

Potential of μ -EDXRF in tree-rings chemical analysis of *Pinus taeda* wood

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In forestry, different methods are tested to understand and predict of wood formation and properties and how silvicultural measures, genetic breeding programs and long-term changes in growth conditions such as climate change affect them. In this context the μ -EDXRF technique, offers possibilities to do analyses on intra-annual ring level and relate them to detailed weather and growth conditions like water and nutrients availability. This study aims to evaluate the potential of μ -EDXRF methodology to assess the presence and concentration of chemical elements in the wood growth rings of *Pinus taeda* of 17 years old. Four ray samples to DHB corresponding of 4 trees of *P. taeda* with different nutritional treatments of cellulosic residues (20, 40, 60 and 100 tn / ha) were selected. Samples were analyzed in the energy dispersive X-ray microfluorescence spectrometer (μ -EDXRF, 1300 Shimadzu model), Rh tube, the voltage of 50 keV and current of 200 μ A, Si (Li) detector cooled with liquid nitrogen. A region of 1000x500 points (500,000 points in total) was selected. The microchemistry map was done with step 100 μ m between selected points, total time of 70 h analysis. Data were processed in the R program and normalized the chemical elements with atomic number > 24 (Cr), with the of radiation Rh Ka Compton scattering to eliminate / minimize the effect of density difference of the growth rings in the same sample. The main chemical elements found in the samples were Na, Si, P, S, K, Ca, Cr, Mn, Fe and Zn. This exploratory testing of μ -EDXRF in the radial profile of *P. taeda* wood samples show potential for detection of chemical elements. Besides becomes a semi-quantitative method for the interpretation of the presence of metals and nutrients in wood, being possible the construction of a methodology of analysis in dendrochemistry/dendronutritional fast and non-destructive.