

Ethyl Methanesulphonate (EMS)-Mediated Mutagenesis Induces Genetic and Morphological Variations in Eggplant (*Solanum melongena* L.)

ABSTRACT

Eggplant (*Solanum melongena* L.) is a vegetable that holds high economic and nutritional value and is renowned for its distinct shape, color and flavor. There has been a considerable focus on enhancing the genetic makeup of eggplant, with specific attention given to breeding for better agronomic characteristics. However, the crop suffers from a narrow genetic base. As part of the efforts to broaden the gene pool of eggplant, a chemical mutagenesis approach has been employed, aimed to generate eggplant genotypes with distinctive characteristics. Altogether 180 seeds of eggplant cultivar, Surya was treated with EMS at 0.7% v/v concentration. In the development of M2 generation, members of 16 M2 families were inspected for phenotypic variation. Notable variations were observed in traits such as plant height, leaf, flower and fruit morphologies. Furthermore, a subset of the mutants was selected to screen for any DNA alterations in a few targeted genes belonging to the Flowering Locus T/Terminal Flower 1 (FT/TFL1) gene family, via amplicon sequencing performed using Pacbio RSII. A mutant sample was discovered to carry a heterozygous mutation at the upstream region of the coding sequence of one of those particular genes. Taken together, the M2 families developed here represent valuable genetic resources that can be explored for gene functional analysis and future breeding programs of eggplant.