

# Inheritance of high oleic acid content in safflower

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## Abstract

Safflower (*Carthamus tinctorius* L.) oil with high oleic acid content (>75%) has a great value for both food and non-food uses. The trait has been reported to be environmentally stable and controlled by recessive alleles at one single gene *Ol*, even though the influence of modifying genes has been suggested. Additionally, germplasm with higher oleic acid content (>85%) has been reported. The objective of the present research was to study the inheritance of high oleic acid content in genetic sources with both levels of high oleic acid content (>75 and >85%, respectively). A genetic study was conducted by crossing the nuclear male-sterile line CL1 (18% oleic acid) and the high oleic acid lines CR-6 (80%) and CR-9 (87%). The evaluation of the F<sub>1</sub> and F<sub>2</sub> seed generations of the crosses CL1 × CR-6 and CL1 × CR-9 indicated that in both cases the high oleic acid trait was controlled by partially recessive alleles at a single locus. The observation of F<sub>2</sub>, F<sub>3</sub>, and F<sub>4</sub> segregants with high oleic acid phenotype but lower oleic acid levels than the parents revealed the presence of modifying genes affecting the trait. Crosses between the two high oleic acid lines produced no transgressive segregation other than that caused by the mentioned modifying genes, suggesting that the high oleic acid lines CR-6 and CR-9 share the same alleles at the *Ol* locus. Differences for oleic acid content between both lines were hypothesized to be produced by the accumulation of genes with a minor effect on the trait.

## Keywords

*Carthamus tinctorius* Fatty acids Genetic study Modifying genes Oleic acid Safflower