

Table S1. Assignment of the carbohydrate and lignin $^{13}\text{C}/^1\text{H}$ correlation signals in the 2D HSQC NMR spectra of the GAX samples.

Label	$\delta_{\text{C}}/\delta_{\text{H}}$	Assignment
<u>Carbohydrate signals</u>		
U _{OMe}	60.4/3.51	C/H of methoxyls in 4- <i>O</i> -methylglucuronic acid
Ar ₅	61.6/3.44	C ₅ /H ₅ in α -L-arabinofuranoside
X ₅	62.8/3.20 and 3.86	C ₅ /H ₅ in β -D-xylopyranoside
X _{5NR}	65.5/370 and 3.06	C ₅ /H ₅ in β -D-xylopyranoside (NR)
X _{4NR}	69.4/3.27	C ₄ /H ₄ in β -D-xylopyranoside (NR)
U ₅	69.5/4.45	C ₅ /H ₅ in 4- <i>O</i> -methylglucuronic acid
α X _{3R}	70.2/3.64	C ₃ /H ₃ in α -D-xylopyranoside (R)
U ₂	71.8/3.20	C ₂ /H ₂ in 4- <i>O</i> -methylglucuronic acid
X ₂	72.6/3.02	C ₂ /H ₂ in β -D-xylopyranoside
U ₃	73.2/3.55	C ₃ /H ₃ in 4- <i>O</i> -methylglucuronic acid
X ₃	73.7/3.23	C ₃ /H ₃ in β -D-xylopyranoside
X ₄	75.3/3.52	C ₄ /H ₄ in β -D-xylopyranoside
X _{3NR}	76.2/3.20	C ₃ /H ₃ in β -D-xylopyranoside (NR)
Ar ₃	77.7/3.62	C ₃ /H ₃ in α -L-arabinofuranoside
Ar ₂	80.0/3.80	C ₂ /H ₂ in α -L-arabinofuranoside
U ₄	81.4/3.06	C ₄ /H ₄ in 4- <i>O</i> -methylglucuronic acid
Ar ₄	86.0/3.96	C ₄ /H ₄ in α -L-arabinofuranoside
α X _{1R}	92.1/4.85	C ₁ /H ₁ in α -D-xylopyranoside (R)
U ₁	97.2/5.06	C ₁ /H ₁ in 4- <i>O</i> -methylglucuronic acid
β X _{1R}	97.3/4.22	C ₁ /H ₁ in β -D-xylopyranoside (R)
X ₁	101.6/4.29	C ₁ /H ₁ in β -D-xylopyranoside
Ar ₁	107.0/5.32	C ₁ /H ₁ in α -L-arabinofuranoside
<u>Lignin signals</u>		
-OCH ₃	55.6/3.73	C/H of methoxyls in lignin
S _{2,6}	103.8/6.69	C ₂ /H ₂ and C ₆ /H ₆ in etherified syringyl units (S)
G ₂	110.9/7.00	C ₂ /H ₂ in guaiacyl units (G)
H _{3,5}	114.5/6.62	C ₃ /H ₃ and C ₅ /H ₅ in <i>p</i> -hydroxyphenyl units (H)
G ₅ /G ₆	114.9/6.72 and 6.94	C ₅ /H ₅ and C ₆ /H ₆ in guaiacyl units (G)
PCA _{3,5}	115.5/6.77	C ₃ /H ₃ and C ₅ /H ₅ in <i>p</i> -coumarates (PCA)
G ₆	118.7/6.77	C ₆ /H ₆ in guaiacyl units (G)
H _{2,6}	128.0/7.23	C ₂ /H ₂ and C ₆ /H ₆ in <i>p</i> -hydroxyphenyl units (H)
PCA _{2,6}	130.0/7.46	C ₂ /H ₂ and C ₆ /H ₆ in <i>p</i> -coumarates (PCA)

R, reducing end units; NR, non-reducing end units