



HAL
open science

A PLANT-SPECIFIC HOMOLOG OF DP1/YOP1 FAMILY PROTEINS PLAYS A PROVIRAL ROLE IN POTYVIRUS INFECTION

Sylvie German-Retana, Luc Sofer, Vincent Simon, Jean-luc Gallois, Amandine Bordat, Nathalie Arvy, Mamoudou Diop, Jens Tilsner

► **To cite this version:**

Sylvie German-Retana, Luc Sofer, Vincent Simon, Jean-luc Gallois, Amandine Bordat, et al.. A PLANT-SPECIFIC HOMOLOG OF DP1/YOP1 FAMILY PROTEINS PLAYS A PROVIRAL ROLE IN POTYVIRUS INFECTION. 12th INTERNATIONAL CONGRESS OF PLANT PATHOLOGY, Aug 2023, Lyon, France. hal-04648035

HAL Id: hal-04648035

<https://hal.inrae.fr/hal-04648035v1>

Submitted on 15 Jul 2024

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.

Reference: A41633MX

Category: 06.13 - MOLECULAR ASPECTS: plant-virus interactions

Author contact: XUE Mingshuo (mingshuo.xue@inrae.fr)

Passage preference: Oral communication

A PLANT-SPECIFIC HOMOLOG OF DP1/YOP1 FAMILY PROTEINS PLAYS A PROVIRAL ROLE IN POTYVIRUS INFECTION

XUE M. (1), SOFER L. (1), SIMON V. (1), ARVY N. (1), BORDAT A. (1), LION R. (1), DIOP M. (2), GALLOIS J. (2), TILSNER J. (3,4), GERMAN-RETANA S. (1)

(1) UMR 1332, Biologie du Fruit et Pathologie, INRAE, Univ. Bordeaux, Equipe de Virologie, Villenave-d'Ornon, FRANCE; (2) UR 1052, Génétique et Amélioration des Fruits et Légumes (GAFL), INRAE, Montfavet, FRANCE; (3) Cell and Molecular Sciences, James Hutton Institute, Dundee, UNITED KINGDOM; (4) Biomedical Sciences Research Complex, University of St Andrews, St Andrews, UNITED KINGDOM

Text

The *Potyvirus* genus is one of the largest genera of plant RNA viruses responsible for serious diseases in crops worldwide. As potyviruses hijack the host secretory pathway and plasmodesmata (PD) for their transport, the goal of this study was to identify membrane and/or PD-proteins that interact with the 6K2 protein, a potyviral protein involved in replication and cell-to-cell movement of turnip mosaic virus (TuMV). Using Split-ubiquitin membrane Y2H assays we screened an Arabidopsis cDNA library for interactors of TuMV-6K2. We isolated AtHVA22a (*Hordeum vulgare* abscisic acid responsive gene 22) that belongs to a multigenic family of proteins homologous to DP1/Yop1 family proteins in yeast and interactors of reticulons. The role of HVA22 proteins in plants are not well-known, except the role in blast disease resistance in rice. Interestingly, proteomics analysis of PD fractions showed that AtHVA22a is highly enriched in Arabidopsis plasmodesmata proteome. We confirmed the interaction between 6K2 and AtHVA22a in yeast, as well as *in planta* by using bimolecular fluorescence complementation (BiFC) and showed that the interaction occurs at the level of the viral replication complexes (VRC) during TuMV infection. Finally, we showed that the propagation of TuMV in plants is increased when AtHVA22a is overexpressed but slowed down upon mutation of AtHVA22a by CRISPR-Cas9. Altogether, our results indicate that AtHVA22a plays an agonistic effect on TuMV propagation.