University of Guam Coconut Rhinoceros Beetle Biological Control Project
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https://github.com/aubreymoore/rearing3

Bioassay Report: V23B

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https://github.com/aubreymoore/rearing3/raw/master/bioassay-V23B.pdf

Contents

1 Summary

Table 1: Bioassay summary.

	bioassay_name	date_start_bioassay	date_end_bioassay	bioassay_treatment	N
0	V23B-1	2018-12-13	2019-01-13	control	5
1	V23B-1	2018-12-13	2019-01-13	heat inactivated	5
2	V23B-1	2018-12-13	2019-01-13	virus	5
3	V23B-2	2018-12-21	2019-01-19	control	5
4	V23B-2	2018-12-21	2019-01-19	heat inactivated	5
5	V23B-2	2018-12-21	2019-01-19	virus	5
6	V23B-3	2019-01-31	2019-02-27	control	5
7	V23B-3	2019-01-31	2019-02-27	heat inactivated	5
8	V23B-3	2019-01-31	2019-02-27	virus	5
9	V23B-4	2019-02-19	2019-03-19	control	7
10	V23B-4	2019-02-19	2019-03-19	heat inactivated	7
11	V23B-4	2019-02-19	2019-03-19	virus	7

Adult beetles incubated at 30℃ and 80% RH for more than 2 weeks to observe possible contamination from green muscardine fungus infection were employed in a bioassay to determine the susceptibility of adults to infection by a virus isolate collected from the Solomon Islands (**V23 B**). Treatment 1 consisted of 10-20 µl sterile filtered water injected at a point on the ventral surface at the junction of the hind leg and the thoracic using a sterile needle. Treatment 2 consisted of 10-20 µl heat-inactivated virus injection while in the treatment 3, beetles were injected with 10-20 µl of untreated virus preparation. Adults were then placed in clean glass mason jars (bleach-treated) with a piece of banana added for food. Beetles were incubated at 30℃ and 80% RH in a Percival incubator. All beetles were weighted every other day but monitored daily for four weeks to observe any possible signs of mortality.

1.1 Replicate 1

A total of nine adult females and six adult males distributed among the three treatments were employed in this replicate.

1.2 Replicate 2

A total of 13 adult females and two males distributed among the three treatments were employed in this replicate.

1.3 Replicate 3

A total of seven adult females and eight adult males distributed among the three treatments were employed in this replicate.

1.4 Replicate 4

A total of seven adult females and 14 adult males distributed among the three treatments were employed in this replicate.

2 Mortality

Table 2: Mortality summary.

	bioassay_treatment	ntotal	ndead	mortality	adjusted_mortality	significance
0	control	22	5	0.227273	0.000000	1.000000
1	heat inactivated	22	5	0.227273	0.000000	1.000000
2	virus	22	20	0.909091	0.882353	0.000009

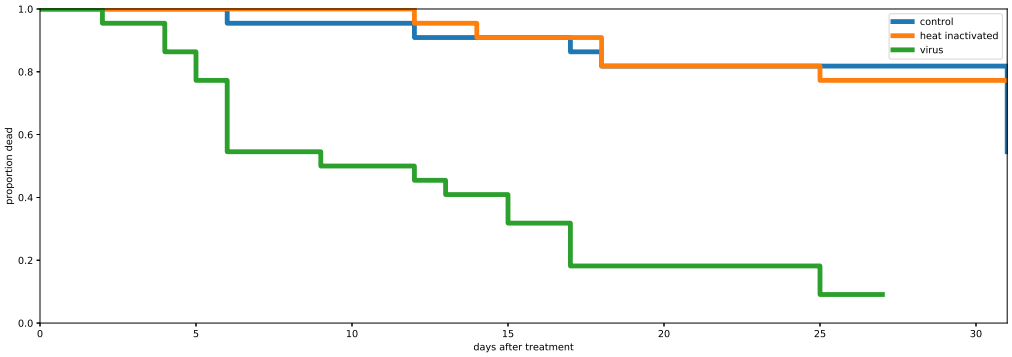

Table 3: Pairwise differences among mortality curves.

		test_statistic	p
control	heat inactivated	0.008648	9.259077e-01
	virus	26.455478	2.696826e-07
heat inactivated	virus	26.310731	2.906692e-07

3 Change in Mass

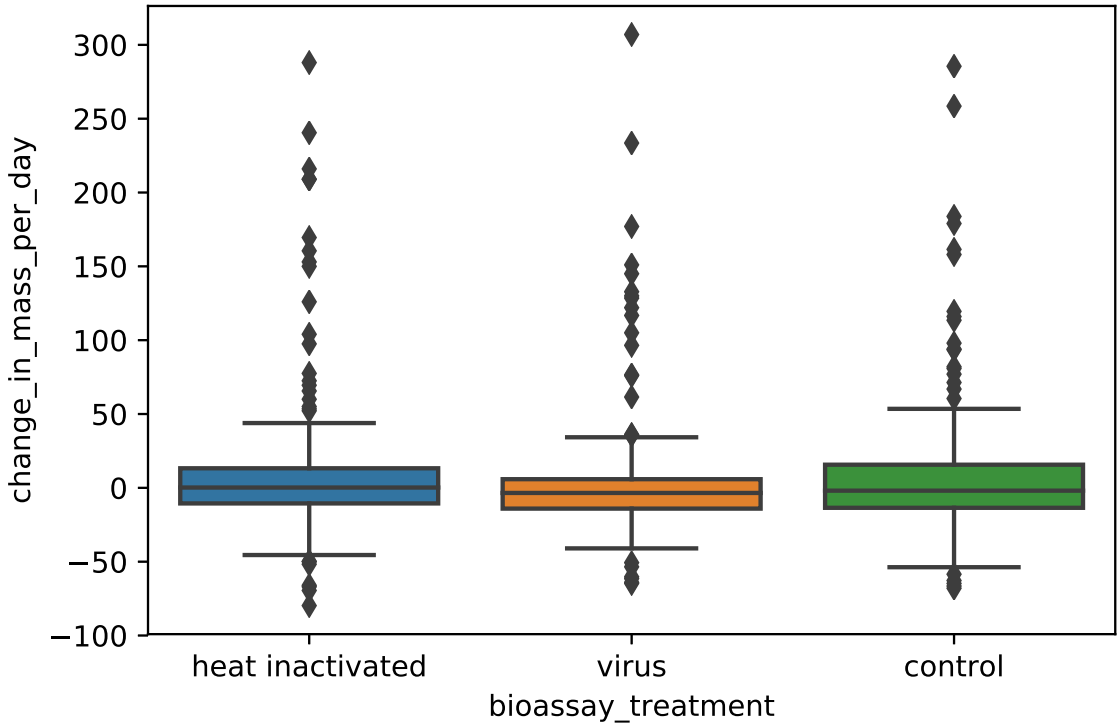

Table 4: Results of pairwise significance tests for differences in change in mass.

	control	heat inactivated	virus
control	-1.000000	0.818527	0.818527
heat inactivated	0.818527	-1.000000	0.707981
virus	0.818527	0.707981	-1.000000