

2-Inheritance of resistance to sunflower broomrape (*Orobanche cumana* Wallr.) in an interspecific cross between *Helianthus annuus* and *Helianthus debilis* subsp. *tardiflorus*

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Abstract

Sunflower broomrape (*Orobanche cumana* Wallr.) constrains sunflower cultivation in many areas of Europe and Asia. Populations classified as race G that overcome all known resistance genes have recently appeared. The objective of this research was to study the inheritance of resistance to broomrape race G in a resistant accession of *Helianthus debilis* subsp. *tardiflorus*. Heads of *H. debilis* subsp. *tardiflorus* were emasculated and pollinated with pollen of the *Helianthus annuus*-susceptible line HA 89. BC1F1, BC1F2, BC1F3, BC2F1, BC2F2 and BC2F3 generations were developed and evaluated for broomrape resistance. F1 plants were resistant, indicating dominance of resistance. BC1 populations segregated in a ratio of one resistant to one susceptible plant, whereas BC1F2 and BC2F2 populations segregated in a ratio of three resistant to one susceptible plant, which was confirmed in the evaluation of the BC1F3 and BC2F3 populations. The results indicated that resistance to broomrape race G in *H. debilis* subsp. *tardiflorus* is controlled by dominant alleles at a single locus. This mode of inheritance will facilitate the introgression of resistance into elite cultivars.

Key words: *Helianthus annuus - Helianthus debilis* subsp. *tardiflorus -* genetic resistance - *Orobanche cumana* - sunflower broomrape