

報告番号	※	第	号
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主論文の要旨

The study on biological control agents on insect pests and diseases management on rice in Cambodia

論文題目 (カンボジアの水稲病虫害管理における生物的防除に関する研究)

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論文内容の要旨

The main objectives of this study “Management of rice insect pests and disease by Biological Control Agents (BCA) in Cambodia” was to establish the suitable and the sustainable management to insect pests and disease in Cambodian rice fields to ensure the food security and good quality of rice, which is cultivated in over 75% of total crop production in Cambodia. Especially the depression of rice blast disease is the most preferential subject. Study-1: examined the degree to depress the incidence of rice blast using *Trichoderma harzianum* as one of BCA and also the effectiveness of the rice variety CAR14 carrying the resistance against rice blast under field conditions; Study-2: examined the effectiveness of *Beauveria bassiana* and Orange oil extract as one of BCA and botanical pesticide on the population density with correlation between natural enemies and insect pests in rice production; and in Study-3: screened the 2'-deoxyuridine (2DU)-degrading microorganisms which showed antagonistic function to the infection of rice blast fungus producing 2DU as an infection-promoting factor

Study-1: Examine the degree to depress the rice blast incidence using *Trichoderma harzianum*; and investigate the effectiveness of the rice variety CAR14 carrying the resistance against rice blast under field conditions in Cambodia. The *T. harzianum* treatment reduced the incidence of leaf blast and neck blast on IR504 (susceptible variety). A resistant variety (CAR14) effectively showed more resistance against blast disease even without *T. harzianum* treatment and comparing to fungicidal use in farmers' practice.

Study-2: *Beauveria vassiana* and Orange oil extract as bio-pesticide, both contributed to decrease the pest population with adjuvant effect under basic IPM which weed control alone was managed, as a result keeping the population balance between pest insects and natural enemies

Study-3: Identify 2'-deoxyuridine (2DU)-degrading microorganisms that will develop as a candidate of BCA to depress the incidence of rice blast fungus. Samples of Soils and rice plants were collected and enrichment-cultured using 2DU as a carbon source. Conclusively, 80 of 2'-deoxyuridine degrading bacteria (2DUDB) were isolated and classified into four classes and into 15 genera. The 2DUDB isolates from rice plants, belonging to *Burkholderia* was the most abundant as the same as in Japan. The *Burkholderia* spp in Japan could suppress the blast pathogen symptom under laboratory condition, implying that the isolated *Burkholderia* spp in Cambodia was expected that may have the same ability.