ASAHI GLASS FOUNDATION

LEMBAGA PENELITIAN DAN
PENGABDIAN KEPADA MASYARAKAT

INSTITUT TEKNOLOGI BANDUNG

Integrated Pest Management :

Effects of Plant Biopesticides and Entomopathogenic Fungi Combinations to Insect Pest Anatomy Damage and Their Immune Proteins Content

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Introduction

- Problems in insect resistance to chemical insecticide
- Insects become stronger and needs more chemical insecticide to kill them
- Insect inherited their resistance character to their offsprings
- Environment received more polluted chemical

Introduction

- Integrated Pest Management (IPM) : combinations of biological, chemical, and cultural methods to control pests
- Our group in ITB, focusing research in biological methods in order to contibute for IPM strategy.

- Botanical insecticide is a bioinsecticide made from part of plant, which can control the insect pest (Gokce *et al*., 2010; Kumar *et al*. 2010).

Introduction

- Progress with *Mirabilis jalapa* plant (Yusanti, 2009; Anggraeni *et al*., 2010; Dwisyanjani, 2011) showed that, although *M. jalapa* bioinsecticide was not directly kill the insect, their physiology was affected :

✓ Reducing the number of F1 and F2 generation and

✓ Repelling the parental to put their eggs on *M. jalapa* bioinsecticide's pre-coated leaf.

Introduction

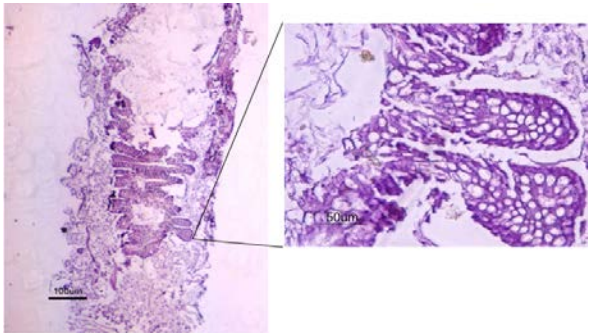
- In 2012, our research focused is on the applying the combination of *M. jalapa* bioinsecticide and entomopathogen to insect pest.
- The result showed that the insect's cellular immune system was not affected (Maulina and Anggraeni, 2012), but on the other hand, the insect's humoral immune system was affected (Suryani and Anggraeni, 2012). More than that, this combination will increase the number of insect killed (Suryani and Anggraeni, 2012).

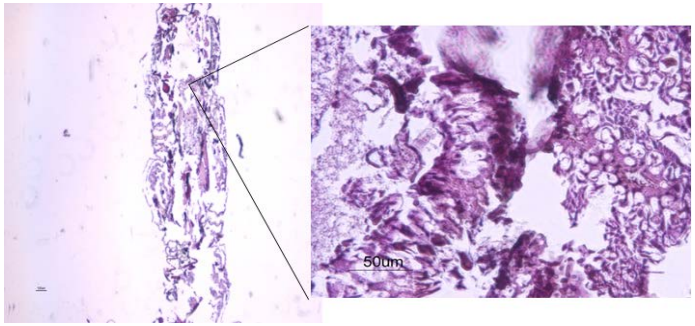
Aims of Research

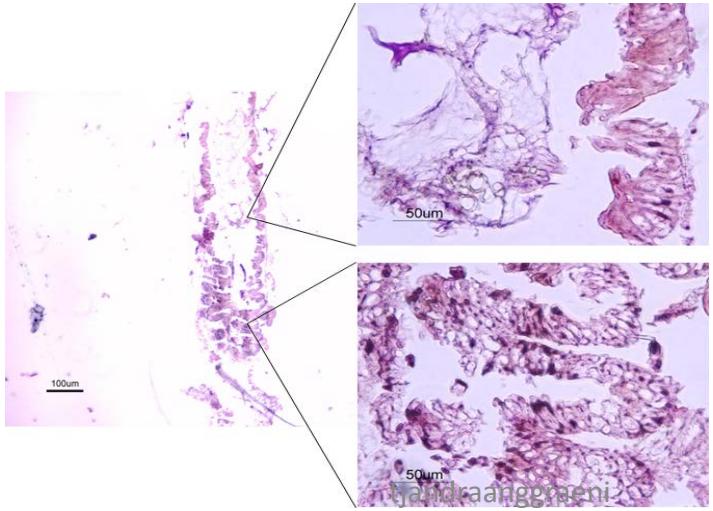
In order to continue our study in applying of the combination of *M. jalapa* bioinsecticide with entomopathogen to insect pest, we used *Beauveria bassiana* fungi as an entomopathogen and *Crocidolomia binotalis* an insect model. The aims of the research were :

- To examine the anatomy damage from time to time
- To analyse the inducible immune protein from time to time

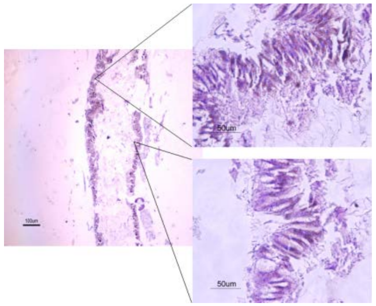
Results : Anatomy Damage (24 h)

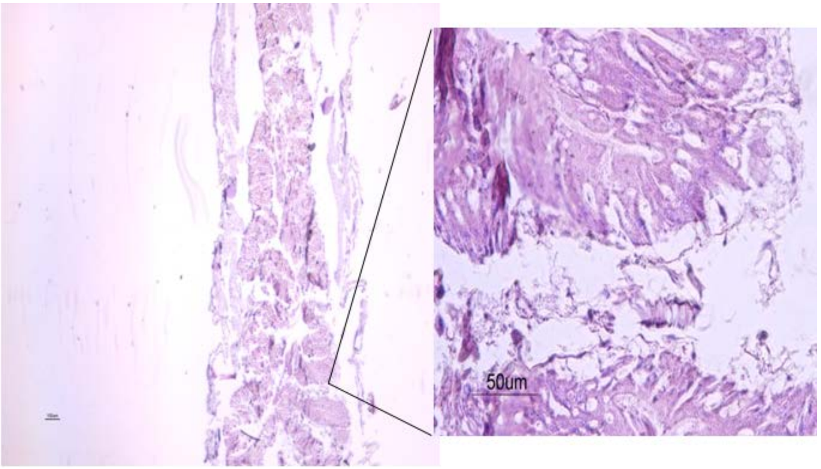


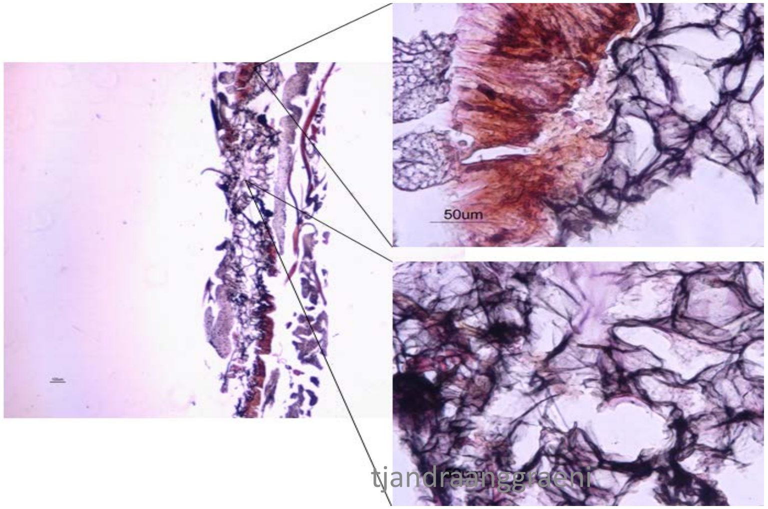




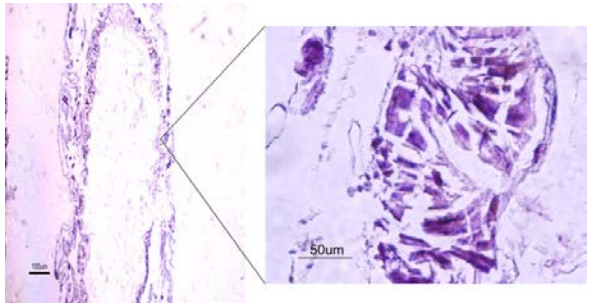
Results Anatomy Damage (48h)

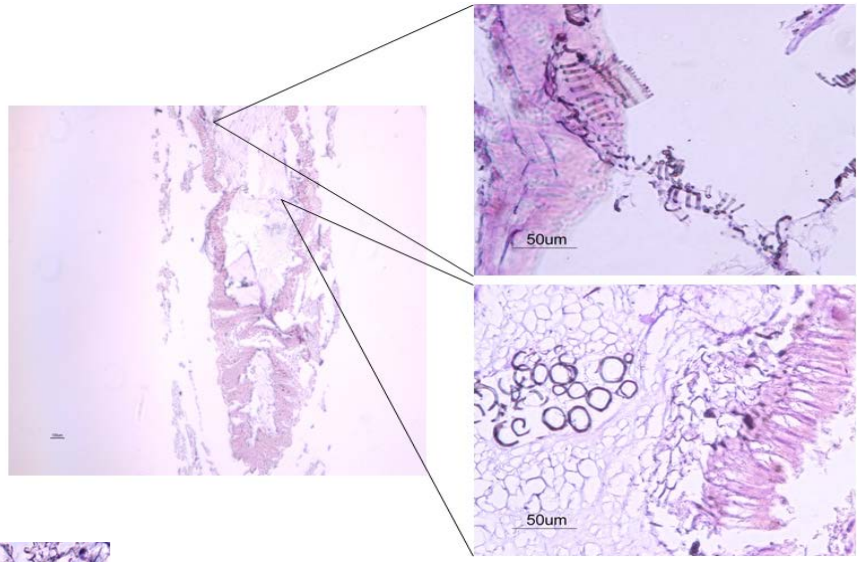


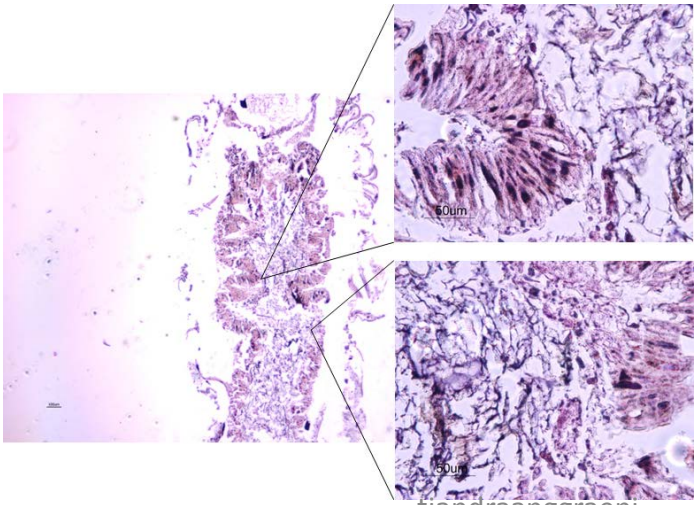




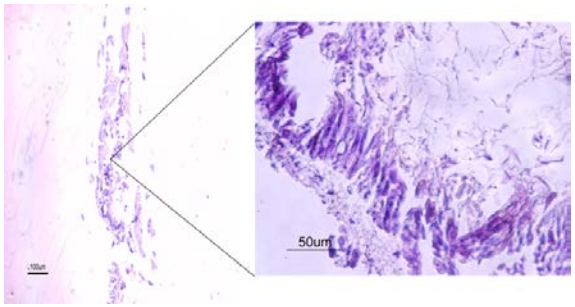
Results Anatomy Damage (72h)

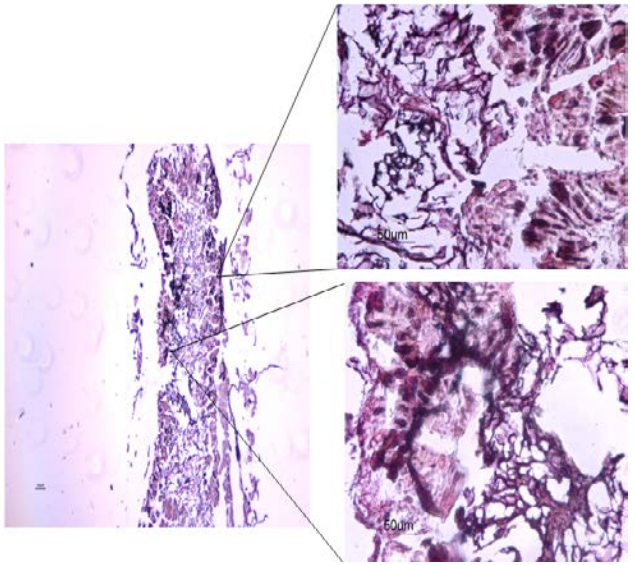


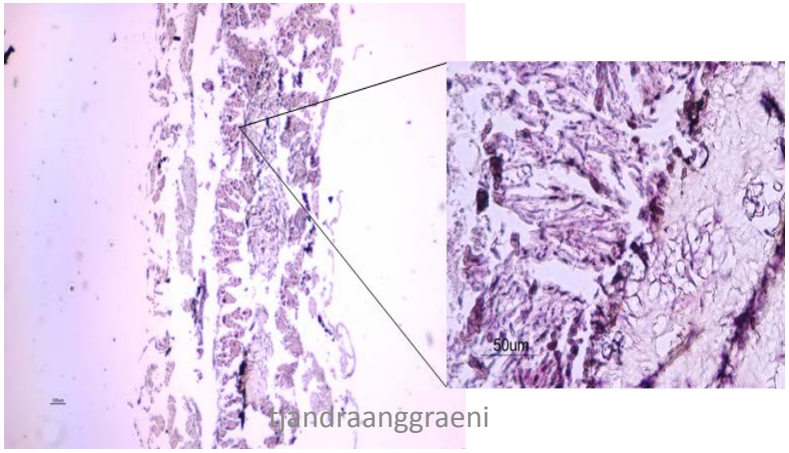




Results Anatomy Damage (96h)





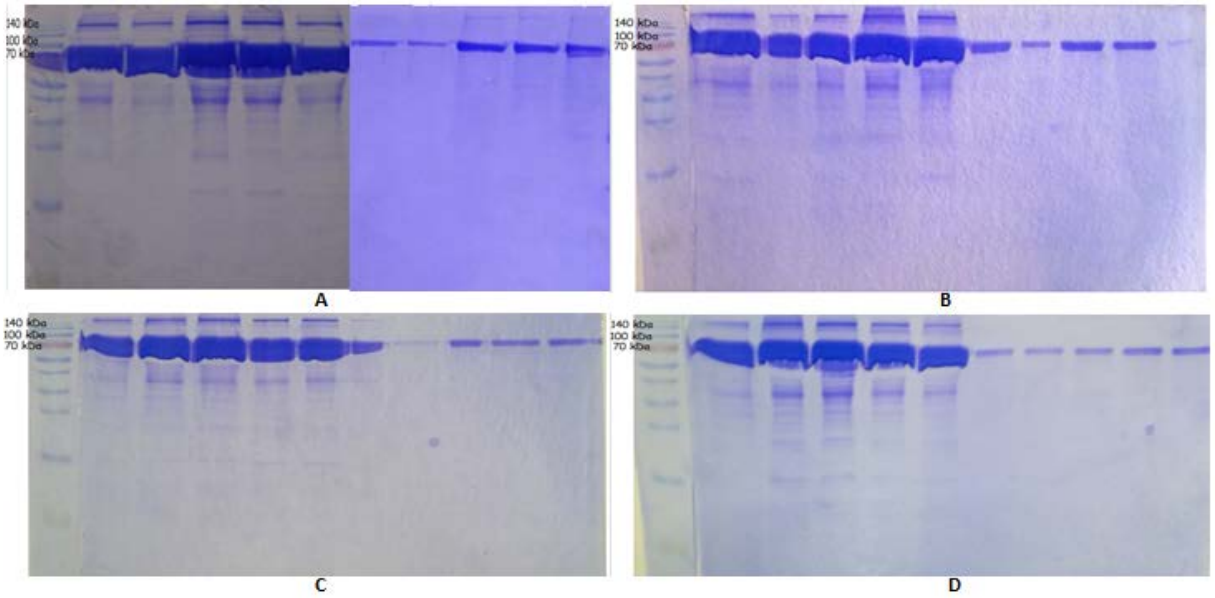


Results Anatomy Damage

The hypha and the mycellium of *B. bassiana* have grown inside the insect body and cause insect's dead.

Applying *M. jalapa* biopesticide before *B. bassiana* cause *B. bassiana* grow slower.

Results : The Inducible Immune Protein

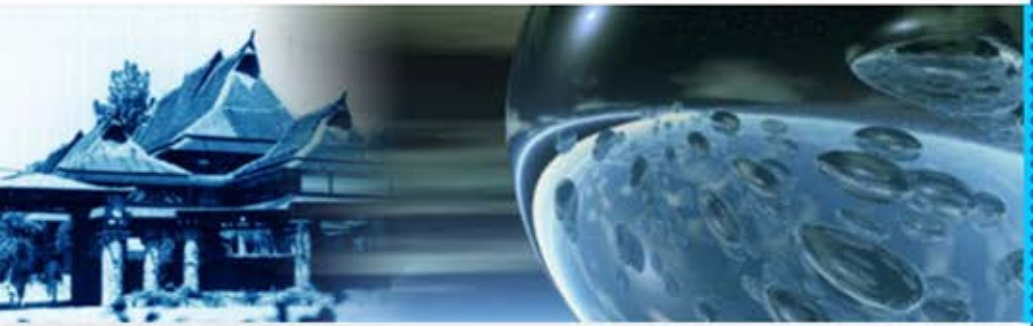


Results : Inducible Immune Protein

- Inducible immune protein has molecullar weight of 70-140 kDa with more protein in the supernatant compare to the pellet.
- The inducible immune protein has only appear clearly within 6 hour. This result was also support by agglutination test

Conclusion

- The insect's anatomy damage was greater in entomopathogenic fungi treatment compare to that in the combinations of *M. jalapa* bioinsecticide and entomopathogenic fungi treatment
- Inducible immune protein has molecullar weight of 70-140 kDa and has only appear clearly within 6 hour.



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Thank you

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