DDWood

Multifactorial Analysis of Natural Decay Durability of Wood

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Summary

Context — Wood resistance to decaying fungi has been reported to be due to the presence of extractives but also numerous additional parameters like lignin content, wood hardness, wood anatomy or wood hydrophobicity. DDWood project aims to evaluate several characteristics of different wood species in relation with extractive content, wood chemical composition, wood hydrophobicity and wood anatomy and to try to correlate these characteristics with wood natural decay durability recorded using different white rot and brown rot fungi. Multivariate data analysis will be carried out to evaluate the effect of the different recorded characteristics on wood durability.

Objectives — The specific objectives are to acquire better knowledge of the reasons of wood natural durability to decay by identifying wood specific characteristics or combinations of specific characteristics, which may correlate with wood durability. It is especially expected to clarify the role of extractives according to their intrinsic properties like antimicrobial, fungicidal, antioxidant, hydrophobic properties, but also to better understand water regulation effect in connection with wood vapor sorption and water uptake directly related to wood anatomy. Wood chemistry and wood density will be also investigated in relation with durability.

Approaches — A sampling will be carried out on different tropical and temperate wood species presenting different levels of durability against wood decaying fungi. For each species, different characteristics will be measured in parallel to their decay durability evaluated against white rot and brown rot fungi. From the obtained data, using classical statistical analysis, the main factors involved in the wood durability will be identified. We expect from these multivariate analyses to built-up models able to predict the natural durability of the tested species in function of their physico-chemical parameters.

Expected results and impacts — Obtained results will permit from a fundamental point of view to gain better insights on the reasons of wood natural decay durability, but also on a more applicated point of view, to propose better use of wood according to its final utilization based on a better knowledge of the reasons of its durability.