

BEAN PREFERENCE FOR OVIPOSITION IN BEAN BEETLES

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Research question:

1. Will the natal bean of the female influence their preference for egg laying?
2. Will more beetles hatch from the eggs laid on the black eyed peas than mung beans due to greater nutritional value?

Conclusion:

1. No significant results showing that natality influence habitat choice.
2. Significant results showing bean beetles prefer mung beans over black eyed peas. No results showing more beetles hatched from black eyed peas.
3. This overall preference for mung beans might be the reason for the mung bean natal beetles showing a preference towards mung beans.
4. Females prefer laying eggs on beans without eggs.

Results:

Graphs showing the lack of preference for natal beans

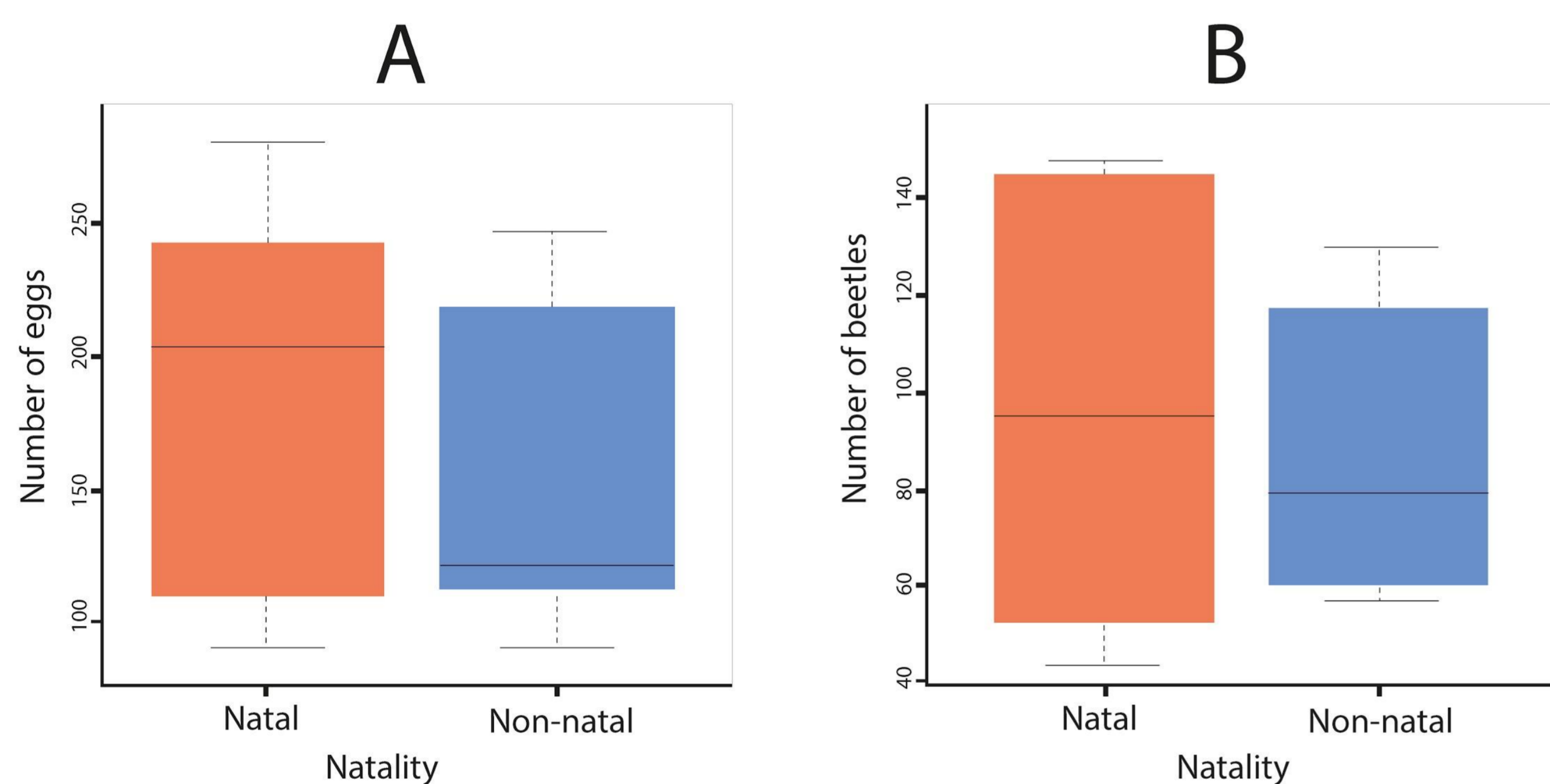


Figure 1: Plot A shows the total number of eggs and plot B show total number of adult beetles found on natal and non-natal beans. T-tests showed no significant difference between natal and non-natal groups in both eggs (t-test, $p = 0.43$) and in adult beetles (t-test, $p = 0.75$). Due to the p-values being greater than 0.05, there is no significant difference in bean beetles preference for either natal or non-natal beans.

Graphs showing a preference for mung beans

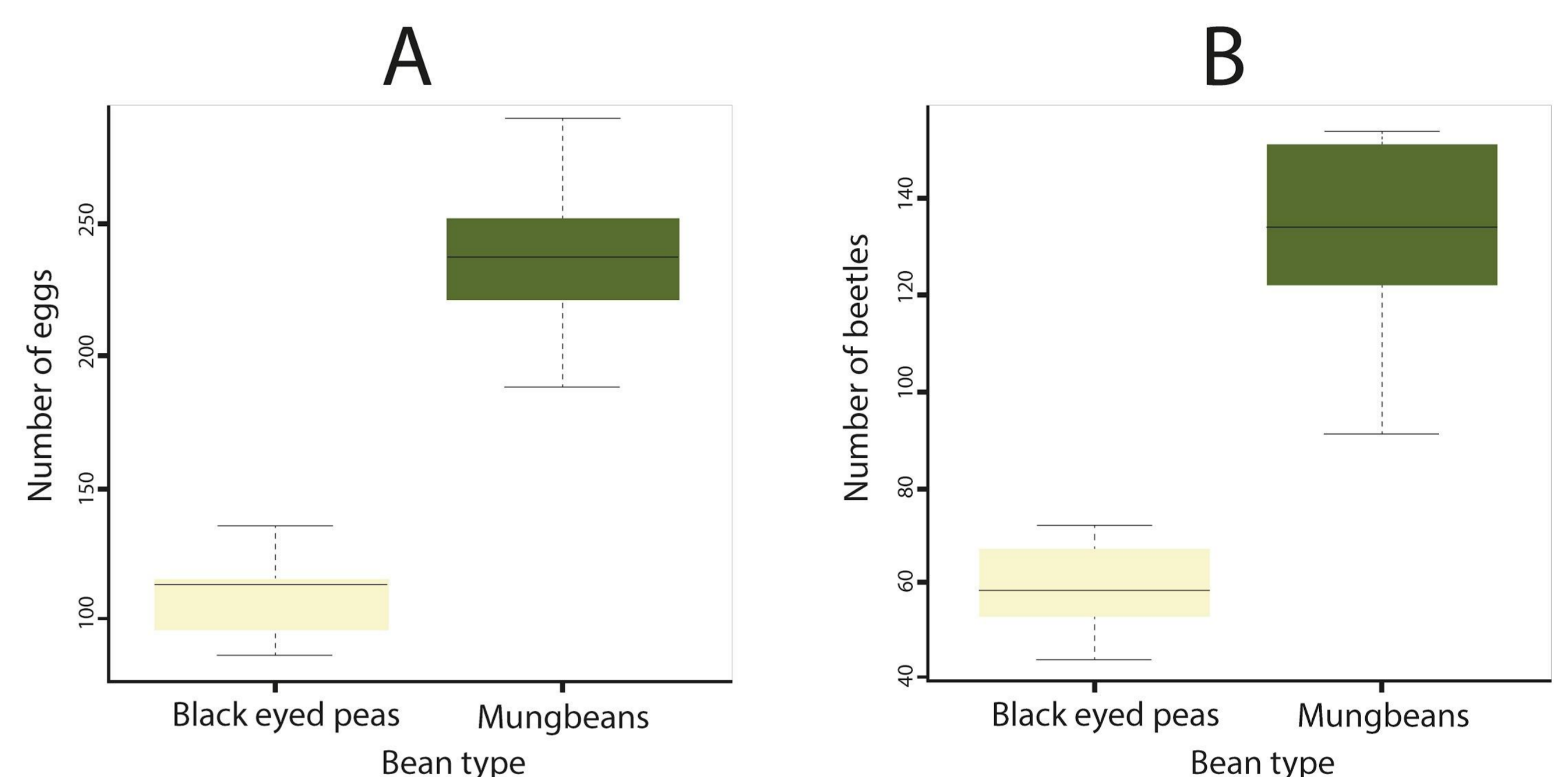


Figure 2: Plot A shows the total number of eggs and plot B total number of adult beetles found on each bean type. T-test showed significantly more eggs (t-test, $p = 0.0004$) as well as adult beetles (t-test, $p = 0.000002$) were found on mung beans. Due to both p-values being less than 0.05, it is evident that there is a significant difference in the preference for mung beans.

Discussion:

According to our results, bean natality had no effect on the beetles laying eggs on the beans. Rather our results found that although the black eyed peas have higher nutrient levels, the beetles sought to lay eggs on mung beans and therefore the mung beans hatched more beetles. However, due to the small size and weight of the mung beans, it is possible that the high amount of mung beans in each petri dish allowed for the egg-laying beetles to lay eggs on the mung beans at ease.

Our results may also be misdirected due to certain errors, in particular the beetles that were not hatched yet or hiding within beans and the lack of visibility of the eggs during the counting on the black eyed peas.

Methods:

- Filled 10 petri dishes with 15 grams of beans: 7.5 grams of mung beans and 7.5 grams of black eyed peas.
- 5 dishes were set aside for beetles that were natal to mung beans and 5 petri dishes were set aside for beetles natal to the black eyed peas
- 2 males and 5 females (non-virgin) with mung bean natality were placed in each of the 5 prepared petri dishes. The same was done for beetles with black eyed pea natality
- 5 days later the eggs laid were counted. It was noted how many eggs there were on each bean type
 - The different beans with eggs were separated into individual petri dishes, with respect to the parent natality
- 3 weeks later the hatched beetles were counted



References:

1. Beck et al.: Effects of evolutionary history on adaptation in bean beetles, a model system for inquiry-based laboratories. *Evolution: Education and Outreach* 2013 6:5
2. Rapid Adaptation of Bean Beetles to a Novel Host (Description). (n.d.). Retrieved April 13, 2019, from https://tiee.esa.org/vol/v6/experiment/beetle_adaptation/description.html

