LIPOVEI HILLS: A STUDY OF THE ŞANOVIŢA – LUCAREŢ VOLCANIC AREA

DEALURILE LIPOVEI. STUDIUL AREALULUI VULCANIC ŞANOVIŢA – LUCAREŢ

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***Abstract**: Lipovei Hills are the most extended piedmont units in the Banat area. The area covered by these hills (about 200,000 ha) are delimited by the Mureş River – north and by the Bega River – South. Eastwards and westwards the limit follows a sinuous trajectory along the Săsău – Lăugiu de Jos – Coşteiu de Sus alignment, and by the Chesinţ – Bencec – Ianova alignment, respectively. According to different previous research, the northern-southern exposition of the fracture system played a major role at the beginning of the volcanic activity in the Quaternary in south-western Romania.*

***Rezumat:** Dealurile Lipovei sunt cele mai extinse unităţi piemontane din Banat. Suprafaţa ocupată de acestea (cca 200.000ha) sunt delimitate de râurile Mureş-Lăpugiu de Jos-Coşteiu de Sus, respectiv Chesinţ-Bencec-Ianova. În conformitate cu diferitele cercetări anterioare orientarea N-S, a sistemului de fracture a jucat un rol major la începutul activităţii vulcanice din cuaternar din SV Romaniei.*

***Key words**: basic eruption rocks, volcano cone, crater*
***Cuvinte cheie:** roci eruptive, vulcan, conuri, crater*

INTRODUCTION

Lipovei Hills have developed along an old synclinal at different geological times and shaped in two stages: radial fragmentation (around a central plateau) and transversal fragmentation (when the summits were frontally attacked by numerous erosion valleys).

The thick sedimentary cover wraps a Carpathian pre-Hercinic crystal foundation (east from Lipova), fractured by a series of foils. Strong movements have activated the old tectonic lines and along the alignment there settled an ophiolitic complex (basic eruptive rocks) between the localities Zăbalţ – Lălueşint – Bata, a chore of granite at Lipova, a layer of diabase gabbros and volcanic lava between Groşi and Fintoag and a basalt cover at Sanoviţa-Lucareţ.

The alkali-basalt alluvial plateau at Şanoviţa – Luncareţ is about 35 km East from Timişoara, 130-200 m high. Volcanic activity resulted in rather fluid basalt lava flows with alumina and nepheline. Gabbros magma developed pretty deep in the ground, by the melting of the granate peridotite sub-stratum.

The basaltic plateau is made up of two lava flows of different spreads, separated by a level of basalt slag found in the quarry at Lucareţ. Here, lower flow is covered by a thin layer of slag that becomes thicker (about 7 m) towards the South, detrimental to the upper basalt flow that disappears. This flow represents the last volcano lava eruption.

MATERIALS AND METHODS

To better understand the process of formation of the soils in the area, we determined the mineral composition of the clayish fraction. We measured physical and chemical soil features. Soil samples were taken from the south-eastern slope of the quarry ST2 – Sanoviţa.

RESULTS AND DISCUSSION

Results of the mineral analysis of the profile at Şanovița are presented in table 1.

Table 1.

Mineral composition (%) in granules of the Şanovița profile

Specification	Depth (cm)										
	0-20	20-40	40-60	80-100	115-135	200-220	350-370	650-670	670-720	770-1810	810-1830
Rock fragments	-	-	-	-	0.35	12.67	0.97	-	-	1.48	1.35
Quartz	40.30	38.30	39.29	41.97	54.84	38.38	34.26	61.37	49.94	36.07	40.01
Feldspar	18.20	15.67	12.29	19.26	13.78	13.77	19.21	11.76	10.69	7.71	18.81
Muscovite	28.22	23.01	23.34	21.88	11.34	18.84	27.51	14.83	12.13	3.01	22.22
Oxides	1.80	16.84	16.93	8.87	17.07	7.85	13.78	6.41	21.28	22.61	8.85
Hornblende	2.36	1.23	1.11	0.64	0.83	-	-	-	-	8.25	-
Chlorite	0.55	0.56	0.51	-	-	2.71	2.60	0.55	-	-	-
Biotite	2.72	0.56	0.51	0.59	0.38	2.03	-	-	1.28	1.51	-
Epidote	1.23	-	1.75	2.03	-	3.08	0.59	0.62	1.46	0.86	3.32
Zoisite	-	0.64	2.33	-	0.87	-	-	-		-	-
Distene	-	0.70	0.63	2.20	-	-	-	0.68	1.60	1.89	-
Staurolite	2.18	0.71	0.65	-	-	-	-	1.40	-	-	-
Rutile	-	0.82	-	0.66	-	-	-	2.40	-	-	1.40
Zircon	1.68	-	1.58	-	-	-	-	-	-	1.17	2.26
Monazite	-	0.99	-	-	-	-	-	-	-	-	-
Glass	-	-	-	0.51	-	-	-	-	-	-	-
Granate	-	-	-	-	0.50	-	0.68	-	0.84	1.98	-
Silimanite	-	-	-	-	0.76	-	0.47	-	-	-	-
Glauconite	-	-	-	-	-	-	-	-	0.84	-	-
Olivine	-	-	-	-	-	-	-	-	-	1.73	0.55
Augite	-	-	-	-	-	-	-	-	-	11.74	1.15

Table 2 presents the main minerals making up the clayish fraction at Şanovița.

Table 2

Mineral composition (%) of the clayish fraction at Şanovița

Horizon	Depth (cm)	Expandable minerals (%)	Illite (%)	Kaolinite (%)
Ao	0-19	42	50	8
El	19-38	41	53	6
Bt	50-68	54	40	6
BD	140-170	31	65	4

After soil mapping, we took under study the mollic preluvosoil (Table 3).

Description of the profile:

Aț: 0-5 cm.

Am: 5-35 cm, 10 YR 3/2, medium clayish, large polyedric sub-angular argyle

AB: 35-55 cm, 10 YR 4/3, medium clayish, low columned argyle

Bt: 55-95 cm, 10 YR 4/4, medium clayish, low prismatic argyle

BC: 95-160 cm, 10 YR 3/6, medium clayish argyle

Bt_2y: 160-260 cm, 10 YR 4/3.5, sphenoid, vertic, flows of $CaCO_3$

Bt_2Cy: 260-320 cm, 10 YR 5/5, vertic faces, spheroid structures, stains of Mn, flows of $CaCO_3$

C_2>320 cm and basalt

Table 3.

Mollic preluvosoil – Şanovița profile

Horizons	Atel	Am	AB	Bt	BC	Bt_2	Bt_2C	C_2	C_2
Depth (cm)	5	35	55	80	95	160	260	320	>320
Coarse sand (2.0-0.2 mm %)	4.1	2.1	2.2	2.3	2.1	2.2	1.5	1.8	4.7
Fine sand (0.2-0.02 mm %)	33.5	28.1	29.0	27.7	27.6	30.0	29.8	25.1	30.3
Dust (0.02-0.002 mm %)	28.8	25.0	25.3	26.3	25.0	24.6	23.4	26.7	44.3
Argyle (below 0.002 mm %)	33.6	44.1	43.5	43.7	45.3	43.1	45.3	45.7	20.7
Physical argyle (sub 0.01 mm %)	46.5	56.8	56.3	57.1	56.8	55.3	56.6	57.7	48.6
Symbol interpretation	TT	TT	TT	TT	TT	TT	TT	TT	LNP
pH (in H_2O)	6.87	6.07	6.78	6.80	6.96	7.46	7.97	8.14	8.07
Humus (%)	3.01	1.60	0.98						
Mobile phosphorus (ppm)	13.48	4.57	3.48						
Assailable potassium (ppm)	130	120	110						
Exchange bases (SB me/100 g of soil)	17.79	18.41	19.02						
Exchangeable hydrogen (SB me/100 g of soil)	1.58	2.98	1.77						
Cation exchange ability (T/me)	19.37	21.39	20.79						
Base saturation degree (V %)	91.84	86.06	91.48						

CONCLUSIONS

Soilification cover is very composite though the very little varied soilification factors have restrained a lot the sense of the evolution. On an altering cover finely diminished, processes of elution-illation led to the development of mature soils of the typical luvosoils type (on low-moderately sloped forms of relief) or stagnic albeluvisols (on the terrace plateau). On the fallowed slopes denutrition maintains soil-genesis process balance (regosols), while on cultivated ones accelerated erosion brought out soilification rocks (regosols and eroded soils).

During the over 1.8 million years from the setting of the basalt rock at Şanovița – Lucareț, physical and chemical alteration ground hard rocks and streaming waters have "washed away" the Piedmont area, carrying towards the west clast materials, and particularly argyle. This could explain the existence of clayish-argyle deposits of red colour responsible for the existence of reddish preluvosoils and luvosoils on the western side of the Lipovei Hills.

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