

Activity of Fungal Entomopathogens against Pineapple Pink Mealy Bug [*Dysmicoccus brevipes* (Cockerell) (Hemiptera: Pseudococcidae)]

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ABSTRACT

Entomopathogenic fungi (EPF) are promising biological control agents against pink pineapple mealybug (PPMB), *Dysmicoccus brevipes* (Cockerell) (Hemiptera: Pseudococcidae), an important insect pest of pineapple. Three EPFs, namely, *Metarhizium anisopliae*, *Beauveria* sp., and *Lecanicillium lecanii*, were tested against PPMB crawlers and adults in a laboratory. Methods of EPF application were direct spraying on insects and pineapple leaf and dipping with a single dosage of a 1 mL suspension of 1×10^8 spores/mL. Mortality rates were determined at 1 to 10 days after treatment (DAT). The results indicated that the three EPFs showed pathogenicity against the PPMB at varying degrees. At 10 DAT, a 100% mortality rate was observed for the treatment of *M. anisopliae* on all application methods and PPMB stages, followed by *L. lecanii* (55.91%) and *Beauveria* sp. (27.98 %). No significant difference in the percentage of infection was observed between PPMB crawlers and adults. Moreover, a slightly higher percentage of infection was observed in the spraying of the conidial suspension at 1×10^8 but this was not statistically significant compared to the leaf dipping method. This study suggests that among the EPFs used, *M. anisopliae* has the potential to be used as a biological control against PPMB.

INTRODUCTION

Pineapple (*Ananas comosus*) is a key Philippine crop, especially the 'Queen' variety in Leyte, Philippines. The pink pineapple mealybug (*Dysmicoccus brevipes*) causes severe crop losses and transmits mealybug wilt virus. Chemical control poses risks; hence, this study evaluated three entomopathogenic fungi (EPFs) *Metarhizium anisopliae*, *Beauveria* sp., and *Lecanicillium lecanii* as biocontrol agents under laboratory conditions.

OBJECTIVES

To evaluate the pathogenicity of three entomopathogenic fungal isolates against pink pineapple mealybugs crawler and adult under laboratory condition

MATERIALS & METHOD



Figure 1. Mass production of PPMB reared in alternate host plant, kalabocha squash

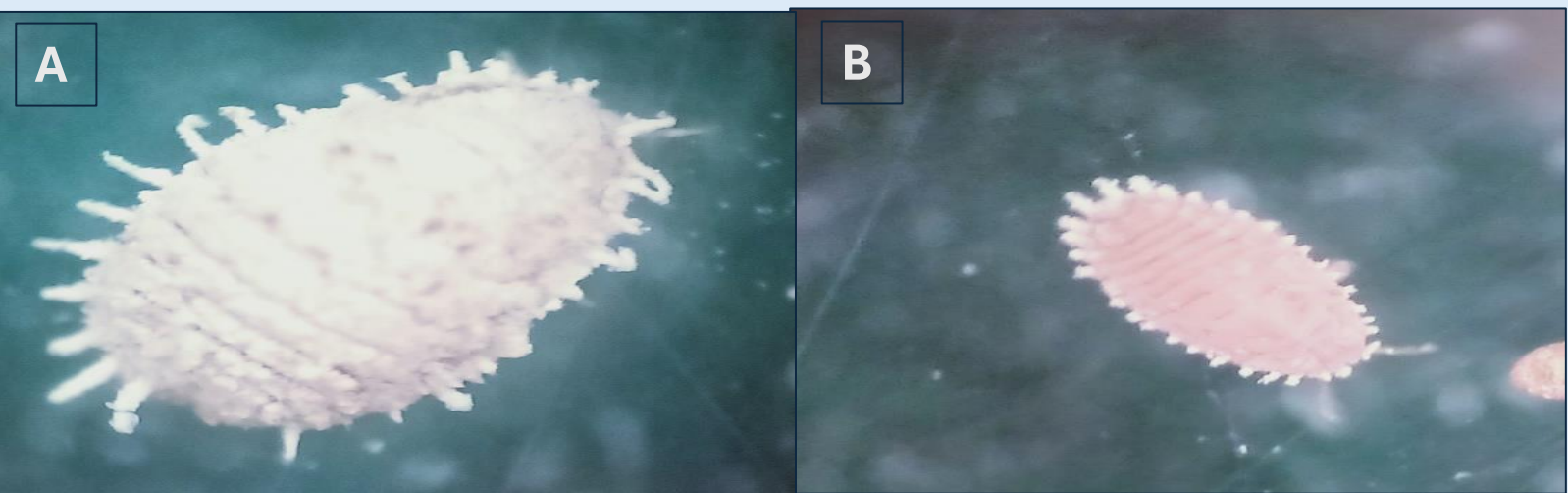


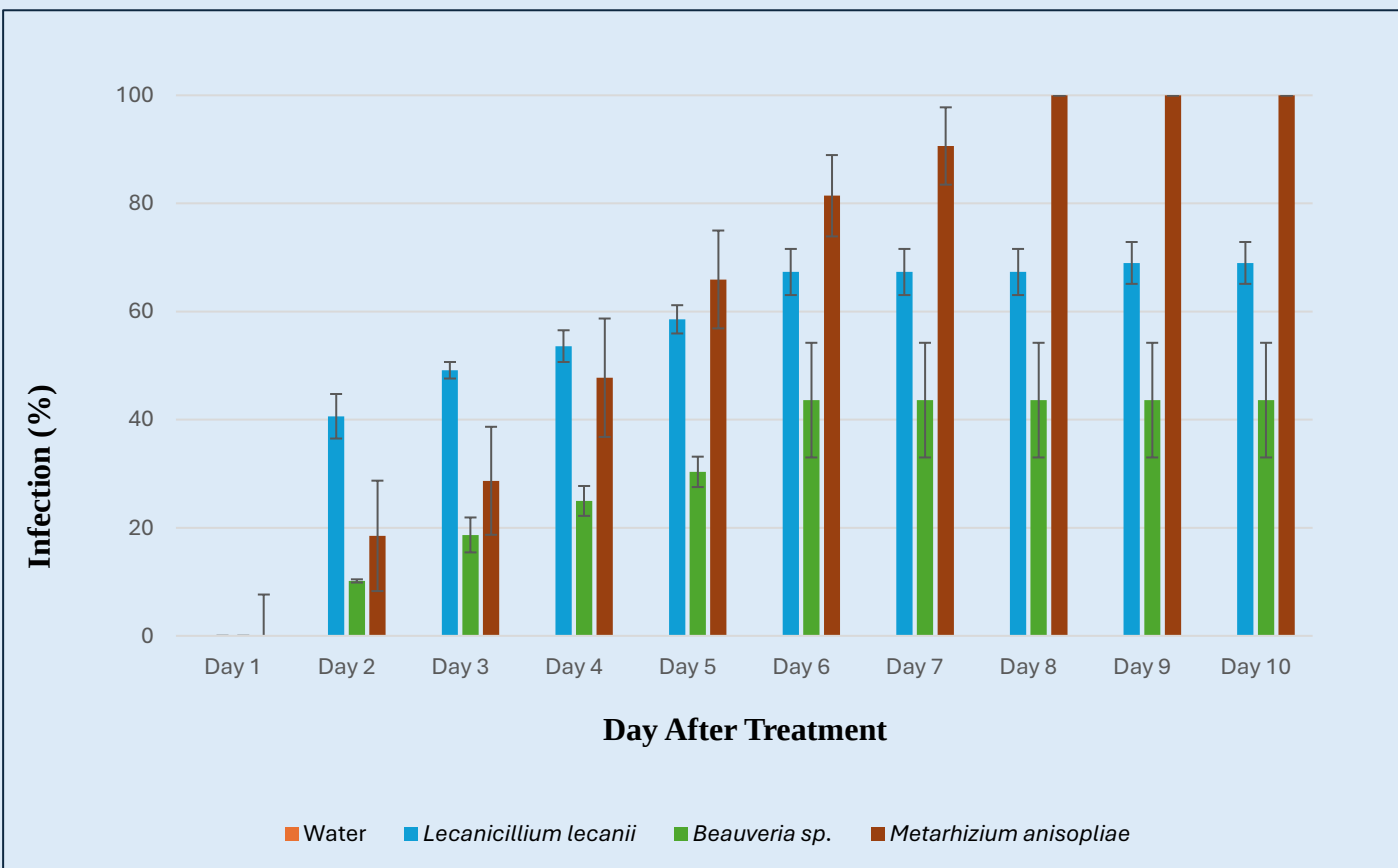
Figure 2. Pink pineapple mealybug developmental stages used in laboratory bioassay A) Adult stage B) crawler (2nd instar)

- EPFs: *M. anisopliae*, *Beauveria* sp., and *L. lecanii*
- Spore concentration: 1×10^8 spores/mL
- Application methods: Direct spraying and pineapple leaf dipping
- Stages tested: Crawler and adult
- Design: RCBD (2x2x4 factorial), 3 replicates
- Parameter: % infection (1–10 days after treatment)

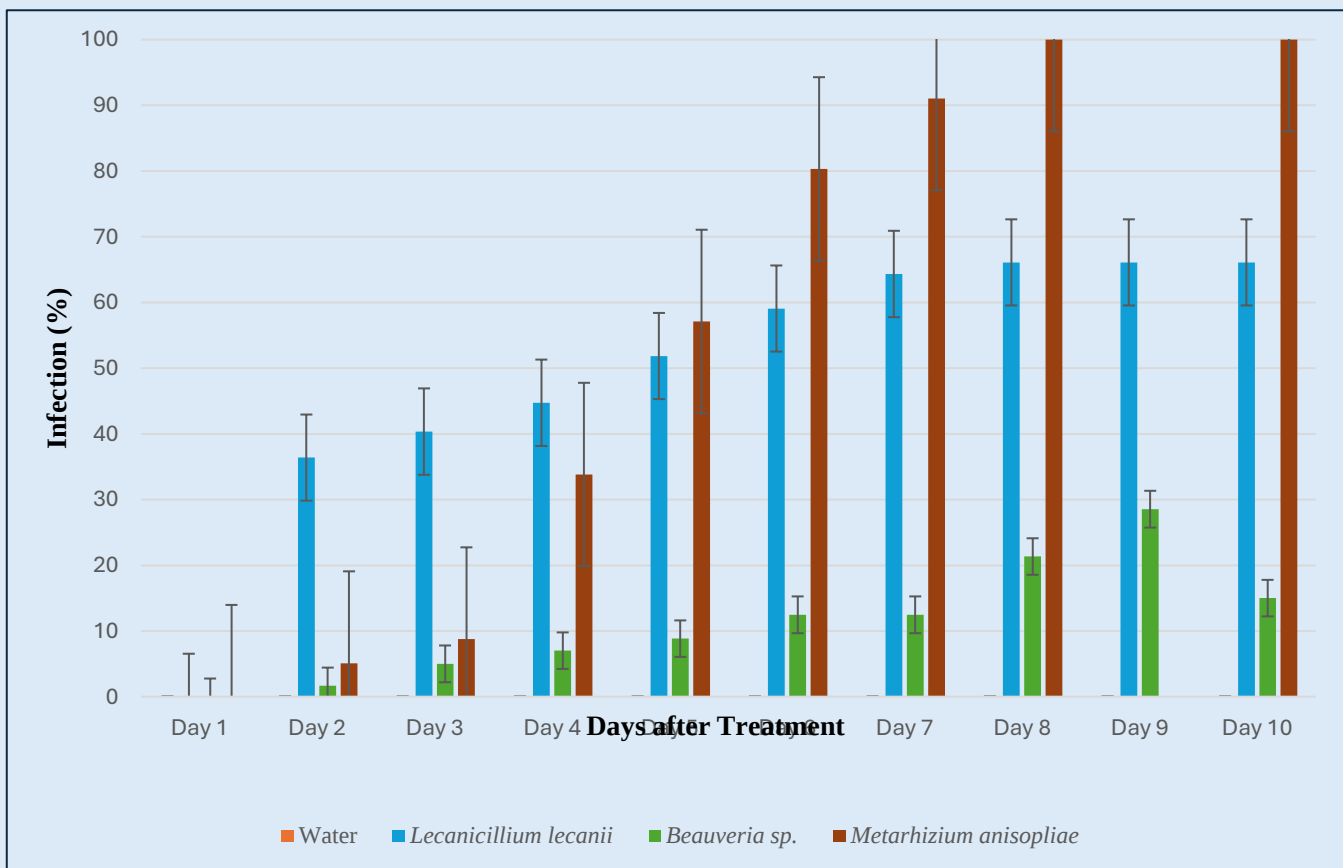
CONCLUSION & RECOMMENDATION

M. anisopliae is the most effective EPF against pink pineapple mealybug. No significant difference was found between crawler and adult stages and between application methods. Field validation and non-target safety tests are recommended for future integration into biological pest management programs.

RESULTS AND DISCUSSIONS

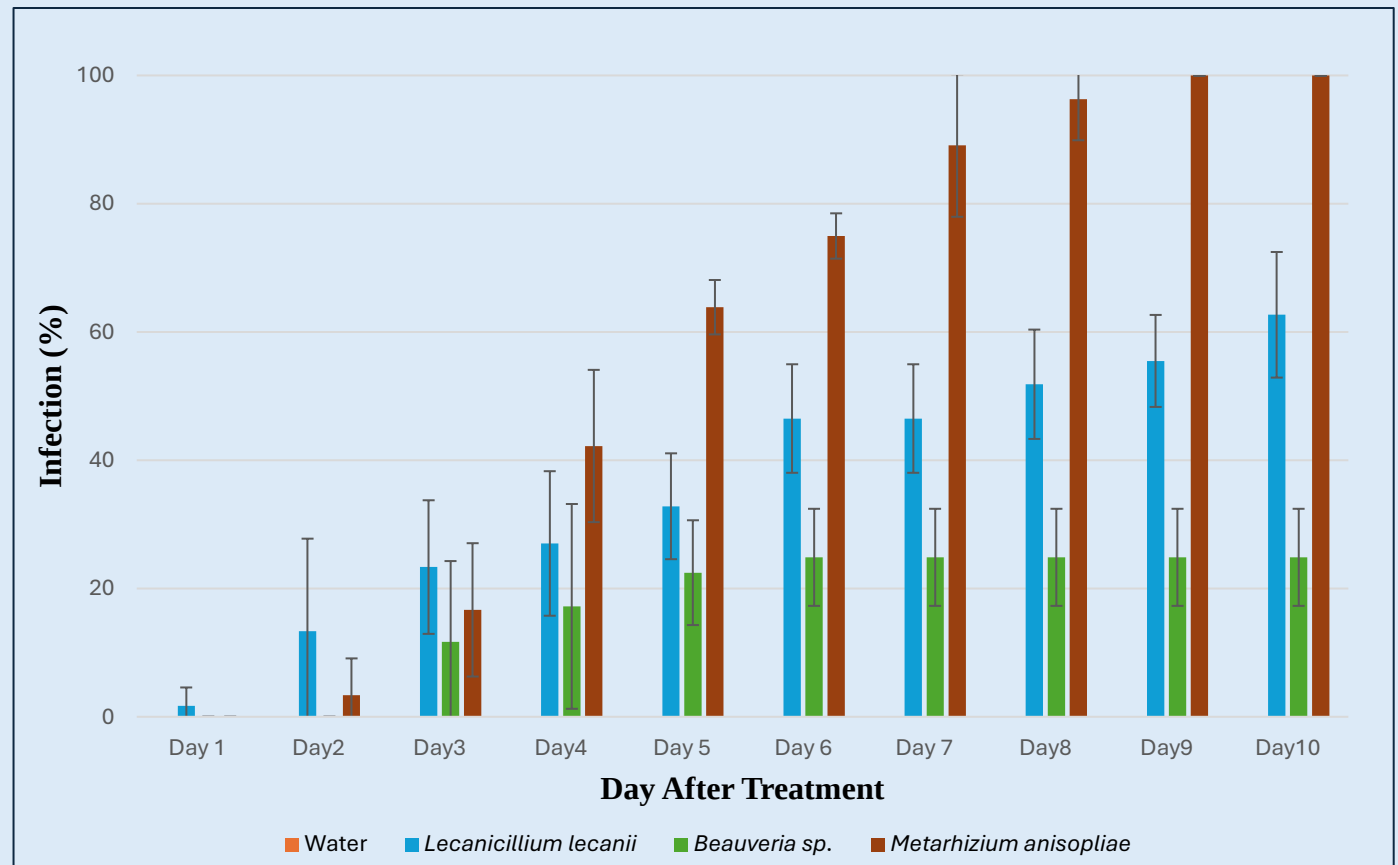


A

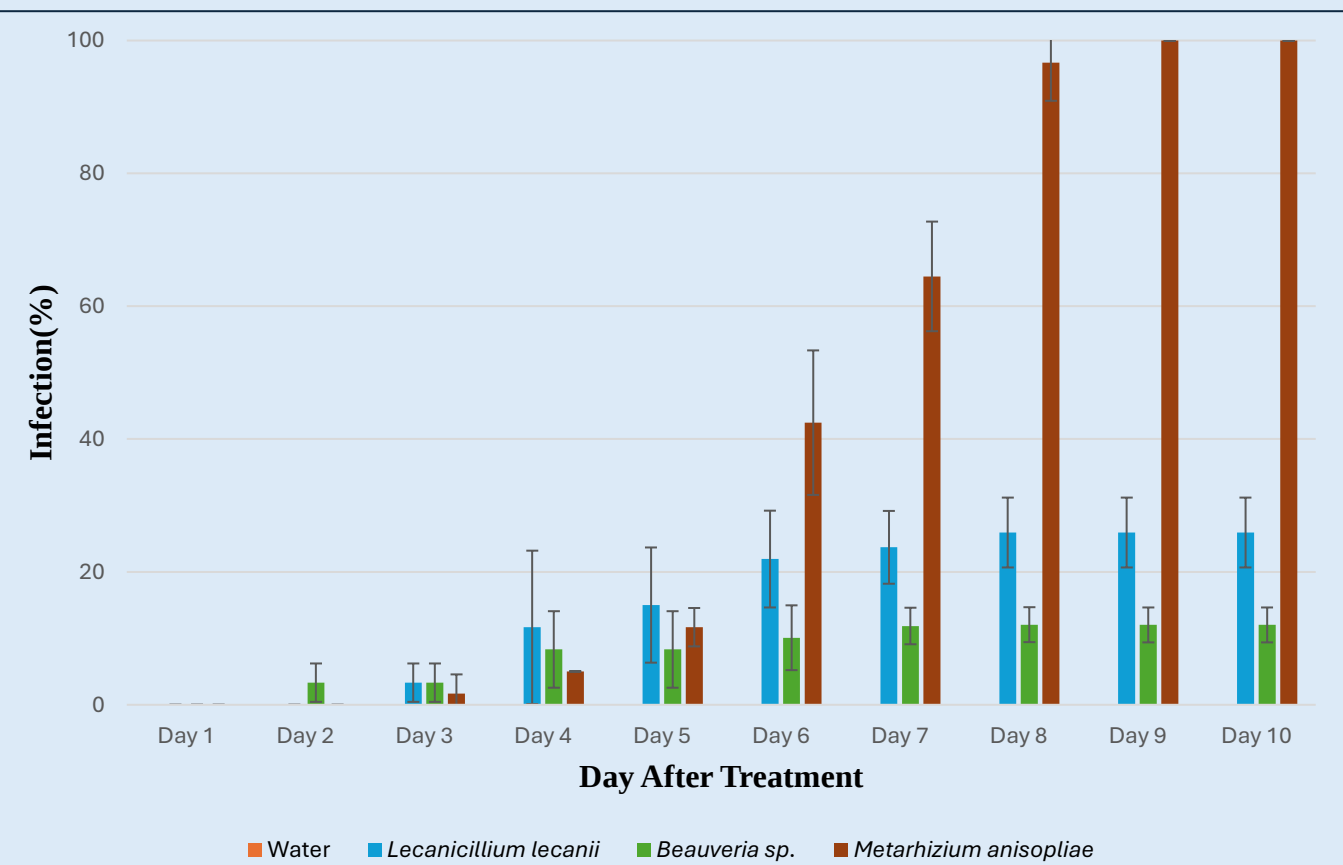


B

Figure 3. Cumulative mean infection rate (%) of PPMB by EPFs at 1-10 DAT with direct spraying method. A) crawler, B) adult



A



B

Figure 4. Cumulative mean infection rate (%) of PPMB by EPFs at 1-10 DAT with dipping method. A) crawler, B) adult

The results show that *Metarhizium anisopliae* consistently caused the highest infection (approaching 100% by 8–10 DAT) across both crawler and adult stages, regardless of application method. *Lecanicillium lecanii* produced moderate infection (55–65%), while *Beauveria* sp. showed the lowest infection levels. No mortality occurred in the water control. These trends indicate the superior virulence and potential field applicability of *M. anisopliae* for managing *D. brevipes*.

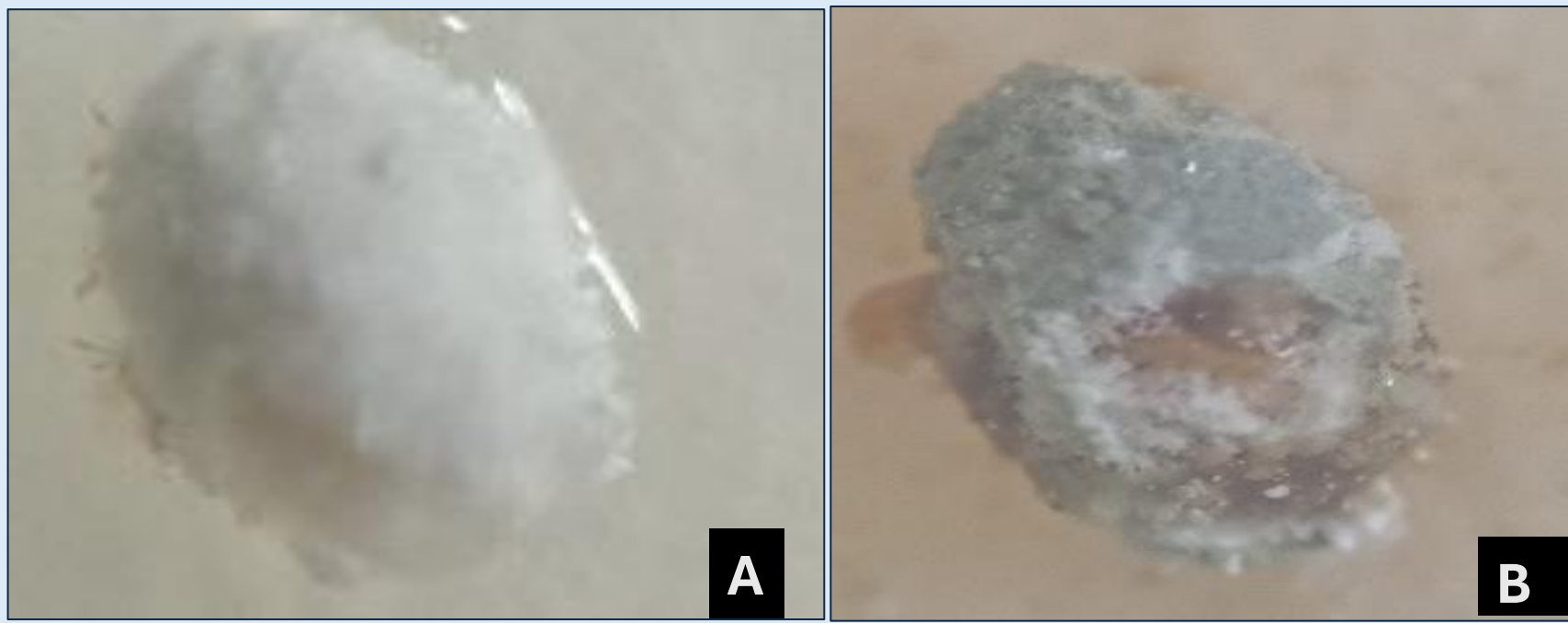


Figure 5. Mycelial growth of *Metarhizium anisopliae* on PPMB; A) *M. anisopliae* 2-3 days after death, note the powdery mycelial growth covering the entire PPMB, B) *M. anisopliae* (4-5 days after death) note the green powdery mycelial growth

ACKNOWLEDGEMENT



REFERENCES

