

Dear Editor,

The manuscript submitted by Oddou-Muratorio and colleagues present novel and interesting data on the functional value of flowering phenology in a well known beech species. The study estimated viability, fecundity and sexual selection combining field and common garden data with paternity analyses. These provides a unique combination of data to better understand the selection regime on flowering phenology. The study was performed using two populations that characterized an altitudinal gradient. The main result was that sexual selection through assortative mating acted on flowering time conditioning (stabilizing selection) on male fitness, while fecundity selection favored early flowering on female fitness. During the reading, the result section was one of the most difficult to follow, maybe because in my opinion it is not clear enough the value of using two populations and the description of what was found in one or the other distract from the relevant points. Overall the manuscript is clearly written and the analyses are sound but still I found some points for further clarification. In particular I am not complete sure that the analytical approximation can really address the main goal. Please found below more specific comments and suggestions.

- 1) Line 3: Two populations are not enough to characterize a gradient. I would focus the tittle on the contribution of the study.
- 2) Lines 17-19: Why is this relevant?
- 3) Lines 22-23: To address the main goal it doesn't seem you need populations at different elevations. What justify this selection of populations?
- 4) Lines 28-34: I would try to follow the same order as in background section, first viability, then fecundity and then assortative mating.
- 5) Line 57: It is not clear why an altitudinal gradient is necessary.
- 6) Lines 79-83: These four explanations are not easy to visualize. If you are not going to provide more details, please check whether it would be better to relocate these lines.
- 7) Lines 114-128: I am not sure a multiple regression analysis is the best approximation since viability, mating and fecundity are expressed sequentially during development and one can condition the other. Since you have a nice hypothesis about the interconnection among the three components of selection why you did not try with a path analysis. In other words, please justify a bit more how the Lande and Arnold approach can help in this case more than other analytical approximations. If you find differences between selection differentials and selection gradients then indirect selection may be relevant and you may loose this information using only multiple regressions. I can understand that multiple regression allowed you to estimate non-linear selection gradients, but at the same time it can only test the more simplified hypotheses which in your case is not very realistic.
- 8) Lines 120-128: I would eliminate these lines since they do not provide additional information to the reader. I would explain in more detail how you are going to distinguish between the different forms of selection on flowering phenology.
- 9) Lines 145-146: At this point I am not sure why using two populations that describe an altitudinal gradient makes a difference. Why you need these two populations to understand the selection regime acting on flowering phenology? Please explain this point early in the Introduction.

10) Lines 150-152: This is a strong assumption! Is there any evidence that seedling growth is positively associated with viability under natural conditions?

11) Line 180: How many branches were monitored per tree to obtain phenological data. How synchronized are phenological changes within individual trees? Does the variance within individual trees can have a consequence on their fitness success? Please justify your methodological approach and make explicit the assumptions.

12) Line 261: If there is a hypothesis behind the use of these two populations, then a more solid approach will be to demonstrate first that populations differed in their selection gradients. That is, by performing an ANOVA for the multiple regression including both populations. A significant Altitude x Population effect will be indicative of differential selection and this justify all the subsequent analyses that you did.

13) Lines 457-458: How can you know that selection gradients differ, without doing a statistical test. See comment above.

14) Line 479: Several lines in the Discussion section are good summaries of the results and can be used to make the point clearer in the Result section. This can allow you to release some space to focus the Discussion on the main conceptual and empirical advance of your results. For instance, what does this study added to what we already know from short lived-species studies? Which of the three forms of selection (viability, fecundity, sexual selection) dominate the selection regime on flowering phenology? Throughout the Discussion is was hard to extract a simple take-home message. At the end it seems that your main contribution is the finding of assortative mating in a tree species.