HAL
open science

Resistance sources against a new an old world begomoviruses associated with epidemic diseases in curcubit crops

Gustavo Romay, Cecile Desbiez, Catherine Wipf-Scheibel, Pauline Millot, Michel Pitrat, Hervé Lecoq

To cite this version:

Gustavo Romay, Cecile Desbiez, Catherine Wipf-Scheibel, Pauline Millot, Michel Pitrat, et al.. Resistance sources against a new an old world begomoviruses associated with epidemic diseases in curcubit crops. 13. International plant virus epidemiology symposium, Jun 2016, Avignon, France. , 165 p., 2016, "Building bridges between disciplines for sustainable management of plant virus diseases". IPVE 2016. Programme and abstracts. hal-02740930

HAL Id: hal-02740930

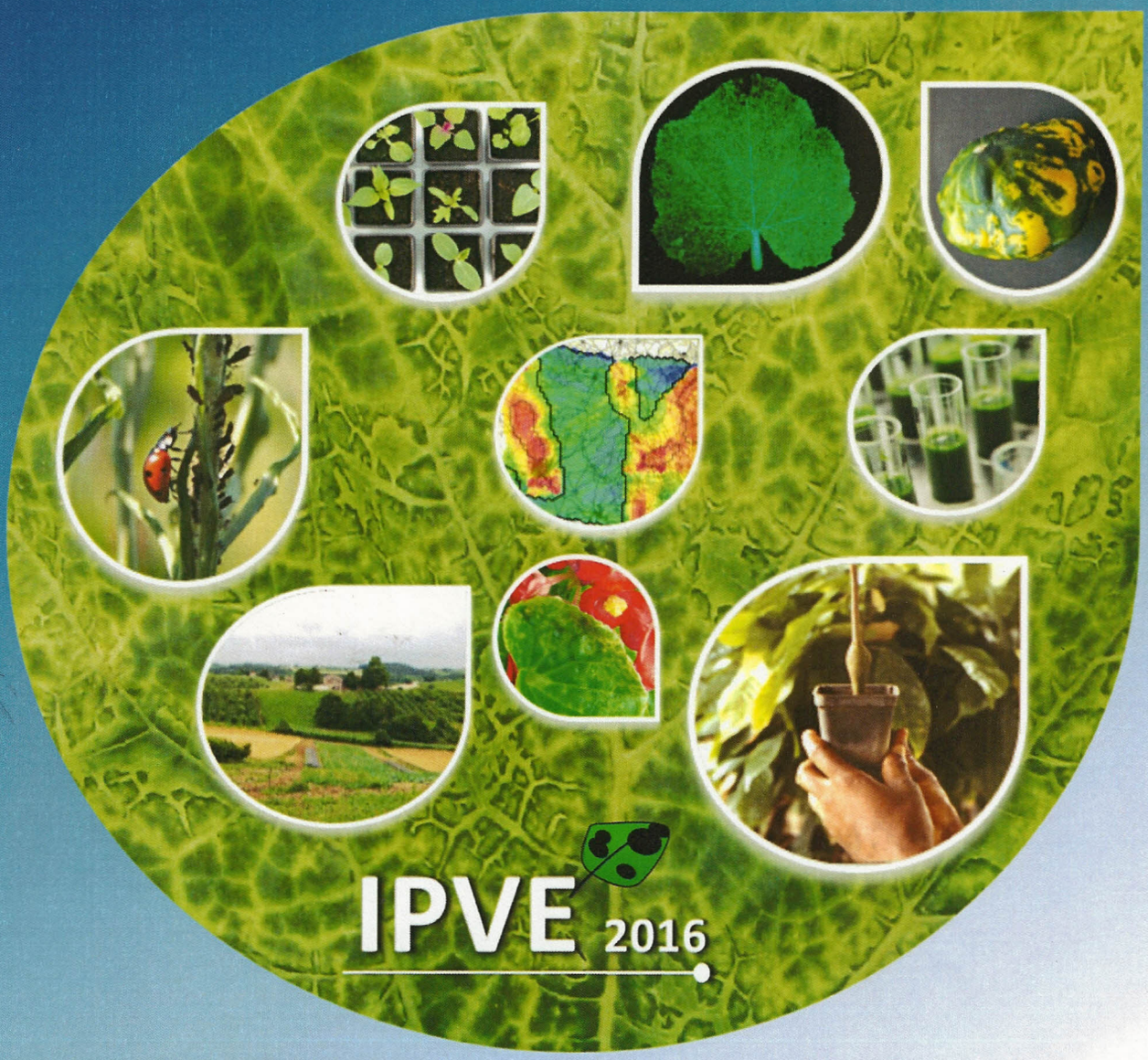
https://hal.inrae.fr/hal-02740930v1

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Building bridges between disciplines for sustainable management of plant virus diseases



13th International Plant Virus Epidemiology Symposium

6-10 june 2016, Avignon, FRANCE

Programme and Abstracts

RESISTANCE SOURCES AGAINST A NEW AN OLD WORLD BEGOMOVIRUSES ASSOCIATED WITH EPIDEMIC DISEASES IN CUCURBIT CROPS

Romay, G. (1), Desbiez, C. (2), C. Wipf-Scheibel, P. Millot, (2), Pitrat, M. (3) and Lecoq, H. (2).

1 Université catholique de Louvain, Earth and Life Institute, Phytopathology, Croix du Sud 2 Bte L07.05.03, 1348 Louvain-la-Neuve Belgium (gustavo.romay@uclouvain.be)
2 INRA, UR407 Unité de Pathologie Végétale, F-84140 Montfavet, France
3 INRA, UR1052 Génétique et Amélioration des Fruits et Légumes. F-84140 Montfavet, France

BACKGROUND and OBJECTIVES

The cucurbits include several important vegetables to human consumption which are threatened for epidemic diseases such as those caused by begomoviruses. The Old World begomovirus *Tomato leaf curl New Delhi virus* (ToLCNDV) was first described in India and is currently spreading in some Mediterranean countries (1, 2). Meanwhile, the New World begomovirus *Melon chlorotic mosaic virus* (MeCMV) has been only described in Venezuela (3). This work aims to evaluate melon lines in order to look for resistance sources against these viruses.

MATERIAL and METHODS

Thirty melon accessions were selected from a germplasm collection at National Institute for Agricultural Research (Avignon, France). The majority of the selected accessions have been previously found to be resistant or tolerant to at least one plant pathogen. An infectious clone of MeCMV, previously developed (2), and another of ToLCNDV, developed in this work, were biolistically inoculated onto plantlets of melon cv. Védrantais. Infectivity of clones was confirmed by symptom observation and PCR with specific primers at 30 days post inoculation (dpi). Subsequently, sap inoculation assays for both begomoviruses were performed onto the 30 melon accessions. In addition, the accession IC-274014 was selected for further inheritance studies of resistance factors against both begomovirus.

RESULTS

Infectivity of the clones was confirmed in susceptible melon cv. Védrantais. The majority of the 30 melon accessions were susceptible to both begomoviruses. Accessions IC-274014, PI 124112, PI 282448, WM7 and WM9 did not exhibit clear symptoms of either ToLCNDV or MeCMV. Accession IC-274014 was selected for inheritance studies of resistance factors. Thus a F1 generation obtained from parents IC-274014 and Védrantais was challenged to viral sap inoculations. The F1 generation exhibited intermediate resistance involving systemic chlorotic spots, however, the size of plants was similar to the resistant parent at 45 dpi.

CONCLUSIONS

In this work five potential sources of tolerant/resistance to MeCMV and ToLCNDV were identified, of which IC-274014 accession showed the best performance. Furthermore, intermediated resistance displays by F1 generation of IC-274014 and Védrantais suggests at least to one recessive gene according to the absence or presence of viruses evaluated in this work. Overall, our results provide evidences of an interesting resistance source against two genetically distant begomoviruses.

REFERENCES

1) Juarez, M., Tovar, R., Fiallo-Olivé, E., Aranda, M.A., Gosalvez, B., Castillo, P., Moriones, E., Navas-Castillo, J. 2014. Plant Dis. 98:857-857
2) Mnari-Hattab, M., Zammouri, S., Belkadhi, M.S., Doña, D.B., Ben Nahia, E., Hajlaoui, M.R., 2015. New Dis. Rep. 31, 21.
3) Romay, G., Lecoq, H., Desbiez, C., 2015. Plant Pathol. 64:1224-1234.