Geminiviruses constitute a group of plant viruses with circular, single-stranded DNA genomes packaged within geminiform particles that infect a wide range of plants. Among the Geminiviridae family, the genus Mastrevirus, Begomovirus and Curtovirus comprise most of the viral species capable to infect dicotyledonous plants. Monopartite begomoviruses and curtoviruses possess similar genome structures, encoding six and seven multifunctional proteins, respectively. In both cases, the virion strand encoded contains two open reading frames (ORFs) (V2 and coat protein, CP), and a third one (V3) is present only in curtovirus; four ORFs are present in the complementary strand (Rep, C2, C3 and C4).

In plants, RNA silencing is an important antiviral mechanism. All plant viruses examined to date encode at least one protein that suppresses antiviral silencing (VSR). Geminiviruses must confront both transcriptional (TGS) and Post-Transcriptional Gene Silencing (PTGS) to achieve successful infections. V2 from Old World begomoviruses has been described as a PTGS and TGS suppressor. Besides begomovirus V2 is also involved in viral movement, it is required for full infection and elicits hypersensitive response (HR)-like cell death when expressed from a Potato virus X (PVX)-derived vector. Less is known about the function of curtovirus V2. Although begomovirus and curtovirus V2 ORFs seem to be orthologous based on genome location and length, their homology at the protein level, which is highly conserved within each genus, is extremely poor.

MATERIALS AND METHODS

BCTV V2 is a local PTGS suppressor

BCTV V2 does not affect the RDR6 independent silencing of the endogenous SUL gene

BCTV V2 phenocopies rdr6 mutation in AMPlicon (AMP) and AMPxGFP lines.

RESULTS

CONCLUSIONS

BCTV V2 is a local PTGS suppressor

BCTV V2 does not affect the RDR6 independent silencing of the endogenous SUL gene

BCTV V2 phenocopies rdr6 mutation in AMPlicon (AMP) and AMPxGFP lines.

In spite of limited sequence homology, BCTV V2, as its begomovirus counterpart:
- is required for a systemic infection.
- is a strong suppressor of intracellular PTGS by impairing the RDR6/SGS3 pathway.
- does not impact local cell-to-cell silencing movement, but produces a delay in the spread of systemic silencing.

Study of the PTGS suppressor activity of V2 protein from geminivirus Beet curly top virus

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