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Strategies for haploid plant production: Experiences from sunflower

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Haploid plants that inherit chromosomes from only one parent significantly facilitate the search and selection of favorable genes and the development of breeding genotypes. Haploidization techniques facilitate the production of pure lines from heterozygous plants in a single generation and represent significant advantages for plant breeders. Haploids can be induced by in vivo or *in vitro* methods. The *in vitro* methods that have been developed to induce embryogenesis are androgenesis, gynogenesis including parthenogenesis induced primarily by pollination with irradiated pollen followed by embryo rescue. Cultivated sunflower is a globally important oilseed, food, and ornamental crop. The main objective of the study on the production of haploid sunflower plants is to accelerate breeding programs through the use of homozygous broomrape and herbicide-resistant double haploid lines. The influence of pollen irradiation on the production of *in vitro* haploid plants from *in situ* induced haploid embryos was investigated in sunflower. Immature flower buds of the ovule donors were emasculated prior to anthesis and were bagged to avoid unwanted outcrossing. Pollinations were carried out on field plants, bagged before anthesis. For pollen inactivation were applied the gamma 60Co irradiation doses: 500 Gy, 1000 Gy and 1500 Gy. Irradiated pollens were used for pollinating the flower buds of the ovule donor. 14-16 days after pollination, immature embryos were observed on binocular microscope for detecting the embryo stage and then transferred to four different MS medium without any plant growth regulators to facilitate the maturation and development of plants. Concerning the number of embryos formed were obtained in pollen inactivation with doses 750 and1000 Gy. Nuclear DNA content of control (diploid) and haploid sunflower plants were evaluated by chromosome analysis and flow cytometry having "n" number of chromosome set.

Biography

Yildiz Aydin has completed her PhD degree from Marmara University, Department of Biology in 2003. Her expertise lies in plant tissue culture and application of PCR-based molecular markers to plant germplasm. Her current research work involves researching haploid plant production protocols for sunflower.

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