LOCAL DETERMINANTS OF ANT FUNCTIONAL DIVERSITY IN A FOREST FRAGMENT

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The functional trait approach is powerful tool for the development of quantitative and predictive models of community assembly rules. Patterns of morphological variation among species allow us to infer the relationship between morphology and ecology, while revealing a system combining ant resource related traits to environmental scales and/or conditions.

Material & Methods

We evaluated local determinants of ant morphological diversity in three vegetation types inside State Park of Xixová-Japuí (PEXJ), a 900ha Atlantic Forest fragment in Southeastern Brazil (Figure). We employed 60 pitfall traps set for seven days (summer and winter) along two transects of 100 meters per area, sampling points at each 10 meters, and recording thirteen ecological variables (see table on Variables) at each collection point.

We quantified the influence of the measured variables on richness and composition of communities and the relationship among resources and environment variables. We used GLMMs, LMEs and GAMMs to test the relationship between species richness, morphological diversity and environmental variables (accounting for spatial and temporal correlation). We selected as predictors of ant diversity the following variables in the analyses:

Richness (taxonomic or morphological) ~ litter + temperature + number of herbs + tree distance + soil slope + soil pH

We analyzed summer/winter datasets together to a general model to our study.

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<th>VARIABLES</th>
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<td>Litter deph (mean of 5 measurements)</td>
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<td>Soil: pH, saturation, and slope</td>
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<td>Relative humidity</td>
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<td>Tree: diameter at breast size and distance of closer tree to trap</td>
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Results

Eighty two ant species belonging to seven subfamilies (29 genera) were collected (65 in the summer and 55 in winter). We found no significant relationships between Richness and the predictors. PD was better explained by Number of Herbs (p=0.06), MPD and MNTD by temperature (p<0.05).

Conclusion

Interestingly, we found that different variables at microscale affect differently the ant functional diversity, depending on the adopted functional metric (PD, MPD or MNTD).