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Dear Dr. Inder Verma,

We are excited to submit our manuscript entitled “Intraspecific genetic variation increases network complexity: empirical evidence from a plant-insect food web” for consideration to be published in Proceedings of the National Academy of Sciences.

In this manuscript, we introduce a genetic component to ecological network research by addressing how genetic variation within key species scales up to determine the organization of multi-trophic interactions. Specifically, we test the theoretical prediction that intraspecific genetic variation leads to increased network complexity, which before now remains untested. Using a large common garden experiment, we illustrate how heritable trait variation in a host plant directly and indirectly determines the assembly of its associated insect food web (network of trophic interactions). We found that different host-plant genotypes supported unique compositions of trophic interactions. Moreover, we found that this genetic specificity in trophic interactions resulted in a 50% increase in food-web complexity over the range of genetic variation in the host-plant population. Taken together, our study suggests that intraspecific genetic variation plays an underappreciated role in shaping the structure and dynamics of ecological networks.

We feel that this manuscript provides a novel and general contribution to science for several reasons. Our study is one of the first to empirically demonstrate the cascading effects of intraspecific genetic variation on food-web structure. In doing so, our study provides clear directives for future research on how ecological and evolutionary processes interact to shape food webs. Finally, our work is multidisciplinary, representing a combination of work from experts in the fields of network theory (Dr. Jordi Bascompte) and ecological genetics (Dr. Greg Crutsinger). As such, we feel this integrative research will be of interest to the broad readership of Proceedings of the National Academy of Sciences.

We think that Dr. Simon Levin, Dr. Robert May, or Dr. William Murdoch would be an appropriate editorial board member for this submission. Possible NAS member editors include Dr. Daniel Simberloff, Dr. Stephen Carpenter, or Dr. Thomas Schoener. Suitable reviewers for this manuscript include: Dr. Anurag Agrawal, Dr. Daniel Bolnick, Dr. Jordi Moya-Laraño, Dr. Priyanga Amarasekare, and Dr. Kailen Mooney.

Thank you for your assistance with this manuscript. I look forward to hearing from you regarding the reviews.

Sincerely and on behalf of my co-authors,

Matthew Barbour