Bhawat Wongkhamprai 2012: Expression of *Pinene Synthase* Gene of Kaffir lime (*Citrus hystrix* D.C.) in *Arabidopsis thaliana* (L.) Heynh. and *Dendrobium formosum* Roxb. ex Lindl.. Master of Science (Genetics Engineering), Major Field: Genetics Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Pattana Srifah Huehne, Ph.D. 87 pages.

β–pinene, a monoterpene, was found as a major component of an essential oil extracted from fruit peel of Kaffir lime (*Citrus hystrix* DC.) known as Makrut. Therefore, in this study, the pinene synthase (*pns*) gene previously cloned from Kaffir lime was constructed into a plant expression vector (pCAMBIA1305.1) and transformed into *Arabidopsis thaliana* and Protocorm–like body (Plbs) of *Dendrobium formosum* Roxb. for gene construction validation. After tested for appropriate hygromycin concentration, the *pns* transgenic Arabidopsis mediated by Agrobacterium tumefaciens EHA105 were selected on 1/2MS containing 20 mg/L hygromycin for 10 days. The Arabidopsis seeds were collected from 1st– 6th generation (T0–T5) of each transgenic lines by hygromycin resistant character. After selection, the percentage of seed survival of T0, T1, T2, T3, T4 and T5 transgenic Arabidopsis gradually increased at rate of 0.27, 45.17, 70.65, 78.88, 80.00 and 83.33 respectively. In addition, the *pns* transgene was successfully integrated into the genome of Arabidopsis transgenic lines when detected by PCR. However, scent from transgenic Arabidopsis flowers was unable to be detected by GC–MS.

Pns gene of Kaffir lime was also transferred to *Den. formosum* Roxb. by *Agrobacterium*–mediated transformation. After selection on MS containing hygromycin and cefotaxime for 12 weeks, the survival percentage of *pns* transgenic protocorm–like body (Plbs) was 1.34 and the pns transgene was successfully integrated into *Dendrobium* genome and the Kaffir lime *pns* transgene was successfully integrated into the genome of some transgenic lines when detected by PCR.

_____   _____   ___ / ___ / ___
Student's signature   Thesis Advisor's signature