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PHYLOGENETIC STRUCTURE IS DETERMINED BY PATCH SIZE IN AN TROPICAL INSELBERG

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Although Inselbergs from around the world are iconic ecosystems, little is known on the underlying mechanisms of community assembly, especially in their characteristic patchy outcrop vegetation. Environmental constraints are expected to cause phylogenetic clustering when ecological niches are conserved within evolutionary lineages. We tested whether vegetation patches from rock outcrops of the Piedra La Tortuga Natural Monument, Northern Amazon basin, are phylogenetically indicating that environmental filtering is the dominant driver of community assemblage therein. We classified all patches according to their size as very small ($< 1 \text{ m}^2$), small ($1-4 \text{ m}^2$), medium-sized ($4-8 \text{ m}^2$), and large patches ($8-15 \text{ m}^2$). From each class, we randomly selected 10 patches, totalizing 40 patches covering 226 m^2 . All individuals found in the 40 isolated patches were identified to the species level. We also correlated measurements of phylogenetic community structure with patch size to outline whether the former is able to explain the latter. In 40 patches, we found 24 species belonging to 22 genera and 19 families. All families belong to the angiosperm clades malvids, fabids, lamiids, and monocots. Mean NRI and NTI values vary considerably from 0.081 to 0.539. NTI values indicate significant clustering towards the tips of the phylogenetic tree. NRI_t shows only weak phylogenetic clustering for vegetation patches from Piedra La Tortuga while NRI_i shows no difference against the null expectation. We conclude that in this rock outcrop vegetation is phylogenetically clustered. Furthermore, we found that phylogenetic turnover between pairs of patches increases with patch size, which is consistent with a scenario of high environmental stress in smaller patches. Considering that assessing the phylogenetic community structure is an important approach to study Inselberg vegetation, further research is necessary to identify nurse species therein, which is pivotal for conservation and restoration of this particular ecosystem.

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