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MORPHOLOGY OF SOMATIC EMBRYO FORMED FROM LEAF EXPLANT CULTURES OF *ANGELICA ACUTILOBA*

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This study describes plant regeneration from leaf explant of *Angelica acutiloba* through somatic embryogenesis, and the effect of growth regulators such as 2,4-D, BA and NAA on somatic embryo abnormalities. The relationship between the cotyledon number of somatic embryo and its germinability is also described. Embryogenic calli were selected from calli formed on explants cultured on MS solid basal medium supplemented with 1 mg/L 2,4-D, 1 mg/L 2,4-D + 0.5mg/L BA, 0.5mg/L 2,4-D and 1mg/L NAA. Cotyledonary abnormalities were observed in somatic embryos which were developed from embryogenic calli cultured on MS medium containing 2,4-D for 6-week and then subcultured on free MS medium for 3 weeks. The frequency of abnormalities was as follows: 22.8% one cotyledon, 42.5% two cotyledons, 16.8% three cotyledons, 7.8% four cotyledons, 1.8% five cotyledons, and 8.2% trumpet-like cotyledons. Two cotyledon embryos showed germinablity of 77.8%. However, the germinability of somatic embryos with anomalous cotyledon was prominently low : one cotyledon, 62.5% ; three cotyledon, 43.3% ; four cotyledon, 60%; five cotyledon, 50% and trumpet-like cotyledon, zero %. Thus, the germinability was almost reverse order to cotyledon number. Therefore, it is suggested that the production of normal somatic embryos with two cotyledons is neccessary for scientific research and industial application.

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Dechlorination of 4-Chlorobenzoic Acid by *Pseudomonas* sp. DJ-12 and Cloning of the Corresponding Gene

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4-chlorobenzoic acid (4CBA) in which hydroxyl group of benzoic acid on *para*-position is substituted with a chloride ion has known as a kind of metabolites of herbicides and PCBs including 4-chlorobiphenyl (4CB). It was reported that 4CBA could be degraded via initial hydrolytic dechlorination involved by 4CBA:CoA ligase, 4CBA:CoA dehalogenase, and 4HBA:CoA thioesterase, or spontaneous dechlorination after ring-cleavage to 4-chlorocatechol. *Pseudomonas* sp. DJ-12 capable of metabolizing 4CB and 4CBA as a sole carbon source is degrading 4CBA via initial hydrolytic dechlorination. By transfection into *E. coli* LE392 using pWE15 cosmid vector, we have cloned the gene responsible for dechlorination from total genomic DNA of *Pseudomonas* sp. DJ-12 and the clone was named as *E. coli* KC1. Then, *E. coli* KC15 and *E. coli* KC152 showing dechlorination activity for 4CBA were constructed by subcloning using *Bam*HI and *Not*I. On resting cell assay of *E. coli* KC152, the conversion 1 mM of 4CBA into 4HBA was detected by UV-spectrophotometry along with the release of chloride ion.