



University of Guam Coconut Rhinoceros Beetle Biological Control Project

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<https://github.com/aubreymoore/rearing3>

# Bioassay Report: MALB

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<https://github.com/aubreymoore/rearing3/raw/master/bioassay-MALB.pdf>

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# 1 Summary

## 2 Description

Adult beetles incubated at 30°C 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 Malaysia (**Mal 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°C 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.

### 2.1 Replicate 1

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

### 2.2 Replicate 2

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

### 3 Mortality

Table 1: Mortality summary.

	bioassay_treatment	ntotal	ndead	mortality	adjusted_mortality	significance
0	control	10	4	0.4	0.0	1.00000
1	heat inactivated	10	4	0.4	0.0	1.00000
2	virus	10	7	0.7	0.5	0.36985

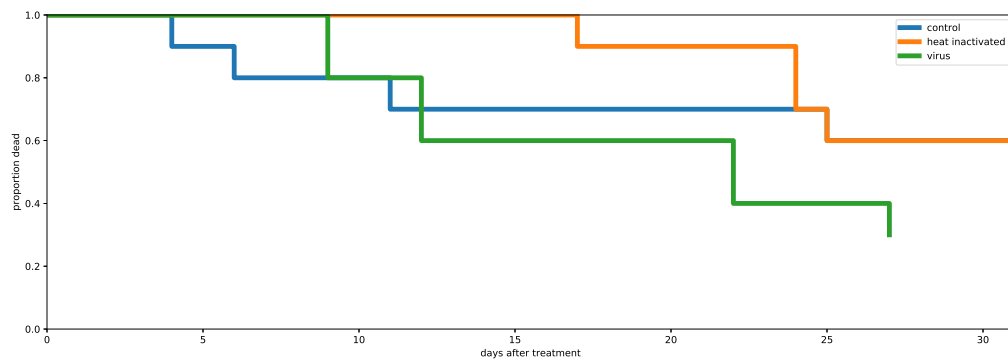


Table 2: Pairwise differences among mortality curves.

		test_statistic	p
control	heat inactivated	0.045611	0.830884
	virus	0.994687	0.318600
heat inactivated	virus	2.636056	0.104463

## 4 Change in Mass

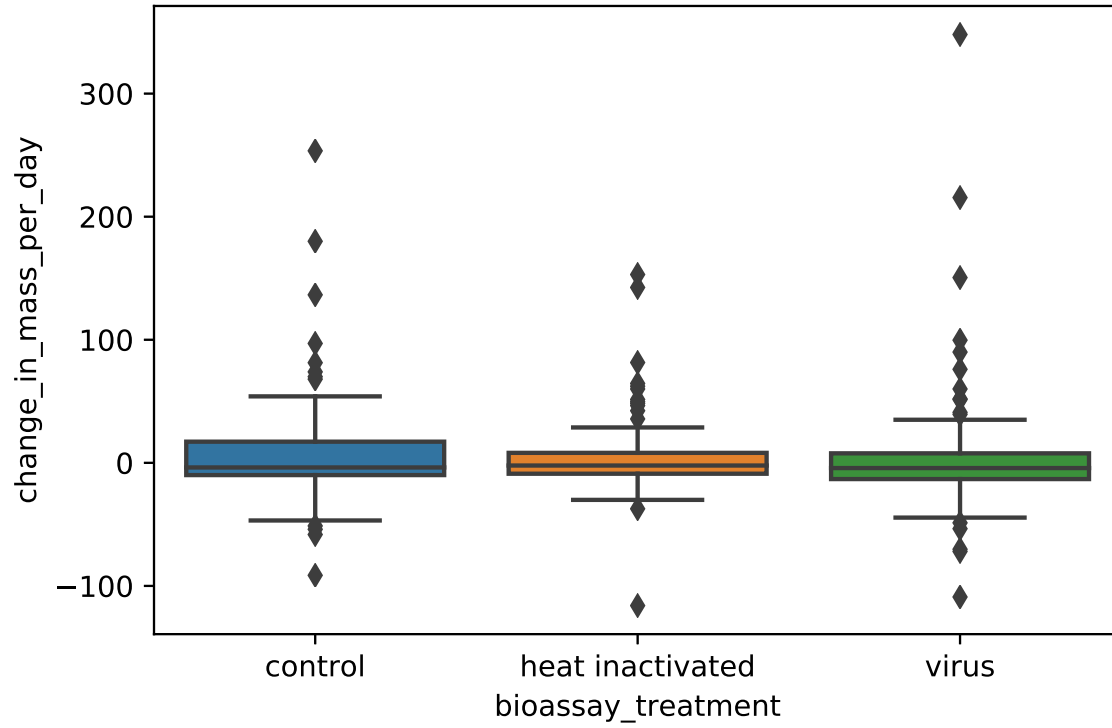


Table 3: Results of pairwise significance tests for differences in change in mass.

	control	heat inactivated	virus
control	-1.000000	0.856799	0.856799
heat inactivated	0.856799	-1.000000	0.759809
virus	0.856799	0.759809	-1.000000

## 5 Post Mortem Images

### 5.1 control



Figure 1: Bioassay: MALB-1; Treatment: control; Beetle ID: 80



Figure 2: Bioassay: MALB-1; Treatment: control; Beetle ID: 81



Figure 3: Bioassay: MALB-1; Treatment: control; Beetle ID: 82



Figure 4: Bioassay: MALB-1; Treatment: control; Beetle ID: 83





Figure 5: Bioassay: MALB-1; Treatment: control; Beetle ID: 84



Figure 6: Bioassay: MALB-2; Treatment: control; Beetle ID: 110



Figure 7: Bioassay: MALB-2; Treatment: control; Beetle ID: 111



Figure 8: Bioassay: MALB-2; Treatment: control; Beetle ID: 112



Figure 9: Bioassay: MALB-2; Treatment: control; Beetle ID: 113





Figure 10: Bioassay: MALB-2; Treatment: control; Beetle ID: 114

## 5.2 heat inactivated



Figure 11: Bioassay: MALB-1; Treatment: heat inactivated; Beetle ID: 85



Figure 12: Bioassay: MALB-1; Treatment: heat inactivated; Beetle ID: 86





Figure 13: Bioassay: MALB-1; Treatment: heat inactivated; Beetle ID: 87



Figure 14: Bioassay: MALB-1; Treatment: heat inactivated; Beetle ID: 88



Figure 15: Bioassay: MALB-1; Treatment: heat inactivated; Beetle ID: 89



Figure 16: Bioassay: MALB-2; Treatment: heat inactivated; Beetle ID: 115



Figure 17: Bioassay: MALB-2; Treatment: heat inactivated; Beetle ID: 116



Figure 18: Bioassay: MALB-2; Treatment: heat inactivated; Beetle ID: 117





Figure 19: Bioassay: MALB-2; Treatment: heat inactivated; Beetle ID: 118



Figure 20: Bioassay: MALB-2; Treatment: heat inactivated; Beetle ID: 119



### 5.3 virus



Figure 21: Bioassay: MALB-1; Treatment: virus; Beetle ID: 90



Figure 22: Bioassay: MALB-1; Treatment: virus; Beetle ID: 91



Figure 23: Bioassay: MALB-1; Treatment: virus; Beetle ID: 92



Figure 24: Bioassay: MALB-1; Treatment: virus; Beetle ID: 93



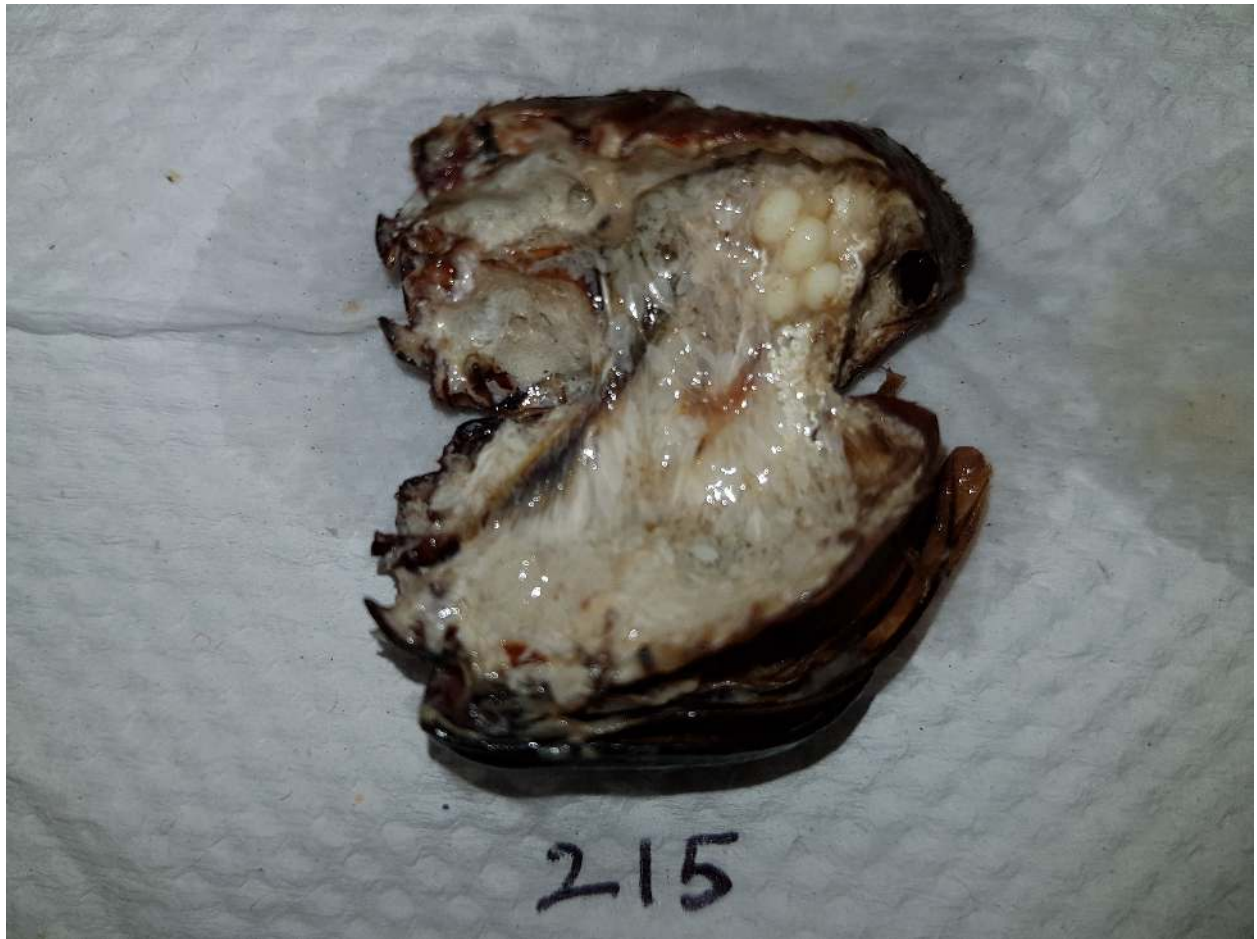


Figure 25: Bioassay: MALB-1; Treatment: virus; Beetle ID: 94



Figure 26: Bioassay: MALB-2; Treatment: virus; Beetle ID: 120

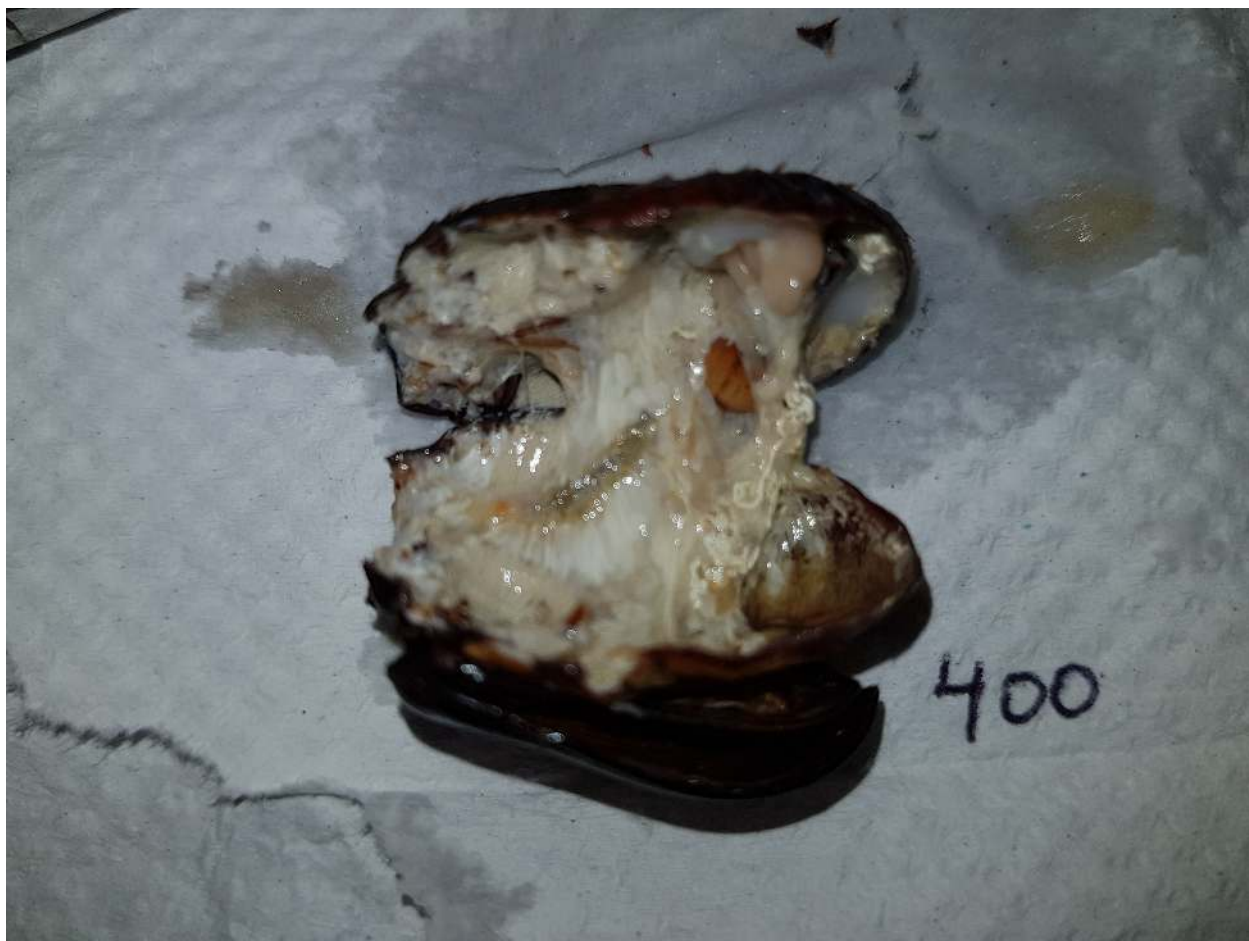


Figure 27: Bioassay: MALB-2; Treatment: virus; Beetle ID: 122



Figure 28: Bioassay: MALB-2; Treatment: virus; Beetle ID: 123





Figure 29: Bioassay: MALB-2; Treatment: virus; Beetle ID: 124