

Kanlaya Rattanathawornkiti 2007: Development of Callus Culture System for Genetic Transformation in Patumma (*Curcuma alismatifolia* Gagnep.). Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Assistant Professor Surawit Wannakrairoj, Ph.D. 86 pages.

Distal, middle and proximal parts from young inflorescent of Patumma 'Chiang Mai' were cultured on modified MS medium supplemented with 10 mg l^{-1} BA and 0.1 mg l^{-1} IAA or supplemented with 0, 0.25, 0.5 or 1 mg l^{-1} TDZ with 4 mg l^{-1} IMA under dark, white light, red light or blue light condition. After 12 weeks, explants cultured on the medium containing 10 mg l^{-1} BA and 0.1 mg l^{-1} IAA gave the highest number of shoots. The media supplemented with $0.1-1 \text{ mg l}^{-1}$ TDZ and 4 mg l^{-1} IMA yielded clumps of retarded multiple shoot of non-significant different size. Red light gave the tallest shoots while the white light gave the largest clumps of retarded multiple shoot. There was no significant effects of difference parts of inflorescent on number of shoots and shoot height.

Callus of Patumma were induced from pseudostem-base explants by cultured on modified MS media supplemented with 0, 0.5, 1.0, 1.5, 2.0, 2.5 or 3.0 mg l^{-1} 2,4-D in combination with 0, 0.01 or 0.05 mg l^{-1} TDZ under dark, white light, red light or blue light condition. After 4 weeks, percentages of callus formation from explants cultured on medium containing $1.0-2.5 \text{ mg l}^{-1}$ 2,4-D were no difference. Blue and red light were more effective on callus induction than white light or dark condition. Explants cultured on the medium supplemented with 1.5 mg l^{-1} 2,4-D and 0.05 mg l^{-1} TDZ under red light were best for callus induction of 91.67 %. When transferred the callus that initiated on the medium supplemented with 0.5 mg l^{-1} 2,4-D and 0.01 mg l^{-1} TDZ to the medium supplemented with 0.05 mg l^{-1} TDZ, the highest frequency of shoot formation at 14.54 % was resulted.

A study on the effect of antibiotics on growth of the callus of Patumma was conducted for 4 weeks. The highest concentration of cefotaxime that callus could grow was 300 mg l^{-1} , while 150 mg l^{-1} hygromycin was sufficient for inhibition of callus growth. A *gus* gene transformation into the callus of Patumma by using *Agrobacterium tumefaciens* strain LBA4404 (pCAMBIA1305.1) revealed that 30 minutes co-cultivation yield GUS-positive calli.

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Student's signature



Thesis Advisor's signature

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