OrNV Witch's Brew Experiment 2: A Last Ditch Attempt to Find Virus Pathogenetic for the Guam Coconut Rhinoceros Beetle Genotype

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In this experiment, we made a 'witch's brew' using frozen beetles which died in the 'Witch's Brew 1' bioassay. Sixty-one adult beetles were forced to swim in the slurry for 30 minutes on June 29, 2015. A control group of 59 beetles were forced to swim in water. Beetles were checked weekly.

By July 27, 2015, mortality of the virus treated beetles (75%) was significantly greater than that of the control group (48%). Treatment mortality corrected for experimental control mortality by Abbott's formula was 53%.

Beetles which died in this experiment were preserved and these will be tested for virus if and when additional funding becomes available.

Methods

Frozen, dead beetles from previous bioassays were added to one liter of water and made into an aqueous slurry using a blender. Vials containing remnants of virus samples from AgResearch New Zealand were agitated in 500 ml of water, and this suspension was added to the blender. The slurry was poured into a small pail and forty beetles were made to swim in this for thirty minutes. A control group of beetles was made to swim in water for thirty minutes.

Beetles were kept in a large container filled with moist, commercially blended steer manure and soil. All beetles were checked weekly. Dead beetles were recorded and frozen.

Analysis

Data were analyzed using an IPython notebook (file name = 'witch's brew 2.ipynb'). Significance of differences in mortality were determined using a Fisher's exact test, and final mortality was adjusted using Abbott's formula.
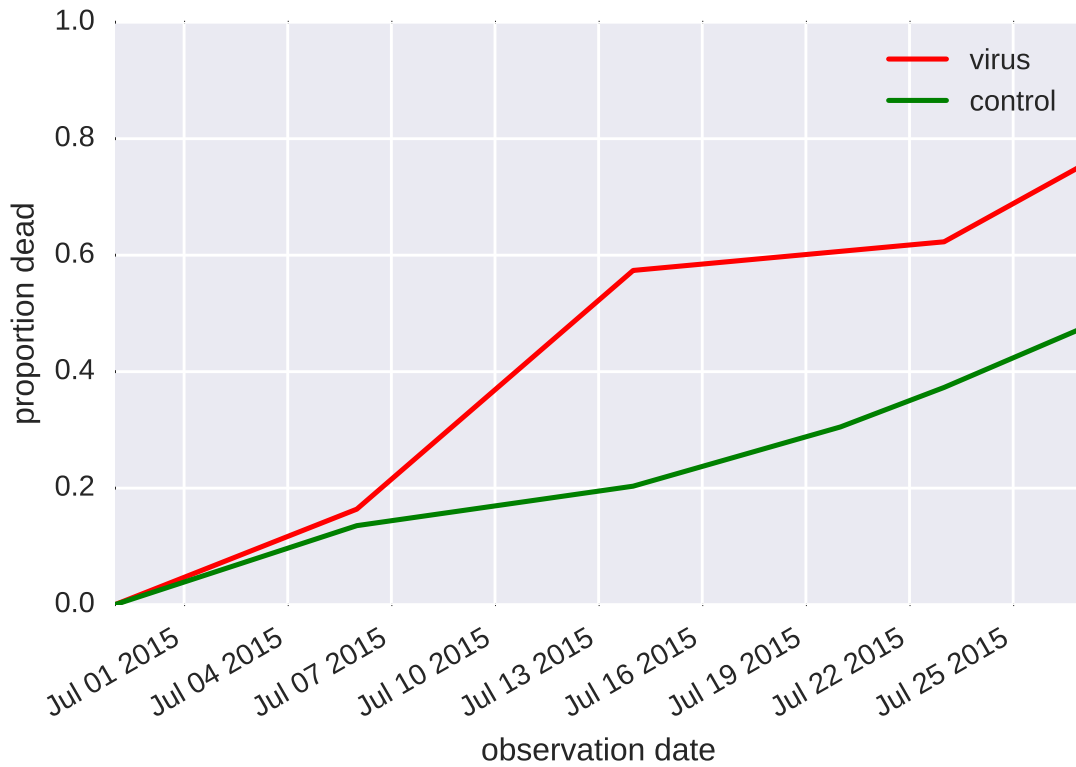
Figure 1: Cumulative mortality.

Results and Discussion

Cumulative mortality of virus-treated beetles (75%) on April 27 (Fig. 1) was significantly greater than that of control beetles (48%); (p = 0.0014; Fisher's exact test). Treatment mortality corrected for experimental control mortality by Abbott's formula was 53%.