

DIFFERENT REFORESTATION TYPES MODULATE THE RECOVERY OF ANT COMMUNITIES IN THE SOUTHERN AMAZON

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SUMMARY

Forest restoration is an important strategy to mitigate biodiversity loss in the Amazon. We evaluated patterns of ant genus diversity across different experimental reforestation models at Fazenda São Nicolau, in Cotriguaçu, Mato Grosso. In the recent reforestations (25 years old), established from pastures, there are two likely sources of queens for colonization or retention: the native forest, considered the final stage of succession, and the pastures, the initial stage. Areas of secondary forest (capoeira) were used as controls to understand how diversity recovery occurs without intervention. We analyzed plantations of *Ficus* sp. (fig trees), *Tectona grandis* (teak), and mixed-species reforestations with three or more associated species. Six plots per treatment were sampled between December 2024 and January 2025 using pitfall traps, totaling 360 sampling points. We observed that the native forest exhibited an exponential decline in zeta diversity, indicating low dominance of genera among sampling points. All other vegetation types showed declines following a power law, demonstrating greater species retention (higher homogeneity) among sampling points. When comparing the mean number of genera shared with the sources (forest and pasture), we found that, except for teak, the number of genera shared with at least one forest point was higher than with pastures, and decreased rapidly as a function of genus frequency in the forest. In all cases, the mean number of genera shared with pastures remained relatively constant, depending on the frequency of occurrence in the forest, indicating the predominance of frequent species from pastures occupying the reforestations. However, in teak reforestations, the number of genera shared with at least one pasture was high, equivalent to that shared with the forest, but also constant, demonstrating high similarity and retention of genera originating from pastures. When directly correlating the frequency of genus occurrence in forests and pastures with the other treatments, we observed a proportional correlation trend between teak and pasture, as well as between fig trees and forest. This indicates neutral colonization processes from forests into fig plantations, as well as neutral retention of genera originating from pastures in teak plantations. We conclude that although reforestations generally promote the recovery of ant communities, the success

depends on the strategy adopted, with mixed-species and fig plantations being the most promising for biodiversity conservation.

Keywords: Reforestation; Ants; Zeta diversity; Ecological recovery; Southern Amazon

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