

Variation in DNA methylation patterns of *Phaseolus* bean interspecific hybrids leads to abnormal embryo and plant development

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Abstract

Use of interspecific crosses in breeding is an important strategy to enlarge the gene pool of the common bean, *Phaseolus vulgaris* L. and to improve its cultivars. Interspecific crosses with a donor species *P. coccineus* have been attempted and in some combinations lead to abortion of immature embryos, usually at the globular or early heart-shaped developmental stages, with most embryos aborting 3-8 days after pollination. The causes of early abortion in interspecific hybrids have been studied and abortive embryos have been histologically characterized. However, little is known about the genomic changes that may occur in the hybrid nucleus owing to the combinations of different parental genomes. We have observed novel Methylation-Sensitive Amplification Polymorphism (MSAP) bands in *Phaseolus coccineus* X *Phaseolus vulgaris* and their reciprocal crosses. Of 390 MSAP fragments analyzed, 168 (43%) showed methylation patterns that differed between the parental species and the hybrids. Variation patterns among interspecific hybrids and parental plants suggest that some methylation changes occurred at random. Our results showed that the interspecific hybrids present new MSAP fragments and changes in the methylation pattern. However, it is possible that these newly generated bands might be derived from altered parental bands arising from epigenetic modification such as cytosine methylation induced by interspecific hybridization.