

Boon Kittisarawanno 2009: Effect of Light Duration, Sucrose Deprivation and Potassium Cyanide on Gene Expression of Alternative Oxidase in Eucalypt (*Eucalyptus camaldulensis*). Master of Science (Biochemistry), Major Field: Biochemistry, Department of Biochemistry. Thesis Advisor: Associate Professor Poontariga Harinasut, Dr.Agr.Sci. 120 pages.

Alternative oxidase pathway in plants, fungi and some protists are the alternative pathway, either it supports the flow of electron through the main pathway or when the obstruction of electron transport pathway happens. This research was attempted to investigate the expression of *alternative oxidase (AOX)* gene at the transcriptional level under various factors such as light duration, sucrose and potassium cyanide (KCN) content by semi-quantitative RT-PCR. *Eucalyptus camaldulensis* clone T5 was selected to investigate the expression of *AOX* gene within 15 days. By observing the morphology, it was found that *E. camaldulensis* clone T5 could endure in the state of 24 hour-light a day or in the dark. It could grow in the absence of sucrose, or insufficient sucrose, 15 mM sucrose. However, it could not stand in 5 mM and 10 mM KCN. Duration of light affected the alteration of the expression of *AOX* gene. When the *E. camaldulensis* were in the longest duration of light, 24 hour-light a day, the expression of *AOX* gene reduced. Contrastingly, when they were in the dark, the expression of *AOX* gene increased. Reduction of sucrose supplementation affected the expression of *AOX* gene. When reduced concentration of sucrose in the same duration of light receiving of 24, 16, 8, 0 hours a day, the expression decreased. 5 mM and 10 mM KCN would activate the expression of the *AOX* gene in the first period of treatment within 5 days but after that the expression of the *AOX* gene decreased. Upon the relation among duration of light, reduction of sucrose and KCN supplementation, it was found that cyanide may be the most effective factor to the expression of *AOX* gene, the second one may be quantity of sucrose and duration of light, in order.

---

Student's signature

---

Thesis Advisor's signature

\_\_\_ / \_\_\_ / \_\_\_