THERMAL EFFECTS ON THE GROWTH AND SURVIVAL OF *Aedes aegypti* PUPAE UNDER LABORATORY CONDITIONS

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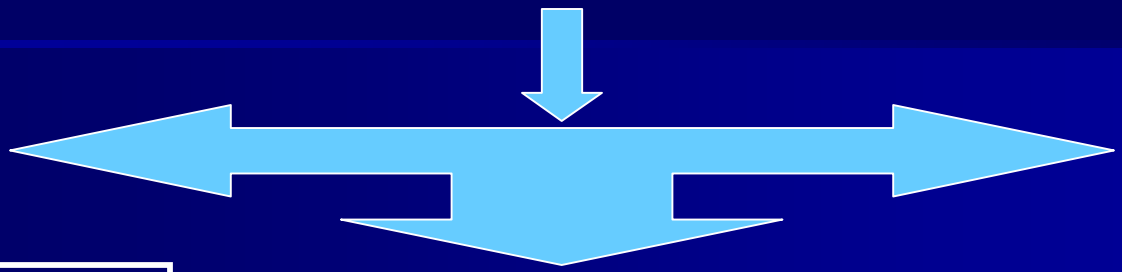
Introduction

- This study is part of the research program entitled **"Biological and Molecular Control of Dengue Infection"**
- Focus is on control of the mosquito vector Aedes aegypti

Biological and Molecular Control of the Mosquito Vector of Dengue Infection



Application of Biological Control Agents Against Aedes aegypti

Environmental Factors Affecting the Growth, Development & Population Dynamics of Aedes aegypti

Cloning and Characterization of Sterol Carrier Protein Genes in Aedes aegypti

Objectives

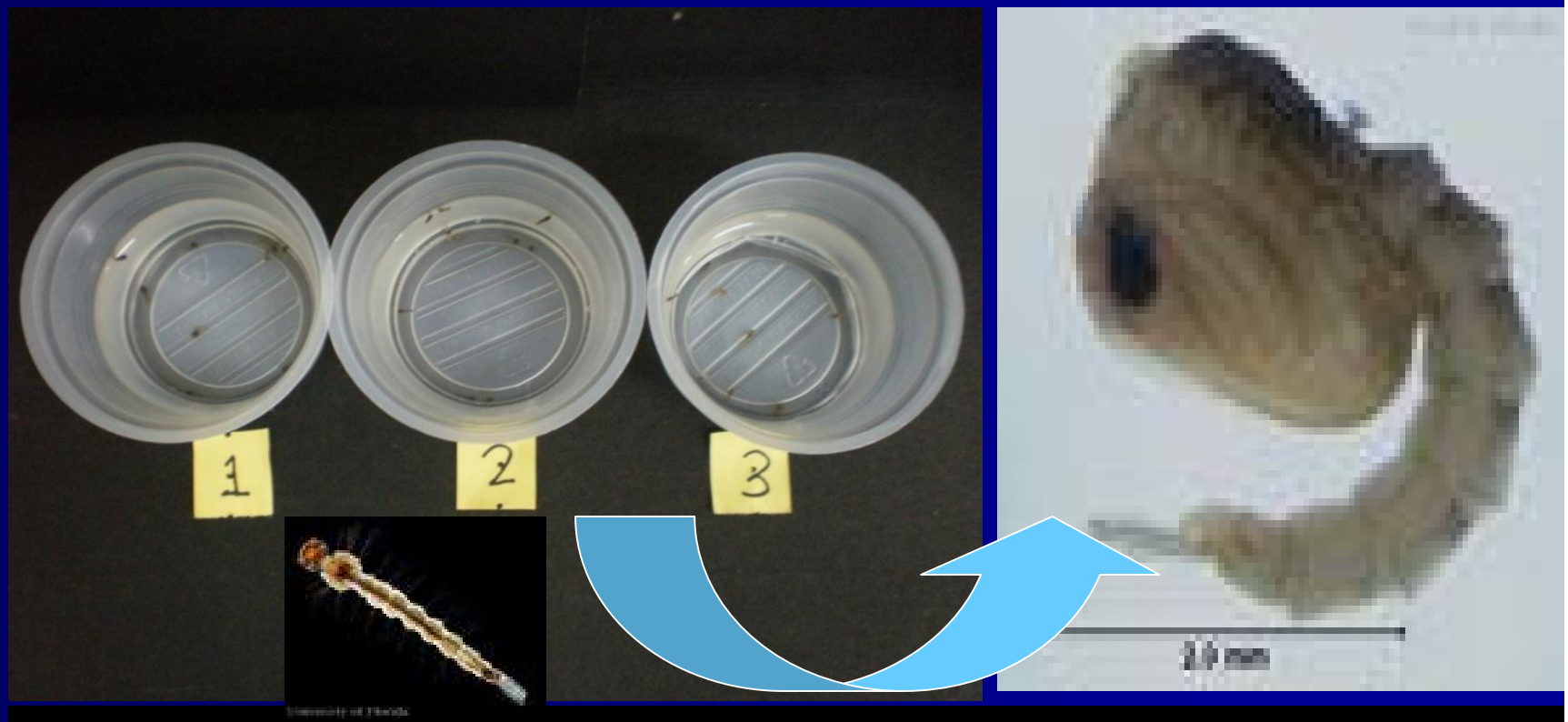
- To determine the effects of increased ambient temperatures on pupal growth of the mosquito Aedes aegypti.
- To determine the survival rate of A. aegypti pupae under varying temperature conditions

Methodology

A. Setting up of containers for mosquito egg deposition and larval collection in the urban areas of Iligan City.

Methodology

Pupae were used due to limitations in rearing of adults in the lab



B. Separation and collection of Aedes aegypti mosquito larvae for rearing up to pupal stage with subsequent exposure to different temperatures.

Results

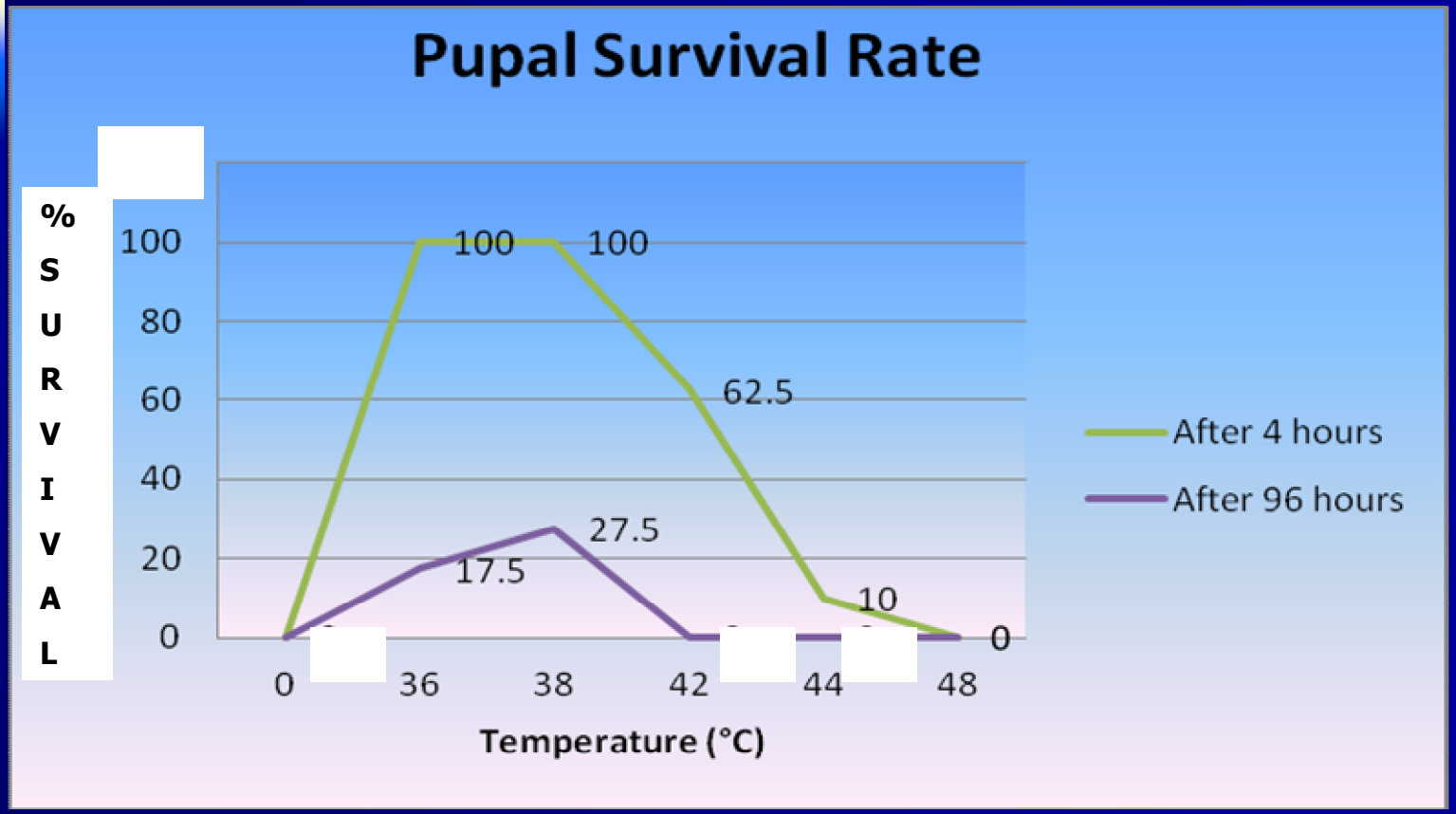


Figure 1. Survival rates of A. aegypti pupae at different temperatures.

Results: Salient Points

- Highest survival rate after 4 hours of exposure was at 38˚C (>96% or almost 100%) followed by 36˚C (>95%)
- Pupae exposed to temperature of 42˚C survived for more than 72 hours
- Pupae exposed at 44˚C and 48˚C survived for more than 2 hours in a decreasing fashion with time

Results: Other Observations Needing Verification

- Life cycle of Aedes aegypti is shorter at higher temperatures having a peak between 36°C and 38°C
- More adults emerge early at higher temperatures than at normal ambient temperatures

Summary and Conclusion

- Higher survival rates of Aedes aegypti pupae were observed when exposed to temperatures of 36°C and 38°C within 4 hours compared to other temperatures
- Results show a deviation from the reported thermal death point of 41°C for 1 hour for A. aegypti aquatic stages because pupae survived at 42°C for 72 hours, and at 44°C and 48°C for 2 hours

Summary and Conclusion

- There is a potential adaptive strategy to survival at higher temperatures leading to a shorter life cycle with concomitant explosion in mosquito population, given that an adult female can lay from 100 to 200 eggs per batch and up to 5 batches in its lifetime

Recommendations for Future R&D Work

- Study the effects of increased temperatures on the complete life cycle of A. aegypti in a suitable laboratory facility equipped with adult mosquito containment set up
- Investigate the effects of increased temperatures on the male:female ratio of adult mosquitoes
- Undertake the other research projects in the dengue control program (for funding) on biological control and molecular approach in controlling the mosquito vector population

Thank you very much for your attention.

You're my next meal!

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