**Supporting Information Table 1**

**Monosaccharide linkage analysis data for *Agave* leaves (mol%)**

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| **Polysaccharide** | **Derivative linkage** | ***A. americana* (mol%)** | ***A. tequilana* (mol%)** |
| Arabinan | *1,5 - Ara (f)**1,2,5- Ara (f)* | 4.8 ± 0.80.7 ± 0.2 | 4.4 ± 0.20.3 ± 0.2 |
| Type I arabinogalactan | *1,4-Gal (p)**1,4,6-Gal (p)* | 6.5 ± 2.10.9 ± 0.5 | 2.3 ± 0.70.0 |
| Type II arabinogalactan | *1,6-Gal (p)**1,3,6-Gal (p)**t-Gal* | 0.2 ± 0.11.1 ± 0.41.1 ± 0.2 | 0.2 ± 0.00.7 ± 0.30.7 ± 0.2 |
| Glucuronarabinoxylan | *1,4-Xyl (p)**1,2,4-Xyl (p)**1,3,4-Xyl (p)**1,2,3,4-Xyl (p)**t-Ara* | 9.9 ± 2.30.6 ± 0.20.2 ± 0.10.6 ± 0.42.1 ± 1.2 | 11.6 ± 2.01.1 ± 0.20.5 ± 0.21.2 ± 0.61.9 ± 0.2 |
| Cellulose | *1,4-Glc(p)* | 31.9 ± 2.1 | 45.3 ± 4.2 |
| Heteromannan | *1,4-Man (p)**1,4-Glc (p)* | 3.3 ± 0.33.3 ± 0.4 | 3.0 ± 0.33.0 ± 0.3 |
| Homogalacturonan | *1,4-Gal A (p)**t-Gal A (p)* | 16.8 ± 1.10.9 ± 0.4 | 5.9 ± 1.90.6 ± 0.1 |
| Rhamnogalactan I/II | *1,2,4-Rha (p)* | 0.7 ± 0.3 | 0.3 ± 0.0 |
| Xyloglucan | *1,4,6-Glc (p)**1,4-Glc (p)**1,2-Xyl (p**1,2-Gal (p)**t-Fuc (p)**t-Xyl (p)* | 3.1 ± 0.33.1 ± 2.11.1 ± 0.30.7 ± 0.10.7 ± 0.52.0 ± 0.6 | 3.7 ± 0.43.7 ± 4.21.3 ± 0.20.6 ± 0.10.9 ± 0.32.6 ± 0.2 |

Analysis completed on alcohol insoluble residues (AIR). Data are presented as relative percent molarity (mol%).