Genotype characteristics of *Eucalyptus benthamii* in developing clonal cultivars / *Caracterização de genótipo de Eucalyptus benthamii no desenvolvimento de cultivar clonal*

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A formação de plantações florestais com eucaliptos em regiões propensas a fortes geadas, comuns no Sul do Brasil, ainda está grandemente vinculada à utilização de sementes de um reduzido número de espécies, havendo pouca disponibilidade de clones comerciais. Nesse contexto, *E. benthamii* é particularmente estratégica para a obtenção de madeira, principalmente para atender finalidades energéticas e utilização na forma roliça. A matriz denominada "brs 203" foi selecionada em um amplo teste de progênies instalado em 2007 na localidade de Candói, PR, Brasil (25°36'S; 52°04'O; 870m), sendo os parentais originários de Kedumba Valley, NSW, Austrália (33°49'S; 150°23'E; 140m). A alta taxa de crescimento e o elevado padrão silvicultural foram os critérios iniciais de seleção. Os valores encontrados para diversos caracteres avaliados aos 9 anos de idade foram os seguintes: DAP 48,7 cm; altura total 33,7 m; altura comercial 29,5 m; volume de tronco com casca 2,60 m³; volume de tronco sem casca 2,14 m³; porcentagem de casca 17,8%; densidade básica 537 kg/m³; teor de cinzas 0,28%; teor de extrativos 2,20%; teor de lignina Klason 24,25%; teor de lignina solúvel em ácido 1,89%; teor de holocelulose 71,38%. Um dos aspectos de destaque desse genótipo é o fato de estar demonstrando em viveiro resultados iniciais bastante favoráveis quanto à formação de raízes a partir de estacas, fundamental para se ter sucesso na estratégia de desenvolvimento de clones comerciais. Muito embora haja necessidade, na sequência dos trabalhos, de se realizar inúmeros testes adicionais de campo comprobatórios de desempenho e qualidade, as perspectivas são promissoras.

Genetic parameters in seed characters of *Stryphnodendron pulcherrimum* under different temperature levels

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The Stryphnodendron pulcherrimum (Fabaceae) is Amazonian tree species also found in Atlantic Forest, Guianas, Venezuela and Colombia. It has a potential for urban afforestation use, reforestation, ecological recovery of degraded areas and extraction of tannin. However, genetic and physiologic traits of its seeds are poorly studied. This work aimed to estimate genetic parameters in *S. pulcherrimum* seeds under different temperatures of germination, proposing superior matrices in seedlings production and subsidize strategies for domestication as well as to genetic enhancement of this specie. Seeds of 21 matrices of the species were collected in Apuí, Amazonas. The design was completely randomized, with four replicates of 25 seeds per matrices. The germination tests were conducted at temperatures of 25, 30 and 35 °C. Whereas genetic parameters, selection gain for germination percentage, mean germination time, synchronization and germination rate indexes were subjected to analysis of variance (ANOVA) in order to examine the difference among matrices or warming level. The genetic variability and high values of heritability and selective accuracy (> 69%) for all germination traits suggest that the phenotypic value can provide a reliable measure for selection of superior genotypes. The highest percentage of germination was obtained in the environment of 25 °C (92%) with decreasing of twinned seeds and mean germination time with increasing temperature. Progenies 11, 14 and 15 presented good germination characteristics for all analyzed environments.

Biometric parameters in seed characters of *Stryphnodendron pulcherrimum*

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The species Stryphnodendron pulcherrimum is a Fabacea. In Brazil it grows in the Amazon region and in the south of Bahia and has importance for the recovery of degraded areas, however, it is difficult to obtain seedlings. The objectives of this work were to estimate biometric parameters of seeds of 21 *S. pulcherrimum* matrices located in Apuí, AM, in order to the selection of those that present the characteristics desirable for future generations. The matrices were selected according to their phenotypic characteristics as plant productivity and sanity. For each matrix, 30 seeds were randomly selected and measured weight, length, width and thickness of each seed. All statistical analyzes were performed using the Genes program. Progenies of *S. pulcherrimum* presented significant genetic variability for all high-heritability (> 87%) traits, as well as mean values for the wet weight of 0.061 g (ranged from 0.046 to 0.081 g), length of 7.11 mm (ranged from 6.47 to 7.78 mm), width of 4.47 mm (ranged from 3.82 to 5.18) and thickness of 2.96 (ranged from 2.68 to 3.24 mm). The repeatability coefficient presented median values, except thickness that assumed low values. The coefficients of determination were higher than 80%, demonstrating that the evaluation of the characteristics can be performed with high reliability. The results show that with only 14 seeds it is possible to evaluate the characteristics with good accuracy in the selection of superior genetic material.

From phloem to xylem: a metabolomic overview of wood formation in hybrid aspen

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Wood (secondary xylem) is a valuable resource for the generation of renewable energy and it is an important feedstock for fiber, pulp and cellulose production. The process of wood formation is strongly affected by environmental conditions such as water, nutrient and light availability. Despite the importance of secondary growth to trees, the metabolic profile underlying wood formation still poorly understood. Here, we present a metabolomics approach (GC-TOF-MS and LC-QTOF-MS) performed to identify both (a) the metabolic distribution from phloem towards wood-forming tissues, (b) key metabolites with specific roles during wood formation. To this purpose, hybrid aspen (Populus tremula x *P. tremuloides*) trees were cultivated under greenhouse conditions and supplied four different levels of nitrogen, to obtain trees with different secondary growth. The stems from four-month-old trees were cryo-sectioned (20 µm) in: bark, inner bark, phloem, expanding phloem, cambium, expanding xylem, xylem, mature xylem and pith. Trees treated with high nitrogen concentration showed higher diameter, height and biomass, compared to the others treatments. By multivariate analysis, we could discriminate tissues and treatments. A gradient of metabolites belonging to different chemical classes (sugars, amino acids, phenolics) was identified along the differentiated wood tissue and towards phloem. The results obtained here represent the metabolic overview of secondary growth and highlighted the powerful combination of cryosectioning and metabolomics analysis in forestry research.