

Kereskényi et al. (2023) Archeometriai Műhely 2023/1 Appendix 1. •

**Appendix Table 1.:** The different analyses performed on the polished stone implements from the Baradla Cave, with their archaeological typology and size. (Abbreviations: Y: yes, N: no, n.a.: no data).

**Melléklet 1. táblázat:** A Baradla-barlangból származó csiszolt kőeszközökön elvégzett különböző vizsgálatok, a kőeszközök régészeti tipizálása és azok mérete. (Rövidítések: Y: igen, N: nem, n.a.: nincs adat).

Sample / Inventory number	Rock-type	Institute	EDS/SEM	XRD	PGAA	MS	Archaeological typology	Size (mm)
BD25	Blueschist	ELTE	Y	N	Y	n.a.	Flat chisel	68*37*15
BD26	Blueschist	ELTE	Y	N	Y	n.a.	Flat chisel	80*32*8
B40/53.188.3	Blueschist	HOM	Y	N	N	0.64	Flat chisel	70*30*5
1997.3.66	Blueschist	MNM	Y	N	Y	0.39	Flat chisel	43*45*16
1997.3.230	Blueschist	MNM	Y	N	Y	0.35	Flat chisel	59*25*8
1969.72.58	Blueschist	MNM	Y	Y	Y	0.51	Flat chisel	58*34*11
53.188.1	Blueschist	HOM	N	Y	N	0.58	Flat chisel	54*35*7
53.188.2	Blueschist	HOM	N	Y	N	n.a.	Flat chisel	65*40*3
BD27	Contact metabasite	ELTE	Y	N	Y	n.a.	Flat chisel	64*28*8
BD28	Contact metabasite	ELTE	Y	N	Y	n.a.	Flat chisel fragment	43*8*5
53.55.1	Contact metabasite	HOM	Y	N	Y	0.46	Flat chisel	50*25*8
1911.21.24	Contact metabasite	MNM	Y	N	Y	0.21	Flat chisel	34*28*9
1951.101.10	Contact metabasite	MNM	Y	N	Y	40.38	Flat chisel	46*35*11
1939.36.5	Greenschist-amphibolite	MNM	N	Y	Y	0.48	Flat chisel	46*40*12
1984.9.1	Greenschist	MNM	Y	N	Y	7.20	Flat chisel	57*43*12
1998.1.26	Greenschist-amphibolite	MNM	N	Y	Y	0.42	Semi-finished stone tool	57*44*17
1948.37.37	Serpentinite	MNM	Y	N	Y	52.71	Flat chisel	46*40*12
1911.21.28	Sandstone	MNM	N	Y	Y	0.06	Curved hoe	139*46*40
1929.64.75	Limestone	MNM	N	Y	Y	0	Handstone	31*48*20
1929.64.63	Basalt	MNM	N	Y	Y	12.71	Flat polished stone tool	65*35*29

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**Appendix Table 2.:** PGAA results of blueschist (Bs) and contact metabasite (Cm) stone implements.**Melléklet 2. táblázat:** A kékpala (Bs) és kontakt metabázit (Cm) kőeszközök PGAA eredményei.

The major components are given in wt%, the trace elements are in ppm. The amount of oxides is calculated from the elemental concentration, based on the oxidation numbers. The number of digits indicates the uncertainties of concentration values. “<D.L.” stands for “less than the Detection Limit”.

	BD25 Bs	BD26 Bs	1997.3. 66 Bs	1997.3. 230 Bs	1969.72. 58 Bs	53.55.1 Cm	1911.21. 24 Cm	BD27 Cm	BD28 Cm	1951. 101.10 Cm
SiO <sub>2</sub>	49.86	45.85	47.78	46.67	47.14	50.50	49.78	49.02	47.78	49.50
TiO <sub>2</sub>	3.10	1.60	1.62	1.66	1.68	1.85	2.03	3.41	3.70	1.70
Al <sub>2</sub> O <sub>3</sub>	13.71	14.14	15.31	15.48	16.16	13.71	13.38	13.89	12.35	14.40
Fe <sub>2</sub> O <sub>3</sub> *	12.02	16.07	11.22	10.33	10.46	12.49	12.72	13.29	15.14	11.19
MnO	0.08	0.17	0.16	0.21	0.23	0.18	0.21	0.19	0.21	0.20
MgO	6.79	8.69	6.71	9.86	8.64	8.34	9.94	7.31	8.91	7.60
CaO	2.34	4.51	11.23	7.90	8.20	9.46	5.87	9.97	9.10	12.00
Na <sub>2</sub> O	6.73	4.26	2.96	3.47	3.71	0.77	2.23	1.22	1.34	0.87
K <sub>2</sub> O	0.14	0.07	0.14	0.65	0.35	0.13	0.65	<D.L.	0.13	0.26
H <sub>2</sub> O	3.66	4.52	2.52	3.74	3.34	1.25	3.14	1.09	1.24	1.22
SO <sub>3</sub>	<D.L.	<D.L.	0.29	<D.L.	<D.L.	<D.L.	<D.L.	0.55	<D.L.	0.94
<b>Total</b>	<b>99.92</b>	<b>99.87</b>	<b>99.93</b>	<b>99.97</b>	<b>99.92</b>	<b>99.93</b>	<b>99.94</b>	<b>99.93</b>	<b>99.92</b>	<b>99.94</b>
B (ppm)	0	0	4	8	9	2	10	2	2	4
Cl	12	6	<D.L.	159	164	45	124	<D.L.	59	248
Sc	64	105	67	64	56	<D.L.	27	<D.L.	31	<D.L.
V	<D.L.	42	308	<D.L.	310	343	225	337	355	453
Cr	364	383	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.
Ni	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.	<D.L.
Sm	<D.L.	<D.L.	5	6	6	35	9	12	14	6
Gd	5	5	4	4	5	6	5	7	8	4

\* Total Fe as Fe<sub>2</sub>O<sub>3</sub>.

**Appendix Table 3.:** Chemical composition of sodic amphiboles in blueschists in wt% (EDS analyses normalized to 100%).

**Melléklet 3. táblázat:** A kékpala kőszközök Na-amfiboljainak kémiai összetétele t%-ban (EDS mérési eredmények 100%-ra normalizálva).

	BD25 Gln	BD26 Gln	BD26 Fgln	69.72.58 Gln	69.72.58 Fgln	97.3.66 Gln	97.3.230 Gln
SiO <sub>2</sub>	55.44	53.63	53.43	57.13	56.40	57.23	57.52
TiO <sub>2</sub>	0.00	0.00	0.04	0.13	0.16	0.00	0.00
Al <sub>2</sub> O <sub>3</sub>	9.67	10.38	10.58	11.21	11.11	11.80	10.18
MnO	0.00	0.00	0.07	0.17	0.11	0.00	0.03
FeO*	11.75	15.19	16.47	12.07	15.29	9.37	9.23
Fe <sub>2</sub> O <sub>3</sub> *	4.42	4.09	3.15	0.98	0.00	0.02	1.83
MgO	9.03	7.68	7.44	8.45	7.56	10.55	10.86
CaO	0.00	0.49	0.75	0.64	1.28	0.32	0.56
Na <sub>2</sub> O	7.61	6.47	5.98	7.06	5.92	8.57	7.67
K <sub>2</sub> O	0.00	0.03	0.05	0.06	0.07	0.00	0.00
H <sub>2</sub> O**	2.08	2.05	2.04	2.11	2.10	2.13	2.13
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
Cation numbers based on 24 oxygens							
Si	7.79	7.65	7.65	7.93	7.91	7.86	7.90
Al	0.21	0.35	0.36	0.07	0.09	0.15	0.10
<b>ΣT</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>
Ti	0.00	0.00	0.04	0.01	0.02	0.00	0.00
Al	1.40	1.40	1.43	1.76	1.75	1.77	1.60
Fe <sup>3+</sup>	0.47	0.44	0.34	0.10	0.00	0.00	0.19
Mn <sup>2+</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe <sup>2+</sup>	1.25	1.53	1.64	1.37	1.66	1.07	0.93
Mg	1.89	1.63	1.59	1.75	1.58	2.16	2.28
<b>ΣC</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>4.98</b>
Mn <sup>2+</sup>	0.00	0.00	0.01	0.02	0.01	0.00	0.00
Fe <sup>2+</sup>	0.14	0.28	0.33	0.03	0.14	0.00	0.06
Ca	0.00	0.08	0.12	0.09	0.19	0.05	0.06
Na	1.87	1.64	1.55	1.87	1.61	1.95	1.89
<b>ΣB</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>1.95</b>	<b>2.00</b>	<b>2.00</b>
Na	0.21	0.15	0.11	0.03	0.00	0.33	0.20
K	0.00	0.01	0.01	0.01	0.01	0.00	0.01
<b>ΣA</b>	<b>0.21</b>	<b>0.16</b>	<b>0.12</b>	<b>0.04</b>	<b>0.01</b>	<b>0.33</b>	<b>0.21</b>

\* Total Fe was measured as FeO. FeO/Fe<sub>2</sub>O<sub>3</sub> ratio was calculated with ACES Excel spreadsheet (after Locock 2014).

\*\* H<sub>2</sub>O was calculated from the stoichiometry: OH=2 apfu.

**Appendix Table 4.:** Chemical composition of Ca-Na- and Ca-amphiboles in blueschists in wt% (EDS analyses normalized to 100%).

**Melléklet 4. táblázat:** A kékpala kőeszközök Ca-Na- és Ca-amfiboljainak kémiai összetétele t%-ban (EDS mérési eredmények 100%-ra normalizálva).

	97.3.230 Bar	97.3.230 F-win	97.3.66 Win	97.3.66 F3-win	BD26 Mg-f-hb	97.3.66 Act
SiO <sub>2</sub>	55.49	49.20	55.71	56.51	46.35	56.23
TiO <sub>2</sub>	0.69	1.60	0.05	0.00	0.07	0.06
Al <sub>2</sub> O <sub>3</sub>	10.30	7.28	4.15	11.86	2.64	1.92
MnO	0.00	0.89	0.14	0.05	0.22	0.22
FeO*	15.86	24.60	7.42	17.05	15.66	8.27
Fe <sub>2</sub> O <sub>3</sub> *	0.00	0.78	1.37	0.00	10.85	1.23
MgO	8.44	5.42	17.00	4.76	10.11	17.75
CaO	1.90	5.56	9.08	0.44	10.82	10.86
Na <sub>2</sub> O	5.12	2.42	2.81	7.23	1.19	1.28
K <sub>2</sub> O	0.13	0.30	0.19	0.03	0.18	0.09
H <sub>2</sub> O**	2.08	1.95	2.09	2.08	1.91	2.08
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
Cation numbers based on 24 oxygens						
Si	7.81	7.42	7.78	7.79	7.06	7.90
Al	0.19	0.58	0.22	0.21	0.47	0.11
<b>ΣT</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>
Ti	0.07	0.18	0.01	0.00	0.00	0.01
Al	1.52	0.72	0.47	0.18	0.00	0.21
Fe <sup>3+</sup>	0.00	0.09	0.14	0.42	0.79	0.13
Mn <sup>2+</sup>	0.00	0.00	0.00	0.00	0.00	0.00
Fe <sup>2+</sup>	1.63	2.79	0.84	0.38	1.91	0.94
Mg	1.77	1.22	3.54	4.03	2.30	3.71
<b>ΣC</b>	<b>5.00</b>	<b>5.00</b>	<b>5.01</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>
Mn <sup>2+</sup>	0.03	0.11	0.01	0.01	0.03	0.03
Fe <sup>2+</sup>	0.23	0.31	0.01	0.18	0.08	0.03
Ca	0.29	0.90	1.36	1.29	1.77	1.63
Na	1.40	0.68	0.60	0.53	0.12	0.31
<b>ΣB</b>	<b>1.95</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>
Na	0.00	0.03	0.16	0.01	0.23	0.03
K	0.02	0.06	0.03	0.14	0.04	0.06
<b>ΣA</b>	<b>0.02</b>	<b>0.09</b>	<b>0.19</b>	<b>0.15</b>	<b>0.27</b>	<b>0.09</b>

\* Total Fe was measured as FeO. FeO/Fe<sub>2</sub>O<sub>3</sub> ratio was calculated with ACES Excel spreadsheet (after Locock 2014).

\*\* H<sub>2</sub>O was calculated from the stoichiometry: OH=2 apfu.

**Appendix Table 5.:** Chemical composition of calcic amphiboles in contact metabasites in wt% (EDS analyses normalized to 100%).

**Melléklet 5. táblázat:** A kontakt metabázit kőszeközök Ca-amfiboljainak kémiai összetétele t%-ban (EDS mérési eredmények 100%-ra normalizálva).

	53.55.1 Mg-hb	1911.21.24 Mg-hb	BD27 Mg-f-hb	BD27 Mg-f-hb	BD28 Mg-f-hb	84.9.1 Act
SiO <sub>2</sub>	46.72	51.67	44.56	46.08	44.88	55.13
TiO <sub>2</sub>	0.20	0.38	0.32	0.17	0.08	0.00
Al <sub>2</sub> O <sub>3</sub>	12.35	7.01	6.75	7.00	8.08	3.41
MnO	0.09	0.09	0.13	0.00	0.08	0.20
FeO*	10.14	9.67	12.15	11.89	12.80	10.56
Fe <sub>2</sub> O <sub>3</sub> *	3.70	1.84	11.54	9.77	9.45	0.72
MgO	12.34	16.17	10.26	11.67	10.24	16.42
CaO	11.20	10.22	11.69	10.51	11.45	10.10
Na <sub>2</sub> O	1.11	0.81	0.57	0.93	0.92	1.17
K <sub>2</sub> O	0.13	0.08	0.10	0.02	0.07	0.22
H <sub>2</sub> O**	2.03	2.07	1.94	1.96	1.95	2.07
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
Cation numbers based on 24 oxygens						
Si	6.72	7.32	6.69	6.82	6.70	7.80
Al	1.28	0.68	1.19	1.18	1.30	0.21
<b>ΣT</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>
Ti	0.02	0.04	0.00	0.02	0.01	0.00
Al	0.82	0.49	0.00	0.04	0.12	0.36
Fe <sup>3+</sup>	0.40	0.20	1.22	1.09	1.06	0.08
Mn <sup>2+</sup>	0.00	0.00	0.00	0.00	0.00	0.00
Fe <sup>2+</sup>	1.12	0.87	1.48	1.27	1.53	1.10
Mg	2.65	3.41	2.30	2.58	2.28	3.46
<b>ΣC</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>
Mn <sup>2+</sup>	0.01	0.01	0.02	0.00	0.01	0.02
Fe <sup>2+</sup>	0.10	0.28	0.04	0.20	0.07	0.15
Ca	1.73	1.55	1.88	1.67	1.83	1.53
Na	0.16	0.16	0.06	0.13	0.09	0.30
<b>ΣB</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>
Na	0.15	0.06	0.10	0.14	0.18	0.03
K	0.02	0.01	0.02	0.00	0.01	0.04
<b>ΣA</b>	<b>0.17</b>	<b>0.07</b>	<b>0.12</b>	<b>0.14</b>	<b>0.19</b>	<b>0.07</b>

\* Total Fe was measured as FeO. FeO/Fe<sub>2</sub>O<sub>3</sub> ratio was calculated with ACES Excel spreadsheet (after Locock 2014).

\*\* H<sub>2</sub>O was calculated from the stoichiometry: OH=2 apfu.

**Appendix Table 6.:** Chemical composition of Fe-Mg amphiboles in contact metabasites in wt% (EDS analyses normalized to 100%).

**Melléklet 6. táblázat:** A kontakt metabázit kőszközők Fe-Mg-amfiboljainak kémiai összetétele t%-ban (EDS mérési eredmények 100%-ra normalizálva).

	53.55.1 Cum	1911.21.24 Cum	BD27 Cum	BD27 Gru	BD28 Cum
SiO <sub>2</sub>	54.36	55.81	46.15	46.58	48.18
TiO <sub>2</sub>	0.00	0.09	0.29	0.43	0.00
Al <sub>2</sub> O <sub>3</sub>	3.34	0.78	3.61	1.68	2.29
MnO	0.25	0.47	0.29	0.49	0.42
FeO*	16.63	20.58	20.51	23.23	22.43
Fe <sub>2</sub> O <sub>3</sub> *	0.21	0.00	10.73	10.60	9.13
MgO	18.28	18.91	11.65	10.91	13.74
CaO	4.48	1.22	4.29	3.93	1.35
Na <sub>2</sub> O	0.35	0.00	0.51	0.19	0.54
K <sub>2</sub> O	0.04	0.08	0.06	0.07	0.00
H <sub>2</sub> O**	2.06	2.05	1.91	1.89	1.92
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>
Cation numbers based on 24 oxygens					
Si	7.75	8.01	7.02	7.93	7.28
Al	0.25	0.00	0.65	0.07	0.41
Ti	0.00	0.00	0.03	0.00	0.00
Fe <sup>3+</sup>	0.00	0.00	0.30	0.00	0.32
<b>ΣT</b>	<b>8.00</b>	<b>8.01</b>	<b>8.00</b>	<b>8.00</b>	<b>8.00</b>
Ti	0.00	0.00	0.00	0.01	0.00
Al	0.31	0.13	0.00	1.76	0.00
Fe <sup>3+</sup>	0.02	0.00	0.93	0.10	0.72
Mn <sup>2+</sup>	0.00	0.00	0.00	0.00	0.00
Fe <sup>2+</sup>	0.79	0.81	1.43	1.37	1.18
Mg	3.88	4.05	2.64	1.75	3.09
<b>ΣC</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>
Mn <sup>2+</sup>	0.03	0.06	0.04	0.02	0.05
Fe <sup>2+</sup>	1.20	1.66	1.19	0.03	1.65
Ca	0.68	0.19	0.70	0.09	0.22
Na	0.09	0.00	0.08	1.87	0.08
<b>ΣB</b>	<b>2.00</b>	<b>1.90</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>
Na	0.01	0.00	0.08	0.03	0.08
K	0.01	0.01	0.01	0.01	0.00
<b>ΣA</b>	<b>0.02</b>	<b>0.01</b>	<b>0.09</b>	<b>0.04</b>	<b>0.08</b>

\* Total Fe was measured as FeO. FeO/Fe<sub>2</sub>O<sub>3</sub> ratio was calculated with ACES Excel spreadsheet (after Locock 2014).

\*\* H<sub>2</sub>O was calculated from the stoichiometry: OH=2 apfu.

**Appendix Table 7.:** PGAA results of greenschist/amphibolite, serpentinite, sandstone, limestone and basalt stone implements.

**Melléklet 7. táblázat:** A zöldpala/amfibolit, szerpentinit, homokkő, mészkő és bazalt kőszközök PGAA eredményei.

The major components are given in wt%, the trace elements are in ppm. The amount of oxides is calculated from the elemental concentration, based on the oxidation numbers. The number of digits indicates the uncertainties of concentration values. “<D.L.” stands for “less than the Detection Limit”.

	1939.36.5 greenschist- amphibolite	1984.9.1 greenschist- amphibolite	1998.1.26 greenschist- amphibolite	1948.37.37 serpentinite	1911.21.28 sandstone	1929.64.75 limestone	1929.64.63 basalt
SiO <sub>2</sub>	46.20	48.07	46.64	39.86	84.41	<D.L	48.32
TiO <sub>2</sub>	0.81	2.37	0.97	0.03	0.38	<D.L	2.17
Al <sub>2</sub> O <sub>3</sub>	12.74	13.69	13.47	2.46	8.26	<D.L	15.88
Fe <sub>2</sub> O <sub>3</sub> *	9.13	12.70	10.18	8.30	1.43	<D.L	10.39
MnO	0.26	0.16	0.24	0.08	<D.L	<D.L	0.16
MgO	9.02	8.78	9.14	36.66	<D.L	<D.L	7.82
CaO	15.50	7.66	13.14	0.56	1.34	52.55	8.60
Na <sub>2</sub> O	3.17	3.00	2.81	<D.L	1.60	<D.L	3.82
K <sub>2</sub> O	0.07	0.11	0.11	<D.L	1.51	<D.L	2.11
H <sub>2</sub> O	3.11	3.31	3.21	11.40	1.06	0.18	0.63
CO <sub>2</sub>	<D.L	<D.L	<D.L	<D.L	<D.L	47.26	<D.L
<b>Total</b>	<b>100.00</b>	<b>99.85</b>	<b>99.91</b>	<b>99.34</b>	<b>99.92</b>	<b>99.99</b>	<b>99.89</b>
B (ppm)	4	2	3	19	14	0	3
Cl	<D.L	621	<D.L	56	72	52	1033
Sc	<D.L	67	56	<D.L	<D.L	<D.L.	<D.L.
V	<D.L	422	437	<D.L	<D.L	<D.L.	<D.L.
Cr	<D.L	<D.L	<D.L	2524	<D.L	<D.L.	<D.L.
Ni	<D.L	<D.L	<D.L	2160	<D.L	<D.L.	<D.L.
Sm	3	9	4	<D.L	10	<D.L.	10
Gd	2	7	3	<D.L	3	<D.L.	5

\* Total Fe as Fe<sub>2</sub>O<sub>3</sub>.