Oral presentation / phytopathology

Transcripts differentially expressed in silicon supplemented cucumber cultures and their potential role for *Cucumber mosaic virus* infection

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The uptake of Silicon (Si) by plants enables protection against various stresses. The plant available form, silicic acid [Si(OH)4], is taken up by the roots, transported to the leaves and finally deposited as silica gel in the space beneath the cuticle layer. To date, Si is seen as a "quasi-essential" element for plants. Beneficial effects are: 1) protection against abiotic and biotic stresses, 2) improvement of physical stability, 3) higher yield and/or 4) disease resistance. Therefore, routinely application of fertilizers supplemented with Si is performed. Besides the improved mechanical barrier and passive defence due to Si incorporation in cell walls, continuous Si uptake plays a substantial role for defence and consequently disease resistance. Many beneficial effects were shown for plants infected with biotrophic fungi. Up to now, the role of Si with regard to plant viruses is not clarified.

Cucumis sativus line B10 *in vitro* cultures were chosen to reveal genes altered due to Si supplementation followed by *Cucumber mosaic virus* (CMV; family: *Bromoviridae*) infection. Direct regeneration of cucumber clones was performed derived from leaf microexplants. The plants were cultivated on Murashige and Skoog medium. Si was supplemented as $Na_2(SiO_2)_xxH_2O$ and the medium for control plants contained NaCl in equal amounts. Six rooted plantlets, three control and three Si pretreated, were mechanically inoculated with CMV. 10 days post inoculation, pooled leaf and stem material from three non-infected and six CMV infected plants was taken. Total RNA was isolated followed by DNaseI treatment. Absence or presence of viral infection was analyzed by performing reverse transcription (RT)-polymerase chain reaction (PCR). Quantitative reverse transcription polymerase chain reaction (qRT-PCR) was performed on selected genes related to CMV infection.

Clonal plant material was successfully established and subsequently cultivated in regeneration medium. Experiments inducing CMV-infection were successfully applied in the *in vitro* cultures and RNA of control, CMV infected and Si pretreated and CMV infected plants was obtained. Removal of DNA was confirmed by performing qRT-PCR on an intronic sequence of the endogenous control. qRT-PCR performed on selected host genes involved in defence response (*WRKY* transcription factor), viral movement and replication (chaperones), resulted in both beneficial and disadvantageous gene shifts due to Si supplementation. Here, we provide a basis for the potential neutral effect of Si on transcript level, proven by qRT-PCR, in cucumber cultures with regard to a plant virus infection.