

Dear Editor,

Please consider our manuscript “How reliably can we infer diversity-dependent diversification from phylogenies” for publication in *Methods in Ecology & Evolution*.

Ecological limits to diversification are currently widely studied, and hotly debated (see for instance two contrasting opinion papers published in a recent issue of the *American Naturalist*: Harmon & Harrison 2015, Rabosky & Hurlbert 2015, both cited in our manuscript). A few years ago two of the authors of the current submission co-developed a method to detect diversity-dependence in diversification from molecular phylogenies, and to estimate the parameters (speciation, extinction, carrying capacity) underlying these dynamics. This method has since been employed to argue for diversity-dependence in various clades. However, the reliability of these tests (i.e. whether they correctly infer diversity-dependent or diversity-independent diversification dynamics) and the accuracy of their inferences remain largely unknown. Here we conduct an extensive simulation study to address these issues. We find severe biases in parameter estimates, the direction of which differs depending on the conditioning applied to the likelihood procedure (i.e. on crown age, tree size, or both). For the most unbiased approach (dual conditioning), we find large uncertainty in parameter estimates. Furthermore, regarding model selection reliability we arrive at the important conclusion that standard model selection tools are inappropriate. On the basis of these results we recommend the use of a bootstrap approach that resolves this issue and simultaneously leads to an estimate of parameter uncertainty, illustrating this approach for the diversification of *Dendroica* warblers.

We believe that our manuscript has important consequences for many studies performing diversification analyses and should therefore appeal to a wide audience. Hence, we feel that *Methods in Ecology & Evolution* is the ideal platform for our manuscript.

Kind regards,

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