On-Uma Rungnoi 2006: Characterization, Inheritance, and Molecular Study of Opaque Leaf Mutant in Mungbean. Doctor of Philosophy (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Professor Peerasak Srinives, Ph.D. 83 pages. ISBN 974-16-1676-7

An opaque leaf mutant in mungbean (*Vigna radiata* (L.) Wilczek) was crossed with 'Berken', an Australian cultivar to produced F_2 population for studying inheritance and molecular tagging. Their F_5 population was used for studying chlorophyll content, chlorophyll fluorescence, seed growth and development, and seed cell morphology. The chlorophyll content in opaque leaf was lower than the normal one, indicated that this trait is a chlorophyll-deficient mutant. The mutant was also lower in maximum quantum yield efficiency of photochemistry, F_v/F_m, and PSII maximum, F'_v/F'_m, but higher in NPQ value compared to normal leaf. The determination of seed growth and development showed that seed from normal leaf plant terminated its growth within 18 days. However, the pattern of seed growth and development of opaque leaf plant was difference from normal one as pod became yellow and wilted at 13 days and completely dried at 14 to 15 days after flowering. The study of seed cell morphology opaque leaf plant revealed that the cotyledon transfer cells had changed at 12 and became deteriorated at 14 days after flowering. The opaque leaf trait found that it was controlled by a single recessive *op* gene and this gene was independent from petiole color and growth habit ones. To tag this gene, 27 SSR primer pairs, 28 ISSR primers and 193 AFLP primer combinations were used in this study. AFLP was the most efficient marker for tagging *op* gene and the marker AGG/ATA was the most tightly linked marker with the distance of 3.4 cM apart from *op* gene.

Student's signature

Thesis Advisor's signature

21 / 10 / 49