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**New motifs within the NB-ARC domain of R proteins: probable mechanisms of integration of geminiviral signatures within the host species of fabaceae family and implications in conferring disease resistance.** (English) [Zbl 1451.92244](#)

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**Summary:** The gemini viruses are a group of plant infectious agents, of which mungbean yellow mosaic India virus (*MYMIV*) belongs to the bipartite subgroup of gemini virus and causes serious yield penalty in the leguminous group of plants. In this investigation we have isolated two resistant gene homologues (RGHs; AY301990, AY301991) from two *MYMIV*-resistant lines of *Vigna mungo* and *V. radiata* that have high homology with a *MYMIV*-resistant linked marker, VMYR1 (AY 297425). These three resistance factors also have similarity with 221 reported *R* gene/RGH sequences in the NB-ARC domain of the family fabaceae. NB-ARC domain is an ancient, highly conserved domain of a class of plant disease resistance genes/proteins. Out of 221 *in silico* translated protein sequences, multialignment of 188 sequences without large insertion or truncation, unlike that of the rest 33, illustrated presence of both TIR and non-TIR subfamilies of NB-ARC domain. A critical analysis of these sequences revealed eight new conserved motifs, in addition to the reported conserved motifs within the NB-ARC domains, which are hitherto not reported. Further analysis of these eight motifs with the aid of PRINTS and PROSITE databases revealed signatures of geminiviral coat protein (GVCP) within the favoured allele, *R* gene or RGHs. GVCP signatures are absent within the NB-ARC domain of three species of *Medicago*, which are non-host to gemini virus. These observations tempted us to predict probable mechanism of integration of GVCP within the plant *R* gene/RGHs and their implications in conferring geminiviral disease resistance to the host plants. Our conjecture is that these signatures were integrated during plant pathogen interaction and are being maintained within this conserved domain through active selection of the favoured allele. We comprehensively addressed the biological significance of GVCP signatures, which probably provides additional defense against gemini viruses through degradation of homologous transcript of the virus.

**MSC:**

92D20 Protein sequences, DNA sequences

92C80 Plant biology

**Keywords:**

fabaceae; disease resistance; gemini virus; NB-ARC domain; mungbean yellow mosaic India virus

**Software:**

BLAST ; PROSITE; PSI-BLAST; ClustalW

**Full Text:** [DOI](#)

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