

***Agrobacterium*-mediated transformation of potato**

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El-Shawaf I.*, Hasan A.*, Bekhit M.*, Hasanein E.*, Salim T.*, Hagemann M.*****

* Genetics Department, Faculty of Agriculture, Benha University, Moshtohor Toukh, Qalubia, Egypt

** Genetics Department, Faculty of Agriculture, Ain Shams University, Shubra El-Kheima, Cairo, Egypt

*** Plant Physiology Department, University of Rostock, Albert-Einstein-Straße 3, 18051 Rostock, Germany

ABSTRACT

In this study a simple and rapid transformation protocol was used. Two economically important tetraploid potato cultivars, viz., Albatros and Desiree were transformed in a relatively short period of time by the gene ggpPS for salinity and drought tolerance. After only one week on callus induction media, green, friable and nodular callus was formed. Callus induction frequency of the two genotypes Albatros and Desiree was 59.7 and 68.6%, respectively. The mean shoot bud formation of the two genotypes Albatros and Desiree was 46.7 and 39.1%, respectively. Meanwhile, average regeneration of shoot bud was 27.9 and 25.6 for the two genotypes respectively. Regenerated shoots were transferred to rooting medium supplemented with 80 mg/l kanamycin. Overall, transformation efficiency of the two genotypes was 13.5 and 9.1%, respectively. The regenerated plants were transferred to micro-tuberization medium. Thirteen plants succeeded to form micro-tubers within ten weeks. Transformation of these plants was confirmed by PCR. The resulting plants did not show any significant morphological changes compared with control plants. Production of these plants paves the way to study the expression of the gene ggpPS in potato.

Key Words: *Solanum tuberosum*, *Agrobacterium tumefaciens*, transformation, somaclonal variation.

INTRODUCTION

Potato (*Solanum tuberosum* L.) is a vegetable crop of major economic importance world wide. It is the fourth most cultivated food crop after wheat, rice and maize and, therefore, the most important dicotyledonous and tuber crop (Nasrin *et al.*, 2003). Reasons for the importance of this plant are its high-yield and its high protein, vitamin and starch content. Potato improvement through conventional breeding is a complicated process. This is due to the fact that economic potato genotypes are tetraploid and genes from the cultivated potato gene pool

are not easily accessible by direct sexual hybridization. In addition, sterility and high level of heterozygosity greatly reduce the efficiency of traditional methods for potato breeding. A highly promising alternative to the conventional breeding is the introduction of foreign genes into plants through genetic transformation (Xing *et al.*, 2008). There are numerous regeneration and transformation protocols reported in potato, many of these have long regeneration periods and low frequencies (An *et al.*, 1986; Romano *et al.*, 2001 and Chang *et al.*, 2002). In many reports an intermediate callus phase is needed (De Block, 1988) which increases and also