

Chompunut Limprasat 2014: Allelopathic Assessment of Transgenic *Dendrobium* Possessed Antisense *CPACO* Gene. Master of Science (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Sermsiri Chanprame, Ph.D. 77 pages.

Allelopathic assessment on transgenic plants is one of the key elements in environmental biosafety assessments. It is important to consider how the transgenic plants are deliberately released to the environment. This study is aimed to evaluate allelopathic activity of transgenic orchids, *Dendrobium* Sonia 'Bom 17' and *Dendrobium* Sonia 'Earsakul' that were transformed with antisense papaya *1-aminocyclopropane-1-carboxylic acid oxidase (CPACO)* from papaya. The allelopathic effects on sequential crop and surrounding microorganisms were assessed based on 4 techniques including; i) sandwich method and ii) soil germination method to determine allelopathy on growth of lettuce, iii) plate cultivation technique to determine allelopathy effects on the surrounding microorganisms including bacteria, actinomycetes and fungi, and finally, iv) high performance liquid chromatography technique to compare chromatogram pattern of phenolic compounds between transgenic and non-transgenic orchids. The result revealed that *Dendrobium* orchid had allelopathic activity on lettuce but there was no significantly different in allelopathy between transgenic and non-transgenic orchids. The evaluation of microorganism population in orchid planting material, which is coconut husk, confirmed that transgenic orchids had no impact on microorganism, compared with the non-transgenic orchid. The chromatogram pattern of phenolic compounds from leaf and flower of transgenic and non transgenic orchid lines are also similar.

---

Student's signature

---

Thesis Advisor's signature