Dendrochronology of *Tachigali myrmecophila Ducke,* from Amazon Rainforest

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International Workshop of Tropical Dendrochronology

INTRODUCTION

The *Tachigali myrmecophila* species, popularly known as Black-taxi, belongs to the Fabaceae family and occur in the Amazon rainforest, in the states of Amapá, Pará and Mato Grosso, Brazil. Knowledge about the tree species potential stock and trunk growth dynamics, combined with technical and economic viability studies are critical for its use in an ecologically sustainable basis [1]. Thus, for the application of this forest management techniques for *T. myrmecophila* trees, the dendrochronological analysis is essential.

OBJECTIVES

The objectives were to characterize and delineate the growth rings of *Tachigali myrmecophila*, and its application on dendrochronology, in order to obtain the tress estimated age and its optimal harvest age for sustained forestry.

MATERIAL AND METHODS

The 3 trees core samples were sanded, scanned and the values of tree ring width obtained on an Image Analysis software were cross-dated by COFECHA, before the confection of the tree ring series on ARSTAN.
Using growth rings raw width, both periodic annual increment (PAI) and mean annual increment (MAI) could be determined, and utilized on Optimal Harvest Age investigation.

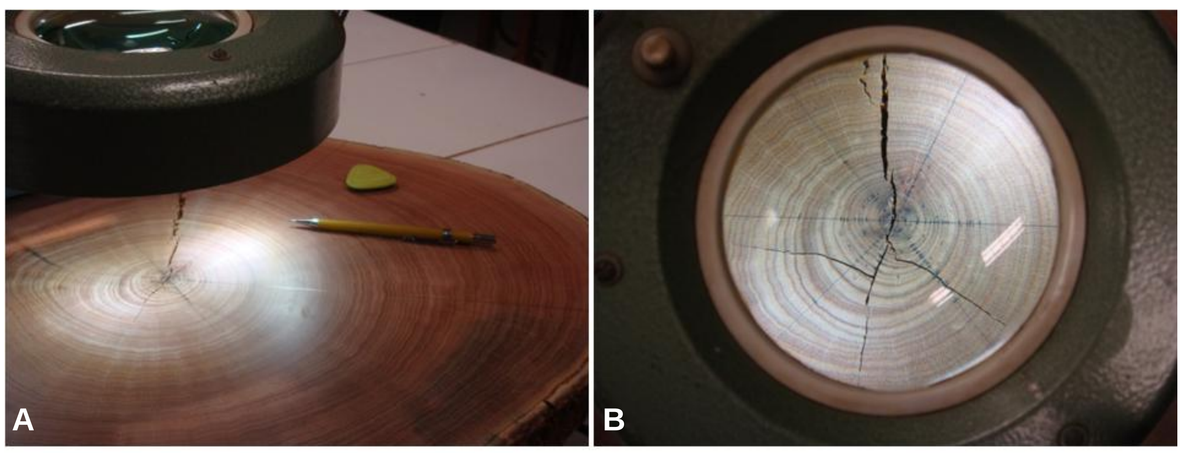

Figure 1. A and B) Marking the tree-rings boundaries in *T. myrmecophila* wood disks, with the aid of a table magnifier; C) *T. myrmecophila* tree-rings width measurement process.

RESULTS

The *T. myrmecophila* trees presented annual tree-rings delimitated by wall thickening/lumen area decrease of latewood cells.
Correlation coefficients between trees (.531) outnumber the critical correlation value required for statistical significance (.422). The trees had an average mean sensitivity value of .311, and ages ranging between 51 and 73 years (TABLE 1). ARSTAN enable the construction of *T. myrmecophila* master chronologies (FIGURE 1).
Cumulative curves in diameter were obtained through the original growth rings width measurements (FIGURE 2). With the *T. mymercophila* tree-rings width, the periodic annual increment (PAI) and the mean annual increment (MAI) were determined, and as a result of local conditions of growth factors, trees revealed differences on MAI values (FIGURE 3). From the standpoint of maximum biological production, the intersection point between MAI and PAI indicates the point of intervention in the stand (FIGURE 4).

CONCLUSIONS

It's evident the existence of a common sign, which indicates a seasonal cycle of growth and allows good fit of *T. mymercophila* tress annual tree-rings series. The growth model tested predicts a cutting cycle of 70 years.

TABLE 1. COFECHA quality control of growth rings series

Site	Series amount	Chronologies extension (Years)	Temporal lapse	Intercorrelation	Sensitivity
J1	3	51	1960-2010	.391	.314
J2	3	73	1938-2010	.652	.287
J3	3	69	1942-2010	.514	.336

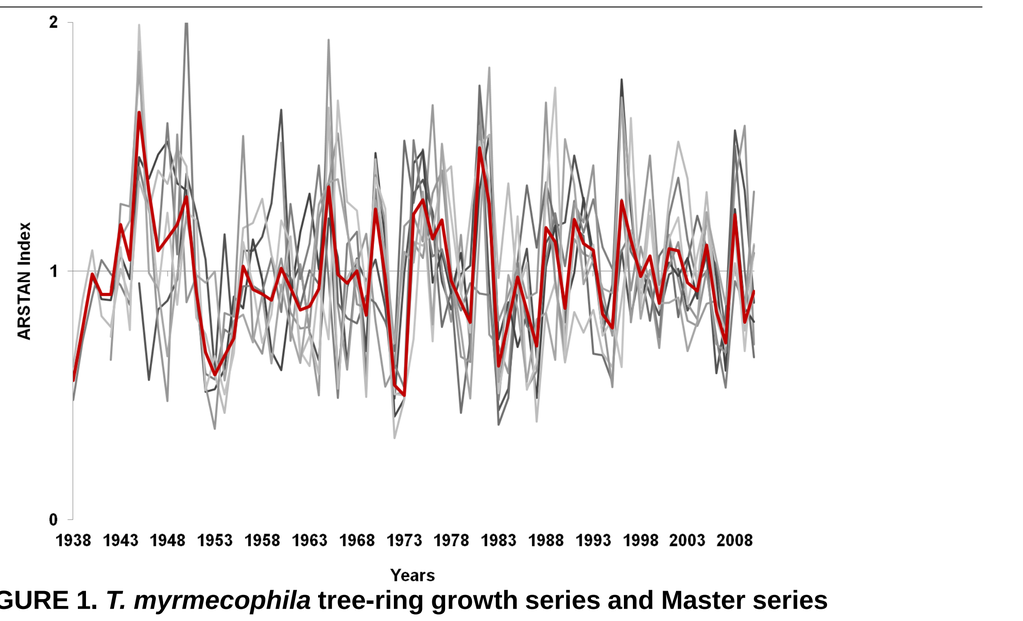

FIGURE 1. *T. myrmecophila* tree-ring growth series and Master series

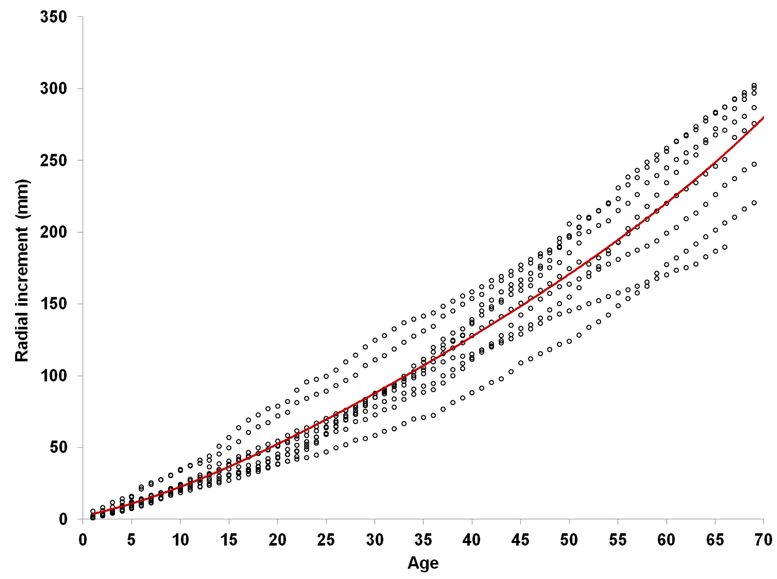

FIGURE 2. Cumulative radial increment of *T. myrmecophila* growth rings

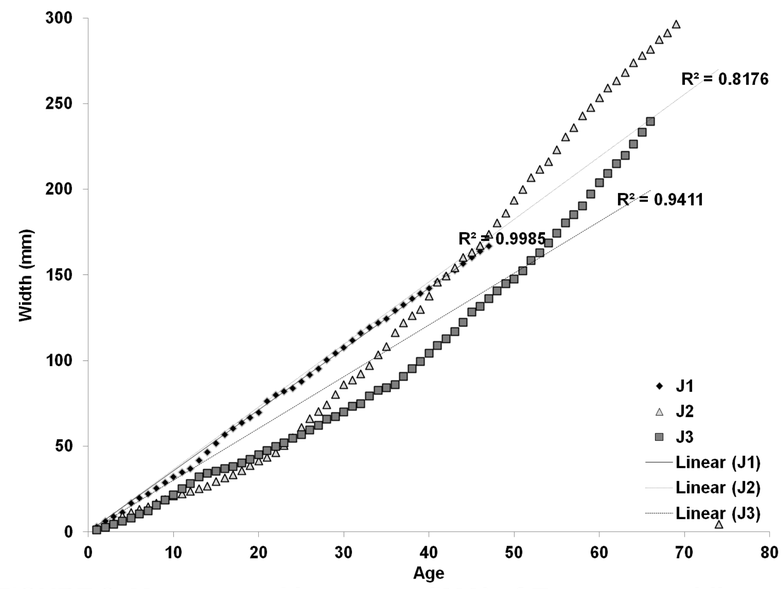

FIGURE 3. Mean annual increment (IMA) of *T. myrmecophila* trees

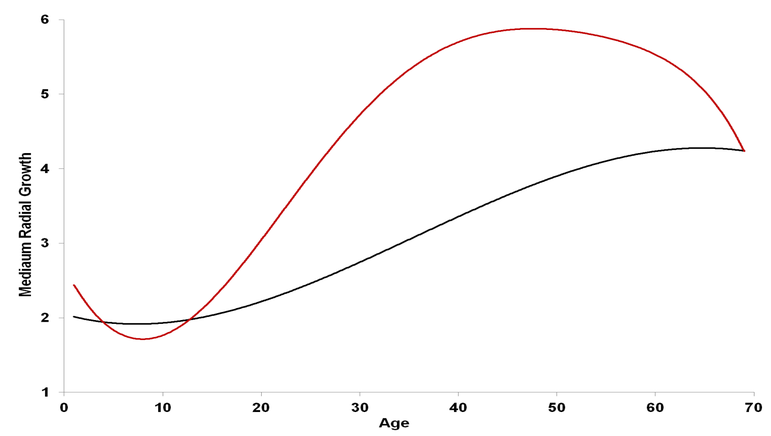

FIGURE 4. Optimal Harvest Age projection of *T. mymercophila* trees

REFERENCES

[1] SOUZA, A.L. Dinâmica da composição florística de uma floresta ombrófila densa secundária após corte de cipós da Reserva da Vale. Rev. Árvore, (26) 5:30-39, 2002.

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