



Undergraduate
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LAUNCH: UNDERGRADUATE RESEARCH



Duration of survival of the Chagas disease parasite (*Trypanosoma cruzi*) in deceased triatomine 'kissing bug' vectors

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Background

- *Trypanosoma cruzi* is a protozoan parasite and the causative agent of Chagas Disease, transmitted by triatomine bugs, commonly known as kissing bugs.^{1,2,3,4}
- Affected humans and animals symptoms range from asymptomatic to severe cardiac, neurological issues, and death.
- Insecticide use can help control the vector of Chagas Disease
- However, this leaves dead bugs in the environment which poses an unknown risk of parasite transmission to dogs or other animals that may contact or consume them

Research Question

The objective of this experiment was to determine how long *T. cruzi* can survive inside of infected, dead *Triatoma gerstaeckeri* in order to determine the point at which the parasite is no longer pathogenic. The reproducibility of parasites was examined after bugs were left out for three different periods of time (0 hrs, 24 hrs, and 48 hrs).

Results

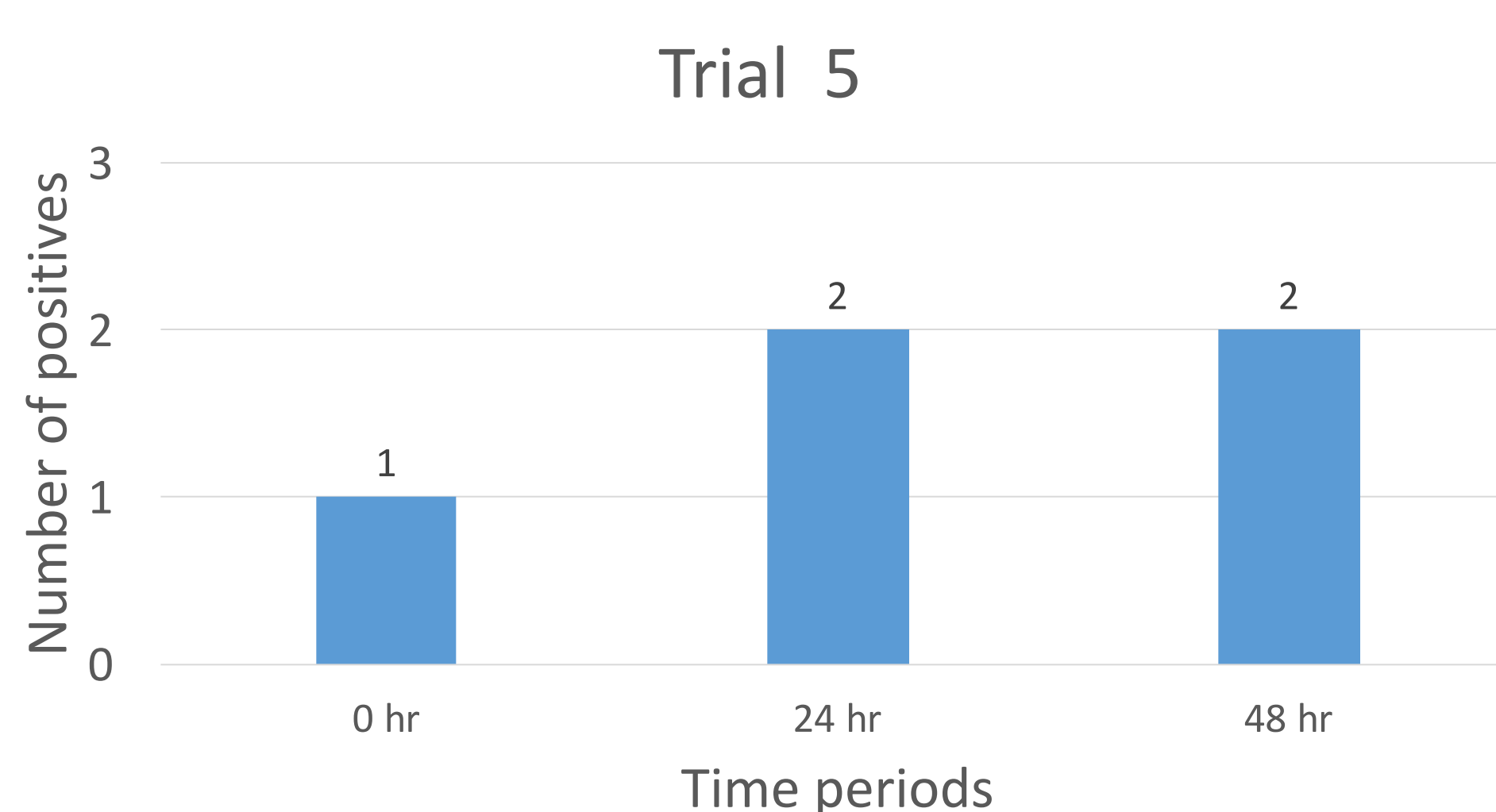


Figure 1. A total of nine infected bugs were used per trial, with all decapitated at T0. Three bugs each were inoculated into culture after three different time points to assess parasite viability. Results of the trial show parasites are viable at each time point.

Methods



In five trials, *Triatoma gerstaeckeri* nymphs were experimentally infected using blood spiked with the protozoan parasite, *T. cruzi*.



At T=0, all nine bugs were decapitated. Group one bugs were used immediately to inoculate cultures with fecal sample through abdominal compression and a portion of gut material.



The remainder of bugs in groups two and three were left out for twenty-four or forty-eight hours before being inoculated into culture.



Cultures were inoculated with fecal sample through abdominal compression and a portion of gut material from dissection.



Cultures were inspected weekly for up to 6 weeks.

Progress

Initially, there was difficulty growing *T. cruzi* in culture due to the competition with the gut bacteria. However, adjustments in the antibiotic and antifungal dosages in the culture media have allowed for *T. cruzi* to be grown in culture.

Conclusions

- Data suggests that the death of *T. cruzi* inside the gut material of a deceased bug occurs at some time point after forty-eight hours.
- Dead bugs should be removed from the environment whenever possible to reduce the chance of transmission.
- Further trials will explore time points beyond forty-eight hours to determine when *T. cruzi* is no longer viable.

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References

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