

Interactive comment on “Research Paper: Detecting climatically driven phylogenetic and morphological divergence among spruce species (*Picea*) worldwide” by Guo-Hong Wang et al.

Anonymous Referee #1

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I read the manuscript “Detecting climatically driven phylogenetic and morphological divergence among spruce species (*Picea*) worldwide” with delight. The manuscript explored the relationship between climate and the phylogenetic and morphological divergence of *Picea* species in the Northern Hemisphere, based on 3388 georeferenced distribution sites. Temperature and precipitation parameters were the main driving factors for the primary divergence of spruce phylogeny and morphology, respectively. The climatic data extracted from current spruce locations captured the ecological divergence among spruces. These results suggested that the primary divergence of morphology and phylogeny among the spruces tended to be driven by different selective pressures. The data and methods are appropriate for this study, the manuscript is well

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organized and presented. I found that the manuscript has a merit for publication in the journal *Biogeosciences*, pending on the authors can address my following concerns. My major concern is that if the climatic data used in this manuscript can represent the local climate of the distribution sites. The Worldclim dataset has been widely used in biogeographic studies. It can be used to surrogate the local climate in plain areas. However, it cannot represent the local climate in the mountainous regions because of the coarse resolution (about 1km). In the mountainous regions, 1 km distance may cover an elevational interval of hundreds of meters (and therefore introduce several degrees of difference in temperature). The authors need to discuss the caveat of using this dataset. Specific points Line 66: “Nearly 34 species” should be “Thirty-four species” Line 83: “niche conservatism” is not a process, but a pattern (result of the processes) Line 130: “Between 34 and 35 species” is conflict to the “34 species” (line 66) Line 132 (and other areas): “flora of China” should be “Flora of China” Line 145, 148, 152: delete “approximately” Line 159-166: set abbreviations for the climatic variables (and use the abbreviations afterwards) Line 216-224: move to the “Materials and Methods” section

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