Dear Editor,

Please find attached the manuscript entitled “Butterfly-mediated shifts in selection on flowering phenology depend on host ant abundance” to be considered for review in Ecology Letters, under the category of Letters.

As you are aware, ecologists have widely acknowledged the existence of spatial variation in phenotypic selection on plant traits and its implications for evolutionary trajectories of plant populations. However, the environmental factors responsible for variation in selection have been rarely identified. In this study, we focus on selection on flowering phenology mediated by species interactions, namely predispersal seed predation by a butterfly with two sequential hosts: plants and ants. We have found that selection shifts from favoring early flowering in the absence of the antagonist to favoring late flowering when it is present. Furthermore, the distribution of the antagonist among plant populations was related to the community context in terms of abundance of its second host. These findings prove that the distribution of an interactor, and indirectly, the context that influences this distribution, can explain patterns of spatial variation in phenotypic selection. Our results also contribute to highlight that, when linking variation in the environment to variation in selection, it is important to evaluate both the effects of species interactions on fitness and the effects of the environment and community context on the interactors. We are confident that our findings represent novel insights in the understanding of the causes of spatial variation in selection, and specifically, on the role of species interactions and the context where they occur in determining this variation.

Although other studies by one of the authors (e.g. Ehrlén & Münzbergová 2009) have also found effects of antagonistic interactions on flowering phenology, the present study constitutes a novelty because it demonstrates that selection may act in opposite directions depending on the presence or absence of an antagonist in plant populations. Besides, previous studies have highlighted the importance of the environmental context for antagonistic interactions (e.g. Arvanitis et al., 2007; Kolb & Ehrlén, 2010; von Euler et al., 2014), but this is one of the first studies linking variation in the community context to variation in selection through species interactions.

The attached work has not been published or accepted for publication elsewhere, and is not under consideration for publication in any other journal or book. Its submission for publication has been approved by both authors, and all persons entitled to authorship have been so named.

We thank you in advance for your consideration of our manuscript.

Yours sincerely,

Alicia Valdés (corresponding author)