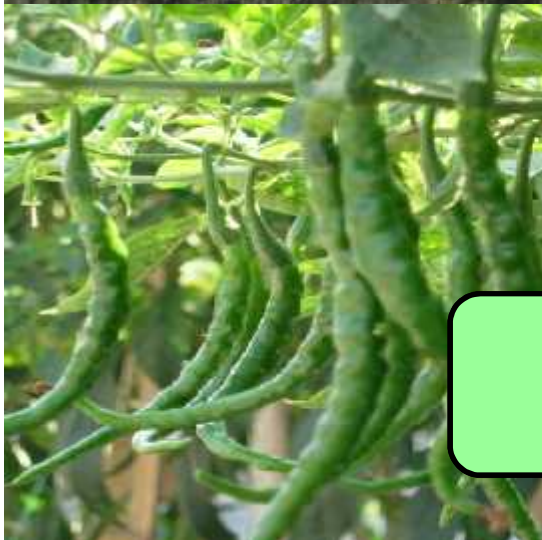




# Effects of Endophytic fungi *Beauveria bassiana* on Seed Germination and Seedling Growth of Chili

TRIZELIA  
REFLINALDON  
MARTINIUS  
YENNY LISWARNI  
FADLY SYAHIRWAN PUTRA

AGRICULTURE FAKULTY  
ANDALAS UNIVERSITY PADANG



# INTRODUCTION



*Beauveria  
bassiana*

ENTOMOPATHOGEN

- *Beauveria bassiana* is an entomopathogenic fungus with worldwide distribution,
- It has been used to control several insect pests

ENDOPHYTIC

- It can live as a plant endophyte and usually does not cause visible damage to the host
- It has been naturally isolated from several plant species, and artificially introduced into many others, such as tomato, cacao, wheat, chili

GROWTH PROMOTERS

- To date, this fungus also has been used as plant growth promoting agents and very few studies have demonstrated the ability of fungal entomopathogens to improve plant growth following their endophytic colonization of plant.

## ENTOMOPATHOGEN



- Entomopathogenic fungi, *B. bassiana* have been use to control several insect pest :
- *Spodoptera litura*
- *Plutella xylostella*
- *Crocidlomia pavonana*,
- *Nezara viridula*,
- *Spodoptera exigua*
- mortality of insect pest up to 100%



# ENDOPHYTIC



- This fungi can live as a plant endophyte occur naturally in different plant species.
- Others have been artificially introduced into plants by different inoculation techniques, such as foliar spray, stem injection, root and seed immersion, and soil drenching

# GROWTH PROMOTERS



- Recently, many studies have demonstrated that *B. bassiana* are able to play a wider role in nature than previously thought, for example, as promoters of plant growth through the increasing of root length, dry and wet weight, foliar area, seed germination, plant height, yield

## Purpose of research

The objectives of this experiment were to evaluate effects of seed treatment using local isolates of *B. bassiana* on seed germination and seedling growth of chili.

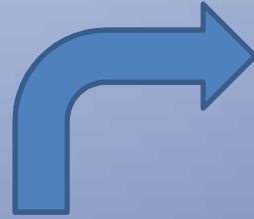
# MATERIALS AND METHODS



## *Plant inoculation with fungal entomopathogens*

- ❑ Prior to use, seeds of chili (local variety-Padang) were surface-sterilized by soaking in 1% sodium hypochlorite (NaOCl) for two minutes followed by soaking in 70% ethanol for two minutes, and finally rinsing in sterile distilled water three times.
- ❑ 25 seeds soaked in the conidial suspension of each fungal strain or in sterile distilled water containing 0.1% Tween 80 (control treatment) for 6 hours were placed on 9 cm Petri dishes lined with sterile moist filter paper. Sterile water was added as needed to keep the filter paper moist. eight replicate dishes were prepared for each treatment and the Petri dishes were kept in the dark at 20 °C for a week. A total of 200 seeds were used per treatment. The total germination percentage were recorded seven days post inoculation.
- ❑ To examine effects of increased seed treatment duration on additional plant growth parameters, inoculated or control seeds were planted in disinfected pots containing sterile planting substrate. The planting substrate was sterilized by autoclaving at 121 °C for 2 h and allowed to cool for 24 h prior to potting. Two seeds were sowed per pot. Plants were watered with sterile distilled water as needed, and were not fertilized throughout the experiments. Percent seedling emergence was measured seven days post inoculation. Plant height (the distance from plant base to the tip of the stem), were measured 28 days post inoculation.





# RESULTS



Treatment	Seed Germination (%)		
	4 dai	5 dai	6 dai
APKo	95,50 a	98,50 a	99,50 a
P114	88,00 a	92,50 b	92,50 b
TD312	73.50 b	98,00 a	100,0 a
Control	47,50 c	68,50 c	91,50 b

Treatment	Radicle length (cm)	Plumule length (cm)
P114	2,74 b	2,89 a
TD312	2,99 ab	3,11 a
APKo	3,32 a	3,22 a
Control	1,07 c	1,12 b

## Seedling emergence

Treatment	Seedling emergence (%)
TD312	91,00 a
APKo	89,00 a
P114	87,00 a
Control	69,00 b

## Seedling height

Perlakuan	Seedling height (cm) $\pm$ SD
TD312	7,24 $\pm$ 1,06 a
APKo	6,08 $\pm$ 0,79 b
P114	4,96 $\pm$ 0,5 c
Control	4,88 $\pm$ 0,51 c



Control

APKo



P114

TD312



## Leaf numbers/plant

Treatment	Leaf numbers/plant $\pm$ SD
TD312	6,20 $\pm$ 0,89 a
APKo	5,60 $\pm$ 0,54 ab
Control	5,20 $\pm$ 0,44 b
P114	5,20 $\pm$ 0,44 b

## Root length

Treatment	Root length (cm) $\pm$ SD
TD312	6,64 $\pm$ 0,9 a
APKo	6,12 $\pm$ 2,1 ab
P114	6,08 $\pm$ 1,2 ab
Control	4,76 $\pm$ 0,5 b

# CONCLUSIONS

- seed treatments using *B. bassiana* significantly increased viability of the treated chili seeds (percentage of increases as compared to untreated seeds in seed germination - up to 9.29%) and accelerate seed germination.
- Application of *B. bassiana* on chili seeds can also increase seedling growth
- Among three isolates of *B. bassiana*, *B. bassiana* TD312 gave the highest germination percentage and seedling growth of chili

# ACKNOWLEDGMENT

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A large, dense pile of bright red chili peppers, likely bird's eye chilies, filling the frame. The peppers are piled high, with some green stems visible. In the center, a white rectangular box contains the text 'THANK YOU' in a bold, black, serif font. The text is slightly shadowed, giving it a 3D appearance as if it's floating above the peppers.

**THANK YOU**