

**Comparison of cross Sections between Tension Wood and Opposite Wood in young Stems of Poplar (*P. Euramericana* Cv 'Ghoy') when submitted to a gravitational Stimulus**

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Tension wood is produced by cambium when submitted to a gravitational stimulus initiated by a modification in the equilibrium status of different tree axis. Its role is directly linked to the conservation of the peculiar morphology of the species and specifically adapted to the environmental condition and stress.

In order to study the induced modification by the stimulus on the wood, we compared the tension wood tissues located along the upper face of a bent shoot to the tissues produced on the opposite lower face. The following wooden characteristics were considered: sizes of fibers and vessels, number of rays and vessels, proportion of these elements.

For that purpose, we did grow in a green house, under controlled conditions, young shoots of 'Ghoy' Poplar, produced during the running year from cuttings. These shoots were artificially bent to an angle of 30° from 10th July up to the end of the vegetative period. Microscopic cross section were taken 20 cm above the shoot insertion and coloured to clearly show the tension wood. A specimen of 2 cm long, taken at the same level, was cut and sector of tension and opposite wood were separately reduced to fibers.

From measurements made after defibration, it appears that vessels of both wood types shows a similar length (370 µm) and external diameter (64 µm). When studying vessels lumina on cross sections, it was observed an identical radial diameter (45 µm), but a decrease of the tangential diameter (37 µm) of 5% , of the area (1323 mm<sup>2</sup>) of 6% and of the number of vessels (183/mm<sup>2</sup>) of 30% when going through tension wood. Finally, the shape of vessels is more circular in the opposite wood.

The length of fibers after defibration from tension wood is 8% greater than the one observed in the opposite wood (480µm), while the whole diameter (22µm) is identical.

The number of rays on the half girth is 13.05 per mm in the sector of tension wood i.e. 9% higher compared to that of opposite wood.

Proportionally compared with opposite wood, walls in tension wood cover 66% of the surface i.e. an increase of 29%, vessels lumina 17% i.e. a decrease of 32% and fibers lumina 17% i.e. a decrease of 26%.

The rays within the tension wood sector increases by 10%, leading to an stem eccentricity.

Key words: **Tension wood, Poplar, Vessel, Fiber, Ray**

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