

One of the greatest challenges of ecology is to understand and predict the fluctuations in the biological populations. When we consider the human intervention in this understanding, we can, at the same time, make predictions about the future of the populations and understand better their natural processes of regulation and control. In this work we carried out a study about the ecology of populations of two shade tolerant tree species (*Guapira opposita* (Vell.) Reitz, that occupies the canopy and *Rudgea jasminoides* (Cham.) Müll.Arg., that occupies the understory) to answer the question of how the structure, population dynamics and seedling performance respond to environmental heterogeneity caused by disturbances related with fragmentation and secondary succession. In the first chapter we tested if the population structure, measured by size distributions, is related to the size and/or to the successional stage of the fragment. From the conclusions generated in this first study, in the second chapter we evaluated if population dynamics parameters, such as asymptotic growth rate and vital rates explain the variation in density and structure. In the third chapter we tested if the seedling performance of these species is affected by canopy openness and litter depth, which are known promoters of environmental heterogeneity in secondary forest fragments. In order to achieve this goal we marked and followed by two years (2007- 2009) populations of both species in six secondary forest fragments of different successional stages in the Southeast Atlantic Plateau. Regarding the population structure, *Guapira* showed variation associated to the degree of forest structuring, while for *Rudgea* the fragment size was the most important explanatory variable, what lead us to hypothesize that *Rudgea* is in risk of local extinction in the medium fragments. Regarding the analysis of population dynamics, *Rudgea* showed a population doubling time in the medium fragments 4.5 times greater than in the large ones, what lead us to conclude that this risk of local extinction can be mitigated or even reversed. For *Guapira*, the rates did not differ between the successional stages, being predicted stable populations in both (955;8776;1). The analysis of the effect of the canopy openness and the litter depth in the seedling performance showed the importance of the interaction between these factors and the relevance of considering the different seedling ontogenetic stages. Through a new approach, we demonstrated how important is to consider complementary studies (structure and dynamics) in order to really understand what happens at population level. Besides, we highlight the importance of studies with dynamics in order to elucidate the demographic mechanisms that occur in each population. This knowledge is a fundamental tool for planning more directional management and conservation actions.