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in

Martelli G.P. (ed.), D'Onghia A.M. (ed.).
Proceedings of the Mediterranean network on certification of citrus. 1995-1997

Bari : CIHEAM

Options Méditerranéennes : Série B. Etudes et Recherches; n. 21

1998

pages 126-128

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=99001649>

To cite this article / Pour citer cet article

Stamo B., D'Onghia A.M. **Detection of CTV in a citrus collection of Albania by immunoprinting.**
In : Martelli G.P. (ed.), D'Onghia A.M. (ed.). *Proceedings of the Mediterranean network on certification of citrus. 1995-1997.* Bari : CIHEAM, 1998. p. 126-128 (Options Méditerranéennes : Série B. Etudes et Recherches; n. 21)



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Detection of CTV in a citrus collection of Albania by immunoprinting

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SUMMARY – A survey was carried out using immunoprinting for the detection of citrus tristeza virus (CTV) in a varietal collection of the Institute of Pomology, Vlora. Seven out of 62 samples were CTV-infected. This is the first record of CTV in Albania.

Key words: citrus, citrus tristeza closterovirus, immunoprinting, Albania

RESUME –L' étude a été conduite en utilisant la technique direct immunoprinting-ELISA pour la détection du CTV dans une collection variétale à l'Institut de Pomologie de Vlora. Sept échantillons sur 62 étaient infectés.Ce travail a permis d'évaluer, pour la première fois l'état sanitaire des agrumes en Albanie et de signaler la présence du CTV.

Mots-clés: agrumes, tristeza des agrumes, closterovirus, immunoprinting, Albanie

Introduction

In Albania there is an increasing demand of citrus propagation material of known sanitary status for the establishment of new orchards.

The varietal collection of the Pomology Institute of Vlora represents the main source of propagative budwood of the country. This collection comprises the main native and international citrus varieties of sweet orange, clementine, mandarin, lemon and other citrus species.

In order to guarantee the distribution of budwood with an acceptable sanitary status and depured from dangerous pathogens as, for example, citrus tristeza virus (CTV), the assessment of the sanitary conditions was urgently needed. This task was therefore carried out in the framework of the Mediterranean Network on Certification of Citrus of IAM-B.

Materials and methods

In autumn 1997 samples were collected from 62 trees of different age and species (Table 1) all grafted onto sour orange rootstocks.

Direct immunoprinting-ELISA for CTV detection was carried out, as described by Garnsey *et al.*, (1993), using a commercial kit (Plant Print-Spain). Tissue blots were prepared by cutting tender shoots, leaves, pedicles and fruit peduncles and pressing the freshly exposed surface on the nitrocellulose membrane.

Blotted membranes were allowed to dry for 30-60 min., then incubated for 1h at room temperature, in a 1% solution of bovine serum albumine to block remaining protein binding sites. After washing, the blotted membranes were exposed to CTV-specific monoclonal antibodies linked with alkaline phosphatase in 10 ml of buffered saline.

The membranes were stained by dissolving one tablet of BCIP-NBT Sigma Fast in 10 ml distilled water and incubating until the appearance of purple violet colour in the positive control. The reaction was stopped by washing the membrane with water and, after drying, the reading was made by using a magnification lens.

Results and conclusions

Although none of the tested trees showed clear-cut symptoms, 7 out of 62 were CTV-infected, represented by W. navel orange (1), Satsuma mandarin (1), Meyer lemon (3), Diamante citron (2) (Table 1).

All tissues from infected trees used for blotting reacted positively, but the clearest reactions were obtained with young shoots.

This is the first record of CTV in Albania. The presence of such a threatening virus is alarming and urgent measures are to be implemented for the elimination of the sources of inoculum. This can only be achieved by establishment of a programme for removal of infected trees (eradication) and certification of propagating material (Roistacher, 1993).

Table 1 – CTV infected trees in the varietal collection

Species/ Cultivar	Inspected trees	
	Tested	Infected
Commercial varieties		
Sweet orange (<i>Citrus sinensis</i>)		
Tarocco	3	
Washington navel	3	1
Ovale calabrese	3	
Jaffa	2	
Local cvs: Thin-rinded	2	
Thick-rinded	2	
Pandalimon	1	
Mandarin (<i>C. reticulata</i>)	2	
Clementine (<i>C. reticulata</i>)	2	
Satsuma (<i>C. unshiu</i>)	4	1
Lemon (<i>C. limon</i>)		
Meyer	5	3
Eureka	1	
Femminello	1	
S. Teresa	2	
Interdonato	1	
Local cvs: Gaxhgau	2	
Babaliu	1	
Nelkamarian	2	
Citron (<i>C. medica</i>)		
Diamante	3	2
Borshi	2	
Lime (<i>C. limettioides</i>)		
Israeli	1	
Kumquat (<i>Fortunella margarita</i>)	1	
Rootstocks		
Trifoliolate orange(<i>Poncirus trifoliata</i>)	4	
Citrange carrizo (<i>P. trifoliata</i> x <i>C. sinensis</i>)	3	
Citrange troyer	2	
<i>Mandarin cleopatra</i> (<i>C. reshni</i>)	1	
Citrumelo (<i>C. sinensis</i> x <i>C. paradisi</i>)	2	
Rubidoux	2	
Israeli hybrids	2	
Total trees	62	9

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