

Plant Diagnostic Tests:

Agdia ImmunoStrips to test Dalmatian toadflax (*Linaria dalmatica* (L.) Miller) Susceptibility to Cucumber Mosaic Virus



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Purpose:

- To determine the susceptibility of Dalmatian toadflax to CMV
 - Infestations of Dalmatian toadflax may serve as a reservoir of CMV and may facilitate the aphid transmission of CMV to both agricultural crops and desirable native plants.
- To assess and improve our understanding of the types of environmental risks posed by this important, invasive weed by determining the CMV-reservoir capacity of Dalmatian toadflax.



Materials and Methods



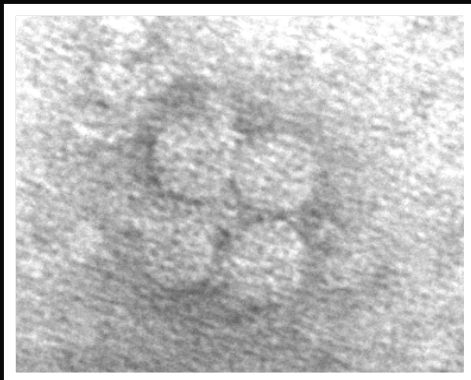
- Dalmatian toadflax seedlings were assigned to two treatments (18 replicates/treatment)
 - no inoculation with CMV (control)
 - inoculation with CMV (Fast New York strain).
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- Tobacco seedlings (*Nicotiana tabacum* L. cv. Havana 38) were assigned to three treatments (6 replicates/treatment)
 - No inoculation (negative control)
 - Inoculation without CMV (positive control)
 - Inoculation with CMV

Materials and Methods



- An inoculation buffer was prepared
- Plants mechanically inoculated by standard methods
- Tested for CMV using ELISA (Agdia ImmunoStrip™ for CMV, Agdia, Inc., Elkhart, IN).



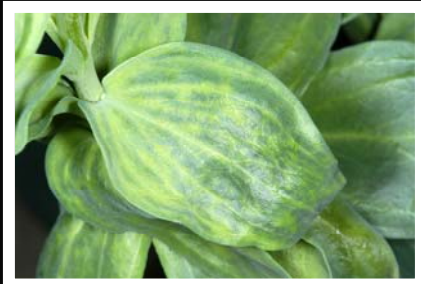
- Transmission electron microscopy was conducted using negatively stained (2% uranyl acetate in water) ground leaf tissue.

Results

- 10 of the 18 'CMV inoculated' Dalmatian toadflax plants tested positive for the virus
- 6 Dalmatian toadflax plants displayed systemic mosaic, chlorosis and leaf curling
- 5 of the 6 tobacco 'CMV inoculated' plants tested positive for the virus
- All control plants tested negative
- Spherical virus particles were observed with an average size of 26.93 ± 2.47 nm



Conclusions



- This is the first report of susceptibility of Dalmatian toadflax to CMV.
- Successful, easy use of immunoStrips
- Practical to field sampling



Future- Determining the presence of other viruses present in Dalmatian toadflax or other invasive weeds

Special Thanks To:

Dr. Sharlene E. Sing¹

Dr. William E. Grey²

Dr. Robert K. D. Peterson²

***Sue K. Brumfield²**

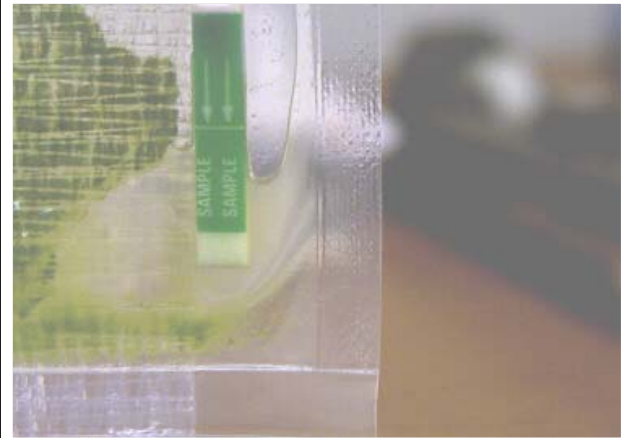
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- Recommended Tissue Size = 0.15 grams or a leaf area of 3 to 5 cm² (1 inch²).
 - **The ImmunoStrip will not perform properly if too much plant tissue is used**
- Place sample between mesh lining
- Rub bag to completely crush tissue
- One sample per bag



- Submerge strip ~ 0.5 cm (1/4 inch) into extract during test
 - May simultaneously test for other pathogens by inserting more strips.
- Control line will appear in 3-5 minutes
 - If control line does not appear- test is invalid
- If sample is positive, a test line will appear shortly after
- Maximum reaction occurs in 30 minutes
 - Strips should be removed

