Research Notes : India : Induced parthenogenesis in soybean

Shashi K. Banga  
Punjab Agricultural University

Surinder S. Banga  
Punjab Agricultural University

Manoj Srivastava  
Punjab Agricultural University

Follow this and additional works at: http://lib.dr.iastate.edu/soybeangenetics

Part of the Agriculture Commons, Agronomy and Crop Sciences Commons, and the Plant Breeding and Genetics Commons

Recommended Citation
Available at: http://lib.dr.iastate.edu/soybeangenetics/vol11/iss1/17

This Article is brought to you for free and open access by the Journals at Iowa State University Digital Repository. It has been accepted for inclusion in Soybean Genetics Newsletter by an authorized editor of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
1) Induced parthenogenesis in soybean.

A field of research currently gaining much interest is the irradiated-pollen-induced ovule transformation in plants. The interest lies mainly in the possibility of modifying the plant genome in a quicker and more economical way. The successful demonstration of such gene transfers have been achieved in Nicotiana (Pandey, 1975; Jinks et al., 1981), Brassica (Banga et al., 1983) and Lycopersicum (Zamir, 1983) for both qualitative and metric traits. This technique is based on the resistance of pollen-grain function to ionizing radiation damage. Heavily irradiated (>100 Krad) are still able to germinate, grow down the style, and effect pseudofertilization leading to haploid or diploid parthenogenesis. The pollen tubes deliver their fragmented DNA to the embryo sacs. The DNA fragments delivered in this manner can be incorporated in the egg nucleus (Pandey, 1980).

Two different strains of soybean (Glycine max [L.] Merr.) with the homozygous genotype, one for white flower (M-4) and another for violet flower (M-9), were utilized in this study. The pollen from M-9 was irradiated with 0, 35, and 50 Krad of gamma rays and used to pollinate flowers of M-4. Controlled emasculations without pollination failed to set any seed, overruling the theory of spontaneous parthenogenesis. Seed set was very small (<2%) for 50 Krad dose, while it was up to 5% for 35 Krad. Mostly small and shrivelled seeds were obtained. It is suspected that, at higher dose (50 Krad), the majority of seed set were haploids. Preliminary studies indicate them to be parthenogenates. Detailed investigations are underway to demonstrate the transfer of paternal characters in a largely maternal background.

References


Shashi K. Banga
Surinder S. Banga
Manoj Srivastava