Dear Editor,

We are pleased to submit our manuscript titled “**Trophic interaction models predict interactions across space, not food webs.**” by Dominique Caron, Ulrich Brose, Miguel Lurgi, Guillaume F. Blanchet, Dominique Gravel, and Laura J. Pollock for consideration for *Global Ecology and Biogeography* as a research article.

Predator-prey interactions and the food webs they form are fundamental to our understanding of ecosystem functions. The recent surge of trophic interaction predictive models have allows to study food web variation across time, space, and better identify species functional role and vulnerability to extinction. However, how these models can predict trophic interactions across systems and higher-level properties have never been tested.

Here, we investigate how well trophic interaction models can predict interactions across space and how well predictions of predator-prey interactions scales up to predict higher-level food web properties (species position and global properties). We use a trait-based model of pairwise trophic interactions, calibrated independently on four different terrestrial vertebrate food webs (Canadian tundra, Serengeti, alpine south-eastern Pyrenees, and entire Europe) and assess the ability of each calibrated instance of the model to predict alternative food webs.

Some key findings are:

* Given enough phylogenetic and environmental similarities between food webs, trait-based models predict most interactions and their absence correctly, even across highly contrasting environments, suggesting food web variation is primarily driven by changes in trait distributions rather than changes in trait-matching relationships.
* Even if most interactions are correctly predicted, we identified systematic biases in species trophic position and food web properties predictions, highlighting the need to integrate trophic interation models and food web models.

Novel aspects are:

* This study is the first specifically testing factors limiting the transferability for models of species interactions.
* This study is the first to identify the inability of trophic interaction models to predict the trophic position of species and network level properties.
* This study provides the first investigation of transferability for models of species interactions.

Thank you for your consideration for this manuscript. This work is original and has not been published or under consideration elsewhere.

Sincerely,

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