# OPTIMIZATION OF AGROBACTERIUM-MEDIATED GENE TRANSFER SYSTEMS IN TURKISH SUNFLOWER (HELIANTHUS ANNUUS L.) VARIETIES

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## ABSTRACT

This study aimed to establish the plant tissue culture and gene transfer systems in some elite Turkish sunflower (*Helianthus annuus* L.) varieties. Plant tissue culture systems were established on Murashige and Skoog (MS) media supplemented with various plant-growth regulators using cotyledonary nodes and meristematic shoots as explants. After surface sterilization, seeds were germinated in MS media for 12 days in growth chamber under 16/8 photoperiods, %60 humidity and 24oC temperature. Following germination, explants were isolated and cultured in MS media containing 0.25 mg/l NAA (1-Naphthaleneacetic acid) and 1 mg/l BAP (6-Benzylaminopurine). Isolated shoots were inoculated with an upper-virulent strain of *Agrobacterium tumefaciens*, which included a kanamycin resistance gene as selective marker, a cauliflower-mosaic-virus-derived 35S promoter, a GFP coding sequence and an antibiotic resistance gene (BAR) for selection of transformed plants. All regenerated shoots were rooted on MS media supplemented with 1 mg/l IBA. GFP protein expression was detected on gel as well as visualized using Fluorescent microscope. *Agrobacterium*-mediated gene delivery system in the meristematic tissues is regarded as an efficient method in production of transgenic sunflowers as well as it forms a baseline for the effective delivery of agronomically valuable gene/s in some Turkish elite sunflower varieties. Many commercial sunflower varieties are seriously affected by various biotic and abiotic stress factors, and also require the chemical control while maintaining the product quality. Traditional breeding strategies do not have ability to address all these limitations but biotechnology does. Thus, present study emphasized the application of molecular and biotechnological methods to improve the some elite sunflower varieties in Turkey.

**Key Words :** Sunflower, tissue culture, gene transfer, regeneration, organogenesis