



## MOLECULAR AND HORTICULTURAL CHARACTERISTICS OF *IN VITRO* INDUCED TOMATO MUTANTS

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### ABSTRACT



In addition to the traditional breeding approaches, genetic variability in tomato can be induced also by means of mutagenesis. The objective of this study was to develop an *In vitro* technique suitable for mutation induction on tomato and characterize them by RAPD and SSR markers as well as horticultural characteristics. The influence of various concentrations (0, 0.07, 0.14 and 0.25%) of the chemical mutagen, Ethyl Methane Sulfonate (EMS), on the *in vitro* shoot formation from cotyledon explants of two tomato cultivars was studied. The percentage of responding explants ranged from 45.2 to 95% in dependence on genotype and EMS concentrations. Two PCR-based techniques, RAPD and SSR, were used for analysis of genetic variations in regenerated plants from *in vitro* cultures combined with EMS treatment (0.25%). The percentage of polymorphism detected by RAPD and SSR primers reached 25.64%. Grouping of the original cultivar and their mutants indicated the genetic distinctness as they are placed in different clusters/groups far from each other. Mutants regenerated from the wide cultivate cultivar in Egypt (Super strain B) were evaluated with their origin cultivar in a field experiment for yield potential and fruit quality. The results revealed that the mutants were differed in number of branches, early and total yield, average fruit weight, fruit firmness and TSS content. Moreover, mutant lines S1, S3, S6 and S13 had some desirable horticultural traits and could be used in improving tomato crop by breeding programs or they could be considered as new breeding lines.