Characterisation of the semi-volatile component of Dissolved Organic Matter by Thermal Desorption – Proton Transfer Reaction – Mass Spectrometry

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Table S1. List of analysed samples. Dilution 1:4 applyed for Kalimantan samples before all the experiments

| RN | Samples | Type | Location | DOC (mg/L) | SVOC DOM [ug C/L] | SVOC DOM % | Group |
|---|---|---|---|---|---|---|---|
| 1 | F1.1 W54 | Forest | Malaysia | 64.94 | 158.83 | 0.24 | SI |
| 2 | F1.2 W54 | Forest | Malaysia | 62.65 | 107.48 | 0.17 | SI |
| 3 | F1.3 W54 | Forest | Malaysia | 66.56 | 80.47 | 0.12 | SI |
| 4 | SE1 W54 | Oil Palm | Malaysia | 58.84 | 166.11 | 0.28 | SOP |
| 5 | SE3 W54 | Oil Palm | Malaysia | 59.09 | 473.17 | 0.80 | SOP |
| 6 | SE4 W54 | Oil Palm | Malaysia | 59.81 | 418.76 | 0.70 | SOP |
| 7 | SA4.1 W54 | Oil Palm | Malaysia | 40.63 | 147.84 | 0.36 | SOP |
| 8 | SA4.2 W54 | Oil Palm | Malaysia | 39.27 | 153.29 | 0.39 | SOP |
| 9 | SA4.4 W54 | Oil Palm | Malaysia | 37.01 | 718.41 | 1.94 | SOP |
| 10 | F1.1 W45 | Forest | Malaysia | 52.63 | 110.02 | 0.21 | SI |
| 11 | F1.2 W45 | Forest | Malaysia | 52.53 | 173.86 | 0.33 | SI |
| 12 | F1.3 W45 | Forest | Malaysia | 53.21 | 143.14 | 0.27 | SI |
| 13 | SE1 W45 | Oil Palm | Malaysia | 45.14 | 174.31 | 0.39 | SOP |
| 14 | SE3 W45 | Oil Palm | Malaysia | 44.27 | 292.07 | 0.66 | SOP |
| 15 | SE4 W45 | Oil Palm | Malaysia | 47.86 | 806.23 | 1.68 | SOP |
| 16 | SA4.1 W45 | Oil Palm | Malaysia | 38.46 | 198.89 | 0.52 | SOP |
| 17 | SA4.2 W45 | Oil Palm | Malaysia | 38.9 | 181.25 | 0.47 | SOP |
| 18 | SA4.3 W45 | Oil Palm | Malaysia | 40.44 | 178.33 | 0.44 | SOP |
| 19 | F1.1 W41 | Forest | Malaysia | 92.57 | 347.73 | 0.38 | SI |
| 20 | F1.2 W41 | Forest | Malaysia | 95.75 | 418.76 | 0.44 | SI |
| 21 | F1.3 W41 | Forest | Malaysia | 93.26 | 369.17 | 0.40 | SI |
| 22 | SE1 W41 | Oil Palm | Malaysia | 53.38 | 260.65 | 0.49 | SOP |
| 23 | SE3 W41 | Oil Palm | Malaysia | 54 | 332.09 | 0.61 | SOP |
| 24 | SE4 W41 | Oil Palm | Malaysia | 60.31 | 799.62 | 1.33 | SOP |
| 25 | SA4.2 W41 | Oil Palm | Malaysia | 46.32 | 339.24 | 0.73 | SOP |
| 26 | SA4.3 W41 | Oil Palm | Malaysia | 43.48 | 370.96 | 0.85 | SOP |
| 27 | SA4.4 W41 | Oil Palm | Malaysia | 46.33 | 618.61 | 1.34 | SOP |
| 28 | 1107 2SEB2-D1 | Intact | Borneo | 13.04 | 90.69 | 0.70 | KI |
| 29 | 1102 2SEB2-D3 | Intact | Borneo | 9.96 | 100.19 | 1.01 | KI |
| 30 | 1059 2SEB2-DA | Intact | Borneo | 10.01 | 64.53 | 0.64 | KI |
| 31 | 1055 2SEB2-D5 | Intact | Borneo | 8.32 | 44.00 | 0.53 | KI |
| 32 | 1104 2SEB2-D2 | Intact | Borneo | 10.75 | 63.88 | 0.59 | KI |
| 33 | 1211 2KAL1-C18 | Degraded | Borneo | 7.35 | 41.22 | 0.56 | KD |
| 34 | 1120 2KAL1-P15 | Degraded | Borneo | 6.38 | 22.51 | 0.35 | KD |
| 35 | 1239 2KAL1-P18 | Degraded | Borneo | 6.14 | 49.67 | 0.81 | KD |
| 36 | 1033 2KAL1-C15 | Degraded | Borneo | 5.9 | 13.78 | 0.23 | KD |
| 37 | 1403 2KAL1-C18E | Degraded | Borneo | 6.38 | 24.68 | 0.39 | KD |

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Table S2. Ions that showed strong significant difference between intact, selectively logged forest (KI) and deforested, extensively drained land (KD) in Kalimantan, Indonesian Borneo

| m/z | Chemical formula | mean KI | mean KD | p value | t value |
|---|---|---|---|---|---|
| 31.017 | CH2OH+ | **1.68** | 0.26 | 0.0002 | -6.3 |
| 33.033 | CH4OH+ | **3.72** | 1.12 | 0.0001 | -7.3 |
| 42.033 | C2H3NH+ | **0.11** | 0.00 | 0.0025 | -6.8 |
| 45.033 | C2H4OH+ | **4.28** | 0.00 | 0.0012 | -8.2 |
| 47.013 | CH2O2H+ | **3.94** | 0.00 | 0.0006 | -9.8 |
| 51.043 | ? | **0.28** | 0.08 | 0.0002 | -6.3 |
| 58.03 | C2H3ONH+ | **0.06** | 0.00 | 0.0048 | -5.7 |
| 60.045 | C2H5ONH+ | **0.28** | 0.03 | 0.0022 | -4.4 |
| 65.023 | CH4O3H+ | **0.46** | 0.00 | 0.0007 | -9.4 |
| 67.054 | C5H6H+ | **0.06** | 0.01 | 0.0020 | -4.5 |
| 69.034 | C4H4OH+ | **0.14** | 0.02 | 0.0014 | -4.8 |
| 70.072 | 13CC4H8H+ | **0.11** | 0.02 | 0.0038 | -4.0 |
| 85.064 | C5H8OH+ | **0.40** | 0.18 | 0.0001 | -7.1 |
| 89.058 | C4H8O2H+ | **0.27** | 0.17 | 0.0022 | -4.4 |
| 95.085 | C7H10H+ | **0.16** | 0.07 | 0.0037 | -4.0 |
| 97.064 | C6H8OH+ | **0.30** | 0.15 | 0.0035 | -4.1 |
| 97.1 | C7H12H+ | **0.11** | 0.02 | 0.0014 | -4.8 |
| 99.079 | C6H10OH+ | **0.24** | 0.12 | 0.0007 | -5.3 |
| 101.058 | C5H8O2H+ | **0.76** | 0.45 | 0.0003 | -6.1 |
| 109.1 | C8H12H+ | **0.41** | 0.23 | 0.0036 | -4.1 |
| 113.058 | C6H8O2H+ | **0.43** | 0.22 | 0.0016 | -4.7 |
| 117.02 | C4H4O4H+ | **0.10** | 0.03 | 0.0038 | -4.0 |
| 121.064 | C8H8OH+ | **0.33** | 0.22 | 0.0030 | -4.2 |
| 123.114 | C9H14H+ | **0.17** | 0.10 | 0.0007 | -5.4 |
| 127.074 | C7H10O2H+ | **0.18** | 0.12 | 0.0007 | -5.4 |
| 127.108 | C8H14OH+ | **0.20** | 0.12 | 0.0002 | -6.7 |
| 129.055 | C6H8O3H+ | **0.07** | 0.01 | 0.0011 | -4.9 |
| 135.045 | C6H8O3H+ | **0.05** | 0.01 | 0.0034 | -4.1 |
| 135.101 | C6H14O3H+ | **0.08** | 0.00 | 0.0127 | -4.3 |
| 141.09 | C8H12O2H+ | **0.31** | 0.19 | 0.0015 | -4.7 |
| 143.104 | C8H12O2H+ | **0.26** | 0.15 | 0.0001 | -6.9 |
| 153.089 | C9H12O2H+ | **0.16** | 0.09 | 0.0035 | -4.1 |
| 155.098 | C9H12O2H+ | **0.21** | 0.13 | 0.0012 | -4.9 |
| 171.13 | C10H18O2H+ | **0.11** | 0.07 | 0.0019 | -4.5 |
| 183.129 | C7H18O5H+ | **0.07** | 0.04 | 0.0003 | -6.2 |
| 193.136 | C9H20O4H+ | **0.06** | 0.03 | 0.0023 | -4.4 |
| 197.144 | C12H20O2H+ | **0.17** | 0.14 | 0.0030 | -4.2 |

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Table S3. Ions that showed strong significant difference between peat swamp forest oil palm plantation (SOP) and the surrounding natural forest buffer zones in Sarawak, Malaysian Borneo (SI)

| m/z | Chemical formula | mean SI | mean SOP | p value | t value |
|---|---|---|---|---|---|
| 41.039 | C3H4H+ | **2.17** | 1.24 | 1.0E-07 | 7.4 |
| 45.014 | ? | 0.00 | **2.72** | 1.7E-04 | -4.8 |
| 51.995 | ? | 0.01 | **0.20** | 3.4E-09 | -8.9 |
| 62.028 | ? | 1.64 | **37.99** | 3.6E-04 | -4.4 |
| 63.024 | DMS + ? | 2.55 | **117.55** | 1.2E-04 | -4.9 |
| 64.031 | ? | 0.03 | **0.57** | 6.5E-04 | -4.1 |
| 70.072 | ? | **0.19** | 0.13 | 8.3E-06 | 5.6 |
| 71.049 | C4H6OH+ | **1.28** | 0.53 | 3.8E-04 | 4.1 |
| 71.085 | C5H10H+ | **0.15** | 0.06 | 2.0E-04 | 4.4 |
| 75.043 | C3H6O2H+ | **2.14** | 0.31 | 1.9E-05 | 5.3 |
| 80.038 | C4H3N2H+ | 0.31 | **18.51** | 5.6E-04 | -4.2 |
| 81.035 | C5H4OH+ | 1.27 | **69.33** | 3.7E-04 | -4.4 |
| 85.064 | C5H8OH+ | **0.79** | 0.41 | 1.2E-04 | 4.6 |
| 87.044 | C4H6O2H+ | **2.83** | 0.96 | 2.9E-04 | 4.2 |
| 89.058 | C4H8O2H+ | **2.35** | 0.38 | 1.2E-04 | 4.5 |
| 95.018 | C5H2O2H+ | **0.22** | 0.01 | 1.6E-04 | 4.4 |
| 97.1 | C7H12H+ | **0.43** | 0.19 | 4.5E-05 | 4.9 |
| 99.079 | C6H10OH+ | **0.58** | 0.31 | 6.7E-06 | 5.7 |
| 103.073 | C5H10O2H+ | **1.12** | 0.23 | 2.9E-04 | 4.2 |
| 109.065 | C5H10O2H+ | **0.20** | 0.08 | 4.0E-09 | 8.8 |
| 111.079 | C5H10O2H+ | **0.31** | 0.16 | 3.4E-05 | 5.0 |
| 117.089 | C6H12O2H+ | **0.57** | 0.14 | 1.8E-04 | 4.4 |
| 121.064 | C8H8OH+ | **0.36** | 0.15 | 6.4E-09 | 8.6 |
| 125.094 | C8H12OH+ | **0.43** | 0.24 | 2.9E-05 | 5.1 |
| 127.074 | C7H10O2H+ | **0.34** | 0.22 | 4.1E-05 | 5.0 |
| 127.108 | C8H14OH+ | **0.28** | 0.18 | 2.2E-05 | 5.2 |
| 139.074 | C8H10O2H+ | **0.74** | 0.28 | 4.2E-04 | 4.1 |
| 153.089 | C9H12O2H+ | **0.35** | 0.23 | 1.9E-04 | 4.4 |
| 179.105 | C11H14O2H+ | **0.26** | 0.16 | 1.5E-04 | 4.5 |
| 191.126 | C9H18O4H+ | **0.27** | 0.10 | 6.8E-05 | 4.8 |
| 197.144 | C12H20O2H+ | **0.28** | 0.12 | 1.6E-04 | 4.4 |
| 209.142 | C9H20O5H+ | **0.21** | 0.12 | 7.0E-08 | 7.5 |
| 211.156 | C9H22O5H+ | **0.10** | 0.06 | 4.8E-04 | 4.0 |
| 223.104 | C16H14OH+ | **0.15** | 0.09 | 3.3E-04 | 4.2 |
| 235.156 | C11H22O5H+ | **0.13** | 0.08 | 2.6E-05 | 5.1 |

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Figure S1. A picture of vials loaded with filtered samples of various color.

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Figure S2. (a, b) PCA plots of PTR-MS data, when Sarawak intact samples taken after drought-like condition were separated into a subgroup (SIs). (c, d, e) boxplot of ions associated with drought-like conditions.