



HAL
open science

New species in the papaya ringspot virus cluster: insights into the evolution of the PRSV lineage

Cecile Desbiez, Gustavo Romy, Pauline Millot, Catherine Wipf-Scheibel,
Gasim Dafalla, Hervé Lecoq

► **To cite this version:**

Cecile Desbiez, Gustavo Romy, Pauline Millot, Catherine Wipf-Scheibel, Gasim Dafalla, et al.. New species in the papaya ringspot virus cluster: insights into the evolution of the PRSV lineage. 16. Rencontres de Virologie Végétale (RVV 2017), Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD). FRA., Jan 2017, Aussois, France. 137 p. hal-01605294

HAL Id: hal-01605294

<https://hal.science/hal-01605294>

Submitted on 2 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.



Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

New species in the *papaya ringspot virus* cluster: insights into the evolution of the PRSV lineage

C. Desbiez¹, G. Romay², P. Millot¹, C. Wipf-Scheibel¹, G. Dafalla³, H. Lecoq¹

¹ Inra, UR0407 Pathologie Végétale, 84140 Montfavet, France

² Université catholique de Louvain, Earth and Life Institute, Phytopathology, Croix du Sud 2 Bte L07.05.03, 1348 Louvain-la-Neuve, Belgium

³ Plant Pathology Center, University of Gezira, Wad Medani, Sudan

More than 70 viruses infect cucurbits worldwide. Among the most common and agronomically important are several potyviruses: *zucchini yellow mosaic virus* (ZYMV), *watermelon mosaic virus* (WMV) and *papaya ringspot virus* (PRSV). Besides these viruses that have a worldwide distribution and present distinct biological, serological and molecular features, several viruses closely related to PRSV that could constitute highly divergent strains of this virus or related species have been defined, and could represent new threats for agriculture.

Biological, serological and molecular studies, as well as analysis of database sequences, were performed in order to characterize the different species in the PRSV cluster and study their geographic distribution and population structure (1,2). Isolates from worldwide origins were tested serologically (DAS-ELISA) or molecularly (RT-PCR with specific or generic primers) for the presence of the different viruses.

Based on their molecular properties, at least 10 distinct species exist in the "PRSV cluster" (3). Their geographic range, field prevalence and agronomic impacts are highly contrasted: PRSV and to a lesser extent *zucchini tigre mosaic virus* (ZTMV) have a worldwide distribution, *Moroccan watermelon mosaic virus* (MWMV) is widespread in Africa and emerging in the Mediterranean Basin but not reported elsewhere, while the other viruses appear endemic to one country even though they can be maintained locally over several decades. The geographic structure and molecular diversity patterns of the putative and acknowledged species suggest that the PRSV-like cluster originated in the Old World, with an important diversification in Africa.

The number of different potyviruses in the "PRSV cluster" is probably still underestimated. Excepting PRSV and to a lower extent ZTMV and MWMV, species in the "PRSV-cluster" seem to have a narrow geographic range and low epidemiological impact so far. At least two species appear endemic to Sudan, with contrasted frequencies. These results show that currently unimportant viruses may emerge if the local conditions change or if they are introduced in a more favourable environment.

Références :

- [1] Quiot-Douine, L., Lecoq, H., Quiot, J.-B., Pitrat, M. and Labonne, G. (1990) Serological and biological variability of virus isolates related to strains of *papaya ringspot virus*. *Phytopathology*, 80, 256-263.
- [2] Lecoq, H., Dafalla, G., Desbiez, C., Wipf-Scheibel, C., Delecalle, B., Lanina, T., Ullah, Z. and Grumet, R. (2001) Biological and molecular characterization of *Moroccan watermelon mosaic virus* and a potyvirus isolate from Eastern Sudan. *Plant Disease*, 85, 547-552.
- [3] Romay, G., Lecoq, H. and Desbiez, C. (2014) *Zucchini tigré mosaic virus* is a distinct species into the *papaya ringspot virus* cluster: Molecular and biological insights. *Archives of Virology*, 159, 277-289.



16^{èmes} Rencontres de
Virologie Végétale

15 - 19 JANVIER 2017 • AUSSOIS - FRANCE



Aussois
du 15 au 19 janvier 2017