**Table SI1**: Percent change of organic matter, Carbon and Nitrogen mass loss, as well as percent change in the δ13C, δ15N and both lignin ratios across litter types and inundations (top = less inundated, bottom = more inundated, Table 1). All values are in % of change from the initial value after 170 days of exposure. These values are reported as median values followed by the standard errors. C is carbon, N is nitrogen, Lig:PS is the lignin-to-polysacharid ratio, LigG:LigS is the lignin guaiacyl-to-syringyl ratio.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mass loss | C | N | *δ*13C | *δ*15N | Lig :PS | LigG :LigS |  |
| OM type |   |   |   |   |   |   |   |  |
| Leaves | 52 ± 2 | 29 ± 10 | 48 ± 11 | -9.3 ± 2 | -32 ± 23 | n.a | n.a |  |
| Abs. roots | 22 ± 3 | 19 ± 4 | 29 ± 7 | 0.0 ± 1 | -22 ± 23 | -24 ± 43 | 9 ± 84 |  |
| Transp. roots | 30 ± 4 | 26 ± 3 | 47 ± 8 | -0.1 ± 2 | -43 ± 48 | -148 ± 49 | 26 ± 12 |  |
| Rhizomes | 24 ±4 | 22 ± 5 | 32 ± 7 | 0.3 ± 1 | -46 ± 35 | -2 ± 16 | 7 ± 15 |  |
| Inundation |  |  |  |  |  |  |  |  |
| SLI-40 | 31 ± 12 | 28 ± 10 | 29 ± 12 | -0.4 ± 4 | -44 ± 43 | -2 ± 61 | 15 ± 104 |  |
| SLI | 26 ± 13 | 25 ± 9 | 35 ± 10 | -0.6 ± 4 | -27 ± 44 | -41 ± 73 | 16 ± 20 |  |
| SLR30 | 26 ±13 | 21 ± 5 | 42 ± 11 | -0.4 ± 5 | -27 ± 29 | -68 ± 67 | 21 ± 12 |  |
| SLR60 | 27 ± 13 | 23 ± 6 | 45 ± 12 | -0.6 ± 5 | -45 ±28 | -6 ± 88 | 7 ± 41 |  |
| SLR100 | 24 ± 14 | 24 ± 6 | 43 ± 13 | 0.15 ± 5 | -32 ± 31 | -24 ± 40 | 18 ± 15 |  |
|  |  |  |  |  |  |  |  |

**Table SI2:** Principal molecules from the pyrolysis products detected from all litter types