Dear Editor,

Here we present our manuscript "Quantifying the importance of an inference model in Bayesian phylogenetics". We hope you will consider it for publication as either a Research Article or Application in Methods in Ecology & Evolution.

Current computational techniques allow phylogenetic reconstruction from sequence alignments of extant organisms. BEAST2 is one of the most popular tools to perform this task: it operates in a Bayesian framework and requires an underlying tree prior model to yield a posterior distribution of phylogenies. Tree priors contain the rules according to which diversification is assumed to occur, and may strongly affect the posterior of phylogenies one obtains. BEAST2 allows third-party users to integrate their tree priors. However, implementing novel tree priors is often not trivial: a method to compute the prior probability must be available and computationally feasible, given that it will be evaluated millions of times in a typical BEAST2 run. Therefore, it is important to know whether the implementation of a novel tree prior can be expected to result in better inference or if current BEAST2 tree priors are sufficiently similar that the resulting posterior is reliable.

With this manuscript we introduce pirouette, an R package that allows to quantitatively assess how strongly the posterior generated by BEAST2 with standard tree prior deviates from the true phylogeny. The package offers a complete pipeline with sensible defaults and is well documented, allowing for an easy use by third-party users that want to test the relevance of their own diversification models in Bayesian phylogenetics. The manuscript describes the functionalities of pirouette through working examples and guides the reader in its usage.

As we deem pirouette to be a potential useful tool for theoretical evolutionary biologists, we think that Methods in Ecology & Evolution will be a suitable journal to host our work.

All authors have agreed to this submission and we declare no conflict of interests.

Kind regards,

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