

Effect of Tree Age and Diameter on Selected Parameters of Black Locust Wood Fibers [†]

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[†] Presented at the title, place, and date.

Abstract: The study investigates selected parameters describing the fibers of black locust (*Robinia pseudoacacia* L.) wood with regard to the tree age and diameter. The material was collected in south-western Poland. We selected three stands aged 38, 61 and 71 growing on the mesotrophic site. In each stand, according to Hartig's method, we chose and felled trees from three diameter classes (class I – the thinnest, class II – medium thick, and class III - the thickest). From each tree, from the section 0.8-1.8 m above the ground we took wood from which we produced samples of 30×20×20 mm. In total, we obtained 34 samples from 17 trees (5 aged 38, 6 aged 61 and 6 aged 71 years). Using Leica SM 2000 R sliding microtome we cut slices from the tangential plane. Subsequently, the slices were macerated and stained with Etzold's dye. OLYMPUS PROVIS AX70 microscope with the OLYMPUS UC90 camera as well as the cellSens Standard software were used to take pictures of single fibers, 15 cells per each sample. On the obtained photos, using ImageJ software we measured fibre dimensional parameters and based on these results calculated the coefficients characterizing the fibres' shape. The following parameters were determined: length, diameter, light, cell wall thickness, slenderness, rigidity, Runkel ratio, flexibility, Mühlsteph's ratio and compactness. Wood of medium thick 61-years-old trees characterized by the smallest variability of analysed features. It turned out that the age of trees had a significant influence on the examined anatomical parameters of black locust fibers. The impact of tree diameter was less important. The youngest wood would be potentially the least useful for the paper industry.

Keywords: *Robinia pseudoacacia*; wood fibers; technical quality of wood

Citation: Lastname, F.; Lastname, F.; Lastname, F. Title. *Environ. Sci. Proc.* **2021**, *3*, x. <https://doi.org/10.3390/xxxxx>

Published: date

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