

**Mutagenic effects of ethyl methanesulfonate on nine protein coding genes in
tomato (*Solanum lycopersicum* L.)**

ABSTRACT

The chemical mutagen ethyl methanesulfonate (EMS) has been generally utilised for the development of novel variants of commercially cultivated crop plants. The general approach involves the application of the mutagen at sub-lethal concentrations, followed by the selection of novel phenotypes based on morphometric characterization. This study was directed towards the evaluation of the effects of EMS at a concentration of 0.5 % on *Solanum lycopersicum*. Mutants were selected based on phenotypic variation, following which nine specific genes such as NRP2 (RNA polymerase II), HKX (hexokinase), P2D1 (photosystem II D1), NEXP (expansin), PHYSN (phytoene synthase), PCANH (carbonic anhydrase), NAGO (argonaute), PRUB (RuBisCO) and NGAG (gag-pol) were isolated via polymerase chain reaction and sequenced to determine the presence of mutations. The results demonstrated that six genes: NRP2, HKX, P2D1, NAGO, NGAG, and NEXP contained mutations that altered the sequence of translated amino acid. In addition to this, a wide range of phenotypic variants was observed. This study concluded that the selected genes were under selection pressure and that undefined physiological processes may be involved in maintaining genetic stability during exposure to chemical mutagens.