

Tanee Sreewongchai 2008: Identification of *Magnaporthe grisea* Avirulence Genes Specific to Rice Blast Resistance Genes. Doctor of Philosophy (Genetic Engineering), Major Field: Genetic Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Mr. Theerayut Toojinda, Ph.D. 110 pages.

Avirulence genes of blast fungus *Magnaporthe grisea* were studied using Quantitative trait loci (QTL) approach. Two haploid mapping populations derived from THL1000xTHL16 and B1-2xTH16 crosses were developed by artificial crossing in the laboratory. THL1000 was isolated from a wild rice *Oryza rufipogon*. B1-2 was isolated from cultivated rice, *Oryza sativa*, and TH16 was isolated from barley, *Hordium vulgare*. Eighty eight and two hundred eighty eight haploid progenies were successfully developed from THL1000xTHL16 and B1-2xTH16 crosses respectively. These populations were used to study the arising of new virulence pathotype from the genetic recombination and to identify the genomic location of avirulence (*Avr*) gene that specific to the resistance gene in 10 rice cultivars such as Sariceltik, Jao Hom Nin (JHN), C101TTP, C101PKT, C104PKT, C105TTP, Azucena, CNT1, IR64 and IR57514.

Transgressive segregation for virulence and avirulence characteristics were observed in rice cultivars Azucena, C101TTP, IR64 and IR57514. Two *Avr* loci that are specific to the resistance genes in Sariceltik were mapped on *M. grisea* chromosomes 2 and 4 in the THL1000xTHL16 haploid population. THL1000 contributed both alleles for the avirulence characteristic. Ten *Avr* loci that are specific to the resistance genes in rice cultivars JHN, C101TTP, C101PKT, C104PKT, C105TTP, Azucena, CNT1, IR64 and IR57514 were mapped on chromosomes 1, 2, 4, 6 and 7 in the B1-2xTH16 haploid population. THL16 contributed *Avr* alleles specific to the resistance genes carried by JHN, C101PKT, C104PKT, C105TTP, CNT1, IR64. B1-2 contributed *Avr* alleles specific to the resistance genes carried by Azucena, C101TTP and IR57514.

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Student's signature

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Thesis Advisor's signature