

This manuscript reports on an experiment addressing the effect of pollen feeding on body mass, reproductive senescence and toxicity in *Heliconius erato*, contrasting effects of different adult diets at 0, 14 and 45 days of age.

Title: The title is a bit over-broad, given that only one species was examined!

Introduction:

Lines 18-28. Earlier studies (1960s-70s) showed that pollen can start germinating in water or sugar solutions and release free amino acids. I have seen pollen tubes growing in pollen from loads removed from *Heliconius*. Cocoonase or any other salivary enzyme would likely alter or speed that process. If kept, this paragraph needs to be a bit more nuanced as to digestion.

Line 43. For those lepidopterans that feed as adults, carbohydrates are obtained in the adult stage. Please re-phrase.

Line 47, but also elsewhere: Boggs, CL 1979 Resource allocation and reproductive strategies in several heliconiine butterfly species. PhD dissertation, U Texas. Chapters 3 and 6 contain mostly otherwise unpublished data on lifespan, mating, and pollen feeding in greenhouse and field for *H. charithonia*, *H. cydno* and *D. julia*

Line 52: "maintaining their...structural morphology..." I don't know of any evidence that *Heliconius* are any better at repairing, e.g., chitin, than are non-pollen feeding butterflies. Rather, it's a difference in allocation in the pupal stage to a more durable morphology (body, wings etc). This is also a trade-off balance that can be understood in terms of nitrogen. See Boggs, C.L. 1981. Nutritional and life history determinants of resource allocation in holometabolous insects. *American Naturalist* 117:692-709. Note: this paper is also relevant elsewhere in the introduction and discussion.

Line 54: Mating multiple times isn't restricted to butterflies that feed on pollen. Please re-phrase.

Methods:

Line 106: what sugar was used? Glucose? Sucrose? A mix?

Line 107: The vetark website indicates that this is whey powder. So presumably it is not an amino acid supplement, but a protein or peptide supplement. This makes a difference for whether it's a mimic of what the butterflies get out of pollen.

Line 113: Did you record whether the butterflies collected pollen, and how much? This makes a big difference in interpreting the results. For example, males could've been outcompeted by females for pollen, which would then be reflected in your results. Also, females may not have started collecting much pollen until they had used larval + male-derived reserves, which again would influence the interpretation of your results for 14 vs 45 days old females (see Boggs, C. L. 1990. A general model of the role of male-donated nutrients in female insects' reproduction. *American Naturalist* 136:598-617, as well as the O'Brien paper that you cite already).

Line 117 and elsewhere. Did males have the opportunity to mate? Who mated with the females initially? The discussion indicates that females might have mated multiply (I've seen the system break down in greenhouse populations for *H. charithonia*). It seems like knowing the male reproductive history is key to understanding age-specific data for males.

Results:

Table 1: Isn't this a 3-way ANOVA?

Table 1: Do you have initial body mass for females and males that were assayed at 14 and 45 days? That would be helpful to put into your analysis as a covariate, and might help reduce some of the unexplained variance in the results.

As far as I can tell, the statistical analysis section doesn't match the stats given in the figures, especially for figure 2 (chi-square???).

Discussion:

Line 195, 238-9: Also Boggs 1981 American Naturalist.

Generally:

The authors should check for typographical errors (several look like auto-correct induced mistakes). In addition, Nahrstedt & Davis 1983 is duplicated in the reference list.