DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

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Debra Peters, Editor in Chief

*Ecosphere*

Dear Dr. Peters,

Please consider our submission of a regular article to *Ecosphere* titled, “**Effects of Native Bryophytes on Exotic Grass Invasion: a Test of the Stress Gradient Hypothesis**”. It provides a unique test of a general theory in ecology and contributes important insights into how biotic interactions shape exotic species invasions.

Understanding the factors that mediate the success of exotic species during invasion of new habitats is a central question in ecology. While ecologists generally assume that native species compete with and thus resist invasion, there is increasing evidence that native species can also facilitate invasion by exotic species as well. The stress gradient hypothesis (SGH) seeks to explain the range of effects native species have on exotics—specifically it predicts that native species will compete with exotics in benign environments, but facilitate invaders in stressful environments.

In our manuscript, we quantify the effects of a native bryophyte on the demographic rates of two exotic annual grass species across an environmental stress gradient and use the results to evaluate the SGH. Our controlled experiment shows that the native bryophyte has either a negative effect—helping to resist invasion—or a positive effect—facilitating invasion—depending on the species and environmental setting. For one exotic species we found support for the SGH—competition in the low stress environment and facilitation in the high stress environment. However, for the other species we found that the interaction did not change across the gradient. Our study allows us to evaluate the SGH in this unique context and has practical implications for understanding the biotic and environmental factors that influence invasion by exotic annual grasses. Importantly, while there have been many investigations of the SGH between competitors with very similar life histories and traits, our study involves exotic vascular plants and a native bryophyte. Studying interactions between species with such different traits has potential to shed light on the generality of the SGH. We believe the results of this study will be of interest to the broad range of readers of *Ecosphere.*

We have no competing interests to declare, and none of the data or results reported in the manuscript have been published or submitted elsewhere.

Sincerely,

Andrew Kleinhesselink & J. Hall Cushman