Areerat Thieankhao 2007: Efficacies of *Trichoderma* spp. for the Inhibition of *Curvularia eragrostidis* and the Control of Flower Rusty Spot on *Dendrobium* Orchid. Master of Science (Agriculture), Major Field: Plant Pathology, Department of Plant Pathology. Thesis Advisor: Assistant Professor Wanwilai Intanoo, Ph.D. 85 pages.

Efficacy of 14 isolates of *Trichoderma* spp. for the control of flower rusty spot on *Dendrobium* orchid caused by *Curvularia eragrostidis* was conducted under nursery condition. All isolates of *Trichoderma* spp. effectively inhibited mycelial growth of *C. eragrostidis* by 51.89 - 60.00 %. Three effective isolates of *T. harzianum* (CB-Pin-01, 84-42 and M23) rapidly grew over pathogen's mycelia by 0.94 -1.50 cm/ day. By using dialysis membrane technique, secondary metabolites produced by all isolates of *Trichoderma* spp. inhibited growth of pathogen's mycelia by 43.93 - 71.57 %. Spraying spore suspension of *T. harzianum* (CB-Pin-01) at 10^7 spore/ ml on orchid flowers at 3 and 5 days prior to pathogen's inoculation, effectively reduced rusty spot on flowers by 79.81 and 77.64 %, respectively. This efficacy was comparable to the use of mancozeb (80 % WP) at 1,200 ppm

Addition of chitinase elicitor into culturing substrates of *T. harzinum* isolates CB-Pin-01 and T50 at a rate of 1 g/100 ml revealed that culture filtrates derived from all treatments added solely or incombination with yeast extract (0.2 % w/w), colloidal chitin (1 % w/w) and chitin (5 % w/w) inhibited spore germination of *C. eragrostidis* on depression slide by 78.75 – 91.88 % and also significantly reduced mycelial length of pathogen by 29.54 – 77.27 % as compared to the control (with out *Trichoderma*). Under nursery condition, spraying of those culture filtrates and spore suspension of *T. harzinum* (CB-Pin-01) at 3 days prior to pathogen inoculation, caused the reduction of rusty spot on flowers by 57.98 – 76.91 % as compared to a control. This efficacy was comparable to the use of mancozeb (80% WP) at 1,200 ppm

Spraying spore suspensions of *T. harzianum* (CB-Pin-01) and pathogen on the flowers of *Dendrobium* orchid as solely, simultaneously or 3 days prior to pathogen inoculation revealed the changes of enzyme activities of β-1, 3 glucanase and chitinase in the flowers every day during 12 days of experiment. The highest activity of β-1, 3 glucanase was detected in plant at 5 days after inoculated with *C. eragrostidis*. The highest chitinase activity was induced in plant at 4 days after solely spraying of *T. harzianum* (CB-Pin-01). Simultaneous spray of antagonist and pathogen caused the increase of chitinase activity in flowers at 10 days after pathogen's application. This investigation demonstrates that enzyme activities related to disease resistance in orchid flowers can be induced after application of *T. harzianum* and/ or *C. eragrostidis*.

Areerat Thieankhao — Student's signature

Wanwilai Intanoo — Thesis Advisor's signature

25 / 05 / 07