How will temperature affect bean beetles (*Callosobruchus maculatus*) sexual reproduction success?

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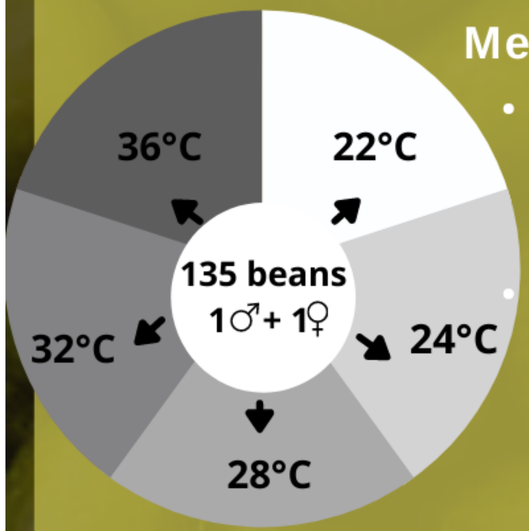
Introduction

Callosobruchus maculatus is an agricultural pest insect with very short life span. Larva feed on embryo and endosperm of bean. Generation time varies between 10-14 days depending on abiotic factors like resource and temperature.

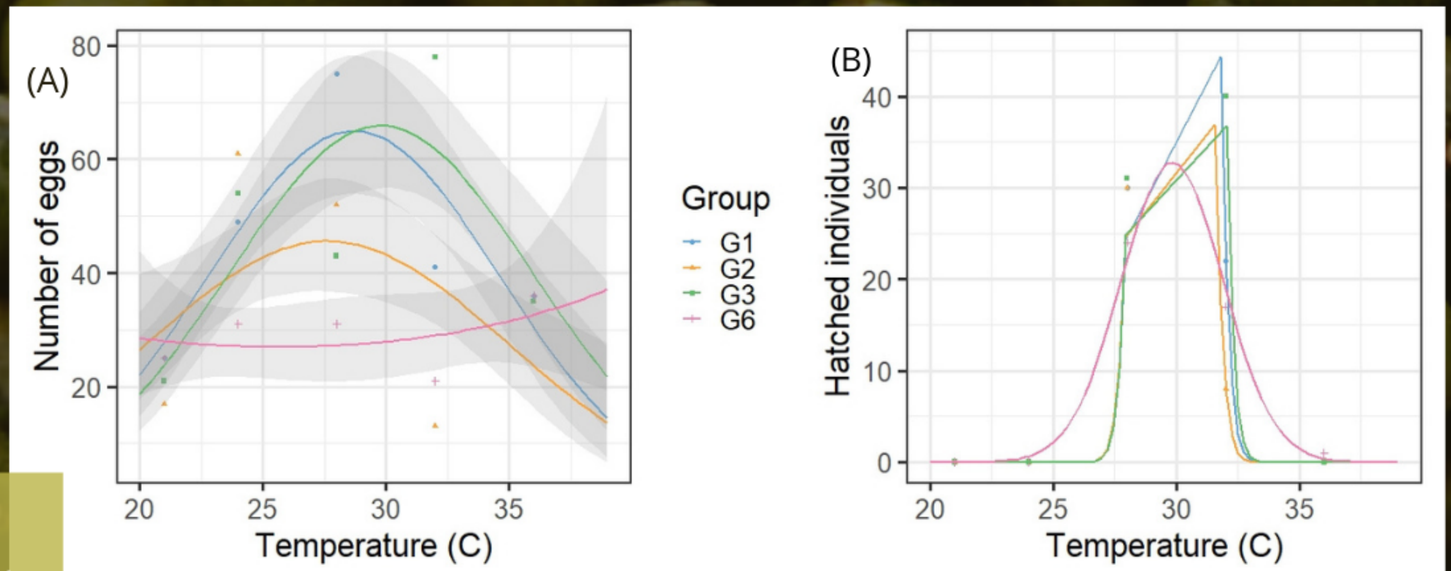
<u>Our hypothesis:</u> *Bean beetles reproductive success is directly influenced by temperature.*

Method



- **Set up:** 135 Mung beans with 1 male and female per petri dish was replicated 4 times per incubator with a specific temperature.
- **Egg counting:** To evaluate the reproductive success we measured the numbers of eggs that were laid after 2 weeks in the incubators.
- **Survivors counting:** We also counted the number of individuals that emerged from the eggs 4 weeks.

Result



- **Description of results (A):** In figure A, we can see that the general trend resembles a parabolic curve with an increase in the number of eggs laid as temperature rose. With a peak at 28 degrees Celsius, at which point the number of eggs started to decrease. (p = 3.89e-09)
- **Description of results (B):** In figure B, We also observed a high rate of emerged beetles at 28 and 32 degrees Celsius, with almost a total absence of emergence at 21, 24 and 36. (p = 9.05e-08)

Discussion: The temperature affected the beetles reproductive success, regarding both egg laying and successful hatchings. This implies that warmer climate would affect bean beetles reproduction success positively. Conclusion: From our results we conclude that optimal temperature is between 28-32 degrees, and support our hypothesis. This could be a issue for mungbeans in the future due to climate change.