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ATLANTIC FOREST REGENERATION IN A PERI-URBAN LANDSCAPE: RESILIENT CAPACITY AND ENVIRONMENTAL INFLUENCE

Maria Manuela Bandeira de Aguiar[1], Ladivânia Medeiros do Nascimento[2], Maria Jesus Nogueira Rodal[3], Thiago Gonçalves-Souza[3], Ana Carolina Borges Lins e Silva[3]*

1. Departamento de Ciência Florestal, Universidade Federal Rural de Pernambuco (UFRPE), Dois Irmãos, Recife, PE 52.171-900, Brazil; 2. Jardim Botânico do Recife, Prefeitura do Recife, Rodovia BR 232, km 7,5, Recife, PE, Brazil; 3. Departamento de Biologia, Universidade Federal Rural de Pernambuco (UFRPE), Dois Irmãos, Recife, PE 52.171-900, Brazil. *Correspondence to ana.blsilva@ufrpe.br

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Secondary forests are crucial for biodiversity conservation and maintenance of ecosystem services, particularly in the tropics. However, forest recovery after abandonment can follow different pathways: either progressive, converging to mature forests, or retrogressive, becoming floristic and structurally simpler than old-growth sites. When available sites for forest regeneration occur under urban or peri-urban influence, can we expect a progressive convergence? We evaluated a chronosequence of Atlantic Forest in a highly disturbed peri-urban landscape in Northeast Brazil. The study was conducted in the Dois Irmãos State Park, Recife, in five sites: two of mature forests (M1 and M2), one of late regeneration (R1, aging approximately 40 years) and two in initial regeneration, one less impacted (R2) and the other more impacted (R3), both under 30 years of abandonment. We used circular sample units of 254 m^2 (canopy) and 78 m^2 (sub-canopy), in which all woody plants (trees, palms and lianas) with DBH ≥ 10 cm (canopy) and ≥ 5 cm (sub-canopy) were identified and measured. We analyzed data for richness, similarity, physiognomic indicators (density, height and basal area), and the influence of abiotic factors (luminosity and slope) on species composition. Overall, our results confirmed the progressive convergence of regenerating forest to mature forest, represented by the increase of species richness, floristic similarity and physiognomy along the chronosequence, and a greater similarity of the sub-canopy with the canopy of older areas. Canopy recovered in about 40 years and the sub-canopy in less than 30 years. Abiotic factors explained only 7.2% and 5.4% of the variation in plant composition for the canopy and sub-canopy, respectively. However, the intensity of impact has influenced all parameters, slowing down or may even stopping the regeneration of the more impacted initial stage. Thus, only heavily impacted sites need more time to naturally regenerate and/or require costly restoration measures.