Dağüstü N, Fraser PD, Enfissi EG, Bramley PM (2008) Screening for high callus induction and *Agrobacterium*-mediated transformation of sunflower (*Helianthus annuus* L.). Biotechnology and Biotechnological Equipment 22(4):933-937.

Abstract

The work described in this paper has used bacterial transgenes (*crtI* and *Hmgr-CoA)* which have the potential to increase oil quality in sunflower (*Helianthus annuus* L.) if an efficient transformation procedure was in place. Optimized procedures for the callus induction from hypocotyl and cotyledon explants, regeneration capacity of sunflower genotypes and transformation to intact embryogenic axis have been established in order to facilitate studies of transformation and production of genetic variability. Callus formation was induced easily from hypocotyl and cotyledon explants. Although cotyledon explants produced low amount of callus per explant, the somatic embryo and direct shoot regeneration capacity of cotyledons were generally much higher than that experienced with hypocotyl explants. Only root regeneration was obtained from hypocotyl explants. Regeneration of embryo and shoot varied from 0 - 29% depended on the genotype and explant. For transformation of sunflower, intact embryogenic axis were dissected from seeds and cocultivated with *Agrobacterium tumefaciens*. Transgenic sunflower lines expressing either *the Erwinia uredovora* phytoene desaturase (*crtI*) gene or hydoxymethyglutaryl- CoA (*Hmgr-CoA*) reductase genes have been obtained. Possible transformants were selected by their ability to grow on kanamycin. Transformation was confirmed by PCR and *npt*II . Green shoots were transferred to rooting medium and showed early flowering *in vitro* culture conditions. The transformation system is more efficient (90-100%) than previous reports and has shown the incorporation of effector transgenes.