

# Entomopathogenic Fungi

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York County Mosquito Control

# What Is It?

- ◆ Entomopathogenic fungi are microorganisms that often infect insects and are fatal.
- ◆ Most are non-toxic to humans and do not harm plants.
- ◆ A method used by nature to regulate insect populations, but not at consistent enough rates to cause heavy population loss.
- ◆ A possible alternative to chemical based pest control management methods.



# How Does It Work?

- ◆ Infection begins with a contact action, in which the spores of the fungus attach itself to the insect's cuticle.
- ◆ Once attached, and under the right conditions, the spores begin to germinate.
- ◆ Sticky, specialized cells known as appressoria begin to form around segmented parts of the insect, starting the process of penetrating the host's exoskeleton through the formation of hyphae.
- ◆ Once the fungus has entered the insect's body cavity, the hyphae continue to spread throughout the host and begin releasing toxins causing paralysis and nutrient depletion, ultimately leading to the insect's death.



# What Did We Find?

- ◆ During two separate trapping events at one of our sites, we came across three *Cx. pipiens* covered in an odd clear spherical fungus.
- ◆ After further research, we learned that what we may have found was a type of Entomopathogenic fungus.
- ◆ This site is located near a neighborhood cul-de-sac with a curb and gutter storm water system. The smaller circle indicates a drop inlet that we believe they are coming from due to its heavy shade and debris keeping the humidity levels consistent. This is an ideal habitat for pip/res.
- ◆ The larger circle indicates our trap locations.





# Can We Use It As Part Of IPM?

- ◇ Currently used by farmers in an attempt to protect their crops.
- ◇ Underutilized and underestimated method of pest management due to lack of knowledge and research on its applications and effectiveness towards mosquito populations.
- ◇ With an increase in pesticide resistance, a new biological method may be able to help.
- ◇ Shows a lot of promise when used in conjunction with other biological or chemical methods.
- ◇ When used under the right conditions, it could be used in storm drain systems where bacterial or chemical pesticides may be problematic.
- ◇ With further research, Entomopathogenic fungi could become an integral part of your Integrated Pest Management program.

# Are There Any Possible Issues?

- ◆ There are many possible issues facing the use of Entomopathogenic fungi as a means of biological pest control. One being using the right fungi that is most effective against the insect you're targeting.
- ◆ Issues such as correct humidity levels, proper application to the surface you are trying to use, the limited shelf life of fungi cultures, and the initial and recurring costs of implementing a program involving the use of EPF.
- ◆ Federal restrictions on the use of fungi near running water could become more strict if it becomes a more popular method.
- ◆ Will need to educate the public on the use and safety of a new biological pesticide.



# Recent Studies

- ◆ Found a few studies and field experiments using EPF as a means of managing mosquito populations. Most of which show promising success.
- ◆ One particular study in Coachella Valley, California stuck out due to its use of EPF in underground storm water systems to manage *Culex* populations.
- ◆ If you are interested in any of the studies or articles I have found please feel free to email me!





# Future Plans

- ◇ We are going to continue monitoring this particular trap site next season.
- ◇ Possibly adding another trap closer to the drop inlet to see if we can find anymore infected mosquitoes.
- ◇ If we can get our hands on an aspirator, we can use it in the storm drain system in the area to see what we catch.

Thank  
You!