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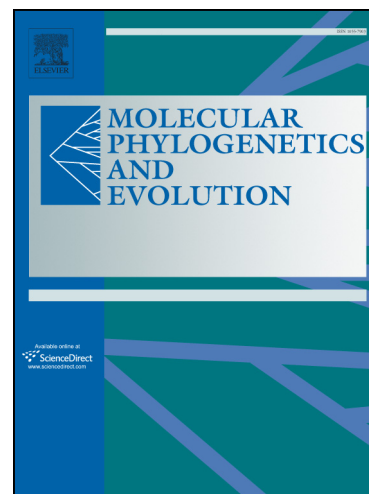
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The distribution of branch lengths in phylogenetic trees

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Abstract

A lot of effort has been devoted to analyse the distribution of branching times observed in a phylogenetic tree. On the other hand, the distribution of branch lengths has not received similar attention. In this paper, the distribution of branch lengths is studied. It is shown that different types of branches within a tree have distinct distributions. Some equations to predict these distributions are derived with respect to diversification parameters and whether the size of the tree is known or not. A simulation study validated these predictions. The inferred distributions are used to develop graphical and statistical tools to assess the goodness-of-fit of diversification models. An application is presented on a recently published dated phylogeny of Carnivora. Some future developments are discussed.

Keywords: diversity, extinction, phylogeny, speciation

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