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Investigation on callus formation and regeneration of different explants of cotton cultivars *in vitro*

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ABSTRACT

Cotton is one of important agricultural and industrial crop plants in the world, but in the last years, decreased cultivation area in Iran. For improvement of cotton breeding programs, we can use tissue culture methods, but because of the regeneration independent on genotype in the *Gossypium* cultivars and tissue culture difficulties in this crop, an optimized regeneration method is necessary for achievement to this aim. Therefore, this study was conducted in Cotton Research Institute of Iran to develop an optimize protocol for cotton regeneration *in vitro*. Three explants cotyledonary leaves, hypocotyls and meristem excited from 7-days old seedling and also immature embryo explants 3-4 days after pollination, from 2 cotton cultivars. The effect of 2 various hormonal combinations of BAP and 2, 4-D on MS basal medium investigated for callus formation and regeneration of cotton explants. The completely randomized design with three replications was used. Analysis of variance

showed significant differences among the hormonal combinations and their interaction on callus formation and regeneration of explants. On the basis of results, the highest percentage of callus formation was obtained to Sahel cultivar and embryo explants, respectively, but the highest percentage of regeneration (79.1%) was obtained to meristem explants. Also, hormonal combinations, explants and cultivars interaction showed that cotyledon and hypocotyls explants of Sahel cultivar in the MS medium containing 2 mg/l BAP and 0.5 mg/l 2, 4-D stood in the first group and had the highest percentage of callus formation.

Key words: *Cotton, Callus formation, Regeneration, in vitro, Hormonal combination.*