Direct organogenesis and transformation of sour orange (Citrus aurantium) using citrus tristeza virus (CTV) coat protein coding gene

Banafsheh Fattah1, Mohammad Mahdi Sohani*1, Abdollah Hatamzadeh1, Alireza Afsharifar2, Behrooz Goleyn3, Mohammad Hossein Rezadoost1, Mohammad Reza Mirzaei1, Amir Hossein Zamani1

1- Faculty of Agricultural sciences, University of Guilan, Rasht, Iran.
2- Faculty of Agricultural Sciences, University of Shiraz, Iran.
3- Faculty of Agricultural Sciences, Citrus Research Institute-Ramsar, Iran.
* Corresponding Author, Email: msohani@guilan.ac.ir

ABSTRACT

In this study transgenic plants of sour orange (C. aurantium) that is an important citrus rootstock were produced by Agrobacterium-mediated transformation. Epicotyl and hypocotyl segments-derived explants were co-cultured with Agrobacterium strain EHA105 carrying pFGC5941 plasmid containing CTV coat protein (p25) gene. One of the main objects of present research was to improve the direct in vitro organogenesis efficiency in C. aurantium. Therefore different combination of BAP (0, 1, 2 mg/L) and NAA (0, 0.25, 0.5 mg/L) were used in selective medium to culture transformed explants. The highest regeneration (57%) was obtained from explant treated with 2 mg/L BAP and 0.25 mg/L NAA. Effects of wounding and vacuum infiltration on transformation efficiency were evaluated either. The best transformation efficiency (11.25%) was obtained from explants that were vacuum infiltrated during transformation and subsequently were cultured in medium containing 2 mg/L BAP and 0.25 mg/L NAA. PCR analysis using two different genes were performed to confirm transformation. Micro grafting of transformed shoots were carried out on non-transgenic, in-vitro grown seedlings.

Key Words

Agrobacterium tumefaciens, Direct Organogenesis, Epicotyl, Growth Regulators, Wounding