

P 87

## Overproduction of 5-Enolpyruvylshikimate-3-Phosphate Synthase (EPSPS) Confers Resistance to the Herbicide Glyphosate in Transgenic Rice

Soo-In Lee, Suk-Cheol Suh<sup>1</sup>, Ki-Byung Lim, Yong-Moon Jin, Ho-Il Kim<sup>\*</sup>

Genomics Division, <sup>1</sup>Plant Biotechnology Division, National Institute of Agricultural Biotechnology (NIAB), RDA, Suwon 441-707, Korea

### Objectives

This study is carried out to produce herbicide (glyphosate or Roundup<sup>®</sup>)-resistant transgenic rice plants containing the EPSPS (5-enolpyruvylshikimate-3-phosphate synthase) gene.

### Material and Methods

1. Plant material: embryogenic callus of rice variety, Nagdongbyeo
2. Methods
  - *Agrobacterium tumefaciens* LBA4404-mediated transformation
  - Southern and northern blot analysis
  - Herbicide application

### Results and Discussion

The herbicide-resistant EPSPS (5-enolpyruvylshikimate-3-phosphate synthase) gene was transformed into embryogenic callus of rice variety, Nagdongbyeo, with *Agrobacterium*-mediated transformation method. A large number of transgenic rice plants were obtained screened with glyphosate. Some of regenerated plants were analysed by Southern and northern blot analysis. The results indicated that EPSPS gene was integrated stably into the genome of rice plants, and most of the transformants showed fertile. Seeds obtained after the first self-cross of transgenic plants germinated and grew normally in the presence of the selectable marker, whereas the control seedlings were bleached. While control plants were extremely sensitive to glyphosate (Roundup<sup>®</sup>), transgenic plants survived sprays of high concentrations of glyphosate. So herbicide-resistant EPSPS gene could be used as selective marker in the transformation of monocotyledon cereal crops, such as rice.