

Supplementary data for the article:

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Supplementary material

Supplementary Table 1: Qualitative and semi-quantitative compositions of the samples determined by binocular method and microscope

Sample	Q	F	M	B	Chl	C	Mm	L	Zr	T	Other minerals
S1/1	52.0	1.0	1.5	n.d.	0.5	45.0	0.73	0.02	n.d.	0.03	n.d.
S2/1	61.0	2.5	0.5	0.1	n.d.	36.0	0.59	0.03	n.d.	n.d.	n.d.
S3/1	58.0	2.5	1.5	n.d.	0.2	38.0	0.72	0.02	n.d.	0.04	0.05 A
S4/1	69.0	3.0	1.0	n.d.	n.d.	15.0	0.80	0.05	n.d.	n.d.	0.04 A; 0.02 R
S5/1	81.0	8.0	1.5	n.d.	0.12	6.5	0.90	0.05	n.d.	n.d.	n.d.
S6/1	42.0	9.0	0.5	n.d.	0.12	47.0	0.77	n.d.	0.03	n.d.	n.d.
S7/1	46.0	4.0	0.5	n.d.	0.15	49.0	0.86	0.04	n.d.	n.d.	n.d.
S8/1	46.0	3.0	0.5	0.5	n.d.	45.0	0.92	0.005	n.d.	n.d.	n.d.
S9/1	72.0	6.0	2.5	n.d.	n.d.	18.0	0.94	0.03	n.d.	n.d.	0.05 P
S10/1	48.5	2.0	2.5	n.d.	n.d.	45.0	0.93	0.02	n.d.	n.d.	n.d.
S11/1	53.0	5.0	3.5	0.5	0.5	35.0	0.93	0.02	n.d.	n.d.	n.d.
S12/1	61.0	5.5	3.5	n.d.	n.d.	28.0	0.93	0.01	0.06	n.d.	n.d.
S13/1	83.0	3.0	2.0	n.d.	n.d.	11.0	0.72	n.d.	0.24	0.05	0.01 S
S14/1	86.0	1.5	2.5	n.d.	n.d.	10.0	0.90	n.d.	0.05	0.10	n.d.
S15/1	86.0	4.0	1.0	0.5	0.5	8.0	0.62	0.02	0.31	0.05	0.05 P; 0.01 R
S16/1	75.0	9.0	3.5	n.d.	n.d.	12.5	0.45	0.005	0.49	n.d.	n.d.
S17/1	84.0	7.0	1.0	n.d.	0.1	8.0	0.86	n.d.	0.03	0.05	0.02 A
S18/1	42.0	1.5	0.5	n.d.	n.d.	56.0	0.90	n.d.	0.07	n.d.	n.d.
S19/1	93.0	n.d.	0.5	n.d.	n.d.	6.5	0.90	n.d.	0.05	n.d.	n.d.
S20/1	81.0	8.0	n.d.	n.d.	n.d.	11.0	0.92	n.d.	0.07	n.d.	n.d.
S21/1	80.0	3.0	n.d.	0.1	n.d.	9.0	0.83	0.03	0.03	0.03	0.02 R; 0.005 St; 0.005 Gt
S22/1	84.0	6.0	n.d.	n.d.	n.d.	4.5	0.86	0.08	0.04	n.d.	n.d.
S23/1	39.0	3.0	n.d.	n.d.	0.1	55.0	0.74	0.05	n.d.	n.d.	n.d.
S24/1	45.5	5.5	n.d.	n.d.	n.d.	49.0	0.40	n.d.	n.d.	n.d.	0.03 R
S25/1	56.0	n.d.	n.d.	n.d.	n.d.	42.0	0.92	0.03	n.d.	0.05	n.d.
S26/1	61.0	n.d.	0.5	n.d.	n.d.	37.0	0.76	0.01	0.03	n.d.	n.d.
S27/1	72.0	6.0	1.5	n.d.	n.d.	20.0	0.83	0.07	0.03	0.01	n.d.
S28/1	88.0	8.0	n.d.	n.d.	n.d.	4.0	0.92	n.d.	n.d.	n.d.	n.d.
S29/1	74.0	10.0	0.5	0.1	0.01	15.5	0.76	0.06	0.07	0.01	0.02 A; 0.005 St
S30/1	67.0	1.0	0.5	n.d.	0.01	18.5	0.87	0.08	n.d.	n.d.	0.02 R
S31/1	80.5	2.0	3.5	n.d.	0.03	9.0	0.55	0.08	0.06	n.d.	0.02 R
S32/1	82.0	2.5	0.5	n.d.	n.d.	9.5	0.48	0.15	n.d.	n.d.	n.d.
S33/1	89.0	4.0	1.5	0.1	n.d.	2.5	0.76	0.04	n.d.	n.d.	n.d.
S34/1	84.0	3.5	1.0	n.d.	n.d.	7.5	0.58	n.d.	0.11	n.d.	n.d.
S35/1	82.0	2.0	1.5	n.d.	0.1	2.5	0.81	0.08	n.d.	n.d.	0.05 P
S36/1	69.0	1.5	0.5	n.d.	n.d.	11.0	0.85	0.05	n.d.	n.d.	n.d.
S37/1	54.0	3.0	n.d.	n.d.	n.d.	36.0	0.95	0.005	n.d.	n.d.	n.d.
S38/1	84.5	3.0	3.5	n.d.	n.d.	3.0	0.91	0.02	n.d.	n.d.	n.d.
S39/1	76.0	2.5	0.5	n.d.	n.d.	3.5	0.85	0.03	n.d.	n.d.	n.d.
S40/1	58.0	5.5	2.5	n.d.	n.d.	26.0	0.80	n.d.	n.d.	n.d.	0.02 R
S41/1	59.0	2.5	10.0	n.d.	n.d.	n.d.	0.89	0.03	0.04	n.d.	0.05 P
S42/1	64.0	9.0	1.0	0.01	8.0	15.0	0.31	n.d.	n.d.	n.d.	0.01 R
S43/1	76.0	9.0	1.5	0.5	3.0	9.0	0.47	0.01	0.03	n.d.	0.08 A; 0.03 P; 0.02 St

S44/1	79.0	5.5	3.0	2.5	0.5	7.0	0.42	n.d.	n.d.	0.09	0.90 S; 0.005 R; 0.18 St; 0.02 Gt; 0.003 E
S45/1	83.0	2.5	3.5	0.1	n.d.	7.0	0.19	n.d.	0.06	n.d.	0.1 A; 0.03 P; 0.03 R; 0.07 Gt

n.d.-not detected

Q-quartz; F-Feldspars; M-Muscovite; B-Biotite; Chl-Chlorites; C-Carbonates (calcite and dolomite); Mm-metallic minerals (magnetite, hematite and other); L-Limonite; Z-Zircon; T-Tourmalines; and other determined minerals (A-Amphiboles; P-Pyroxenes; S-Sphene; R-Rutile; St-Stauroilite; Gt-garnets; and E-Epidotes;

Supplementary Table 2: Qualitative and approximate semi-quantitative compositions of the 45 samples at II depth and 10 samples at the I depth determined by XRPD method.

Sample	Composition of the whole sample	Composition of the clays-micas
S1/2	Q >> F > minor Cl	I ~ Chl
S2/2	Q >> minor F ~ Cl	I ~ Chl
S3/2	Q >> minor Cl ~ F	I ~ Chl
S4/2	Q >> minor Cl ~ F	I >Chl
S5/2	Q >> minor Cl ~ F ~ C ~ D	I ~ M ~ Chl
S6/2	Q >> Cl > F > minor C ~ D	I ~ Chl
S7/2	Q >> Cl > minor C ~ D ~ F	I >Chl
S8/2	Q >> Cl > F > minor C ~ D	I ~ Chl
S9/2	Q >> Cl > D > C > minor F	I >Chl
S10/1	Q > C > Cl > D > F	I ~ Chl
S10/2	Q >> D > Cl > C > minor F	I >Chl
S11/2	Q >> Cl > D > minor C ~ F	I >Chl
S12/2	Q >> D > Cl > minor C ~ F ~ A	I >Chl
S13/2	Q >> Cl > D > minor C ~ F ~ A	I >Chl
S14/1	Q > F > C > D > minor Cl	I ~ Chl
S14/2	Q >> D > C > Cl > minor F ~ A	I >Chl
S15/1	Q > Cl > D > C > F	I >Chl
S15/2	Q > Cl > F > D > C	I >Chl
S16/2	Q > D > Cl > minor F ~ C	I >>Chl
S17/2	Q > Cl > minor F ~ D ~ C	I >>Chl
S18/2	Q > Cl > minor F ~ D ~ C	I >Chl
S19/2	Q >> F > minor Cl ~ D ~ C ~ A	I >Chl
S20/2	Q >> Cl > F > D > minor C	I >Chl
S21/2	Q > F > C > minor Cl ~ A ~ D	I ~ M ~ Chl
S22/2	Q >> Cl > F > minor C ~ A	I >>Chl
S23/1	Q > C > F > Cl > D	I ~ Chl
S23/2	Q > Cl > C > D > F	I >Chl
S24/2	Q > Cl > D > C > F	I >>Chl
S25/2	Q > Cl > F > C > D	I >Chl
S26/1	Q >> Cl ~ C ~ D ~ F	I ~ Chl
S26/2	Q >> F > Cl ~ D + C	I >Chl
S27/2	Q >> Cl > F > C > D	I >>Chl
S28/2	Q >> Cl > minor D ~ F ~ C	I >Chl
S29/1	Q >> Cl > F	I ~ Chl
S29/2	Q > Cl > minor F ~ D	I >Chl
S30/2	Q >> Cl > minor F ~ D ~ C	I >Chl
S31/2	Q >> Cl > minor F ~ D ~ C ~ A	I ~ Chl
S32/2	Q >> Cl > minor F ~ C ~ D ~ H	I >Chl
S33/2	Q >> F > Cl > minor D ~ A	I >Chl
S34/2	Q > Cl > C > D > minor F ~ A	I >>Chl
S35/2	Q >> minor Cl ~ F ~ D ~ A ~ H	I >>Chl
S36/2	Q >> Cl > F > minor C ~ A	I >>Chl
S37/2	Q >> C > Cl > F > minor D ~ G	I >Chl
S38/2	Q > F > Cl	I >>Chl
S39/1	Q >> Cl > C > D > F	I ~ Chl
S39/2	Q >> Cl > F > minor D ~ C	I >Chl

S40/2	Q > F > Cl > C > D	I > Chl
S41/1	Q >> minor F ~ Cl	I ~ Chl
S41/2	Q >> minor Cl ~ F ~ H	I >> Chl
S42/2	C > Q > Cl > minor F ~ D	I >> Chl
S43/1	Q > F > C > Cl	I > Chl
S43/2	Q > Cl > F ~ C ~ D > minor A	I > Chl ~ M
S44/2	Q >> minor Cl ~ C ~ F ~ D	I > Chl
S45/1	Q >> minor Cl ~ F ~ C ~ D	I > Chl
S45/2	Q > Cl > D ~ F ~ C > minor A	I > Chl ~ M

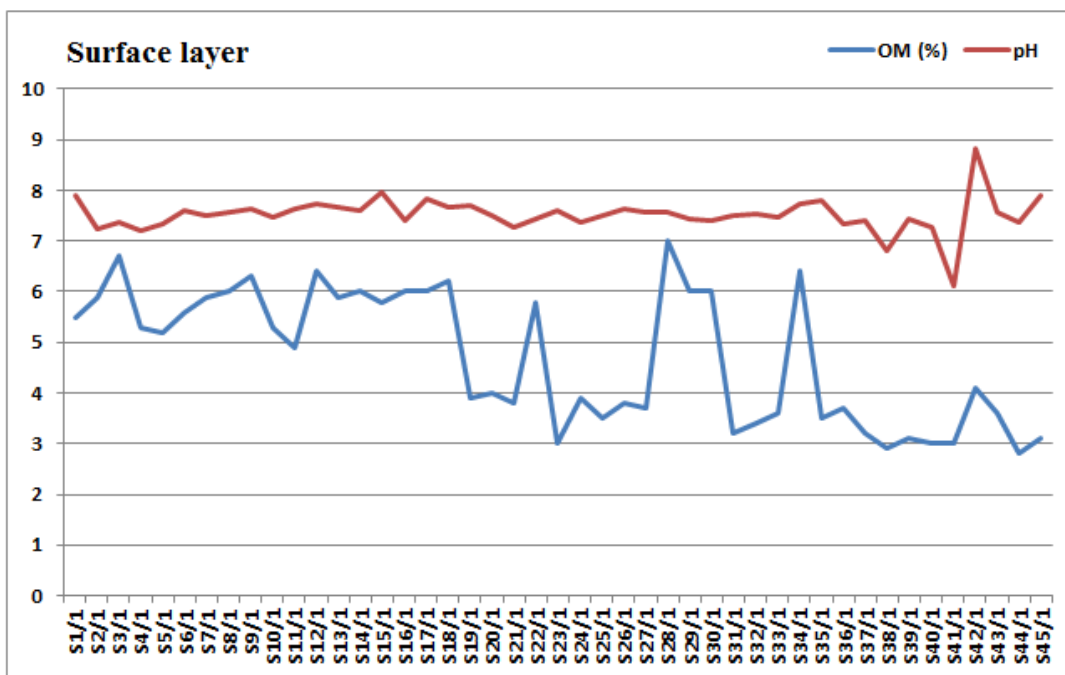
Q-quartz; F-Feldspars; Cl-Clays-micas; C-Calcite; D-dolomite; A-Amphiboles; H-Hematite; G-Gypsum; I-Illite-sericite; Chl-Chlorites; and M-Montmorillonite. Symbols: ">>"-prevail over; ">"-more than; "~"-almost equal contents; and "+"-and.

Supplementary Table 3: pH in nonagricultural and agricultural soils

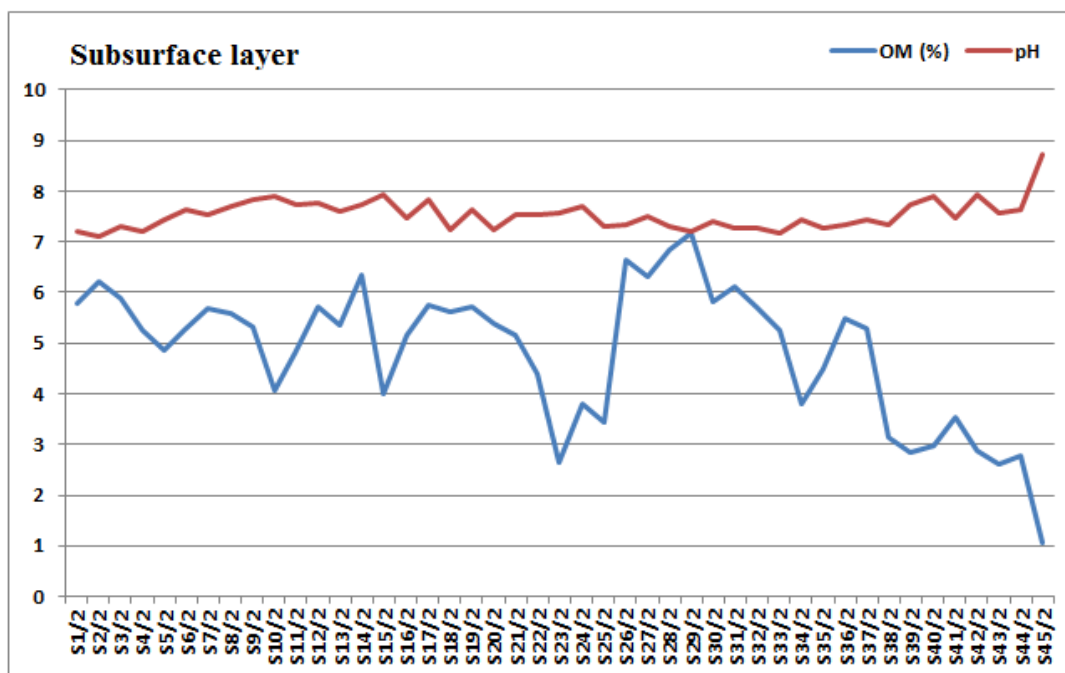
Layer		pH (nonagricultural soils)	pH (agricultural soils)
Surface	Mean± St dev	7.65 ±0.34	7.42± 0.34
	min	7.24	6.20
	max	8.81	7.82
Subsurface	Mean± St dev	7.56± 0.36	7.53 ±0.23
	min	7.11	7.18
	max	8.71	7.91

Supplementary Table 4: Organic matter in nonagricultural and agricultural soils

Depth		nonagricultural soils	agricultural soils
I	Linear coefficient (R ²)	0.024	0.19
	Correlation coefficient (R)	0.15	0.44
II	Linear coefficient (R ²)	0.049	0.065
	Correlation coefficient(R)	0.22	0.25

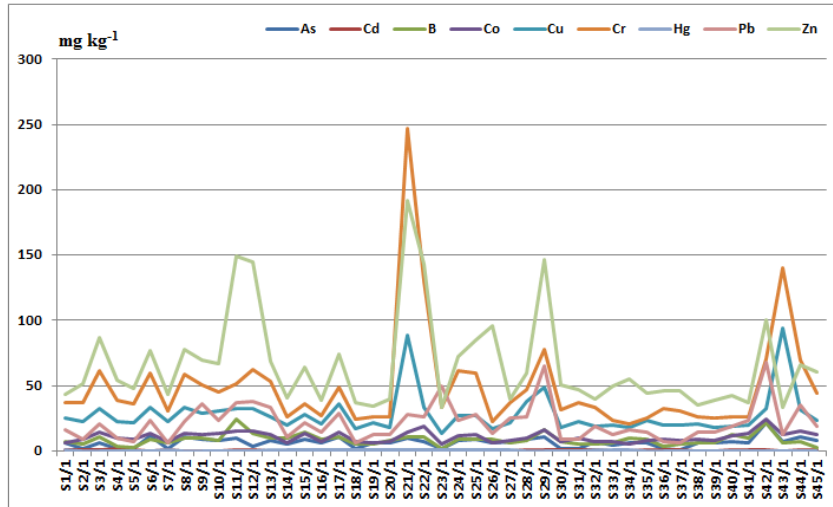


a)

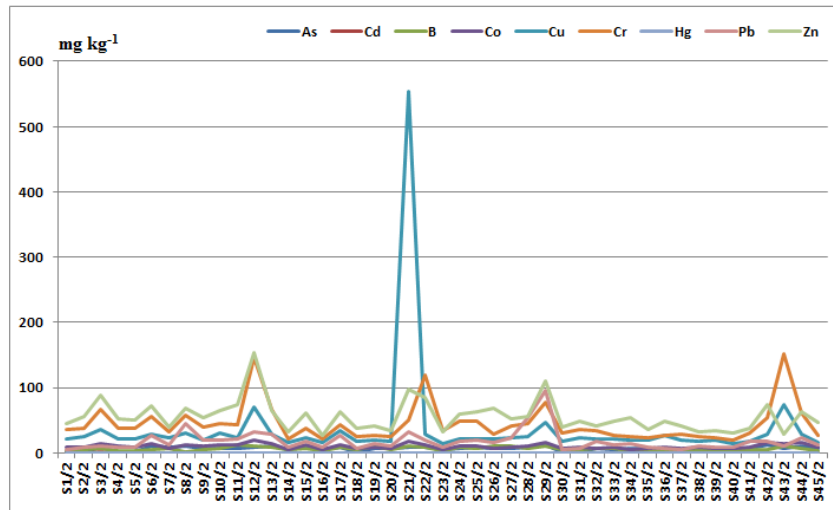


b)

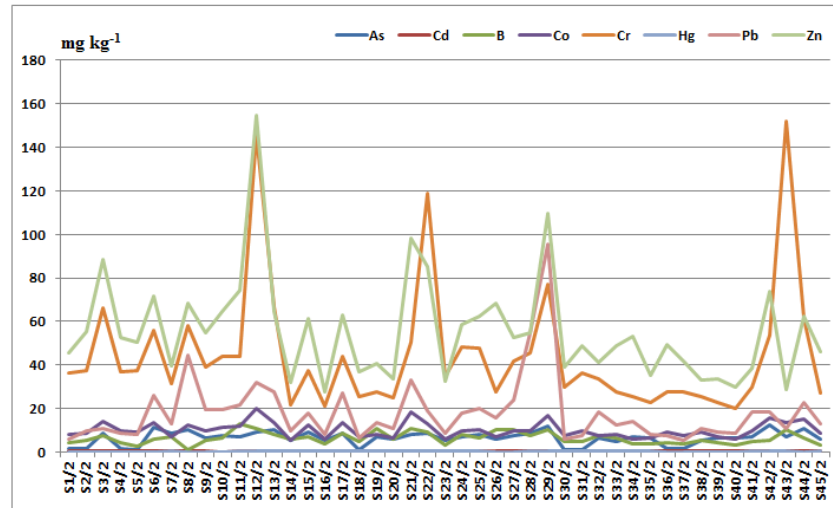
Supplementary Figure 1. Organic matter content (%) and pH values for studied soils. a) Surface layer; b) Subsurface layer.



a)

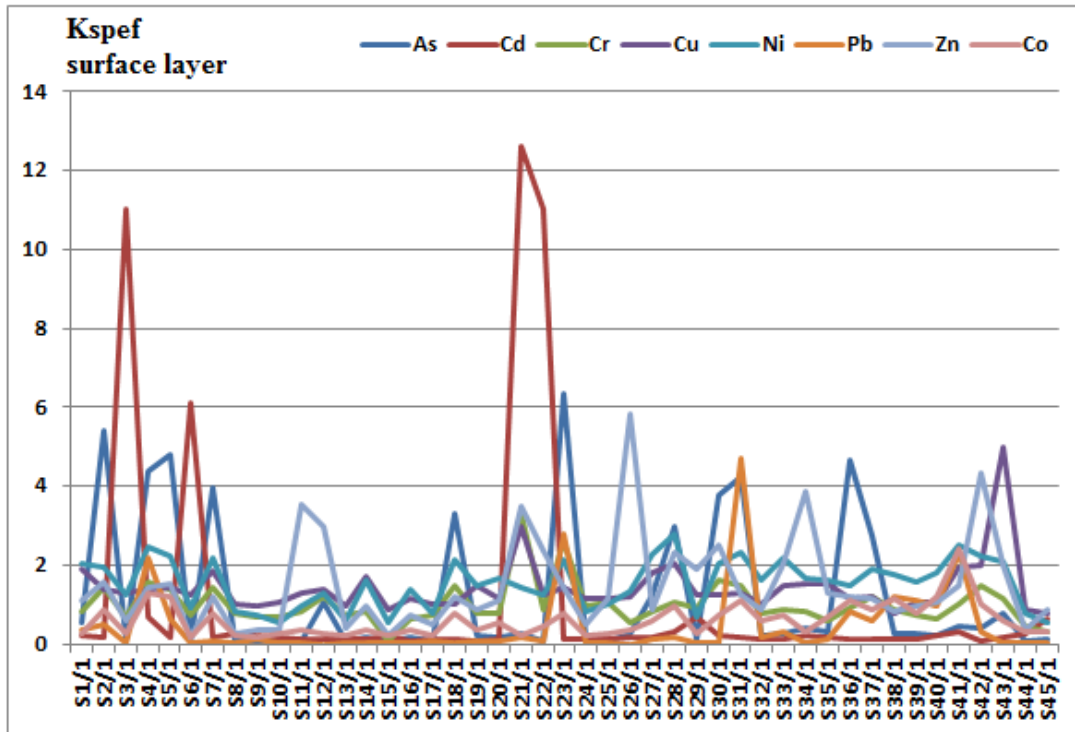


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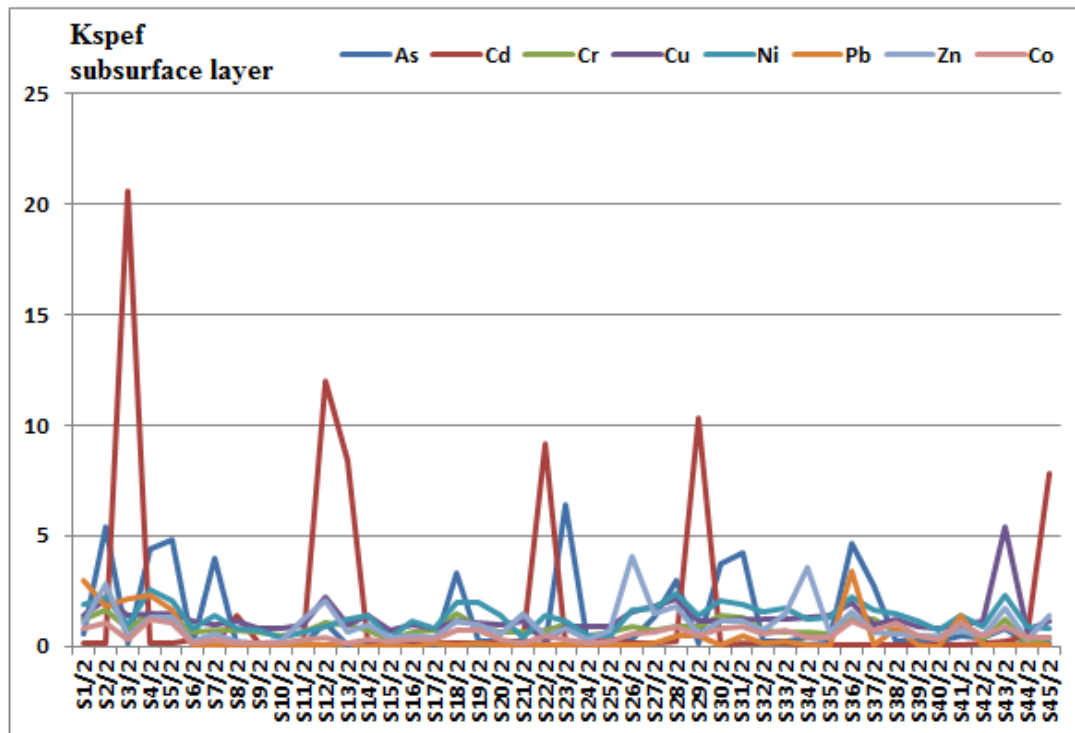


c)

Supplementary Figure 2. Pseudototal content of elements in studied soils: a) surface layer; b) subsurface layer; c) subsurface layer (without Cu).



a)



b)

Supplementary Figure 3. Ksp_{ef} values for studied soils: a) surface layer; b) subsurface layer.