HAL open science

Interaction of phloem proteins and viral factors involved in virus long distance movement in the plant

Caren Dayana Rodriguez Medina, Sophie Chapuis, Luc L. Sofer, Frederic Revers, Véronique Ziegler-Graff, Véronique Brault

To cite this version:

Caren Dayana Rodriguez Medina, Sophie Chapuis, Luc L. Sofer, Frederic Revers, Véronique Ziegler-Graff, et al.. Interaction of phloem proteins and viral factors involved in virus long distance movement in the plant. 13. Rencontres de virologie végétale, Jan 2011, Aussois, France. hal-02745883

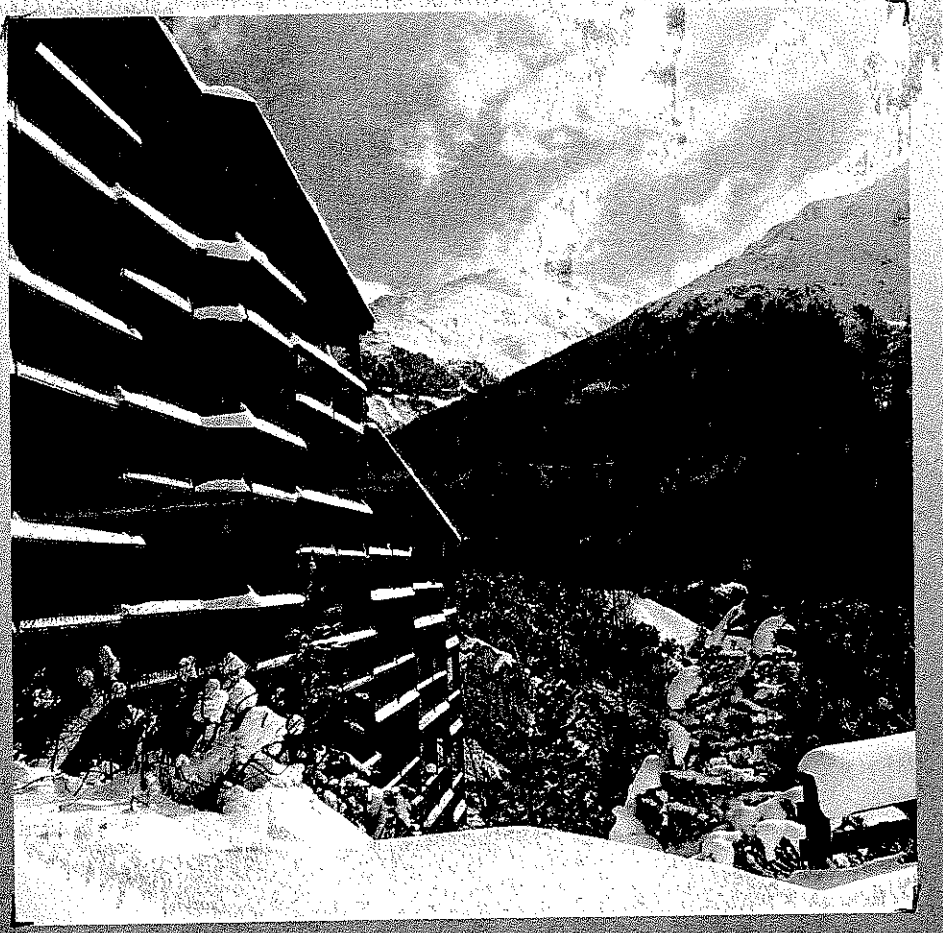
HAL Id: hal-02745883

https://hal.inrae.fr/hal-02745883v1

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.



Aussois du 16 au 20 janvier 2011

SFP
Société Française de Phytopathologie

INRA
Institut National de la Recherche Agronomique

19- Interaction of phloem proteins and viral factors involved in virus long distance movement in the plant

Caren RODRIGUEZ-MEDINA[1], Sophie CHAPUIS[2], Luc SOFER[3], Frédéric REVERS[3], Véronique ZIEGLER-GRAFF[2], Véronique BRAULT[1]

[1] UMR SVQV INRA-UDS, Virologie Vection, 28 rue de Herrlisheim, 68021 Colmar cedex, France
[2] Institut de Biologie Moléculaire des Plantes, Virologie Végétale, 12 rue du Général Zimmer, 67084 Strasbourg, France
[3] UMR GDPP INRA-UB2, Centre de Bordeaux, BP 81, 33883 Villenave d'Ornon cedex, France

Plant viruses exploit the long distance movement system of the plant to promote systemic infection. Compatible interactions between plant and viral factors are expected to occur during systemic movement of the virus. However, despite the importance of these interactions, present understanding of the plant and viral factors involved in long distance movement of the virus is limited. This project aims at the identification of phloem proteins that interact with viral factors involved in long distance movement of the virus in the plant. This project is conducted with a phloem-restricted virus belonging to the *Polerovirus* genus and a potyvirus which infect all cell types.

In order to study these interactions, a phloem specific cDNA library has been constructed from FACS-sorted fluorescent protoplasts prepared from transgenic *A. thaliana* expressing the GFP under the control of a companion cell (CC)-specific promoter. Enzymatic digestion conditions had first to be optimized to release the CC protoplasts. Hundred clones from the library were sequenced and the results showed a high representation in the library of genes involved in protein synthesis revealing the highly active state of CC. The phloem cDNA library was first screened by yeast two-hybrid system using the viral capsid proteins of *Turnip yellow virus* (TuYV, *Polerovirus*) as baits. TuYV form icosahedral virions which contain the major coat protein and a minor constituent or readthrough protein. Both structural proteins are required for TuYV long distance movement in the plant. The four candidates identified so far, a late embryogenesis protein, GAPDH3, Polyubiquitine 10 and a serine/threonine kinase all interact with the minor capsid protein. Screening of the cDNA library with the coat protein of *Lettuce mosaic virus* (LMV, *Potyvirus*) will be performed soon.