

Role of Amino Acid Cysteine in the Suppression of *Xanthomonas citri* pv. *glycines* Bacterial Pustule Disease of Soybean

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ABSTRACT

Bacterial pustule is a major bacterial disease of soybean caused by Xanthomonas citri pv. glycines. The discovery of safety organic compounds that can control plant disease could provide an alternative strategy that may help reduce the pathogen resistance against antibiotics. Thus, the role of amino acids in suppressing the virulence of X. citri pv. glycines 12-2 was investigated. X. citri pv. glycines 12-2 were grown in M9 minimal medium (M9) and rich medium nutrient broth (NB) supplemented with each of 11 amino acids at 10 mM for tested the ability of amino acids to inhibit the growth of the pathogen. Cysteine, serine, and threonine were found to be the most effective amino acids to inhibit the growth of X. citri pv. glycines in M9 minimal medium but only cysteine could significantly inhibit the growth of X. citri pv. glycines in NB. Minimum inhibitory concentration (MIC) value of cysteine in inhibiting the growth of X. citri pv. glycines was 2.5 mM. We demonstrated that a short time exposure of 10 mM cysteine caused a cell death rather than just inhibiting the growth of X. citri pv. glycines 12-2 when determined by live/dead cells staining. Foliar application of cysteine mixed with X. citri pv. glycines on soybean were able to reduce the severity of bacterial pustule on soybean. In addition, glutamic acid and threonine have a protective effect on bacterial pustule disease. The results presented here indicated amino acids cysteine has the potential to be used for managing bacterial pustules of soybean.

Keywords: Soybean, Bacterial pustule, Plant disease control, Amino acids, Antibacterial compounds