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Development of herbicide resistant potato lines: A step towards transgenics in Turkey

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The significant breakthrough in plant biotechnology is the development of techniques to transform genes from unrelated sources into commercially important crop plants. Modern technologies of genetic transformation have enabled researchers to introduce any trait of economic importance in crops. The herbicide resistant crops were cultivated on an area of approximately 100 million hectares in 2015; mainly expressing EPSPS gene that encode resistance to non selective glyphosate. In order to introduce herbicide resistant trait in four potato cultivars (Lady Olympia, Agria, Desiree and Marabel), we first optimized an efficient, cost effective, reproducible, genotype independent and stable *Agrobacterium* mediated genetic transformation protocol in potato using leaf and internodal explants. *Agrobacterium* strain LBA4404 harboring recombinant binary vector pBin19 containing beta-glucuronidase *uidA* gene under the control of 35S promoter was used for this purpose. Besides that, the optimal concentration of glyphosate was determined using leaf and internodal explants of cultivars in *in vitro* experiments. After developing an efficient transformation protocol, we infected explants cultivars with *Agrobacterium* strains LBA4404 harboring pCAMHE-EPSPS plasmid under the control of 35S promoter. Glyphosate was used at a concentration of 1.5 mM for the selection of primary transformants. The primary transformants were further analyzed for the gene integration and expression analysis. The results revealed the proper integration and expression of introduced gene in putative transgenic plants obtained as a result of different transformation events. The transgenic potato lines are being screened against glyphosate applications in green house conditions. These transgenic lines are expected to an excellent source of germplasm for an efficient potato breeding program.

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Effect of the polycyclic aromatic hydrocarbons exposure on sperm DNA in idiopathic male infertility

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There is an increasing awareness of the potential role of genetic and environmental factors in idiopathic male infertility. However, there is little compelling evidence to date to suggest that the risk of idiopathic male infertility among the general population is influenced by exposure to certain chemicals. Thus the first objective of the present study is to assess the occurrence and distribution of PAHs in mussels of Alex Coast, to identify the origin of PAHs in the Alex Coast, Secondary, to investigate the possible association between exposure to PAHs and male idiopathic infertility through; estimation of urinary metabolites of PAHs, malonaldehyde (MDA), GSH, GST, testosterone, FSH, prolactin, Semen analysis and sperm chromatin dispersion test (Halo sperm). The present results of the study revealed that there were high concentration of many PAHs detected in the tissues of two species of mussels collected from Alex Coast which may supposed to be at big risk for human health. Also, the present results revealed that there was a high level of urinary 1-hydroxy pyrene, 1-hydroxy naphthalene, 2-hydroxy naphthalene in the urine of detected infertile group. In the current study, a high significant increase in the level of MDA in the sera of detected idiopathic infertile group was observed with a significant decrease in glutathione content. Where, the compounds resulting from the oxidation of PAHs have the ability to enter redox cycles, which increased the formation of reactive oxygen species (ROS) and thus caused sperm DNA damage. The data provide strong evidence that semen samples containing a statistical threshold of 30% sperm DNA fragmentation have a reduced level of pregnancy success. The results of the present study elucidated that there were DNA fragmentation from 32-40% in the sperm of some idiopathic infertility subjects.

Notes:

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