Optimized Growth Condition with Cost-Effective Medium Based on Fertilizer and Chitin of *Bacillus Thuringiensis* Kky

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Summary Points

Six different pathogenic fungi were controlled by

***B. thuringiensis* kky**

Cost-effective medium was developed

- Based on fertilizer and crab shell powder

***B. thuringiensis* kky was cultured in various conditions.**

- Different concentrations of NaCl
- Different concentrations of Tryptic soy broth(TSB) and Yeast extract(YE)
- Different temperatures

Cultural characteristics of *B. thuringiensis* kky were determined.

- Colony forming unit(CFU)
- Enzyme producing activities(Chitinase, β,1,3-Glucanase, Protease)
- pH and EC

•Motivation/Introduction

• *Bacillus thuringiensis* is used as the common biological insecticides due to their ability to produce delta-endotoxin which has highly toxic effects on various insect groups.

•Microbial insecticides using *B. thuringiensis* have become one of the alternative ways to chemical pesticides which cause serious side effects on the environment.

•Objectives

• To examine the antifungal activities of *B. thuringiensis* kky against plant-pathogenic fungi

• To investigate the growth condition in cost-effective medium

•To analyze the enzyme producing activities at different temperatures.

•Methodology

• *B. thuringiensis* kky was isolated from soil

• Antifungal activities of *B. thuringiensis* kky against six different plant pathogenic fungi were done by dual culture assay.

• The cost-effective medium, Black-White medium(BW medium) was developed by using fertilizer, power chitin and crab shell powder.

• The growth conditions of *B. thuringiensis* kky was studied in various concentrations of NaCl, Tryptic soy broth(TSB) with Yeast extract(YE), respectively.

• Also, at 30°C and 40°C, the growth rate by colony forming unit(CFU), the activities of three different enzyme(Chitinase, β,1,3-glucanase, Protease) and change of pH, EC were investigated.

•Results

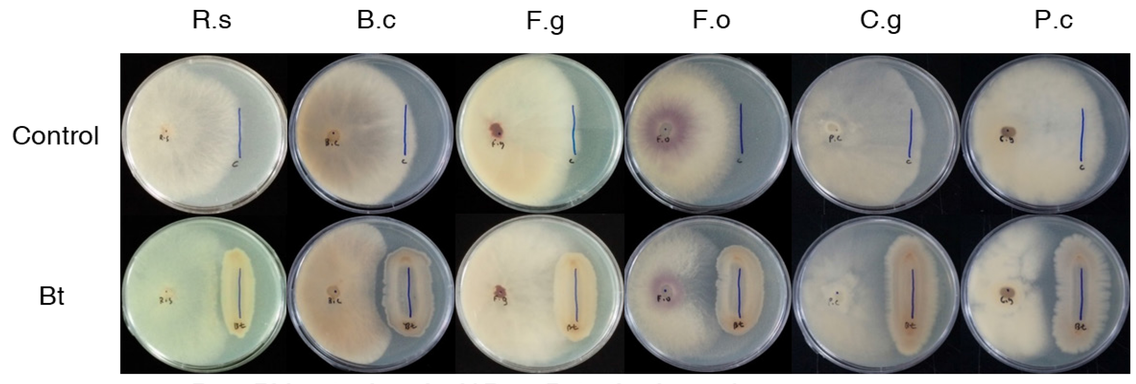

Fig 1. Growth inhibitory effect of *B. thuringiensis* kky on various plant-pathogenic fungi

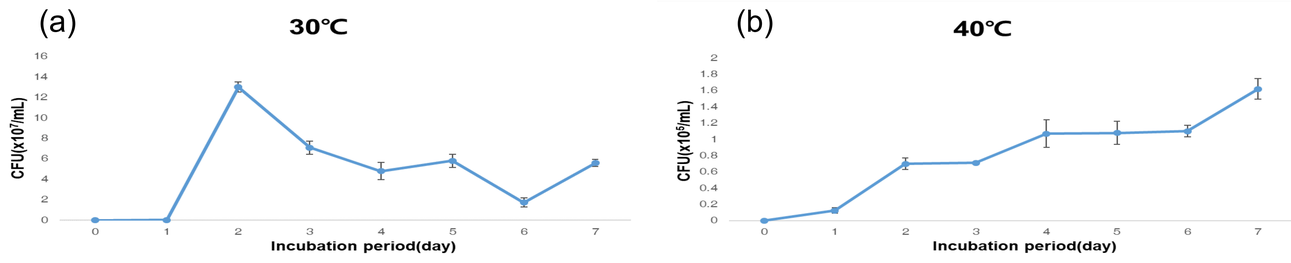

Fig 2. Effect of temperature on the growth rate by CFUs of *B. thuringiensis* kky (a) 30°C (b) 40°C

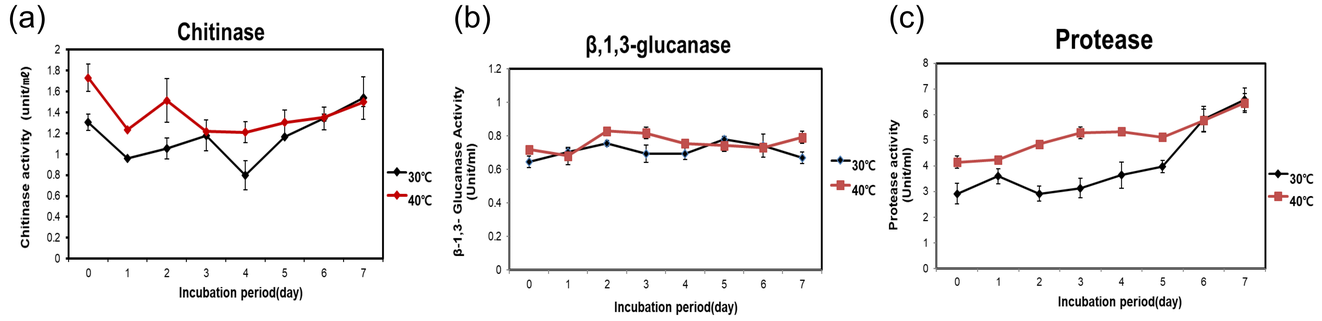

Fig 3. Enzyme producing activities of *B. thuringiensis* kky at different temperatures (a) Chitinase (b) β,1,3-Glucanase (c) Protease

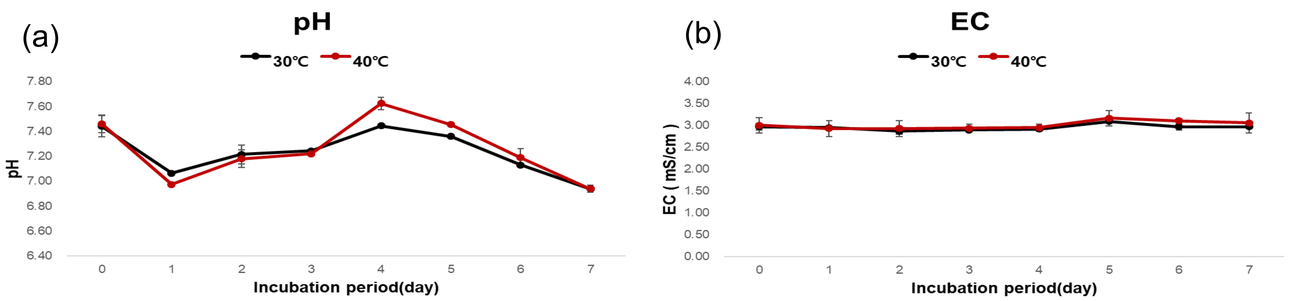

Fig 4. Change of pH and EC contents of *B. thuringiensis* kky at different temperatures (a) pH (b) EC

•**Conclusion.** This study revealed that the culture of *B. thuringiensis* KKY in the cost-effective medium at 30°C for 2 days can be used for agricultural pest control.

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