

# THEY GROW UP SO FAST!

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SUFFOLK'S USAGE OF INCUBATORS  
FOR LARVAL AND ADULT REARING

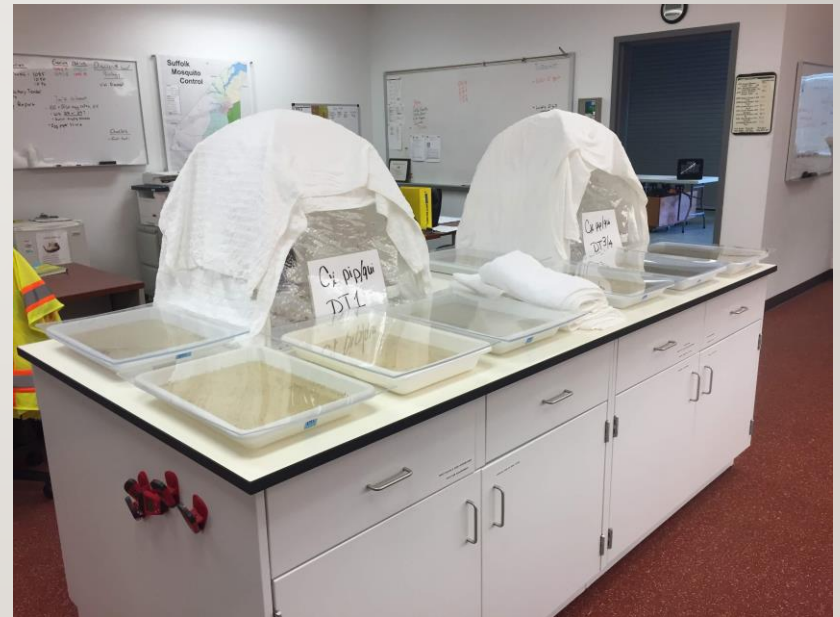
BY JAY KISER

WITH SUFFOLK MOSQUITO CONTROL

# ISSUES BEFORE THE INCUBATORS

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- Growing mosquitoes in the office:
  - Fluctuations of AC and heating
  - Inconsistent humidity
  - No supervision over weekends



# ISSUES BEFORE THE INCUBATORS

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- Growing mosquitoes in the office:
  - Mass death of adult mosquitoes after 3-5 days
    - What was causing this?



# ISSUES BEFORE THE INCUBATORS

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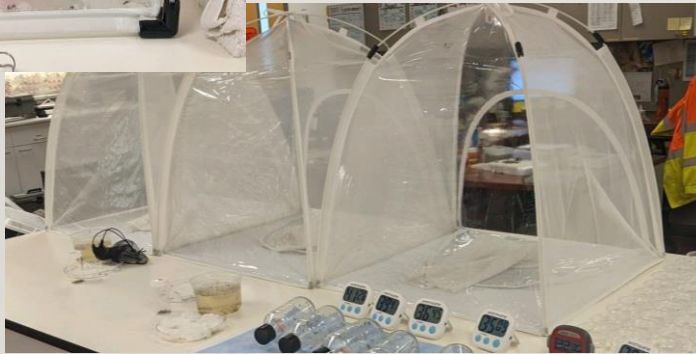
- Growing mosquitoes in the office:
  - Death in our control bottles
    - Mostly *Culex pipiens*
    - Sometimes *Aedes albopictus*





# STEPS TAKEN TO FIX THE ISSUES

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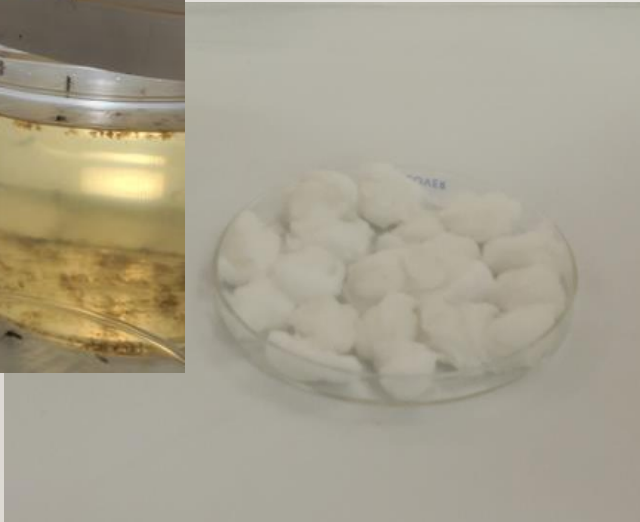


2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Dorm shape and size
  - Small cubes had better survival

# STEPS TAKEN TO FIX THE ISSUES

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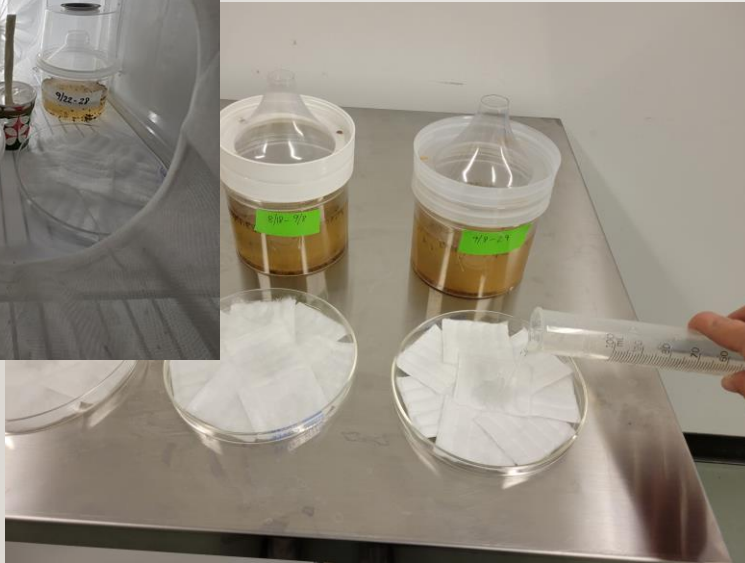


2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Sugar feeding method
    - Wicking cup lasted longer

# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Added water
    - Seemed helpful, but no major difference



# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Number of rafts per tray
    - 5-7 rafts
    - No significant different in health





# STEPS TAKEN TO FIX THE ISSUES

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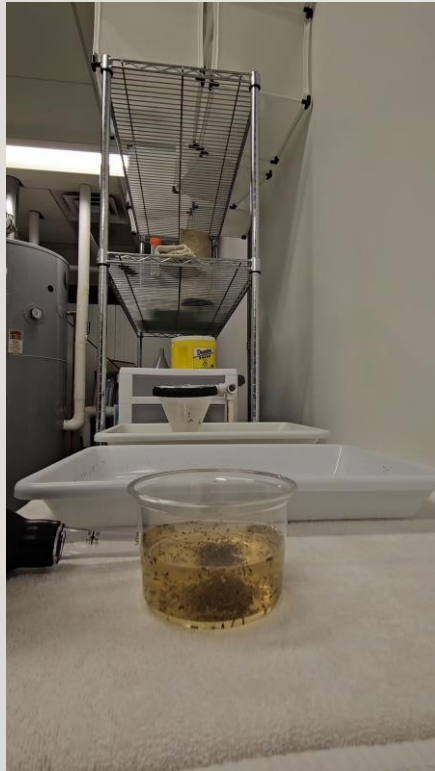
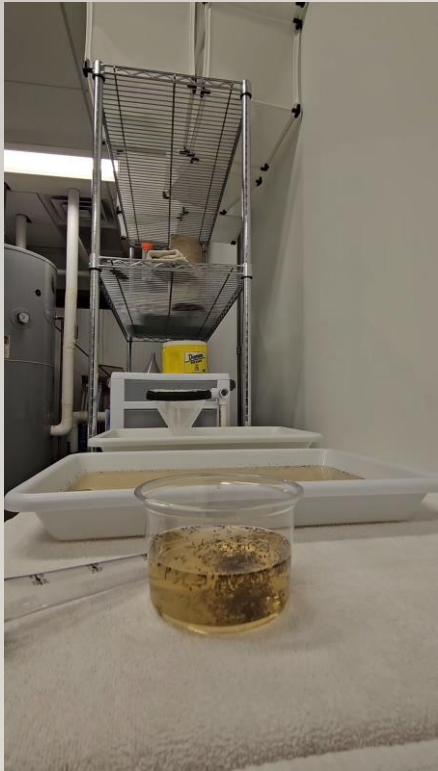
2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Turkey baster vs net filter
  - Net filter was much faster



# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Turkey baster vs net filter
    - Net filter was much faster

# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:

- Turkey baster vs net filter
- Separation of males/early pupae with ice bath vs turkey baster





# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:

- Separation of pupae with ice bath vs turkey baster
  - Ice bath works well, but we now let males hatch and separate them after 1-2 days later





# STEPS TAKEN TO FIX THE ISSUES

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2022 Presentation by Karen Akaratovic

- Comparison studies:
  - Separation of pupae with ice bath vs turkey baster
    - Ice bath works well, but we now let males hatch and separate them after 1-2 days later

# PURCHASE OF INCUBATORS IN FALL 2022

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# INCUBATOR COST BREAK DOWN

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- Single incubator with shipping
  - Percival I36VL
  - \$13,935.00
- 2,700 EEEV or WNV VecTor Test Strips
  - 1-3 years in Suffolk
- DI water filtration system
  - \$160.00
- 3 x 55gallon drums of Duet
- An extended cab pickup truck
- Total of:
  - \$28,030.00



# SPACE/ORGANIZATION: BEFORE INCUBATORS

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# SPACE/ORGANIZATION: AFTER INCUBATORS

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# TEMPERATURE AND HUMIDITY

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- *Aedes albopictus*

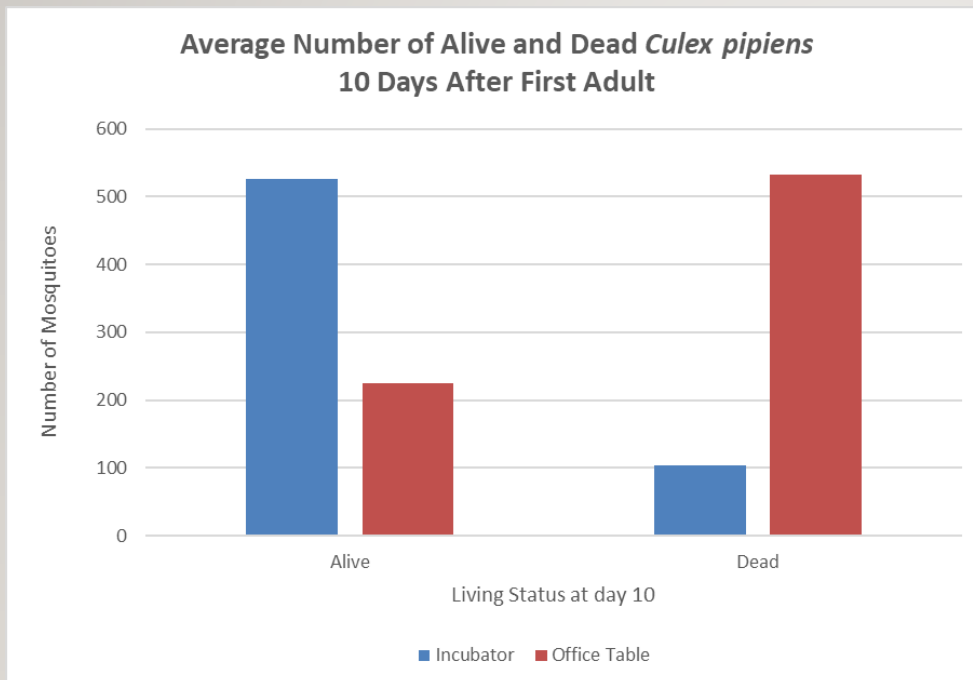
- 28°C
- 80% relative humidity
- 14hrs light, 10hrs dark
  - 6am-8pm

- *Culex pipiens*

- 30°C (Later 26°C)
- 80% relative humidity
- 16hrs light, 8hrs dark
  - 6am-10pm

# INCUBATOR VS OFFICE TABLE

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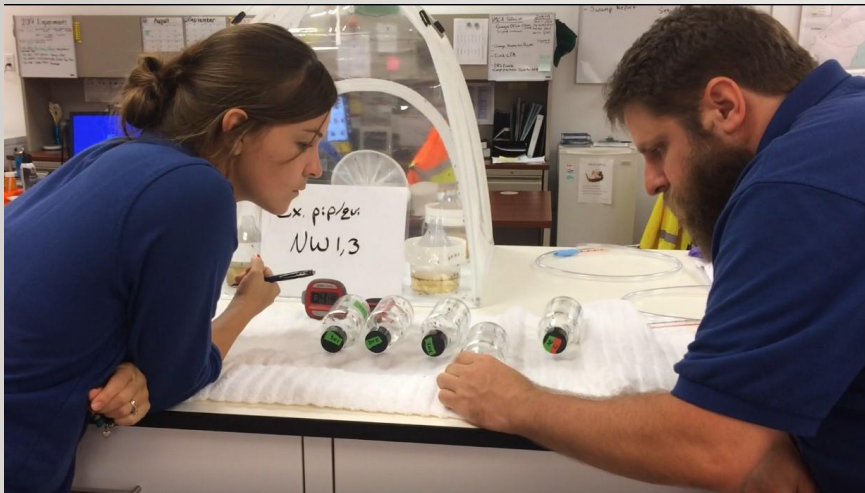


- Incubator:
  - At 30°C, first adults seen 6 days after first eggs hatched
  - At 26°C, first adults seen 7 days after first eggs hatched
  - Average of 86.3% adults living at day 10 after first adult
- Office table:
  - 9 days from first hatched eggs to first adults
  - Average of 29.7% adults living at day 10 after first adult

# HOW WAS THE SURVIVAL IN OUR CONTROL BOTTLES?

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**Not good!** ☹️



- November 2022
  - Reared *Aedes albopictus* from eggs in the incubators
  - CDC bottle bioassay with 3 active ingredients
  - 50-100% death in the control bottles for each test



# POSSIBLE ISSUES

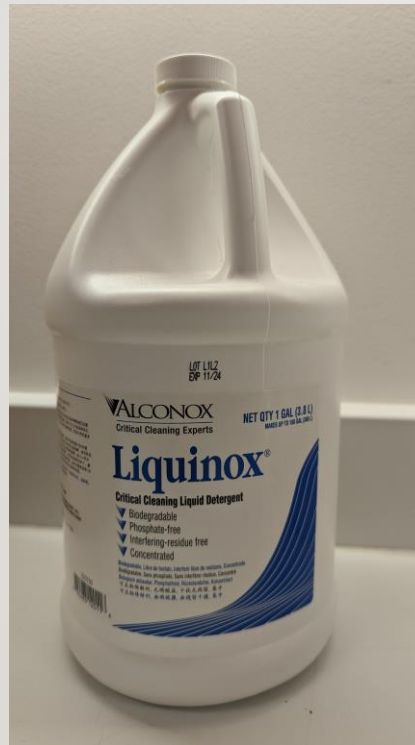
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- Health of mosquitoes
- Acetone
- Bottles contaminated
  - Not washed thoroughly
  - Residual pesticides
  - Residual soap
- Bottle caps contaminated



# STEPS TAKEN AND NEW CLEANING PROCESS

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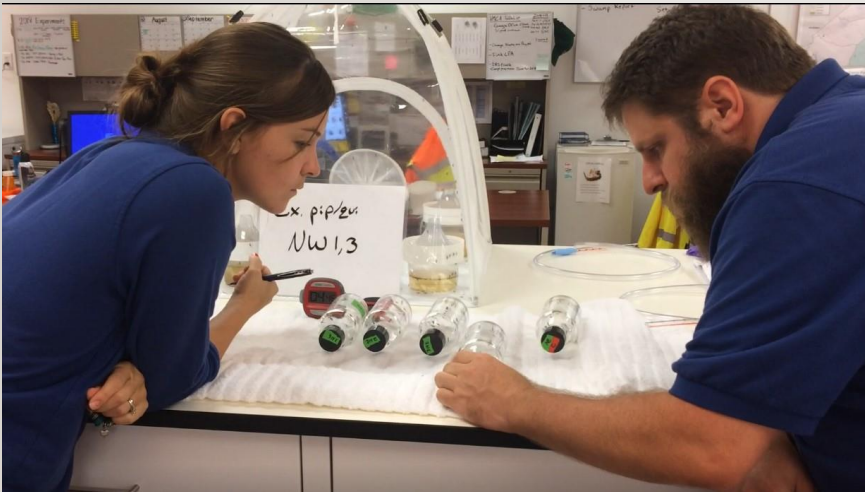


- Discard bottle caps and use aluminum foil
- New cleaning process after testing:
  - Rinse each bottle with 3-5 mL of acetone
  - Wash bottles with Liquinox
    - 50mL of soap to 5 gallons of water
  - Triple rinse with water
  - After bottle dry, rinse each bottle with 3-5 mL of acetone

# NOW HOW WAS THE SURVIVAL IN OUR CONTROL BOTTLES?

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**Great! 😊**



- Winter, Summer, and Fall of 2023
  - Reared both *Culex pipiens* and *Aedes albopictus* from eggs in the incubators
  - 17 CDC bottle bioassay tests were run during this time.
  - 15 had 0% death in the control bottles 2 had 3-4% death



# NEW POOTERS

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Older pooter setup built in-house



New HEPA filter pooter from John Hock





# THANK YOU!

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- Karen Akaratovic
  - Pictures, videos, and testing duties
- Charles Abadam
  - Pushing to get the incubators
- City of Suffolk
  - Purchasing equipment and understanding our needs
- Lindsey Baxter
  - Helping with new cleaning protocols
- CDC
  - Helping with in-house pesticide resistance testing questions and active ingredients

