

GROWTH ANALYSES ON FOUR NATIVE TREE-SPECIES OF THE BRAZILIAN ATLANTIC RAINFOREST: SEASONAL AND LONG-TERM DYNAMICS

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With less than eight percent of the original extent remaining and a magnitude of biological diversity similar to the Amazon forest the Brazilian Atlantic rain forest is one of the most endangered ecosystems of the world.

A sound understanding of growth patterns in mixed forests is essential for the conservation and successful reforestation of these unique forests and for efficient habitat management. For analyzing the seasonal growth dynamics of selected tree-species a dendrometer measurement station has been installed in a naturally regenerated forest stand near Antonina, Paraná. The area is located in the Reserva Natural do Rio Cachoeira owned by SPVS - *Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental*. Electronic point dendrometers were installed on each of five individuals of *Andira antheimia* (Vell.) Macbr., *Pera glabrata* (Schott) Baill., *Tapirira guianensis* Aubl. and *Vochysia bifalcata* Warm. These instruments allow to detect changes in stem radial dimension at high temporal (e.g. every 5 minutes) and spatial (up to 0.001 mm) resolution. To our knowledge, this activity is the first to study stem radius changes in tropical trees using such a high resolution in time and space.

The investigated sample trees show characteristic inter- and intra-specific patterns in stem radius variations. They differ in the magnitude of growth as well as in the daily amplitude of contraction and expansion. We analyzed the growth dynamics with respect to the species' status in natural succession and in relation to variations in environmental conditions. In a second step we use several biometric variables (e.g. diameter at breast height, total tree height, crown width, crown ratio) to test the hypothesis that intra-specific variation in diameter growth depends on tree size.

Using retrospective growth analysis based on increment cores, long-term dynamics and the tree growth effecting conditions can be analyzed. Therefore we used the method of High-Frequency Densitometry, developed at the Institute for Forest Growth, to detect the hardly visible growth zones and calculate the yearly increment over the whole life-span of the trees. The so analyzed species were *V.bifalcata*, *P. glabrata* and *Hyeronima alchornoides*. In total 75 trees were sampled, occurring on 4 sites varying in soil type and succession status. Preliminary results shows that the tree's status in competition as well as crown size indices correlate significant with their long-term growth dynamics.

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