

Development of SCAR markers linked to male sterility and very high linoleic acid content in safflower

Yamen A. S. Hamdan, Leonardo Velasco, Begoña Pérez-Vich

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Abstract

Practically no molecular tools have been developed so far for safflower (*Carthamus tinctorius* L.) breeding. The objective of the present research was to develop molecular markers for the closely linked genes *Li*, controlling very high linoleic acid content, and *Ms*, controlling nuclear male sterility (NMS). A mapping population of 162 individuals was developed from the NMS line CL1 (64–79% linoleic acid) and the line CR-142 (84–90%), and phenotyped in the F₂ and F₃ generations. Bulk segregant analysis with random amplified polymorphic (RAPD) markers revealed linkage of five RAPD bands to the *Li* and *Ms* genes. RAPD fragments were converted into sequence-characterized amplified region (SCAR) markers. A linkage map including the five SCAR markers and the *Li* and *Ms* genes was constructed. SCAR markers flanked both loci at minimum distances of 15.7 cM from the *Li* locus and 3.7 cM from the *Ms* locus. These are the first molecular markers developed for trait selection in safflower.

Keywords

Carthamus tinctorius Linoleic acid Nuclear male sterility RAPD Safflower SCAR