be induced by other pathogens (Roistacher, 1995), in particular the agent of the Citrus chlorotic dwarf disease which is widespread in this country.

Table 1. Results of CVV detection by DAS-ELISA in suspected trees

Location	Suspected plants N.	ELISA positive plants N.
Yenice, Içel	6	0
Çeşmeli, Içel	5	3
Badras, Içel	3	1
Bekirde, Içel	8	1
Ataş, Içel	6	0
Adanalioğlu, Içel	3	0
Tarsus, Içel	3	0
Huzurkent, Içel	5	5
Dörtyol, Hatay	1	0
Herbaceous indicators	4	2
Woody indicators	10	2
Total	**54**	**14 (26%)**

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