FICTION SAMPLES

Cryonium:

Chapter 1: A never before ‘breakthrough’

Paramount P has been taking credit for every new invention and breakthrough since the beginning of the twenty-third century. The Capital Megalopolis has never shown much enthusiasm or interest toward the constantly oncoming credits. It need not have, as half the brains of the universe were literally habituated to being in Paramount P-City. Of course, Paramount P began to blossom as the center of activity of the whole universe during the end of the twenty-second century. The Decorum and the chief tribunal house by name ‘Esplanade House’, was re-instated. It was once was called ‘New Washington D C.’ (New Washington D C was reformed and renamed after Washington D C of the twenty-first century). After the Great Apocalyptic event of the early twenty-second century, which washed away 95 percent of the whole population of the world, planet earth began to reform into a very systematic and much-

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advanced habitation of the Universe and was re-named as 'Global Origin of Revived Brave Society' (Earlier earth) or GORBS in short.

The present Gaffer, Esq. Jean Mayden (The fourth Gaffer of Paramount P) was well aware of these facts. Esq. Mayden was greatly admired for his wonderful record of achieving the (never-before!) maximum Measure of Perfection. He had scored a total of 92 percent in the pre-referendum and later post-referendum bouts. The maximum earlier Measure of Perfection was 82 percent. After scoring a legendary 92 percent in the Measure of Perfection meter, Esq. Mayden became the fourth ever Gaffer of Gorbs. His tenure of time would last for another long year, total being ten years, after which, he had to take the Measure of Perfection test again. Anything below 92 percent would, of course, put him down. But then, that was certainly not in the mind of Esq. Mayden. He had not scored the record Measure of Perfection in a flash; rather he had earned it through his hard self-trained mind. He had spent nearly eighteen years of his life in a secluded place to train himself to have no human emotion left in his core. As per the popular dictum mentioned in *Version 3 of Digital Dictum Diary (D3)* — *Only a weakened mind falls and feels IT — (Here IT refers to the Vetoed word 'love' — Section 4 — Mind the Veto words)*, Esq. Mayden had never allowed his mind to get weakened, rather he had managed to literally eject all the emotive elements out of his brain.

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Anatomical, ultrastructural, physical, and mechanical properties of two-year-old *Eucalyptus grandis* x *Eucalyptus urophylla* clones

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Abstract

Eucalyptus wood is used for various purposes; however, the wood of younger trees has limited use. This study aims to characterize and propose the various uses of two-year-old *Eucalyptus* wood. Six two-year-old *Eucalyptus grandis* x *Eucalyptus urophylla* clones have been selected and their anatomical, ultrastructural, physical, and mechanical characteristics evaluated. Clone A shows more robust fibers with better microfibril arrangement, resulting in better mechanical properties, and therefore, a better performance for structural use. Clone F shows a low variation of basic density in the radial direction, facilitating its machinability, and Clone B shows a lower coefficient of anisotropy, and therefore, is recommended for locations with high variations of humidity. The heterogeneity of the characteristics of the evaluated clones confirms the need for further studies, to choose those most adequate to each use.

Introduction

The forest sector is very important for the Brazilian economy. *Eucalyptus* plantations aim to produce wood for various purposes, such as panels, cellulose, energy, and sawmills.

Wood is a heterogeneous material, making its use difficult. The anatomical and ultrastructural characteristics reflect the physical and mechanical behavior of wood, and therefore, its use depends on a complete survey of these features.

Silvicultural practices such as thinning and natural phenomena such as wind damage, can induce wood harvest when the trees are young. The lack of alternatives for this material leads to its use for energy. However, its use in the production of small objects and in the furniture industry is unexplored and can add value to this wood type.

Using two-year-old wood depends on a complete study of their anatomy, ultrastructure, physics, and mechanics. Therefore, the aim of this study is to characterize two-year-old *Eucalyptus* clones and suggest the uses for this material.

Methodology

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Biological Material

Three two-year-old trees were selected from each of the six *Eucalyptus* clones. Three 5 cm thickness disks were removed, 1.3 m above the ground level, to determine the density, anatomy, and ultrastructure of its wood. A three-meter log was removed from just above this position, and from this log, a central plank was removed as a specimen, with a saw blade, for the mechanical characterization and evaluation of the dimensional and volumetric variation of the wood.

Anatomical characterization

A sample was obtained from an intermediate position in the pith to the bark, in one of the 5 cm disks that was removed from 1.3 m above the ground level. Histological slides and macerated materials were prepared. The length and width of the fiber, lumen diameter, diameter and frequency of the vessels, and height and width of the rays were measured. The wall thickness of the fiber was obtained by the difference between the width of the fiber and the lumen diameter, divided by two. The cell wall fraction was calculated using the equation: $Cwf = (2 \times Cwt)/Fw) \times 100$, where, Cwf = Cell wall fraction (%); Fw = fiber width (μm); Cwt = cell wall thickness (μm).

Microfibril angle measurement

The microfibril angle of the S2 layer was measured in the specimens used in the anatomical characterization. After saturation, the wood blocks were cut with a microtome in the tangential plane in 10 μm thick sections and macerated with hydrogen peroxide solution and glacial acetic acid in the ratio 2:1 at 55°C for 24 hours to prepare temporary slides.

The measurement of the microfibril angle was performed by polarized light microscopy with an Olympus BX51 microscope adapted with a rotary stage, graduated from 0° to 360°, connected to the image analysis program Image Pro-plus.

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Novel Genomic and Evolutionary Insight of WRKY Transcription Factor in Plant Lineage

Abstract

The evolutionarily conserved WRKY TF (transcription factor) regulates different aspects of gene expression in plants, and modulates growth, development and abiotic stress responses. Therefore, it is very important to understand the details regarding WRKY TFs. Large-scale genomic analyses of the WRKY TF gene family from 43 plant species were conducted. The results of our study revealed that, WRKY TFs could be grouped and specifically classified as of monocot or dicot plant lineage. In this study, we found several novel WRKY TFs. The Tajima's D test statistics revealed that WRKY TFs have undergone extensive genetic polymorphism during the course of evolution. This paper is the first to report of a revised grouping system for the WRKY TF gene family in plants. The presence of different new forms of WRKY TFs in the plant genome appears to be very crucial in the evolution of WRKY TFs. Tissue-specific gene expression analyses in *Glycine max* and *Phaseolus vulgaris* shows that *WRKY11-1*, *WRKY11-2* and *WRKY11-3* are ubiquitously expressed in all tissue types, and *WRKY15-2* is highly expressed in stem, root, nodule and pod both in *G. max* and *P. vulgaris*.

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Numerous studies been conducted with WRKY TFs in different plant species including *A. thaliana* [4] *Brachypodium distachyon* [14] *Gossipium raimondii* [46] *Lotus japonicas* [47] *O. sativa* [48] *Riccinus communis* [49] *Setaria italica* [50] *Solanum lycopersicum* [51] *Triticum aestivum* [52] and *Vitis venifera* [53]. Different research groups have arranged different grouping systems to the WRKY TFs, and there is a lack of consistency in the grouping system among these reports. Consequently, it was highly important to formulate a new grouping system for all the WRKY TFs of the plant kingdom available till date to have a clear grouping system of WRKY TF. Besides this, Xi *et al.*, (2005) earlier reported about the presence of deduced WRKY domain [11]. As a result, we were also very interested to know whether WRKY TFs posses any additional, novel, modified WRKY domains in its genome. Rinerson *et al.*, (2015) reported about presence of chimeric WRKY TFs that contains combinations of novel protein domains and WRKY TF domain [54]. Hence, it was also very interesting to find out more details about these chimeric proteins. Genome sequencing data from different plant species are currently increasing enormously, which has provided an excellent platform for better understanding the WRKY TFs gene family. Therefore, we conducted genome-wide identification of the WRKY TF gene family from 43 different plant species, and analyzed their genomic, phylogenetic and other basic characteristics to decipher their novel genomic constitution.

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