Response to Referee #2: Figures and Table

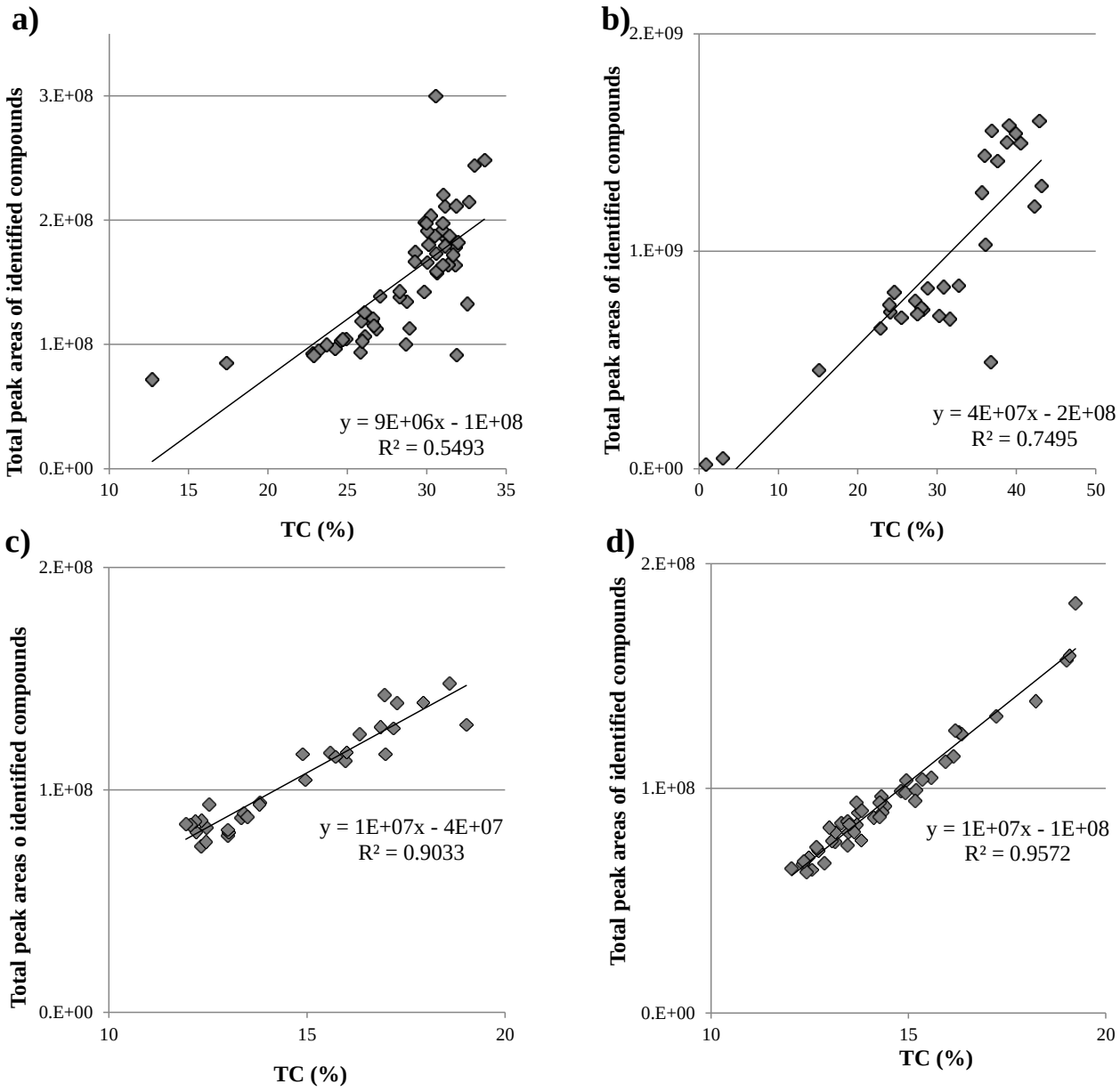

Fig. R1 Relationships between the sum of total peak areas of identified compounds by Py-GC/MS and total carbon content (TC, in %) from others of our studies where we investigate OM molecular composition in sediments cores of three boreal lakes with a) lake Drågsjön, 61 samples for the period 8550 BC – AD 2010; b) lake Lång-Algsön, 30 samples for the period 8320 BC – AD 1990; c) varved lake Nylandsjön 32 samples for the period AD 1972-2006, and in d) an unique sediment sample collection (n = 48) from the varved lake Nylandsjon used to study post-deposition OM diagenesis. In these lake sediments, TC content represent the total organic carbon (TOC) content because of absence of carbonates or really low carbonate content.

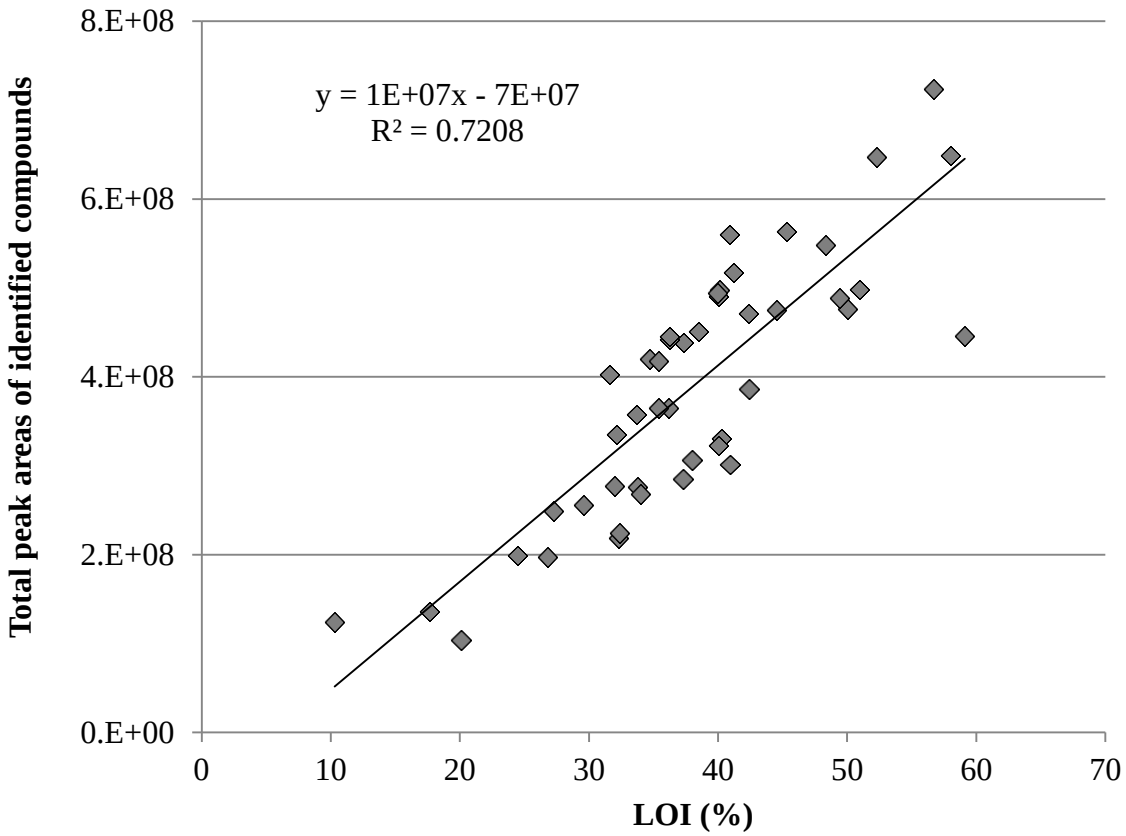

Fig. R2 Relationship between the sum of peak areas of total identified compounds by Py-GC/MS and LOI (in %) in the 42 sediment samples of Härsvatten

Table R1. Kovats Retention Index (RI) values for the identified pyrolytic organic compounds determined from our analyses (i.e. $RI_{this\ study}$) and comparison with the theoretically estimated non-polar RI ($RI_{estimated}$) and the experimental RI (RI_{NIST}) reported in the "NIST Chemistry Webbook" website (http://webbook.nist.gov/chemistry/) and in the 'NIST/EPA/NIH 2011' library.

N.D.: Non determined because the series of n-alkanes require to calculate the RI values of those compounds could not be detected

U.: unknown, because the RI values for those compounds are not reported in the "NIST Chemistry Webbook" and in the 'NIST/EPA/NIH 2011' library

Name	RT	$RI_{this\ study}$	$RI_{estimated}$	RI_{NIST} *
3-furaldehyde	189.5	N.D.		
2-furaldehyde	204.1	N.D.		
2-acetyl-furan	267.2	N.D.		
Methyl-2-furaldehyde	269.8	N.D.		
2(5H)-furanone	270.5	N.D.		
Methyl-2-furaldehyde	276.9	N.D.		
Dihydro-methyl-furanone	277.8	N.D.		
2(5H)-Furanone, 5-methyl-	292.5	907	868	914-917
Methyl-2-furaldehyde	312.8	920	920	924-987
2-Furancarboxylic acid, methyl ester	422.7	1086	909	950-985
2,5-Dimethyl-4-hydroxy-3(2H)-furanone (furaneol)	424.6	1088	1022	1023-1097
2,3 dihydro- benzofuran	543.0	1227	1036	1187-1224
5-(hydroxymethyl)-2-Furaldehyde	551.9	1236	1163	1176-1236
5,6-dihydro-2H-Pyran-2-one	278.7	N.D.		
4-hydroxy-5,6-dihydro(2H)-pyran-2-one	344.2	941	U	U
Dianhydrorhamnose	383.4	1041	U	U
Levoglucosenone	450.1	1119	993	1070
Levosugars (Levogalactosan)	535.7	1375	U	U
Ahydrohexose	729.0	1450	U	U
Levosugars(Levomannosan)	761.5	1447	U	U
Levosugars (Levoglucosan)	771.4	1493	1404	1486-1491
Acetamide	166.3	N.D.		
3-acetamido-furan	555.4	1239	1202	1142-1202
3 acetamido-4-pyrone	656.4	1353	U	U
Oxazoline structure	801.9	1548	U	U
Pyridine	151.9	N.D.		
2-methyl-pyridine	197.6	N.D.		
3/4-methyl-pyridine	234.6	N.D.		
2-Acetylpyridine	377.2	1034	U	U
3-Acetylpyridine	404.0	1065	U	U
2-Methyl-5-acetoxypyridine	734.1	1457	U	U
Pyrrole	154.2	N.D.		
Methyl-pyrrole	216.2	N.D.		
2-formyl-pyrrole	354.2	1008	988	1005-1030
2-acetyl-pyrrole	402.0	1062	1035	1026-1064
2-Formyl-1-methylpyrrole	459.9	1129	1077	1092-1105
Maleimide	335.9	935	U	U
Succinimide	462.1	1131	934	U
Benzeneacetonitrile	474.2	1147	1138	1089-1143
Benzenepropanenitrile	563.9	1248	1238	1186-1242
Indole	609.9	1293	1174	1260-1303
Methyl-indole	686.1	1394	1288	1380-1410
Diketodipyrrole	922.7	1722	U	U
DKP Pro-Ala	938.0	1746	U	U
DKP Pro-Val	989.4	1826	U	U
DKP Pro-Val	1005.9	1852	U	U
DKP Cyclo-Leu-Pro	1049.0	1922	U	U
DKP Pro-Pro	1067.0	1953	U	U
DKP Pro-Phe	1284.3	2352	U	U
Alkylamide1	986.8	1821	U	U
Alkylamide2	1081.1	1977	U	U
Alkylamide3	1197.6	2185	U	U
Alkylamide4	1237.3	2260	U	U
Alkylamide5	1304.2	2392	U	U

Alkylamide6	1579.6	3020	U	U
n-C9:1	N.D.			
n-C13:1	603.4	1286	1204	1187-1289
n-C14:1	684.6	1392	1421	1389-1396
n-C16:1	834.4	1593	1602	1590-1593
n-C17:1	903.6	1693	U	1692-1703
n-C18:1	969.2	1794	1801	1788-1793
n-C19:1	1031.8	1894	1900	1883-1899
n-C20:1	1091.5	1994	U	1889-1994
n-C21:1	1148.5	2096	2117	2060
n-C22:1	1203.2	2195	2198	2192-2195
n-C23:1	1255.5	2295	U	2288-2295
n-C24:1	1305.7	2395	U	2394-2396
n-C25:1	1352.9	2498	U	2483-2496
n-C26:1	1400.5	2596	U	2593-2596
n-C27:1	1445.6	2697	U	2688-2694
n-C28:1	1488.5	2796	U	2794-2797
n-C9:0	282.2			
n-C10:0	347.4			
n-C11:0	435.0			
n-C12	515.5			
n-C13:0	617.3			
n-C14:0	690.7			
n-C15:0	767.1			
n-C16:0	839.5			
n-C17:0	908.1			
n-C18:0	973.5			
n-C19:0	1035.7			
n-C20:0	1095.0			
n-C21:0	1150.7			
n-C22:0	1206.1			
n-C23:0	1258.1			
n-C24:0	1308.1			
n-C25:0	1355.1			
n-C26:0	1402.4			
n-C27:0	1447.1			
n-C28:0	1490.2			
n-C29:0	1530.3			
n-C30:0	1571.8			
n-C31:0	1610.9			
n-C32:0	1648.6			
n-C33:0	1685.0			
n-C35:0	1723.9			
2-K C13	765.4	1498	1449	1476-1498
2-K C16	975.0	1803	1748	1780-1805
2-K C17	1038.2	1904	1847	1875-1890
2-K C19	1155.9	2109	2046	2087-2106
2-K C20	1210.9	2209	2206	U
2-K C21	1263.7	2311	2309	U
2-K C23	1363.0	2517	2513	U
2-K C24	1410.0	2617	U	U
2-K C25	1455.1	2719	U	U
2-K C26	1498.6	2821	U	U
2-K C27	1540.6	2925	U	U
2-K C28	1581.3	3024	U	U
2-K C29	1620.7	3126	U	U
2-K C31	1696.0	3328	U	U
Phenol	329.2	931	901	952-1004
2- methyl-phenol	396.2	1056	1014	1029-1039
3/4- methyl-phenol	414.9	1077	1014	1051-1063
Dimethyl-phenol	418.4	1156	1127	1077-1130
Ethyl- phenol	497.3	1177	1114	1106-1162
Propenyl-phenol	646.7	1340	1203	1232-1258
Guaiacol (G)	428.7	1093	1090	1052-1090
Ethyl-guaiacol (guaiacyl-2C)	596.2	1279	1303	1243-1287
4-vinyl-guaiacol (guaiacyl -2C)	625.6	1311	1293	1272-1295
4-propenyl-guaiacol (guaiacyl -3C)	660.9	1359	1392	1339-1452
Vanillin (guaiacyl -1C or -aldehyde)	695.9	1407	1392	1350-1447

4-alleneguaiacol (guaiacyl -3C)	741.0	1466	U	U
Acetovanillone (guaiacyl -2Cor aldehyde)	763.1	1495	1439	1447-1503
Vanillic acid, methyl ester (guaiacyl -1C or -acid)	785.5	1525	1470	1463-1525
Guaiacylacetone (guaiacyl -3Cor -aldehyde)	796.0	1540	1538	1488-1531
Syringol (syringyl)	655.4	1352	1279	1349-1367
4-vinyl-syringol (syringy-2C)	819.5	1572	U	1517-1573
4-formyl-syringol (syringy-1C)	887.6	1670	1581	1617-1670
4-allenesyringol (syringy-3C)	901.0	1690	U	U
Acetosyringone (syringy-2C)	961.1	1781	1628	1740-1744
Prist-1-ene	929.0	1732	U	U
Prist-2-ene	936.3	1743	U	U
Phytadiene 1	999.1	1841	U	U
Phytadiene 2	1026.0	1884	U	U
Cholest-2-ene	1522.1	2880	2380	U
Cholesta-3,5-diene	1543.4	2932	U	U
Stigmasta-5,22-dien-3-ol, acetate, (3β)-	1601.1	3075	2879	U
Sitosterol	1623.4	3133	2731	3173-3220
Cholesta-3,5-dien-7-one	1668.7	3255	2562	U
Stigmasta-3,5-dien-7-one	1750.1	3462	2696	U
γ-Tocopherol	1594.1	3057	3036	3055
α-Tocopherol	1632.2	3157	3149	3111
Trinosphopane	1526.4	2890	U	U
Norhopene (triterpene C29)	1548.9	2945	U	U
22,29,30-trisnorhop-17(21)-ene	1553.8	2957	U	U
22,29,30-trisnorhop-16(17)-ene	1567.1	2989	U	U
Norhopane (C30/C31?)	1630.7	3153	U	U
Norhopene (C30/C31?)	1659.0	3229	U	U
Benzene	**113.9**	N.D.		
Benzaldehyde	311.2	919	982	925-966
Acetyl-benzene	408.1	1069	1029	1041-1078
Styrene	254.2	N.D.		
Ethyl-methyl-benzene	368.2	1024		945-973
Indene	389.7	1048	1014	1029-1051
Benzene C7	664.9	1365	1390	1337-1350
Benzene C9	822.1	1576	1555	1552-1586
Naphthalene, 1,2-dihydro-	484.9	1160	1149	1137-1166
2,3-dihydro-inden-1-one	599.8	1283	1218	1218-1320
1/2-methyl-napthalene	612.1	1295	1345	1263-1298
2/1methyl-napthalene	626.7	1313	1345	1267-1298
Biphenyl	680.8	1386	1367	1338-1392
Fluorene	836.9	1596	1494	1549-1611
Anthracene	972.2	1798	1782	1740-1800