Amornrat Wongnok 2006: Effects of Light Emitting Diodes and Medium on *In Vitro* Development of *Phalaenopsis* Orchids. Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Assistant Professor Chitrapan Piluek, M.S. 71 pages.

The effects of light sources from fluorescent bulb and Light Emitting Diodes (LEDs) were studied on axenic seed germination and micropropagation of *Phalaenopsis* hybrid. Four type of light sources from LEDs were compared: 100% red, 90% red plus 10% blue, 80% red plus 20% blue and 50% red plus 50% white. After 2 months from germination, seeds had high germination rate and developed to be protocorms in every light sources except in 50% red plus 50% white LEDs. The growth and development of protocorms were highest under 80% red plus 20% blue LEDs in VW medium with 10 g/l table sugar without banana in 4 months after germination.

For micropropagation of *Phalaenopsis* hybrid, the lateral buds of *in vitro* young inflorescences were cultured for shoot production and PLBs induction under the same type of light sources. The results showed that the highest number of shoots were obtained under 90% red plus 10% blue LEDs, the shoot tips which excised from young shoots had most PLBs induction 48% under the red and blue LEDs. The PLBs multiplication had the highest fresh weight under red and blue LEDs. The last experiment was studied on effects of paclobutrazol in media incombination with light sources on plantlets growth. After cultured for 4 months, the plantlet had more everage fresh weight, height and leaf length in LEDs than under fluorescent bulb. There was no significant effects of paclobutrazol at 0.1-1.0 ppm on the growth of plantlets.

Amornrat Wongnok — Student's signature

Chitrapan Piluek — Thesis Advisor's signature

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