Detection and epidemiology of pospiviroids (DEP)

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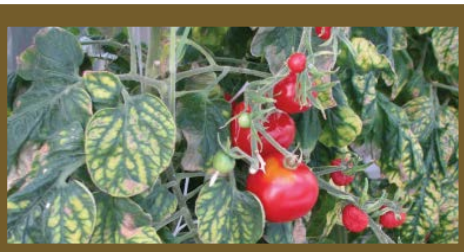


Funding

Virtual Common Pot via a competitive call. Each funder only pays for the participation of their own national researchers. Total funding: €325,000

Research consortium

Austria: AGES; Denmark: Aarhus University; France: INRA, LNPV; Germany: JKI; Netherlands: PPS; Slovenia: Agricultural Institute of Slovenia; United Kingdom: Fera

Goals

To provide new knowledge of the epidemiology and diagnosis of Potato spindle tuber viroid, Citrus exocortis viroid, Columnea latent viroid, Chrysanthemum stunt viroid, Tomato apical stunt viroid and Tomato chlorotic dwarf viroid, with major efforts targeting:

- The risk of transmission of pospiviroids from ornamental plants to crops of tomato and potato.
- Development and validation of diagnostic laboratory manuals for surveillance and seed-testing by national plant health authorities.

Contact information

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Objectives

- To survey for new natural hosts of the six pospiviroids and investigate host-pospiviroid interactions
- To investigate possible transmission pathways that might spread pospiroids from ornamentals to crops
- To develop and validate (ringtest) diagnostic RT-PCR- based assays for pospiviroids, and reliable assays for the detection of PSTVd in tomato seeds

Key outputs and results

- New plant hosts of pospiviroids were found
- Transmission of PSTVd within ornamentals and from ornamentals to tomato plants did not occur with western flower thrips, onion thrips, honeybees and bumblebees. PSTVd was effectively transmitted with viroid-infected plant sap on fingers and tools. Transmission of PSTV from ornamentals to tomato by insects is negligible while PSTV is easily transmitted mechanically
- The conventional PCR primers Pospi1 reliably detected PSTVd, TCDVd, CEVd, TASVd and CSVd; the Vid primers reliably detected PSTVd, TCDVd and CLV.
- A generic real-time PCR test for all six pospiviroids and specific real-time PCR tests for CEVd, CLVd and TASVd have been designed and shown to be reliable.
- PSTVd can be detected in tomato seeds by RT-PCR and real time RT-PCR. The experimental threshold detection is < 1:1000 infected/healthy seeds. Variable PSTVd concentrations in individual seeds and low percentages of seed infected in commercial production make it difficult to determine a definitive detection threshold and sample size.