Bayraktaroğlu M, Dagustu N **(**2011) *In vitro* regeneration of sunflower (*Helianthus annuus* L.). International Symposium on Sunflower Genetic Resources 16-20 October 2011, Kuşadası, İzmir, Turkey.

Abstract

Mature 10 sunflower (*Helianthus annuus* L.) genotypes (T0910182-2, T0910792-1, T0910817-1, T0910950-2, T0911033-2, T0910791-1, T0910791-4, T0910791-3, T0910930-2, T0910285-1) which improved from Trakya Agricultural Research Institute, Edirne, were studied for *in vitro* regeneration from callus or directly explants (cotyledons or hypocotyls). The cotyledons and hypocotyls were excised from 4 day-old seedlings and cultured on embryo induction medium (EIM) supplemented with %1 benzylaminopurine (BAP), %1 Naphthaleneacetic acid (NAA) and %0.1 Gibberellic acid (GA_3). The experiments were kept in 18/6 hour light/dark photoperiod at 26±2 ^oC for one month. The aim of this study was to determine *in vitro* regeneration capacity of selected genotypes and develop a regeneration protocol applicable to a variety of Turkish sunflower genotypes for using germplasm protection for specific varieties. In this experiment, sunflower genotypes have been tested for their ability to produce callus, shoot and root organs and embryo like structure (ELS) levels. In this study, the results have showed that the rates of callus, shoot and root organ formation and ELS depending on genotype, explant, time and the interaction between each of them. The highest shoot regeneration was obtained from T0910817-1 (5.83%) while T0910791-1 (86.15%) produced the highest callus formation. The highest root regeneration was obtained from T0910792-1 (8.33%) while T0910950-2 (6.25%) produced the highest ELS. The third and fourth weeks gave the best shoot (3.33%), root (3.00%) regeneration and ELS (4.50%) and the same group, while the best callus formation was obtained from just fourth week. The highest shoot (3.17%), root (3.00%) and ELS (3.50%) regeneration were obtained from cotyledone explants while hypocotyle explant produced the highest callus formation (88.38%). The experiment was laid out according to completely randomized design with 3 replications. In the study, 10 genotypes, 2 explants and 4 times were used as treatments. Analysis of variance was performed on data using the MINITAB (University of Texas, Austin, TX) and MSTAT-C (Version 2.1, Michigan State University, 1991) programs. The F-protected least significant difference (LSD) was calculated at the 0.05 probability level. The experiments management at Tissue Culture Laboratory and controlled climate cabine at Uludag University, Faculty of Agriculture, Department of Field Crops in 2010.