

DRIS standards for nutritional evaluation of *Phaseolus vulgaris* in Cerrado, Goiás state, Brazil

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Supplementary Table 1. Leaf DRIS standards (mean, standard deviation and coefficient of variation) of nutrients and their binary relations, and ratio of variances for irrigated common beans cultivated in the municipality of Cristalina, Goiás state, during the 2009/10 harvest, considering the reference population (n=82 plots).

Variable ¹	----- Cristalina (GO) ¹ -----			----- Paiva Júnior (2011) -----			Test F
	Average	Standard deviation	CV% ²	Average	Standard deviation	CV% ²	
N (g kg ⁻¹)	57.382	3.693	6.435	42.4	1.30	3.17	8.07**
P (g kg ⁻¹)	4.815	0.594	12.337	4.0	0.40	8.86	2.20*
K (g kg ⁻¹)	23.841	3.254	13.650	17.4	1.10	6.59	8.75**
Ca (g kg ⁻¹)	12.847	1.277	9.939	12.7	1.30	10.32	0.96 ^{ns}
Mg (g kg ⁻¹)	4.597	0.636	13.846	4.2	0.30	6.45	4.49**
S (g kg ⁻¹)	1.782	0.294	16.486	2.0	0.30	13.97	0.96 ^{ns}
Na (mg kg ⁻¹)	129.529	17.736	13.693	-	-	-	-
B (mg kg ⁻¹)	44.971	9.784	21.756	62.15	7.02	11.30	1.94*
Cu (mg kg ⁻¹)	7.412	1.654	22.311	6.95	1.76	25.34	1.13 ^{ns}
Fe (mg kg ⁻¹)	195.735	55.444	28.323	260.90	23.82	9.13	5.42**
Mn (mg kg ⁻¹)	56.441	16.708	29.603	165.60	21.42	12.94	1.64*
Zn (mg kg ⁻¹)	45.971	8.953	19.475	45.75	5.78	12.62	2.40**
Co (mg kg ⁻¹)	0.258	0.031	11.898	-	-	-	-
Mo (mg kg ⁻¹)	0.846	0.059	7.013	-	-	-	-
N/P	12.023	1.054	8.769	10.73	0.81	7.56	1.69 ^{ns}
P/N	0.084	0.007	8.752	0.09	0.01	7.61	2.04*
N/K	2.443	0.302	12.364	2.45	0.17	6.91	3.16**
K/N	0.415	0.051	12.252	0.41	0.03	6.88	2.89**
N/Ca	4.501	0.447	9.935	3.38	0.36	10.69	1.54 ^{ns}
Ca/N	0.224	0.021	9.600	0.30	0.03	10.59	2.04**
N/Mg	12.650	1.395	11.028	10.16	0.59	5.81	5.59**
Mg/N	0.080	0.009	11.425	0.10	0.01	5.76	1.23 ^{ns}
N/S	32.900	4.922	14.962	22.12	2.94	13.29	2.80**
S/N	0.031	0.005	17.042	0.05	0.01	13.14	4.00**
N/Na	0.451	0.074	16.477	-	-	-	-
Na/N	2.268	0.350	15.449	-	-	-	-
N/B	1.320	0.222	16.826	-	-	9.67	-
B/N	0.782	0.154	19.691	-	-	9.91	-
N/Cu	8.077	1.657	20.522	-	-	22.80	-
Cu/N	0.129	0.027	21.354	-	-	25.23	-
N/Fe	0.314	0.086	27.309	-	-	9.01	-
Fe/N	3.406	0.906	26.604	-	-	8.80	-
N/Mn	1.094	0.298	27.257	-	-	10.47	-
Mn/N	0.986	0.297	30.152	-	-	11.49	-
N/Zn	1.282	0.192	15.023	-	-	11.97	-
Zn/N	0.799	0.134	16.815	-	-	11.74	-
N/Co	227.124	41.116	18.103	-	-	-	-
Co/N	0.004	0.001	15.206	-	-	-	-
N/Mo	68.231	7.509	11.005	-	-	-	-
Mo/N	0.015	0.002	10.861	-	-	-	-
P/K	0.205	0.030	14.655	0.23	0.02	8.03	2.25**
K/P	4.998	0.802	16.056	4.39	0.37	8.45	4.70**
P/Ca	0.378	0.054	14.364	0.32	0.05	15.81	1.17 ^{ns}

Ca/P	2.700	0.381	14.123	3.21	0.46	14.43	1.46 ^{ns}
P/Mg	1.058	0.134	12.666	0.95	0.10	10.95	1.80 [*]
Mg/P	0.961	0.129	13.479	1.06	0.11	10.61	1.38 ^{ns}
P/S	2.759	0.493	17.878	2.07	0.26	12.77	3.60 ^{**}
S/P	0.375	0.073	19.401	0.49	0.06	12.77	1.48 ^{ns}

To be continued...

Supplementary Table 1. Continuation

Variable ¹	----- Cristalina (GO) ¹ -----			----- Paiva Júnior (2011) -----			Test F
	Average	Standard deviation	CV%	Average	Standard deviation	CV%	
P/Na	0.038	0.008	20.110	-	-	-	-
Na/P	27.302	4.951	18.134	-	-	-	-
P/B	0.110	0.015	13.406	-	-	8.40	-
B/P	9.326	1.614	17.313	-	-	8.37	-
P/Cu	0.676	0.148	21.944	-	-	22.90	-
Cu/P	1.549	0.336	21.707	-	-	25.08	-
P/Fe	0.026	0.007	26.689	-	-	14.25	-
Fe/P	40.806	10.929	26.783	-	-	13.75	-
P/Mn	0.092	0.027	29.839	-	-	15.37	-
Mn/P	11.900	3.835	32.143	-	-	15.29	-
P/Zn	0.107	0.013	12.634	-	-	12.58	-
Zn/P	9.533	1.301	13.645	-	-	12.06	-
P/Co	19.125	4.350	22.744	-	-	-	-
Co/P	0.054	0.011	19.517	-	-	-	-
P/Mo	5.733	0.942	16.441	-	-	-	-
Mo/P	0.179	0.027	14.971	-	-	-	-
K/Ca	1.862	0.236	12.694	1.39	0.20	14.25	1.39 ^{ns}
Ca/K	0.546	0.071	13.099	0.73	0.10	14.01	1.98 [*]
K/Mg	5.237	0.733	13.991	4.17	0.38	9.16	3.72 ^{**}
Mg/K	0.195	0.030	15.229	0.24	0.02	8.88	2.25 ^{**}
K/S	13.605	2.309	16.969	9.03	1.03	11.46	5.03 ^{**}
S/K	0.076	0.013	17.921	0.11	0.01	11.94	1.69 ^{ns}
K/Na	0.187	0.033	17.696	-	-	-	-
Na/K	5.528	1.080	19.532	-	-	-	-
K/B	0.548	0.111	20.286	-	-	10.89	-
B/K	1.911	0.463	24.210	-	-	11.11	-
K/Cu	3.363	0.839	24.953	-	-	24.55	-
Cu/K	0.316	0.080	25.266	-	-	27.08	-
K/Fe	0.131	0.040	30.951	-	-	11.39	-
Fe/K	8.345	2.593	31.070	-	-	11.28	-
K/Mn	0.450	0.112	24.908	-	-	14.40	-
Mn/K	2.389	0.736	30.823	-	-	15.25	-
K/Zn	0.529	0.085	16.022	-	-	12.24	-
Zn/K	1.938	0.315	16.242	-	-	13.12	-
K/Co	94.685	22.155	23.398	-	-	-	-
Co/K	0.011	0.002	21.890	-	-	-	-
K/Mo	28.306	4.340	15.334	-	-	-	-
Mo/K	0.036	0.006	16.048	-	-	-	-
Ca/Mg	2.825	0.328	11.630	3.03	0.33	10.86	1.01 ^{ns}
Mg/Ca	0.359	0.043	11.944	0.33	0.03	17.57	2.05 [*]
Ca/S	7.365	1.175	15.955	6.63	1.23	18.59	1.10 ^{ns}
S/Ca	0.140	0.031	21.891	0.16	0.03	18.45	1.07 ^{ns}
Ca/Na	0.101	0.018	17.927	-	-	-	-
Na/Ca	10.213	1.958	19.174	-	-	-	-
Ca/B	0.296	0.060	19.854	-	-	13.20	-
B/Ca	3.515	0.725	20.612	-	-	15.47	-
Ca/Cu	1.813	0.417	22.981	-	-	24.66	-
Cu/Ca	0.582	0.140	24.121	-	-	26.87	-
Ca/Fe	0.071	0.023	32.746	-	-	13.52	-
Fe/Ca	15.361	4.296	27.969	-	-	11.90	-

Ca/Mn	0.244	0.070	28.694	-	-	16.07	-
Mn/Ca	4.414	1.312	29.734	-	-	17.57	-
Ca/Zn	0.287	0.052	18.091	-	-	15.62	-

To be continued...

Supplementary Table 1. Continuation

Variable ¹	----- Cristalina (GO) ¹ -----			----- Paiva Júnior (2011) -----			Test F
	Average	Standard deviation	CV%	Average	Standard deviation	CV%	
Zn/Ca	3.590	0.645	17.963	-	-	15.50	-
Ca/Co	50.866	10.183	20.020	-	-	-	-
Co/Ca	0.020	0.003	17.484	-	-	-	-
Ca/Mo	15.246	1.778	11.663	-	-	-	-
Mo/Ca	0.066	0.008	12.206	-	-	-	-
Mg/S	2.629	0.487	18.526	2.19	0.34	15.47	2.05*
S/Mg	0.393	0.075	19.089	0.47	0.07	14.28	1.15 ^{ns}
Mg/Na	0.036	0.007	19.621	-	-	-	-
Na/Mg	28.692	5.475	19.082	-	-	-	-
Mg/B	0.105	0.018	16.817	-	-	10.16	-
B/Mg	9.796	1.545	15.771	-	-	10.40	-
Mg/Cu	0.648	0.165	25.550	-	-	22.04	-
Cu/Mg	1.636	0.404	24.704	-	-	24.69	-
Mg/Fe	0.025	0.007	28.829	-	-	9.01	-
Fe/Mg	43.021	12.205	28.370	-	-	8.95	-
Mg/Mn	0.088	0.029	33.604	-	-	12.48	-
Mn/Mg	12.558	4.396	35.003	-	-	13.17	-
Mg/Zn	0.102	0.019	18.303	-	-	11.50	-
Zn/Mg	10.057	1.655	16.462	-	-	11.44	-
Mg/Co	18.288	4.801	26.251	-	-	-	-
Co/Mg	0.057	0.011	20.197	-	-	-	-
Mg/Mo	5.474	0.936	17.103	-	-	-	-
Mo/Mg	0.188	0.034	18.058	-	-	-	-
S/Na	0.014	0.002	18.395	-	-	-	-
Na/S	74.084	13.631	18.399	-	-	-	-
S/B	0.041	0.011	25.860	-	-	17.23	-
B/S	25.852	6.922	26.777	-	-	16.80	-
S/Cu	0.252	0.065	25.933	-	-	26.78	-
Cu/S	4.261	1.202	28.219	-	-	29.18	-
S/Fe	0.010	0.003	33.013	-	-	18.16	-
Fe/S	111.428	30.127	27.037	-	-	18.54	-
S/Mn	0.034	0.115	33.712	-	-	18.60	-
Mn/S	32.748	12.632	38.572	-	-	20.56	-
S/Zn	0.040	0.008	21.517	-	-	15.07	-
Zn/S	26.256	5.933	22.599	-	-	15.17	-
S/Co	7.036	1.516	21.541	-	-	-	-
Co/S	0.148	0.030	20.262	-	-	-	-
S/Mo	2.123	0.419	19.752	-	-	-	-
Mo/S	0.487	0.089	18.306	-	-	-	-
Na/B	2.999	0.689	22.970	-	-	-	-
B/Na	0.355	0.101	28.399	-	-	-	-
Na/Cu	18.440	5.290	28.688	-	-	-	-
Cu/Na	0.059	0.017	28.330	-	-	-	-
Na/Fe	0.709	0.197	27.863	-	-	-	-
Fe/Na	1.538	0.509	33.096	-	-	-	-
Na/Mn	2.467	0.732	29.686	-	-	-	-
Mn/Na	0.442	0.136	30.799	-	-	-	-
Na/Zn	2.905	0.602	20.730	-	-	-	-
Zn/Na	0.361	0.086	23.881	-	-	-	-
Na/Co	513.257	118.589	23.105	-	-	-	-
Co/Na	0.002	0.0004	19.401	-	-	-	-
Na/Mo	153.597	22.066	14.366	-	-	-	-
Mo/Na	0.007	0.001	14.737	-	-	-	-

To be continued...

Supplementary Table 1. Continuation

----- Cristalina (GO) ¹ -----				----- Paiva Júnior (2011) -----			Test F
Variable ¹	Variable ¹	Standard deviation	CV%	Variable ¹	Standard deviation	CV%	
B/Cu	6.347	2.030	31.994	5.18	0.59	11.30	11.84**
Cu/B	0.170	0.044	26.154	0.20	0.02	10.63	4.84**
B/Fe	0.243	0.071	29.100	0.24	0.03	13.91	5.60**
Fe/B	4.459	1.315	29.496	4.24	0.57	13.45	5.32**
B/Mn	0.871	0.390	44.742	0.38	0.06	15.43	42.25**
Mn/B	1.307	0.434	33.190	2.69	0.40	14.90	1.18 ^{ns}
B/Zn	0.998	0.258	25.827	1.37	0.15	10.73	2.96**
Zn/B	1.045	0.186	17.812	0.74	0.08	11.11	5.41**
B/Co	180.203	62.244	34.541	-	-	-	-
Co/B	0.006	0.001	24.714	-	-	-	-
B/Mo	53.674	13.738	25.595	-	-	-	-
Mo/B	0.020	0.004	21.145	-	-	-	-
Cu/Fe	0.041	0.015	36.603	0.03	0.01	28.44	2.25**
Fe/Cu	27.997	11.059	39.501	39.82	10.40	26.12	1.13 ^{ns}
Cu/Mn	0.142	0.052	36.757	0.04	0.01	24.75	27.04**
Mn/Cu	8.065	3.497	43.360	25.02	5.85	23.40	2.80**
Cu/Zn	0.166	0.048	28.847	0.15	0.04	26.64	1.44 ^{ns}
Zn/Cu	6.481	1.812	27.953	6.90	1.53	22.21	1.40 ^{ns}
Cu/Co	29.078	6.710	23.077	-	-	-	-
Co/Cu	0.036	0.009	24.287	-	-	-	-
Cu/Mo	8.803	2.106	23.919	-	-	-	-
Mo/Cu	0.119	0.026	22.094	-	-	-	-
Fe/Mn	3.701	1.327	35.862	1.59	0.18	11.57	54.35**
Mn/Fe	0.307	0.114	37.080	0.64	0.08	12.17	2.03*
Fe/Zn	4.360	1.307	29.989	5.78	0.85	14.67	2.36**
Zn/Fe	0.251	0.079	31.609	0.18	0.03	14.85	6.93**
Fe/Co	775.846	261.086	33.652	-	-	-	-
Co/Fe	0.001	0.0004	30.172	-	-	-	-
Fe/Mo	232.967	69.810	29.966	-	-	-	-
Mo/Fe	0.005	0.001	29.221	-	-	-	-
Mn/Zn	1.269	0.448	35.307	3.67	0.58	15.90	1.68*
Zn/Mn	0.875	0.273	31.255	0.28	0.04	15.60	46.58**
Mn/Co	227.248	102.785	45.230	-	-	-	-
Co/Mn	0.005	0.002	34.072	-	-	-	-
Mn/Mo	66.631	18.698	28.062	-	-	-	-
Mo/Mn	0.016	0.004	27.784	-	-	-	-
Zn/Co	183.994	58.023	31.535	-	-	-	-
Co/Zn	0.006	0.001	25.354	-	-	-	-
Zn/Mo	54.773	12.371	22.587	-	-	-	-
Mo/Zn	0.019	0.004	20.618	-	-	-	-
Co/Mo	0.306	0.042	13.705	-	-	-	-
Mo/Co	3.338	0.533	15.957	-	-	-	-

¹ Foliar macronutrients were expressed as g kg⁻¹ and the micronutrients in mg kg⁻¹; ² coefficient of variation.

Supplementary Table 2. DRIS indexes calculated by the procedure proposed by Alvarez and Leite (1992) and by the Nutritional Balance Index (NBI) obtained by the leaf analyses of 86 sampling points for irrigated common beans cultivated in Cristalina, Goiás state, during the 2009/10 harvest.

Point of Sampling	Indexes DRIS ¹														NBI ²	Order of restriction (Deficiency to Excess)
	N	P	K	Ca	Mg	S	Na	B	Cu	Fe	Mn	Zn	Co	Mo		
1	4	-2	-4	-3	3	3	2	-6	0	-2	-2	1	6	-2	38	B>K>Ca>P=Fe=Mn=Mo>Cu>Zn>Na>Mg=S>N>Co
2	-2	9	7	0	1	4	-7	11	-12	3	1	7	-11	-12	87	Cu=Mo>Co>Na>N>Ca>Mg=Mn>Fe>S>K=Zn>P>B
3	1	1	-3	6	4	0	-11	-10	3	5	2	-1	-1	2	50	Na>B>K>Zn=Co>S>N=P>Mn=Mo>Cu>Mg>Fe>Ca
4	-3	9	7	-6	7	-4	-4	12	6	0	-10	1	-4	-10	84	Mn=Mo>Ca>S=Na=Co>N>Fe>Zn>Cu>K=Mg>P>B
5	-3	-1	-10	2	-1	1	8	4	-15	16	0	-5	4	0	73	Cu>K>Zn>N>P=Mg>Mn=Mo>S>Ca>B=Co>Na>Fe
6	4	-7	5	4	4	-6	3	-7	-9	3	4	-6	8	0	69	Cu>P=B>S=Zn>Mo>Na=Fe>N=Ca=Mg=Mn>K>Co
7	-3	-3	3	-2	0	9	12	-11	-4	10	3	-5	-2	-6	74	B>Mo>Zn>Cu>N=P>Ca=Co>Mg>K=Mn>S>Fe>Na
8	-6	1	6	2	-1	-11	1	6	-5	9	-6	27	-19	-4	103	Co>S>N=Mn>Cu>Mo>Mg>P=Na>Ca>K=B>Fe>Zn
9	-1	8	4	-3	0	-13	-1	5	18	-7	-8	-5	-2	5	79	S>Mn>Fe>Zn>Ca>Co>N=Na>Mg>K>B=Mo>P>Cu
10	4	2	-10	-3	-14	-6	6	-2	1	2	27	-5	-5	5	92	Mg>K>S>Zn=Co>Ca>B>Cu>P=Fe>N>Mo>Na>Mn
11	-3	-4	-4	-4	7	-2	-3	-9	5	4	0	3	5	3	55	B>P=K=Ca>N=Na>S>Mn>Zn=Mo>Fe>Cu=Co>Mg
12	2	-2	3	14	7	-3	-2	-12	0	-19	1	4	3	5	77	Fe>B>S>P=Na>Cu>Mn>N>K=Co>Zn>Mo>Mg>Ca
13	2	-4	1	7	5	1	-1	-6	10	-14	1	1	1	-4	59	Fe>B>P=Mo>Na>K=S=Mn=Zn=Co>N>Mg>Ca>Cu
14	2	3	-9	-1	0	10	-13	-4	-4	29	0	-4	-7	-2	88	Na>K>Co>B=Cu=Zn>Mo>Ca>Mg=Mn>N>P>S>Fe
15	1	2	-14	-6	-4	-1	19	-3	-5	2	-8	-2	9	10	87	K>Mn>Ca>Cu>Mg>B>Zn>S>N>P=Fe>Co>Mo>Na
16	8	14	-5	-10	4	-7	-21	15	12	8	-13	17	-8	-14	157	Na>Mo>Mn>Ca>Co>S>K>Mg>N=Fe>Cu>P>B>Zn
17	3	8	3	-5	-4	-7	8	8	4	-13	-2	4	-9	3	80	Fe>Co>S>Ca>Mg>Mn>N=K=Mo>Cu=Zn>P=Na=B
18	4	6	-7	-6	-1	-4	10	-2	-10	-3	-13	1	19	7	94	Mn>Cu>K>Ca>S>Fe>B>Mg>Zn>N>P>Mo>Na>Co
19	0	-1	5	-17	1	33	10	-8	-1	0	-11	-3	-3	-3	96	Ca>Mn>B>Zn=Co=Mo>P=Cu>N=Fe>Mg>K>Na>S
20	-4	-2	1	2	-10	0	-5	-3	-5	1	16	-9	5	12	75	Mg>Zn>Na=Cu>N>B>P>S>K=Fe>Ca>Co>Mo>Mn
21	2	3	4	8	-5	12	-3	-1	-8	-24	2	8	2	1	83	Fe>Cu>Mg>Na>B>Mo>N=Mn=Co>P>K>Ca=Zn>S
22	-3	-3	-2	-1	-14	-12	-2	-4	18	-1	18	-11	2	15	107	Mg>S>Zn>B>N=P>K=Na>Ca=Fe>Co>Mo>Cu=Mn

To be continued...

Supplementary Table 2. Continuation

Point of Sampling	indexes ¹														BIN ²	Order of restriction (Deficiency to Excess)
	N	P	K	Ca	Mg	S	Na	B	Cu	Fe	Mn	Zn	Co	Mo		
23	1	6	5	-2	3	-2	-15	15	-12	15	-4	7	-6	-12	103	Na>Cu=Mo>Co>Mn>Ca>S>N>Mg>K>P>Zn>B=Fe
24	-2	0	-4	-11	-7	13	6	0	15	-5	1	-1	0	-6	71	Ca>Mg>Mo>Fe>K>N>Zn>P=B=Co>Mn>Na>S>Cu
25	-7	-14	12	2	1	3	9	-6	-12	11	10	-11	1	0	101	P>Cu>Zn>N>B>Mo>Mg=Co>Ca>S>Na>Mn>Fe>K
26	-3	-10	11	3	-8	10	3	0	-7	-9	-7	7	3	7	88	P>Fe>Mg>Cu=Mn>N>B>Ca=Na=Co>Zn=Mo>S>K
27	6	0	-7	5	-3	-7	-6	0	18	-4	2	-11	11	-5	85	Zn>K=S>Na>Mo>Fe>Mg>P=B>Mn>Ca>N>Co>Cu
28	1	0	7	0	-9	-6	-12	-6	0	-4	17	-4	12	6	85	Na>Mg>S=B>Fe=Zn>P=Ca=Cu>N>Mo>K>Co>Mn
29	1	0	-8	1	-9	1	5	-1	-9	19	-8	2	4	2	72	Mg=Cu>K=Mn>B>P>N=Ca=S>Zn=Mo>Co>Na>Fe
30	-1	-5	-15	11	18	3	-7	32	9	-5	-32	-23	9	3	173	Mn>Zn>K>Na>P=Fe>N>S=Mo>Cu=Co>Ca>Mg>B
31	2	-5	10	13	4	8	-2	-10	5	-23	1	3	-8	2	98	Fe>B>Co>P>Na>Mn>N=Mo>Zn>Mg>Cu>S>K>Ca
32	-9	5	-5	1	3	2	0	1	11	-6	-7	13	0	-9	74	N=Mo>Mn>Fe>K>Na=Co>Ca=B>S>Mg>P>Cu>Zn
33	-2	-1	1	0	18	-16	7	21	-25	-1	31	7	-37	-5	174	Co>Cu>S>Mo>N>P=Fe>Ca>K>Na=Zn>Mg>B>Mn
34	4	-13	10	-3	0	-4	3	-7	6	2	2	-8	6	1	69	P>Zn>B>S>Ca>Mg>Mo>Fe=Mn>Na>N>Cu=Co>K
35	-3	-5	6	-6	-4	21	-3	4	-6	11	-14	9	0	-10	103	Mn>Mo>Ca=Cu>P>Mg>N=Na>Co>B>K>Zn>Fe>S
36	-5	-5	-7	-10	-6	5	20	-4	26	-6	-7	-4	7	-5	116	Ca>K=Mn>Mg=Fe>N=P=Mo>B=Zn>S>Co>Na>Cu
37	4	10	3	-1	1	-1	-5	7	3	-14	-16	22	-1	-12	101	Mn>Fe>Mo>Na>Ca=S=Co>Mg>K=Cu>N>B>P>Zn
38	6	-3	12	1	1	5	5	4	-3	-15	5	-1	-10	-7	79	Fe>Co>Mo>P=Cu>Zn>Ca=Mg>B>S=Na=Mn>N>K
39	10	7	-6	-3	-2	-1	5	1	2	-6	3	-13	0	3	63	Zn>K=Fe>Ca>Mg>S>Co>B>Cu>Mn=Mo>Na>P>N
40	5	-9	3	0	-3	3	-15	-4	12	3	-22	49	-14	-9	152	Mn>Na>Co>P=Mo>B>Mg>Ca>K=S=Fe>N>Cu>Zn
41	0	-4	-13	-16	-3	-3	-4	-14	1	10	51	-3	1	-4	127	Ca>B>K>P=Na=Mo>Mg=S=Zn>N>Cu=Co>Fe>Mn
42	-4	-9	21	-4	5	12	-3	0	4	-19	-11	10	4	-6	110	Fe>Mn>P>Mo>N=Ca>Na>B>Cu=Co>Mg>Zn>S>K
43	-2	-1	13	-6	1	18	4	-3	-2	-19	-9	12	0	-7	98	Fe>Mn>Mo>Ca>B>N=Cu>P>Co>Mg>Na>Zn>K>S
44	9	-9	1	10	18	4	-4	38	-17	-14	-7	-16	-6	-5	158	Cu>Zn>Fe>P>Mn>Co>Mo>Na>K>S>N>Ca>Mg>B
45	-19	20	-17	13	5	8	2	8	0	-9	6	7	-21	-4	138	Co>N>K>Fe>Mo>Cu>Na>Mg>Mn>Zn>S=B>Ca>P
46	-16	-36	-9	9	16	-11	2	22	-21	6	55	13	-21	-10	247	P>Cu=Co>N>S>Mo>K>Na>Fe>Ca>Zn>Mg>B>Mn

To be continued...

Supplementary Table 2. Continuation

Point of Sampling	indexes ¹														NBI ²	Order of restriction (Deficiency to Excess)
	N	P	K	Ca	Mg	S	Na	B	Cu	Fe	Mn	Zn	Co	Mo		
47	-8	-7	-17	4	10	13	-4	67	-9	-16	-23	-17	2	6	203	Mn>K=Zn>Fe>Cu>N>P>Na>Co>Ca>Mo>Mg>S>B
48	1	-25	4	3	22	-10	-1	19	-13	-2	26	10	-26	-9	173	Co>P>Cu>S>Mo>Fe>Na>N>Ca>K>Zn>B>Mg>Mn
49	-5	5	1	-5	-3	26	-14	4	-5	-2	10	5	-3	-12	99	Na>Mo>N=Ca=Cu>Mg=Co>Fe>K>B>P=Zn>Mn>S
50	0	6	7	0	-3	22	-4	2	-11	-8	-8	2	-1	-5	79	Cu>Fe=Mn>Mo>Na>Mg>Co>N=Ca=B>Zn>P>K>S
51	-7	-54	-12	22	20	-12	-4	38	-19	-2	70	-6	-25	-10	302	P>Co>Cu>K=S>Mo>N>Zn>Na>Fe>Mg>Ca>B>Mn
52	3	4	-9	3	-3	-5	-14	-4	5	-5	15	8	14	-13	105	Na>Mo>K>S=Fe>B>Mg>N=Ca>P>Cu>Zn>Co>Mn
53	-2	-21	10	10	11	-6	-11	19	-10	1	4	5	-15	4	129	P>Co>Na>Cu>S>N>Fe>Mn=Mo>Zn>K>Ca>Mg>B
54	0	-5	17	-3	7	13	-10	2	-9	-5	-10	7	-3	-2	93	Na=Mn>Cu>P=Fe>Ca=Co>Mo>N>B>Mg=Zn>S>K
55	-4	5	0	-10	-1	15	7	7	-7	-11	13	3	-9	-8	99	Fe>Ca>Co>Mo>Cu>N>Mg>K>Zn>P>Na=B>Mn>S
56	-7	-25	-9	5	16	-1	-12	31	-18	9	33	7	-18	-11	203	P>Cu=Co>Na>Mo>K>N>S>Ca>Zn>Fe>Mg>B>Mn
57	-14	-32	-22	18	-14	5	-9	21	17	-16	31	26	-1	-10	236	P>K>Fe>N=Mg>Mo>Na>Co>S>Cu>Ca>B>Zn>Mn
58	-5	-6	7	-8	11	9	-11	15	-1	-2	-7	3	3	-8	96	Na>Ca=Mo>Mn>P>N>Fe>Cu>Zn=Co>K>S>Mg>B
59	-11	-13	3	19	24	7	-17	23	-7	9	-12	-1	-5	-18	170	Mo>Na>P>Mn>N>Cu>Co>Zn>K>S>Fe>Ca>B>Mg
60	-2	-22	5	15	12	1	9	26	-19	-7	-8	-11	1	0	139	P>Cu>Zn>Mn>Fe>N>Mo>S=Co>K>Na>Mg>Ca>B
61	7	-21	14	14	13	-7	3	27	-16	-7	-8	-5	-18	4	162	P>Co>Cu>Mn>S=Fe>Zn>Na>Mo>N>Mg>K=Ca>B
62	1	-31	-2	12	6	-5	1	28	5	4	1	-14	1	-7	118	P>Zn>Mo>S>K>N=Na=Mn=Co>Fe>Cu>Mg>Ca>B
63	-1	-8	-1	6	-2	-5	0	-3	2	-4	20	23	-11	-18	105	Mo>Co>P>S>Fe>B>Mg>N=K>Na>Cu>Ca>Mn>Zn
64	-3	7	3	-13	-9	9	-3	9	-5	-10	3	11	6	-6	97	Ca>Fe>Mg>Mo>Cu>N=Na>K=Mn>Co>P>S=B>Zn
65	-8	4	-1	-9	-9	19	-1	4	0	-12	16	5	-4	-5	95	Fe>Ca=Mg>N>Mo>Co>K=Na>Cu>P=B>Zn>Mn>S
66	-1	-7	-6	-13	-10	-7	-7	-4	0	-12	47	34	-8	-6	162	Ca>Fe>Mg>Co>P=S=Na>K=Mo>B>N>Cu>Zn>Mn
67	2	7	0	9	4	-8	-7	4	-4	-12	2	21	-10	-7	96	Fe>Co>S>Na=Mo>Cu>K>N=Mn>Mg=B>P>Ca>Fe
68	-1	-6	0	-8	-5	12	-4	1	-13	-15	20	21	9	-10	123	Fe>Cu>Mo>Ca>P>Mg>Na>N>K>B>Co>S>Mn>Zn
69	-13	-16	-4	16	25	0	-6	18	10	2	-24	1	2	-10	146	Mn>P>N>Mo>Na>K>S>Zn>Fe=Co>Cu>Ca>B>Mg
70	-13	-15	2	9	23	2	5	19	4	11	-19	-4	-12	-13	152	Mn>P>N=Mo>Co>Zn>K=S>Cu>Na>Ca>Fe>B>Mg

To be continued ...

Supplementary Table 2. Continuation.

Point of Sampling	indexes ¹														NBI ²	Order of restriction (Deficiency to Excess)
	N	P	K	Ca	Mg	S	Na	B	Cu	Fe	Mn	Zn	Co	Mo		
71	-4	-10	-12	-7	-10	3	10	16	13	-11	19	20	-13	-15	161	Mo>Co>K>Fe>P=Mg>Ca>N>S>Na>Cu>B>Mn>Zn
72	0	9	9	5	11	0	-2	14	-10	-2	-28	-4	5	-9	108	Mn>Cu>Mo>Zn>Na=Fe>N=S>Ca=Co>P=K>Mg>B
73	8	-14	10	17	20	-13	11	13	-13	-8	-12	-1	-22	4	168	Co>P>S=Cu>Mn>Fe>Zn>Mo>N>K>Na>B>Ca>Mg
74	-3	-10	3	-10	-14	-5	-1	-5	2	-15	30	27	7	-6	140	Fe>Mg>P=Ca>Mo>S=B>N>Na>Cu>K>Co>Zn>Mn
75	-5	-15	-11	-14	-20	-13	-1	-6	5	-3	50	43	-6	-4	197	Mg>P>Ca>S>K>B=Co>N>Mo>Fe>Na>Cu>Zn>Mn
76	-9	-30	-3	13	21	-6	-18	33	-32	22	36	5	-23	-11	263	Cu>P>Co>Na>Mo>N>S>K>Zn>Ca>Mg>Fe>B>Mn
77	-2	-18	9	17	27	-15	-1	25	-20	21	-12	-32	6	-5	210	Zn>Cu>P>S>Mn>Mo>N>Na>Co>K>Ca>Fe>B>Mg
78	-9	1	-33	-22	-13	0	-7	-5	10	-6	67	34	2	-18	229	K>Ca>Mo>Mg>N>Na>Fe>B>S>P>Co>Cu>Zn>Mn
79	-17	-20	-10	19	23	8	-8	21	14	3	-14	3	-7	-17	183	P>N=Mo>Mn>K>Na>Co>Fe=Zn>S>Cu>Ca>B>Mg
80	1	-10	19	2	9	9	-2	6	-7	-10	-16	-2	-2	1	96	Mn>P=Fe>Cu>Na=Zn=Co>N=Mo>Ca>B>Mg=S>K
81	4	-12	0	3	4	-10	-2	0	-2	-1	28	17	-21	-8	114	Co>P>S>Mo>Na=Cu>Fe>K=B>Ca>N=Mg>Zn>Mn
82	0	-8	17	-2	8	3	-5	-1	-9	-2	-7	12	1	-6	82	Cu>P>Mn>Mo>Na>Ca=Fe>B>N>Co>S>Mg>Zn>K

¹Index for calculation of NBI; ²The procedure of Beaufils (1973) was used to calculate IBN.

