*Dr. Barton,*

*Thank you for providing another quick round of revisions. In this round of revisions, I realized the manuscript still went a bit too far with the conclusions regarding myrmecochores tolerance of habitat disturbance. I made sure to remove any explicit reference to such a conclusion and tried to just focus on the point that ant communities and myrmecochores can persist if there are a few years of poor elaiosome production. My fear is that such an argument would make it seem like this mutualism can withstand forested habitat loss. Spring ephemerals require closed-canopy forests, so most types of habitat change are expected to be quite disruptive. On top of that the hypothesis and experimental design is focused on elaiosome limitation, not ecological disturbance.*

*Thank you,*

*Rob Clark*

*All my responses in italics below, which excerpts of the altered text in italics surrounded by quotes.*

*Comments from the editor:*

I reviewed the revision, and while it is much improved, a few issues with this manuscript remain, and I provide a few suggestions below that will improve the clarity and credibility of this paper.  
  
Line 24: Add “Five years following removal treatments,”

*Text added.*  
  
Line 26: Add, relative to control plots

*Text added.*  
  
Line 27:  I would be more cautious in your claim since the pattern you observed could arise from “not always being elaiosome limited” or simply that the effectiveness of your removal treatments declined over the 5 years that went by between removal treatments and revisiting ant communities, as your plant survey suggests.

*I changed these two sentences to:*

*“Ant forager abundance was not impacted by the treatments five years after the removal of elaiosomes. In sum, Aphaenogaster populations may not always be limited by the availability of elaiosomes or myrmecochorous plants produce can recover quickly (<5 years) to provide enough food for these ants.”*  
  
Line 61 minor grammatical error

*I thought this sentence was overly complex, so I changed it to:*

*“Spring ephemerals have short leafing and flowering times, often senescing before the forest canopy closes.”*  
  
Line 70: you’re not really referring to a question here– This is more of an objective.

*Fair point. I edited the sentence to be clearer on this objective.*

*“Demonstrating whether or not seed dispersing ants are limited by the availability of elaiosomes is an important objective for the protection of ant-dispersed plant communities.”*  
  
119-122: I’m not finding the methodological detail requested by the reviewer in the appendix.  It’s still not clear if you noted the presence/absence or abundance of each of the plants in your survey.  Also, I know it’s not exactly the same site, but if you presented the 2010 survey as a pie chart similar to Fig 1, that would be much more useful for readers.  I don’t understand the purpose of your species accumulation curves.  The primary value of those “pre” surveys is showing what an unmanipulated community originally looked like way back when.

*I added the line transect methods to the body of the manuscript since its applied across multiple figures in the appendices and important for showing the before and after composition.*

*The new methods text reads:*

*“At each site, I designated transects starting at the habitat edge and continued inward to the center of the forest fragment. A meter tape was laid down across the forest floor and pinned with a tent stake at both ends. Plants overhanging this line were quantified by measuring the total coverage over our transect lines in cm. Sampling effort varied among sites, for more details on the size of transects, see Figs. S1-S5. All non-graminoid, herbaceous, vascular plants were identified species, including both ant-dispersed and non-ant dispersed plants.”*

*I also changed Figure S2 to be a pie chart style figure. I agree this is a great way to show the “before” conditions. We saw approximately 15% of the plant community composition as non-ant-dispersed plants at the start of the project at the Henry Buck Trail, and the range of values seen in our post-manipulation survey appear to be on a similar scale. I did not add a statistical test since the 150m transect is a slightly different sampling regime than the paired 50m transects of the post-manipulation transects.*

*I kept the other surveys as species accumulation curves in the appendix since the goal was to show the diversity and richness at other similar secondary forest sites in Connecticut.*

Line 239: Do you mean forest loss?  
  
Somewhere in the discussion, I would like to see the author qualify their conclusions with a clearer acknowledgement that the non-significant reductions in aphaenogaster might simply be due to the fact that the elaisome removal treatments were barely detectable 5 years out.  Perennial plants appear robust to disturbance, and this seems like a more likely explanation than the claim that mutualisms are robust to disturbance (made at 234)

*I removed the forest loss sentence in revisions. I also edited this first paragraph significantly. I agree the conclusion of the mutualism being “robust to disturbance” is a bit of a reach still. I instead have tried to frame it more along the lines of the experimental design – myrmecochores and ants can tolerate a food “poor” years in which not many elaiosomes are produced. However, more disturbance could have a significant impact (habitat loss, climate change, seed depletion).*  
  
Line 256:  Please add some additional acknowledgement that your study lacks baseline data needed to confirm that ant-myrmecochore mutualisms are indeed robust to disturbance

*I edited the first half of this paragraph to be more conservative in its conclusions. I also added that we did not have pre-experiment ant foraging activity data.*

*“Contrary to the predictions of the elaiosome-limitation hypothesis, I did not observe evidence of a population-level impact of elaiosome removal on Aphaenogaster foraging activity. I observed no change in the recruitment of Aphaenogaster workers to baits during our sampling process, matching findings from in which removal of elaiosome-bearing plants did not reduce Aphaenogaster worker abundance or nest occupancy (Warren et al. 2019). In other systems, seed-dispersing ants can be limited by other resources other than elaiosomes. For example, surveys show that Aphaenogaster are probably not elaiosome-limited in small forest fragments (Mitchell et al. 2002). However, my results should be interpreted carefully as the study area only encompasses a single population of Aphaenogaster colonies and the study lacks data on Aphaenogaster abundance prior to elaiosome removal.”*  
  
Line 282:  Why? The purpose of this sentence is unclear

*I rewrote this section to address a comment higher up about the potential for the ant community to recover between the three-year removal period and the bait assay.*  
  
Line 283:  Explanation for what?

*This sentence is unclear and ‘elaiosome mimicry’ is too complex of a point to introduce in the second-to-last paragraph in the manuscript. I just shortened it. Now I just make the point that some elaiosomes are known to not provide very much of a reward to ants, and perhaps at other locations high-quality elaiosomes may be more prevalent.*

*To address these two comments and the comment arising at line 27 (above):*

*“Finally, several factors may explain why we saw no effects of manual elaiosome removal on Aphaenogaster foraging activity. Aphaenogaster may have recovered quickly following the three-year removal, returning to prior numbers for the multiple growing seasons occurring between removal and the bait assay. Other conditions may be site-specific. For example, Aphaenogaster potentially benefit most from elaiosomes when insect prey can be scarce (Clark and King 2012). However, at this site insect prey may not be limiting at all. At other locations where insect prey is less available, there could be a significant population-level impact of elaiosomes. but this gap in food availability perhaps did not occur at the field site selected. Furthermore, the nutritional benefits of elaiosomes vary greatly among plant species (Pfeiffer et al. 2010) and our site may have included myrmecochores that provide a relatively low reward. Lower relatively nutritional quality of elaiosomes may explain why removal had a minimal impact on Aphaenogaster. It is possible that elaiosomes of higher quality may be provided by a different plant-community composition than the one observed at the site this experiment was conducted.”*