List of Supplementary data

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Manuscript title: **The speciation of water-soluble Al and Zn in the rhizosphere of forest soils**

Summary of document:

Supplementary data 1: Scenarios used to represent the relative composition (%) of water-soluble organic carbon (WSOC) in the different soil samples of this study. Scenarios are based on a synthesis of the literature[a].

Scenario	Sampling sites[b]	Fulvic acids	Humic acids	Acetic acid
		-------------- % --------------		
1	Bulk: RN sites and site MTG 3	95	-	5
2	Rhizosphere: RN sites and site MTG 3	40	-	60
3	Bulk: sites MTG 1 and MTG 2	70	30	-
4	Rhizosphere: sites MTG 1 and MTG 2	17	8	75

a   For more details on the scenarios, the reader is referred to Cloutier-Hurteau *et al.* (2007), *Env Sci Technol*, 41:8104.

b   RN = Rouyn-Noranda area; MTG = Monteregian area.

Supplementary data 2: Mean ammonium oxalate (AO) extractable Al and Fe in the bulk (B) and rhizosphere (R) soils of the two sampling areas.

| Samples	Al_{AO} [a]		Fe_{AO} [a]	
	B	R	B	R
	----------------- g kg^{-1} -----------------			
Rouyn-Noranda area				
RN 1a	9.01	7.52	7.54	10.6
RN 1b	9.44	6.00	9.31	13.1
RN 1c	3.37	3.91	7.54	9.05
RN 2a	3.33	3.40	6.55	7.85
RN 2b	2.62	2.97	5.32	6.46
RN 2c	3.38	3.25	7.03	7.17
RN 3a	2.24	2.67	4.08	4.76
RN 3b	3.35	3.18	7.01	6.18
RN 3c	2.07	2.61	3.55	4.50
Monteregian area				
MTG 1a	5.00	5.13	5.86	4.86
MTG 1b	7.83	6.34	5.20	4.62
MTG 1c	2.52	2.94	6.29	6.24
MTG 2a	2.52	2.57	14.4	30.6
MTG 2b	1.87	2.31	7.58	9.12
MTG 2c	2.68	2.48	7.77	9.90
MTG 3a	4.83	4.73	12.0	9.68
MTG 3b	3.22	3.93	11.9	8.99
MTG 3c	4.59	4.69	11.5	7.97
Method detection limit	0.04		0.02	

Supplementary data 3: Mean values of inorganic cations and anions[a] concentrations (standard deviation in parentheses) from water extracts of soils from Rouyn-Noranda (RN) and Monteregian (MTG) areas and for the bulk (B) and the rhizosphere (R) soil components.

Area	Component	Na[b]	NH$_4$	K	Ca	Mg	Cl	NO$_3$	SO$_4$
		--- μmol L^{-1} ---							
Rouyn-Noranda area	**B**	37.2aa[c] (11.4)	10.5aa (2.05)	30.2aa (11.3)	27.3aa (12.7)	17.8aa (3.18)	8.40aa (2.72)	15.4aa (18.8)	32.5aa (30.3)
Number of samples		9	9	9	9	9	9	9	9
Rouyn-Noranda area	**R**	45.9aa (12.1)	20.2ab (5.82)	99.5ab (28.7)	34.1aa (5.29)	18.7ab (2.69)	25.8ab (6.28)	7.88ab (8.68)	53.5ab (21.6)
Number of samples		6	6	6	6	6	6	6	6
Monteregian area	**B**	76.0ba (36.7)	5.87ba (3.98)	12.7ba (5.75)	171ba (96.4)	52.1ba (15.5)	28.5ba (14.3)	70.2ba (37.3)	67.4ba (43.1)
Number of samples		9	9	9	9	9	9	9	9
Monteregian area	**R**	94.5ba (26.1)	2.35ba (2.24)	48.3bb (22.8)	241bb (195)	61.6bb (20.1)	67.9bb (16.8)	15.6ab (31.9)	60.2aa (32.2)
Number of samples		6	6	6	6	6	6	6	6
Method detection limit		1.00	0.50	1.00	0.45	2.90	1.00	0.50	1.00

a   The fluoride anion was also measured but was almost always under the detection limit of the method set to 5 μmol L^{-1}.

b   Na = water-soluble Na; NH$_4$ = water-soluble NH$_4$; K = water-soluble K; Ca = water-soluble Ca; Mg = water-soluble Mg; Cl = water-soluble Cl; NO$_3$ = water-soluble NO$_3$; SO$_4$ = water-soluble SO$_4$.

c   Results of the Mann-Whitney and the Wilcoxon signed-rank tests used to compare means between sampling areas and soil components, respectively. For a given microbial property, the first letter refers to the comparison between sampling areas whereas the second letter refers to the comparison between soil components. In each case, distinct letters indicate that the mean is significantly different at $\alpha = 0.10$.
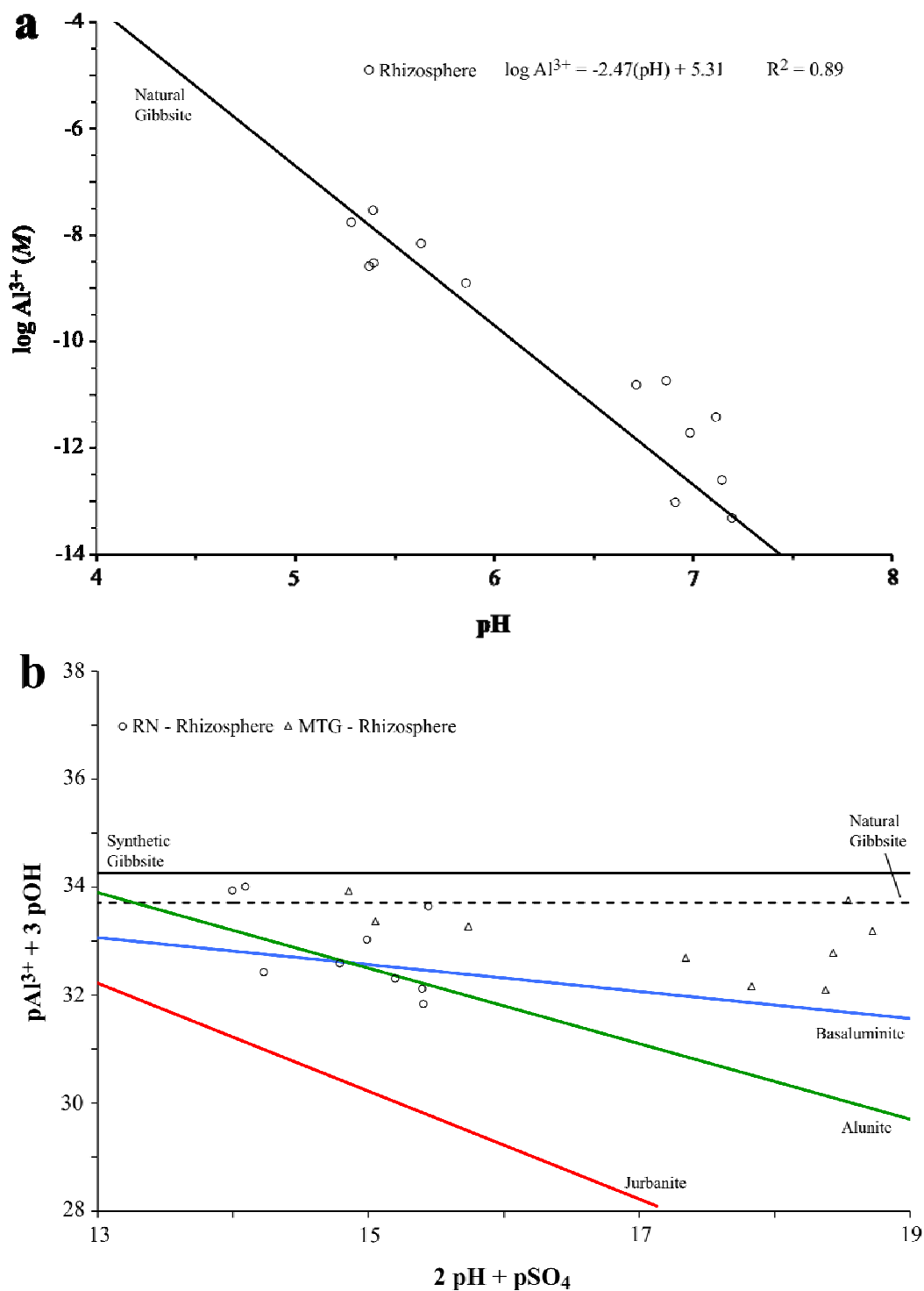
Supplementary data 4: Solubility diagrams for (a) natural gibbsite-like minerals and for (b) secondary aluminum sulfate minerals for the rhizosphere soils of the Rouyn-Noranda (RN) and Monteregian (MTG) sampling areas.