Evaluation of the Entomopathogenic Fungal Endophytes as Pest Control Agents

Min-Nan Tseng[1], Yu-Chu Chen[2]

Abstract

A fungal endophyte is an endosymbiont that lives within a plant without causing any apparent disease. Some endophytes isolated from a wide variety of plants have been reported as entomopathogenic fungi. Entomopathogenic fungal endophytes, such as *Beauveria bassiana*, can infect insects and have the potential to be biocontrol agents. *B. bassiana* has been isolated from many plants and was reported as an endophyte for maize in 1930. Researchers thought that it may be possible to inhibit pests by inoculation of maize with fungal entomopathogens. Thus, they started a series of field experiments in 1988. This study applied the *B. bassiana* conidia to whorl-stage maize by foliar application and stem injection. Then they investigated the levels of colonization of *B. bassiana* and the ratio of infected pests (*Ostrinia nubilalis*). The results showed that above 90% of maize were colonized by *B. bassiana* although maize plants had various levels of colonization in their different tissues. Furthermore, the results from their field experiments in 1989 also showed that there is a statistically significant in reducing the density of *Ostrinia nubilalis* by endophytic *B. bassiana*. This study also applied *B. bassiana* conidia to flowering-stage maize to investigate if the plant growth stage influences the colonization of *B. bassiana*. To understand the relationship between the natural inoculum and maize, the researches investigated the effect of different tillage systems on the population density of *B. bassiana* in the soil. In summary, *B. bassiana* can endophytically colonize maize as well as inhibit pests. However, it is unclear if *B. bassiana* can produce mycotoxin in plants and if the accumulation of mycotoxins in plants will be harmful to humans and animals. These questions about public health and safety concerns need to be answered before applying *B. bassiana* in practical applications.

Key words：endophytic fungi, *Beauveria bassiana*, entomopathogenic fungi, *Ostrinia nubilalis*

[1, 2] Assistant Researcher, Associate Researcher and Chief of Crop Environment Section (Corresponding author E-mail: yuchu@mail.kdais.gov.tw), Kaohsiung District Agricultural Research and Extension Station.