

Martin BRABEC

Jan TIPPNER

Petr ČERMÁK

Jaromír MILCH

Jakub DÖMÉNY

David DĚCKÝ

Samuel KRAMÁR

martin.brabec@mendelu.cz

SHEAR BEHAVIOUR OF OAK WOOD (*QUERCUS L.*) UNDER DIFFERENT MOISTURE CONDITIONS

(REPORT 3/3 – 2021)

This work was supported by the Specific University Research Fund of the FFWT Mendel University in Brno (Grant No. LDF_TP_2019015).

Michal VODÁK

Martin ŠVÉDA

Anna OBERLE

Petr ZATLOUKAL

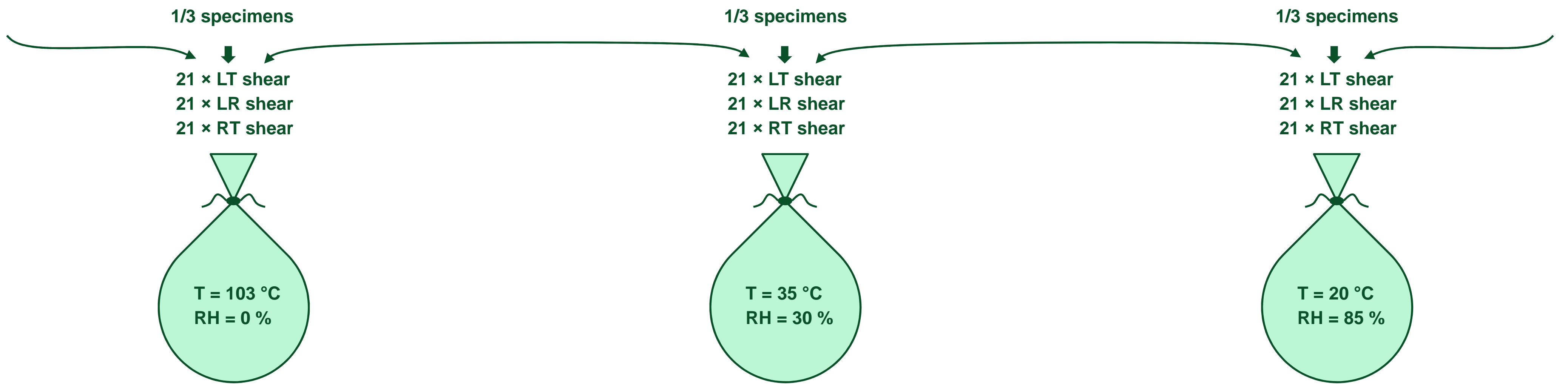
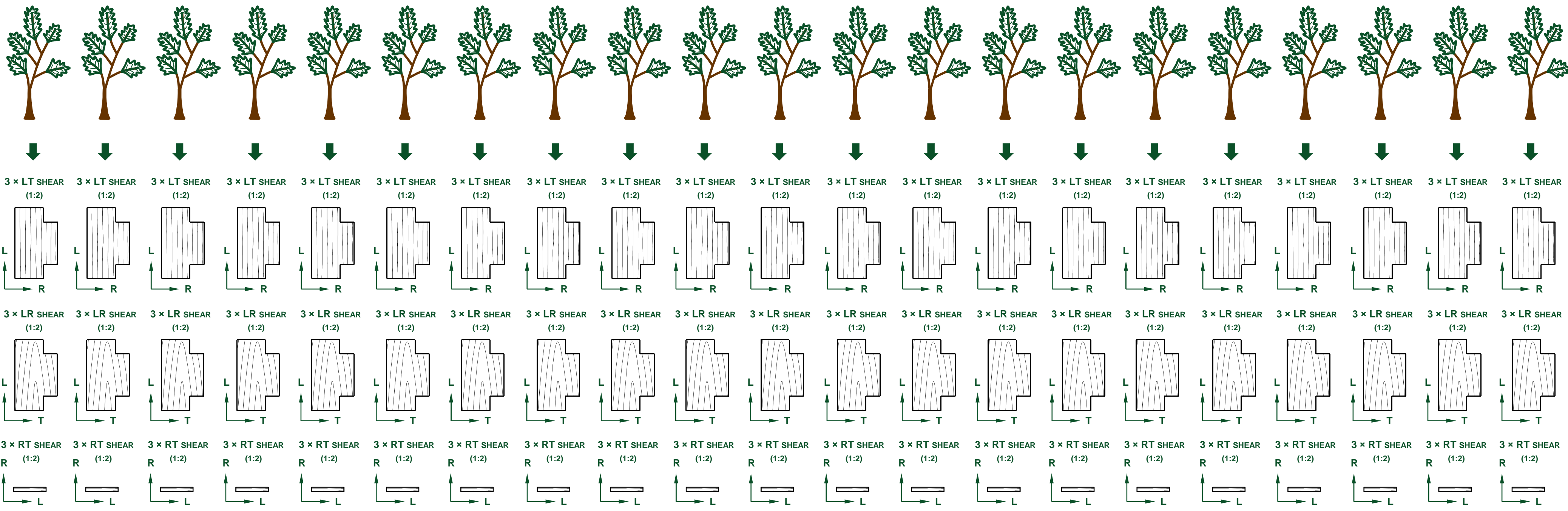
Patrik NOP

Valentino CRISTINI

Jan ZLÁMAL

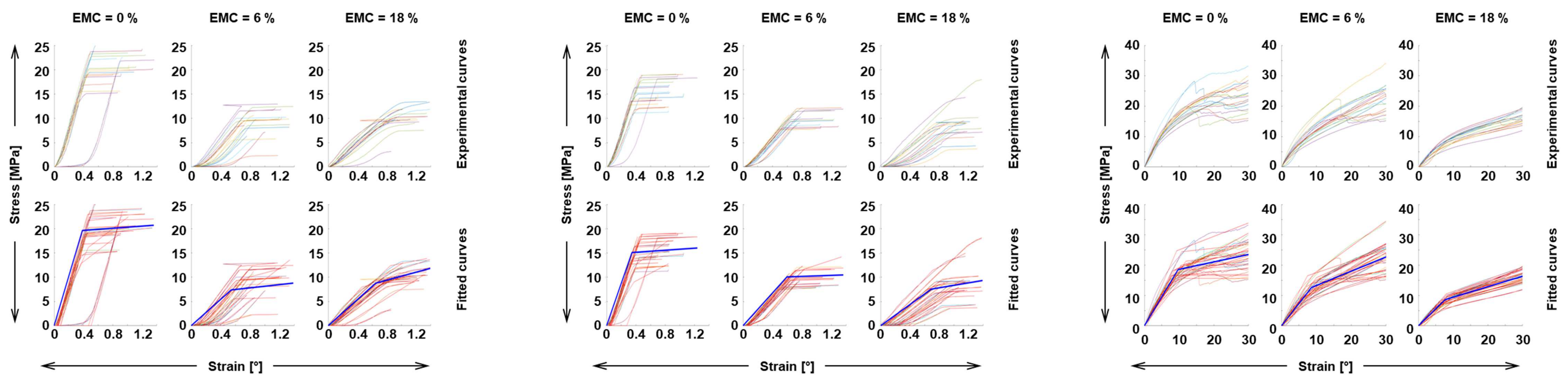
Mojtaba Hassan VAND

zatlou6@node.mendelu.cz



In order to determine the elastic and plastic material characteristics by using of standardized test, the sub-volume of specimens, where the close-to-pure shear stresses can be induced, was defined by holding a distance between the specimen and the static support.

The deformation induced in LR and LT specimens were determined by means of the optical technique based on Digital Image Correlation (DIC), meanwhile; the deformation of RT specimens was controlled by a crosshead position.



	G_{elast}	T_{yield}	G_{tang}	$T_{ultimate}$
EMC = 0 %	4928	19.9	212	20.8
EMC = 6 %	1441	10.2	306	9.1
EMC = 18 %	1319	9.9	410	10.1

	G_{elast}	T_{yield}	G_{tang}	$T_{ultimate}$
EMC = 0 %	4261	15.1	421	15.9
EMC = 6 %	1496	8.5	425	10.0
EMC = 18 %	1080	8.4	336	8.5

	G_{elast}	T_{yield}	G_{tang}	$T_{ultimate}$
EMC = 0 %	195	18.5	24	23.9
EMC = 6 %	150	12.6	47	22.7
EMC = 18 %	112	8.6	35	16.3

The fitting of curves was based on the elastic and tangent modulus determination in the first step. Then in the second step, the yield strength as an intersection of these two lines was defined.

The ultimate strength was calculated as maximum applied force related to shear plane area.

The whole fitting procedure was parametrically scripted in Matlab environment.

The fitted shear characteristics will be subsequently calibrated together with normal characteristics, which were determined in the previous project period. The calibration is set as iterative procedure.