

JOINT EVENT

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Velvet bean severe mosaic begomovirus DNA-A encoded RNA silencing suppressor proteins

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Geminiviruses (family Geminiviridae) are classified into nine genera and unassigned viruses on the basis of host range, insect vector and genome organization. These genera are: Becurtovirus, Begomovirus, Capulavirus, Curtovirus, Eragrovirus, Grablovirus, Mastrevirus, Topocovirus and Turncurtovirus. Begomoviruses are divided into two categories i.e. bipartite or monopartite (old world) bipartite (new world). Viruses have evolved to encode unique proteins to counter RNA silencing known as RNA silencing suppressors (RSS). Several begomovirus and their associated betasatellite-encoded viral proteins have been identified as RSSs. A large number of structural such as coat protein (CP) and non-structural viral proteins possessing suppressor activity have been involved in crucial viral functions, including viral movement, viral replication etc. *Mucuna pruriens* (L) DC (Velvet bean/“magic bean”) of family Fabaceae is used in Ayurvedic medicines for Parkinson’s disease, liver dysfunction, blood-related diseases, snake bite, endocrine and male reproductive disorders. Velvet bean severe mosaic virus (VbSMV) is a bipartite DNA virus infecting *Mucuna pruriens* (Velvet bean) belongs to the genus Begomovirus, family Geminiviridae. In this study VbSMV was identified from velvet bean. For the identification of suppressor proteins, primers were designed for all genes of VbSMV by adding appropriate site for restriction enzymes for inframe cloning in the vector. Out of the two assays reported for the identification of suppressor genes we used *Agrobacterium* co-infiltration assay. It was delineated that proteins encoded by VbSMV viz. AV2 (pre-coat protein), AC2 (TrAP), AV1 (coat protein) are suppressors of RNA silencing as identified through *Agrobacterium* co-infiltration assay using *Nicotiana benthamiana* as a host plant. AV2 showed strong suppressor activity whereas AC2 and AV1 were found to be weak suppressors. This is the first report on identification of suppressor of RNA silencing encoded by VbSMV infecting a medicinal plant. Identified suppressor proteins are being used to develop virus resistant transgenic plants and understanding RNA silencing pathway.

Biography

Research interests of Narayan Rishi are: (i) Developed DAC&DAS-ELISA based detection of citrus yellow mosaic Badnavirus using expressed recombinant VAP; (ii) Identified strains of PVS&PVY inducing partial resistance to potato late & early blight; (iii) Genetic variability in cotton leaf curl begomovirus (CLCuV), cloning & sequencing of coat protein & movement genes of CLCuV; (iv) Developed CLCuV resistant GM cotton the first in world; (v) Sequencing and diversity in DNA β associated with monopartite begomoviruses; (vi) First report of association of *Mycoplasma* (Phytoplasma) with grassy shoot disease of sugarcane; (vii) First report of identification of strains A&F of sugar cane mosaic virus (SCMV) in India; (viii) Purification of SCMV & raising high titer antisera that was used in ELISA and other serological tests in India. President, Indian Virological Society; Member ICTV and IUMS; Member Quinquennial Review Team, Indian Council of Agricultural Research; Awarded Prof SN Das Gupta- and Prof MV Naydu- Memorial Lectures and Prof Kameshwar Sahai Bhargava Oration Awards.

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