

Interactive comment on “Phylogenetic support for the Tropical Niche Conservatism Hypothesis despite the absence of a clear latitudinal species richness gradient in Yunnan’s woody flora” by G. Tang et al.

Anonymous Referee #2

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The authors tested for the Tropical Niche Conservatism Hypothesis using woody plants in Yunnan Province, China. There are major problems in this study. Here, I would mention some of them.

(1) The authors used herbarium collections to document species distributions and then related species compositions in geographic areas derived from the species distributions to environmental variables. As shown in several recent publications, including those for China’s plants (e.g., Yang et al. 2013 *Journal of Biogeography* 40:1415-1426), studies using data derived from herbarium collections can result in substantially

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biased conclusions due to incompleteness of documentation of species richness and distributions.

(2) Yunnan Province has about 13000 species of angiosperms, about 6000 of which are woody plants (according to *Flora of Yunnan* and *Flora of China*). The authors used only 2319 (or 40%) species of the entire woody flora of Yunnan. This incompleteness of data at the provincial level would have been translated into smaller scales used in the study. It is impossible that this low proportion of the woody flora can adequately represent the woody flora of Yunnan. Results for patterns of species richness (SR), phylogenetic diversity (PD), and net relatedness index (NRI) can all be substantially biased when using such incomplete datasets.

(3) The authors used modeling methods to generate species distributions and then used the generated species distributions to related environmental variables. Because the species-presence data are very incomplete as mentioned above, it is very unlikely the modeled species distribution data can be reliable for their study. In addition, the current literature show that modeled species distributions can be substantially biased. It is incorrect to use modeled species distributions in the study.

(4) Of the 4936 grid cells of 10 km by 10 km in Yunnan, the authors used only about 10% of the 4936 grid cells in their study. Such low coverage of the study area plus the low quality of the data as mentioned above would unlikely have resulted in unbiased results. According to the authors, the use of only 10% of their grid cells was to reduce computation. However, other studies have used much larger datasets in computing the same phylogenetic indices. For example, Brunbjerg et al. (2014, *Journal of Plant Ecology* 7:101-114) used 18463 samples.

In addition to major problems, there are some other potential problems. For example, at the end of section 2.4, the author indicated that their phylogeny was based on APG II (APG 2003). APG II is an outdated phylogeny. APG III (APG 2009) has been available for years and has been commonly used in phylogenetic studies. Why did you use APG

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II rather than APG III?

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