



Technical Report on the Development of a Geochemical Atlas of Cyprus

Volume 4 – Appendix: Analytical Quality Control

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1 APPENDICES

1.1 Composition of geological reference materials used in the project.

OREAS 45P Ferruginous Soil Secondary Reference Material.

Constituent	Recommended Value 4-acid digest	95% Confidence Interval		Tolerance limits 1- =0.99, =0.95	
		Low	High	Low	High
<i>Four acid digest:-</i>					
Antimony, Sb (ppm)	0.92	0.83	1.01	0.82	1.02
Arsenic, As (ppm)	13.4	11.9	14.9	11.6	15.1
Bismuth, Bi (ppm)	0.21	0.19	0.22	0.20	0.22
Cadmium, Cd (ppm)	< 0.2	IND	IND	IND	IND
Chromium, Cr (ppm)	1103	1065	1141	1071	1135
Cobalt, Co (ppm)	122	115	128	116	128
Copper, Cu (ppm)	749	740	759	709	790
Lead, Pb (ppm)	22	22	23	21	24
Nickel, Ni (ppm)	385	369	401	374	396
Phosphorous, P (ppm)	454	414	494	434	474
Silver, Ag (ppm)	0.32	0.27	0.36	0.32	0.32
Sodium, Na (ppm)	804	729	879	799	809
Zinc, Zn (ppm)	142	139	146	133	152
<i>Aqua regia digest:-</i>					
Antimony, Sb (ppm)	0.38	0.30	0.46	0.36	0.41
Arsenic, As (ppm)	4.4	4.0	4.9	3.9	5.0
Bismuth, Bi (ppm)	0.18	0.16	0.21	0.18	0.18
Cadmium, Cd (ppm)	0.09	0.08	0.10	0.08	0.10
Chromium, Cr (ppm)	892	802	982	868	916
Cobalt, Co (ppm)	107	102	111	104	109
Copper, Cu (ppm)	674	623	724	655	692
Gold, Au (ppb)	49	42	56	47	52
Lead, Pb (ppm)	19	17	20	17	20
Nickel, Ni (ppm)	292	257	326	283	300
Palladium, Pd (ppb)	54	33	75	42	66
Platinum, Pt (ppb)	72	57	87	54	90
Silver, Ag (ppm)	0.30	0.28	0.32	0.29	0.31
Zinc, Zn (ppm)	123	115	131	118	128

IND - indeterminate

USGS GXR-6 certified values (Gouveia *et al.* 1994). Values in ppm (mg/kg).

Element	Value
Ag	0.35
Al	17.71
As	330
Au	0.095
B	9.8
Ba	1300
Be	1.40
Bi	0.29
Ca	0.18
Cd	0.18
Ce	36.0
Co	13.8
Cr	96
Cs	4.2
Cu	66
Dy	2.8
Er	0.90
Eu	0.76
Fe	5.58
Ga	36
Gd	2.97
Hf	3.58
Hg	58
In	0.26
K	1.87
La	13.9
Li	32
Lu	0.33
Mg	0.61
Mn	1006

Element	Value
Mo	2.10
Na	0.10
Nb	5.4
Nd	12.5
Ni	27
P	400
Pb	101
Pd	220
Pt	150
Rb	90
S	0.02
Sb	3.50
Sc	27.6
Se	27.6
Sm	2.67
Sn	1.70
Sr	35
Ta	0.49
Tb	0.43
Te	0.02
Th	5.3
Ti	0.497
Tl	2.20
Tm	0.30
U	1.58
V	205
W	1.9
Y	18.4
Yb	1.92
Zn	118
Zr	135

Actlabs ICP-MS values for project reference materials CYP-A to C). Values in mg/kg except Ca, Fe, Mg, Na, P and Ti in %.

	ICP-MS DL	Aqua regia ICP-MS CYP-A			Aqua regia ICP-MS CYP-B			Aqua regia ICP-MS CYP-C		
		Expect	Low	High	Expect	Low	High	Expect	Low	High
Ag	0.003	0.013	0.000	0.033	0.017	0.000	0.036	0.023	0.006	0.039
Al	0.01	0.71	0.51	0.90	4.43	3.32	5.54	0.79	0.57	1.01
As	0.1	1.7	1.1	2.3	2.0	1.2	2.7	1.5	0.9	2.1
Au										
B	0.5	2.3	0.0	5.0	3.1	0.0	7.2	3.6	0.0	7.4
Ba			1033.	1376.						
	0.5	1205.0	7	3	22.6	18.3	26.9	23.8	19.9	27.7
Be	0.1	0.4	0.2	0.6	0.3	0.1	0.4	0.2	0.0	0.3
Bi	0.02	0.09	0.07	0.11	0.03	0.01	0.04	0.02	0.01	0.03
Br										
Ca	0.01	31.85	24.70	39.00	6.86	5.56	8.16	0.40	0.30	0.49
Cd	0.01	0.25	0.19	0.31	0.15	0.11	0.19	0.09	0.06	0.11
Ce	0.01	13.20	10.90	15.50	7.26	6.02	8.50	5.01	4.18	5.84
Co	0.1	8.2	7.1	9.3	33.6	29.3	37.8	210.0	182.0	238.0
Cr										1328.
	0.5	18.1	13.9	22.3	50.7	40.2	61.2	1152.0	975.4	6
Cs	0.02	0.42	0.27	0.57	0.25	0.12	0.38	0.71	0.49	0.93
Cu	0.01	31.80	27.22	36.38	82.74	73.50	91.98	19.04	16.41	21.67
Dy	0.1	2.0	1.6	2.4	2.2	1.9	2.6	0.5	0.4	0.6
Er	0.1	1.1	0.8	1.3	1.5	1.2	1.8	0.3	0.1	0.4
Eu	0.1	0.5	0.4	0.6	0.5	0.4	0.6	0.2	0.1	0.2
Fe	0.01	0.78	0.53	1.03	5.98	5.09	6.87	13.00	11.02	14.98
Ga	0.02	2.15	1.58	2.72	10.04	8.38	11.70	1.48	1.05	1.90
Gd	0.1	2.6	2.2	3.0	2.3	1.9	2.8	0.8	0.6	0.9
Ge	0.1	0.1	0.0	0.1	0.1	0.0	0.2	0.2	0.0	0.4
Hf	0.1	0.1	0.0	0.1	0.2	0.1	0.3	0.0	0.0	0.0
Hg	0.01	0.01	0.00	0.04	0.02	0.00	0.06	0.06	0.02	0.10
Ho	0.1	0.4	0.3	0.5	0.5	0.4	0.6	0.1	0.0	0.1
In	0.02	0.02	0.01	0.03	0.04	0.03	0.05	0.01	0.00	0.02
Ir										
K	0.01	0.15	0.10	0.19	0.52	0.36	0.68	0.05	0.03	0.07
La	0.5	10.9	9.0	12.8	3.4	2.7	4.1	3.2	2.6	3.8
Li	0.1	7.8	5.5	10.1	25.2	16.6	33.8	2.8	1.8	3.8
Lu	0.100	0.100	0.009	0.191	0.200	0.143	0.257	0.100	0.100	0.100
Mg	0.01	0.49	0.38	0.59	2.66	2.13	3.19	11.10	8.29	13.91

Actlabs ICP-MS values for project reference materials CYP-A to C). Values in mg/kg except Ca, Fe, Mg, Na, P and Ti in %.

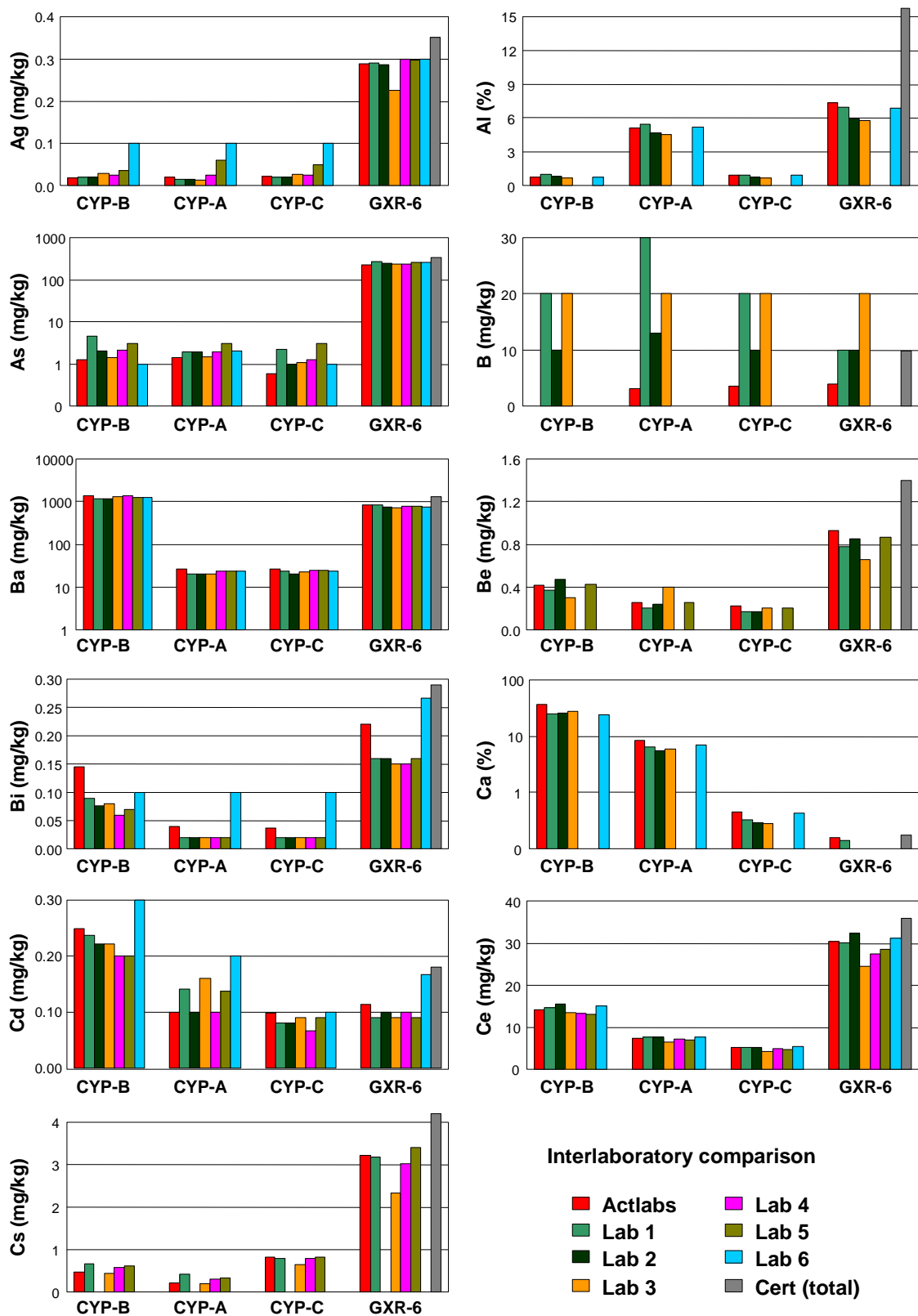
	ICP-MS	Aqua regia ICP-MS			Aqua regia ICP-MS			Aqua regia ICP-MS		
		CYP-A			CYP-B			CYP-C		
	DL	Expect	Low	High	Expect	Low	High	Expect	Low	High
Mn	1	721	601	841	1187	976	1398	1935	1484	2386
Mo	0.01	0.17	0.11	0.23	0.26	0.16	0.36	0.41	0.22	0.60
Na	0.001	0.125	0.044	0.206	0.860	0.254	1.466	0.115	0.054	0.176
Nb	0.1	0.2	0.1	0.3	0.1	0.0	0.2	0.0	0.0	0.0
Nd	0.02	8.45	6.37	10.53	4.25	3.21	5.29	2.64	2.13	3.15
Ni	0.1							2630.		4355.
		31.4	23.7	39.1	78.6	63.0	94.2	3493.0	1	9
P	0.01	0.03	0.025	0.035	0.09	0.08	0.1	0.03	0.025	0.035
Pb	0.01	4.93	4.13	5.73	4.64	3.23	6.05	4.50	3.79	5.21
Pr	0.1	2.1	1.7	2.6	1.0	0.8	1.2	0.7	0.5	0.8
Pt	0.002	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.022
Rb	0.1	7.1	4.9	9.3	11.6	7.8	15.4	3.2	2.2	4.2
Re	0.001	0.001	0.000	0.004	0.001	0.000	0.003	0.002	0.000	0.005
Sb	0.02	0.23	0.16	0.29	0.12	0.06	0.18	0.12	0.05	0.18
Sc	0.1	2.8	2.0	3.6	24.7	19.3	30.1	18.1	14.2	22.0
Se	0.1	0.7	0.0	1.7	0.4	0.0	1.0	0.3	0.0	0.8
Sm	0.1	2.3	1.9	2.7	1.4	1.1	1.7	0.6	0.5	0.7
Sn	0.5	0.3	0.2	0.4	0.5	0.3	0.6	0.2	0.1	0.4
Sr	1	1075	735	1415	95	78	111	11	9	13
Ta	0.005	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Tb	0.1	0.3	0.2	0.4	0.4	0.3	0.5	0.1	0.1	0.1
Te	0.02	0.06	0.00	0.12	0.02	0.00	0.08	0.04	0.00	0.10
Th	0.1	1.1	0.8	1.4	0.5	0.4	0.6	0.7	0.6	0.8
Ti	0.001	0.051	0.030	0.072	0.000	0.000	0.064	0.000	0.000	0.010
Tl	0.02	0.06	0.04	0.08	0.05	0.03	0.07	0.05	0.03	0.07
Tm	0.1	0.2	0.1	0.3	0.2	0.1	0.3	0.1	0.1	0.1
U	0.1	0.5	0.4	0.6	0.6	0.5	0.7	0.2	0.2	0.2
V	1	18	13	24	152	133	171	49	41	56
W	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Y	0.01	13.30	11.01	15.59	13.25	11.30	15.20	2.70	2.24	3.16
Yb	0.1	1.0	0.8	1.2	1.5	1.2	1.7	0.3	0.2	0.4
Zn	0.1	30.3	22.9	37.7	93.2	78.6	107.8	62.2	53.4	71.0
Zr	0.1	2.3	1.8	2.8	7.5	5.7	9.3	1.9	1.5	2.3

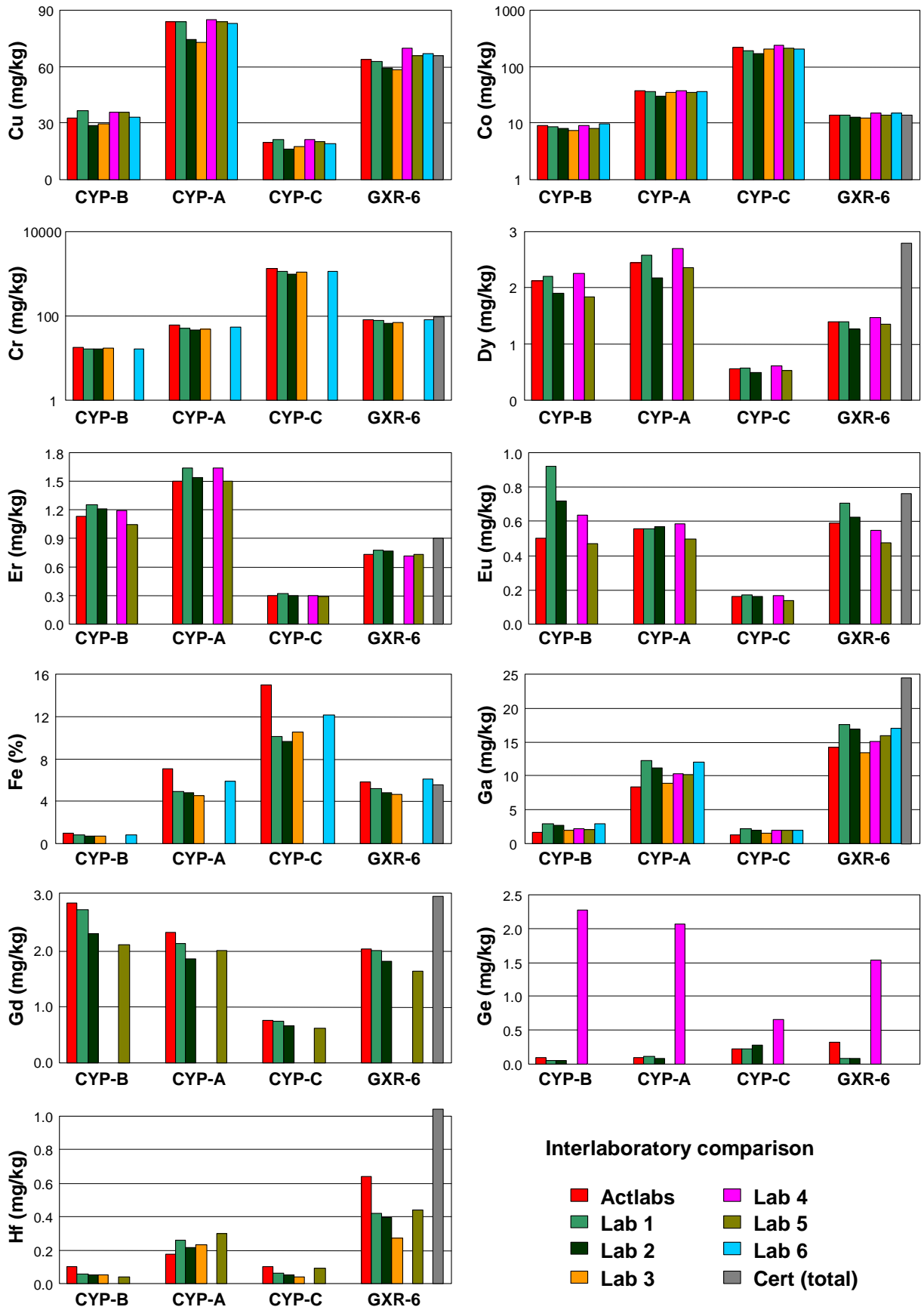
Actlabs INAA values for reference materials Till-1 to Till-4. Values in mg/kg.

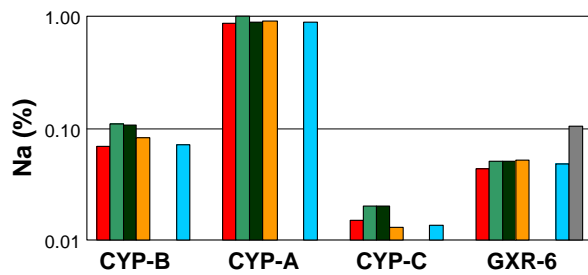
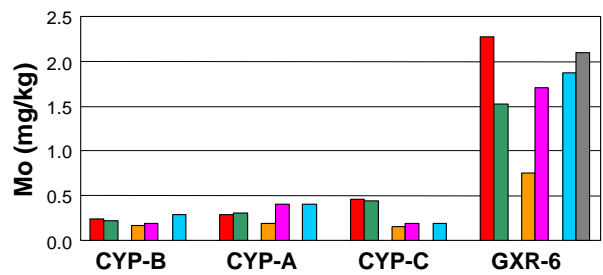
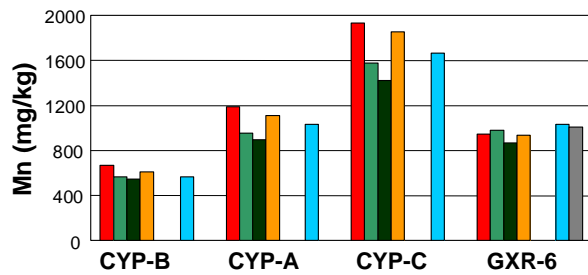
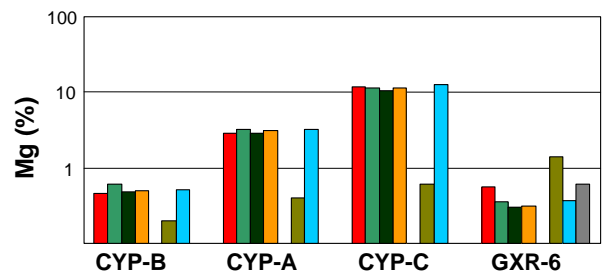
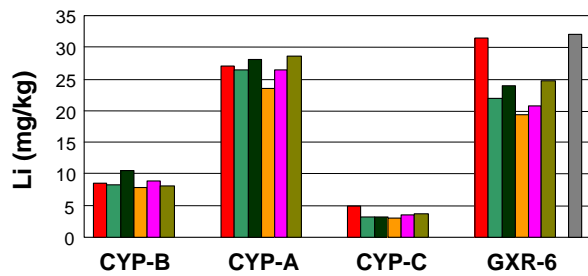
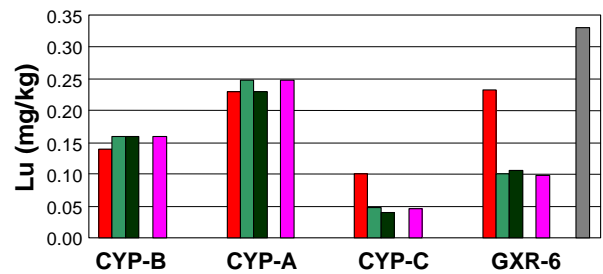
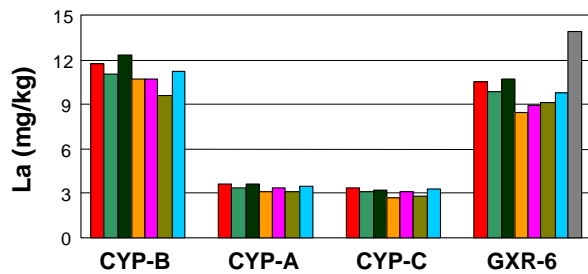
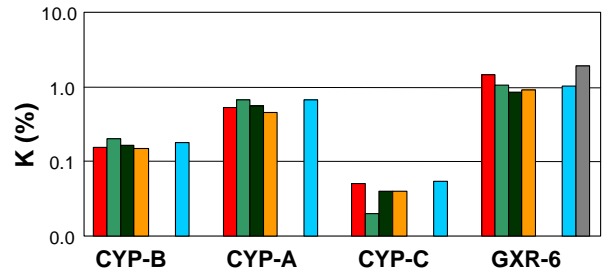
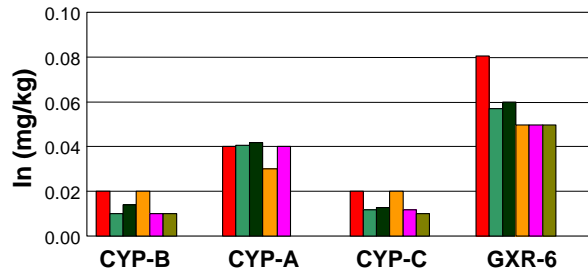
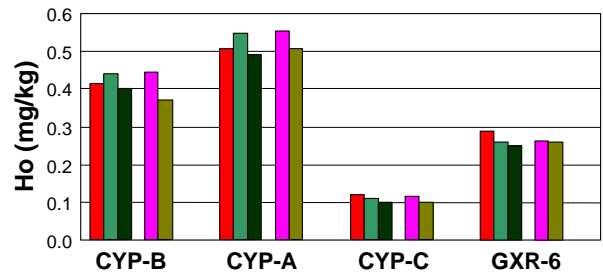
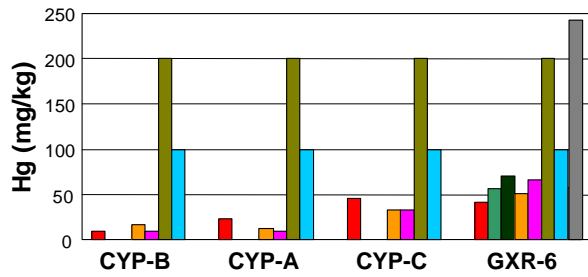
	INAA	INAA			INAA			INAA			INAA		
	DL	Till-1			Till-2			Till-3			Till-4		
		Expect	Low	High	Expect	Low	High	Expect	Low	High	Expect	Low	High
Ag	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
As	0.5	18.0	15.1	20.9	26.0	22.4	29.6	87.0	81.3	92.7	111.0	99.3	122.7
Au	0.002	0.013	0.000	0.061	0.002	0.000	0.004	0.006	0.001	0.011	0.005	0.001	0.009
Ba	50	702	493	911	540	405	675	489	334	644	395	230	560
Br	0.5	6.4	4.9	7.9	12.2	10.1	14.3	4.5	2.5	6.5	8.6	6.7	10.5
Ce	3	71	65	77	98	88	108	42	36	48	78	67	89
Co	1	18	16	20	15	13	17	15	13	17	8	7	9
Cr	5	65	56	74	74	66	82	123	113	133	53	46	60
Cs	1	1	0	2	12	9	15	2	0	3	12	10	14
Eu	0.2	1.3	0.8	1.8	1.0	0.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Hf	1.0	13.0	10.1	15.9	11.0	9.1	12.9	8.0	6.4	9.6	10.0	7.3	12.7
Ir	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
La	0.5	28.0	25.8	30.2	0.0	0.0	0.0	21.0	19.7	22.3	41.0	36.5	45.5
Lu	0.05	0.60	0.47	0.73	0.60	0.47	0.73	0.20	0.12	0.28	0.50	0.37	0.63
Mo	1				14	2	26				16	8	24
Nd	5	26	20	32	36	28	44	16	3	29	30	17	43
Ni	20	24	0	190	0	0	0	39	0	83	20	0	115
Sb	0.1	7.8	6.9	8.7	0.8	0.0	1.7	0.9	0.2	1.6	1.0	0.2	1.8
Sc	0.1	13.1	12.1	14.1	12.0	11.0	13.0	10.0	9.1	10.9	10.0	9.0	11.0
Sm	0.1	5.9	4.0	7.8	7.4	4.9	9.9	3.3	2.3	4.3	6.1	4.1	8.1
Ta	0.5	0.7	0.0	2.1	1.9	0.0	3.8				1.4	0.1	2.7
Tb	0.5	1.0	0.4	1.6	1.2	0.5	1.9				1.1	0.5	1.7
Th	0.2	5.6	4.4	6.8	18.4	15.9	20.9	4.6	3.4	5.8	17.4	13.8	21.0
Tm													
U	0.50	5.60	4.09	7.11	5.70	4.25	7.15	2.10	0.76	3.44	5.00	3.47	6.53
Yb	0.20	3.90	3.41	4.39	3.70	3.17	4.23	1.50	1.24	1.76	3.40	2.77	4.03
Zn	50.0	56.0	0.0	141.7	130.0	47.5	212.5	56.0	16.8	95.2	70.0	7.6	132.4

1.2 Comparison of analytical results for Actlabs (in red) and six other certified commercial laboratories in the round-robin analysis of three project-specific GRMs (CYP-A,-B,-C) and USGS GXR6.

Values represent average of three replicates. Gaps indicate the analyte was not reported by the laboratory.

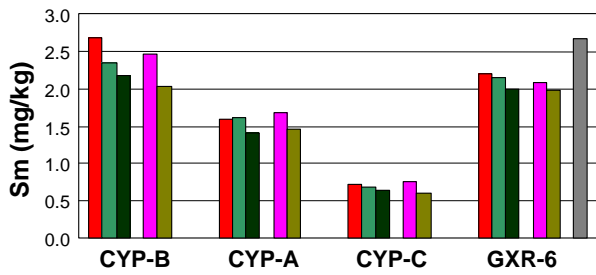
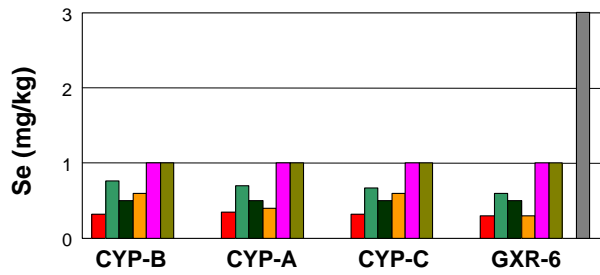
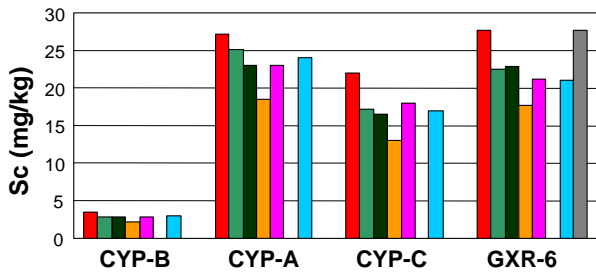
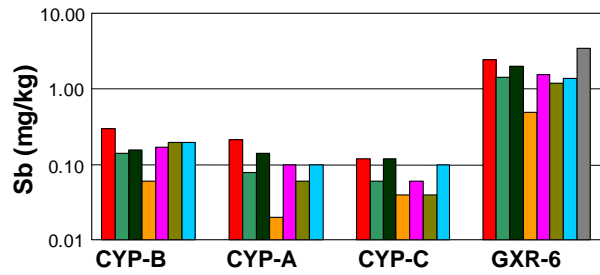
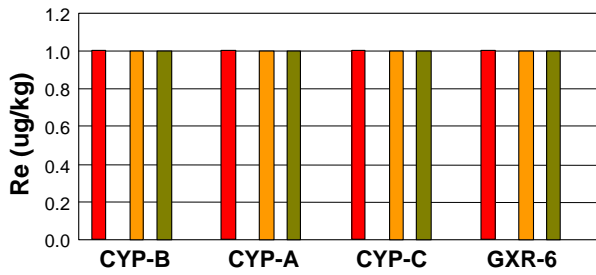
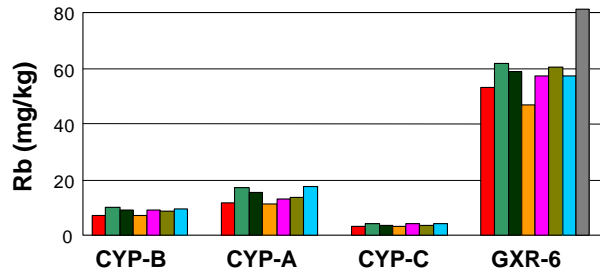
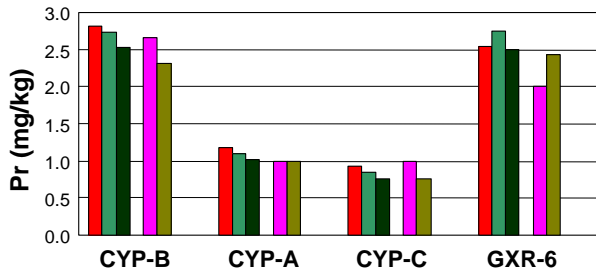
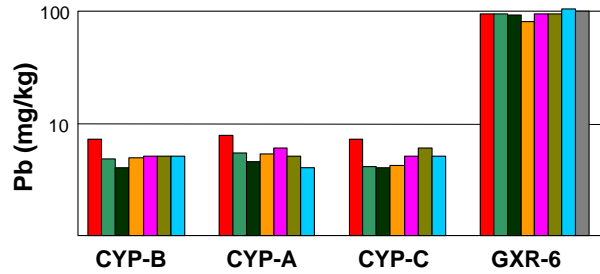
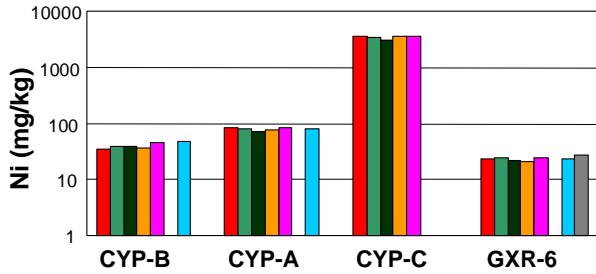
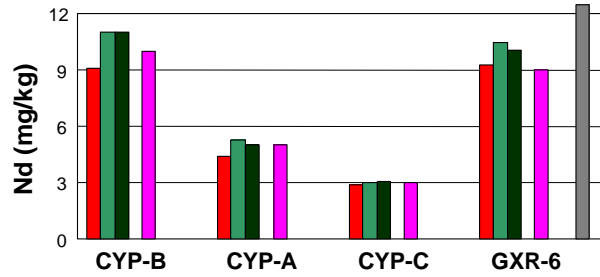
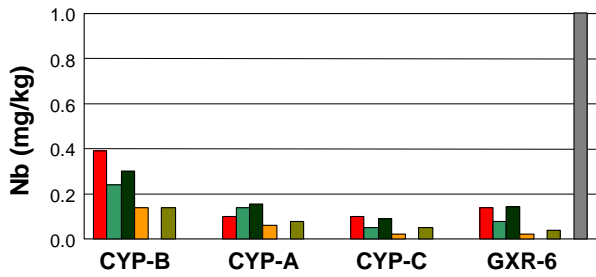






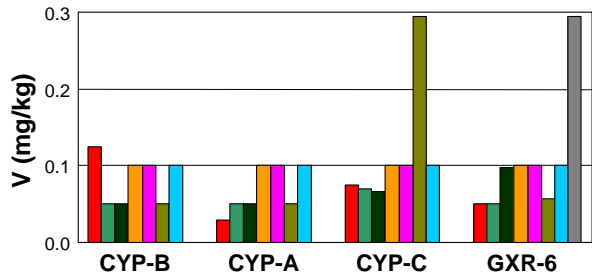
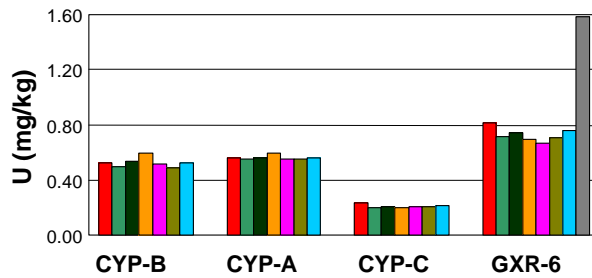
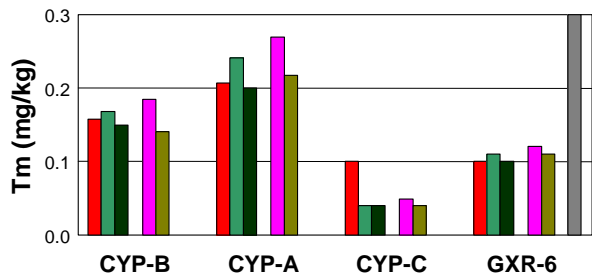
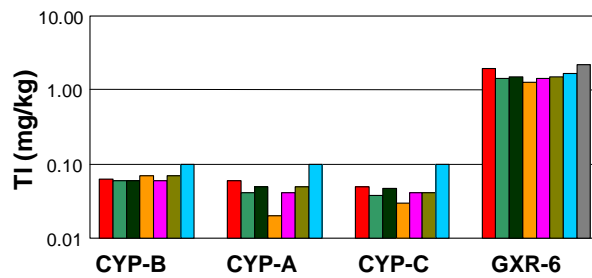
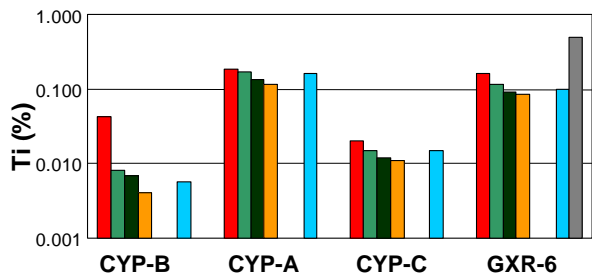
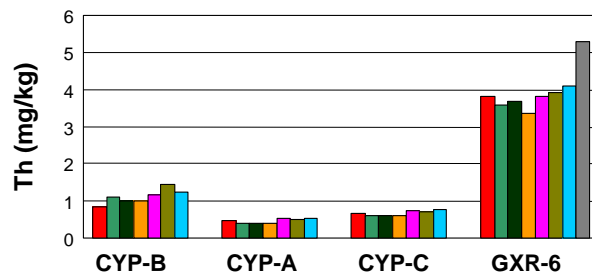
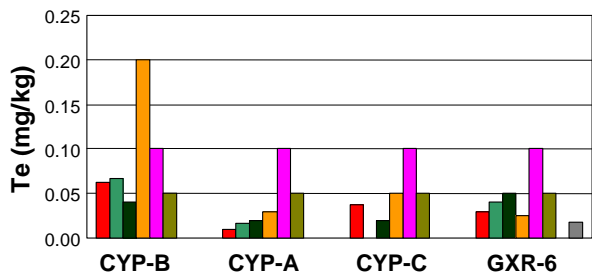
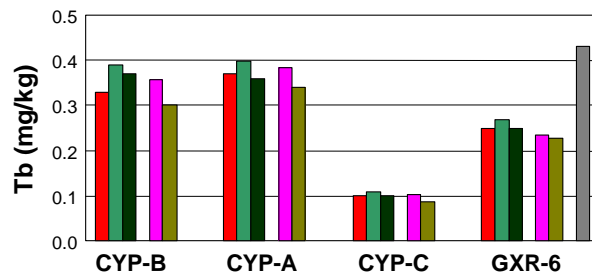
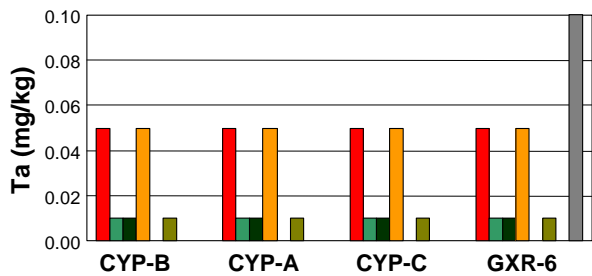
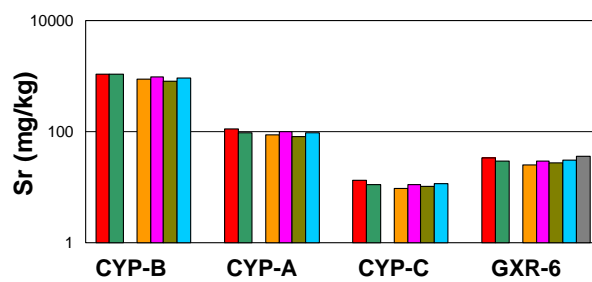
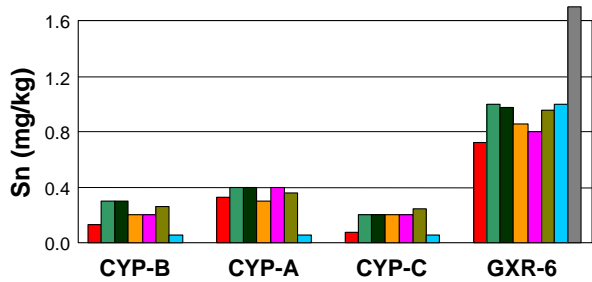
Interlaboratory comparison

- Actlabs
- Lab 1
- Lab 2
- Lab 3
- Lab 4
- Lab 5
- Lab 6
- Cert (total)



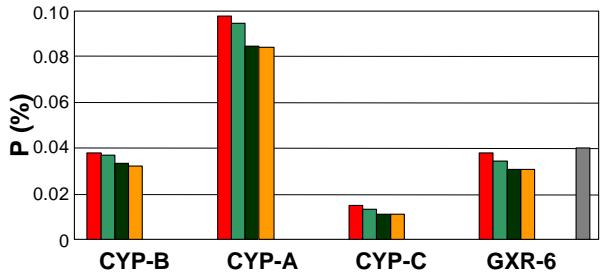
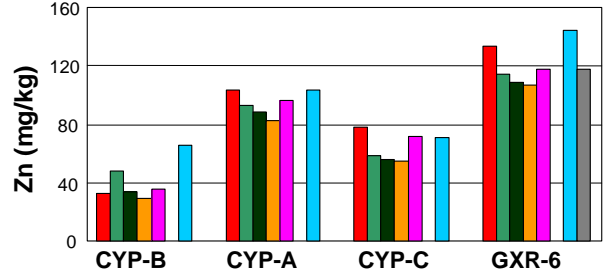
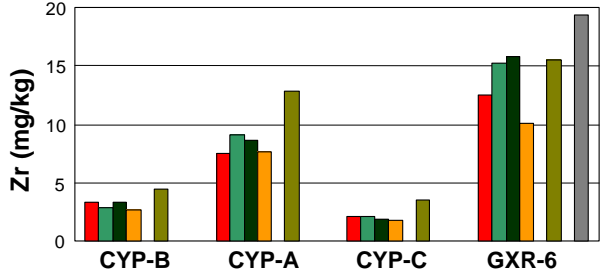
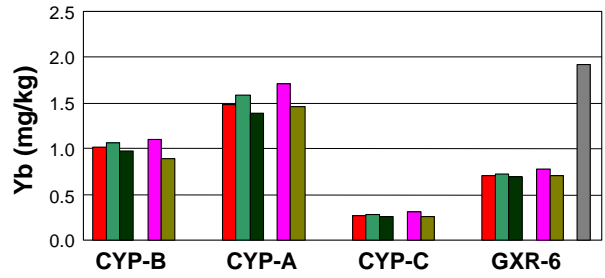
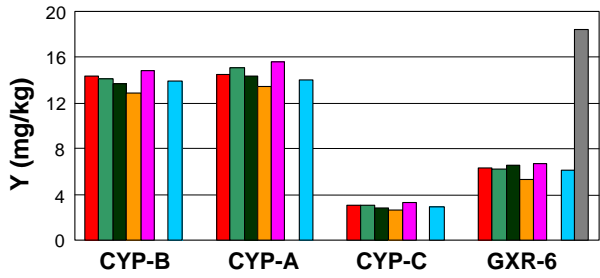
Interlaboratory comparison

- Actlabs
- Lab 1
- Lab 2
- Lab 3
- Lab 4
- Lab 5
- Lab 6
- Cert (total)



Interlaboratory comparison

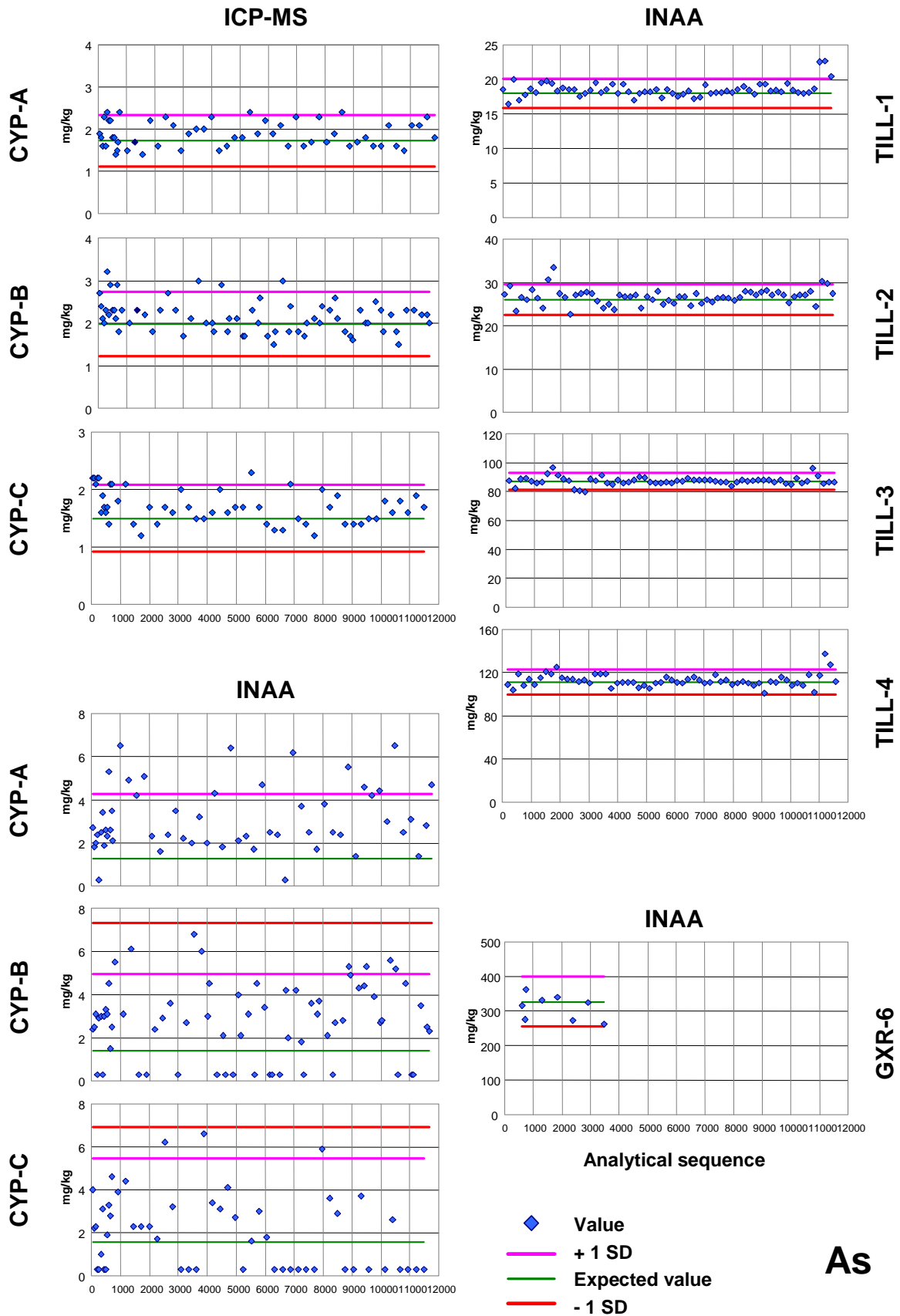
- Actlabs
- Lab 1
- Lab 2
- Lab 3
- Lab 4
- Lab 5
- Lab 6
- Cert (total)



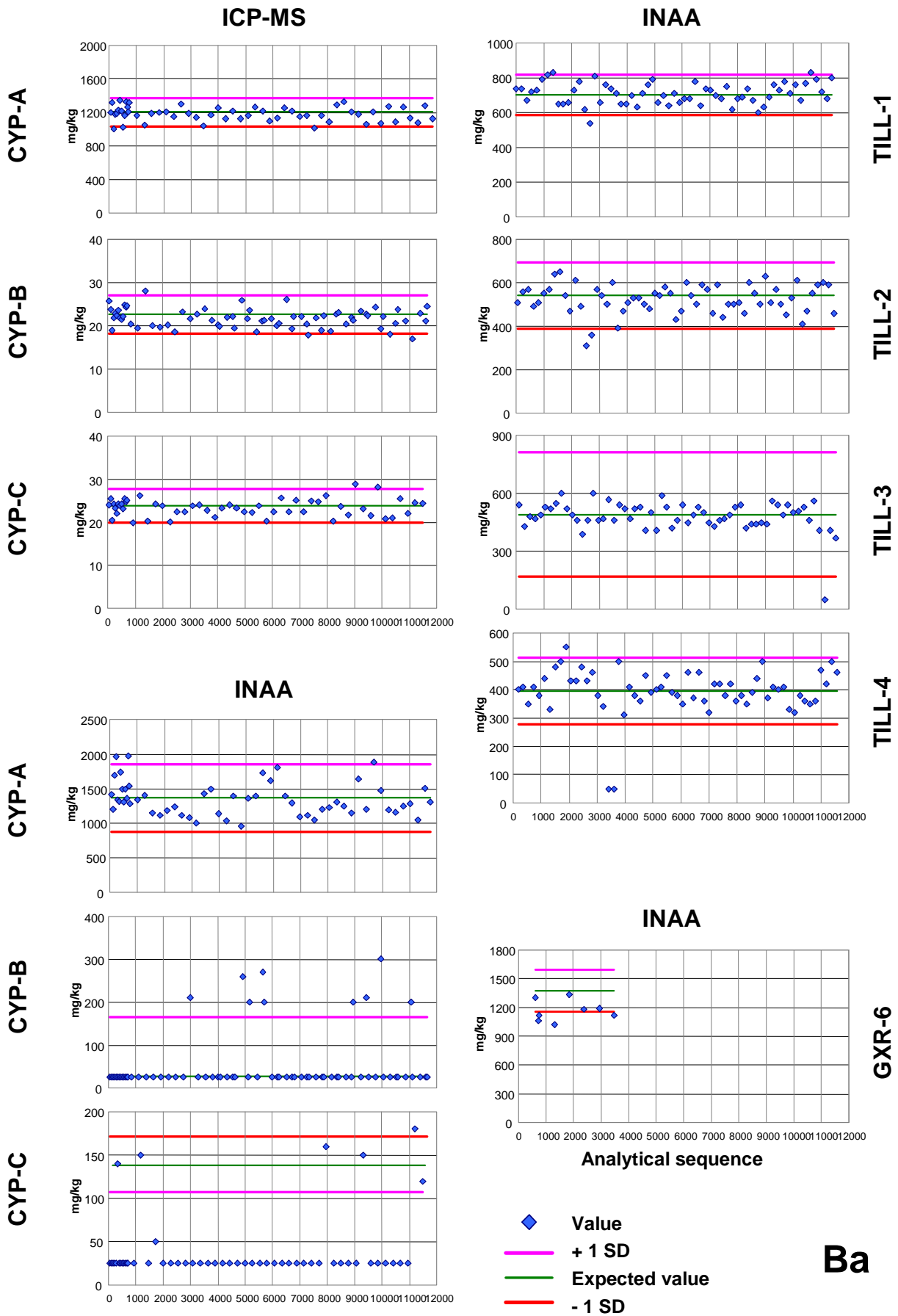
Interlaboratory comparison

- Actlabs
- Lab 1
- Lab 2
- Lab 3
- Lab 4
- Lab 5
- Lab 6
- Cert (total)

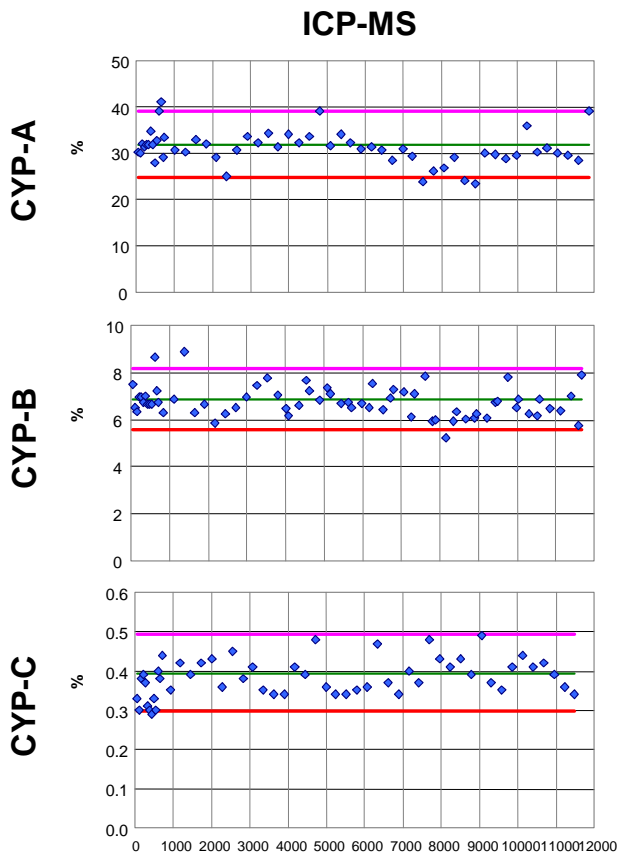
1.3 Warning values set at recommended/certified value ± 1 standard deviation on the analyses across the entire dataset.



As



Ba

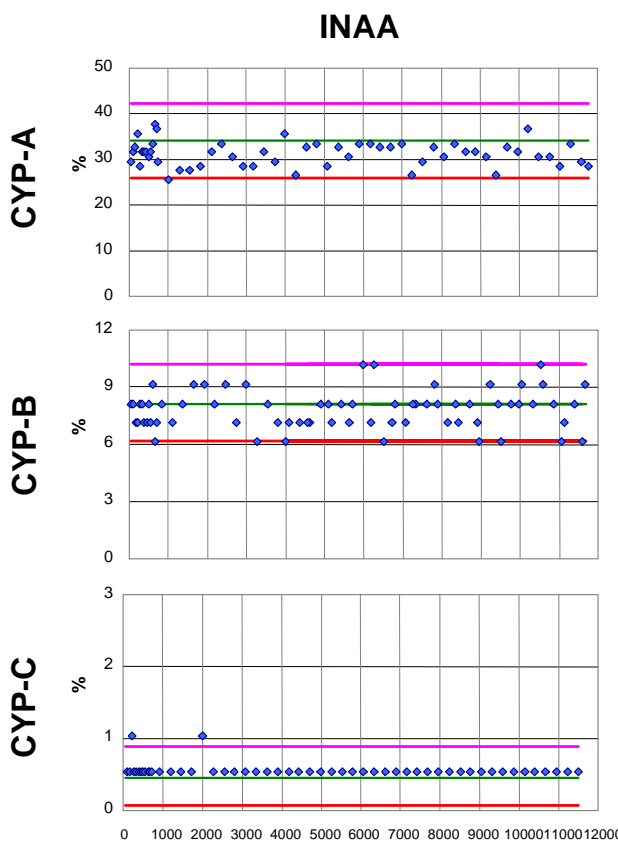


INAA

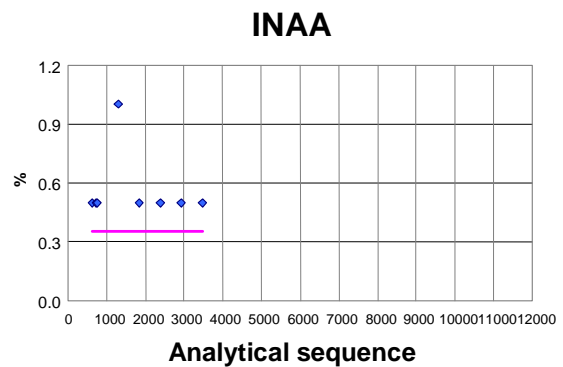
TILL-1

TILL-2

TILL-3

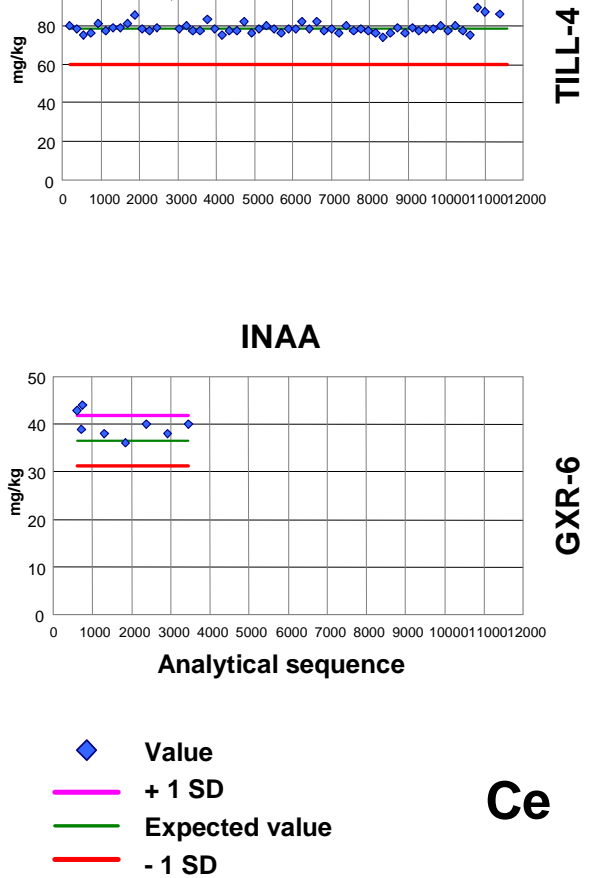
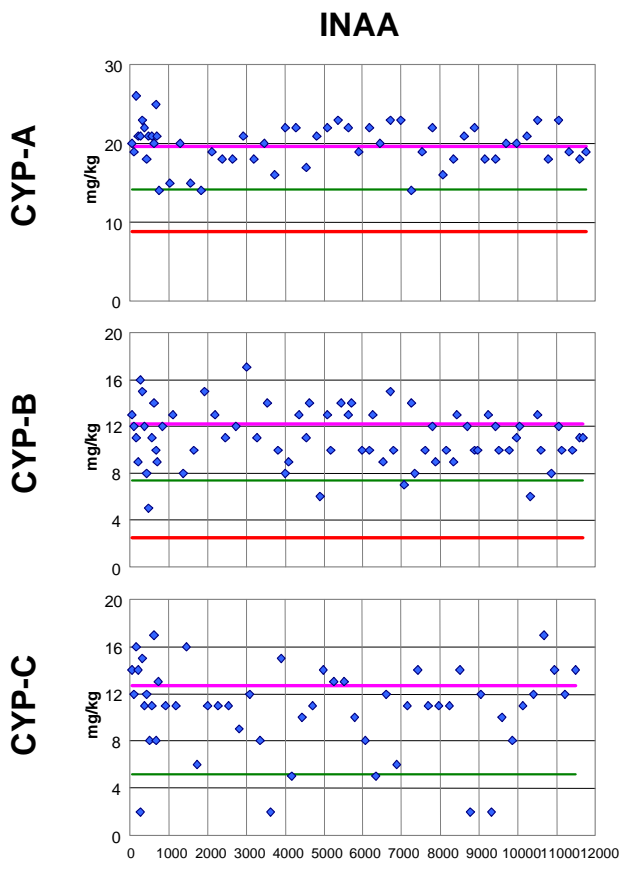
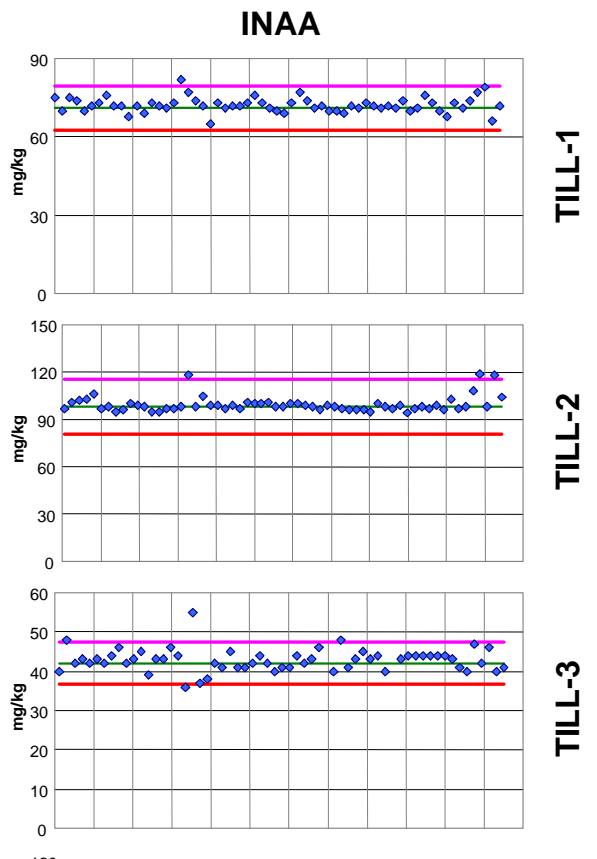
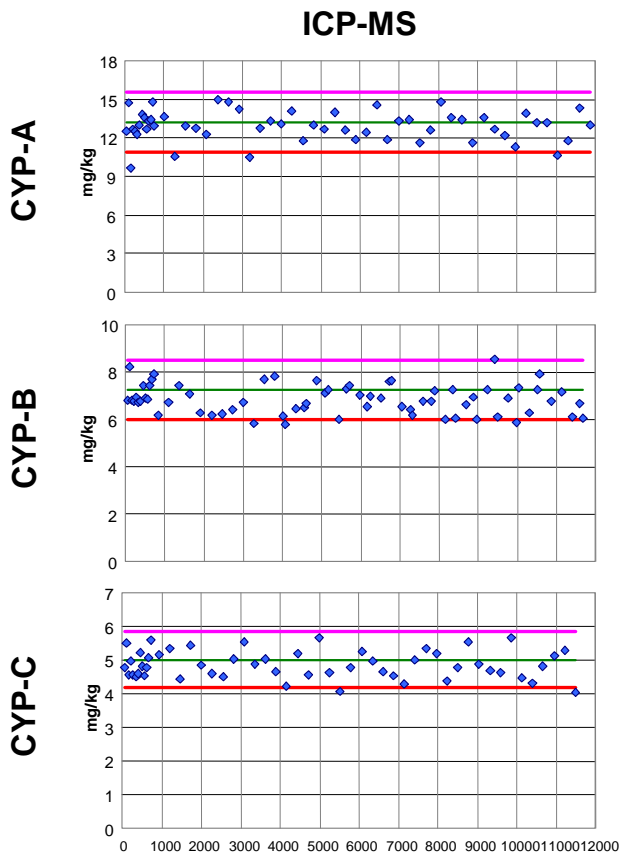


TILL-4



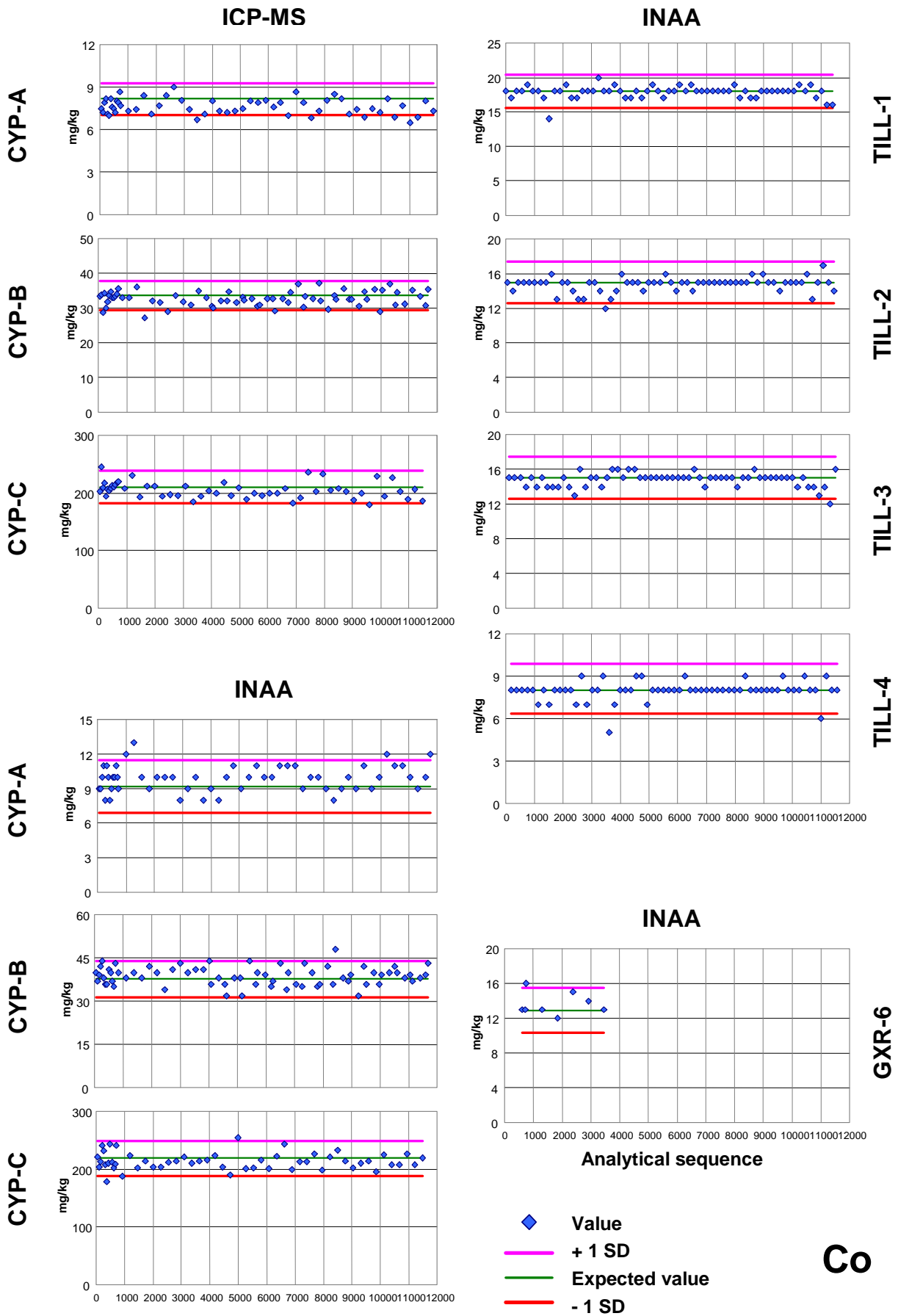
- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

Ca

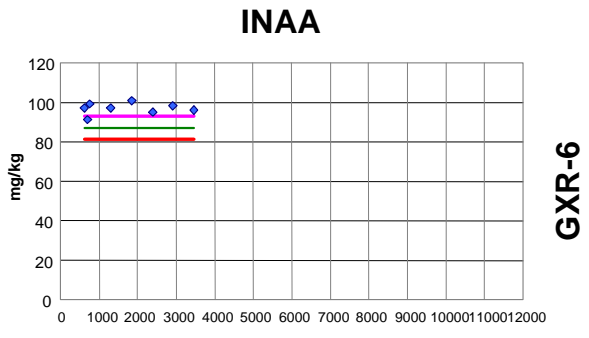
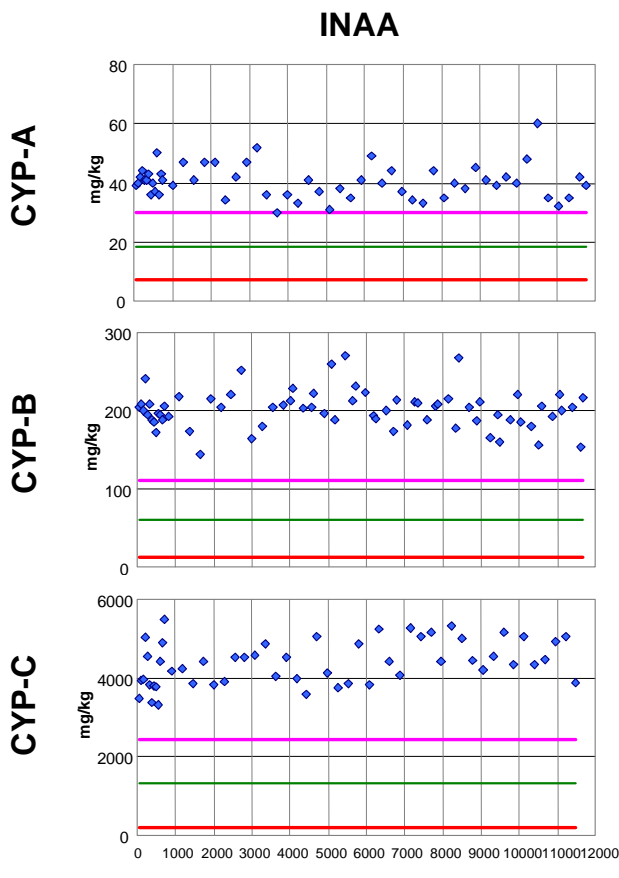
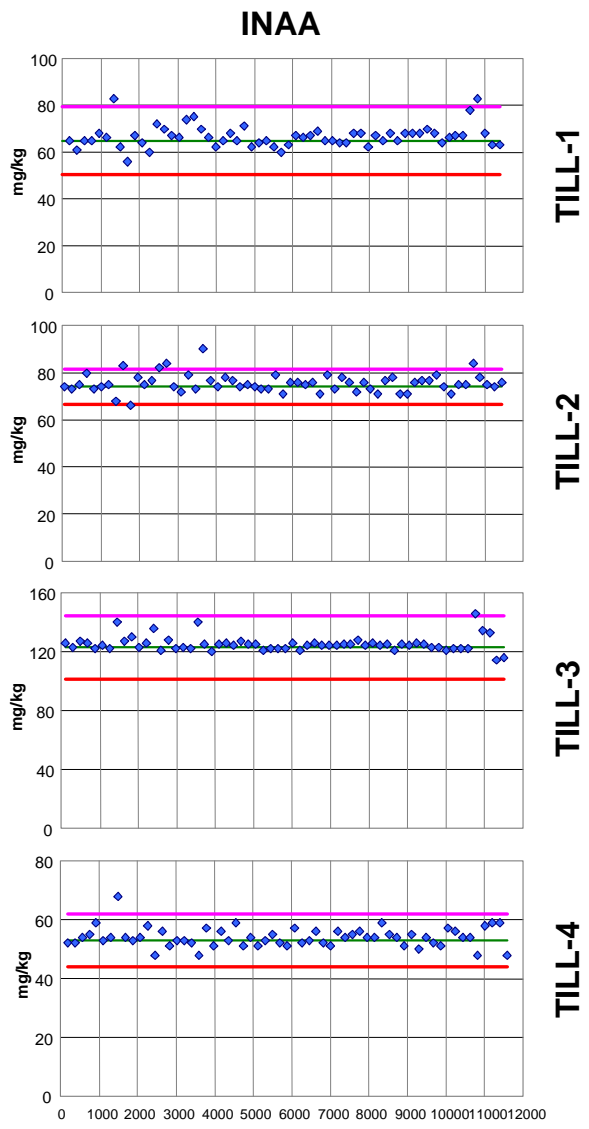
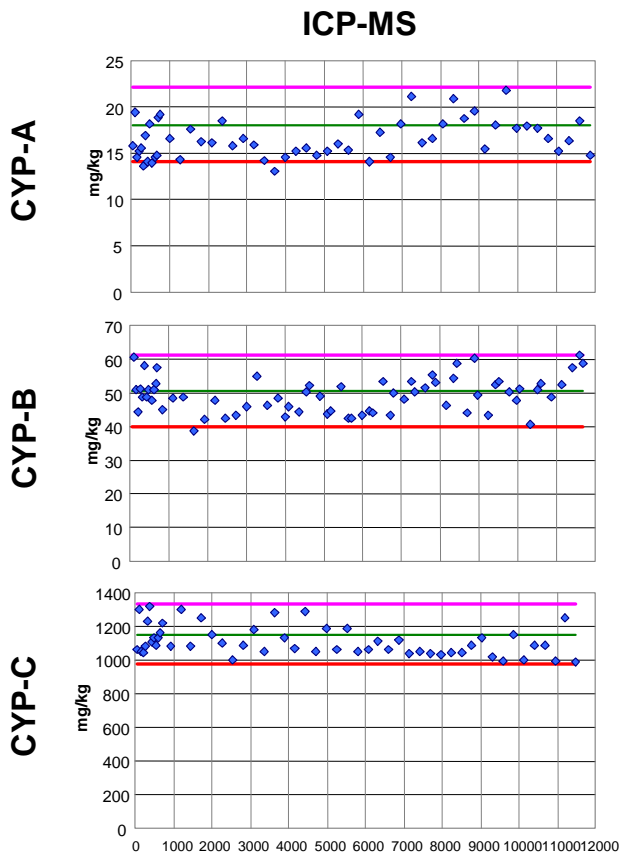


◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Ce



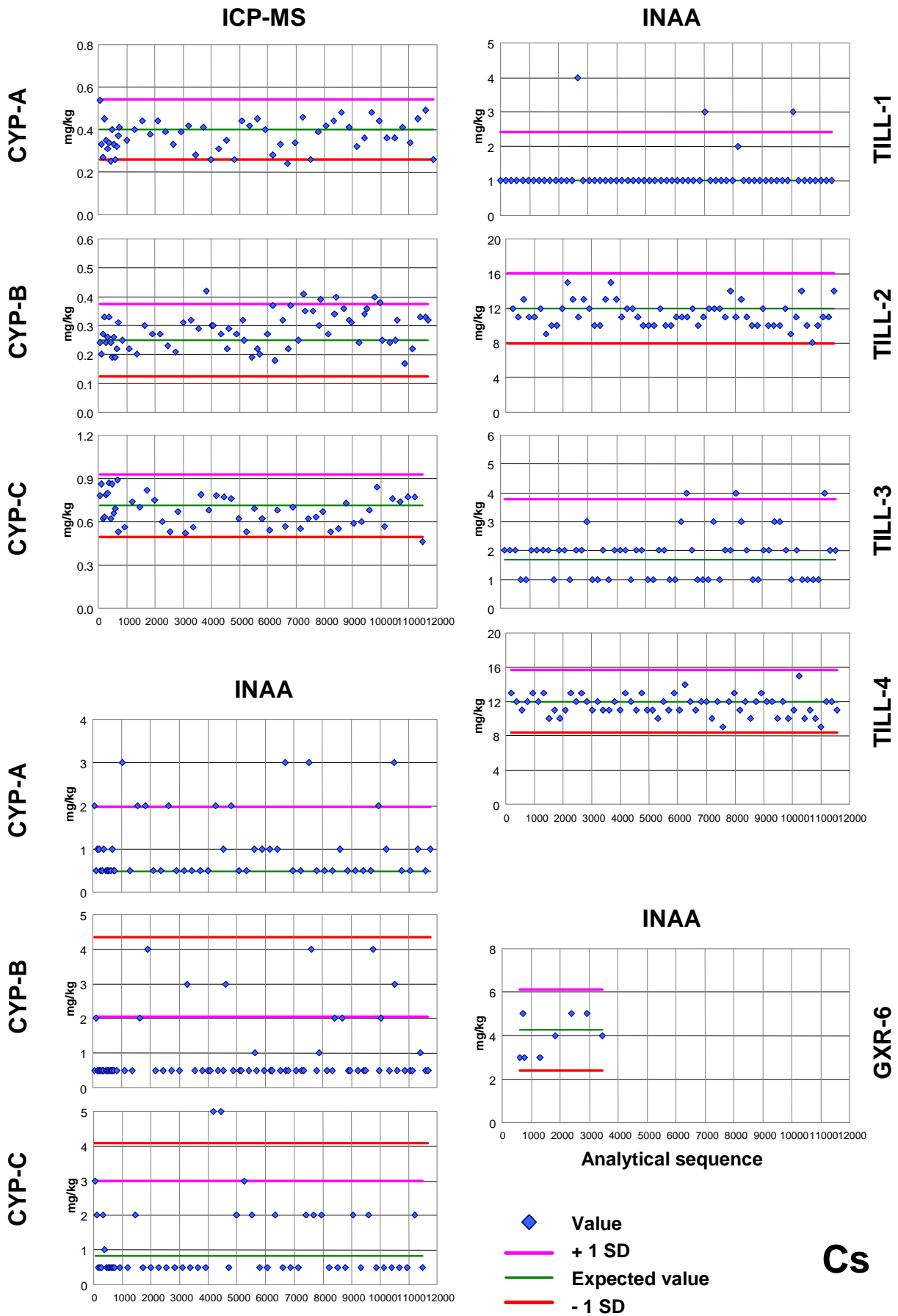
Co

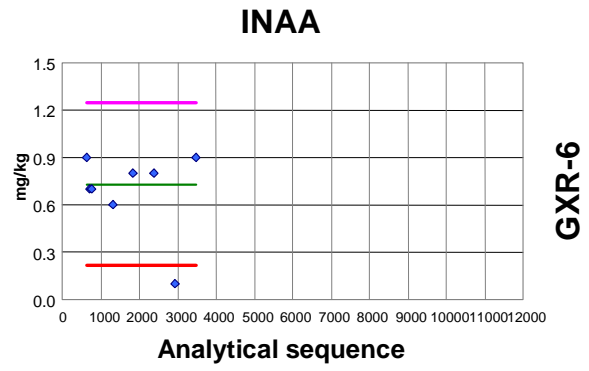
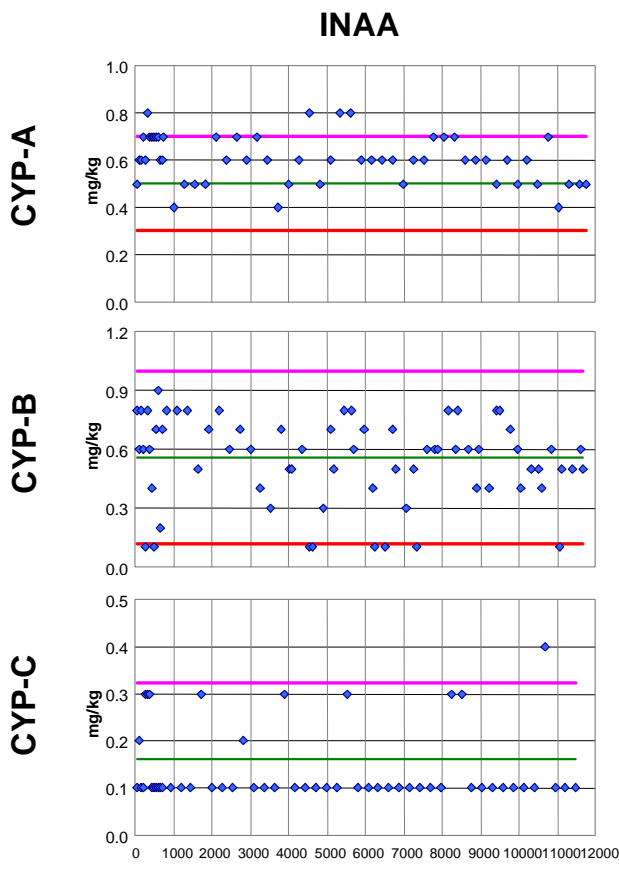
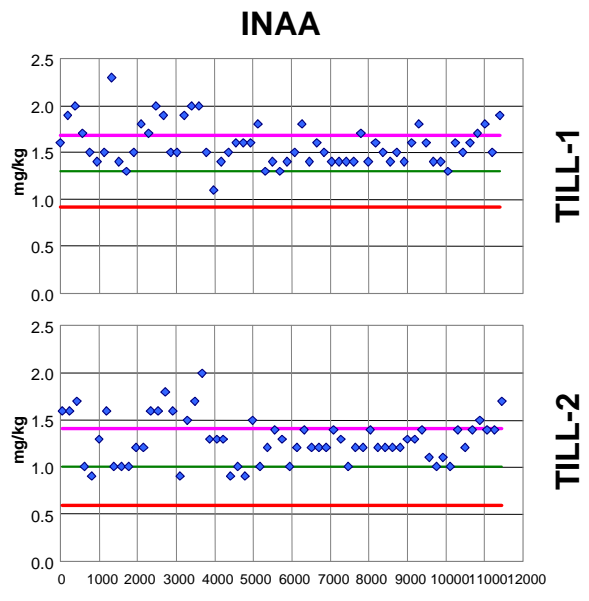
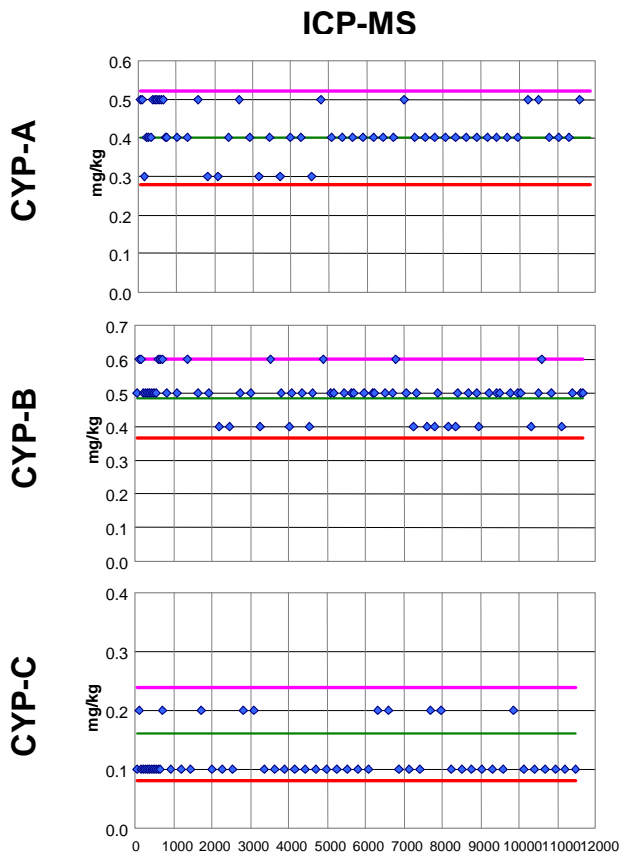


Analytical sequence

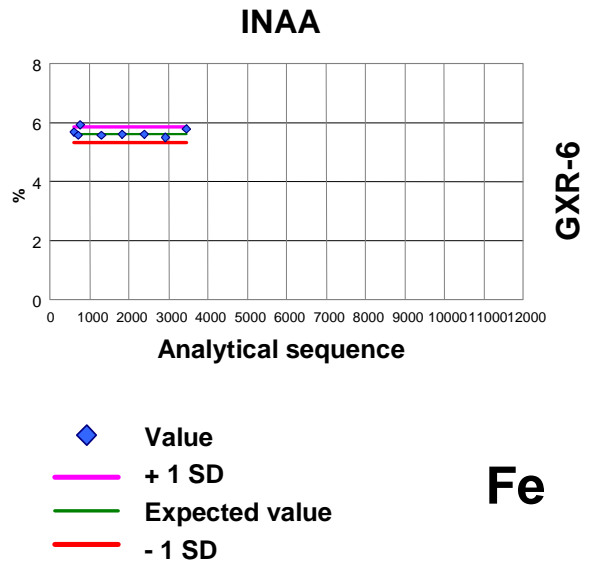
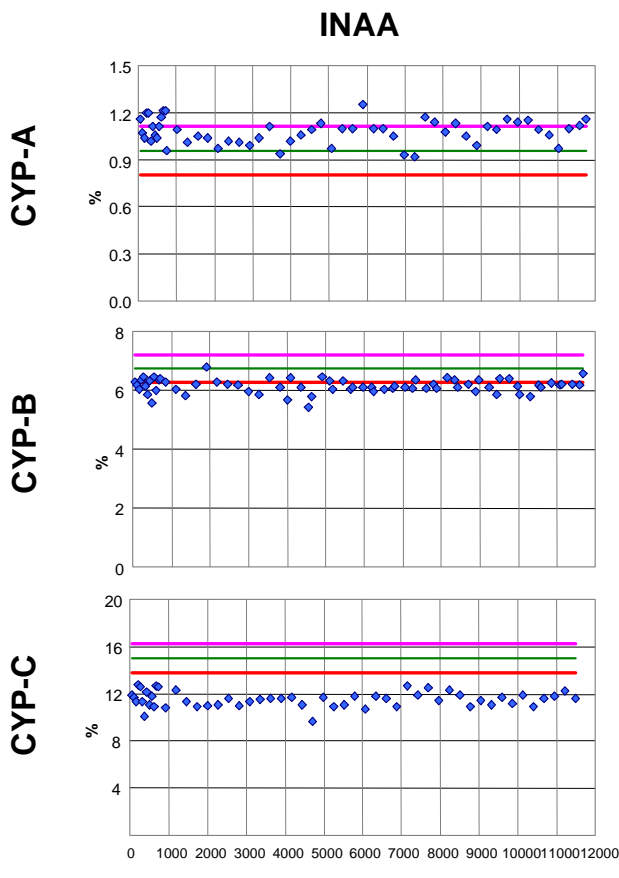
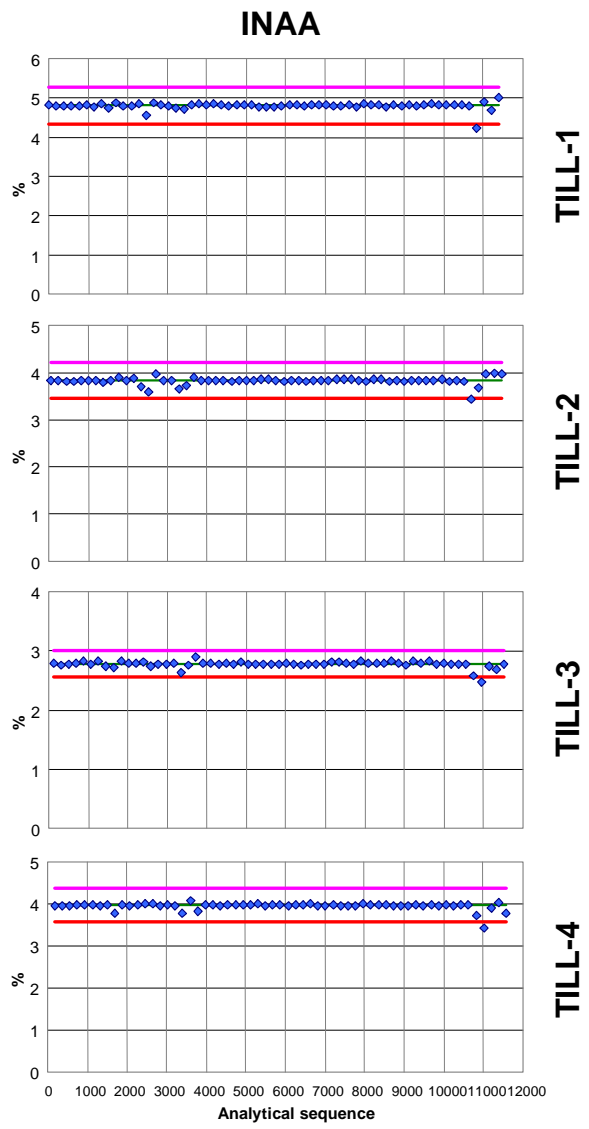
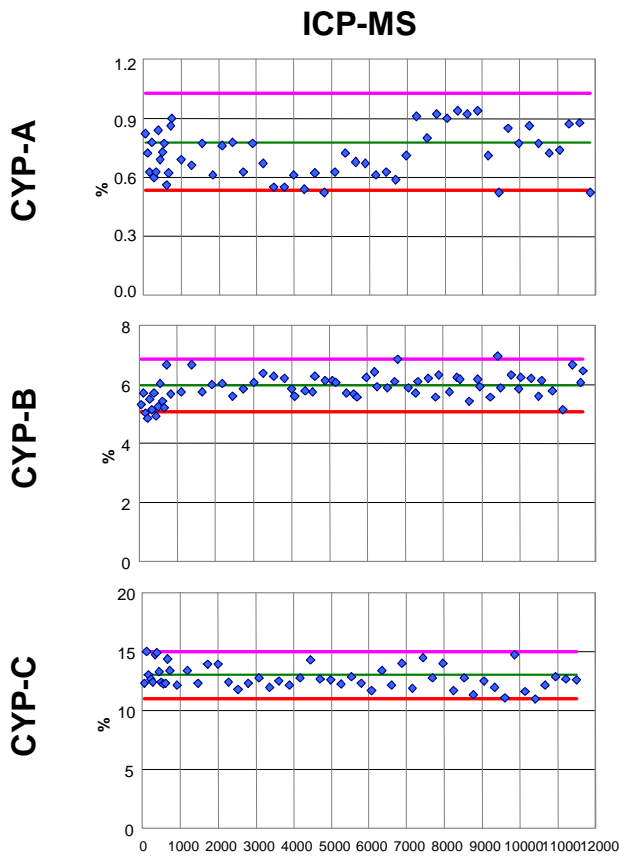
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Cr



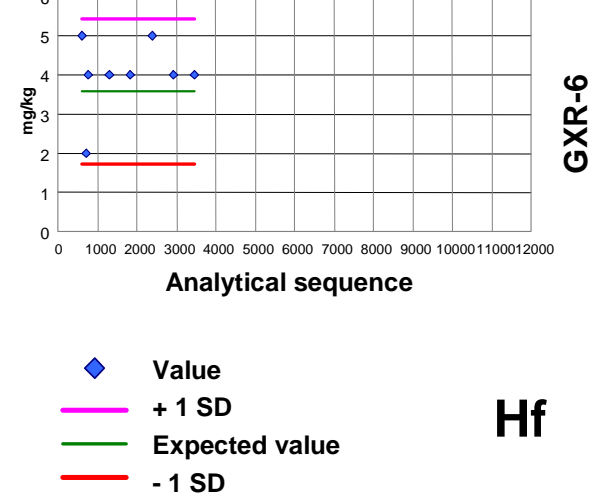
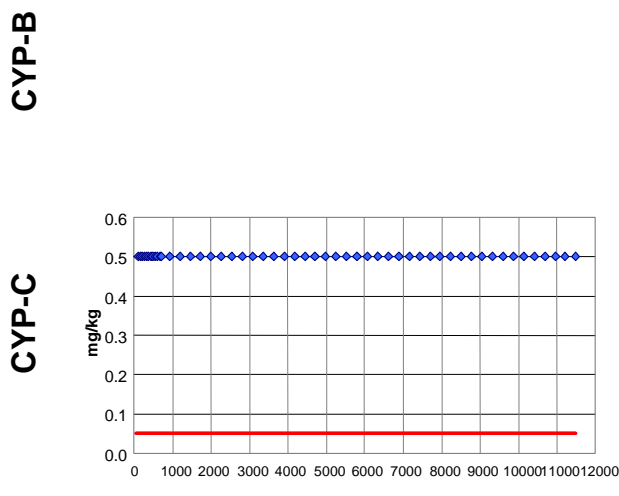
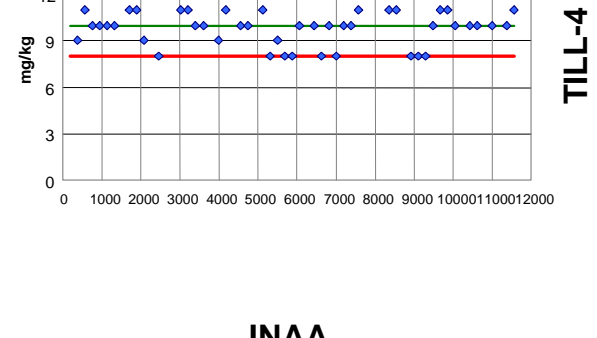
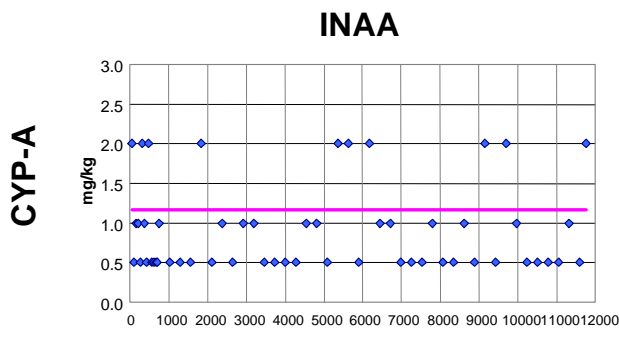
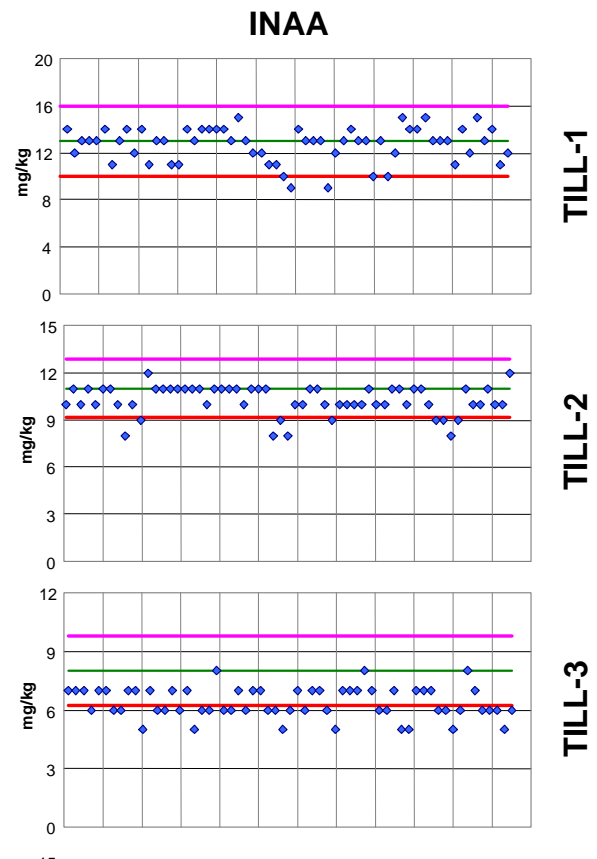
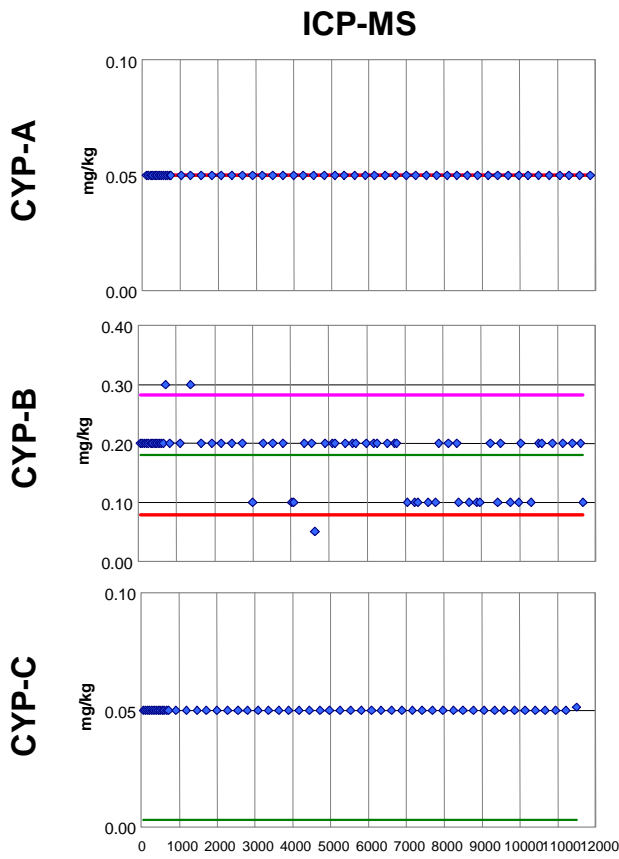


Eu



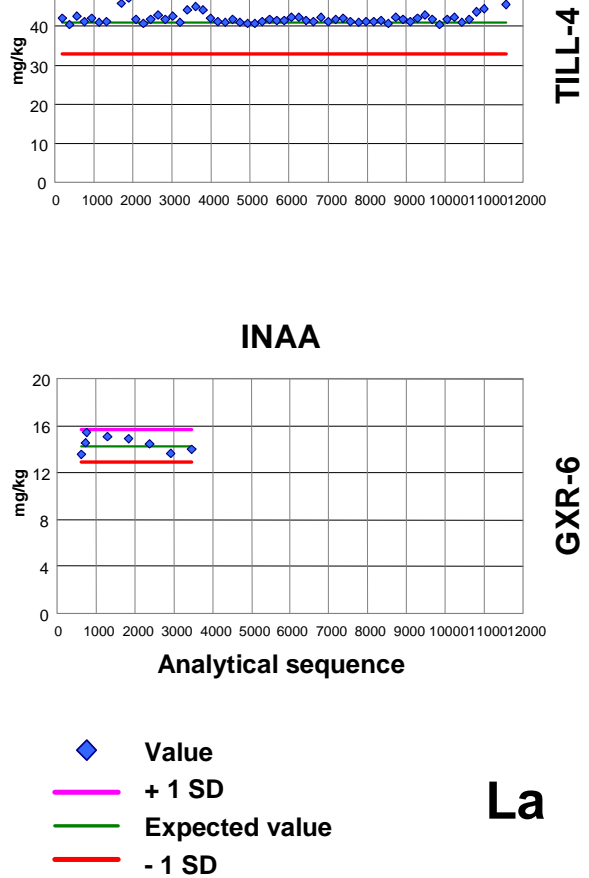
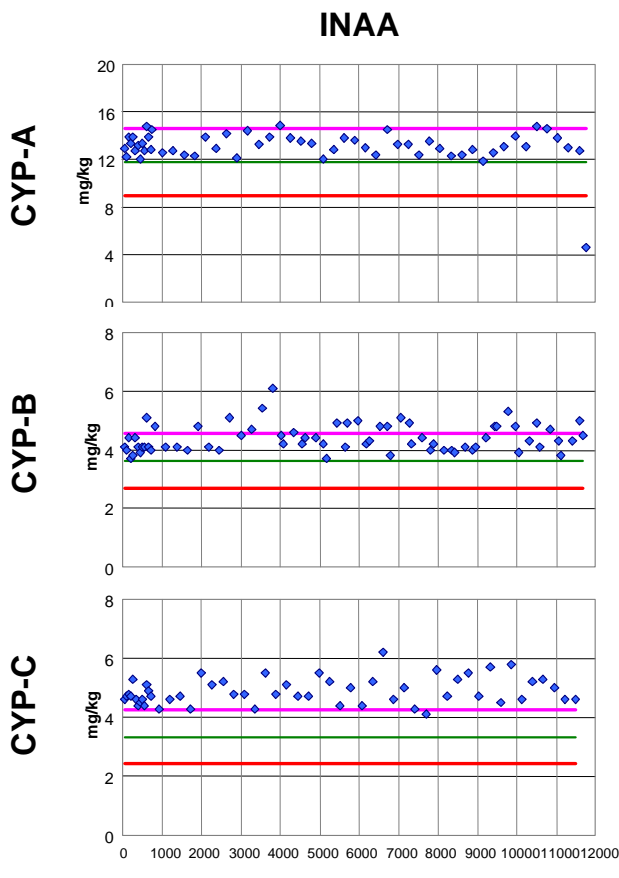
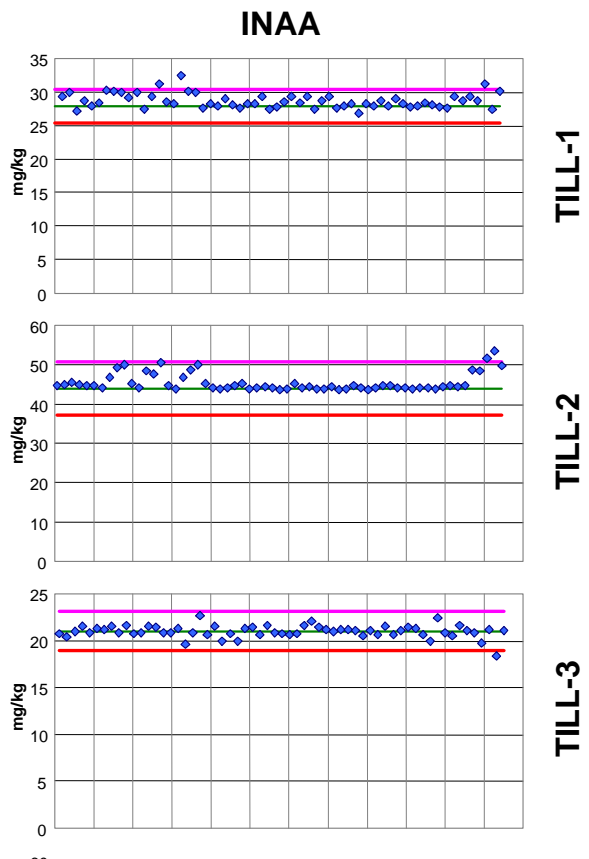
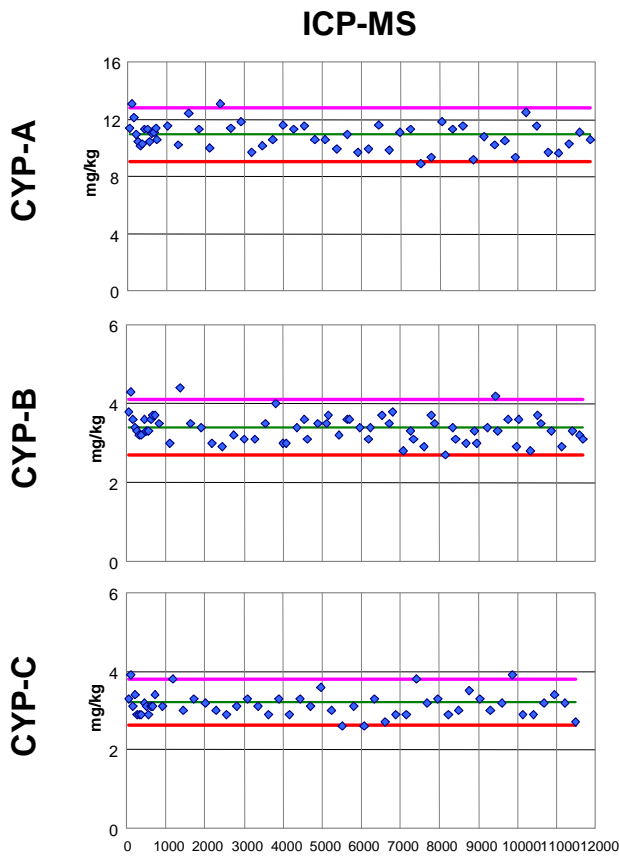
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Fe



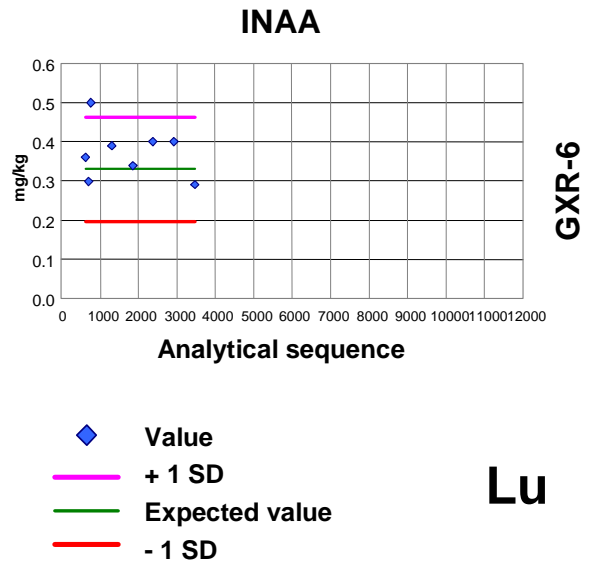
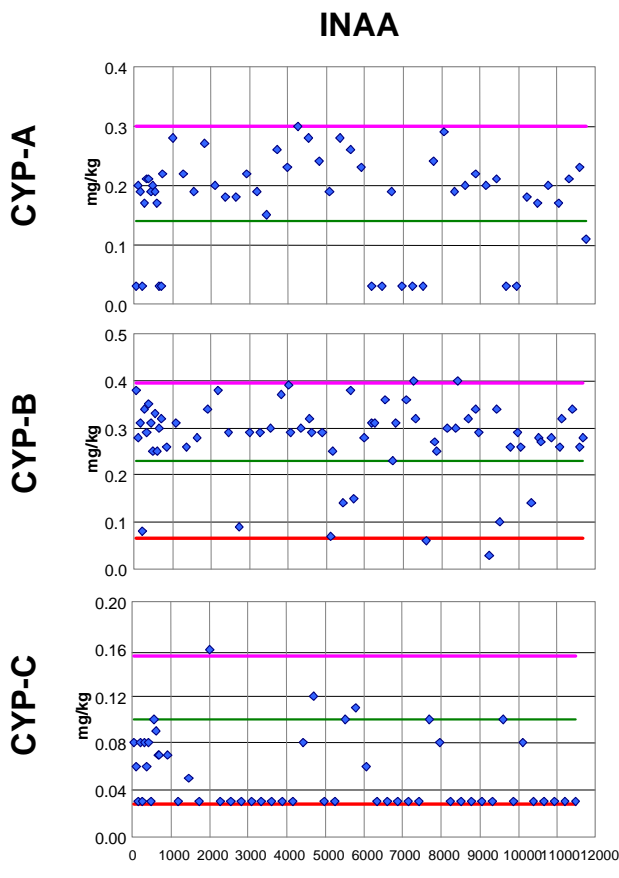
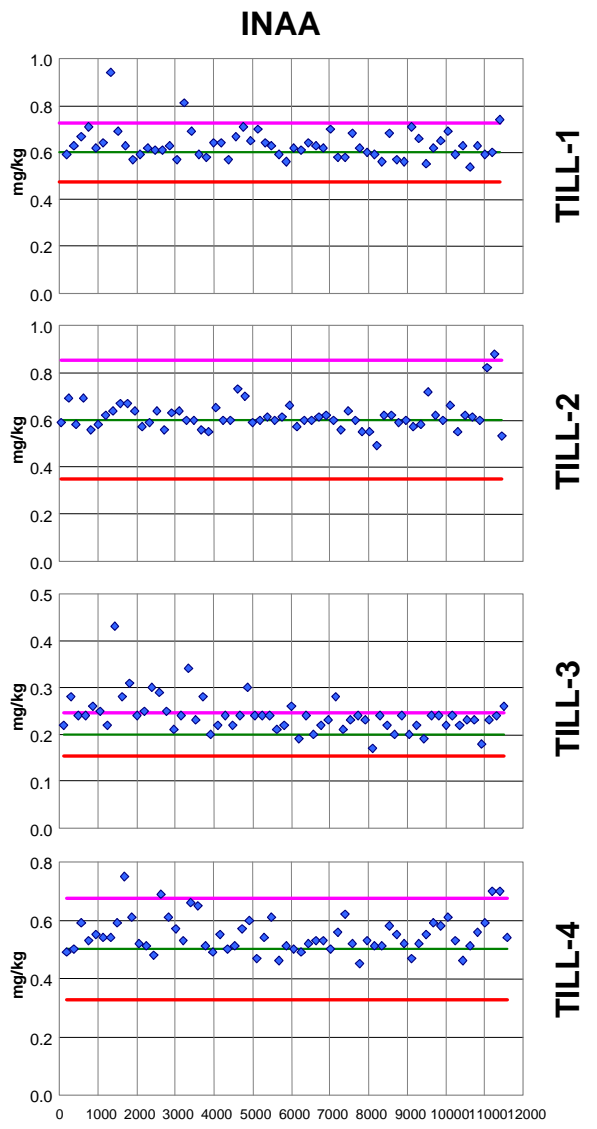
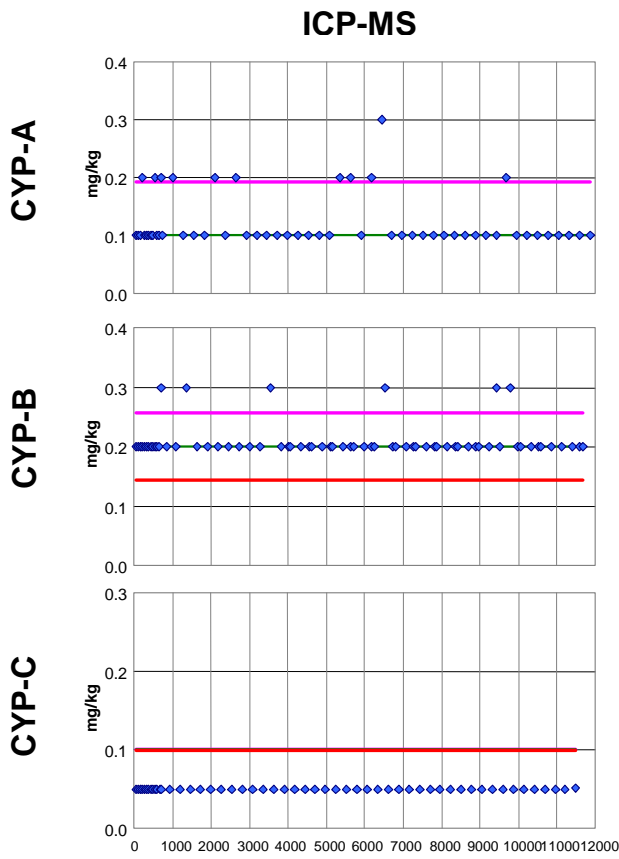
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Hf



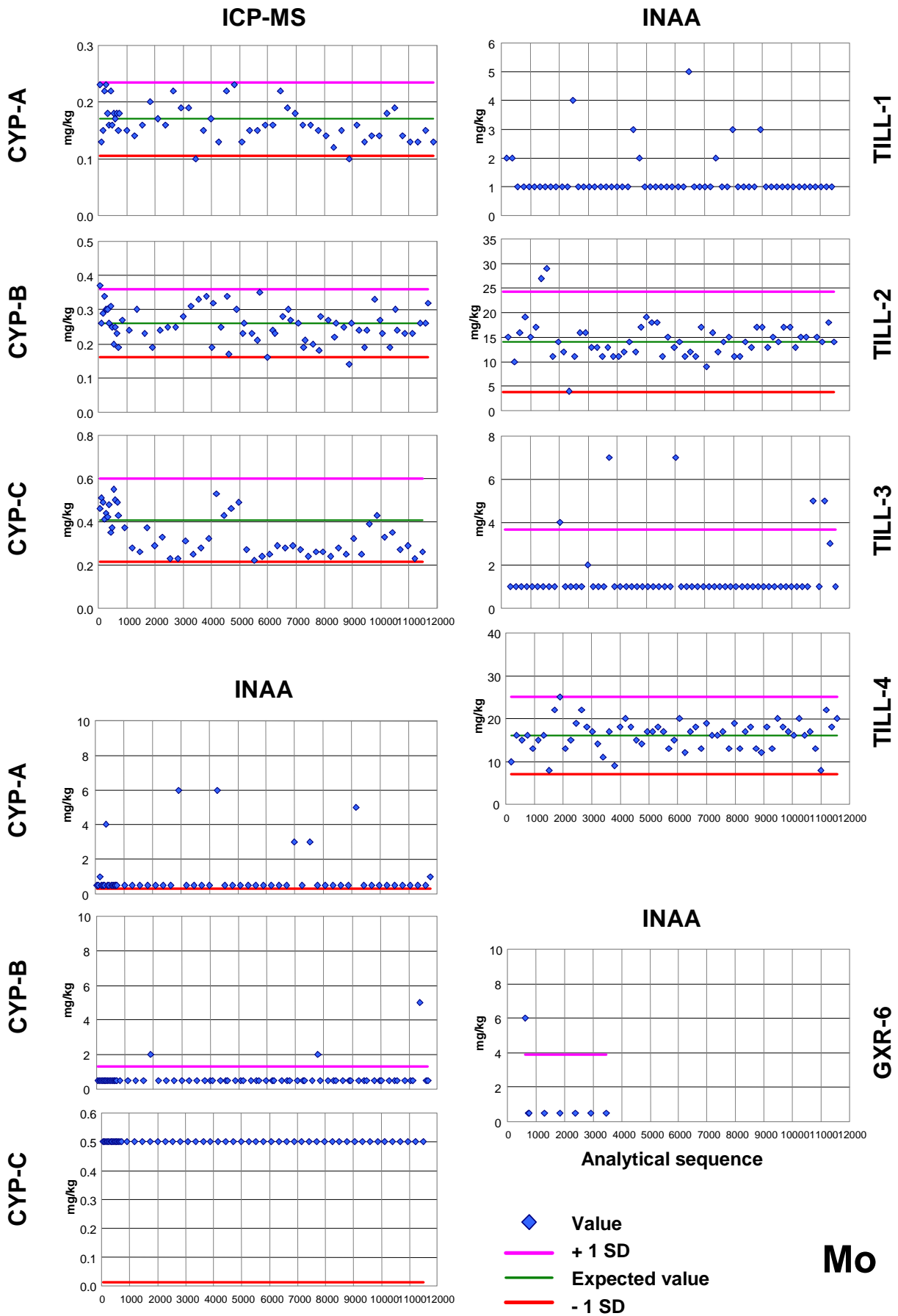
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

La

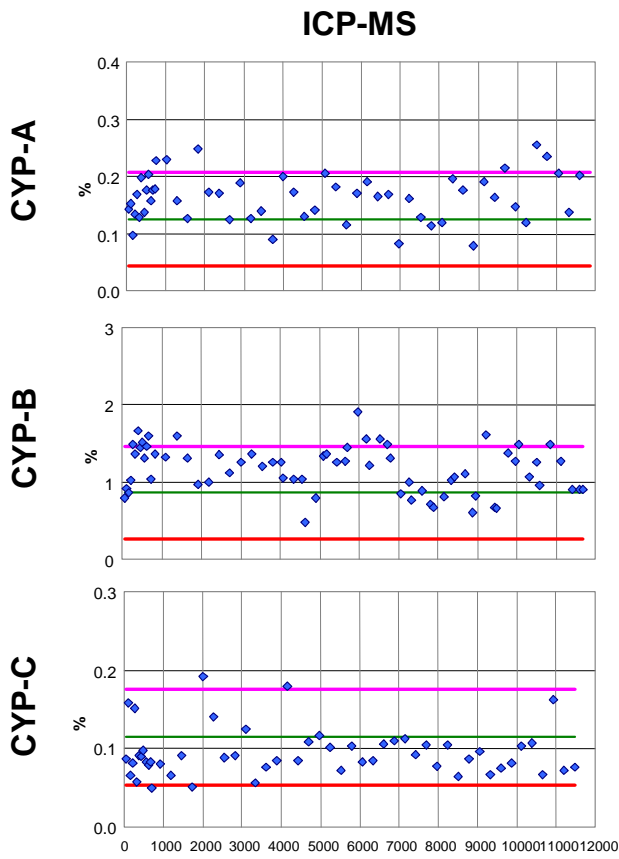


◆ Value
— + 1 SD
— Expected value
— - 1 SD

Lu



Mo

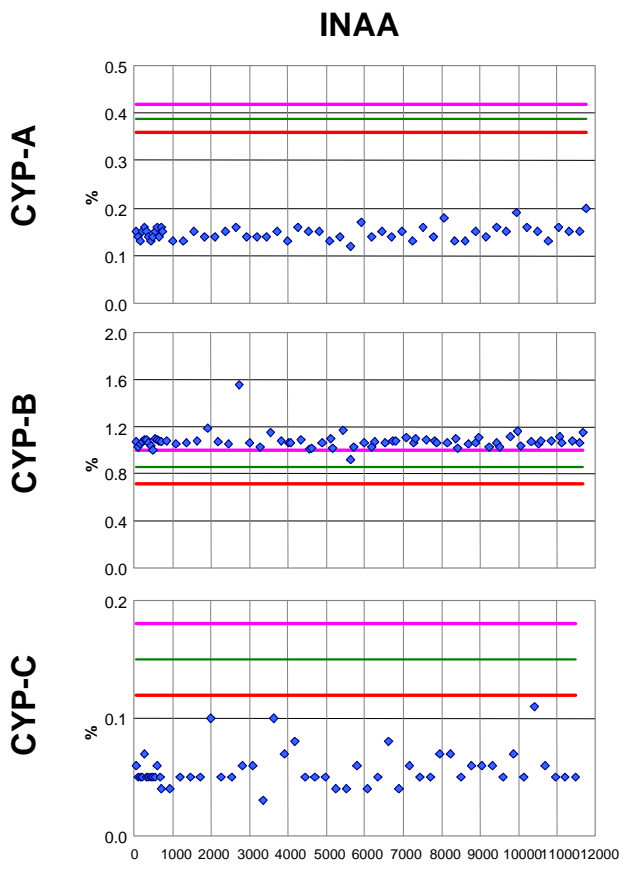


INAA

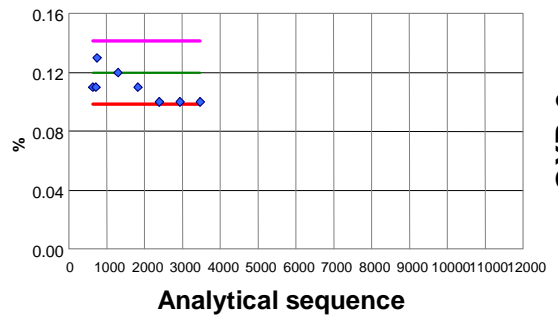
TILL-1

TILL-2

TILL-3



INAA

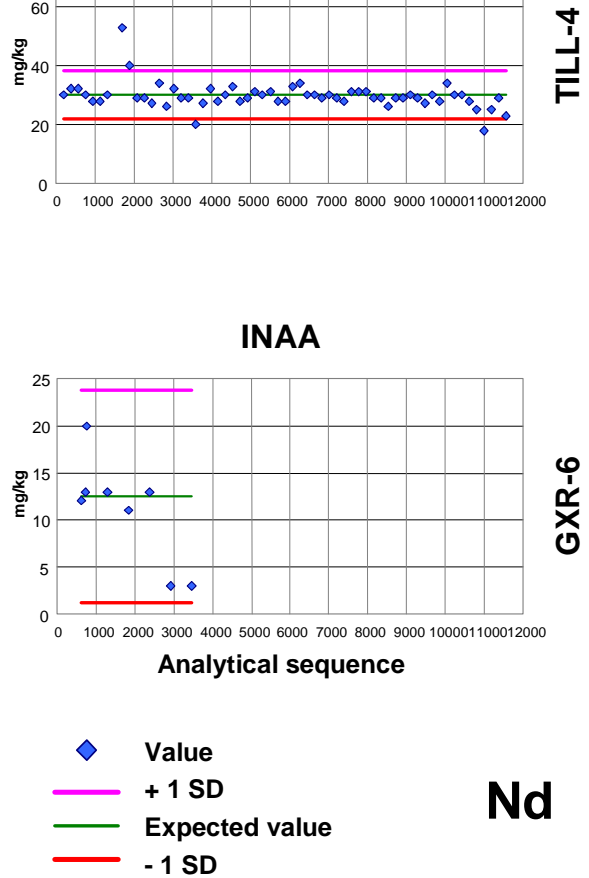
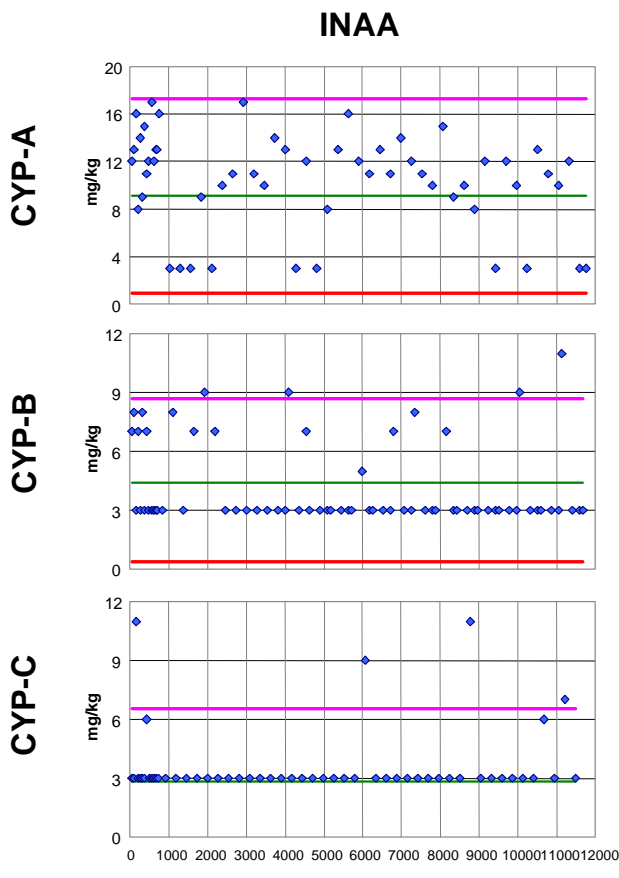
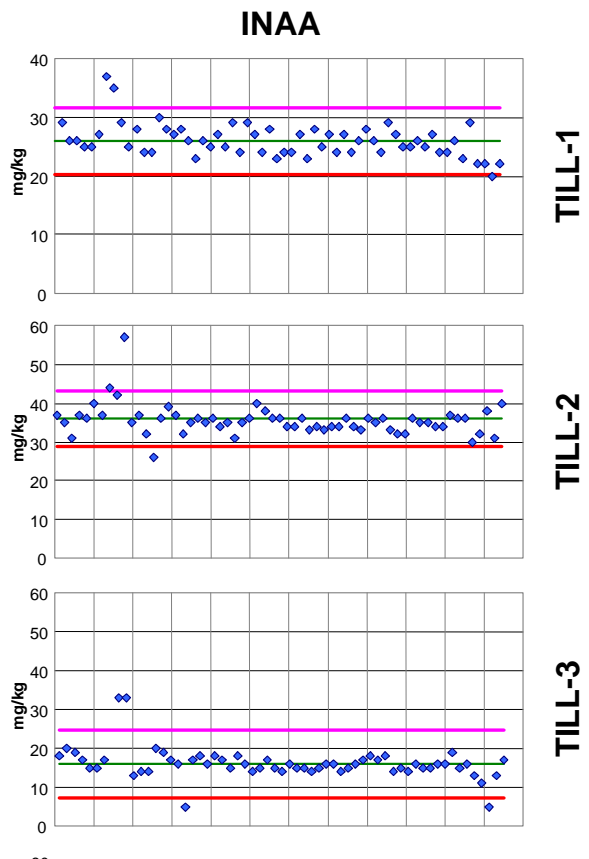
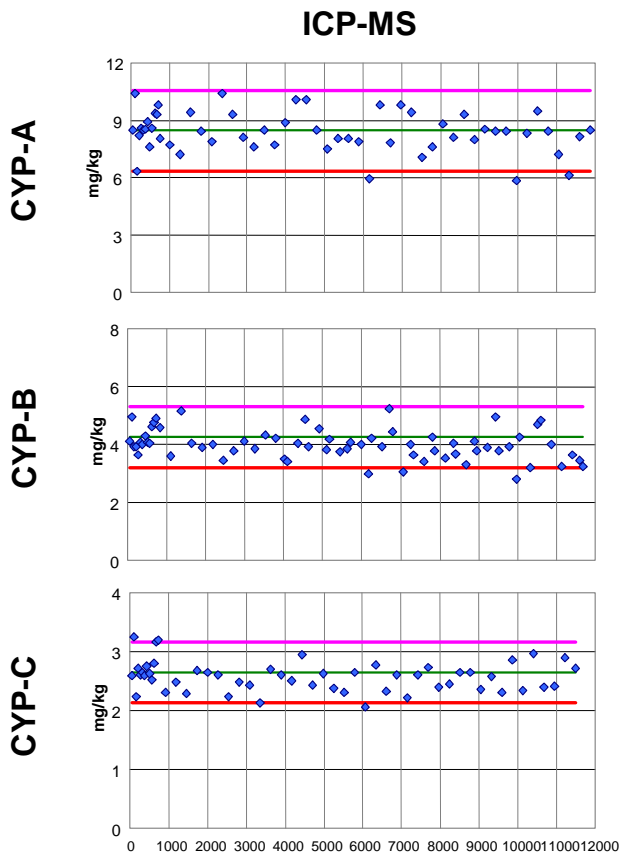


TILL-4

GXR-6

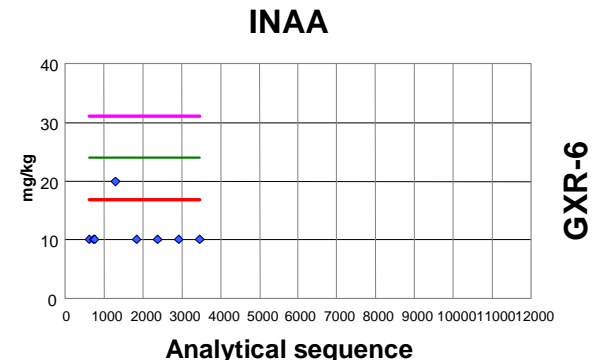
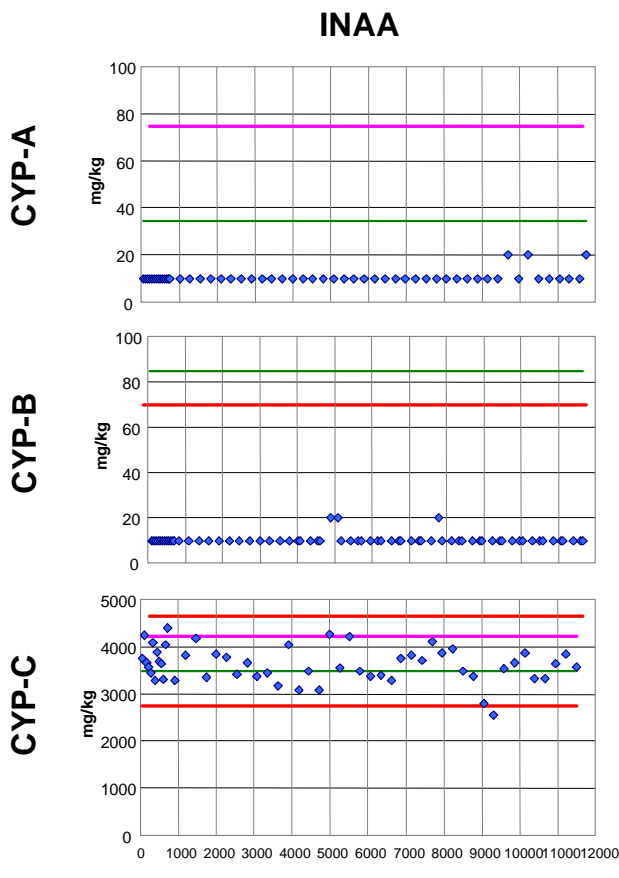
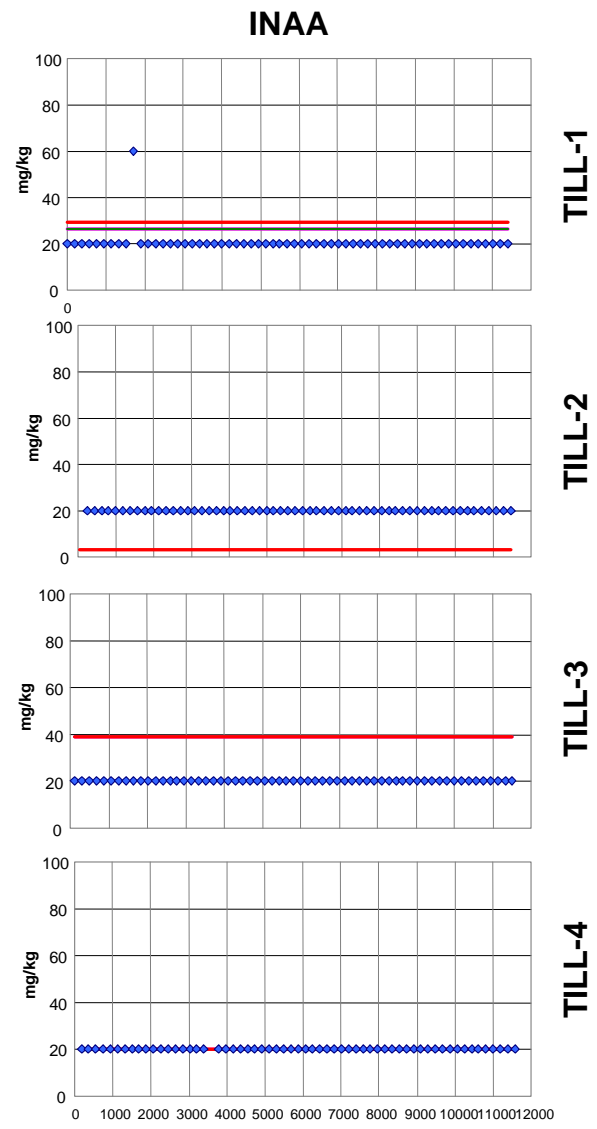
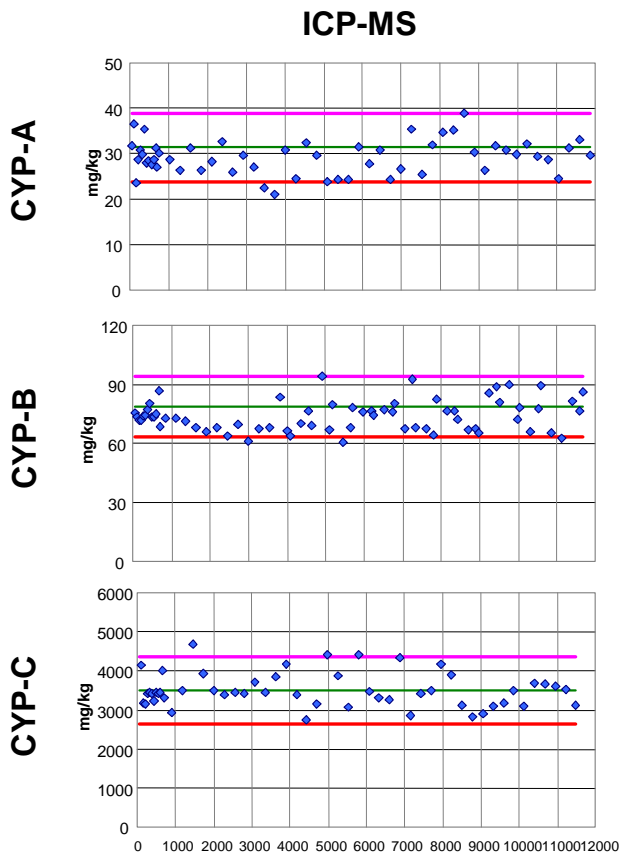


Na



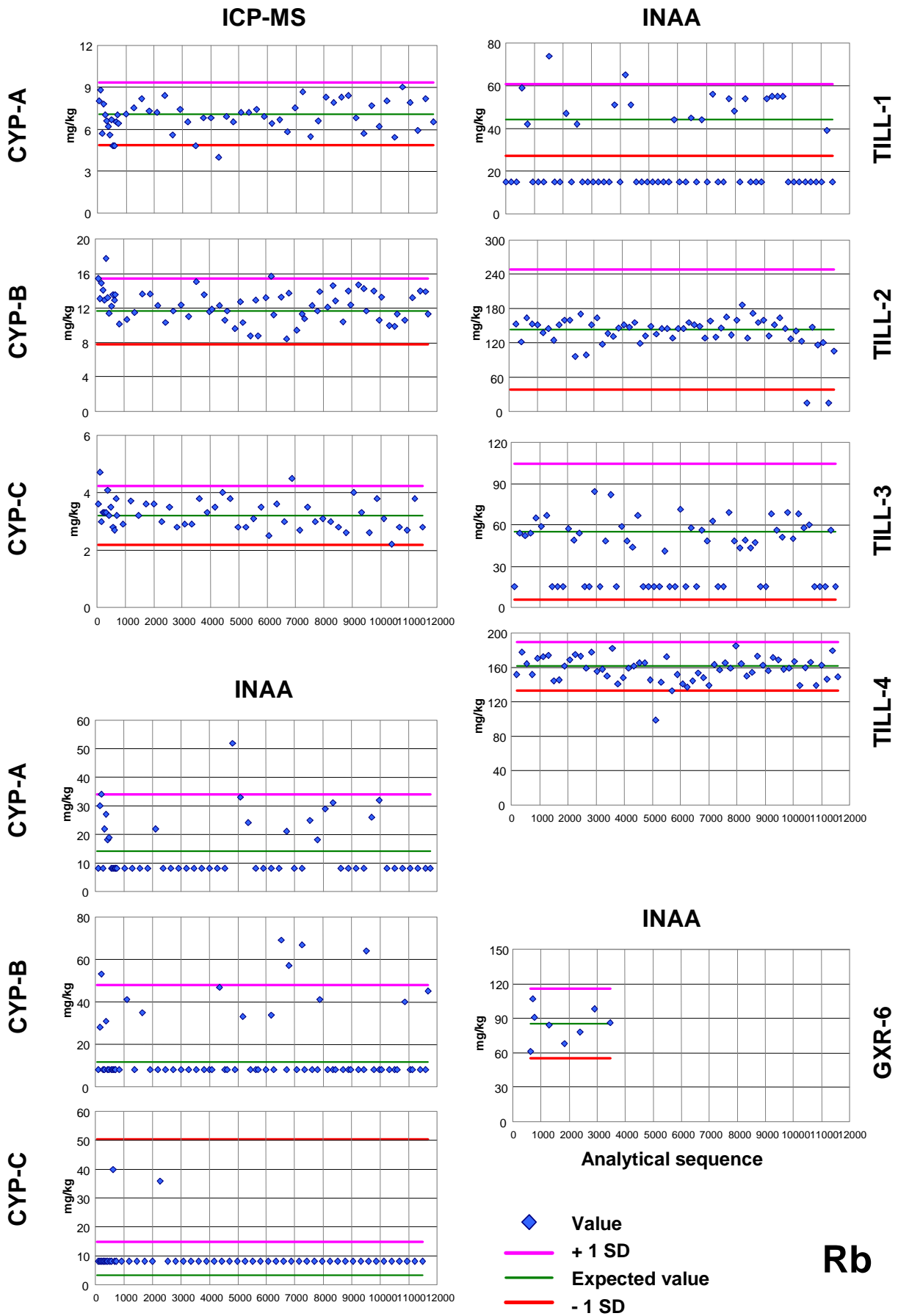
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Nd



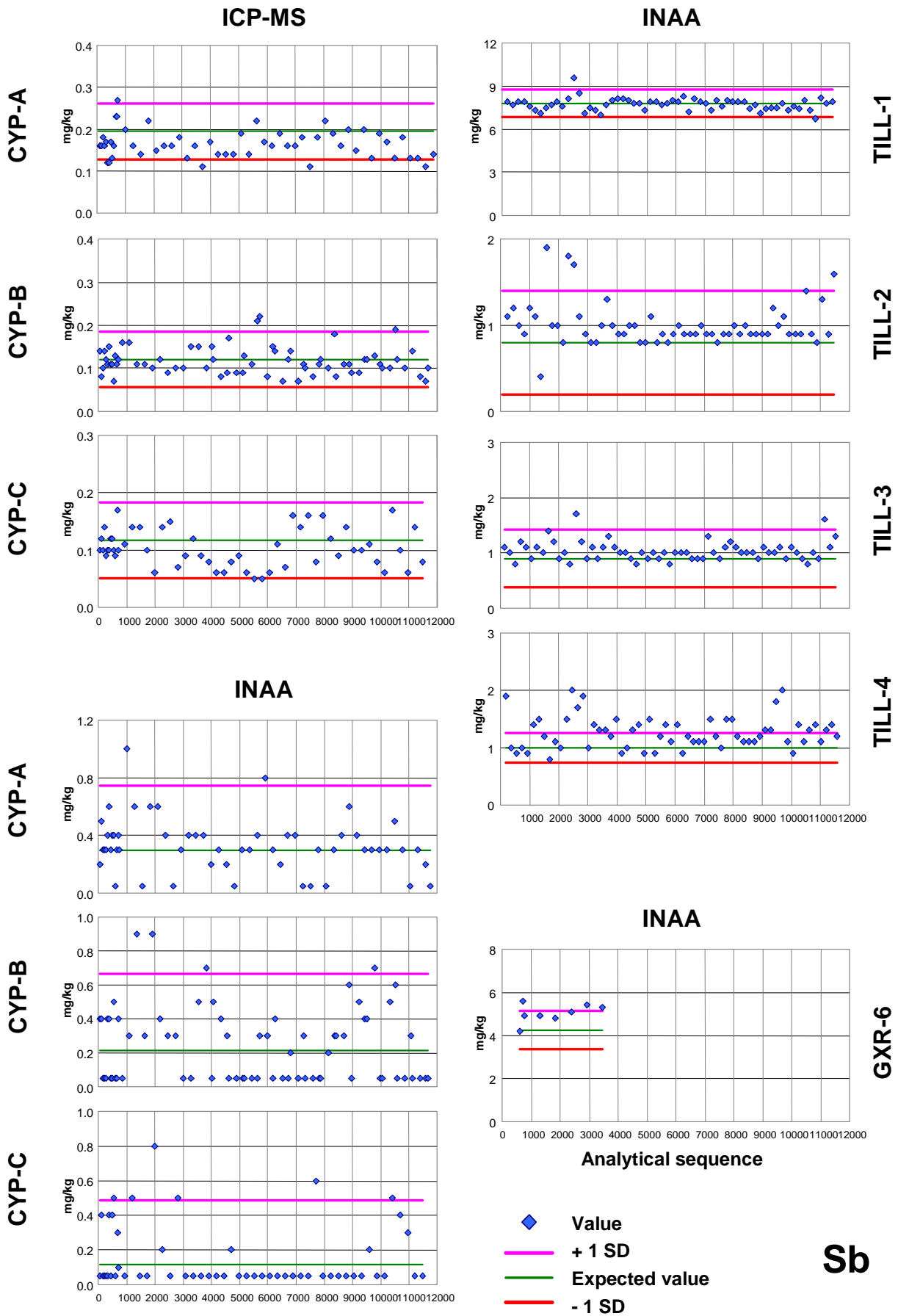
◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

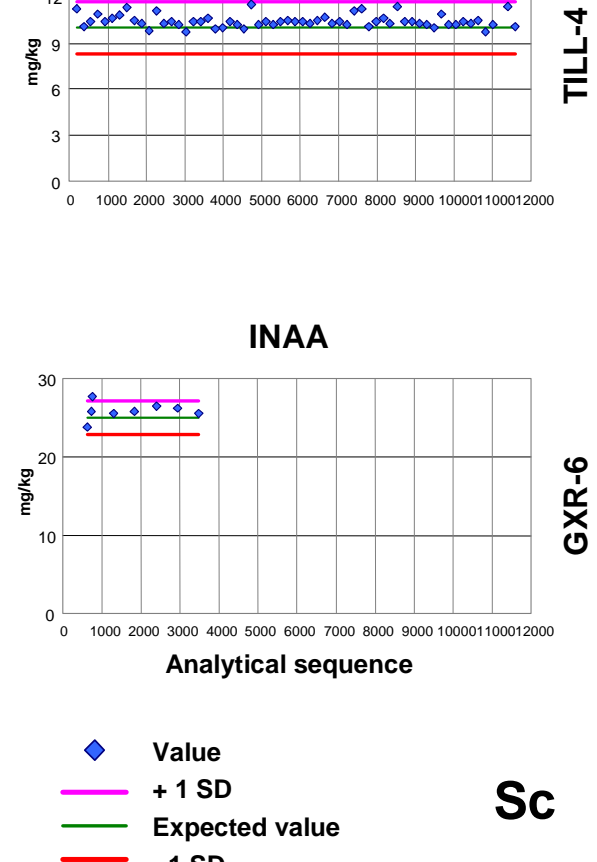
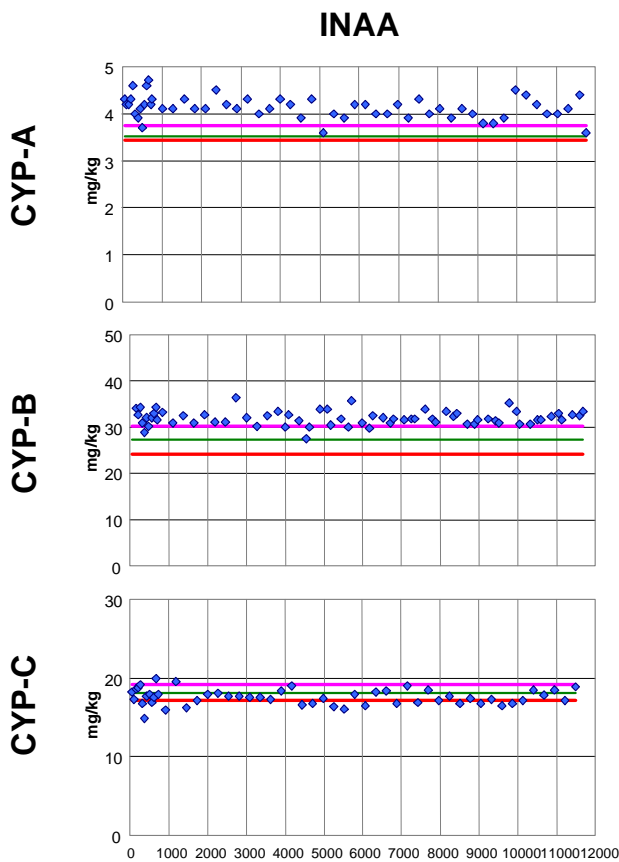
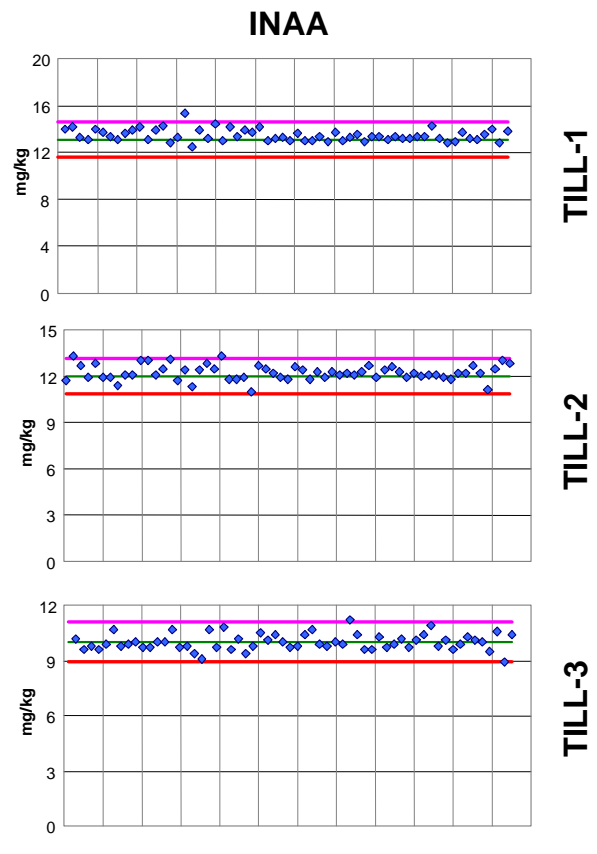
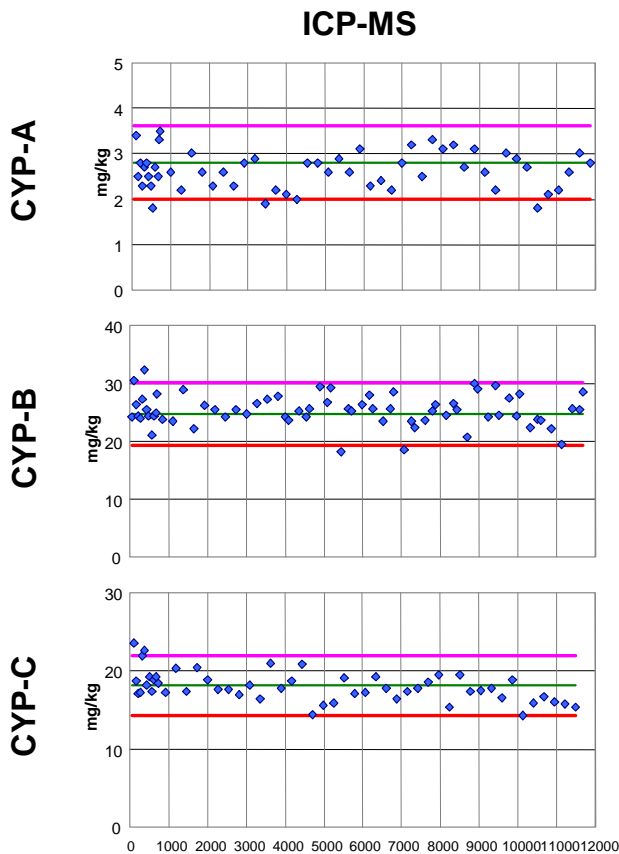
Ni



◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

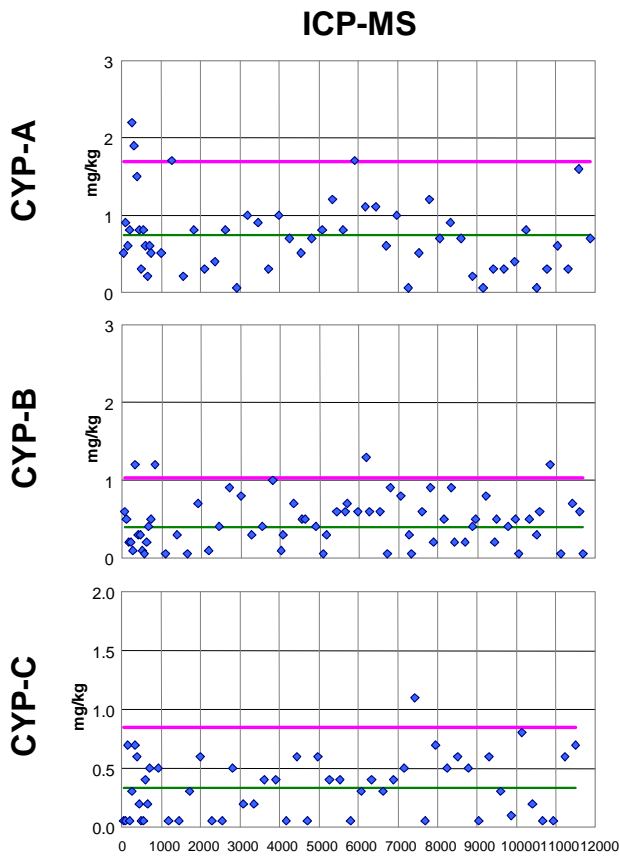
Rb





◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

Sc

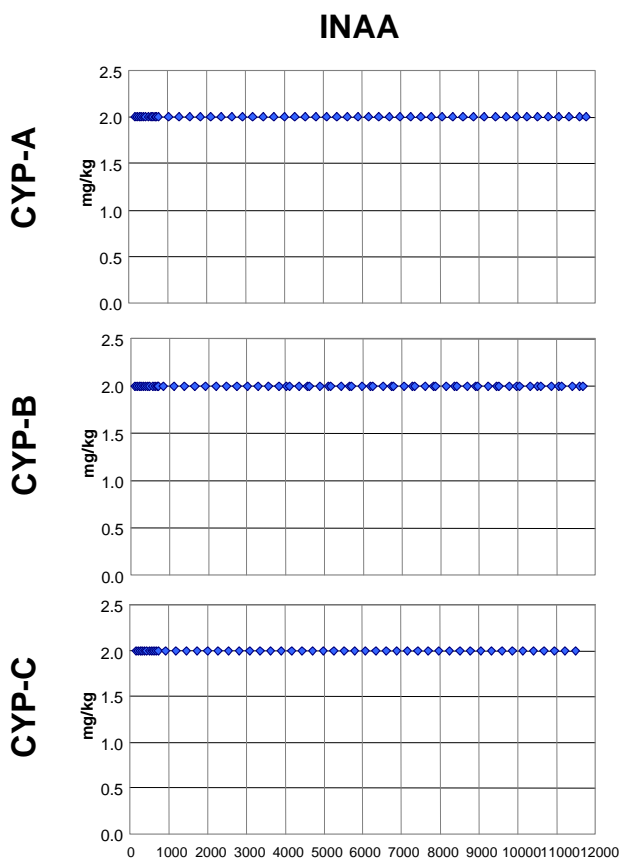


INAA

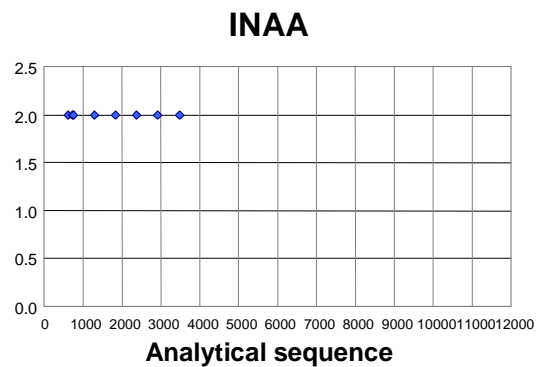
TILL-1

TILL-2

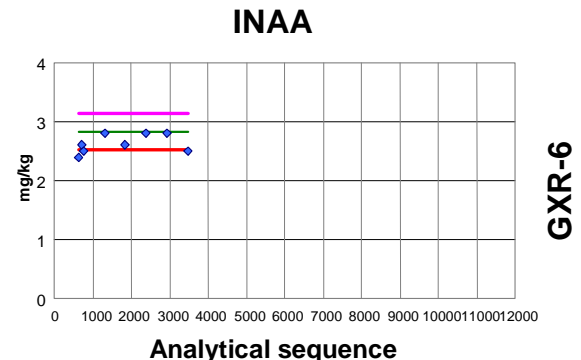
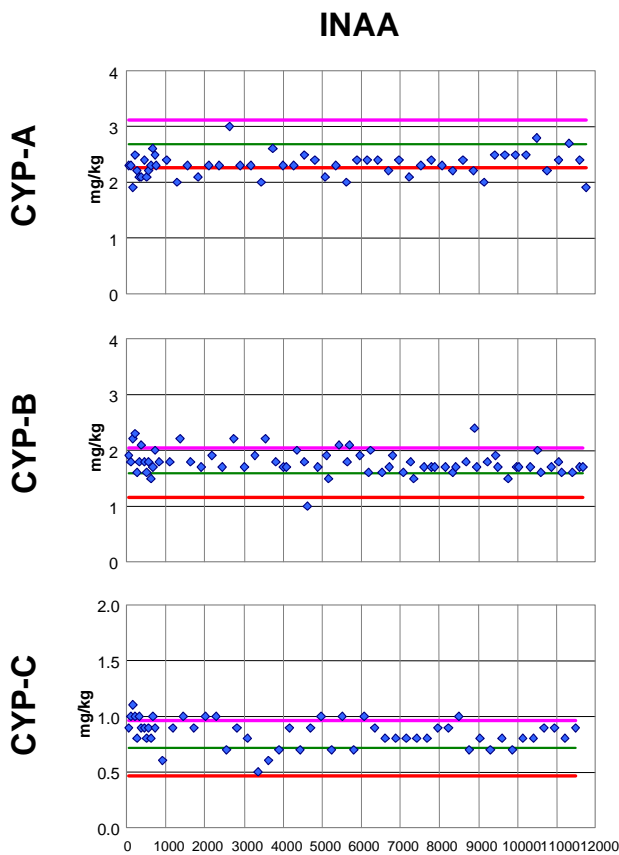
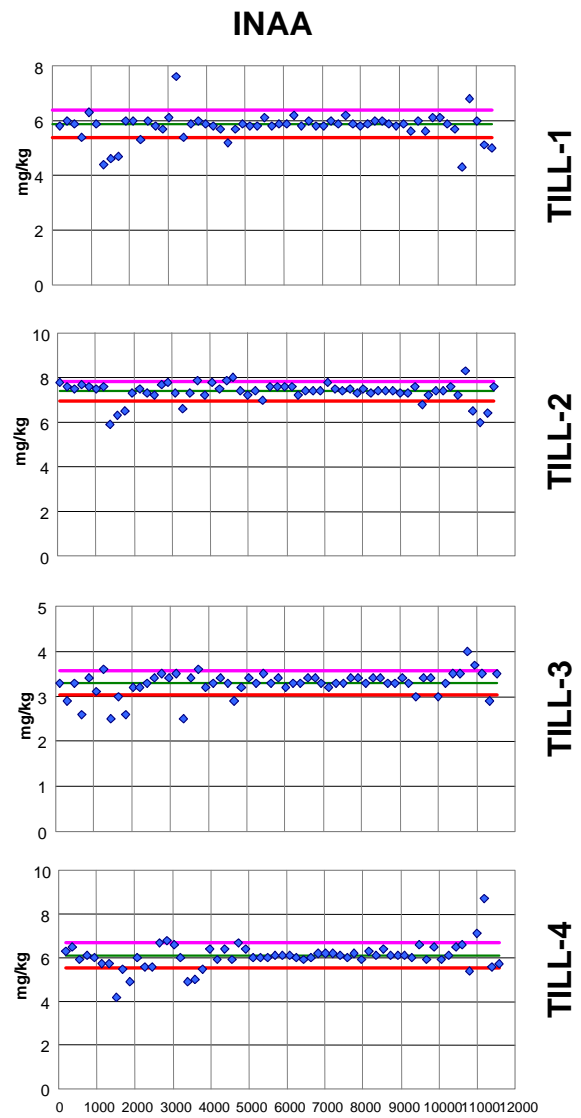
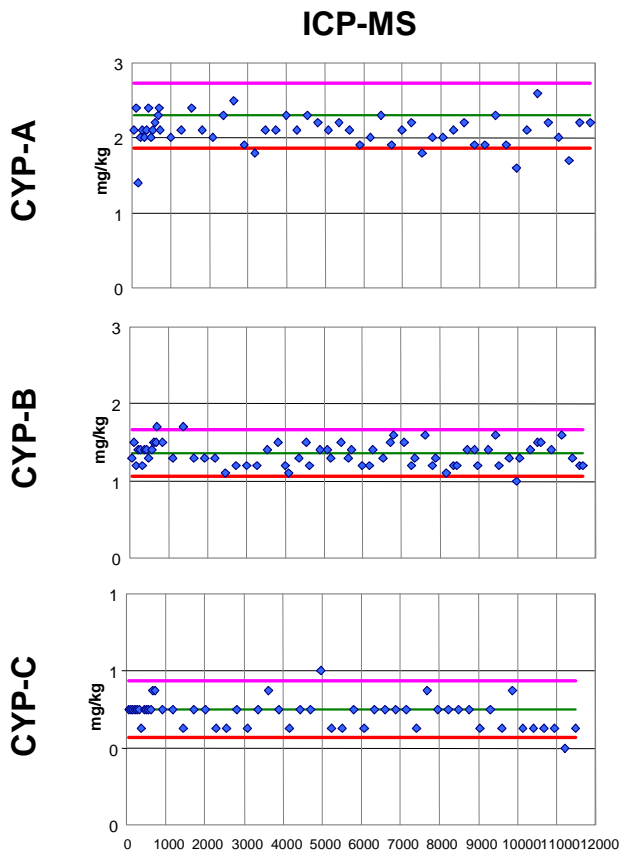
TILL-3



TILL-4



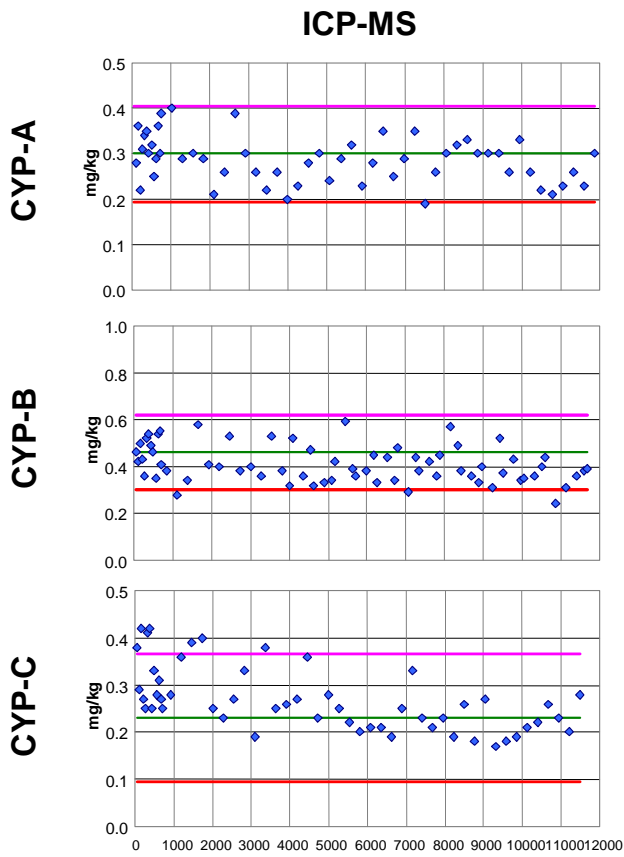
Se



Analytical sequence

- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

Sm

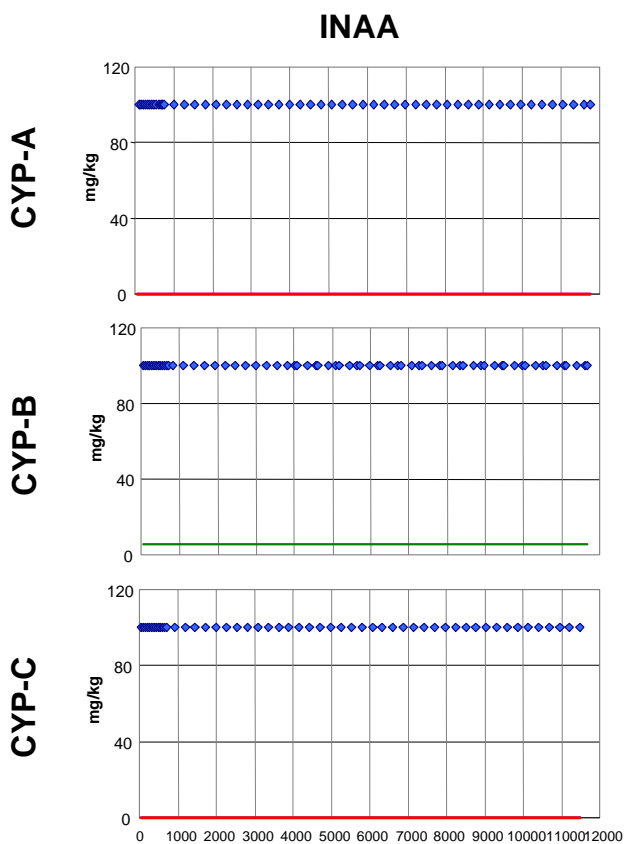


INAA

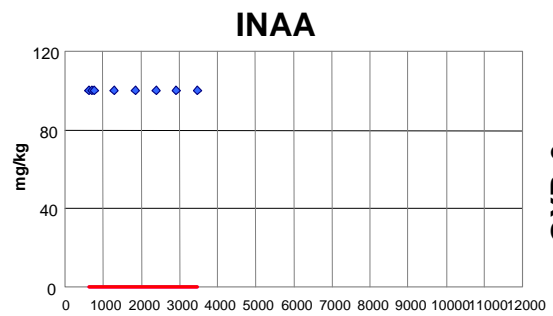
TILL-1

TILL-2

TILL-3



TILL-4

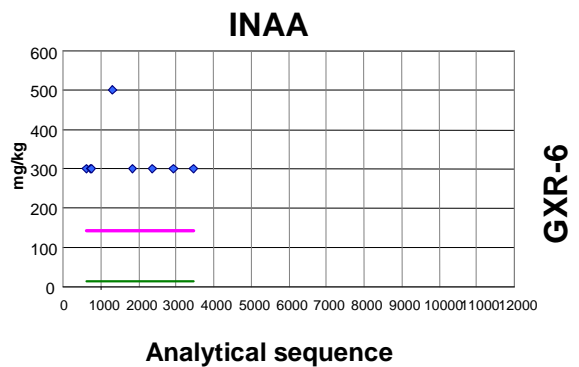
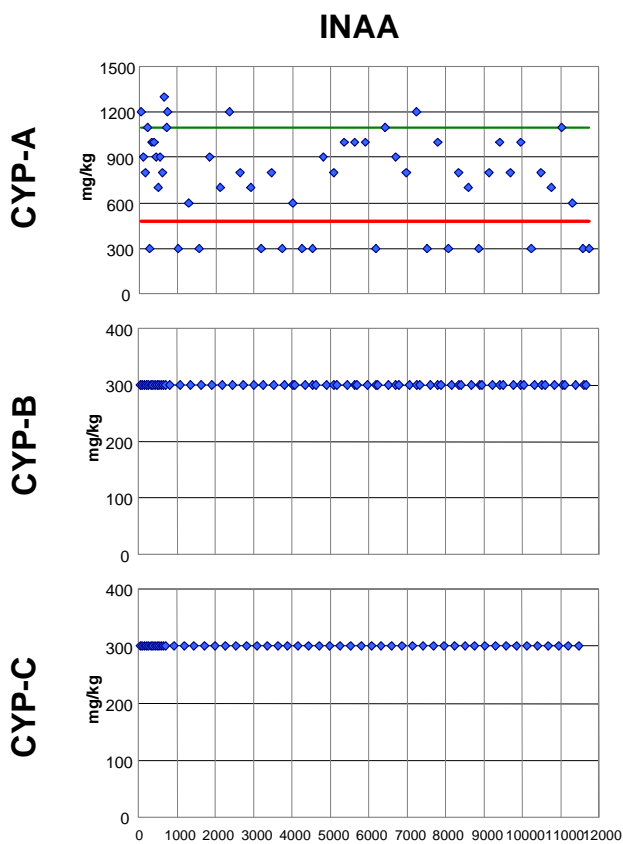
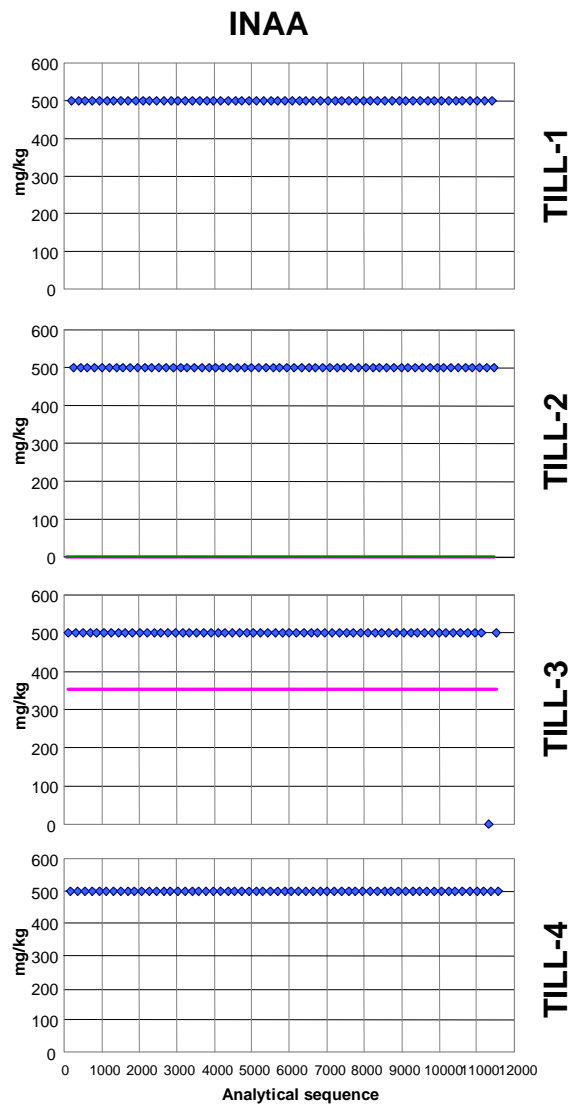
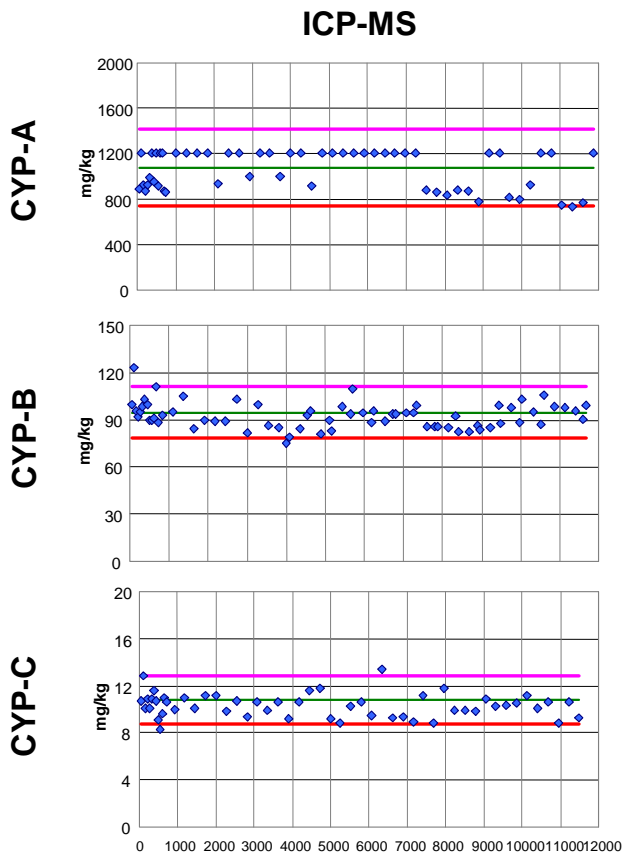


GXR-6

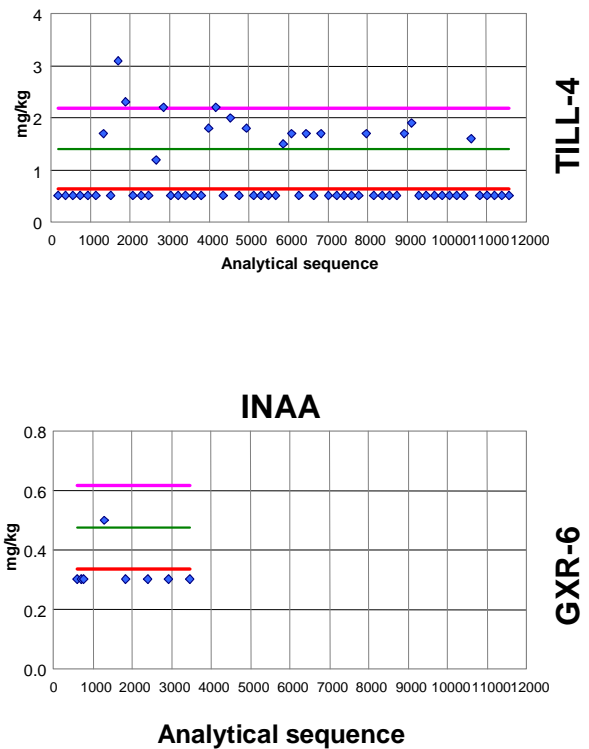
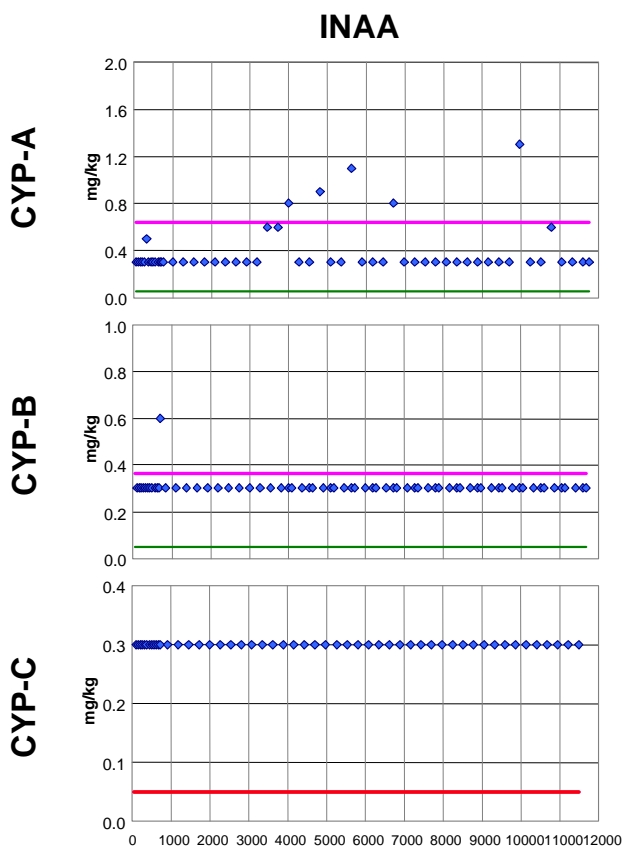
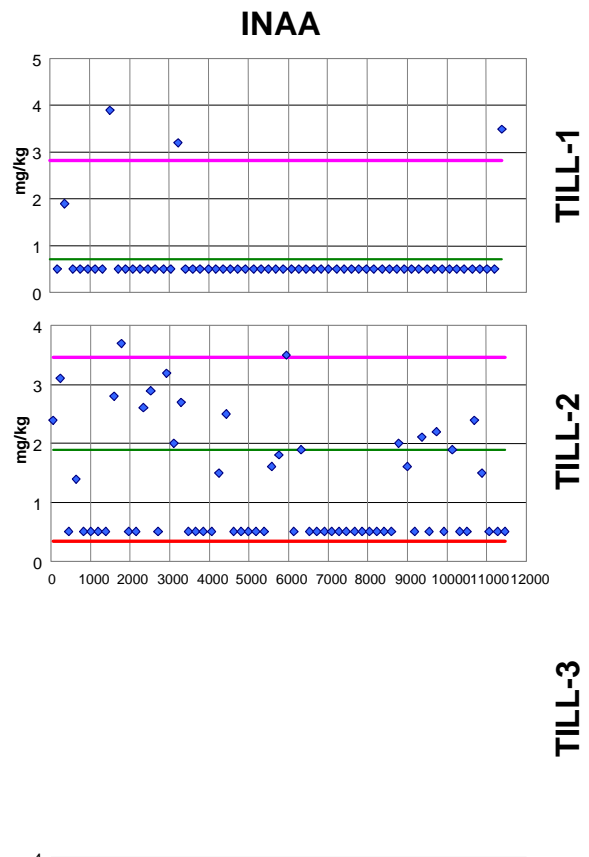
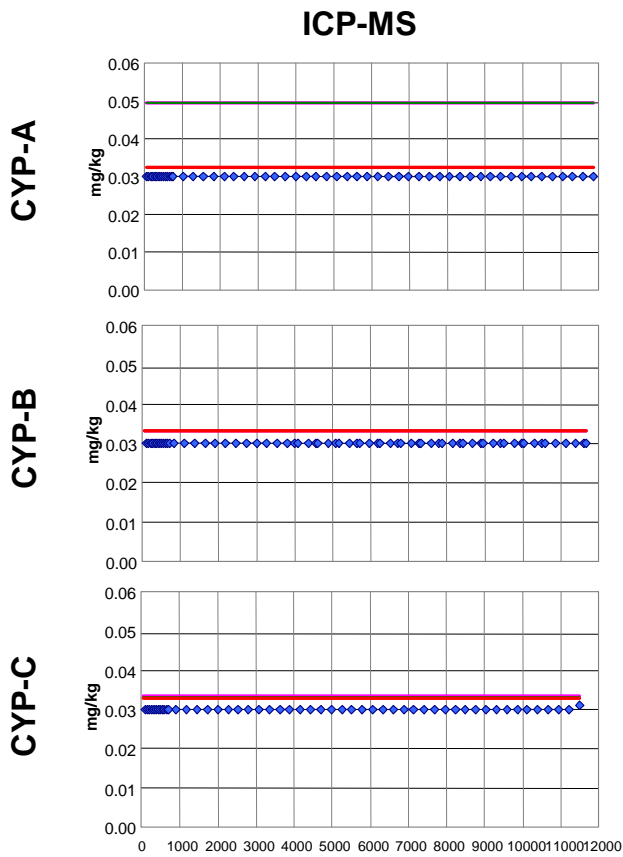
Analytical sequence

- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

Sn

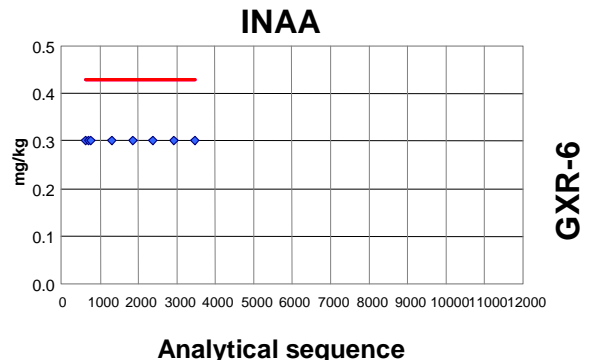
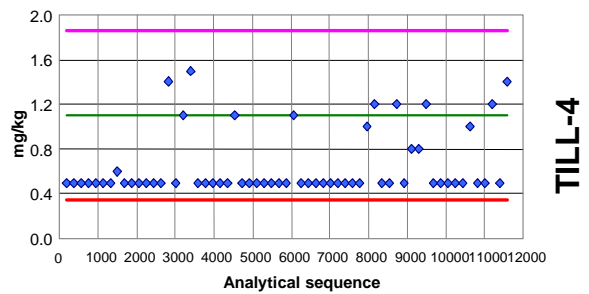
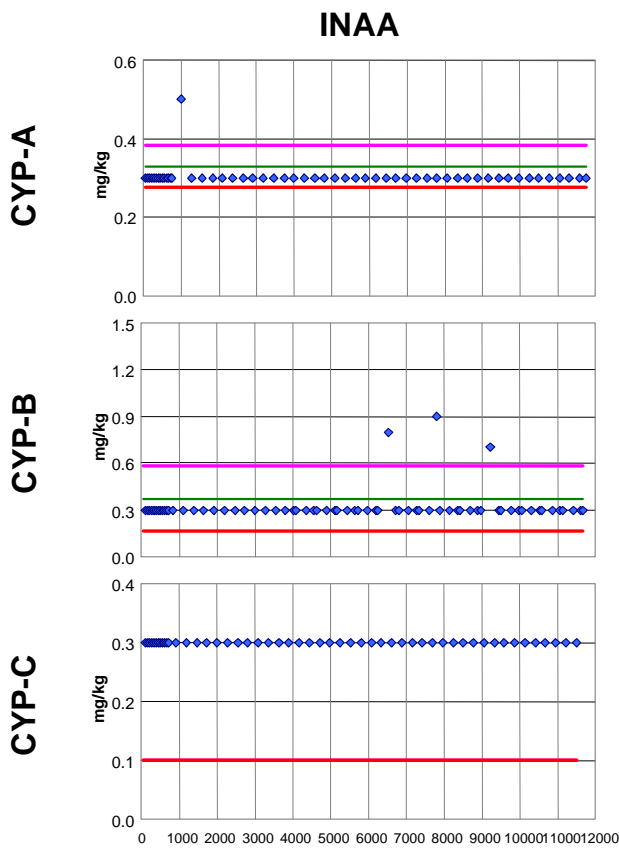
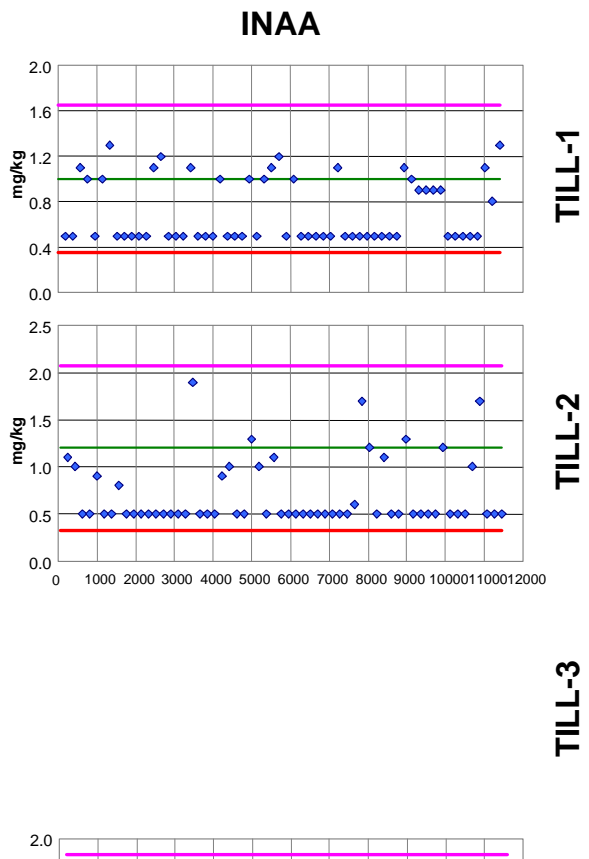
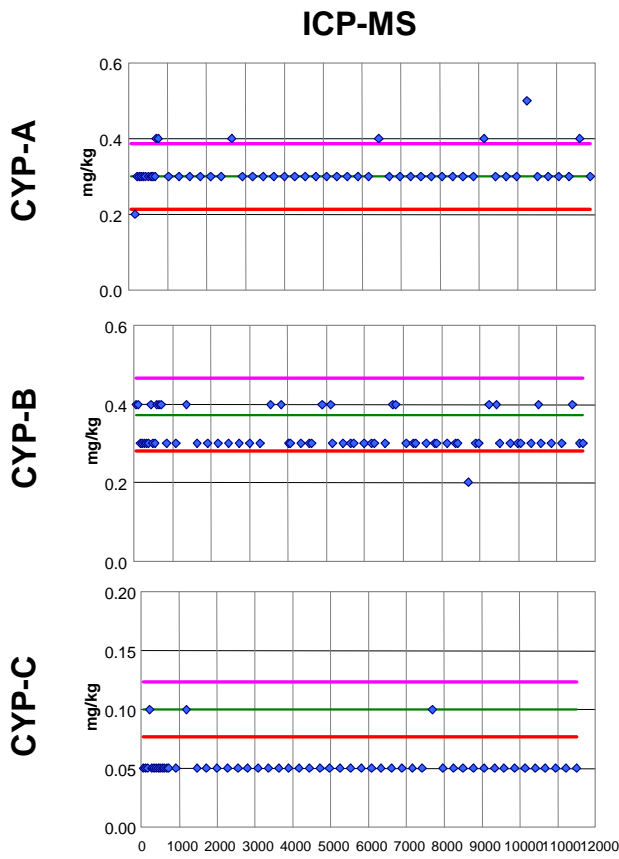


Sr

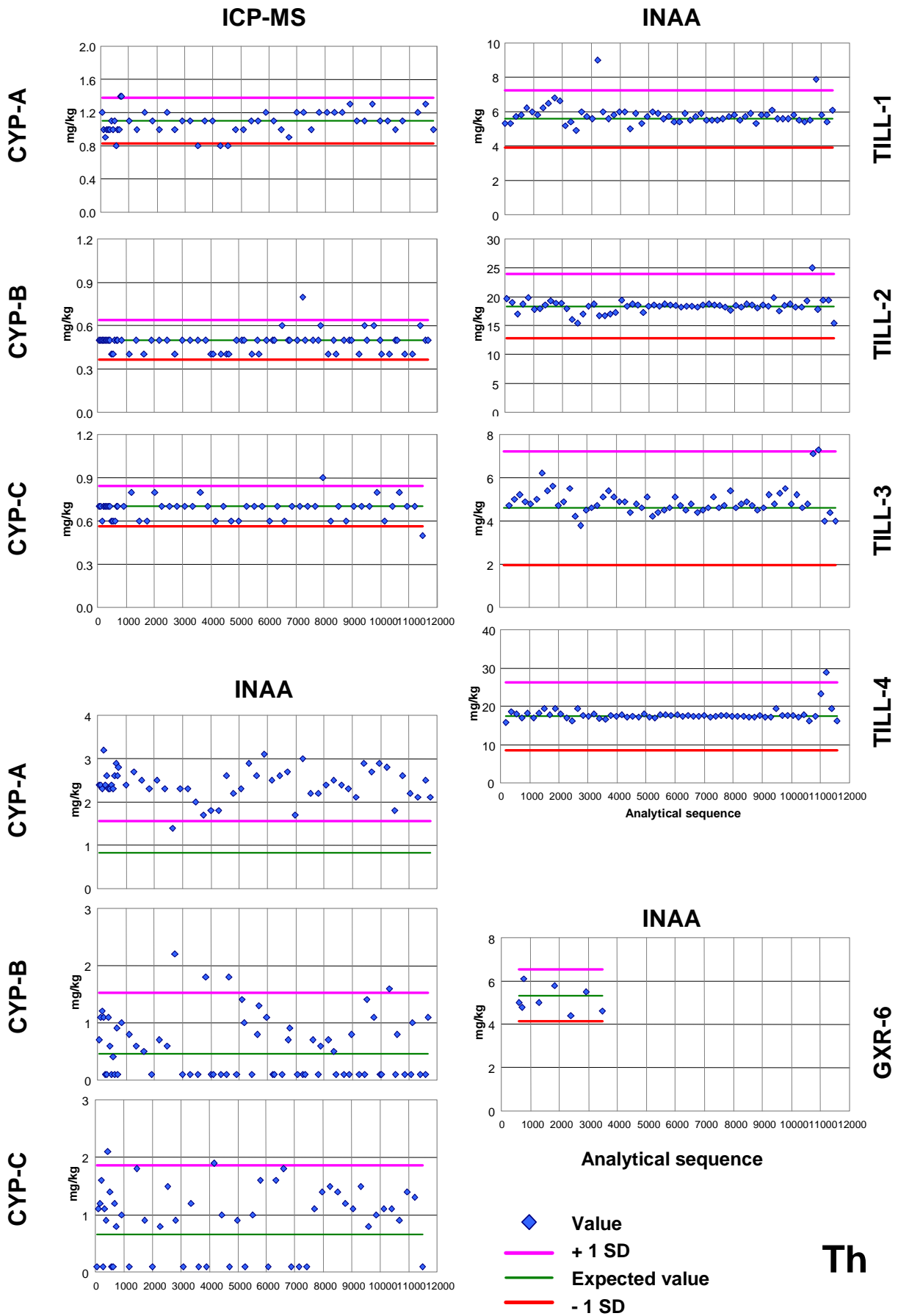


◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

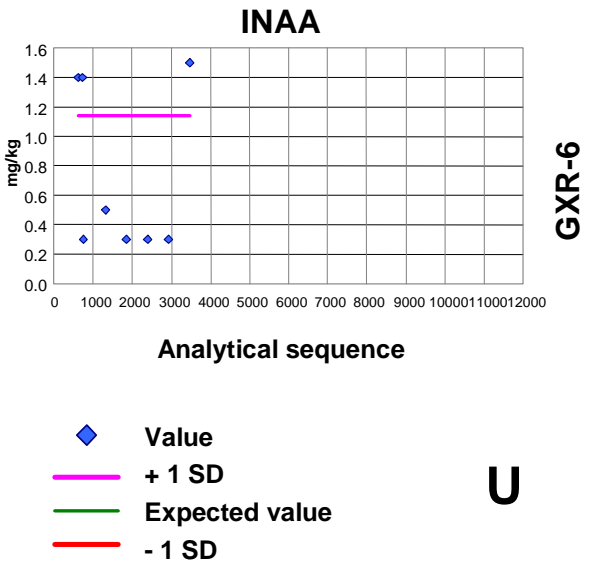
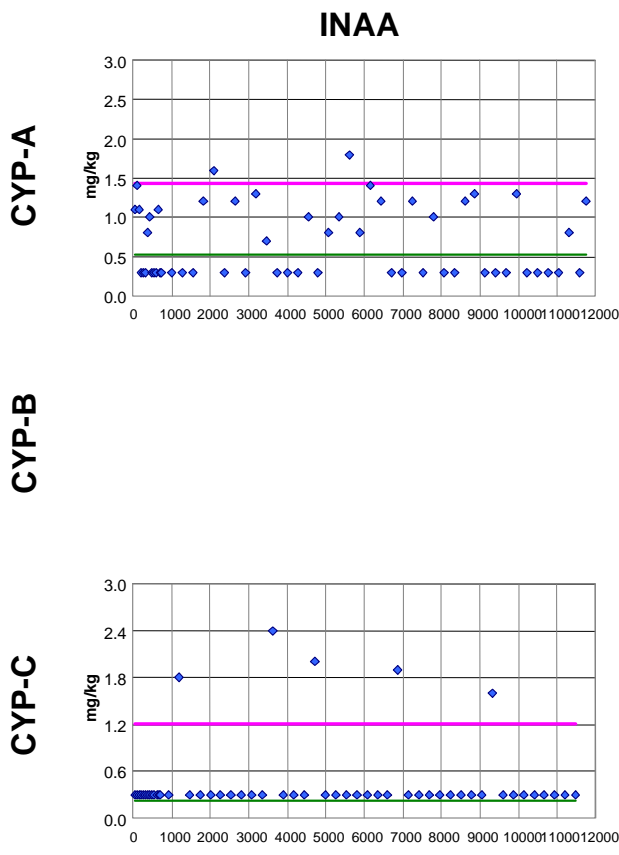
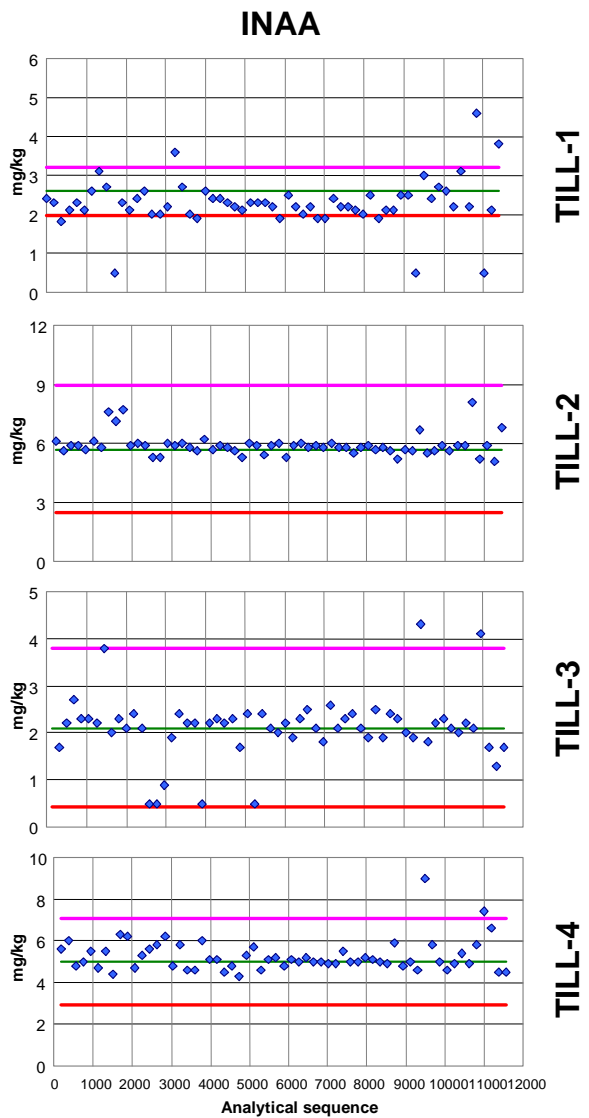
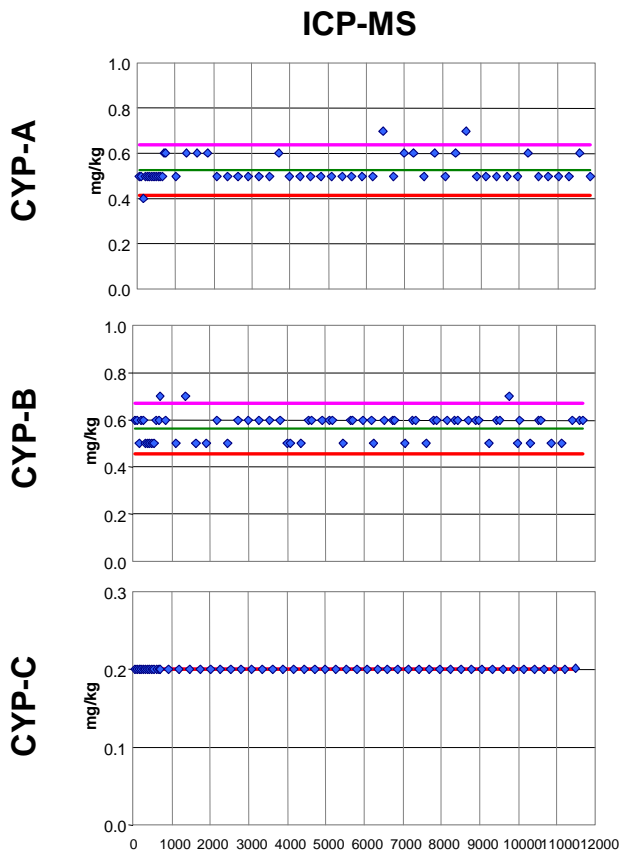
Ta



Tb

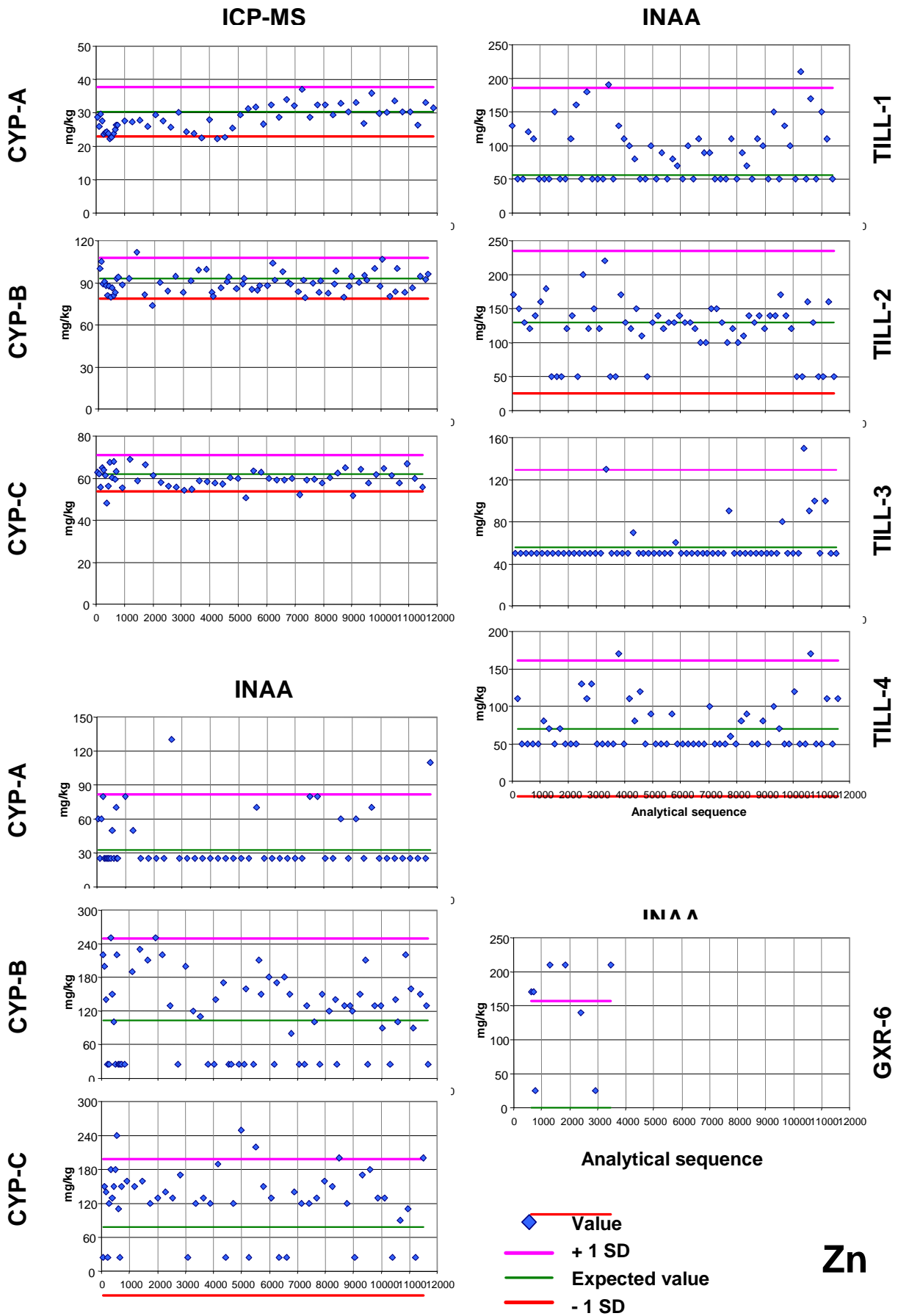


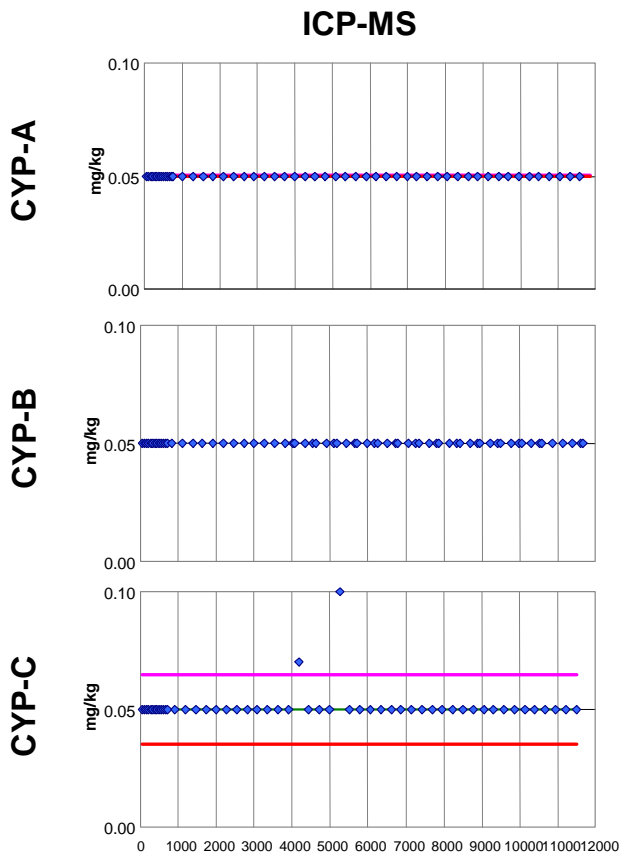
Th



◆ Value
 — + 1 SD
 — Expected value
 — - 1 SD

U



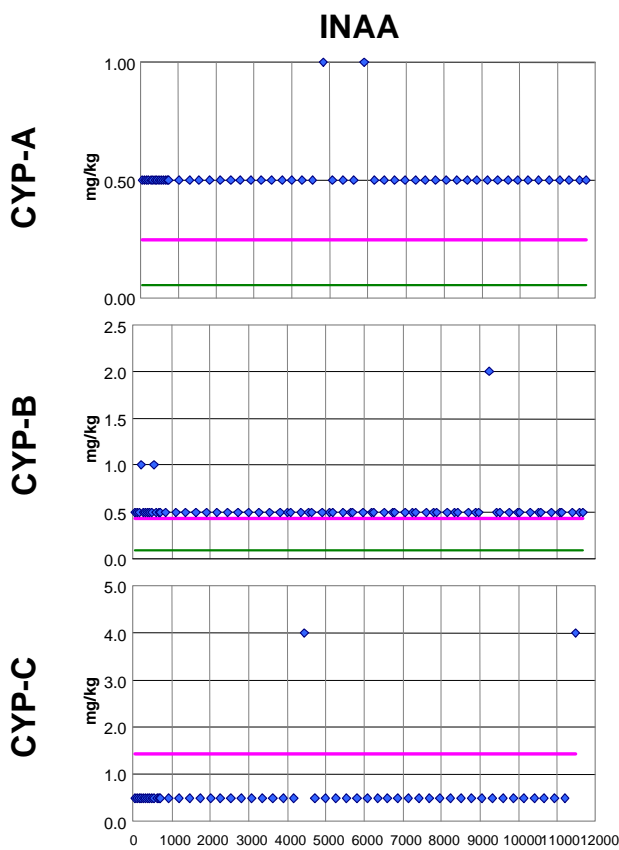


INAA

TILL-1

TILL-2

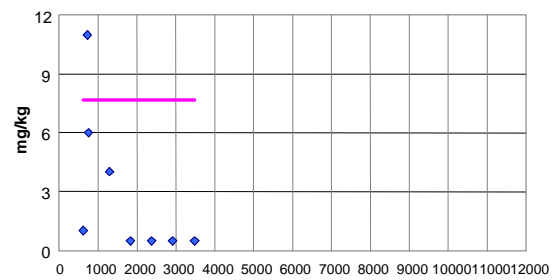
TILL-3



INAA

TILL-4

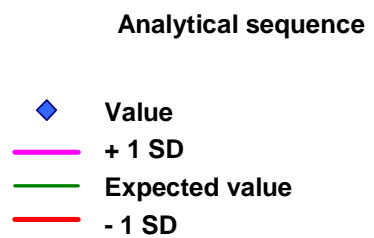
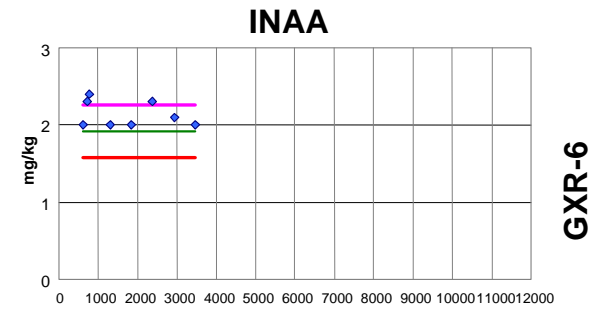
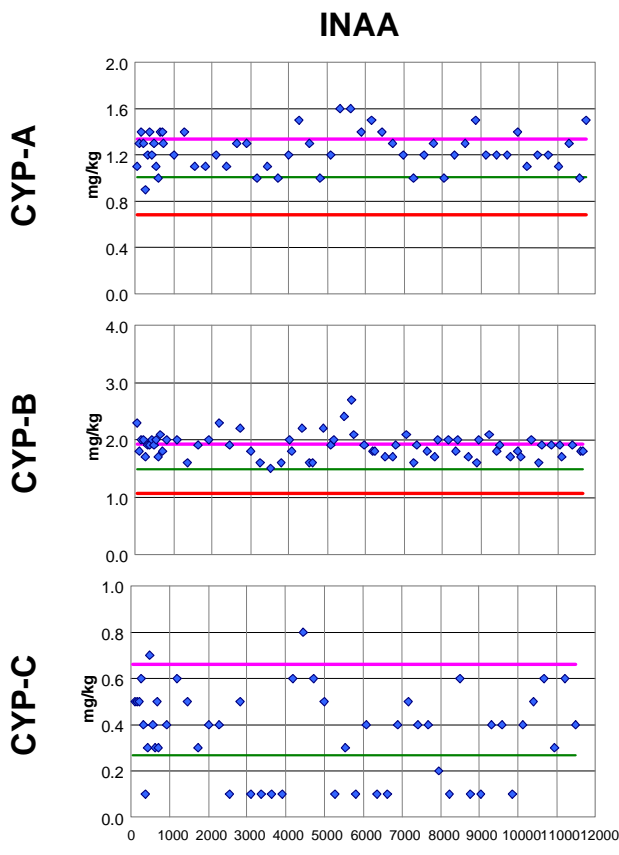
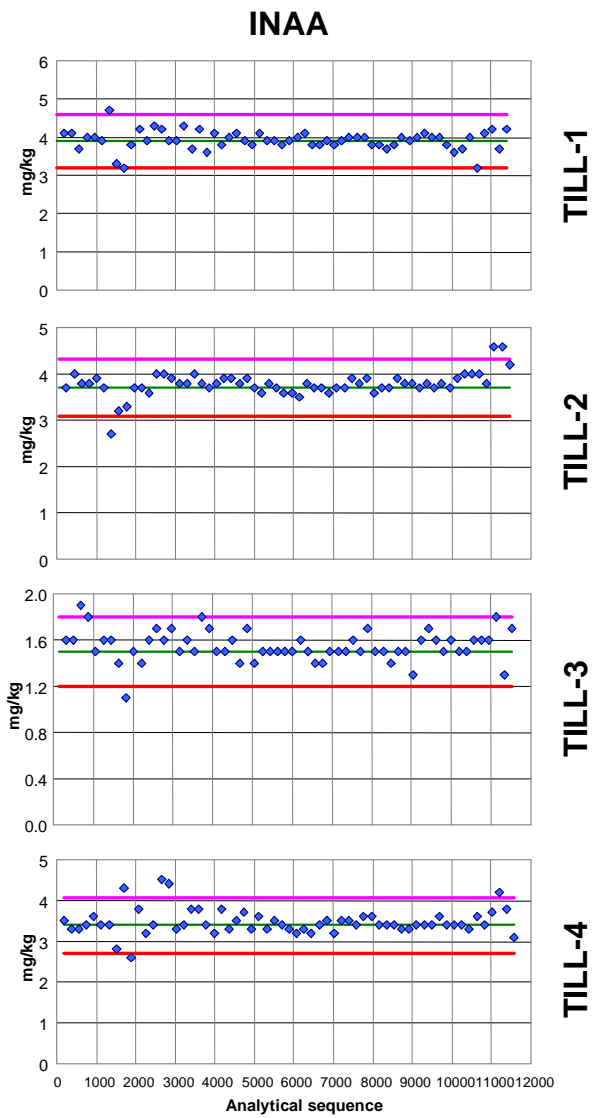
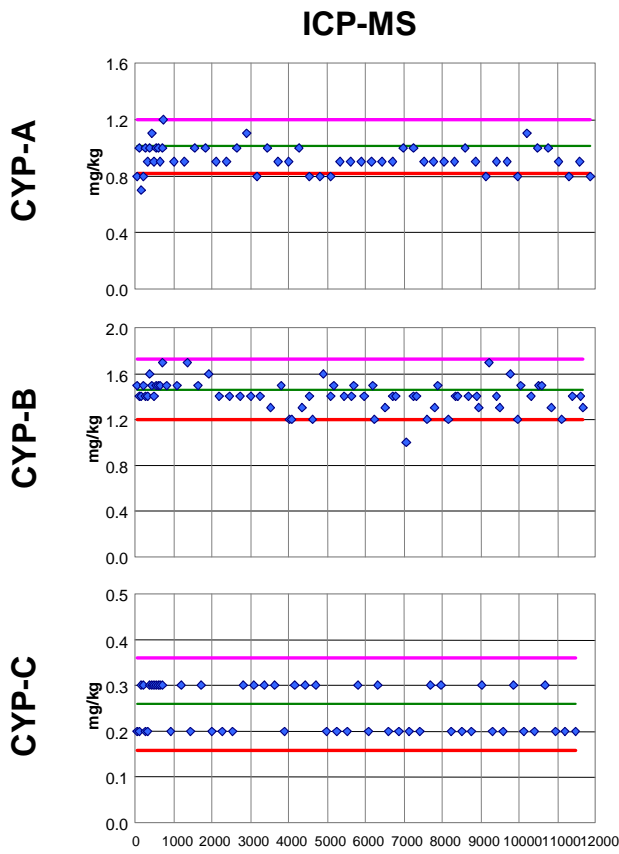
GXR-6



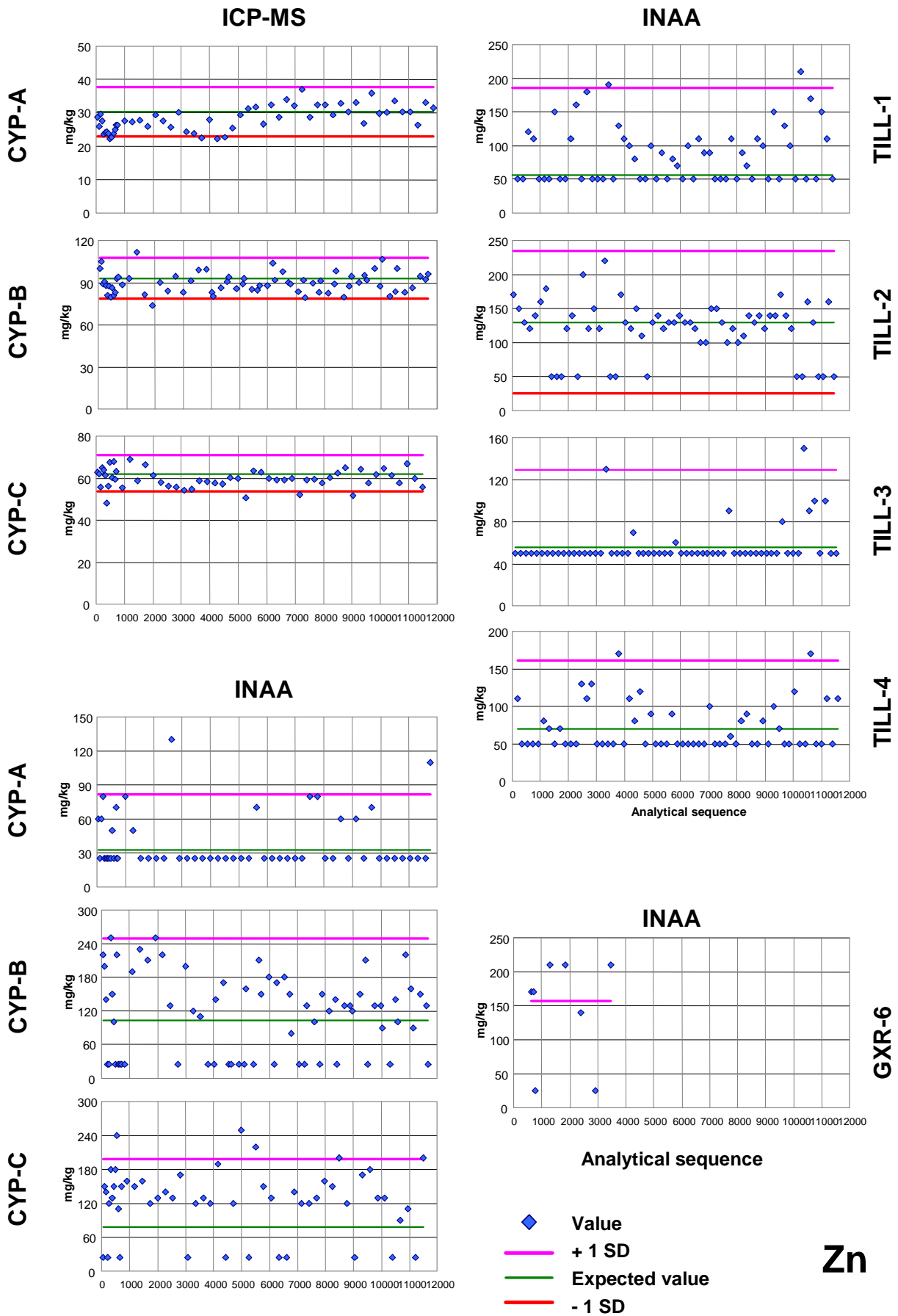
Analytical sequence

- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

W



Yb

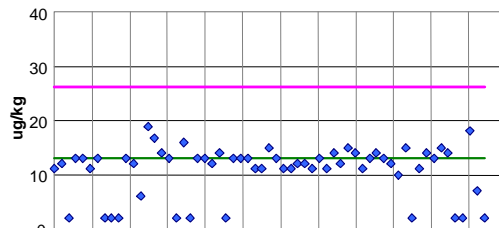


Zn

ICP-MS

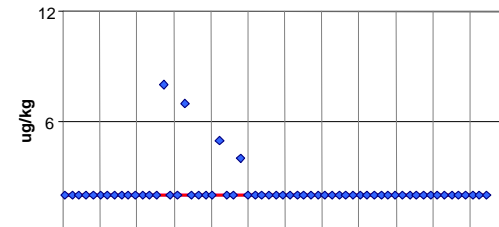
INAA

CYP-A



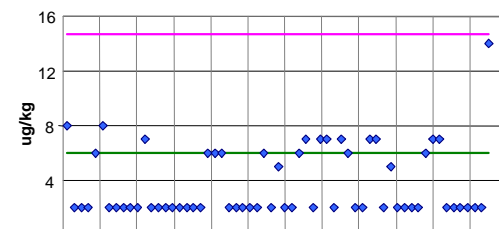
TILL-1

CYP-B



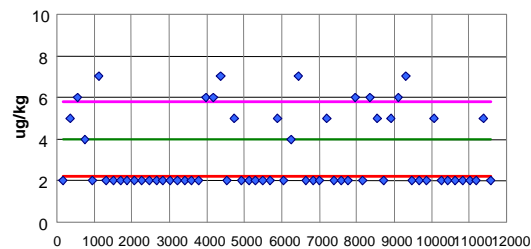
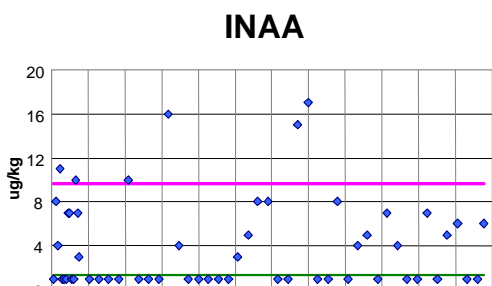
TILL-2

CYP-C



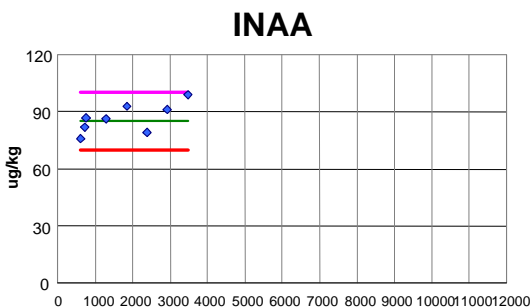
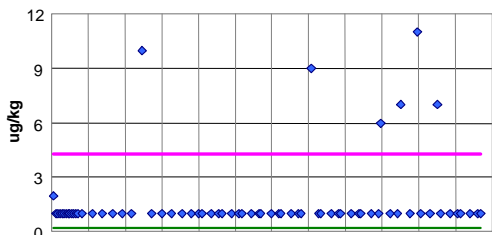
TILL-3

CYP-A



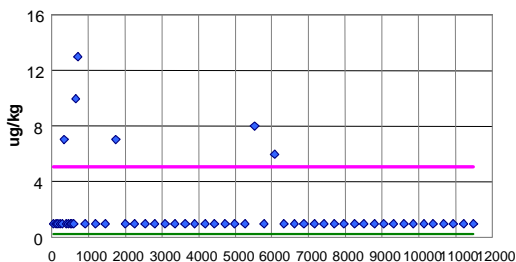
TILL-4

CYP-B



GXR-6

CYP-C



Analytical sequence

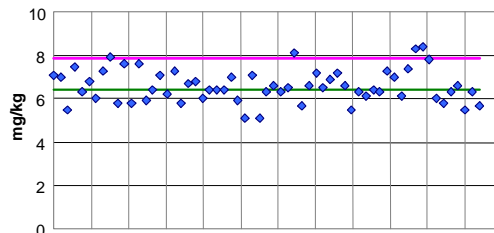
- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

Au

ICP-MS

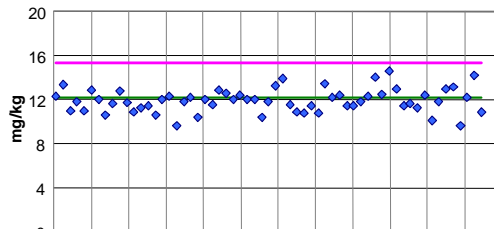
INAA

CYP-A



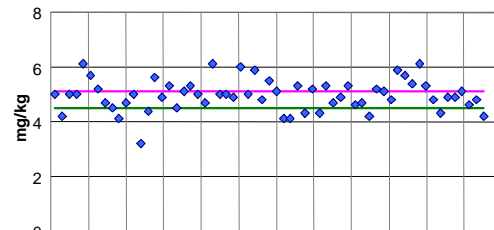
TILL-1

CYP-B



TILL-2

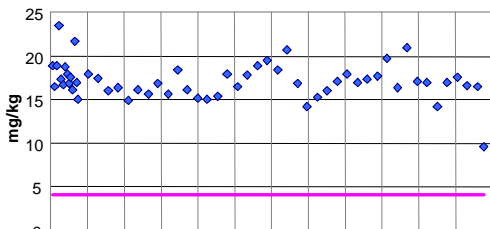
CYP-C



TILL-3

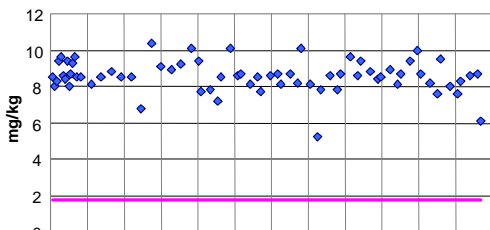
CYP-A

INAA

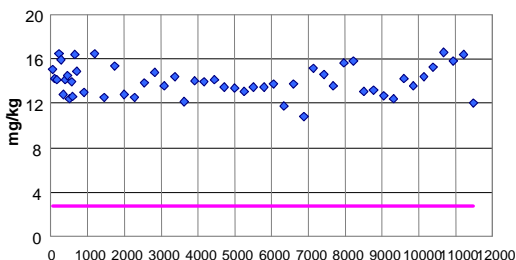


TILL-4

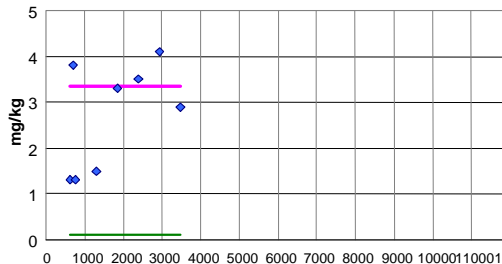
CYP-B



CYP-C



INAA

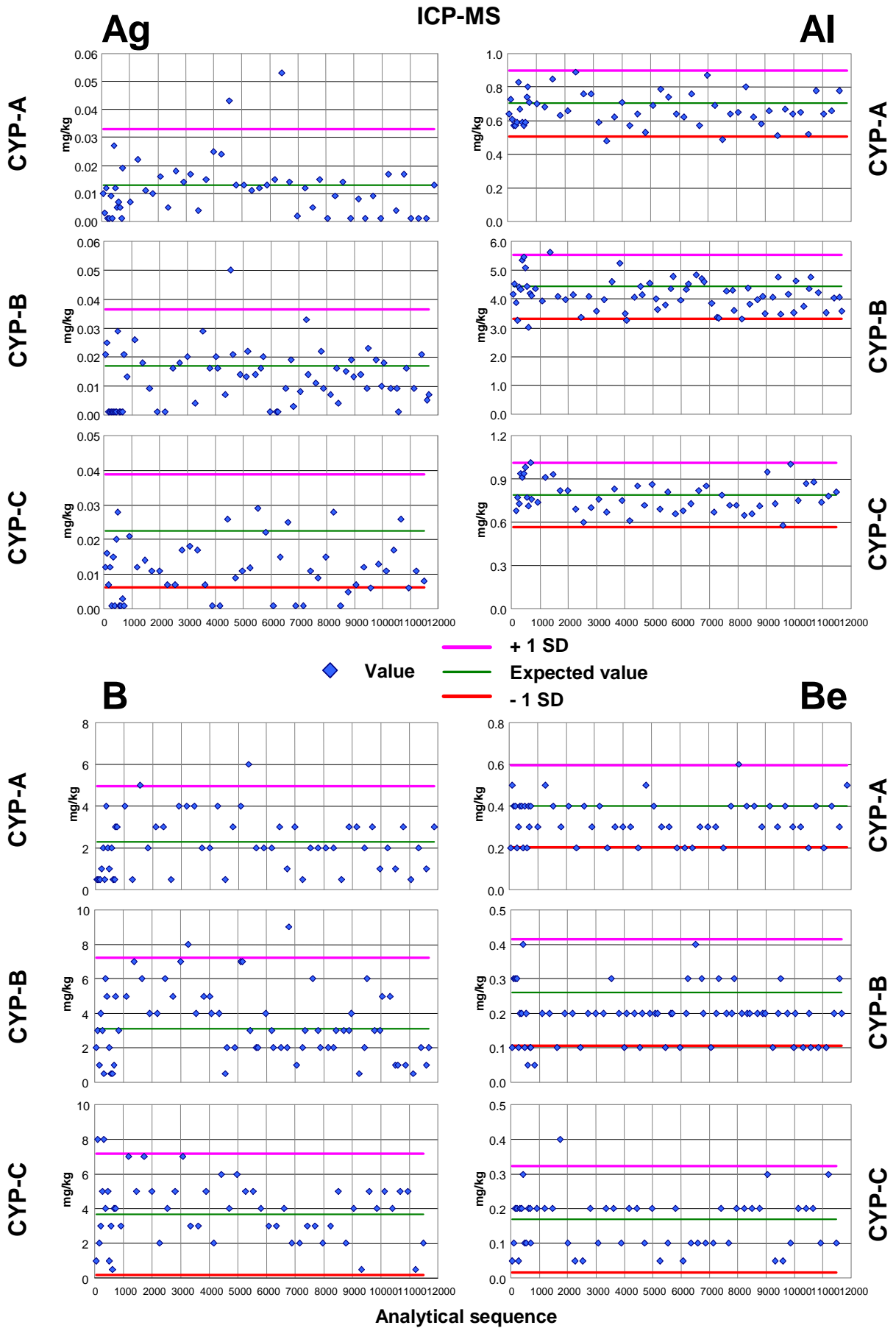


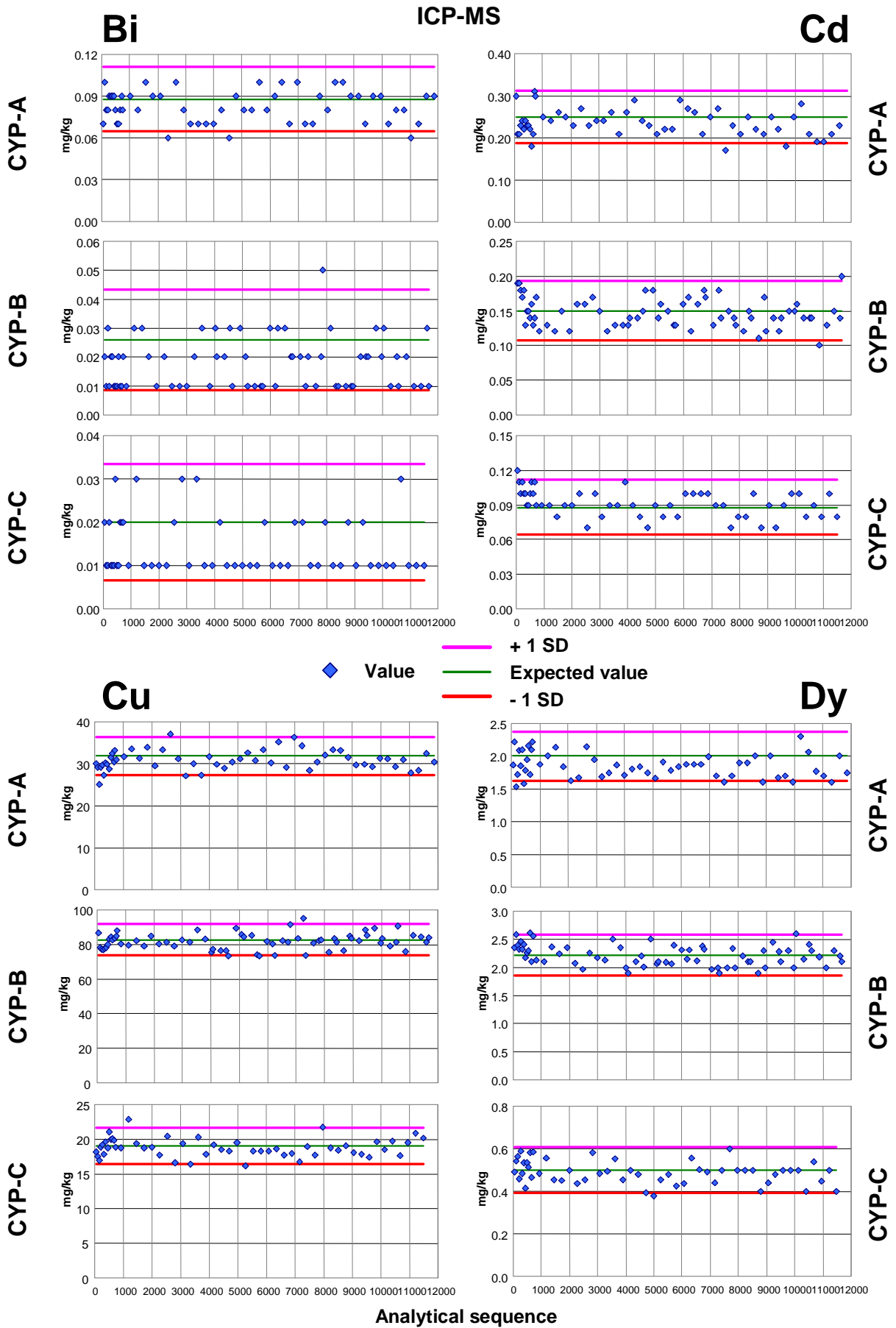
GXR-6

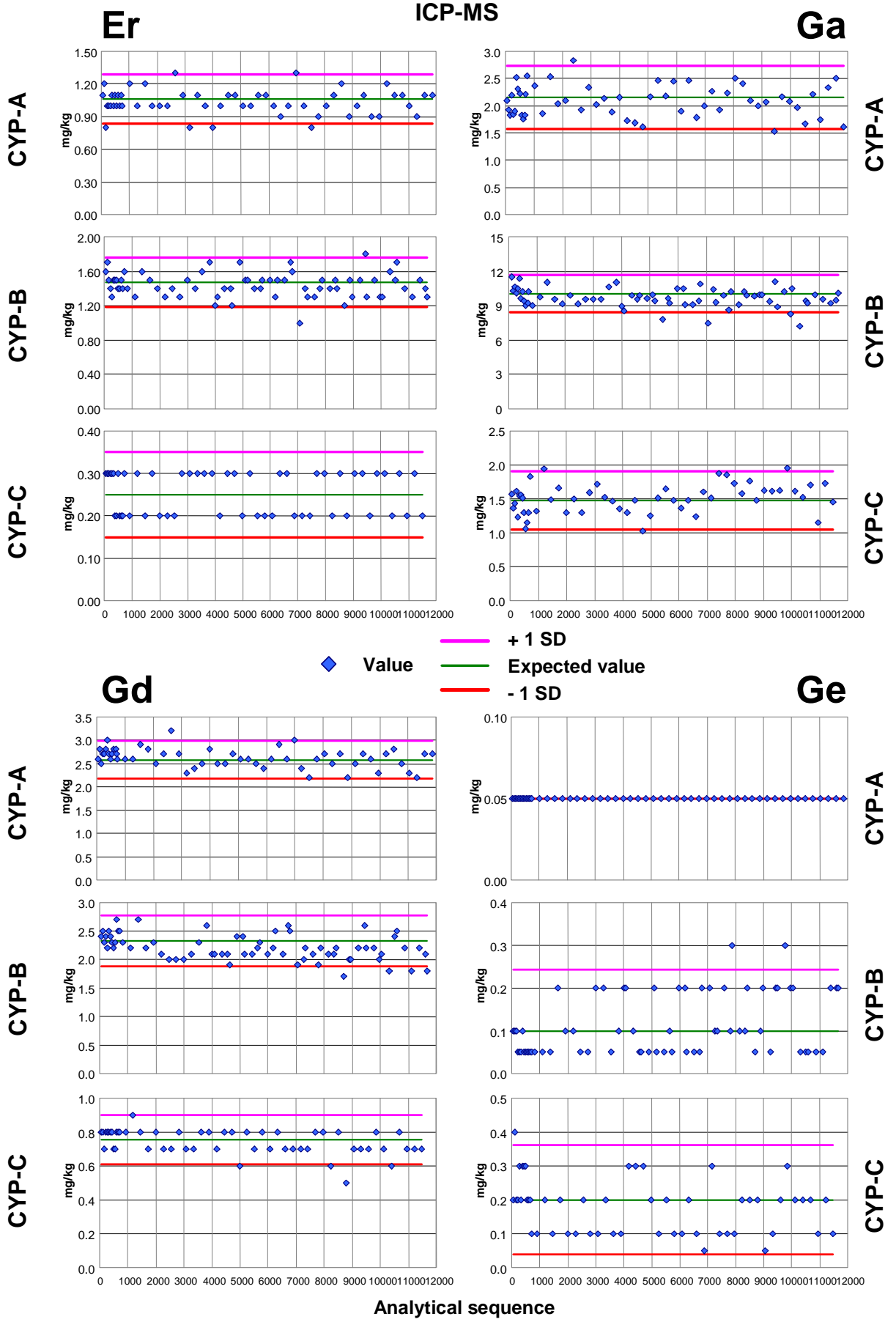
Analytical sequence

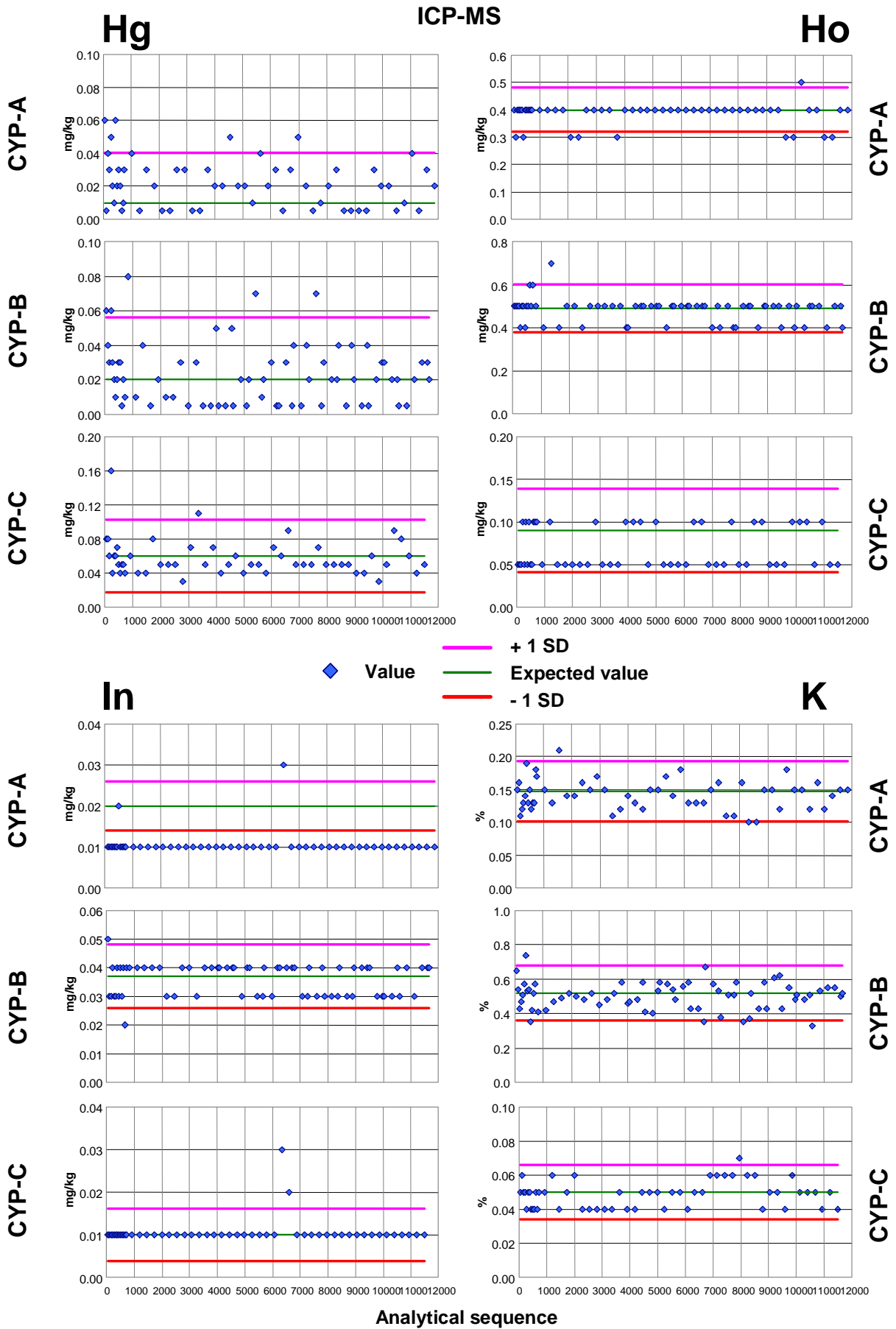
- ◆ Value
- + 1 SD
- Expected value
- - 1 SD

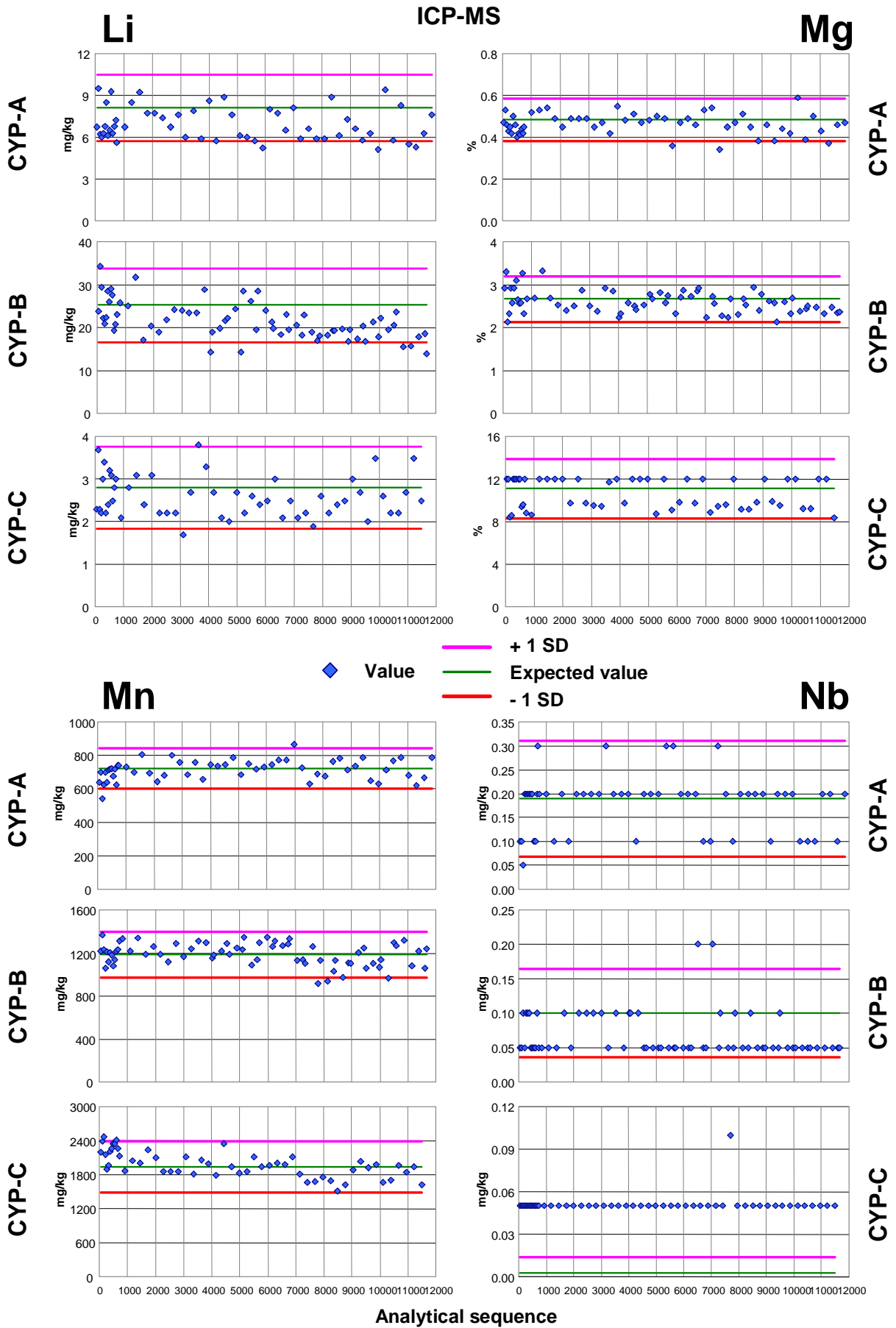
Br

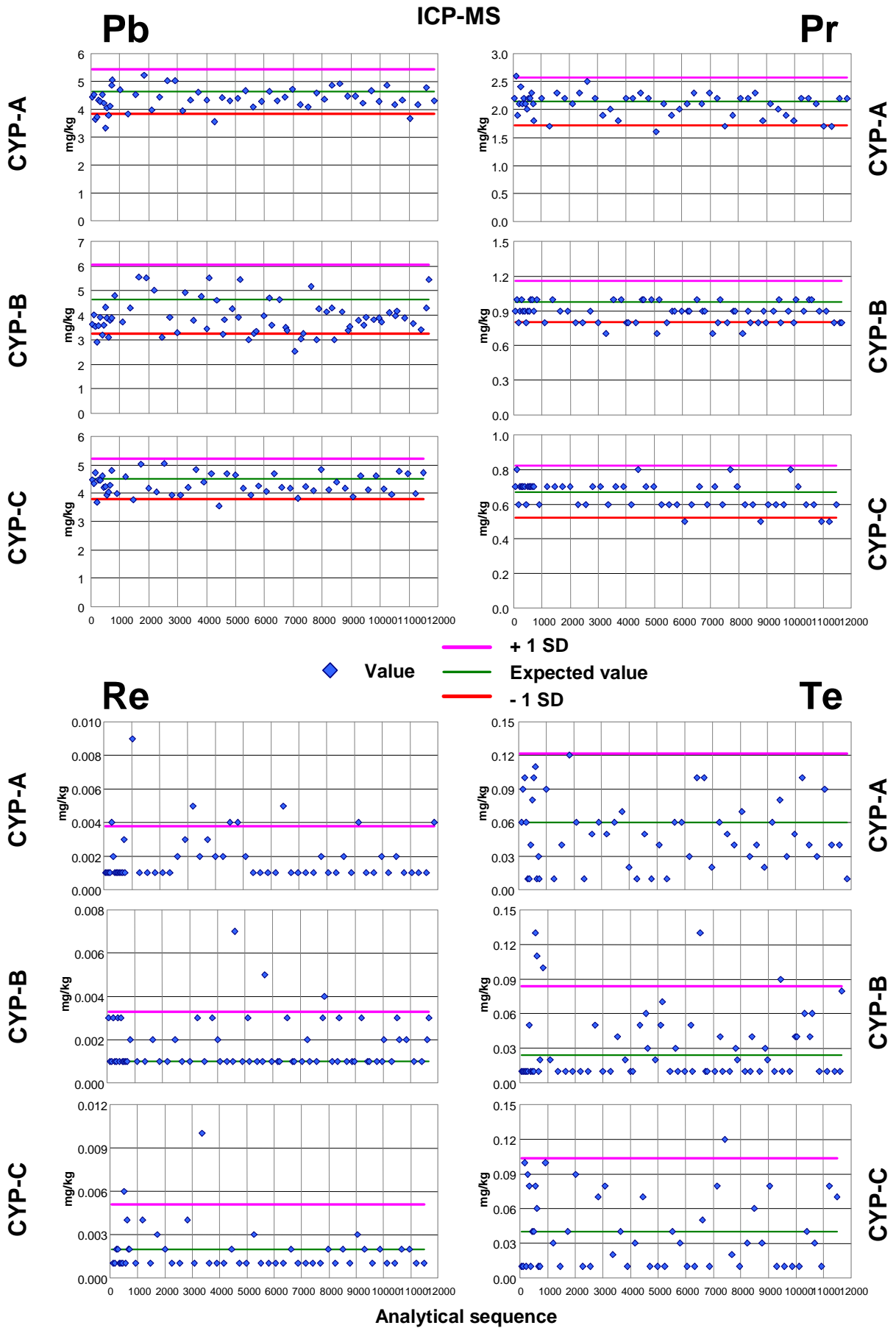


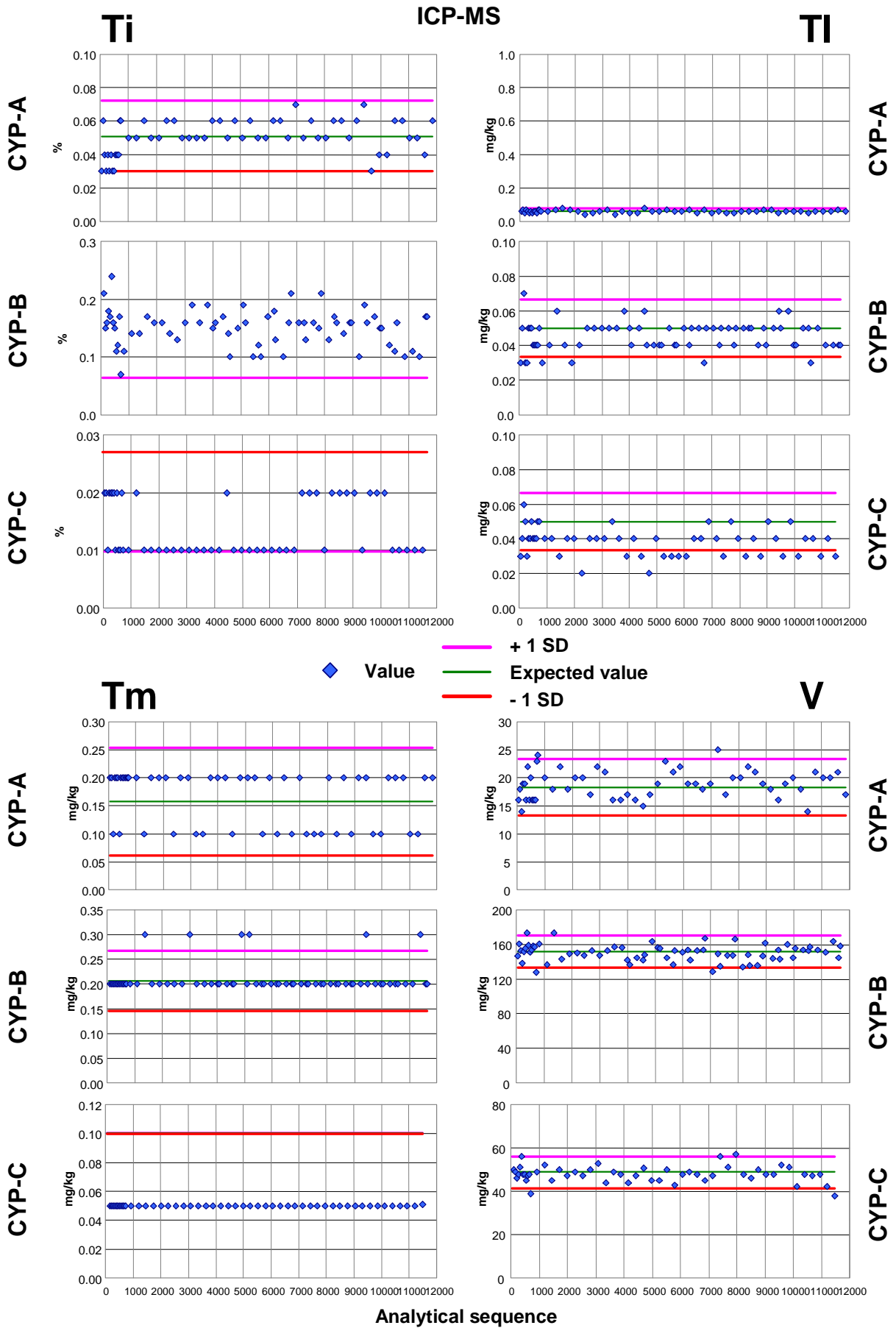


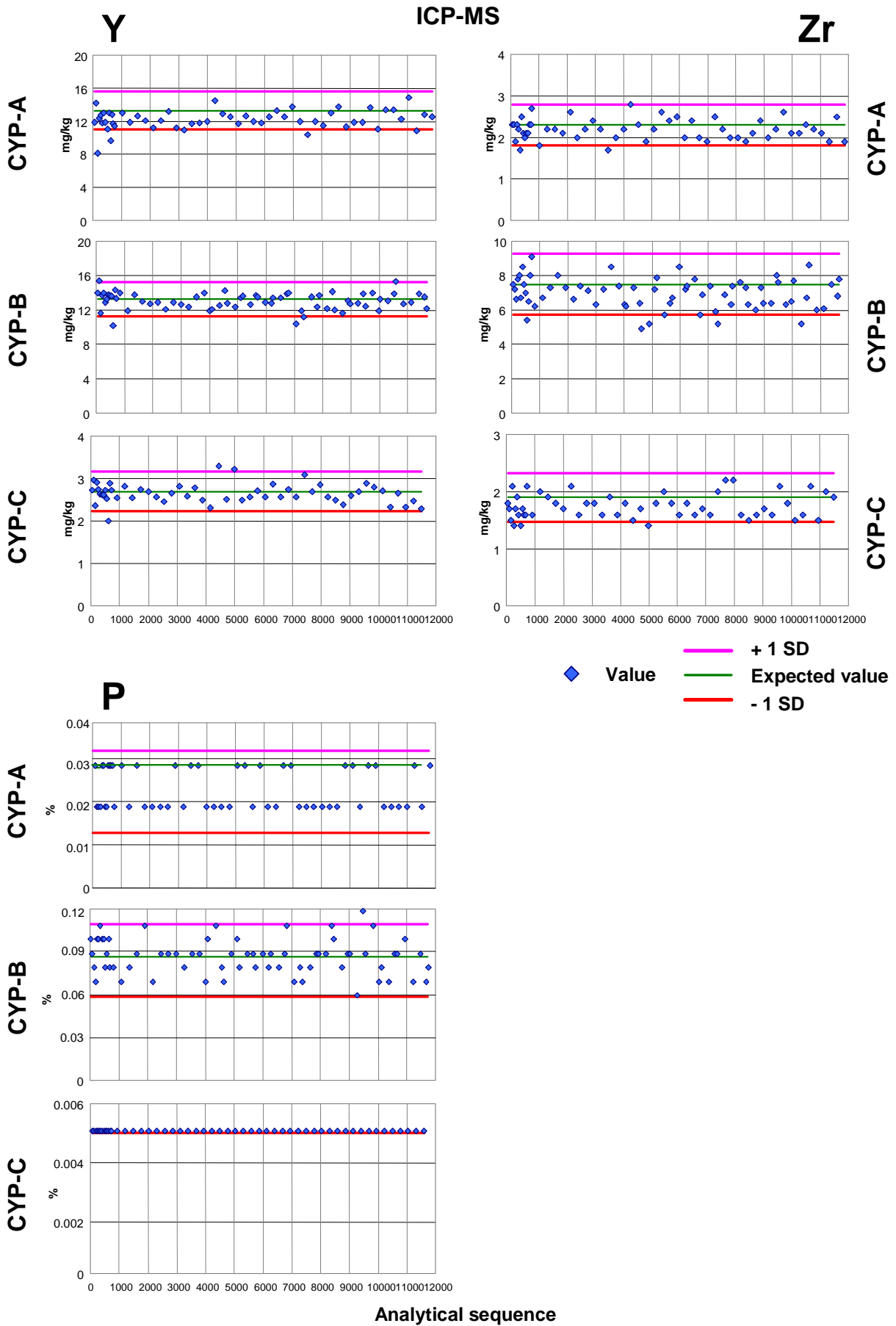






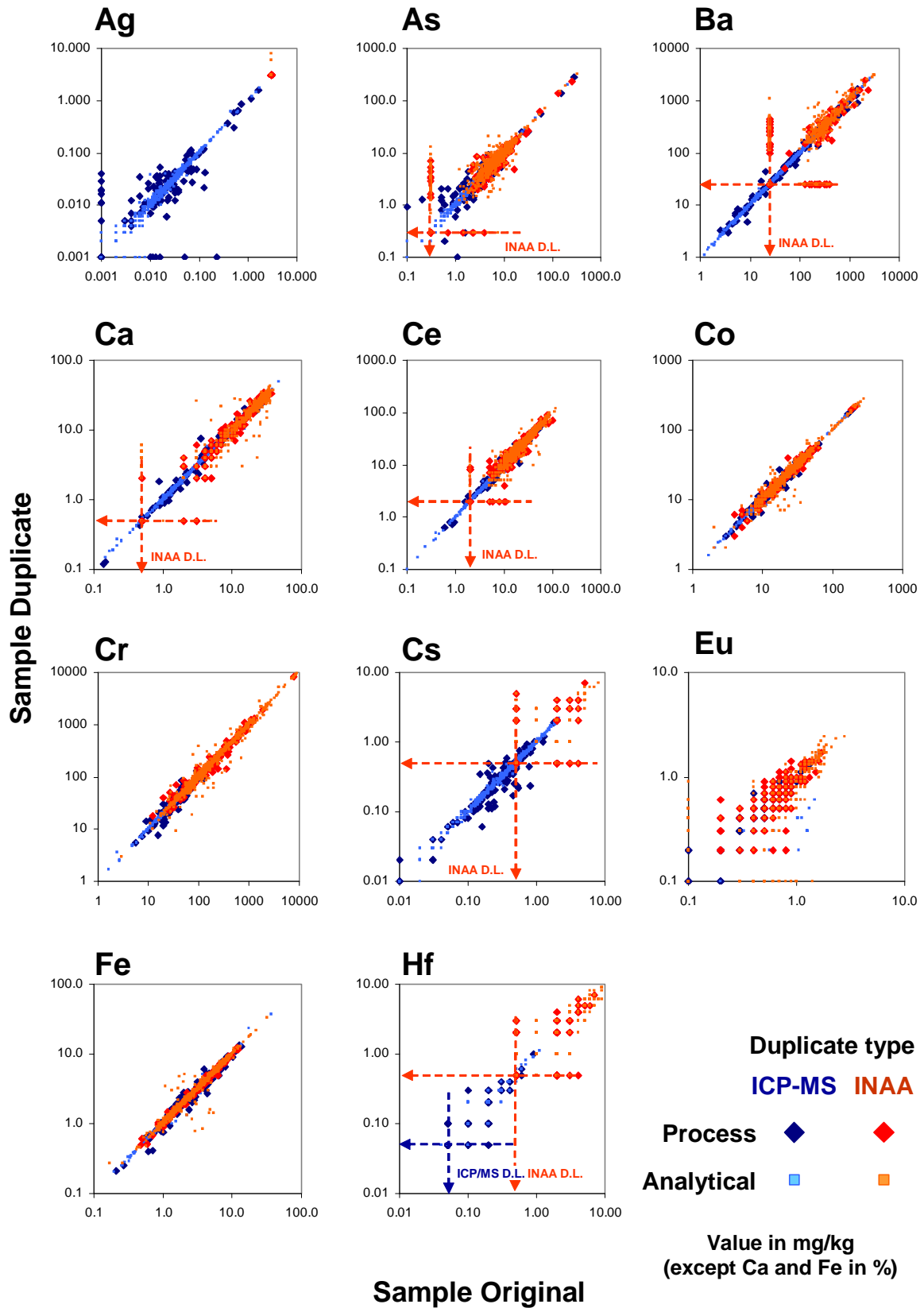


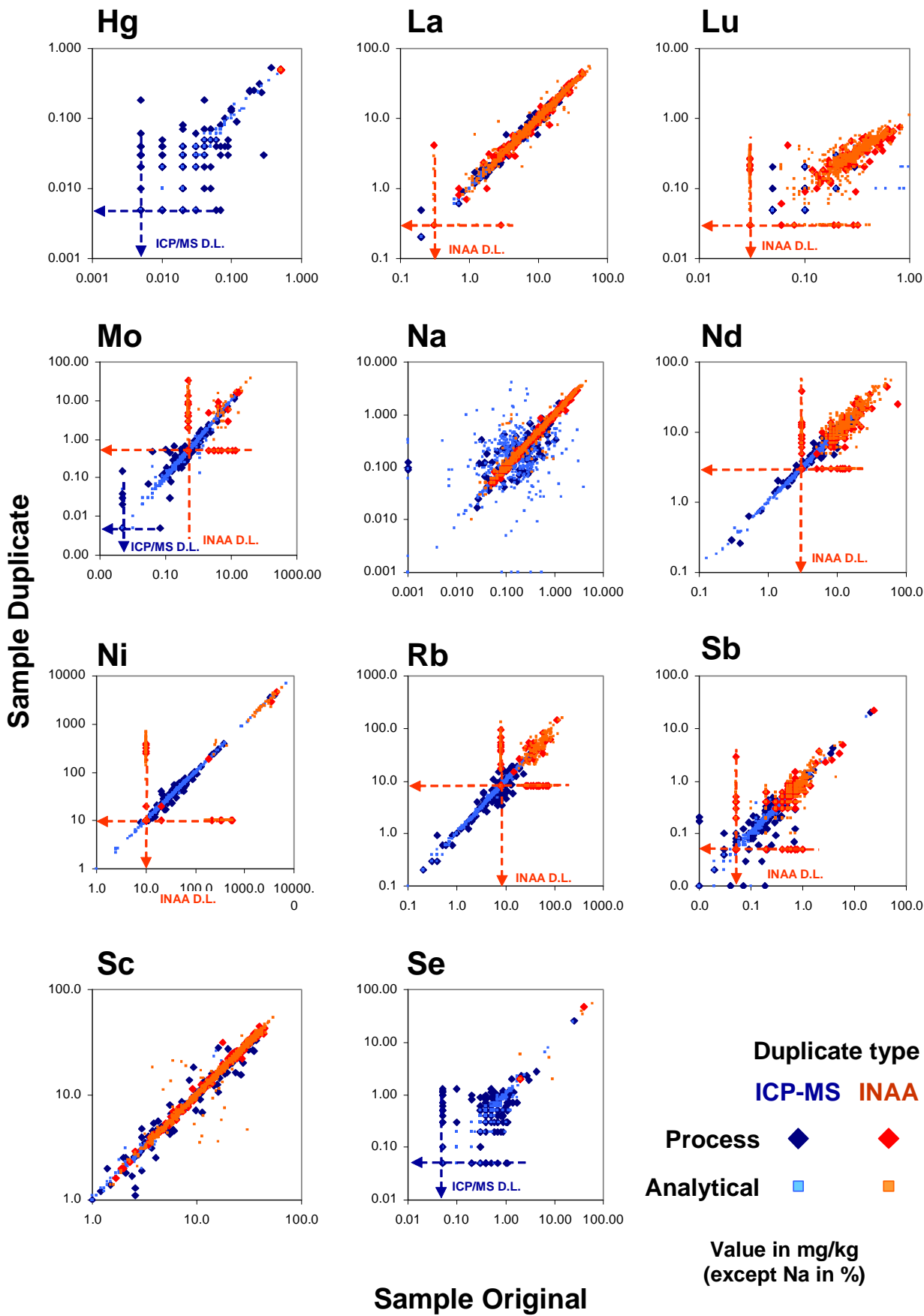


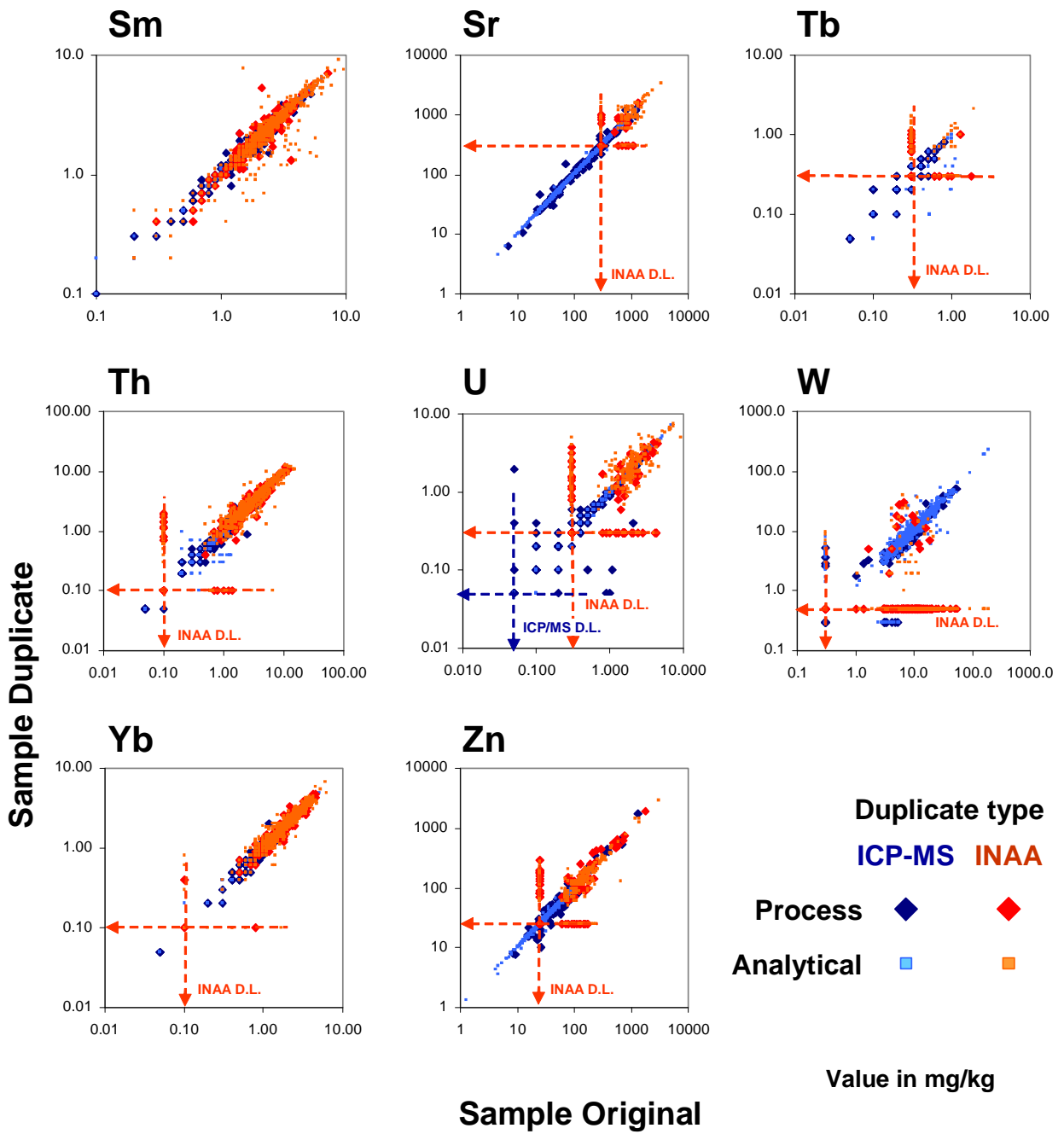


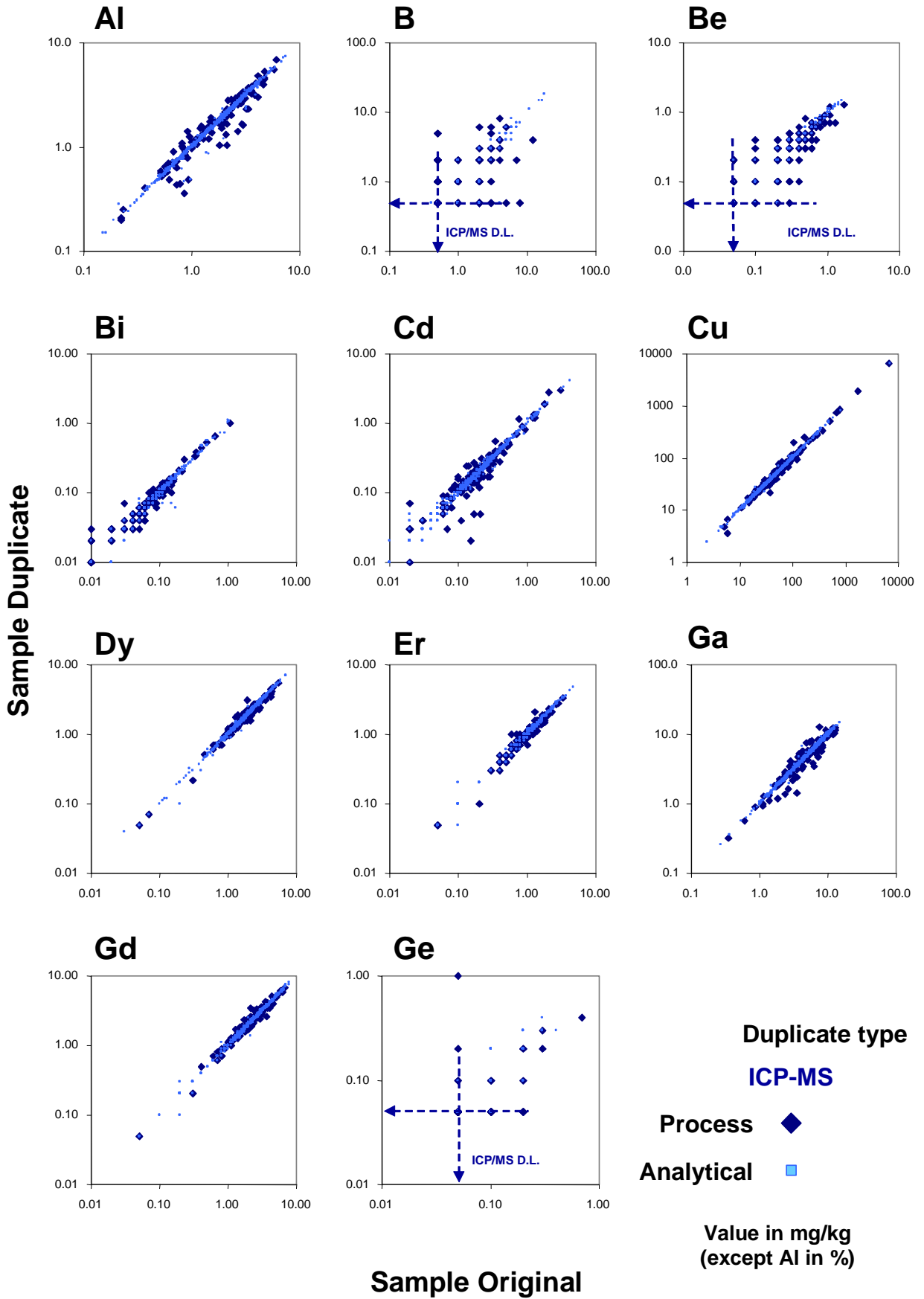
1.4 Scatter plot comparison of original versus sample processing duplicates and analytical sub-sample duplicates analyses by aqua regia ICP-MS and INAA.

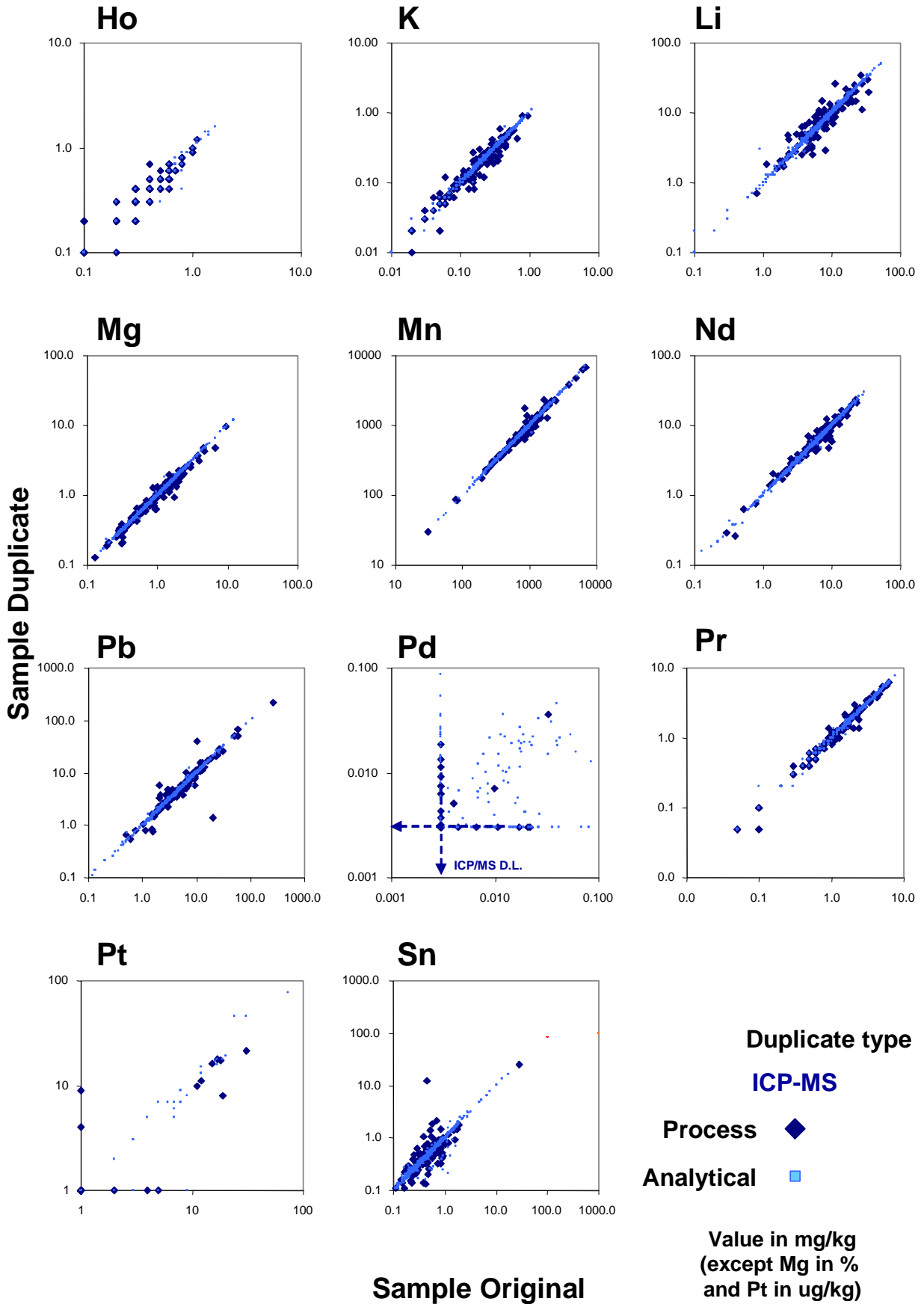
Detection limits for methods indicated where it impinges on analytical values.

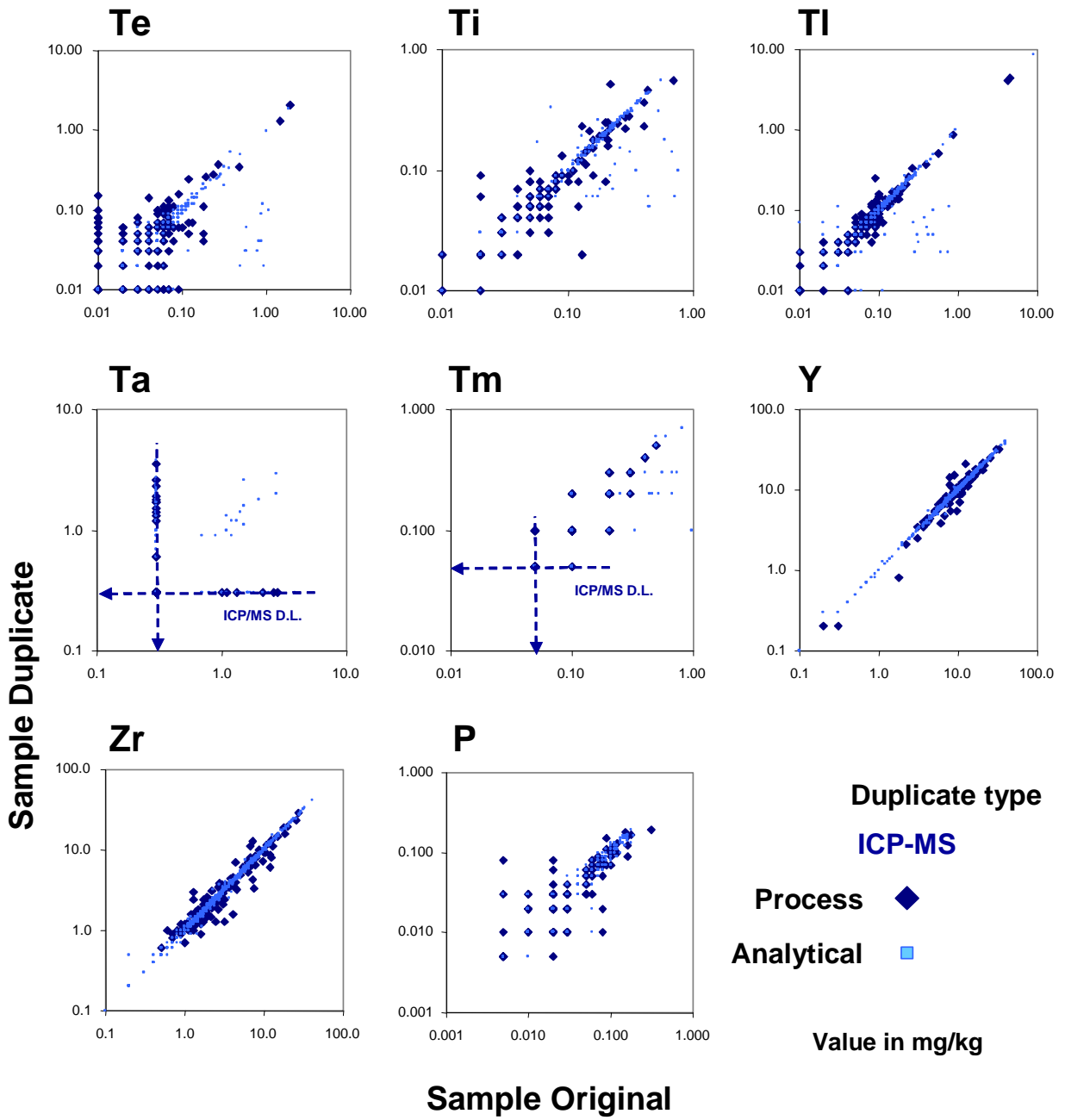






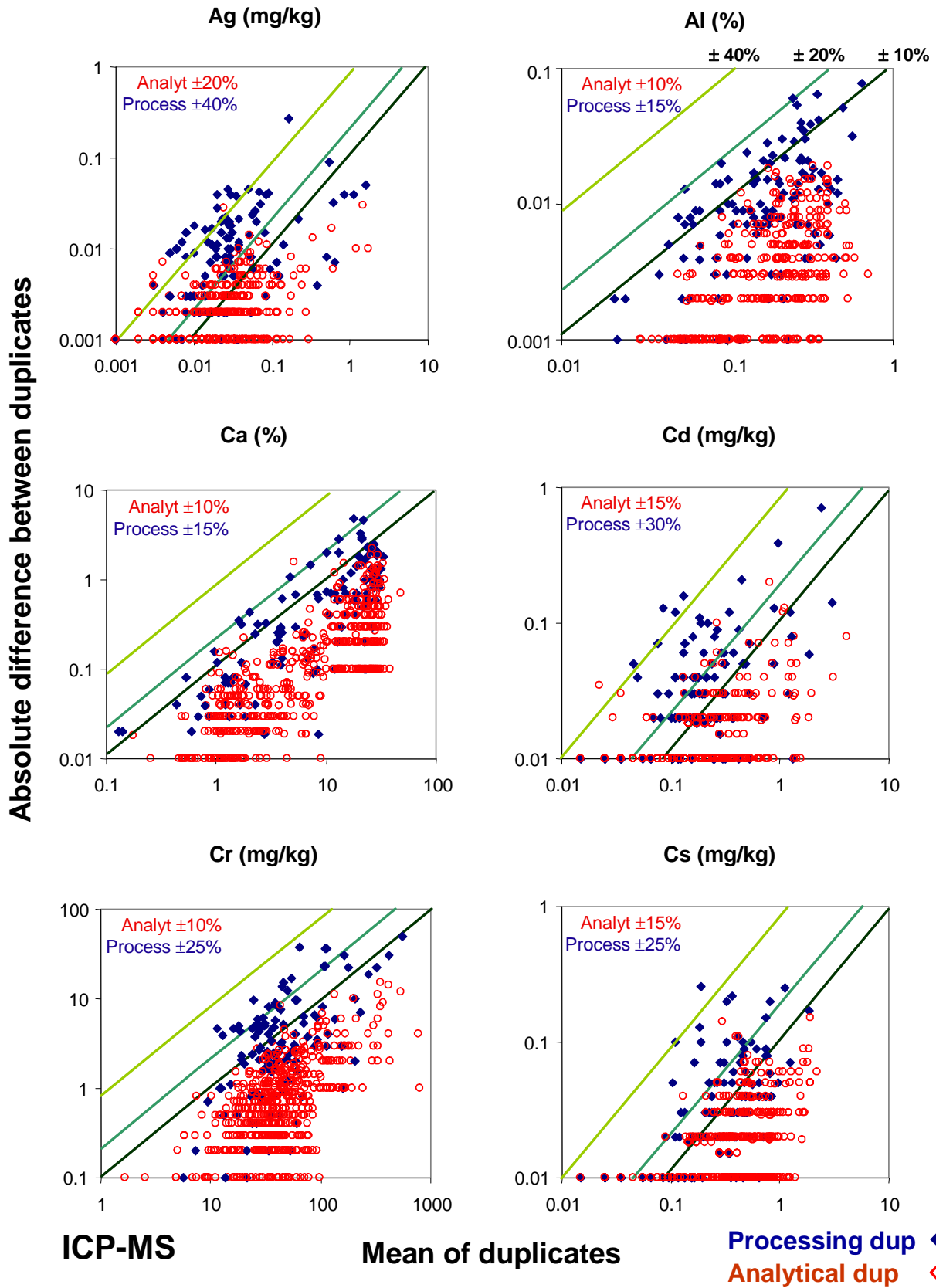


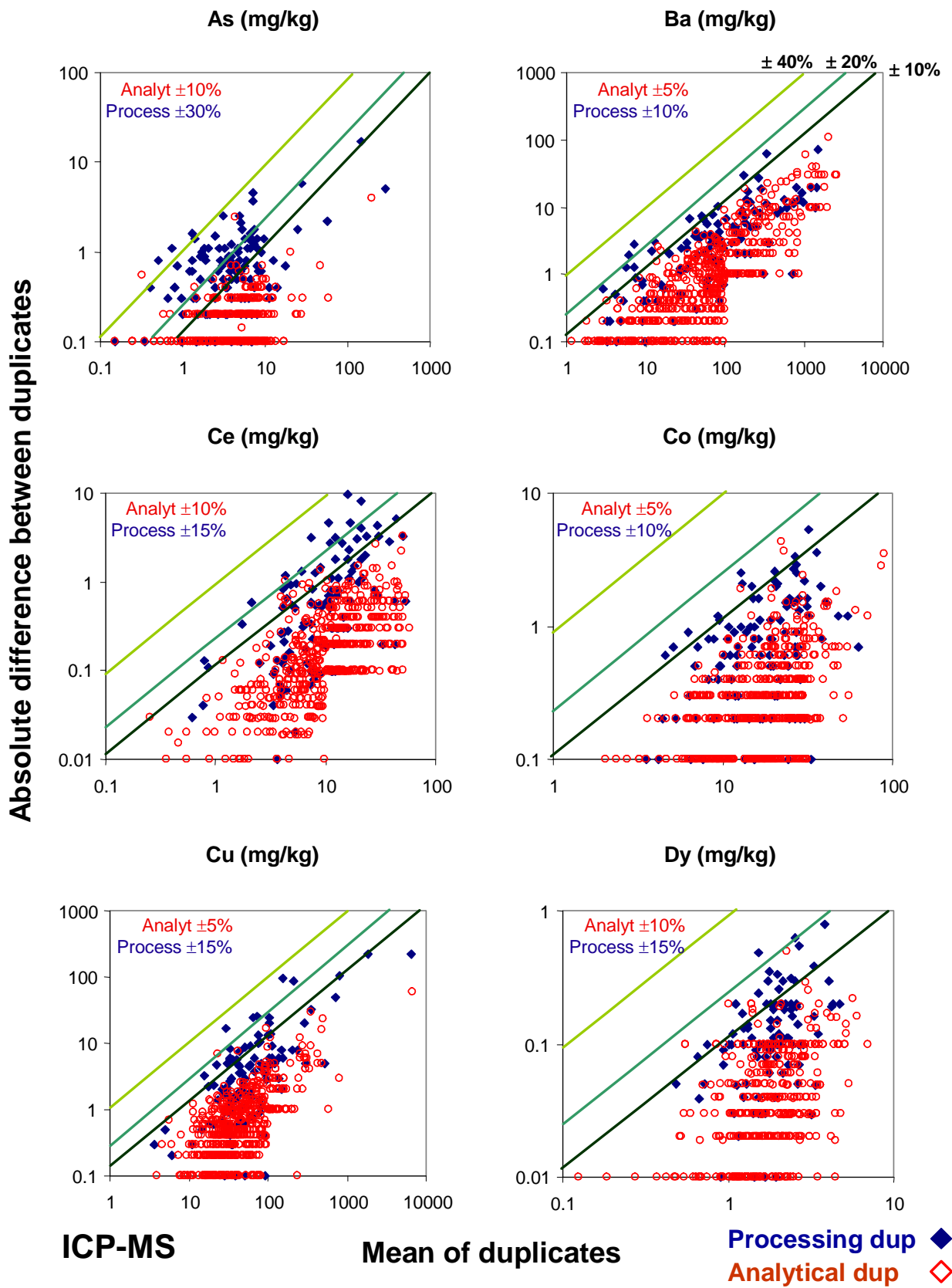


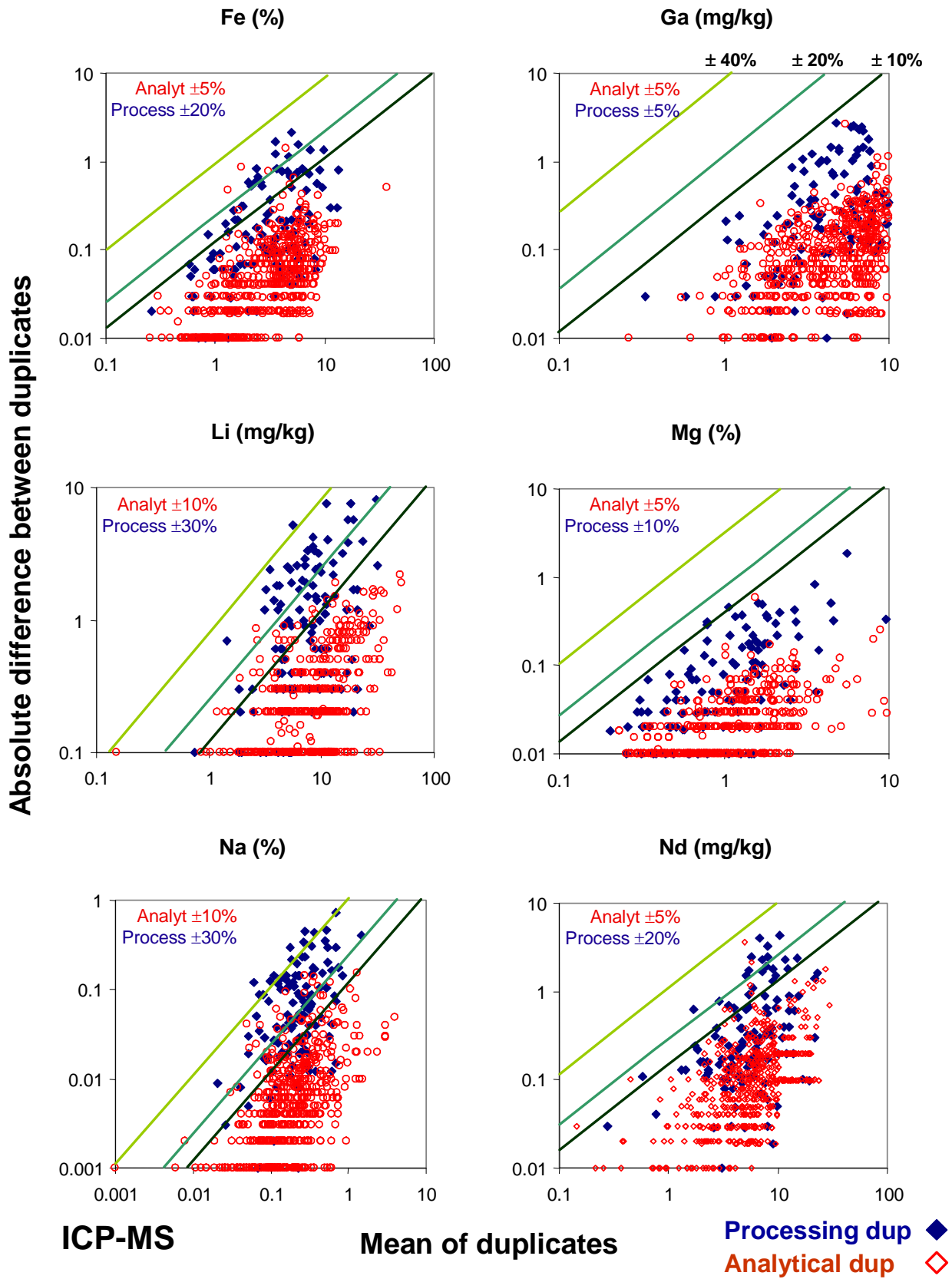


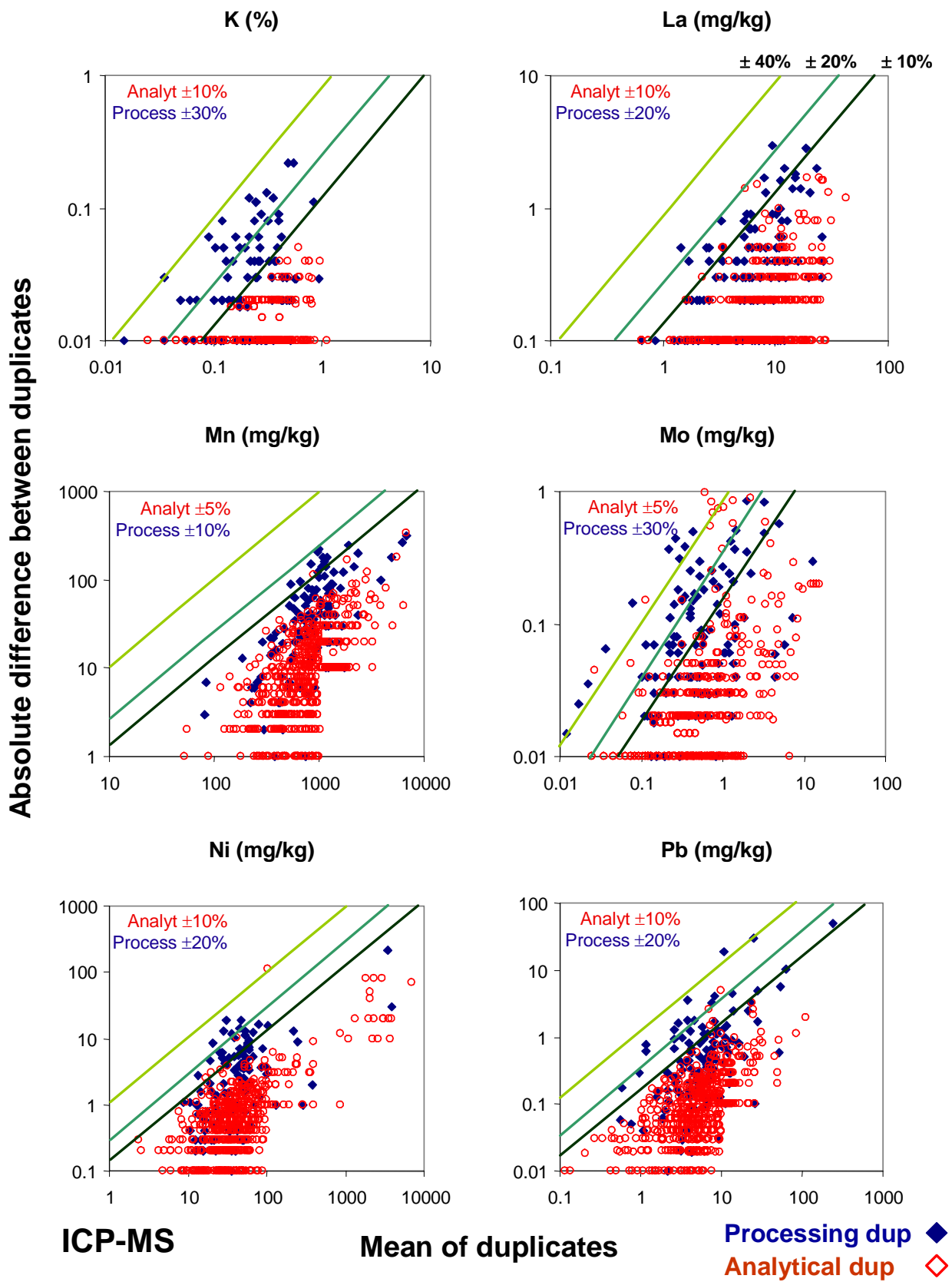
1.5 The control lines represent the 90% percentile for absolute differences at precisions of $\pm 10\%$, $\pm 20\%$ and $\pm 40\%$.

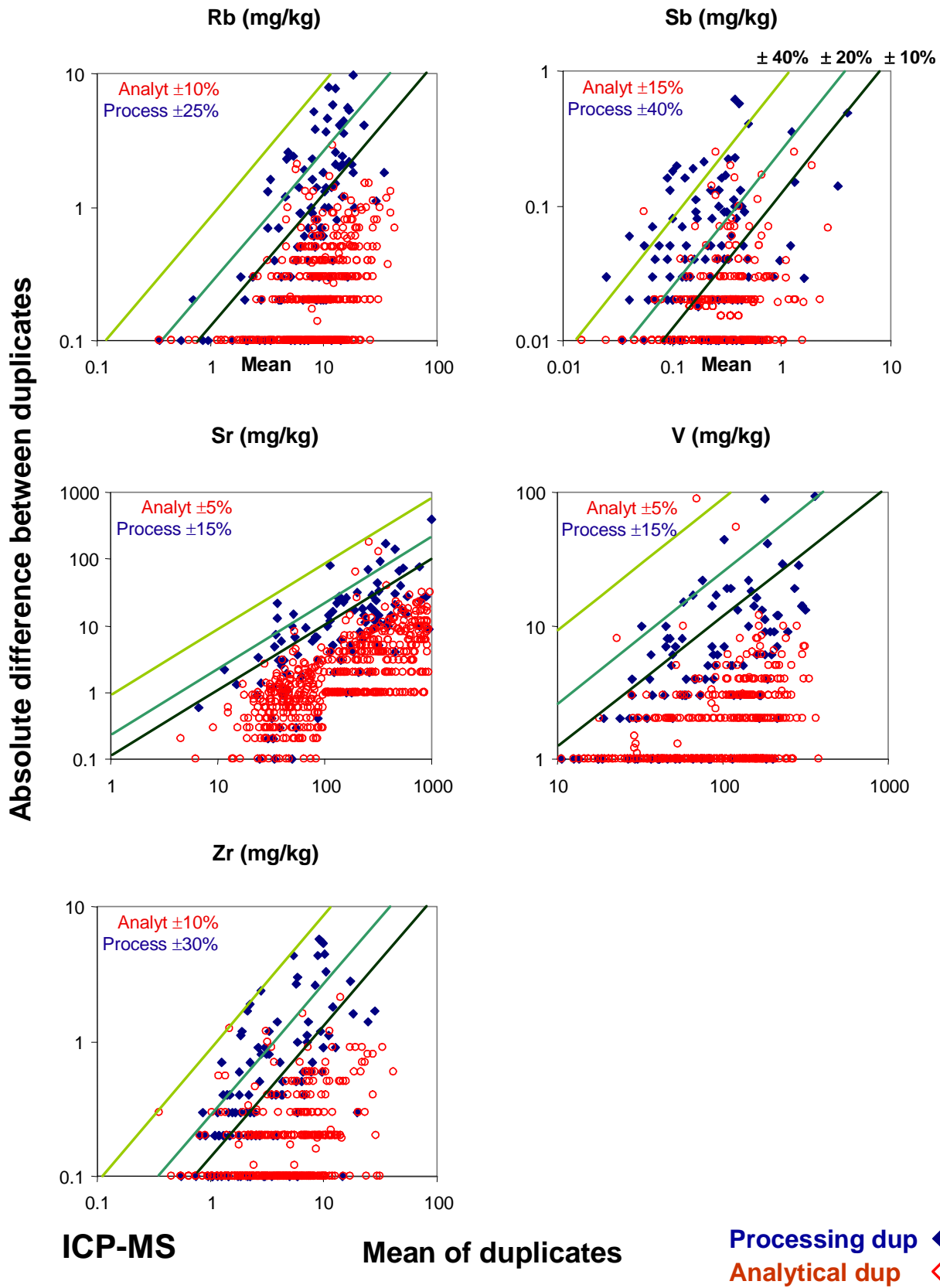
Analytic and processing precisions are based on the estimated precision line that contains >90% of points. Precision lines not determined where the majority of analyses were below analytical detection limits.

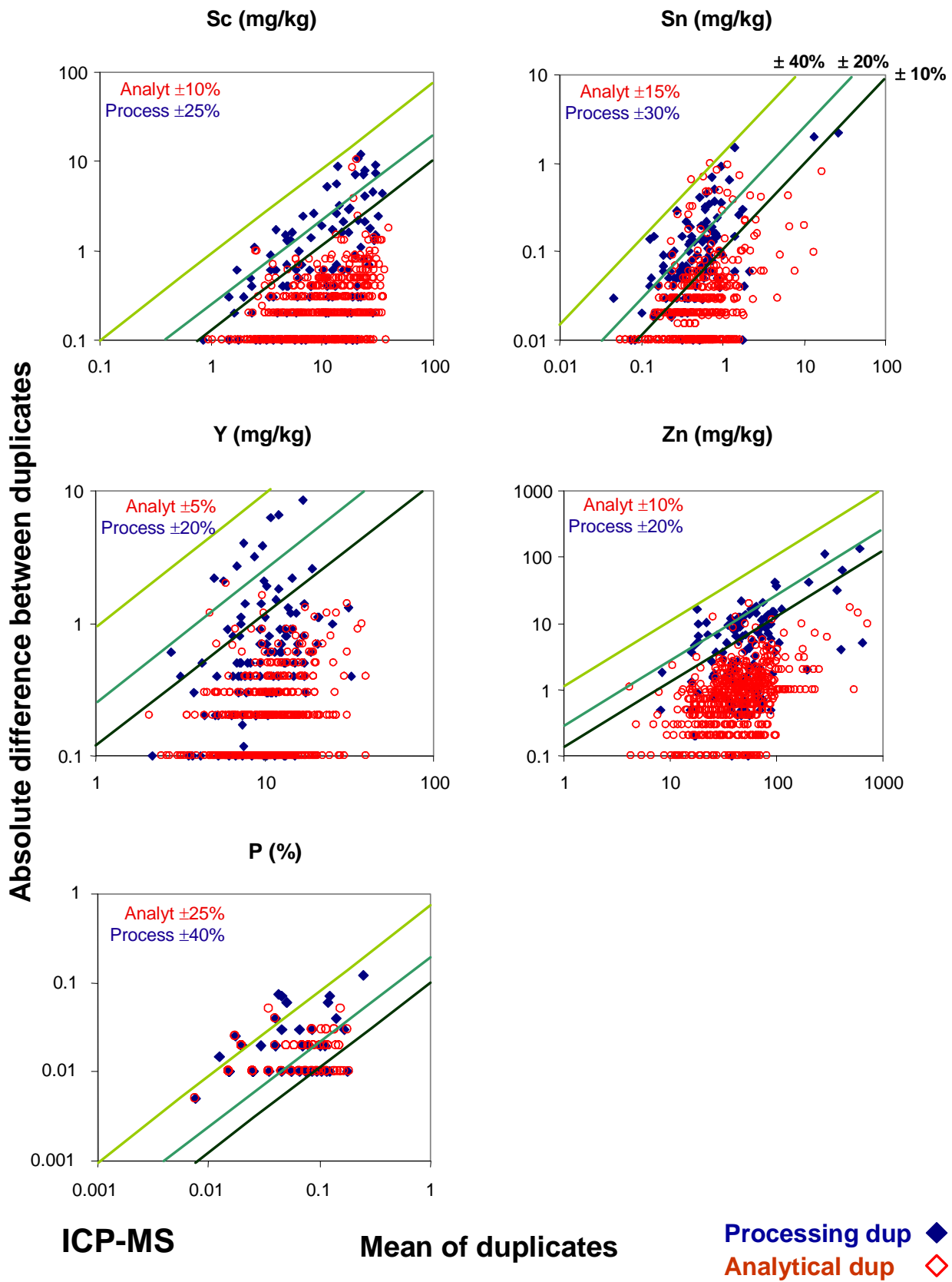


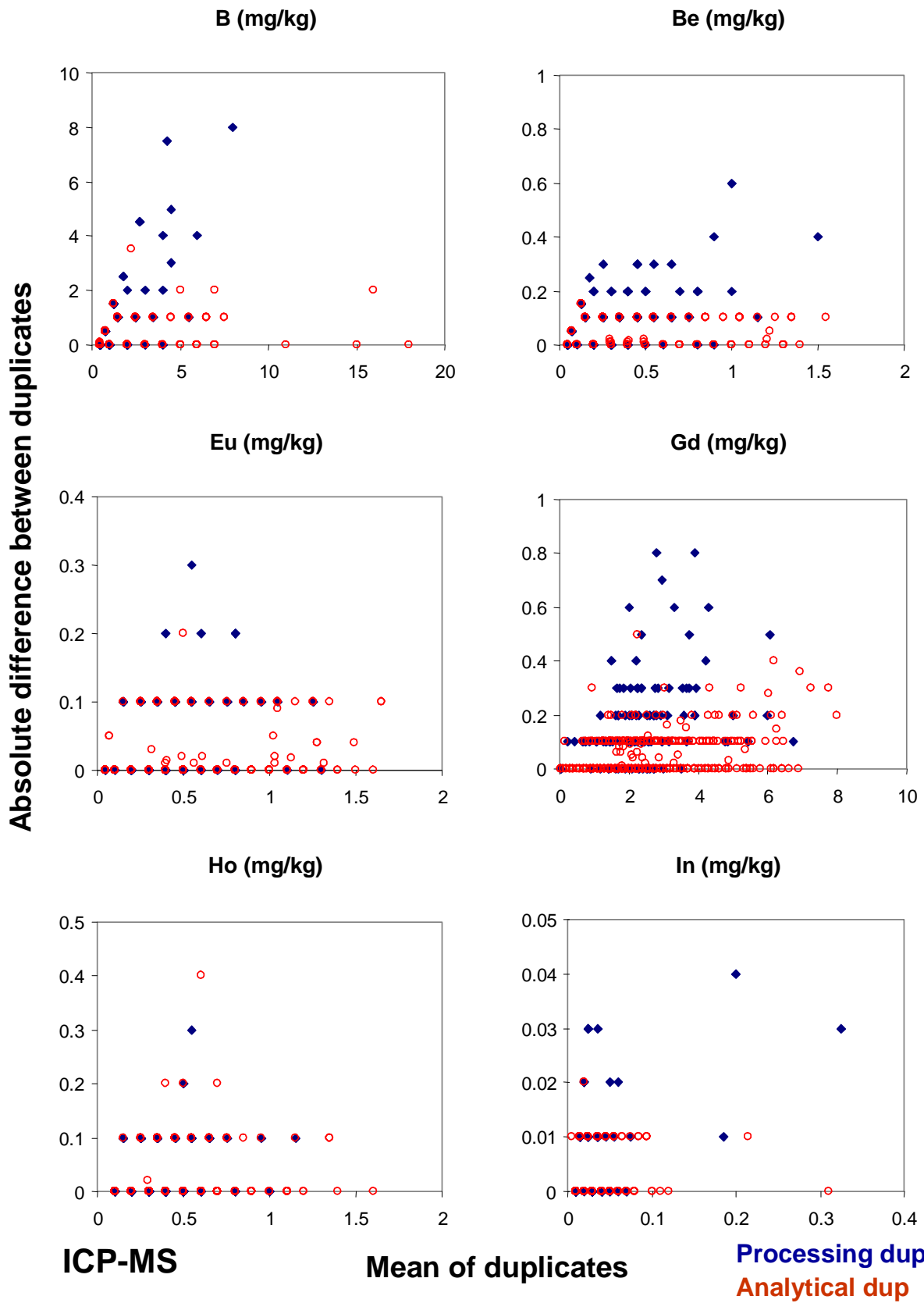


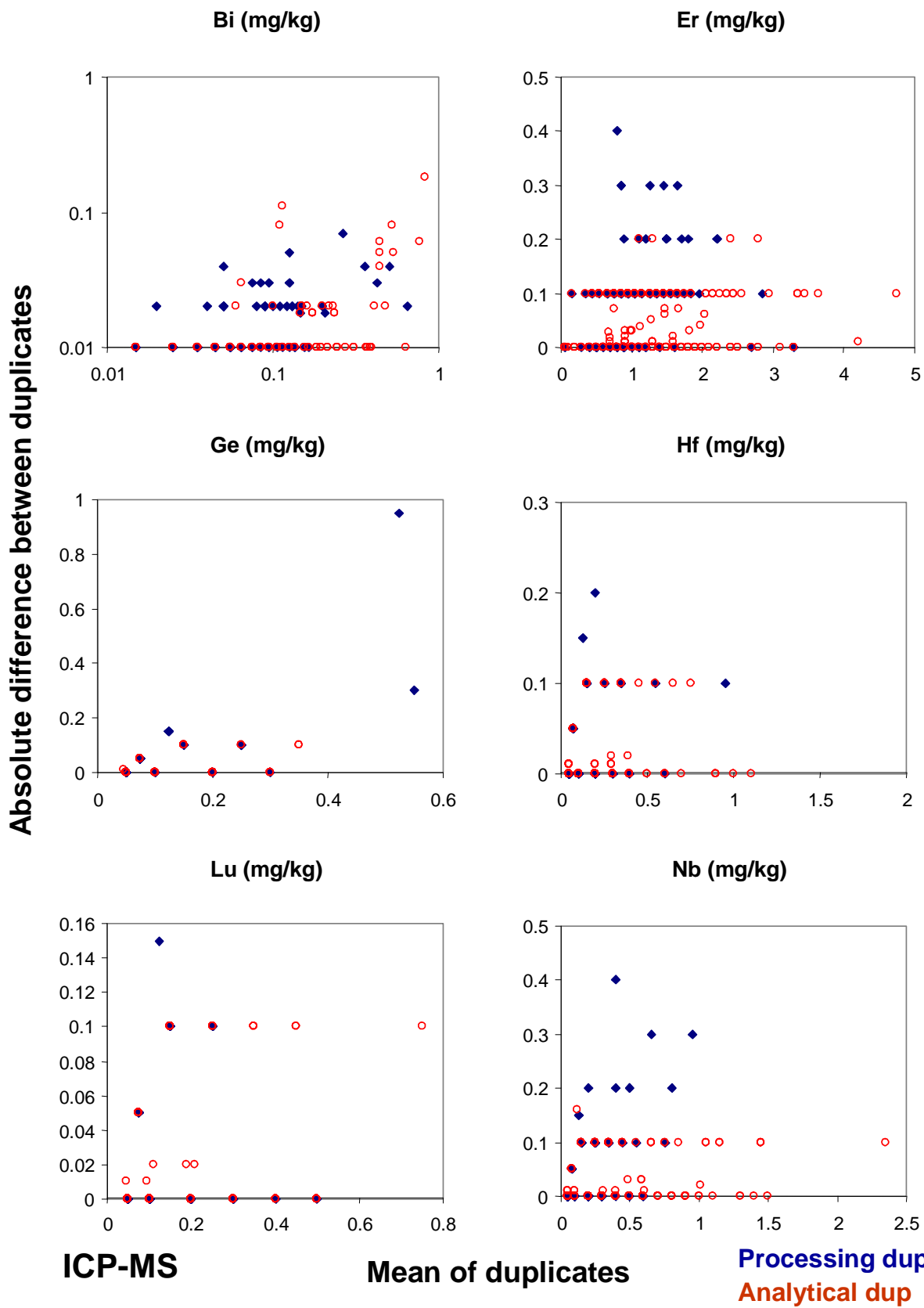


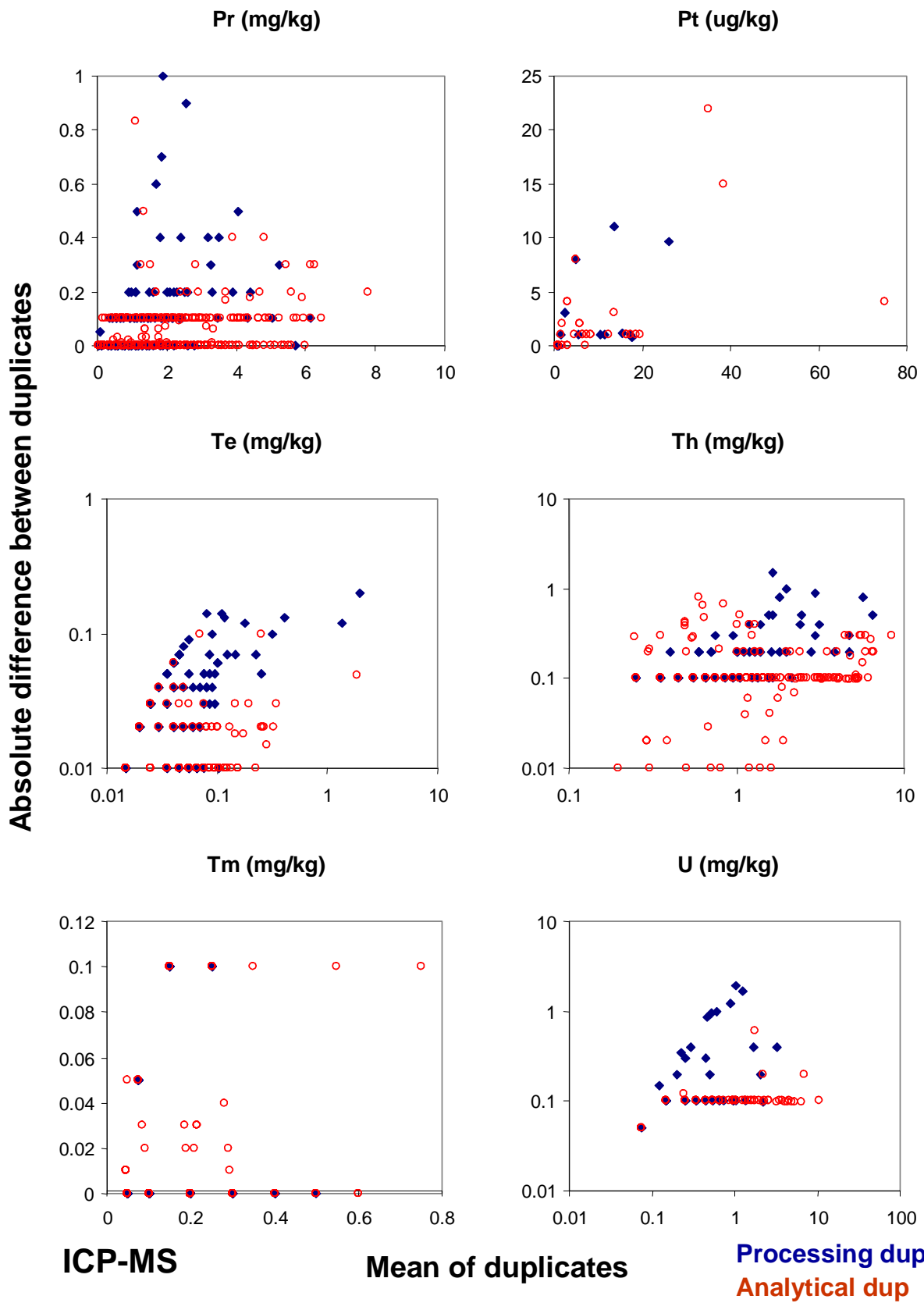


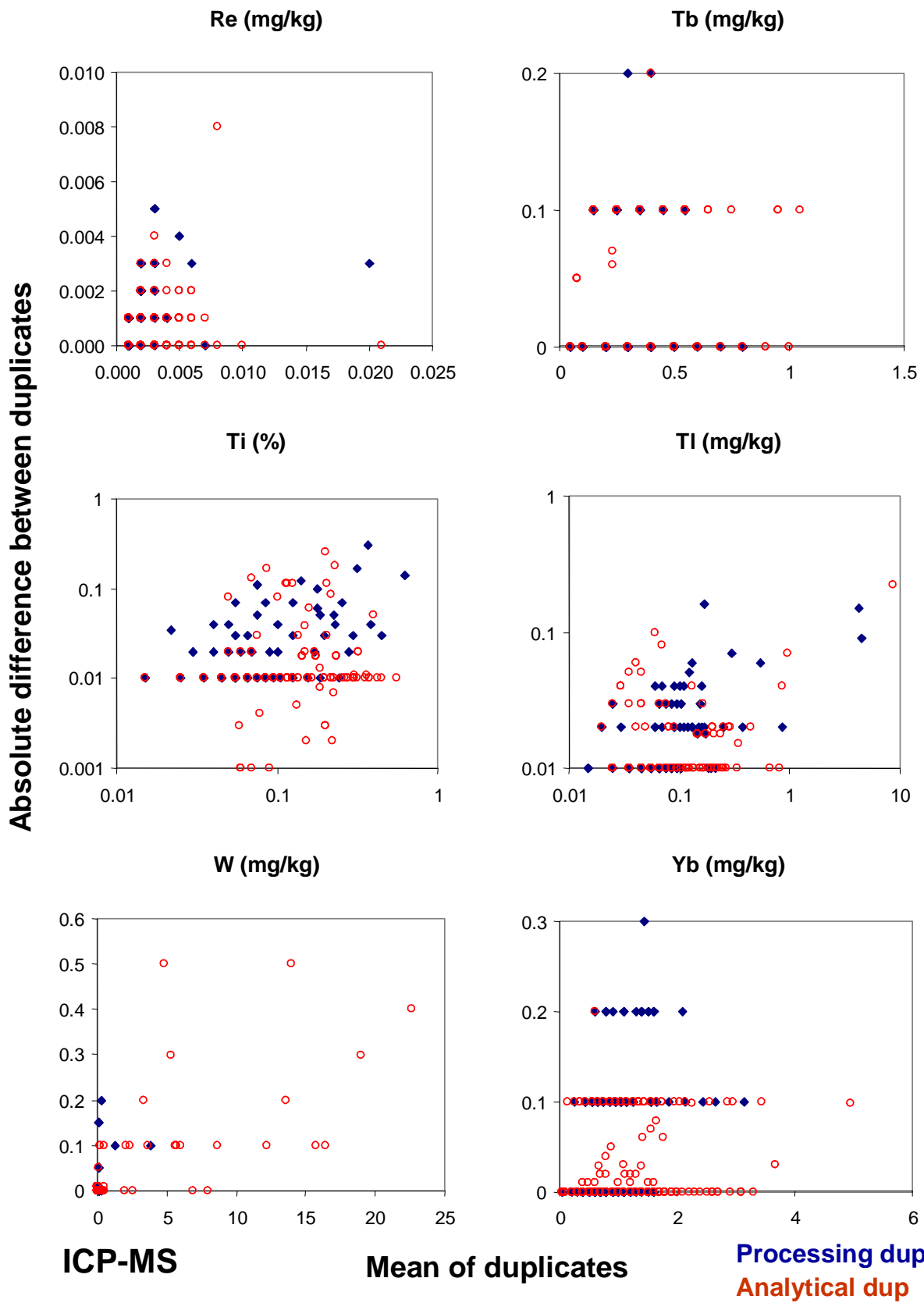


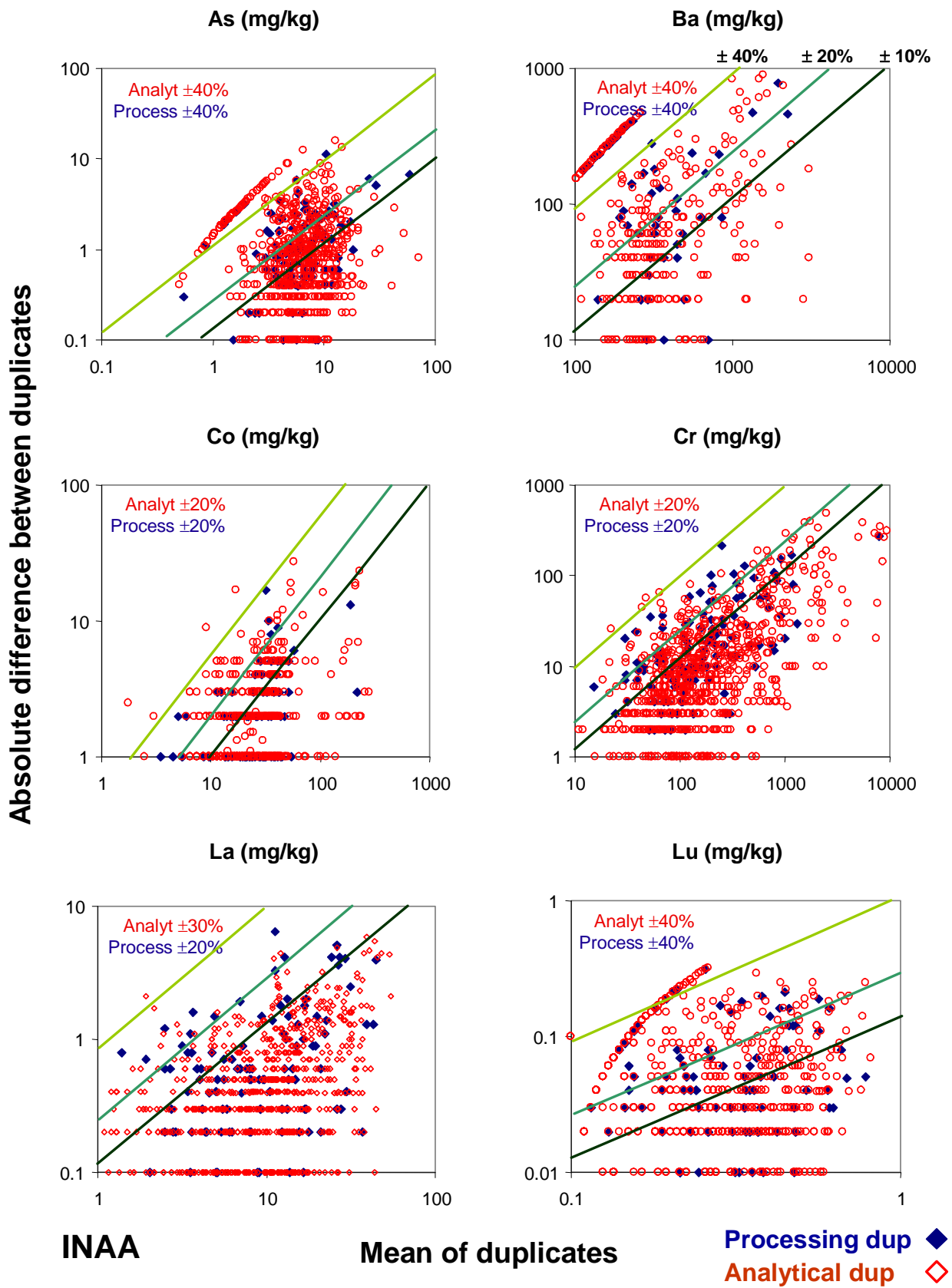


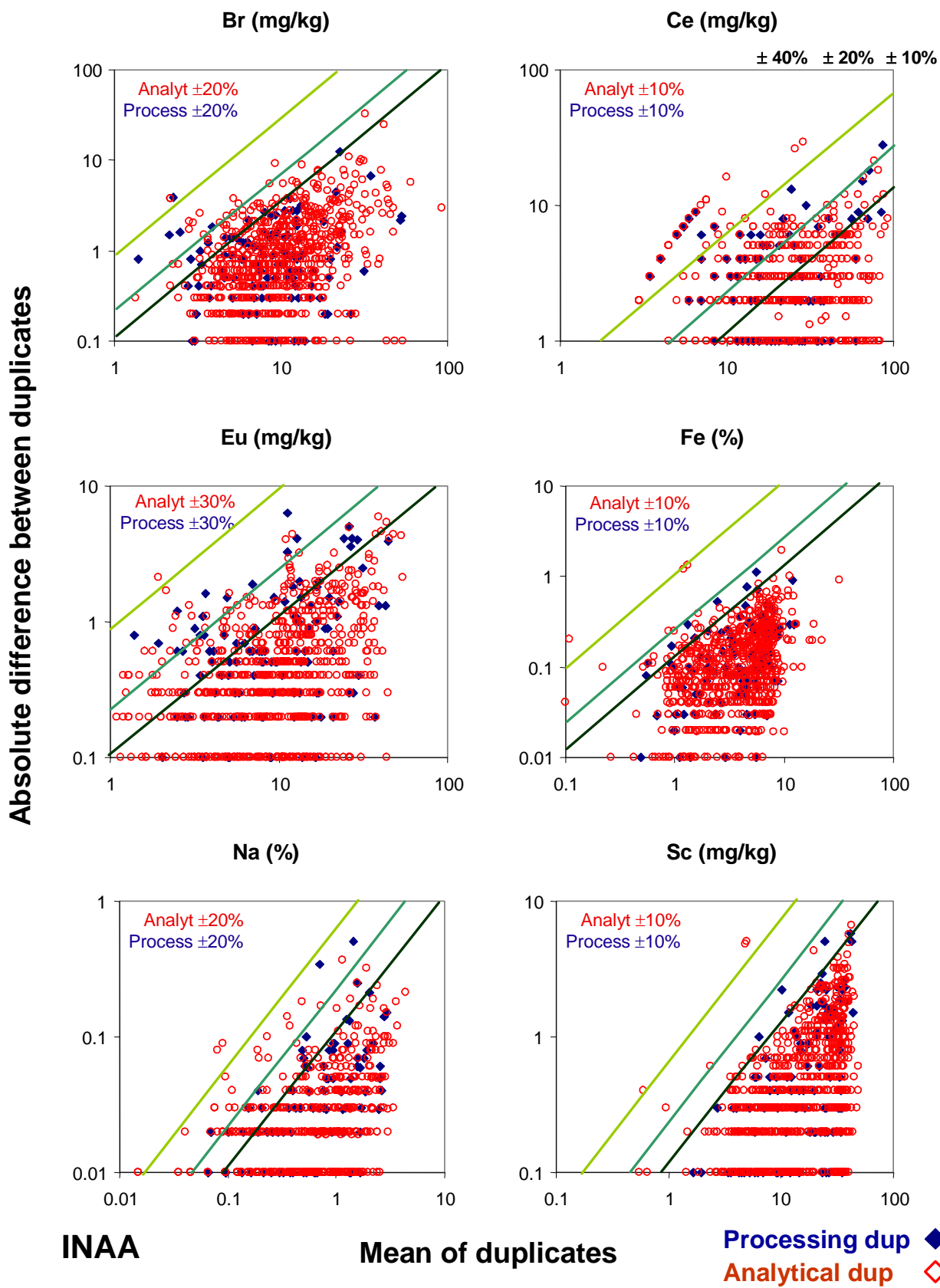


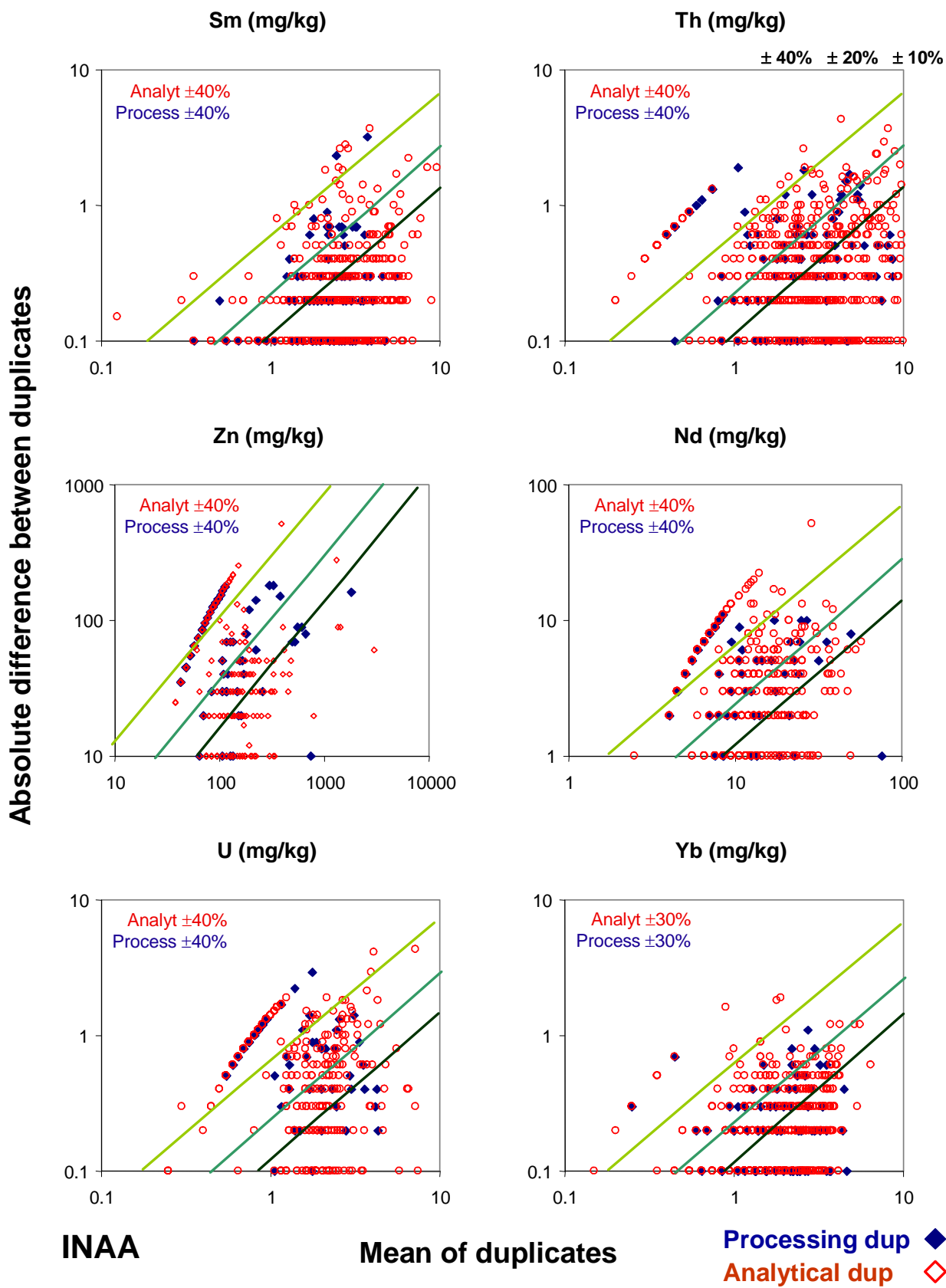


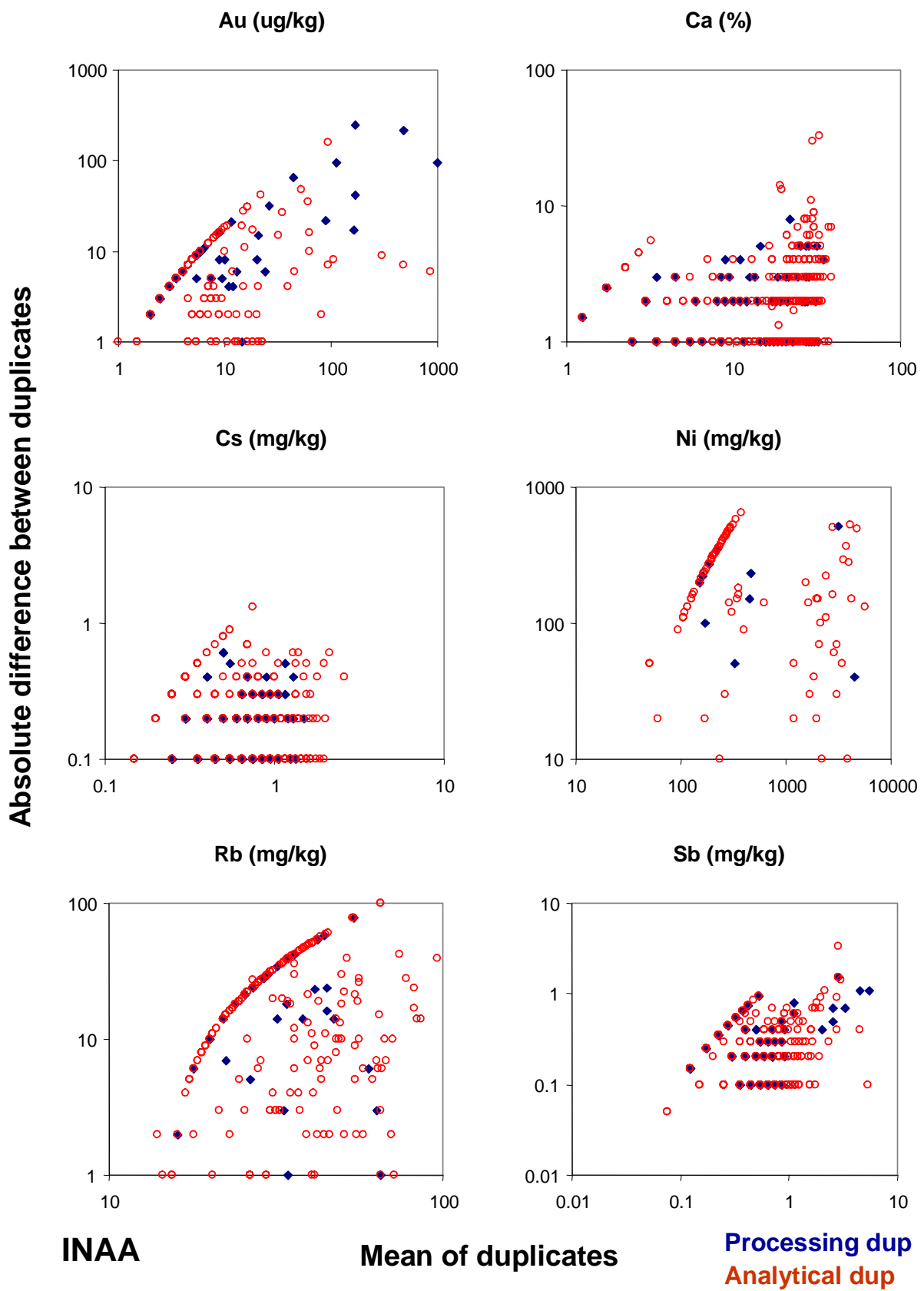




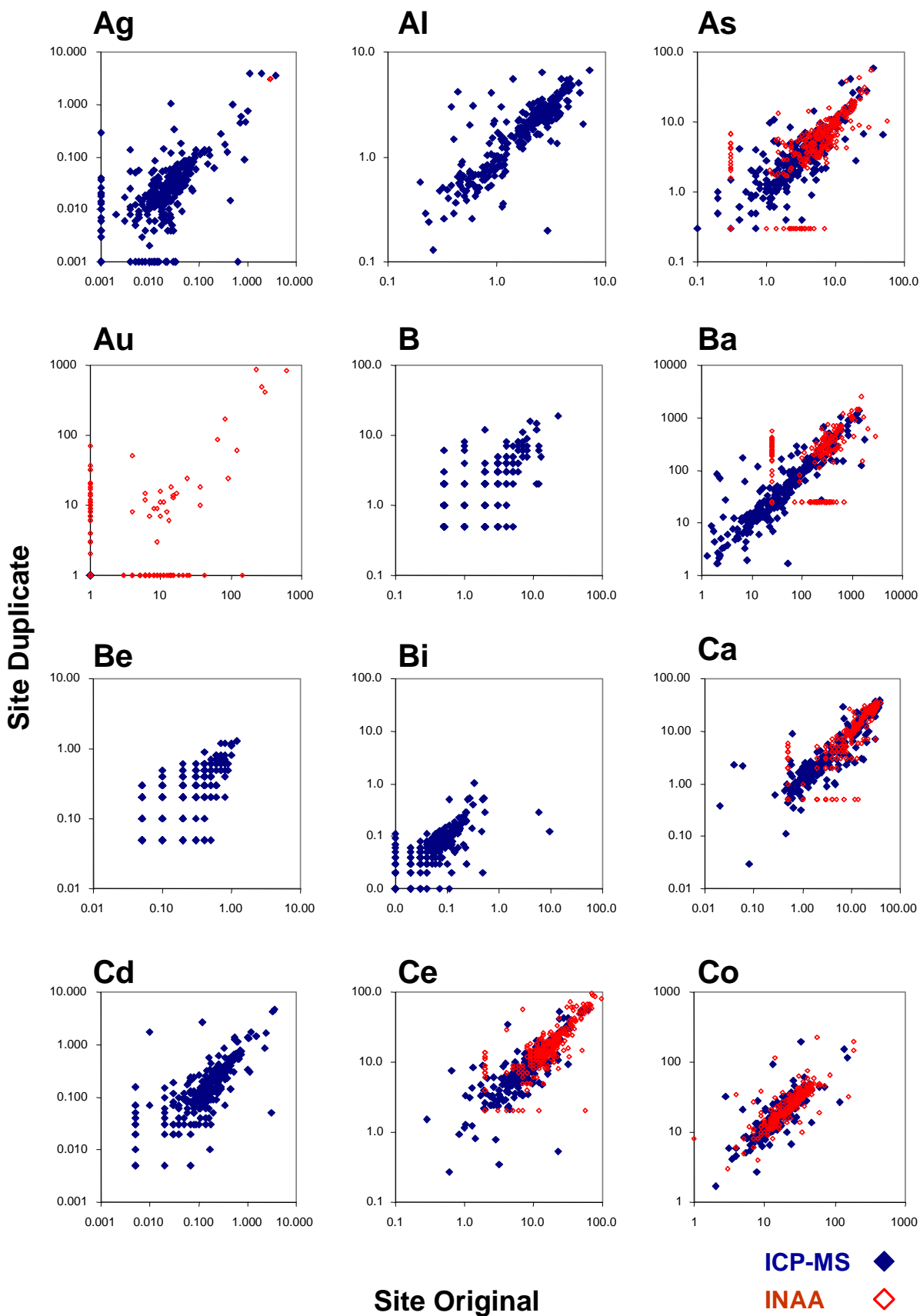


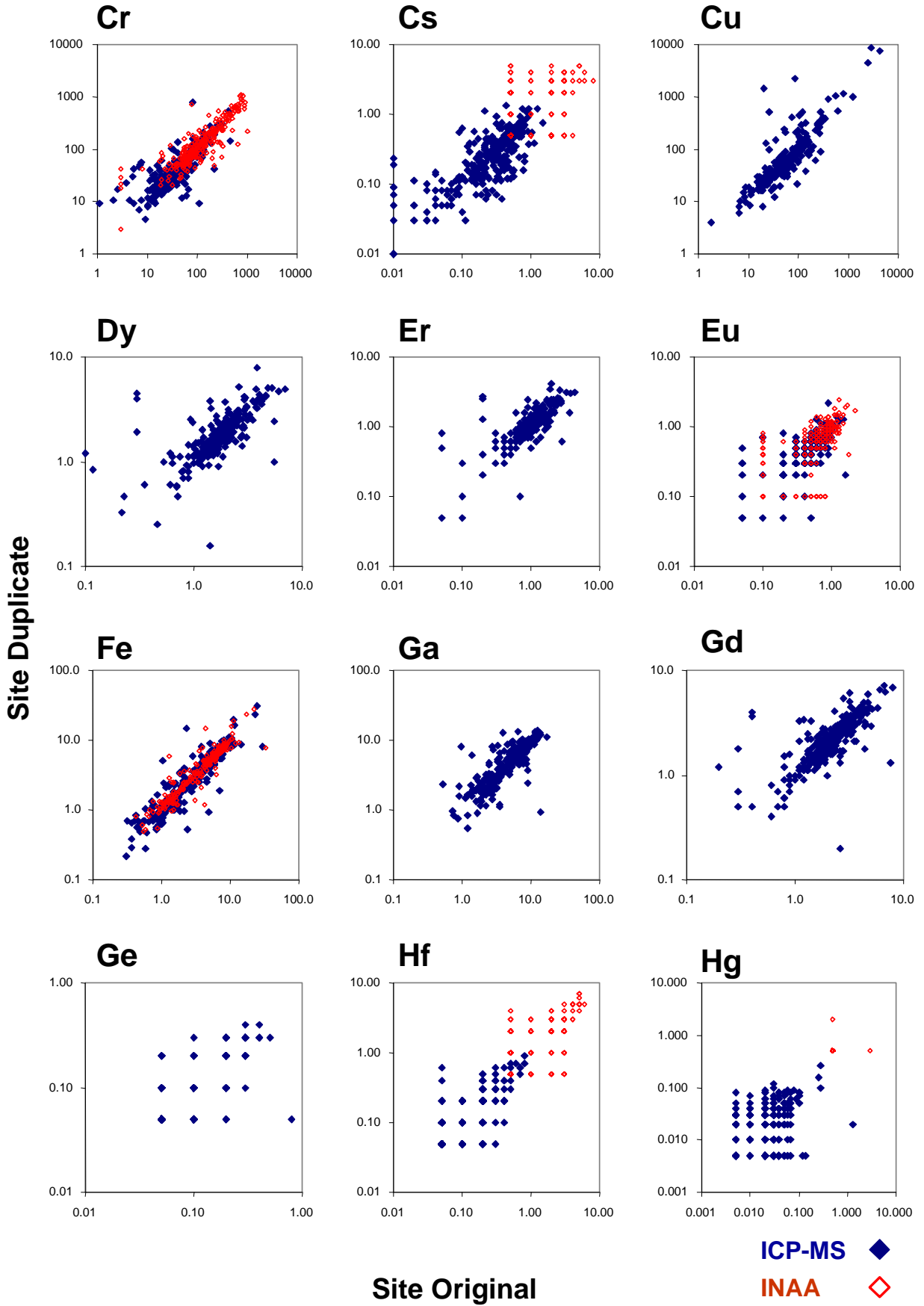


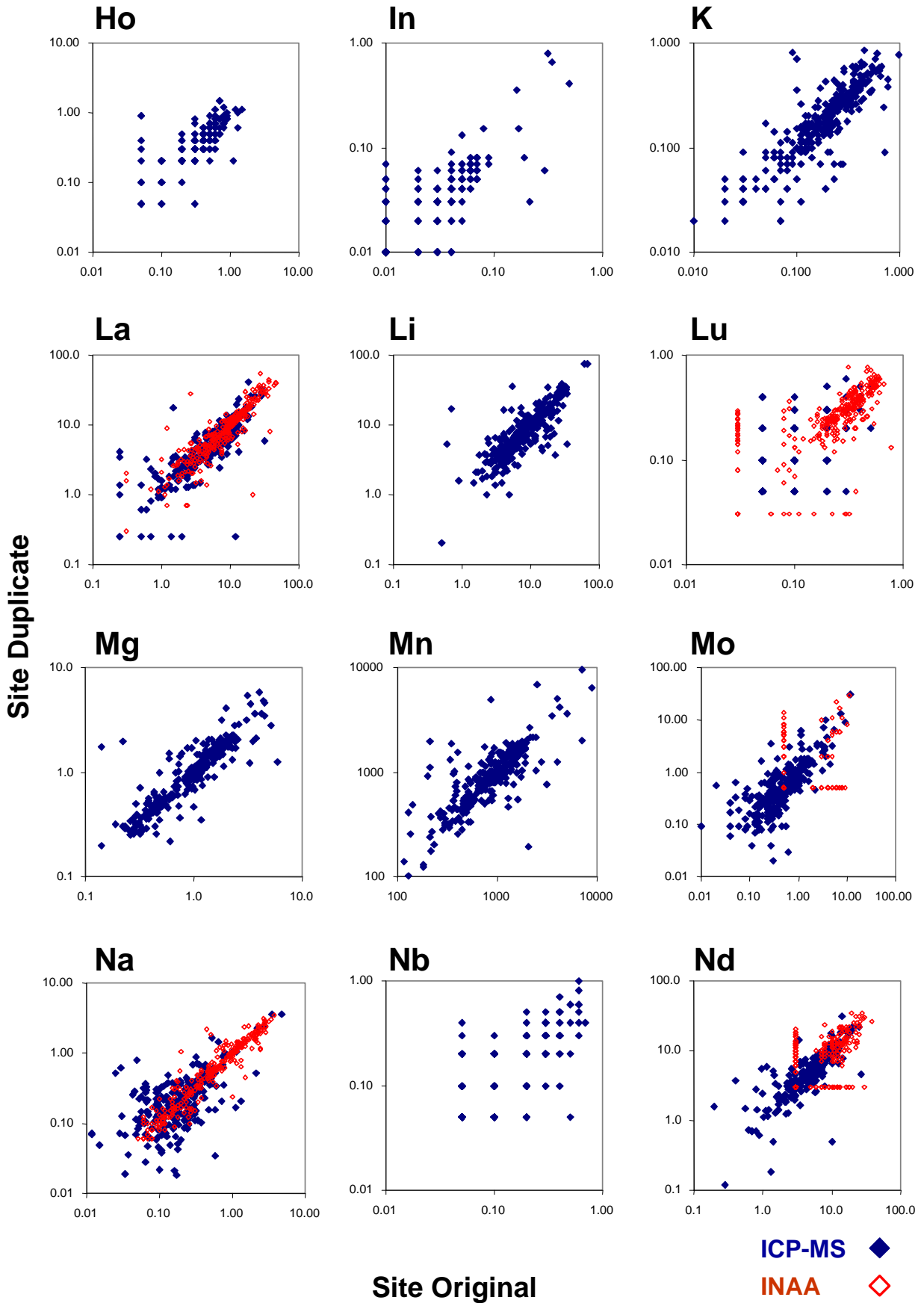


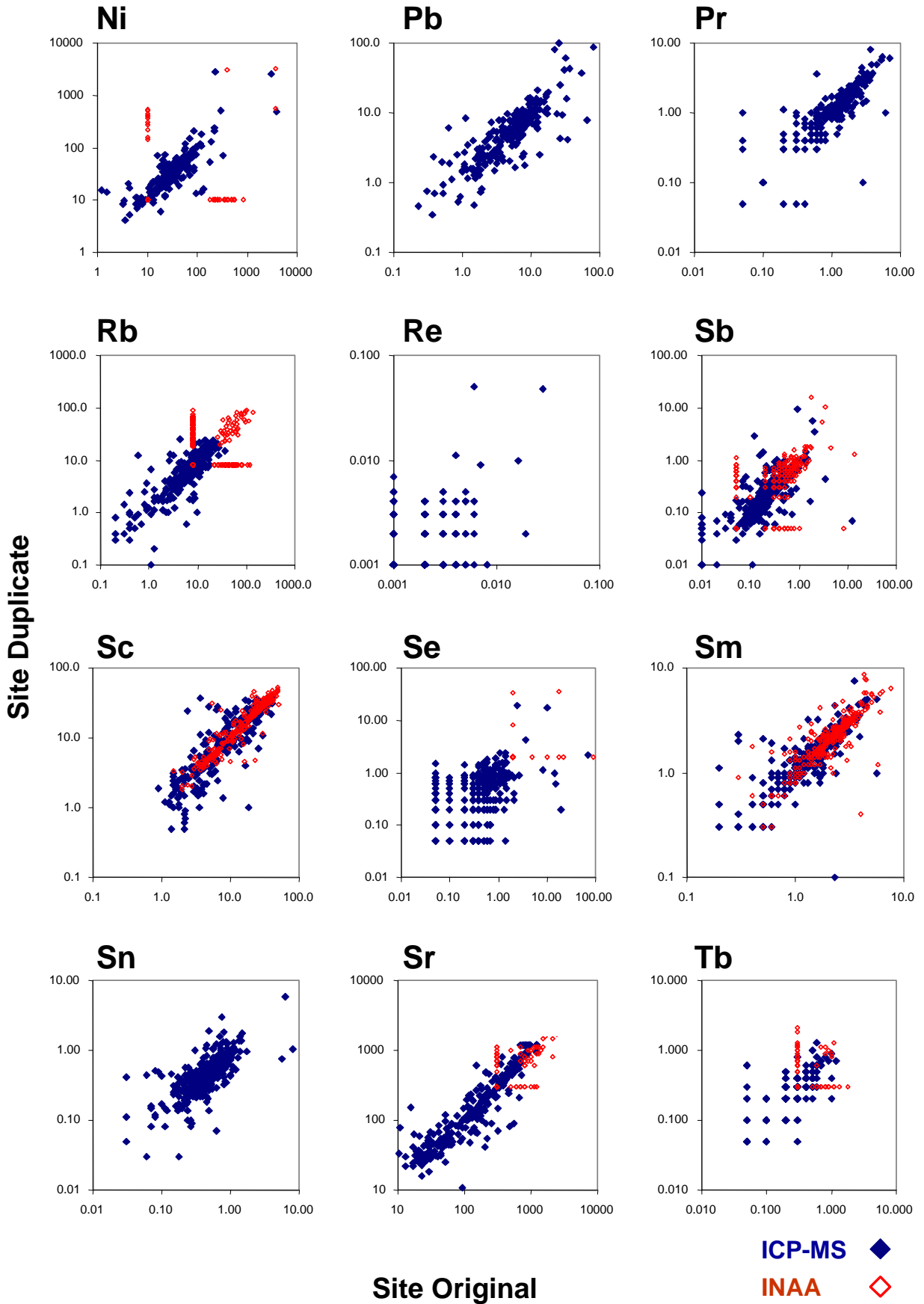


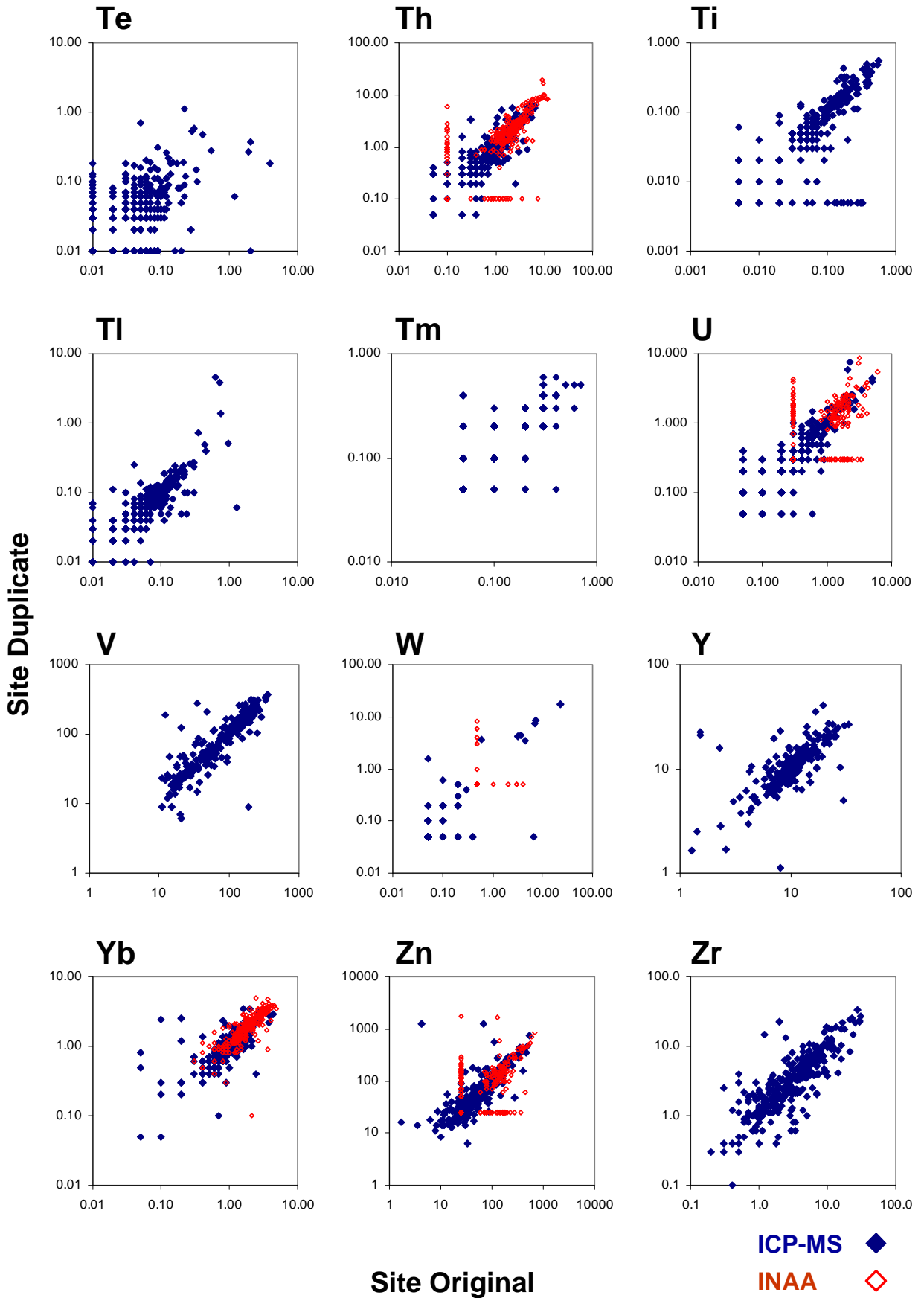
1.6 Scatter plot comparison of field sampling site duplicates.



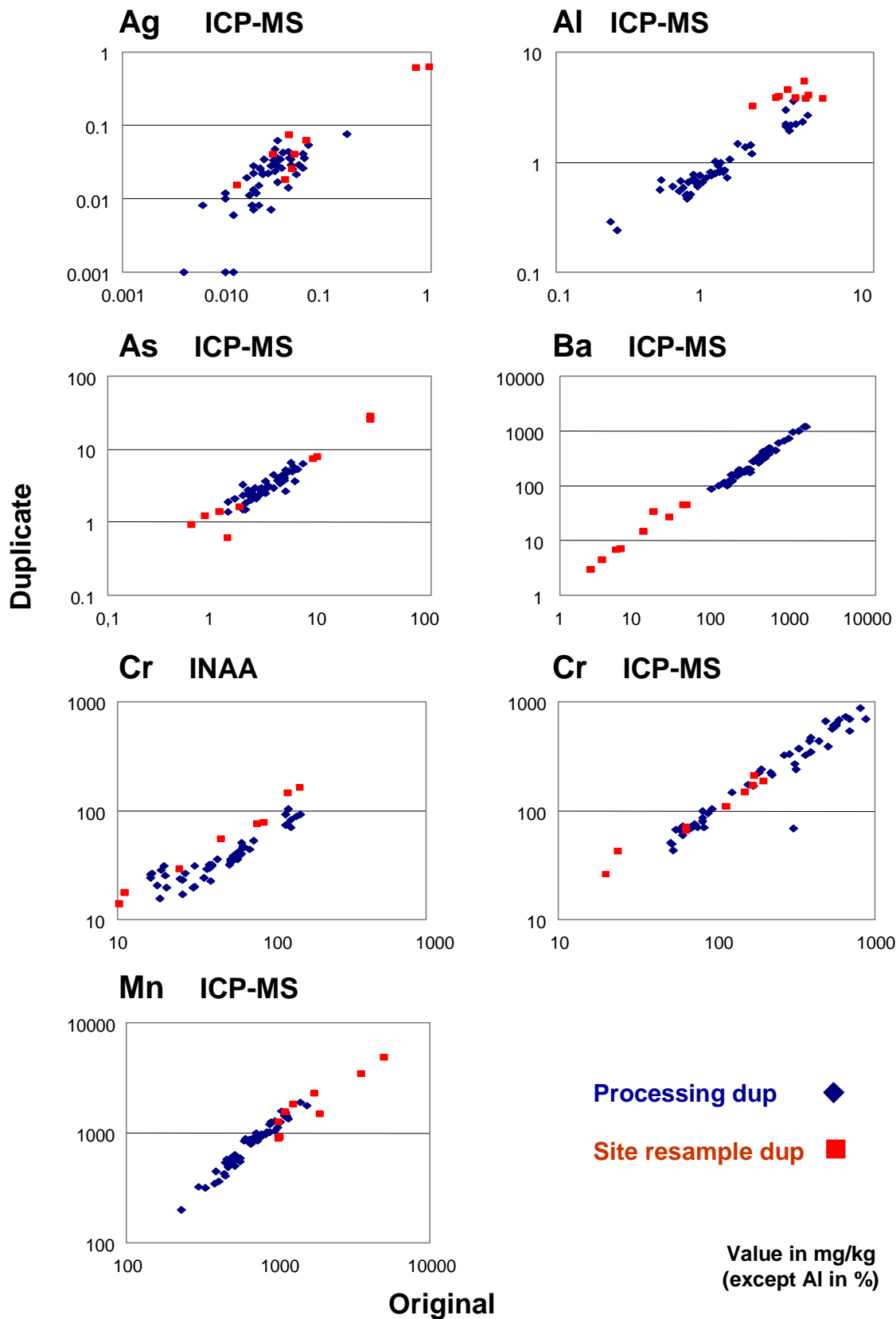


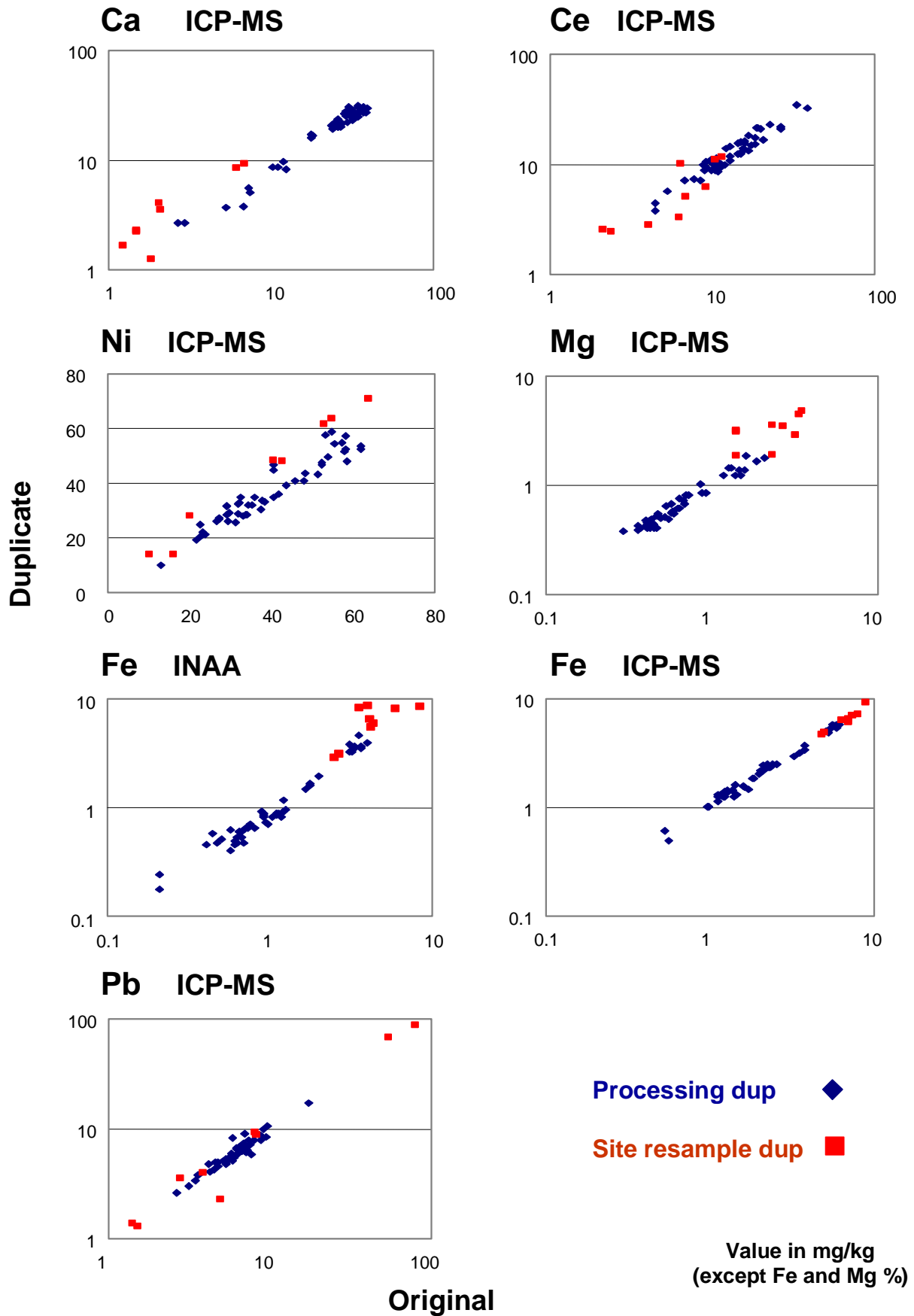




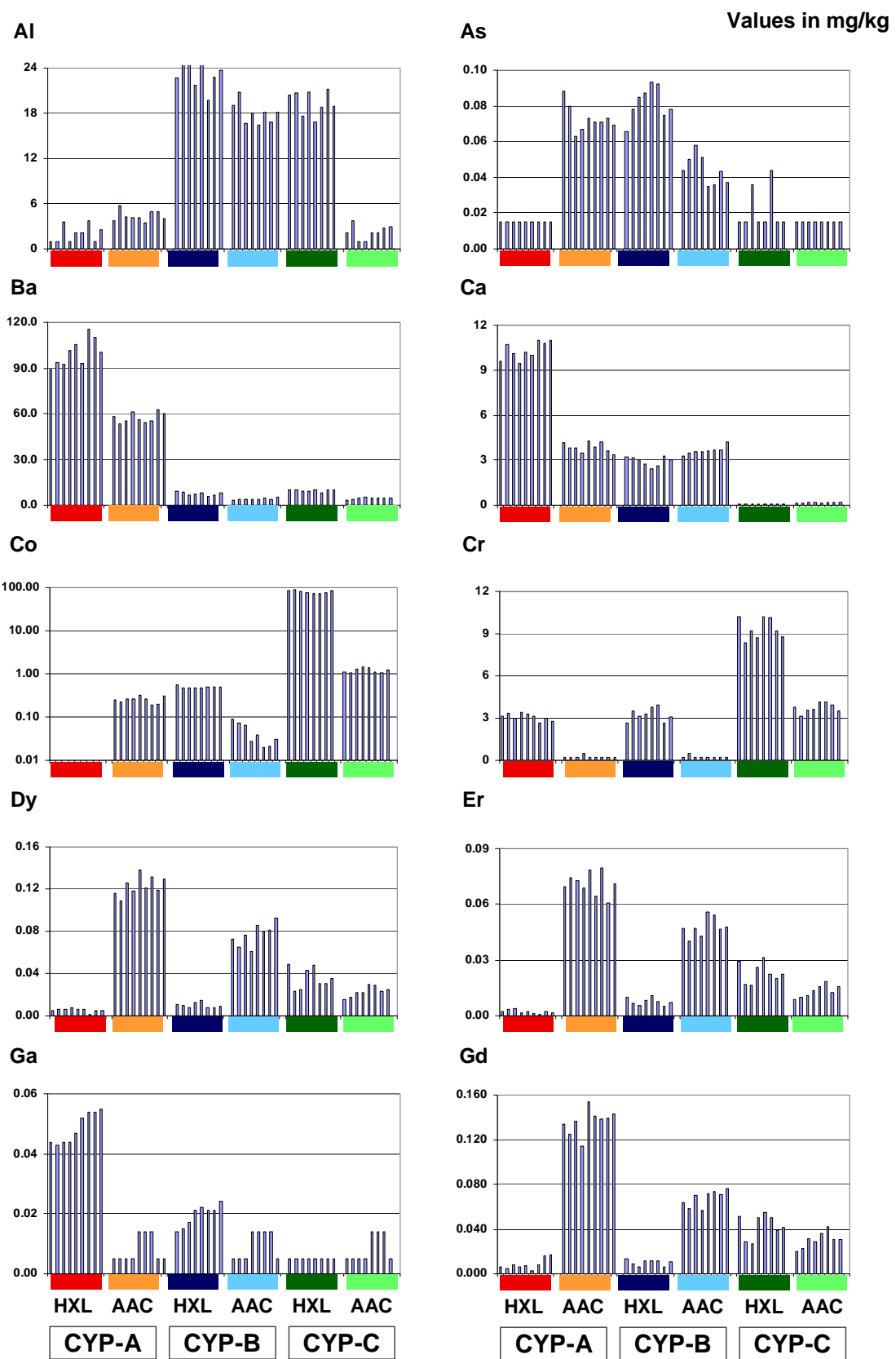


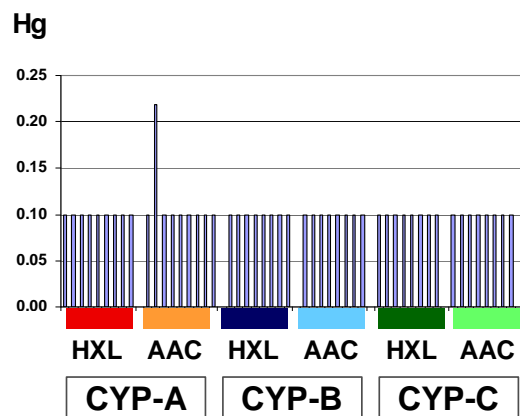
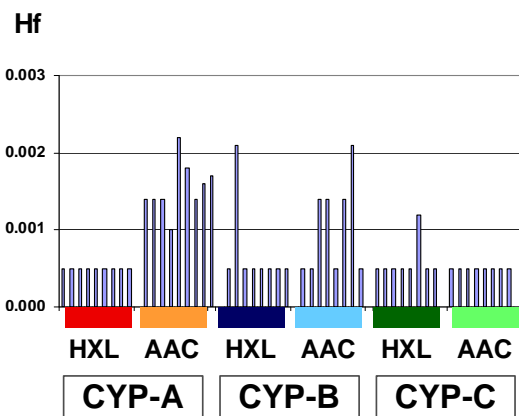
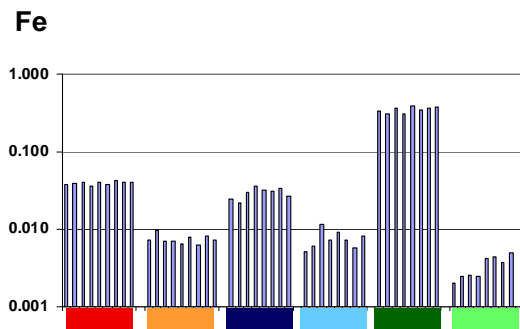
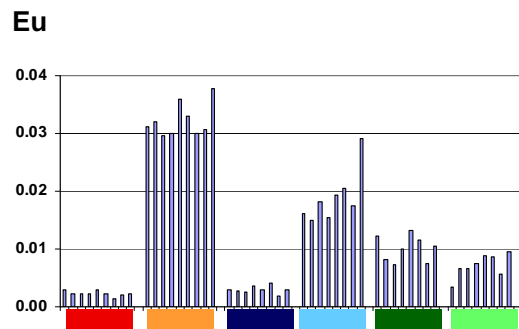
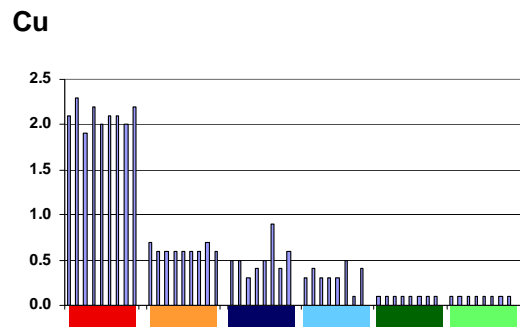
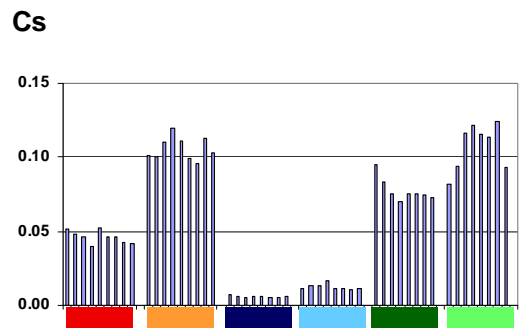
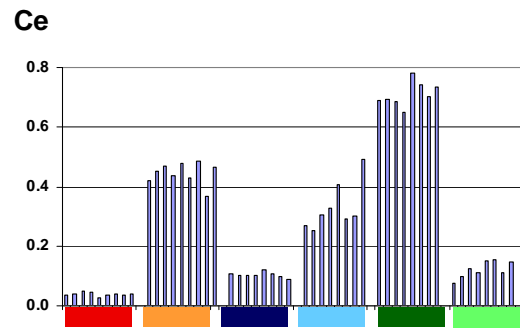
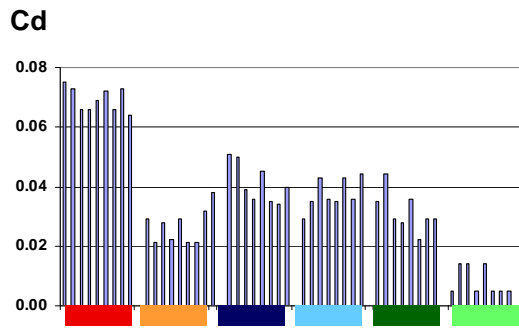
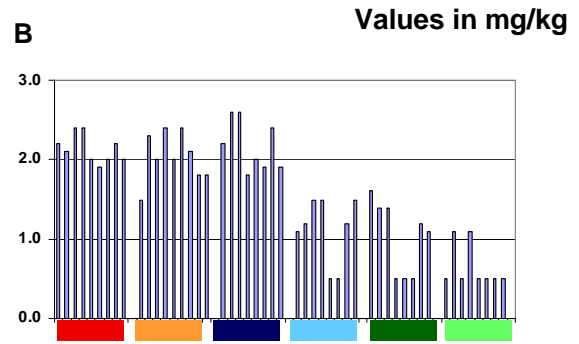
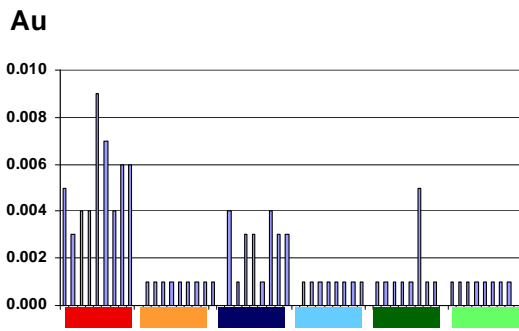
1.7 Scatter plot comparison between sites resampled by different field crews and samples processed by different laboratory preparation assistants.

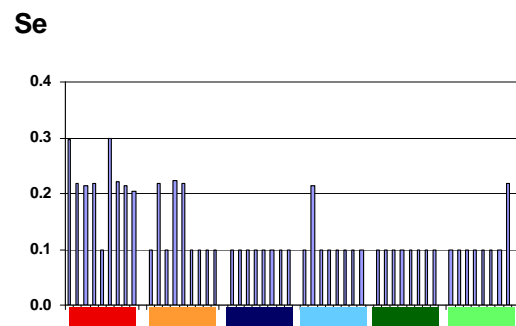
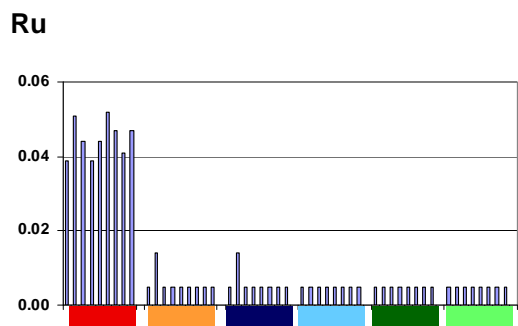
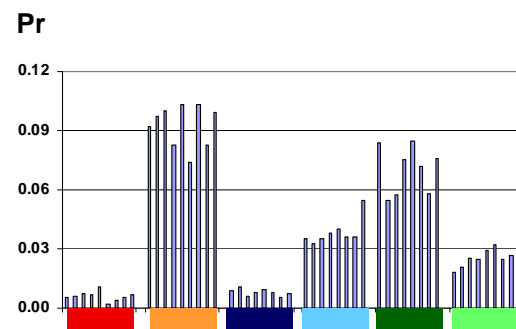
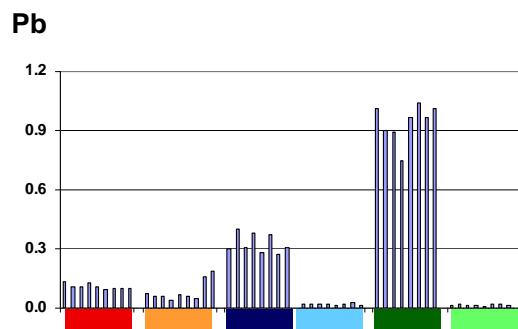
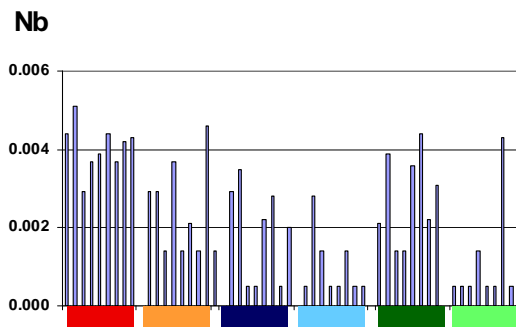
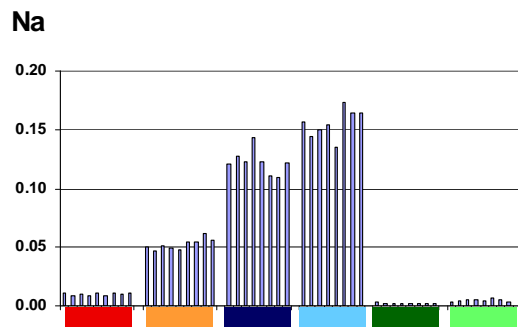
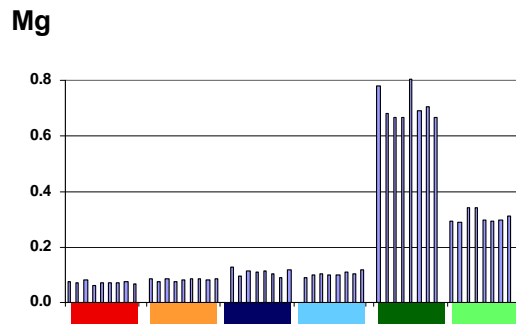
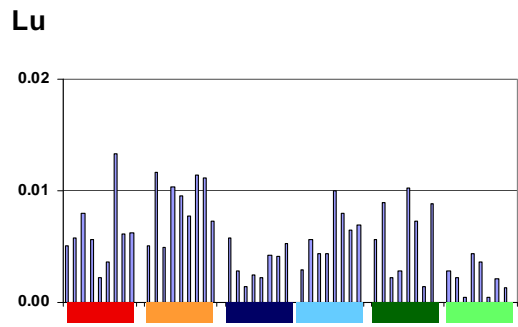
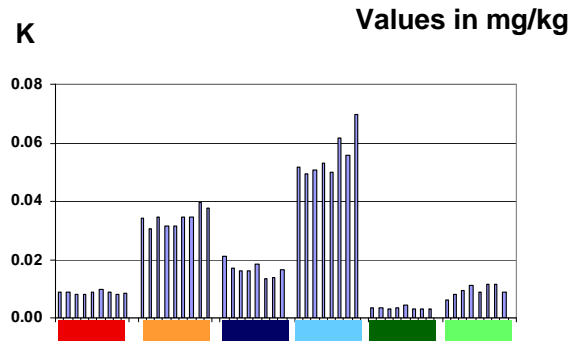
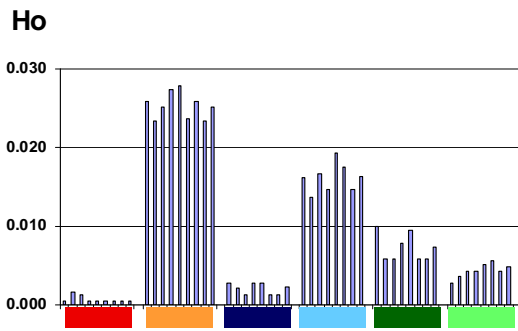




1.8 Variation in selective extraction (AAC and HXL) for project geological reference materials.



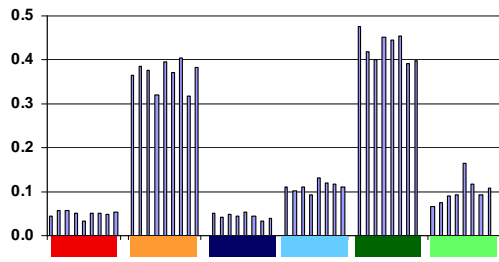




HXL AAC HXL AAC HXL AAC
CYP-A CYP-B CYP-C

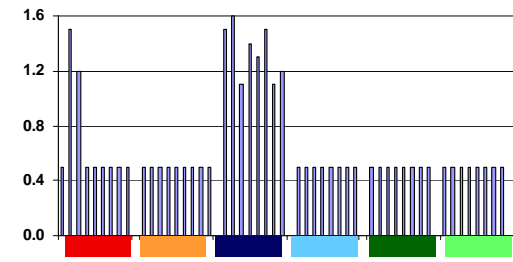
HXL AAC HXL AAC HXL AAC
CYP-A CYP-B CYP-C

La

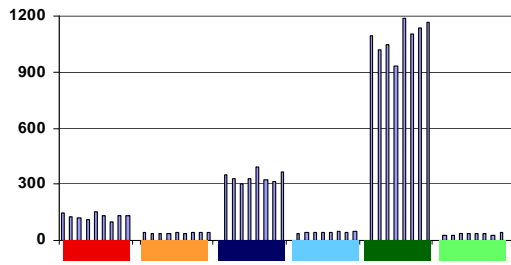


Li

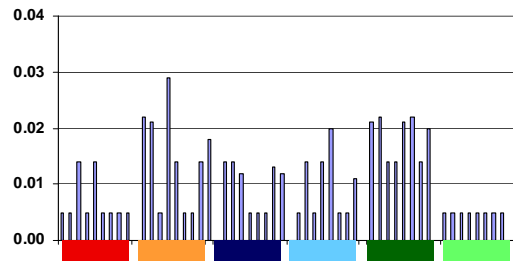
Values in mg/kg



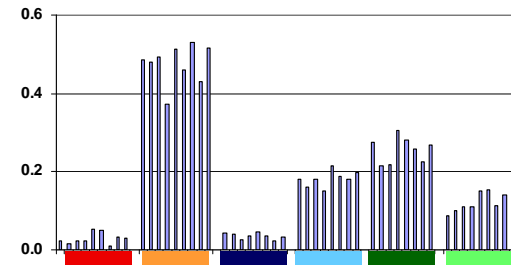
Mn



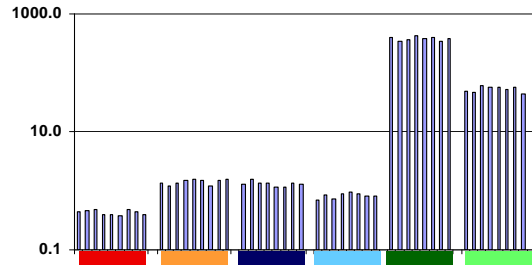
Mo



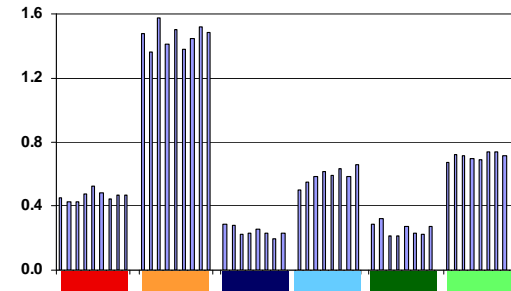
Nd



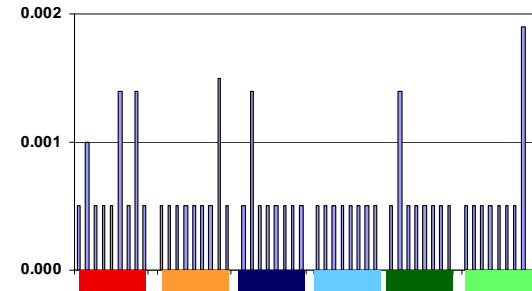
Ni



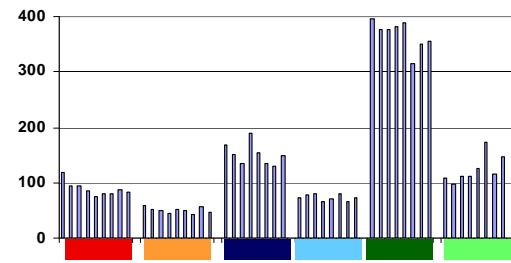
Rb



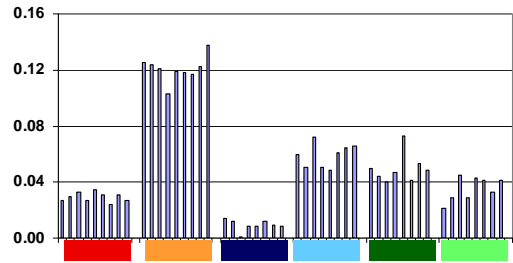
Re



Si



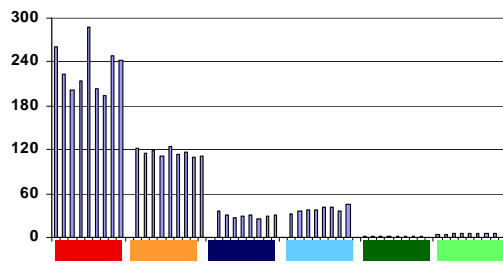
Sm



HXL AAC HXL AAC HXL AAC
 CYP-A CYP-B CYP-C

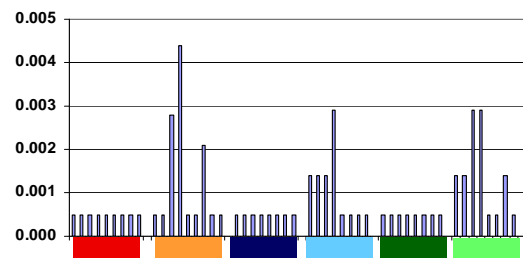
HXL AAC HXL AAC HXL AAC
 CYP-A CYP-B CYP-C

Sr

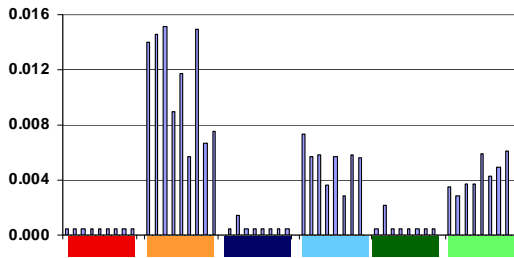


Ta

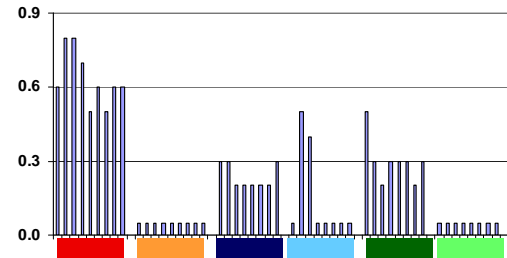
Values in mg/kg



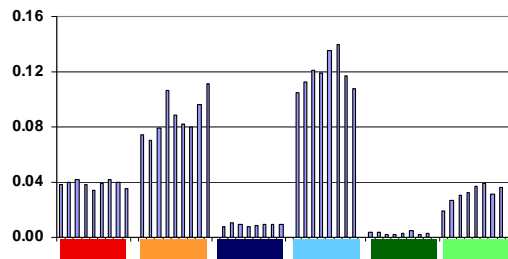
Th



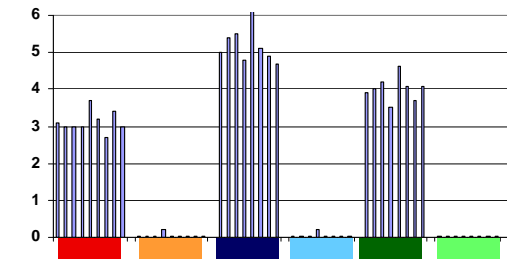
Ti



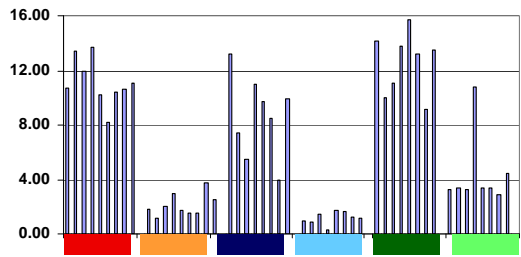
U



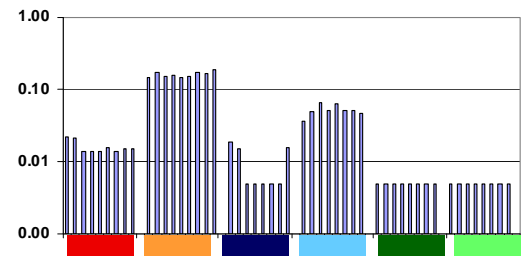
V



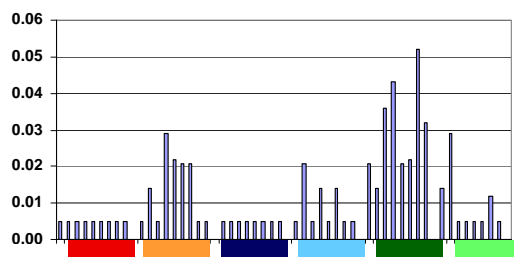
Zn



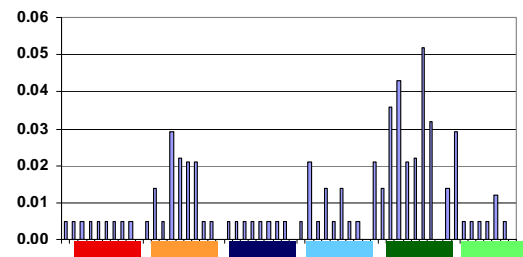
Zr



Te



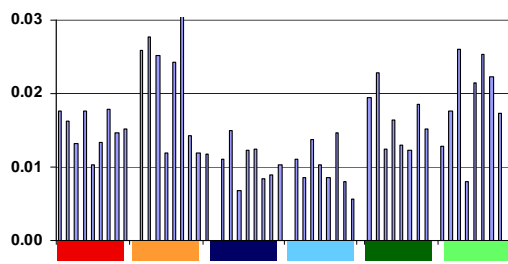
Te



HXL AAC HXL AAC HXL AAC
 CYP-A CYP-B CYP-C

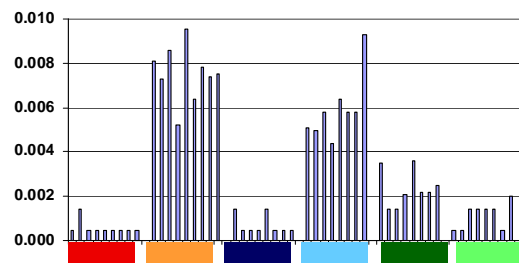
HXL AAC HXL AAC HXL AAC
 CYP-A CYP-B CYP-C

TI

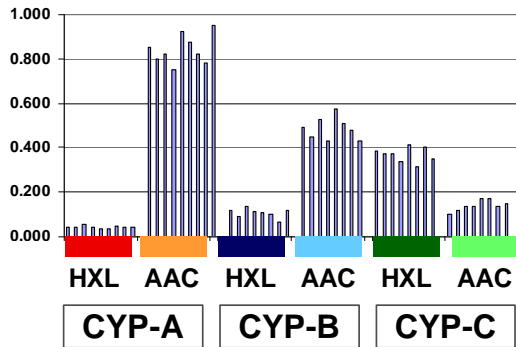


Tm

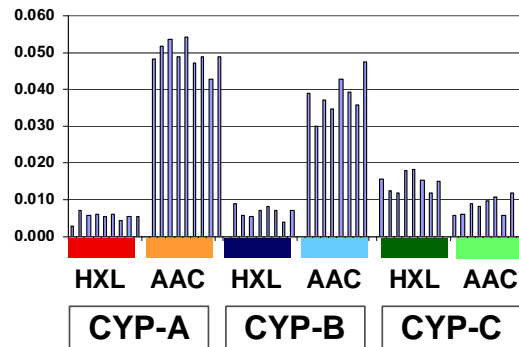
Values in mg/kg



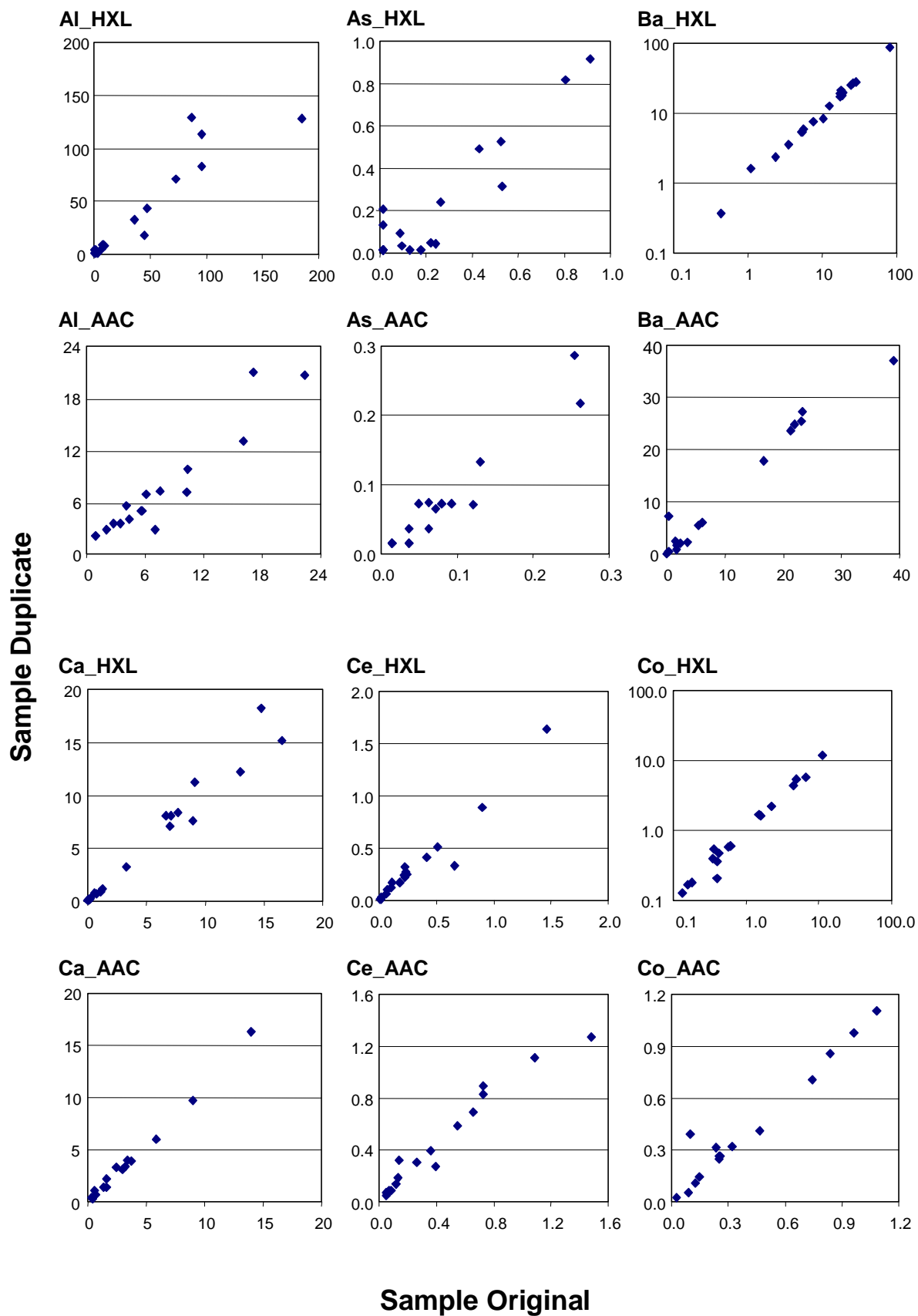
Y

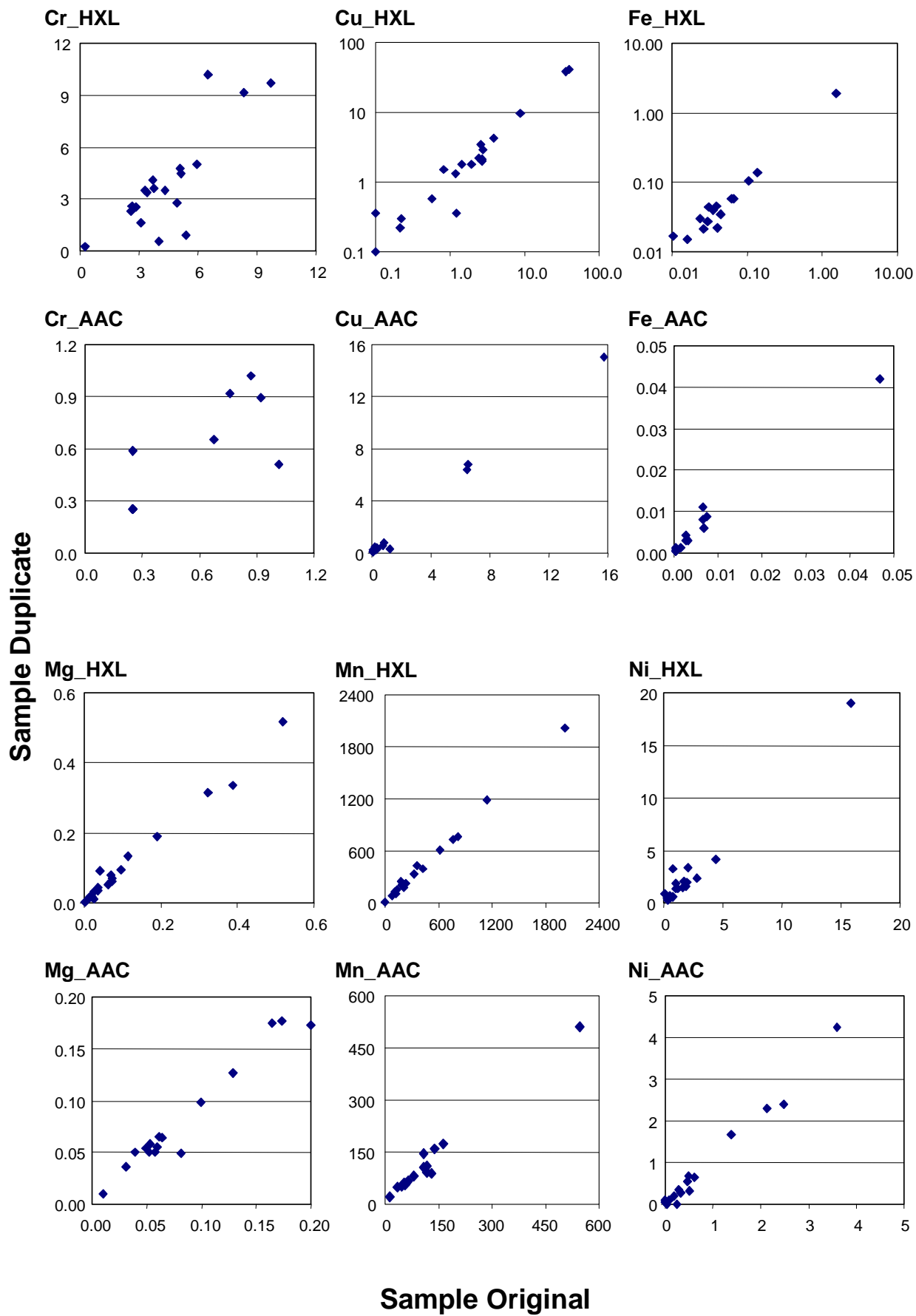


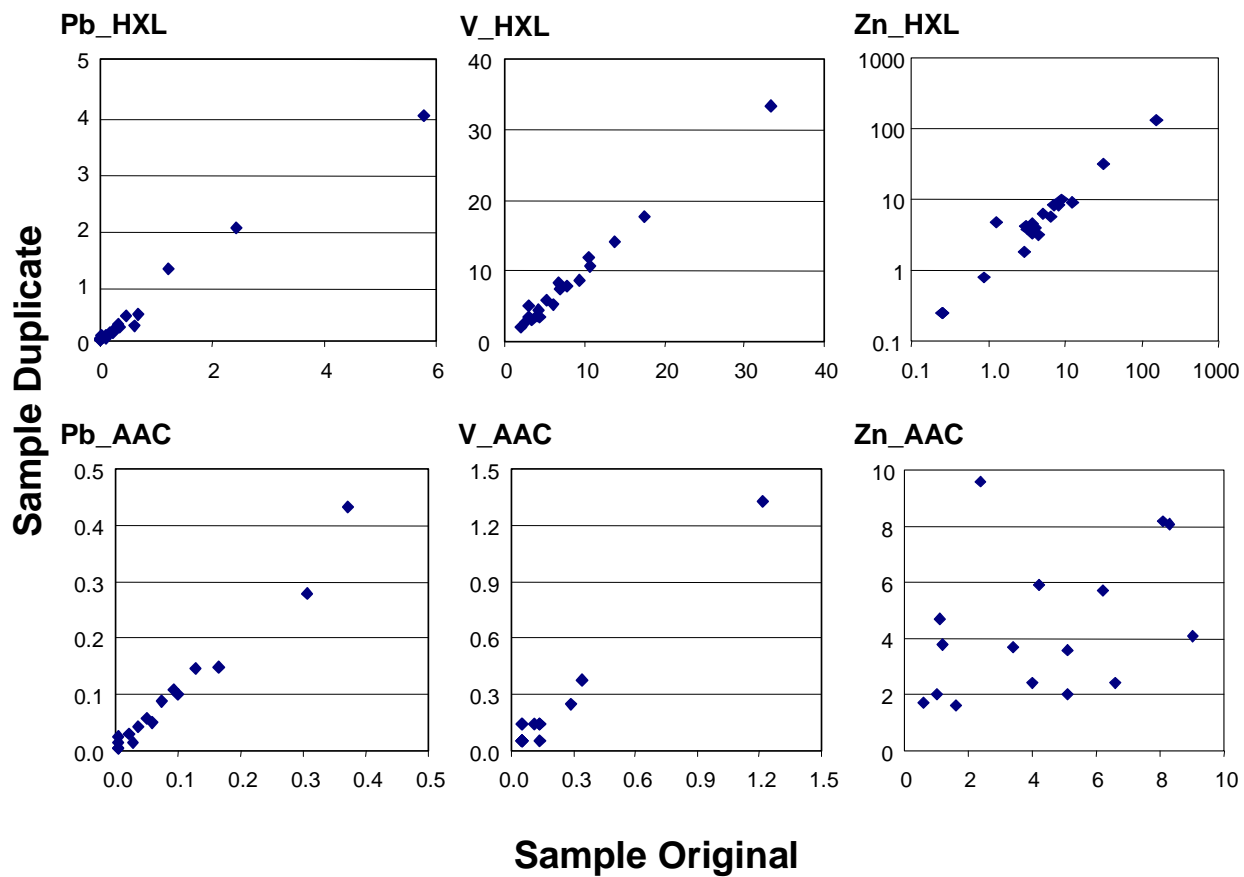
Yb



1.9 Scatter plot comparison of processing and analytical duplicates for selective extractions (AAC and HXL). Values in ppm except Ca, Fe and Mg in %.







1.10 Summary statistics for reference materials. Comparison with certified values and analytical detection limits and decision whether analyses meet the defined DQOs.

CYP-A	Ag ICPMS mg/kg	Al ICPMS %	As ICPMS mg/kg	B ICPMS mg/kg	Ba ICPMS mg/kg	Be ICPMS mg/kg	Bi ICPMS mg/kg	Ca ICPMS %	Cd ICPMS mg/kg	Ce ICPMS mg/kg	Co ICPMS mg/kg	Cr ICPMS mg/kg	Cs ICPMS mg/kg	Cu ICPMS mg/kg
<i>Detection limits</i>	0.003	0.01	0.1	0.5	0.5	0.1	0.02	0.01	0.01	0.01	0.1	0.5	0.02	0.01
Mean	0.011	0.66	1.9	2.2	1182.9	0.3	0.08	31.24	0.24	12.92	7.6	16.6	0.37	30.89
Standard deviation	0.010	0.10	0.3	1.3	85.6	0.1	0.01	3.57	0.03	1.15	0.6	2.1	0.07	2.29
Rec / cert value	0.013	0.71	1.7	2.3	1205.0	0.4	0.09	31.85	0.25	13.20	8.2	18.1	0.42	31.80
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	17.2	6.3	8.9	5.6	1.9	19.1	6.9	2.0	5.6	2.2	7.1	8.7	12.6	2.9
Mean / DL	4	66	19	4	2366	3	4	3124	24	1292	76	33	19	3089
Mean vs rec/cert value	OK	OK	High	OK	OK	OK	OK	OK	OK	OK	OK	Low	Low	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-A	Dy ICPMS mg/kg	Er ICPMS mg/kg	Eu ICPMS mg/kg	Fe ICPMS %	Ga ICPMS mg/kg	Gd ICPMS mg/kg	Ge ICPMS mg/kg	Hf ICPMS mg/kg	Hg ICPMS mg/kg	Ho ICPMS mg/kg	In ICPMS mg/kg	K ICPMS %	La ICPMS mg/kg	Li ICPMS mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.01	0.1	0.02	0.0	0.5	0.1
Mean	1.853	1.03	0.4	0.7	2.1	2.6	0.05	0.05	0.02	0.39	0.01	0.1	10.83	6.96
Standard deviation	0.186	0.11	0.1	0.1	0.3	0.2	0.01	0.00	0.02	0.04	0.00	0.0	0.93	1.17
Rec / cert value	2.000	1.06	0.5	0.8	2.2	2.6	0.05	0.05	0.01	0.40	0.02	0.1	10.90	7.80
Rec vs mean ± 1SD	OK	OK	Low	OK	OK	OK	OK	OK	OK	OK	Low	OK	OK	OK
Abs % diff from Mean	7.9	2.5	19.1	7.6	2.8	1.6	1.8	0.0	55.0	3.7	89.8	3.2	0.7	12.1
Mean / DL	19	10	4	72	105	26	1	1	2	4	1	14	22	70
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Low
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-A	Lu ICPMS mg/kg	Mg ICPMS mg/kg	Mn ICPMS mg/kg	Mo ICPMS mg/kg	Na ICPMS %	Nb ICPMS mg/kg	Nd ICPMS mg/kg	Ni ICPMS mg/kg	Pb ICPMS mg/kg	Pr ICPMS mg/kg	Pt ICPMS mg/kg	Rb ICPMS mg/kg	Re ICPMS mg/kg	Sb ICPMS mg/kg
<i>Detection limits</i>	0.100	0.01	1.0	0.0	0.0	0.1	0.02	0.1	0.01	0.1	0.0	0.1	0.001	0.02
Mean	0.121	0.46	715.4	0.2	0.2	0.2	8.37	29.37	4.37	2.09	<0.002	6.9	0.00	0.16
Standard deviation	0.046	0.05	60.2	0.0	0.0	0.1	1.04	3.85	0.40	0.21	0.0	1.1	0.00	0.03
Rec / cert value	0.100	0.49	721.0	0.2	0.1	0.2	8.45	31.40	4.93	2.14	0.0	7.1	0.00	0.23
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Low
Abs % diff from Mean	17.6	5.2	0.8	3.5	23.0	5.9	1.0	6.9	12.8	2.2	2.9	59.6	37.0	37.0
Mean / DL	1	46	715	16	162	2	418	294	437	21	1	69	2	8
Mean vs rec/cert value	OK	OK	OK	OK	High	OK	OK	OK	Low	OK	OK	OK	OK	Low
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Low
CYP-A	Sc ICPMS mg/kg	Se ICPMS mg/kg	Sm ICPMS mg/kg	Sn ICPMS mg/kg	Sr ICPMS mg/kg	Ta ICPMS mg/kg	Tb ICPMS mg/kg	Te ICPMS mg/kg	Th ICPMS mg/kg	Ti ICPMS %	Tl ICPMS mg/kg	Tm ICPMS mg/kg	U ICPMS mg/kg	V ICPMS mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.5	1.0	0.0	0.1	0.02	0.1	0.001	0.0	0.1	0.1	1
Mean	2.639	0.73	2.1	0.3	1049.6	0.1	0.31	0.05	1.08	0.05	0.1	0.2	0.53	18.96
Standard deviation	0.404	0.47	0.2	0.1	170.1	0.0	0.04	0.03	0.14	0.01	0.0	0.0	0.06	2.61
Rec / cert value	2.800	0.73	2.3	0.3	1075.0	0.1	0.30	0.06	1.10	0.05	0.1	0.2	0.53	18.30
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	6.1	0.0	9.9	4.3	2.4	0.0	4.0	20.0	1.7	1.3	0.3	4.1	0.7	3.5
Mean / DL	26	7	21	1	1050	10	3	3	11	50	3	2	5	19
Mean vs rec/cert value	OK	OK	Low	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-A	W ICPMS mg/kg	Y ICPMS mg/kg	Yb ICPMS mg/kg	Zn ICPMS mg/kg	Zr ICPMS mg/kg	P ICPMS %	Ag INAA mg/kg	As INAA mg/kg	Au INAA mg/kg	Ba INAA mg/kg	Br INAA mg/kg	Ca INAA %	Ce INAA mg/kg	
<i>Detection limits</i>	0.100	0.01	0.1	0.1	0.1	0.01	5	0.5	0.002	50.0	0.5	1	3	
Mean	0.050	12.22	0.9	28.2	2.2	0.02	<5	3.34	0.004	1349.1	17.1	30.27	19.65	
Standard deviation	0.000	1.14	0.1	3.7	0.2	0.01	0.00	0.004	0.004	242.8	2.1	4.04	3.07	
Rec / cert value	0.050	13.30	1.0	30.3	2.3	0.03								
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK								
Abs % diff from Mean	0.0	8.9	9.2	7.4	5.1	20.2								
Mean / DL	1	1222	9	282	22	2	1	1	2	27	34	30	7	
Mean vs rec/cert value	OK	Low	OK	OK	OK	OK								
Decision	Accept	Accept	Accept	Accept	Accept	Accept								
CYP-A	Co INAA mg/kg	Cr INAA mg/kg	Cs INAA mg/kg	Eu INAA mg/kg	Fe INAA %	Hf INAA mg/kg	Hg INAA mg/kg	Ir INAA ug/kg	La INAA mg/kg	Lu INAA mg/kg	Mo INAA mg/kg	Na INAA %	Nd INAA mg/kg	Ni INAA mg/kg
<i>Detection limits</i>	1.000	5	1.0	0.2	0.0	1.0	1	5	0.5	0.05	1.0	0.0	5	20
Mean	10.327	43.09	1.0	0.6	1.2	0.9	<1	<0.005	13.09	0.18	<1	0.2	11.02	<200
Standard deviation	3.692	20.95	0.8	0.1				0.00	1.41	0.08	0.0	0.1		
Mean / DL	10	9	1	3	1	1	1	1	26	4	1	16	1	1
CYP-A	Rb INAA mg/kg	Sb INAA mg/kg	Sc INAA mg/kg	Se INAA mg/kg	Sm INAA mg/kg	Sn INAA mg/kg	Sr INAA mg/kg	Ta INAA mg/kg	Tb INAA mg/kg	Th INAA mg/kg	U INAA mg/kg	W INAA mg/kg	Yb INAA mg/kg	Zn INAA mg/kg
<i>Detection limits</i>	15.000	0.1	0.1	3.0	0.1	200.0	500	0.5	0.5	0.2	0.5	1.0	0.2	50
Mean	13.945	0.40	4.6	<3	2.3	<200	758.18	0.42	0.30	2.39	0.7	0.5	1.25	43.09
Standard deviation	10.032	0.42	3.7	0.0	0.2	0.0	320.12	0.30	0.03	0.40	0.5	0.2	0.19	38.00
Mean / DL	1	4	46	1	23	1	2	1	1	12	1	1	6	1

CYP-B	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.003	0.01	0.1	0.5	0.5	0.1	0.02	0.01	0.01	0.01	0.1	0.5	0.02	0.01
<i>Mean</i>	0.013	4.14	2.2	3.3	21.7	0.2	0.02	6.77	0.15	6.84	32.7	49.5	0.28	81.71
<i>Standard deviation</i>	0.010	0.56	0.4	2.1	2.2	0.1	0.01	0.65	0.02	0.62	2.1	5.3	0.06	4.62
<i>Rec / cert value</i>	0.017	4.43	2.0	3.1	22.6	0.3	0.03	6.86	0.15	7.26	33.6	50.7	0.25	82.74
<i>Rec vs mean ± 1SD</i>	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
<i>Abs % diff from Mean</i>	33.8	7.1	8.2	6.3	4.1	37.1	44.9	1.4	1.9	6.1	2.7	2.5	12.1	1.3
<i>Mean / DL</i>	4	414	22	7	43	2	1	677	15	684	327	99	14	8171
<i>Mean vs rec/cert value</i>	OK	OK	High	OK	OK	OK	OK	OK	OK	OK	OK	OK	High	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-B	Dy	Er	Eu	Fe	Ga	Gd	Ge	Hf	Hg	Ho	In	K	La	Li
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.01	0.1	0.0	0.0	0.5	0.1
<i>Mean</i>	2.218	1.44	0.5	5.9	9.7	2.2	0.11	0.18	0.02	0.48	0.0	0.5	3.37	21.54
<i>Standard deviation</i>	0.182	0.14	0.1	0.4	0.8	0.2	0.07	0.05	0.02	0.06	0.0	0.1	0.35	4.28
<i>Rec / cert value</i>	2.220	1.47	0.5	6.0	10.0	2.3	0.10	0.18	0.02	0.49	0.0	0.5	3.40	25.20
<i>Rec vs mean ± 1SD</i>	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
<i>Abs % diff from Mean</i>	0.1	2.1	2.3	1.3	3.5	5.0	11.1	2.4	14.2	2.2	3.1	3.6	0.8	17.0
<i>Mean / DL</i>	22	14	5	591	485	22	1	2	2	5	2	50	7	215
<i>Mean vs rec/cert value</i>	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Low
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-B	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Pb	Pr	Pt	Rb	Re	Sb
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	%	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.01	1.0	0.0	0.0	0.1	0.02	0.1	0.01	0.1	0.0	0.1	0.001	0.02
<i>Mean</i>	0.209	2.60	1190.4	0.3	1.2	0.1	3.99	74.00	3.93	0.89	0.0	12.4	0.00	0.12
<i>Standard deviation</i>	0.029	0.27	105.4	0.0	0.3	0.0	0.52	7.81	0.70	0.09	0.0	1.9	0.00	0.03
<i>Rec / cert value</i>	0.200	2.66	1187.0	0.3	0.9	0.1	4.25	78.60	4.64	0.98	0.0	11.6	0.00	0.12
<i>Rec vs mean ± 1SD</i>	OK	OK	OK	OK	OK	Low	OK	OK	OK	Low	OK	OK	OK	OK
<i>Abs % diff from Mean</i>	4.2	2.3	0.3	1.8	25.9	47.8	6.5	6.2	18.2	10.7	100.0	6.1	41.4	2.9
<i>Mean / DL</i>	2	260	1190	26	1161	1	200	740	393	9	1	124	2	6
<i>Mean vs rec/cert value</i>	OK	OK	OK	OK	High	OK	OK	OK	Low	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-B	Sc	Se	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl	Tm	U	V
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.5	0.5	0.0	0.1	0.02	0.1	0.001	0.0	0.1	0.1	1
<i>Mean</i>	25.338	0.47	1.3	0.4	92.7	0.0	0.32	0.03	0.48	0.15	0.0	0.2	0.57	150.38
<i>Standard deviation</i>	2.725	0.32	0.2	0.1	8.3	0.0	0.05	0.03	0.07	0.03	0.0	0.0	0.05	9.49
<i>Rec / cert value</i>	24.700	0.39	1.4	0.5	94.7	0.1	0.37	0.02	0.50	0.18	0.1	0.2	0.56	152.00
<i>Rec vs mean ± 1SD</i>	OK	OK	OK	OK	OK	OK	Low	OK	OK	OK	OK	OK	OK	OK
<i>Abs % diff from Mean</i>	2.5	16.2	1.8	12.1	2.1	0.0	15.4	18.0	3.3	100.0	10.4	1.7	1.5	1.1
<i>Mean / DL</i>	253	5	13	1	185	10	3	1	5	151	2	2	6	150
<i>Mean vs rec/cert value</i>	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-B	W	Y	Yb	Zn	Zr	P	Ag	As	Au	Ba	Br	Ca	Ce	
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	INAA	INAA	INAA	INAA	INAA	INAA	INAA	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	
<i>Detection limits</i>	0.100	0.01	0.1	0.1	0.1	0.01	5	0.5	0.002	50.0	0.5	1	3	
<i>Mean</i>	0.050	13.04	1.4	89.9	7.0	0.07	< 5	2.90	0.002	51.4	8.6	7.68	11.10	
<i>Standard deviation</i>	0.000	0.97	0.1	7.3	0.9	0.03	0.00	0.002	0.002	70.0	0.9	1.01	2.42	
<i>Rec / cert value</i>	0.100	13.25	1.5	93.2	7.5	0.09								
<i>Rec vs mean ± 1SD</i>	Low	OK	OK	OK	OK	OK								
<i>Abs % diff from Mean</i>	100.0	1.6	3.6	3.7	7.9	17.5								
<i>Mean / DL</i>	0	1304	14	899	70	7	1	1	1	1	17	8	4	
<i>Mean vs rec/cert value</i>	OK	OK	OK	OK	OK	OK								
Decision	Accept	Accept	Accept	Accept	Accept	Accept								
CYP-B	Co	Cr	Cs	Eu	Fe	Hf	Hg	Ir	La	Lu	Mo	Na	Nd	Ni
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	1.000	5	1.0	0.2	0.0	1.0	1	5	0.5	0.05	1.0	0.0	5	20
<i>Mean</i>	38.754	201.52	0.9	0.5	6.2	0.9	< 1	< 0.005	4.41	0.28	< 1	1.1	4.16	27.25
<i>Standard deviation</i>	3.173	24.42	0.9	0.2			0.00	0.51	0.08	0.0	0.1			
<i>Mean / DL</i>	39	40	1	3	1	1	1	1	9	6	1	108	1	1
CYP-B	Rb	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Th	U	W	Yb	Zn
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	15.000	0.1	0.1	3.0	0.1	200.0	500	0.5	0.5	0.2	0.5	1.0	0.2	50
<i>Mean</i>	17.145	0.26	32.0	< 3	1.8	< 200	< 500	0.36	0.33	0.55	0.4	0.5	1.89	113.41
<i>Standard deviation</i>		0.29	1.5	0.0	0.2	0.0	0.00	0.36	0.14	0.53	0.4	0.2	0.21	72.79
<i>Mean / DL</i>	1	3	320	1	18	1	1	1	1	3	1	1	9	2

CYP-C	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.003	0.01	0.1	0.5	0.5	0.1	0.02	0.01	0.01	0.01	0.1	0.5	0.02	0.01
Mean	0.011	0.78	1.7	3.8	23.4	0.2	0.01	0.38	0.09	4.86	205.0	1111.5	0.68	18.80
Standard deviation	0.008	0.11	0.3	1.9	2.0	0.1	0.01	0.05	0.01	0.42	14.0	88.3	0.11	1.31
Rec / cert value	0.023	0.79	1.5	3.6	23.8	0.2	0.02	0.40	0.09	5.01	210.0	1152.0	0.71	19.04
Rec vs mean ± 1SD	Low	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	98.8	1.1	12.3	3.1	1.7	9.9	39.5	3.3	3.8	3.0	2.4	3.6	5.0	1.3
Mean / DL	4	78	17	8	47	2	1	38	9	486	2050	2223	34	1880
Mean vs rec/cert value	OK	OK	High	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-C	Dy	Er	Eu	Fe	Ga	Gd	Ge	Hf	Hg	Ho	In	K	La	Li
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.01	0.1	0.0	0.0	0.5	0.1
Mean	0.488	0.25	0.1	12.8	1.5	0.7	0.18	0.05	0.06	0.07	0.0	0.0	3.14	2.59
Standard deviation	0.054	0.05	0.0	1.0	0.2	0.1	0.08	0.00	0.02	0.02	0.0	0.0	0.30	0.49
Rec / cert value	0.500	0.25	0.2	13.0	1.5	0.8	0.20	0.00	0.06	0.09	0.0	0.1	3.22	2.80
Rec vs mean ± 1SD	OK	OK	Low	OK	OK	OK	OK	High	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	2.4	1.9	34.6	1.7	1.8	1.6	11.6	100.0	4.3	28.9	5.4	2.7	2.4	8.1
Mean / DL	5	3	1	1279	75	7	2	1	6	1	1	5	6	26
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	Low
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-C	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Pb	Pr	Pt	Rb	Re	Sb
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	%	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.01	1.0	0.0	0.0	0.1	0.02	0.1	0.01	0.1	0.0	0.1	0.001	0.02
Mean	0.050	10.66	1979.4	0.3	0.1	0.1	2.57	3498.87	4.31	0.65	0.0	3.3	0.00	0.10
Standard deviation	0.000	1.41	225.7	0.1	0.0	0.0	0.26	431.46	0.36	0.07	0.0	0.5	0.00	0.03
Rec / cert value	0.100	11.10	1935.0	0.4	0.1	0.0	2.64	3493.00	4.50	0.67	0.0	3.2	0.00	0.12
Rec vs mean ± 1SD	Low	OK	OK	OK	OK	High	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	99.9	4.1	2.2	19.5	21.3	100.0	2.6	0.2	4.5	2.6	100.0	1.7	10.4	13.6
Mean / DL	1	1066	1979	34	95	1	129	34989	431	7	2	33	2	5
Mean vs rec/cert value	OK	OK	OK	Low	Low	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-C	Sc	Se	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl	Tm	U	V
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.5	0.5	0.0	0.1	0.02	0.1	0.001	0.0	0.1	0.1	1
Mean	17.925	0.34	0.6	0.3	10.3	0.1	0.05	0.04	0.68	0.01	0.0	0.1	0.20	47.84
Standard deviation	1.938	0.26	0.1	0.1	1.0	0.0	0.01	0.03	0.07	0.00	0.0	0.0	0.00	3.69
Rec / cert value	18.100	0.33	0.6	0.2	10.8	0.1	0.10	0.04	0.70	0.00	0.1	0.1	0.20	48.80
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	Low	OK	OK	High	Low	Low	OK	OK
Abs % diff from Mean	1.0	3.4	3.9	14.3	4.5	0.0	89.3	3.9	2.5	100.0	30.5	99.9	0.0	2.0
Mean / DL	179	3	6	1	21	10	1	2	7	14	2	1	2	48
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	High	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-C	W	Y	Yb	Zn	Zr	P	Ag	As	Au	Ba	Br	Ca	Ce	
	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	INAA	INAA	INAA	INAA	INAA	INAA	INAA	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	
<i>Detection limits</i>	0.100	0.01	0.1	0.1	0.1	0.01	5	0.5	0.002	50.0	0.5	1	3	
Mean	0.051	2.65	0.2	59.7	1.7	0.01	< 5	2.10	0.002	39.6	14.0	0.54	10.74	
Standard deviation	0.007	0.23	0.1	4.4	0.2	0.00	0.00	0.003	0.003	40.4	1.4	0.22	3.75	
Rec / cert value	0.050	2.70	0.3	62.2	1.9	0.05								
Rec vs mean ± 1SD	High	OK	OK	OK	OK	OK								
Abs % diff from Mean	100.0	1.9	5.2	4.1	8.6	89.8								
Mean / DL	1	265	2	597	17	1	1.0	1.0	0.9	0.8	28	0.5	3.6	
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK								
Decision	Accept	Accept	Accept	Accept	Accept	Accept								
CYP-C	Co	Cr	Cs	Eu	Fe	Hf	Hg	Ir	La	Lu	Mo	Na	Nd	Ni
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	1.000	5	1.0	0.2	0.0	1.0	1	5	0.5	0.05	1.0	0.0	5	20
Mean	213.547	4395.66	1.1	0.1	11.5	0.5	< 1	< 0.005	4.88	0.05	< 1	0.1	3.60	3597.17
Standard deviation	14.877	560.69	1.1	0.1				0.00	0.45	0.03	0.0	0.0		
Mean / DL	214	879	1.1	0.7	1.0	1.0	1.0	1.0	9.8	1.1	1.0	5.6	1.0	1.0
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
CYP-C	Rb	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Th	U	W	Yb	Zn
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	15.000	0.1	0.1	3.0	0.1	200.0	500	0.5	0.5	0.2	0.5	1.0	0.2	50
Mean	9.132	0.15	17.6	< 3	0.8	< 200	< 500	0.30	0.30	0.94	0.5	0.6	0.36	127.64
Standard deviation		0.19	1.0	0.0	0.1	0.0	0.00	0.00	0.00	0.69	0.5	0.7	0.19	68.54
Mean / DL	1.0	1.5	176	1.0	8.5	1.0	1.0	1.0	1.0	4.7	0.9	0.6	1.8	2.6
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept

USGS GXR-6	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu
	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg
<i>Detection limits</i>	0.003	0.01	0.1	0.5	0.5	0.1	0.02	0.01	0.01	0.01	0.1	0.5	0.02	0.01
Mean	0.265	5.10	285.0	0.5	902.0	0.6	0.15	0.16	0.04	29.80	13.7	81.8	2.80	73.10
Standard deviation	0.277	5.28	252.0	0.5	793.0	0.6	0.17	0.19	0.10	29.80	12.5	70.0	2.01	62.90
Rec / cert value	0.255	5.48	262.0	0.5	852.0	0.8	0.15	0.17	0.08	27.60	12.6	64.2	2.72	65.40
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	3.8	7.5	8.1	0.0	5.5	33.3	0.0	6.3	100.0	7.4	8.0	21.5	2.9	10.5
Mean / DL	88	510	2850	1	1804	6	8	16	4	2980	137	164	140	7310
Mean vs rec/cert value	OK	OK	High	OK	OK	Low	OK	OK	OK	OK	High	High	OK	High
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
USGS GXR-6	Dy	Er	Eu	Fe	Ga	Gd	Ge	Hf	Hg	Ho	In	K	La	Li
	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.01	0.1	0.0	0.0	0.5	0.1
Mean	1.500	0.80	0.5	5.1	15.6	2.0	0.05	0.50	0.11	0.30	0.1	1.1	10.20	20.70
Standard deviation	1.420	0.70	0.5	6.1	13.9	2.2	0.05	0.40	0.12	0.30	0.1	0.9	10.80	17.70
Rec / cert value	1.310	0.60	0.4	5.8	14.2	2.2	0.05	0.50	0.09	0.20	0.1	0.9	11.40	13.60
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	12.7	25.0	20.0	15.0	9.0	10.0	0.0	0.0	18.2	33.3	0.0	23.2	11.8	34.3
Mean / DL	15	8	5	505	780	20	1	5	11	3	3	112	20	207
Mean vs rec/cert value	High	High	High	Low	High	Low	OK	OK	High	OK	OK	High	Low	High
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
USGS GXR-6	Lu	Mg	Mn	Mo	Na	Nb	Nd	Ni	Pb	Pr	Pt	Rb	Re	Sb
	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg
<i>Detection limits</i>	0.100	0.01	1.0	0.0	0.0	0.1	0.02	0.1	0.01	0.1	0.0	0.1	0.001	0.02
Mean	0.050	0.30	1190.0	1.6	0.2	0.1	9.07	21.90	94.40	2.30	0.0	50.6	0.00	2.44
Standard deviation	0.100	0.26	1160.0	1.5	0.1	0.1	9.45	18.40	105.00	2.20	0.0	44.2	0.00	2.41
Rec / cert value	0.050	0.30	1175.0	1.4	0.2	1.0	8.19	21.70	95.00	2.30	0.0	56.7	0.00	2.17
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	Low	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	0.0	0.0	1.3	14.8	12.0	1900.0	9.7	0.9	0.6	0.0	0.0	12.1	0.0	11.1
Mean / DL	1	30	1190	162	175	1	454	219	9440	23	1	506	1	122
Mean vs rec/cert value	OK	OK	OK	High	High	OK	High	OK	OK	OK	OK	Low	OK	High
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
USGS GXR-6	Sc	Se	Sm	Sn	Sr	Ta	Tb	Te	Th	Ti	Tl	Tm	U	V
	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg
<i>Detection limits</i>	0.100	0.1	0.1	0.5	0.5	0.0	0.1	0.02	0.1	0.001	0.0	0.1	0.1	1
Mean	27.200	0.70	2.0	0.9	29.4	0.1	0.20	0.03	4.40	0.10	1.4	0.1	0.80	175.00
Standard deviation	24.700	0.60	2.3	1.3	28.4	0.1	0.20	0.01	3.90	0.12	1.5	0.1	0.90	155.00
Rec / cert value	26.800	0.40	1.8	0.9	28.7	0.1	0.20	0.03	4.30	0.12	1.6	0.1	0.70	163.00
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Abs % diff from Mean	1.5	42.9	10.0	1.2	2.4	0.0	0.0	0.0	2.3	20.0	9.2	0.0	12.5	6.9
Mean / DL	272	7	20	2	59	10	2	2	44	100	71	1	8	175
Mean vs rec/cert value	OK	High	High	OK	OK	OK	OK	OK	OK	Low	Low	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
USGS GXR-6	W	Y	Yb	Zn	Zr	P	Ag	As	Au	Ba	Br	Ca	Ce	
	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS mg/kg	ICPMS %	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA %	INAA mg/kg	INAA mg/kg
<i>Detection limits</i>	0.100	0.01	0.1	0.1	0.1	0.01	5	0.5	0.002	50.0	0.5	1	3	
Mean	0.050	4.59	0.7	115.0	18.5	0.05	< 5	310.50	0.087	1165.0	2.3	0.56	39.75	
Standard deviation	0.050	5.65	0.8	113.0	14.9	0.01	0.00	0.00	0.008	108.5	1.7	0.18	2.66	
Rec / cert value	0.090	5.70	0.7	112.2	17.2	0.04	0.00	0.00	0.085	1374.0	0.0	0.00	36.60	
Rec vs mean ± 1SD	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	High	High	High	
Abs % diff from Mean	80.0	24.2	0.0	2.4	7.0	15.6			1.9	17.9	100.0	100.0	7.9	
Mean / DL	1	459	7	1150	185	5	1	1	43	23	5	1	13	
Mean vs rec/cert value	OK	Low	OK	OK	OK	OK			OK	Low	OK	OK	OK	
Decision	Accept	Accept	Accept	Accept	Accept	Accept			Accept	Accept	Accept	Accept	Accept	
USGS GXR-6	Co	Cr	Cs	Eu	Fe	Hf	Hg	Ir	La	Lu	Mo	Na	Nd	Ni
	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA %	INAA mg/kg	INAA mg/kg	INAA ug/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA %	INAA mg/kg	INAA mg/kg
<i>Detection limits</i>	1.000	5	1.0	0.2	0.0	1.0	1	5	0.5	0.05	1.0	0.0	5	20
Mean	13.625	96.75	4.0	0.7	5.7	4.0	< 1	< 0.005	14.43	0.37	< 1	0.1	11.00	11.25
Standard deviation	1.302	2.96	0.9	0.3					0.00	0.69	0.07	0.0		
Rec / cert value	12.900	86.90	4.3	0.7					0.00	14.30	0.33	0.0	0.1	
Rec vs mean ± 1SD	OK	High	OK	OK					OK	OK	OK	OK	OK	
Abs % diff from Mean	5.3	10.2	6.3	6.2					0.9	11.4	9.1			
Mean / DL	14	19	4	3	1	1	1	1	29	7	1	11	1	1
Mean vs rec/cert value	OK	High	OK	OK					OK	OK	OK	Low		
Decision	Accept	Low	Accept	Accept					Accept	Accept	Accept	Accept	Accept	
USGS GXR-6	Rb	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Th	U	W	Yb	Zn
	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg	INAA mg/kg
<i>Detection limits</i>	15.000	0.1	0.1	3.0	0.1	200.0	500	0.5	0.5	0.2	0.5	1.0	0.2	50
Mean	84.125	5.03	25.9	< 3	2.6	< 200	< 500	0.33	0.30	5.15	0.9	3.0	2.14	145.00
Standard deviation		0.43	1.1	0.0	0.2	0.0	0.00	0.07	0.00	0.60	0.9	3.8	0.17	78.15
Rec / cert value		4.55	25.0	2.8				0.48	0.43	5.33	0.0	0.0	1.92	0.00
Rec vs mean ± 1SD		OK	OK	Low				Low	Low	OK	OK	OK	OK	High
Abs % diff from Mean		15.4	3.4	7.8				46.5	43.3	3.5	100.0	100.0	10.2	100.0
Mean / DL	1	50	259	1	26	1	1	1	1	26	2	3	11	3
Mean vs rec/cert value		High	OK	OK				OK	OK	OK	OK	OK	High	OK
Decision		Accept	Accept	Accept				Accept	Accept	Accept	Accept	Accept	Accept	Accept

TILL -1	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.002	50.0	0.5	1.000	3	1	5	1	0.2	0.0	1	1
Mean	0.000	18.66	0.014	700.2	6.6		72.48	17.85	66.61	1.13	1.6	4.8	12.72	<1
Standard deviation	0.000	1.47	0.024	104.5	0.8		3.24	0.89	4.75	0.53	0.3		1.45	
Rec / cert value	0.000	18.00	0.013	702.0	6.4		71.00	18.00	65.00	1.00	1.3		13.00	
Rec vs mean ± 1SD	High	OK	OK	OK	OK		OK	OK	OK	OK	OK		OK	OK
Abs % diff from Mean		3.5	10.0	0.3	2.7		2.0	0.8	2.4	11.6	17.8	100.0	2.2	
Mean / DL	1	37	7	14	13		24	18	13	1	8	1	13	1
Mean vs rec/cert value	OK	OK	OK	OK	OK		OK	OK	OK	OK	High	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept		Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL -1	Ir	La	Lu	Mo	Na	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sn	Sr
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.1	1.0	0.0	5.0	20	15	0.1	0.1	3.0	0.1	200	500
Mean	0.000	28.69	0.6	<1	0.0	26.0	30.66	27.03	7.74	13.47	0.0	5.7	0.00	<500
Standard deviation	0.000	1.09	0.1	0.0	0.0	2.8	83.22		0.43	0.51	0.0	1.0	0.00	0.00
Rec / cert value	0.000	28.00	0.6	0.0	0.0	26.0	24.00		7.80	13.10	0.0	5.9	0.00	0.00
Rec vs mean ± 1SD	High	OK	OK	OK	High	OK	OK		OK	OK	High	OK	High	OK
Abs % diff from Mean		2.4	5.2			0.1	21.7	100.0	0.8	2.7		4.1		
Mean / DL	1	57	13	1	1	5	2	1	77	135	1	57	1	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL -1	Ta	Tb	Th	U	W	Yb	Zn							
	INAA	INAA	INAA	INAA	INAA	INAA	INAA							
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
<i>Detection limits</i>	0.500	0.5	0.2	0.5	1.0	0.2	50							
Mean	0.672	0.71	5.8	5.7	0.0	3.9	86.07							
Standard deviation	0.683	0.28	0.6	0.8	0.0	0.2	42.83							
Rec / cert value	0.700	1.00	5.6	5.6	0.0	3.9	56.00							
Rec vs mean ± 1SD	OK	Low	OK	OK	High	OK	OK							
Abs % diff from Mean	4.1	40.6	3.6	0.9		0.5	34.9							
Mean / DL	1	1	29	11	1	20	2							
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK							
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept							
TILL -2	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.002	50.0	0.5	1.0	3	1	5	1	0.2	0.0	1	1
Mean	0.000	26.70	0.002	523.8	11.9	0.0	99.57	14.77	75.57	11.30	1.3	3.8	10.28	<1
Standard deviation	0.000	1.80	0.001	67.5	1.1	0.0	5.08	0.86	3.93	1.44	0.2		0.93	0.00
Rec / cert value	0.000	26.00	0.002	540.0	12.2	0.0	98.00	15.00	74.00	12.00	1.0		11.00	
Rec vs mean ± 1SD	High	OK	OK	OK	OK	High	OK	OK	OK	OK	OK		OK	OK
Abs % diff from Mean		2.6	12.9	3.1	2.5		1.6	1.6	2.1	6.2	22.4	100.0	7.0	
Mean / DL	1	53	1	10	24	1	33	15	15	11	6	1	10	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	High	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL -2	Ir	La	Lu	Mo	Na	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sn	Sr
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.1	1.0	0.0	5.0	20	15	0.1	0.1	3.0	0.1	200	500
Mean	0.000	45.56	0.6	14.4	0.0	35.5	<20	138.52	1.04	12.23	0.0	7.1	0.00	500.00
Standard deviation	0.000		0.1	6.1	0.0	4.0	0.00		0.43	0.49	0.0	1.3	0.00	0.00
Rec / cert value	0.000		0.6	14.0	0.0	36.0	0.00		0.80	12.00	0.0	7.4	0.00	0.00
Rec vs mean ± 1SD	High		OK	OK	High	OK	OK		OK	OK	High	OK	High	High
Abs % diff from Mean		100.0	2.7	2.6		1.4		100.0	23.0	1.9		3.7		100.0
Mean / DL	1	1	12	14	1	7	1	1	10	122	1	71	1	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	High	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL -2	Ta	Tb	Th	U	W	Yb	Zn							
	INAA	INAA	INAA	INAA	INAA	INAA	INAA							
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
<i>Detection limits</i>	0.500	0.5	0.2	0.5	1.0	0.2	50							
Mean	1.185	0.70	18.4	5.9	0.0	3.8	120.00							
Standard deviation	0.974	0.35	1.3	0.7	0.0	0.3	41.23							
Rec / cert value	1.900	1.20	18.4	5.7	0.0	3.7	130.00							
Rec vs mean ± 1SD	OK	Low	OK	OK	High	OK	OK							
Abs % diff from Mean	60.3	70.6	0.1	4.0		2.1	8.3							
Mean / DL	2	1	92	12	1	19	2							
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK							
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept							

TILL-3	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.002	50.0	0.5	1.0	3	1	5	1	0.2	0.0	1	1
Mean	0.000	87.41	0.004	481.8	4.8	0.0	42.70	14.79	125.16	1.82	0.0	2.8	6.38	<1
Standard deviation	0.000	2.85	0.003	77.4	1.0	0.0	2.93	0.78	5.24	0.81	0.0	0.78		
Rec / cert value	0.000	87.00	0.006	489.0	4.5	0.0	42.00	15.00	123.00	1.70	0.0		8.00	
Rec vs mean ± 1SD	High	OK	OK	OK	OK	High	OK	OK	OK	OK	High		Low	
Abs % diff from Mean		0.5	57.1	1.5	6.8		1.7	1.4	1.7	6.6		100.0	25.4	
Mean / DL	1	175	2	10	10	1	14	15	25	2	1	1	6	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL-3	Ir	La	Lu	Mo	Na	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sn	Sr
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.1	1.0	0.0	5.0	20	15	0.1	0.1	3.0	0.1	200	500
Mean	0.000	20.97	0.2	<1	0.0	16.8	22.79	40.57	1.07	10.00	0.0	3.2	0.00	<1000
Standard deviation	0.000	0.66	0.0	0.0	0.0	6.7	21.77		0.33	0.44	0.0	0.5	0.00	0.00
Rec / cert value	0.000	21.00	0.2		0.0	16.0	39.00		0.90	10.00	0.0	3.3	0.00	
Rec vs mean ± 1SD	High	OK	High		High	OK	OK		OK	OK	High	OK	High	
Abs % diff from Mean		0.1	16.8			4.8	71.2	100.0	15.7	0.0		2.7		
Mean / DL	1	42	5	1	1	3	1	1	11	100	1	32	1	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	High	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL-3	Ta	Tb	Th	U	W	Yb	Zn							
	INAA	INAA	INAA	INAA	INAA	INAA	INAA							
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
<i>Detection limits</i>	0.500	0.5	0.2	0.5	1.0	0.2	50							
Mean	0.000	0.00	4.9	2.1	0.0	1.5	56.89							
Standard deviation	0.000	0.00	0.6	0.7	0.0	0.1	19.62							
Rec / cert value	0.000	0.00	4.6	2.1	0.0	1.5	56.00							
Rec vs mean ± 1SD	High	High	OK	OK	High	OK	OK							
Abs % diff from Mean			5.7	0.4		3.1	1.6							
Mean / DL	1	1	24	4	1	8	1							
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK							
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept							
TILL-4	Ag	As	Au	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	Hg
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.002	50.0	0.5	1.0	3	1	5	1	0.2	0.0	1	1
Mean	0.000	112.69	0.003	394.3	8.6	0.0	79.89	7.97	54.00	11.57	0.0	3.9	10.38	<1
Standard deviation	0.000	5.87	0.002	82.5	0.9	0.0	5.60	0.68	3.36	1.18	0.0	1.34		0.00
Rec / cert value	0.000	111.00	0.005	395.0	8.6	0.0	78.00	8.00	53.00	12.00	0.0		10.00	
Rec vs mean ± 1SD	High	OK	Low	OK	OK	High	OK	OK	OK	OK	High		OK	
Abs % diff from Mean		1.5	57.2	0.2	0.1		2.4	0.4	1.9	3.7		100.0	3.6	
Mean / DL	1	225	2	8	17	1	27	8	11	12	1	1	10	1
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL-4	Ir	La	Lu	Mo	Na	Nd	Ni	Rb	Sb	Sc	Se	Sm	Sn	Sr
	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA	INAA
	ug/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
<i>Detection limits</i>	5.000	0.5	0.1	1.0	0.0	5.0	20	15	0.1	0.1	3.0	0.1	200	500
Mean	0.000	42.40	0.6	16.3	0.0	30.2	26.07	157.51	1.30	10.47	0.0	5.9	0.00	<0.05
Standard deviation	0.000	2.26	0.1	3.9	0.0	6.3	47.37		0.40	0.48	0.0	1.0	0.00	0.00
Rec / cert value	0.000	41.00	0.5	16.0	0.0	30.0	20.00		1.00	10.00	0.0	6.1	0.00	
Rec vs mean ± 1SD	High	OK	OK	OK	High	OK	OK		OK	OK	High	OK	High	
Abs % diff from Mean		3.3	9.1	1.6		0.7	23.3	100.0	23.2	4.5		2.8		
Mean / DL	1	85	11	16	1	6	1	1	13	105	1	59	1	1
Mean vs rec/cert value	OK	OK	High	OK	OK	OK	OK	OK	High	OK	OK	OK	OK	OK
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept	Accept
TILL-4	Ta	Tb	Th	U	W	Yb	Zn							
	INAA	INAA	INAA	INAA	INAA	INAA	INAA							
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
<i>Detection limits</i>	0.500	0.5	0.2	0.5	1.0	0.2	50							
Mean	0.882	0.65	17.8	5.3	0.0	3.5	70.49							
Standard deviation	0.656	0.29	1.8	0.8	0.0	0.3	31.22							
Rec / cert value	1.400	1.10	17.4	5.0	0.0	3.4	70.00							
Rec vs mean ± 1SD	OK	Low	OK	OK	High	OK	OK							
Abs % diff from Mean	58.7	69.4	2.3	5.1		2.1	0.7							
Mean / DL	2	1	89	11	1	17	1							
Mean vs rec/cert value	OK	OK	OK	OK	OK	OK	OK							
Decision	Accept	Accept	Accept	Accept	Accept	Accept	Accept							