Notes on Vergara et al. 2014

Dear Dr. Vergara,

We tried to replicate your work on the Red Queen dynamics (Vergara *et al.* 2014 *American Naturalist*) and found some discrepancies between our analysis and the results/figures presented in the paper.

The data was downloaded from Dryad and imported into R. Following the methods section, we excluded males for our analysis. Observations that had "UNKOWN" ploidy were also excluded: our filtered data set had 1179 observations.

ANOVA

We fitted a generalized linear model with a binomial error and logit link and performed ANOVA:

```
## Analysis of Deviance Table (Type II tests)
##
## Response: Microphallus
##             Df   Chisq Pr(>Chisq)
## Year         4 17.4871  0.0015539 **
## Site         3 30.0973  1.317e-06 ***
## Ploidy       1  8.8908  0.0028661 **
## Year:Site   12 90.1854  4.546e-14 ***
## Year:Ploidy  4 22.8825  0.0001337 ***
## Site:Ploidy  3  5.6393  0.1305393
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

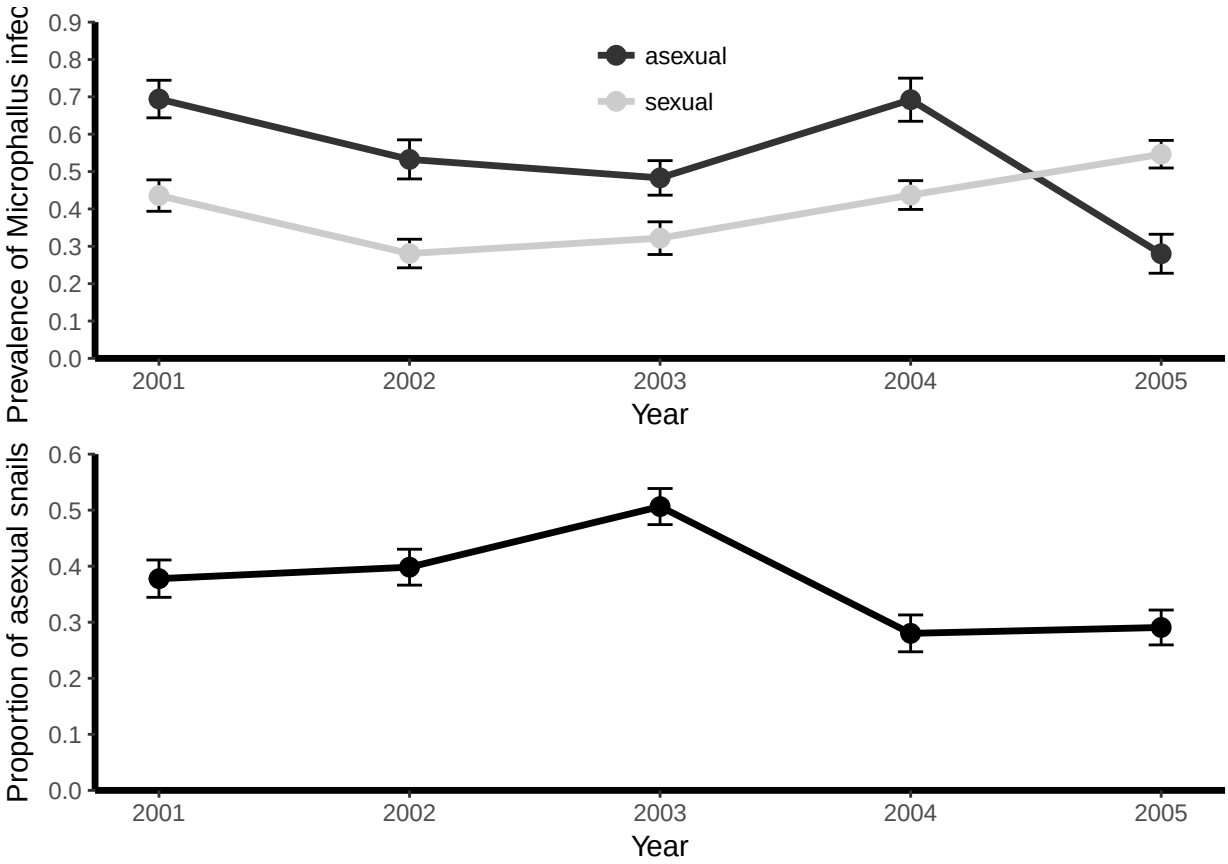
We get chi square values that are almost identical to the ones presented in the paper for all the interaction terms but not for first order terms. We get higher chi square values for all three effects. There are many differences between the defaults for ANOVA (or ANOVA-like) analyses in SAS and R; if you could provide the SAS code for your analyses, we could probably figure out how to replicate it in R ...

Geometric fitness

```
##     Sexual   Asexual
## 1 1.021473 0.9321791
```

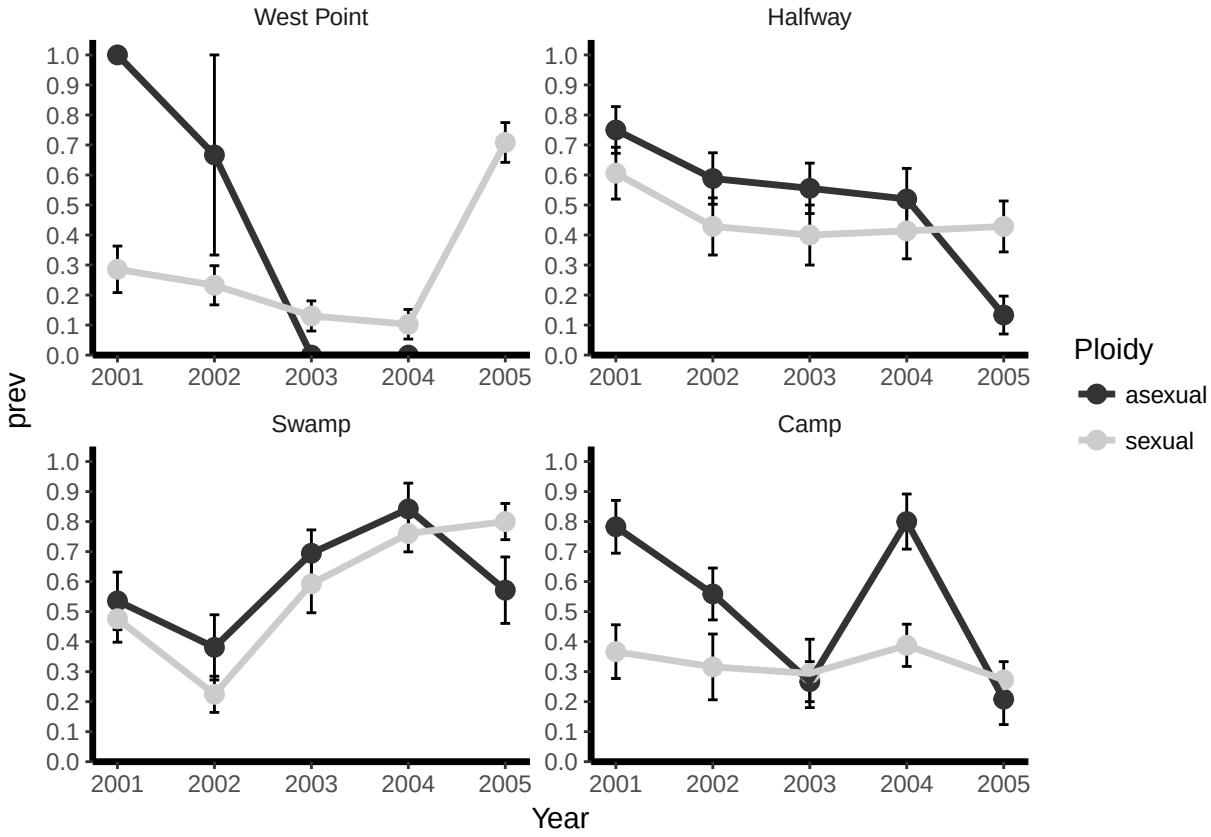
We get slightly different values for geometric fitness.

Figure 1



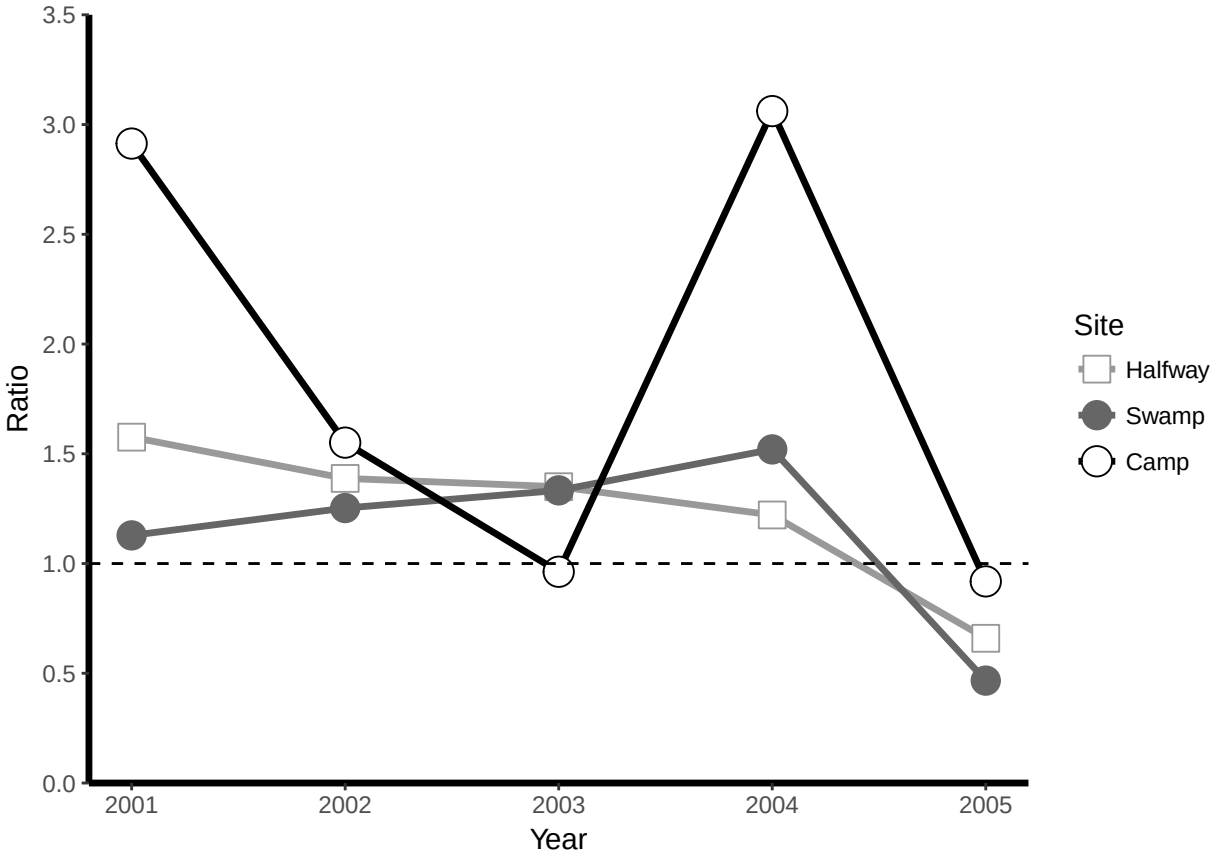
For the prevalence of asexual snails across time, we get noticeably narrower standard errors compared to figure 1A in the paper. In figure 1B, we get a graph that is shifted upward by approximately 0.1. We tried taking the mean across sites first and averaging across those means but still were not able to match the results presented in the paper.

Figure 2



Prevalence of infection in 2002 at the West Point site has a noticeably larger standard error error than the one presented in the paper. We were able to match the figure in the paper when we switched from using the sample standard deviation to population standard deviation (not shown here).

Figure 3



Two major discrepancies can be found by looking at the ratio of uninfected sexual females at Halfway in 2002 and at Swamp in 2004. In the paper, ratio of uninfected sexual females at Halfway in 2002 stays below the 1:1 ratio line. However, if we look at figure 2 (either the one presented here or the paper), asexual snails have higher prevalence compared to sexual snails at Halfway in 2002. This implies that the ratio of uninfected sexual females at Halfway in 2002 should be greater than 1. Similar argument applies to 2004 Swamp: we don't see a three-fold difference in figure 2.