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

Bioassay Report: PNG

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October 30, 2019

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

Contents

1 Summary

Table 1: Bioassay summary.

	bioassay_name	date_start_bioassay	date_end_bioassay	bioassay_treatment	N
0	PNG-1	2019-01-07	2019-02-04	control	5
1	PNG-1	2019-01-07	2019-02-04	heat inactivated	5
2	PNG-1	2019-01-07	2019-02-04	virus	5
3	PNG-2	2019-01-15	2019-02-15	control	5
4	PNG-2	2019-01-15	2019-02-15	heat inactivated	5
5	PNG-2	2019-01-15	2019-02-15	virus	5
6	PNG-3	2019-02-15	2019-03-15	control	7
7	PNG-3	2019-02-15	2019-03-15	heat inactivated	7
8	PNG-3	2019-02-15	2019-03-15	virus	7
9	PNG-4	2019-02-27	2019-03-27	control	10
10	PNG-4	2019-02-27	2019-03-27	heat inactivated	10
11	PNG-4	2019-02-27	2019-03-27	virus	10

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 Pupae New Guinea (**PNG)**. 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 seven adult females and eight adult males distributed among the three treatments were employed in this replicate.

1.2 Replicate 2

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

1.3 Replicate 3

A total of nine adult females and 12 adult males distributed among the three treatments were employed in this replicate.

1.4 Replicate 4

A total of 14 adult females and 16 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	27	7	0.259259	0.00	1.000000e+00
1	heat inactivated	27	8	0.296296	0.05	1.000000e+00
2	virus	27	25	0.925926	0.90	8.193890e-07

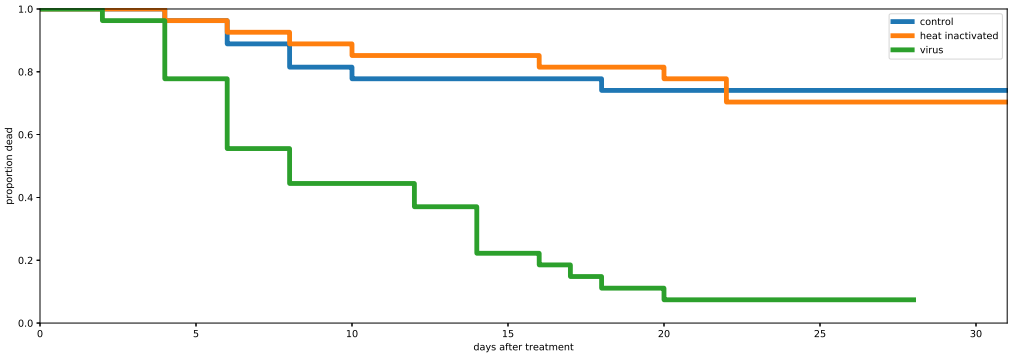

Table 3: Pairwise differences among mortality curves.

		test_statistic	p
control	heat inactivated	0.032268	8.574412e-01
	virus	25.286585	4.941336e-07
heat inactivated	virus	28.824370	7.924768e-08

3 Change in Mass

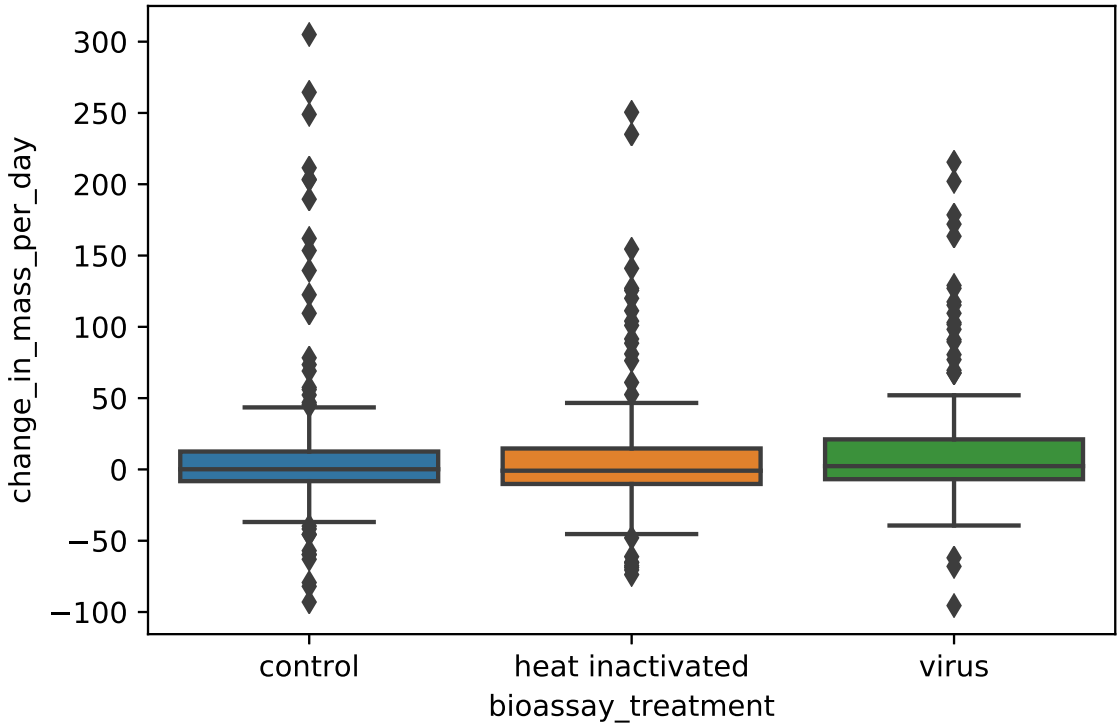

Table 4: Results of pairwise significance tests for differences in change in mass.

	control	heat inactivated	virus
control	-1.000000	0.854094	0.365357
heat inactivated	0.854094	-1.000000	0.365357
virus	0.365357	0.365357	-1.000000