Supplementary Material

Results

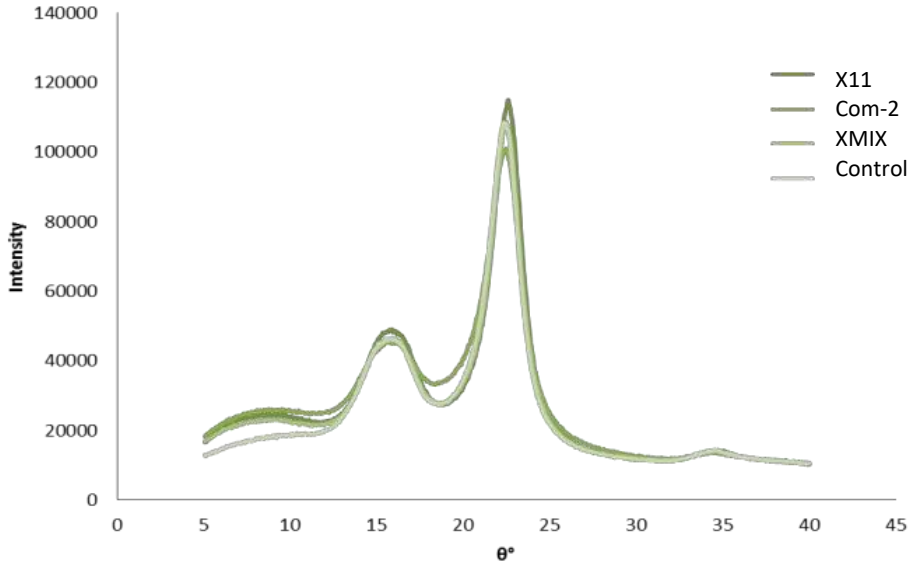

Figure S1. X-ray diffraction spectra of the pulps treated with the three xylanases (Xyn 11, Com-2, XMIX) compared to the control pulp.

Table S1. Crystallinity values for the pulps treated with the three xylanases (Xyn 11, Com-2, XMIX) compared to the control pulp.

Enzyme tested	Crystallinity index of the treated pulp (%)
X11	76.3
Com-2	67.2
XMIX	74.9
Control	74.8

Table S2. Analysis of the effluents generated by the Xyn11-assited bleaching ($XD_0E_pD_1$) of eucalyptus kraft pulp at pilot scale compared with the reference sequence ($D_0E_pD_1D_2$).

Bleaching sequence	X D Ep D	D Ep D D
COD, kg/T of o.d. pulp		
After X	8.3	-
After D_0	5.4	16.0
After Ep	11.9	23.4
After D_1	1.9	7.6
After D_2	-	2.6
BOD, kg/T of o.d. pulp		
After X	2.1	
After D_0	1.6	2.1
After Ep	5.1	5.7
After D_1	0.9	0.6
After D_2	-	0.04
AOX, kg/T of o.d. pulp		
After X	0	-
After D_0	0.15	0.16
After Ep	0.03	0.03
After D_1	0.04	0.05
After D_2	-	0.02

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Table S3. Medium composition for production of Xyn 11 at pilot scale in *E. coli.*

Component	**g/L**
CSL	15
Yeast extract	10
$(NH_4)_2SO_4$	0.4
KH_2PO_4	2.66
$MgSO_4$ x $7H_2O$	0.24
$K2HPO_4$	1.06
Citric acid	0.34
Antifoam	0.2
Technical water	Adjusted for start of fermentation volume

Table S4. Standards used for the determination of the papermaking properties.

Papermaking Property	**Determination Procedure**	**Limit for acceptance (%)**
Drainage index, Schopper-Riegler	ISO 5267-1:1999	±4%
Air Resistance – Gurley method	ISO 5636-5:2013	±20%
Burst Index	ISO 2758:2015	± 15%
Tensile Index	ISO 1924-2:2008	± 12%
Tear Index	ISO 1974:2012	± 9%
Scott Test	TAPPI 569	± 6%