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## Development of Transgenic Potato Plants using Multiple Stress-tolerant Expression Vectors

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### Objectives

To develop transgenic potato plants with enhanced tolerance to multiple stress, we developed expression vectors using a stress-inducible SWPA2 promoter and multiple stress-tolerant genes such as NDPK2 and SOD/APX genes (1-3). Transgenic potato plants (cv. Superior and Atlantic) were generated using an *Agrobacterium*-mediated transformation system.

### Materials and Methods

#### 1. Materials

- Plant materials: potato (*Solanum tuberosum* L.) cv. Superior, Atlantic
- Explants: leaves, stems.
- Vectors: E35S pro::NDPK2/pCAMBIA2300/EHA105 (EN vector)  
SWPA2 pro::NDPK2/pCAMBIA2300/EHA105 (SN vector)  
SWPA2 pro::mSOD1+SWPA2::APX/pCAMBIA2300/EHA105 (SSA vector)

2. Methods: Tissue culture, *Agrobacterium*-mediated transformation, PCR analysis, Southern blot analysis

### Results and Discussion

Three expression vectors such as EN, SN and SSA were used to generate transgenic potato plants (cv. Superior and Atlantic) by an *Agrobacterium*-mediated transformation system. Transgenic

potato plants were regenerated on MS medium containing 400 mg/L claforan and 100 mg/L kanamycin. The integration of foreign genes in forty plants was confirmed by PCR with SWPA2 or NDPK2 primer. In order to identify the copy number of foreign genes in potato plants, total genomic DNA was isolated from transgenic plants and analyzed by Southern blot analysis. As the result, one to four copies were inserted into genomic DNA. The transgenic potato plants are expected with enhanced tolerance to multiple environmental stresses. The further characterization of transgenic potato plants is under investigation.

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### References

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