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The Application of Mannose Selection System to Chinese Cabbage Transformation

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Objectives

Recently the use of antibiotics and herbicide as selection agents in the medium has caused widespread public concern. To avoid the use of those agents, alternative selection systems have been proposed and developed. One of them is to use mannose as a carbon source in the media and many plant species can not metabolize mannose to other sugars. Phospho-mannose isomerase (PMI) which can convert mannose to fructose is not present in plants. *PMI* gene from *E. coli* has been cloned, and recently maize and sugar beet have been successfully transformed with *PMI* as a selection marker gene.

This study was carried out to apply this mannose selection system to chinese cabbage which have been known as one of the most difficult crops to be transformed.

Material and Method

1. Plant material: cotyledons and hypocotyls 5 days after seedling of Maeryuk F₁ chinese cabbage

2. Method: *Agrobacterium tumefaciens* LBA4404-mediated transformation

3. Regeneration medium: MS basal medium with various combined concentrations of sucrose and mannose

Results

1. The shoot formation rate of cotyledons is higher than that of hypocotyls at all the combinations.

2. The shoot formation from both cotyledons and hypocotyls was inhibited at the combination of 30g/L sucrose and 4g/L mannose.

3. The results suggest that the appropriate selection concentrations for chinese cabbage are the combinations of 30g/L sucrose and 7 g/L mannose at the cotyledons, and 30g/L sucrose and 6g/L mannose at the hypocotyls, respectively.

Mannose Test

