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**Transgenic tobacco plants expressing *ACR2* gene of *Arabidopsis thaliana* exhibit reduced accumulation of arsenics and increased tolerance to arsenate**

**Abul Mandal**  
University of Skovde, Sweden

Toxic metals such as arsenics, lead, cadmium or chromium are the major environmental pollutants that severely contribute to contamination of the global food chain directly through their accumulation in the edible parts of the cultivated crops or indirectly via meat-milk pathway. Fortunately, plant genetic engineering has the potential for developing new crop cultivars for removal of the toxic substances from the polluted sources or for avoiding accumulation of these contaminants in the edible parts. Previously, we have identified and studied four key genes that are involved in accumulation of arsenics in plants. In this study, we have cloned and transformed the *ACR2* gene (Arsenic reductase 2) of *Arabidopsis thaliana* into tobacco plants (*Nicotiana tabacum*). Our results revealed that the transgenic tobacco plants are more tolerant to arsenic than the wild-type control plants. These plants can grow on medium containing 200  $\mu\text{M}$  of arsenate, whereas the non-transgenic plants can hardly survive under this condition. Furthermore, when exposed to 100  $\mu\text{M}$  of arsenate for 35 days accumulation of arsenics in shoots of the transgenic plants decreases significantly (28  $\mu\text{g/g d wt.}$ ) compared to that observed in the non-transgenic control plants (40  $\mu\text{g/g d wt.}$ ). This study shows that *A. thaliana ACR2* gene is a potential candidate for genetic engineering of plants to develop new cultivars that can be grown on arsenic contaminated fields and can supply harmless foods containing no or significantly reduced amount of arsenics.

**Biography**

Abul Mandal has completed his PhD from University of Agriculture in Cracow, Poland and Post-doctoral studies from University of Stockholm, Sweden. In 2010, he was appointed as a Professor of Molecular Biology at the System Biology Research Center of the University of Skovde, Sweden. Currently, he is heading the Physiology and Toxicology research group at this University. He has published more than 100 papers in reputed peer reviewed journals and has been serving as an Editorial Board Member of several scientific journals.

[abul.mandal@his.se](mailto:abul.mandal@his.se)

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