

Abstract

Biological Control of Rice Brown Spot by *Bacillus* Spp. in Thailand [†]

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Abstract: Rice brown spot (BS), caused by *Bipolaris oryzae* (Breda de Haan) Shoemaker, is a serious disease causing infection in all growth stages of rice and significantly affect to yield and grain quality losses. This study aimed to find effective antagonistic microorganisms to control BS, hundreds of microbial isolates were obtained from rice paddy fields across Thailand. A total number of 31 antagonistic microbes were selected and screened against *B. oryzae* by dual culture technique. The results showed that CRI_15183 has highly percentage of inhibition (67.35%) followed by ACKB03, CRI_15059, CRI_15010, No.33, CRI_15186 and BUDN027 with 57.25, 54.01, 53.28, 52.94, 52.65 and 51.26%, respectively. Then, sequencing of 16S rDNA confirmed two species of *Bacillus* amongst the isolates, *B. subtilis* and *B. amyloliquefaciens*. Three isolates including CRI_15183, CRI_15186 and ACKB03 were formulated with talcum based powder, stored at room temperature and sampled to test their shelf life monthly. In greenhouse experiment, the results revealed that CRI_15186 has highest effective with 14.08 percent of disease incidence followed by CRI_15183 and ACKB03 with 15.06 and 15.98%, respectively. The field experiments will be conducted in wet season this year. There have been only a few reports on the improvement of rice brown spot control involving biological control agents. However, the use of antagonistic microbes can reduced the used of fungicides and developed environmentally safe for the management of rice brown spot disease.

Keywords: brown spot; *B. amyloliquefaciens*; *B. subtilis*; biological control

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