

CYTOGENETIC STUDY OF HELIANTHUS STRUMOSUS AND ITS F₁ AND BC₁F₁ HYBRIDS WITH CULTIVATED SUNFLOWER

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ABSTRACT

Helianthus strumosus L. is represented in Novi Sad collection of wild sunflower species with large number of accessions (14 with seed reserves and 20 in the field collection). It is often used as a source of resistance to disease-causing agents in the breeding of cultivated sunflower. Interspecific crosses with cultivated sunflower lines were performed using 17 accessions of this species. Six F₁ hybrid combinations were obtained using two *H.strumosus* accessions with a total of 48 plants, while in backcrossing 51 BC₁F₁ plant was obtained. Nine originated from crossing F₁ and 42 from crossing F₁OP with cultivated sunflower. Cytogenetic analysis showed 3 levels of ploidy in the examined accessions of *H.strumosus* (n = 17, 34 and 51) and high pollen viability ranging from 83.13- 98.93%. F₁ hybrids exhibited reduced pollen viability (26.83 - 55.34%), and there were occurrences of male sterility. Analysis of chromosomal association of F₁ hybrids showed that chromosome number was 68, and that most commonly observed associations were 25-34 bivalents with the occurrence of quadrivalents, hexavalents and univalents. BC₁F₁ hybrids also had male sterile plants, while pollen viability ranged from 5.66 - 80.85%. Analysis of chromosomal associations in diakinesis showed a varying number of chromosomes (55 - 70), while the number of bivalents was 15-27, trivalents 0-3, quadrivalents 0-4, hexavalents 0-1 and univalents 1-5. In addition to irregular patterns of chromosome pairing in diakinesis, F₁ and BC₁F₁ hybrids also exhibited irregularities like fast, lagging chromosomes and chromosome bridges in other stages of meiosis. Cytogenetic analyses show the difficulties in obtaining progenies of interspecific hybrids that will contain the desirable genes from *H.strumosus*.

Key Words : Sunflower, *Helianthus strumosus* L., Interspecific crosses, Cytogenetic analyses