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RUTCHADAPORN SRIPRANG PHYSIOLOGICAL ANALYSIS OF *XANTHOMONAS CAMPESTRIS* PV. *PHASEOLI* IN RESPONSE TO OXIDANTS KILLING AND PHYSIOLOGICAL AND MOLECULAR ANALYSIS OF *HEMK*-LIKE GENE. THESIS ADVISORS : SKORN MONGKOLSUK Ph.D., CHUENCHIT BOONCHIRD Ph.D., JARUNYA NARANGAJAVANA Dr.Agr.Sc. 150 p. ISBN 974-662-089-4

*Xanthomonas campestris* pv. *phaseoli* (*Xp*) defense mechanism against oxidative stresses, such as H<sub>2</sub>O<sub>2</sub>, superoxide radical, hydroxyl radical and combination of these reactive oxygen species was studied. Combination of menadione (MD) and tert butylhydroperoxide (tBOOH) had a synergistic killing effect, whereas combination of MD+H<sub>2</sub>O<sub>2</sub> had an antagonistic effect toward oxidants killing in *Xp*.

*Xp* and *Xp* harboring plasmids which had high level expression of *oxyR*, *katE*, *ohr*, *ahpCF* and *sodA* did not confer protection against killing effects of MD+tBOOH treatment. *Xp* harboring pUFR*oxyR* or pUFR*katE* conferred protection against MD+H<sub>2</sub>O<sub>2</sub> and H<sub>2</sub>O<sub>2</sub>+tBOOH oxidant killing. Exposure of *Xp* to sub-lethal level of MD did not confer protection against deleterious effect of MD+tBOOH. An *Xp* mutant in peroxide regulon (*XpHr*) and stationary phase cells were more resistant to MD+tBOOH killing than wild-type *Xp*.

*Xanthomonas* ability to defend against an electrophilic compound (*N*-ethylmaleimide, NEM) was studied. Plasmids harbored in *Xp* which have high level expression of *oxyR* or *katE* conferred protection against NEM killing. By contrast, *Xp* harbored plasmid with high level expression of *ahpCF* or *ohr* did not protect against NEM killing. The level of resistance correlated with catalase activity.

*Xanthomonas hemK* like gene located upstream of *ahpC* and coded for HemK like protein with a molecular weight about 31 kDa. *hemK* was a single copy gene found in all *Xanthomonas* strains tested. Oxidant pretreatments had no induction effect on the gene. In addition, strains that had high level expression of *oxyR* showed no difference in expression of this gene. The level of expression of *hemK* in various growth phase cells was not different.