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# Forest Research and Cooperation for Sustainable Development

## XXV IUFRO World Congress, 29 sept - 5 October 2019, Curitiba, PR, Brazil

## Abstracts

### Population structure of *Pentaclethra macroloba* (Willd.) Kuntze in high and low floodplains of the Amazonian estuary

*Adelson Rocha Dantas[1], Maria Teresa Fernandez Piedade[1], Marcelino Carneiro Guedes[2], Ana Claudia Lira-Guedes[2]*
*[1]Instituto Nacional de Pesquisas da Amazônia, Manaus, Brasil; [2]Programa de Pós-Graduação em Ecologia, Manaus, Brasil; [2]Embrapa Amapá, Macapá, Brasil (adelson.dantas@yahoo.com.br; maua.manaus@gmail.com; marcelino.guedes@embrapa.br; ana-lira.guedes@embrapa.br)*

The flood cycle of floodplain forests and topographic variations are important factors of diversification and morphological and ecophysiological adaptations of the plant community. *Pentaclethra macroloba* is a hyperdominant species adapted to flood variations. The objective of this study was to characterize the *P. macroloba* population structure between environments with high topography, flooded only during the rainy season and peak flood of the river, (high várzea-HV) and low topography with daily flood (low várzea-LV). The study was carried in the Mazagão Experimental Field, Brazil. Four plots of 1 ha were installed in each environment. All individuals with DBH ≥ 5 cm were measured and georeferenced. ANOVA test, 0.05% probability, was applied to verify the structural differences between two environments. The HV had higher population density (51.2 individuals.ha-1) compared to the LV (36.7 individuals.ha-1), although without significance. Basal area was higher in the HV (10.42 m²) in comparison with LV (5.90 m²), with significant difference ($F = 7.13$, $p = 0.00795$). The maximum DAP of HV was 67 cm with mean of 24 cm. The LV presented maximum DBH of 42 cm with mean of 21 cm, showing structural difference between the two environments ($F = 6.22$, $p = 0.0131$). The aggregation index showed high aggregation in the LV ($R = 0.89$) than in the HV ($R = 0.79$), differing significantly between the two environments ($F = 11.31$, $p = 0.0008$). Frequency and time of flooding are ecological drives that structure the population of pracaxizeiro causing morphological and ecophysiological adaptations to the individual.

## C2t: PHYSIOLOGY AND GENETICS

### Environmental interactions and marker assisted selection in a changing world

*Luciano Medina-Macedo[1], Jacqueline Grima Pettenati[1], Ana Clara Oliveira Ferraz Barbosa[2], Juliana Vitoria Messias Bittencourt[3], Ludmila Ferreira Bandeira[4], Alexandre Siqueira Guedes Coelho[4]*
*[1]LRSV - Laboratoire de Recherche en Sciences Végétales, Toulouse, France; [2]Instituto Florestal Goiano, Urutaí, Brasil; [3]Universidade Tecnológica Federal do Paraná, Ponta Grossa, Brasil; [4]Universidade Federal de Goiás, Goiânia, Brasil (medina.ppgebb@gmail.com; grima@lrsv.ups-tlse.fr; bioaco@gmail.com; julianavitoria@utfpr.edu.br; ludmilafb@gmail.com; asgcoelho@gmail.com)*

There is evidence that climatic changes can influence genetic interactions among traits as well as the genetic variance themselves. Genetic correlations can shift when populations encounter different environmental conditions, reflecting the fact that genes influencing a trait in one environment may not be important in a different one. Thus, is necessary to understand the forces driving the adaptive ability of forest species. Starting from 300 SSR primers, one hundred without segregation distortion were select to build a genetic map to QTL mapping in a double-hybrid Eucalyptus progeny composed by 200 individuals (select hybrid among *E. dunnii* and *E. grandis* x *E. globulus*). Genetic data, as well as growth and wood properties assessed by NIRS, were gathered in Brazil at field trials located in Minas Gerais and Rio Grande do Sul provinces. An integrated genetic map with 11 linkage groups was built, covering approximately 90% of Eucalyptus genome in a total length of 1420 cM. Applying 99% confidence, a total of seven QTL were associated to growth (diameter, height and to volume), in addition to another twelve QTL related to wood properties (three to density; four to cellulose yielding; three to lignin content; and two QTL to relation siringil/guaiacil). Among these QTL, one QTL related to lignin content and another to cellulose content displayed interactions among environments. These results allow the adoption of breeding strategies as Marker Assisted Selection, taking into account the alleles according to the location and ensuring operational solutions to better adapt forests to climate changes.

### Genetic variability among genotypes of paricá (*Schizolobium parahyba* var. *amazonicum*) with regard to initial growth in Sinop, Mato Grosso, Brazil / *Variabilidade genética entre genótipos de paricá (Schizolobium parahyba var. amazonicum) quanto ao crescimento inicial em Sinop - Mato Grosso*

*Aisy Botega Baldoni[1], Flávio Dessaune Tardin[1], Andreia Alves Botin[2], Jairo Alex de Barros Marques[3], Fábio Linsbinski de Oliveira[3], Adailthon Jourdan Rodrigues Silva[3], Bruno Spiering[3], Denise Caragnato Parisotto[4], Leonarda Grillo Neves[4]*
*[1]Embrapa Agrossilvipastoril, Sinop, Brasil; [2]Universidade Federal do Mato Grosso, Cuiabá, Brasil; [4]Universidade do Estado de Mato Grosso , Cáceres, Brasil (aisy.baldoni@embrapa.br; flavio.tardin@embrapa.br; andreia.botin@yahoo.com.br; jairo—alex@hotmail.com; fabiolinsbinski@hotmail.com; adailthonrodrigues@gmail.com; bruno_spiering@hotmail.com; dcparisotto@gmail.com; leonardaneves@unemat.br)*

O paricá (*Schizolobium parahyba* var. *amazonicum*) é uma espécie nativa da Amazônia, de rápido crescimento e vem ganhando espaço no cenário nacional dentre as culturas florestais plantadas. Para um plantio bem-sucedido são necessárias plantas de boa qualidade e que apresentem desenvolvimento uniforme. O melhoramento genético pode contribuir para a seleção de genótipos superiores, que manifestem as características desejáveis para a cadeia produtiva, estimulando o plantio. Neste contexto, o objetivo foi avaliar a existência de variabilidade genética entre 58 genótipos e possibilidade de seleção de matrizes superiores, por meio da avaliação do crescimento inicial médio de suas progênies. Para tanto, as progênies foram plantadas na área experimental da Embrapa Agrossilvipastoril, no município de Sinop-MT, num delineamento experimental de blocos casualizados, com 4 repetições e 5 plantas por parcela, nas quais foram mensurados o diâmetro do coleto (mm), altura (m) e número de folhas, 6 meses após o plantio. Os dados coletados foram submetidos a análise de variância, considerando, para cada parcela, a média das cinco plantas. Posteriormente, foi obtida a matriz de distâncias entre genótipos proposta por Mahalanobis e agrupamento dos genótipos pelo método de otimização de Tocher. Os resultados da análise de variância demonstraram diferenças significativas entre genótipos ($P < 0,05$) para todas as características avaliadas. Pela matriz de distâncias, os genótipos 12 e 42 foram os mais similares e os genótipos 44 e 50 os mais divergentes. Nove grupos de médias foram formados pelo método de Tocher, demonstrando variabilidade genética e possibilidade de seleção de matrizes promissoras para a região.

### Simulating environmental changes to evaluate the frost resilience of *Eucalyptus* clones

*Luciano Medina-Macedo[1], Jacqueline Grima Pettenati[1], Francisco de Assis Bibeiro[2], Juliana Vitoria Messias Bittencourt[3], Rosana Clara Victoria Higa[4], Antonio Rioyei Higa[5]*
*[1]Laboratoire de Recherche en Sciences Végétales, LRSV, Toulouse, France; [2]Ciliar Mudas, Conchal, Brasil; [3]Universidade Tecnologica Federal do Paraná, Ponta Grossa, Brasil; [4]Embrapa Florestas, Colombo, Brasil; [5]Universidade Federal do Paraná, Curitiba, Brasil (medina.ppgebb@gmail.com, grima@lrsv.ups-tlse.fr, francisco@ciliarmudas.com.br; julianavitoria@utfpr.edu.br, rosana.higa@embrapa.br; higa@ufpr.br)*

The evolving climate is a significant driver of change, reducing forest health and productivity. In spite the Brazilian Forestry be the worldwide leader on Eucalyptus cellulose production and yield, this sector had strong economic losses with low-temperature events at every 20 years since the 1970s. To guarantee