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Serological Identification of Vegetable Viruses Derived from Guizhou Province of China

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Nine hundred and fifty-two symptomatic samples from 8 major vegetable planting counties in Guizhou provinces of China in 2013 and 2014 were detected six viruses by DAS-ELISA methods. The results showed that a kind of CMV、TMV、BBWV、CGMMV、TSMV and TuMV was detected in 273 samples at least. Among 6 viruses, CMV was the most commonly detected，being found in 16.49% of the samples, followed by other 5 viruses, in 2.63%、1.58%、0.53%、1.05% and 2.10%, respectively. It suggested that the major virus types infecting vegetables was CMV in Guizhou Province. According to the infection of a single virus, CMV was detected in all 11 vegetables. TuMV was found in eggplant, Chinese cabbage, radish and cabbage, and TSWV in pepper and tomato. There were 7 complex virus infections types, including CMV+TMV、CMV+TuMV、CMV+TSWV、CMV+BBWV、TMV+BBWV、 TuMV+BBWV and CMV+TuMV+BBWV. The positive rate of CMV+TMV was 1.05%, higher than others.

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Localization of EMARaV proteins by *in planta* agrobacterium-mediated transformation

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Introduction: Agrobacteria were used to express and localize the green fluorescent protein (gfp)-fused nucleocapsid and p4 protein of *European mountain ash ringspot-associated virus* (EMARaV) in planta. EMARaV infects European mountain ash (*S. aucuparia* L.) and causes chlorotic ringspots and mottling of leaves. The virus is suspected to influence the decline of branches and even the entire tree.
EMARaV is composed of four ss(-)RNA genome segments and is assigned to the genus *Emaravirus*. Each of the four viral RNAs is coding for one protein (p1-p4). Currently it is unknown, which function the RNA4 encoded p4 protein adopts in the infection process. For many plant viruses the existence of a gene silencing suppressor and a movement protein is essential. These functions could not be associated with the proteins encoded by RNA1-RNA3. It can be assumed that EMARaV RNA4 encodes a gene silencing suppressor and/or a movement protein.
Objective: Inferences about the function of the p4 protein of EMARaV are expected by investigating the localization of the protein *in planta*.
Materials and methods: For localization purposes the nucleocapsid protein (p3) and the p4 protein of EMARaV were C-terminal fused with gfp. Additionally, the movement protein of the *Tomato spotted wilt virus* (TSWV) was cloned as a reference for putative movement protein function of EMARaV p4. Agrobacteria were transformed with these gfp constructs and *Nicotiana benthamiana* leaves were subsequently agroinfiltrated. Confocal laser scanning microscopy was used for localization of viral proteins.
Results: The functionality of the gfp fusion constructs of EMARaV p3 and p4 protein, as well as TSWV NSm protein was proved by use of an anti-gfp antibody in western blot analysis of agroinfiltrated *N. benthamiana* leaf material. The localization of the viral proteins in epidermal cells of *N. benthamiana* leaves was possible. First results of this study will be presented and discussed.
Conclusion: Elucidation of the function of the p4 protein of EMARaV is of great importance for understanding infections of host plants and the virus replication. The localization of viral proteins provides preliminary information on the putative protein function. Further studies using specific cell compartment markers are necessary to prove the hypothesis whether the p4 protein functions as gene silencing suppressor and/or movement protein.