STUDIUL FAEOZIOMURILOR DIN PARTEA DE VEST A CÂMPIEI TIMIŞULUI ŞI A BÂRZAVEI

A STUDY OF THE PHAEOSIOMS IN THE WESTERN SIDE OF THE TIMIS AND BARZAVA PLAINS

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***Abstract**: Phaeosioms are soils typical for the more moist and warm steppe (prairie) areas. As a consequence, accumulation of organic matter is high, but alteration and levigation are also more intense. They develop on basic materials, unconsolidated, such as loess, loessoid deposits, and glacial deposits.In the temperate area, phaeosioms border chernozems, in the sub-tropical phaeosioms border kastanozems, and in the northern hemisphere they can neighbour albeluvisoils and can have grains spoilt from loam films.*

***Rezumat**: Faeoziomurile sunt soluri tipice regiunilor de stepă mai umede şi mai calde(preerii). În consecință acumularea de materie organică este mare, dar şi alterarea şi levigarea sunt mai intense. Se formează pe materiale bazice, neconsolidate, cum ar fi loessul, depozitele loessoide, depozitele glaciale.În zona temperată, faeoziomurile mărgineesc cernoziomurile, în climatul subtropical faeoziomurile mărginesc kastanoziomurile, iar în emisfera nordică se pot învecina cu albeluvisolurile şi pot avea grăunți dezbrăcați de pelicule de argilă.*

***Cuvinte cheie**: sol, faeoziom, resurse de sol*
***Key words**: soil, phaeosiom, soil resources*

INTRODUCTION

Mixing old and new alluvia with loess on not flooded portions is due to subsidence movements started in the Dacian and continued still today. This is why it is difficult to imagine an evolution scenario based exclusively on the soilification of some types of materials.

TECTONIC AND MORPHOLOGICAL CONDITIONS

The Timis Plain is a relatively recent form of relief, formed by repeated flooding by the two rivers – Timis and Bega – rivers that used to intersect and separate within vast swampy areas.

The Plain is surrounded by old higher "small hills" (Bugeac, Alibunar, and Zrenianin), formed of old, well matured alluvia.

The deepening of the river beds of the two rivers is due to the lowering of the basic level by about 30 m of the draining river – the Tisa – which kept for a long while the area in a somehow immersed state.

Gradually, the wind and partially flooding waters have mixed old alluvia with new ones ad with loessoid materials from the two higher "isles" (the area between Parta and Ciacova on the left bank of the river Timis and the area between Peciu and Giulvaz, on the right bank of the same river).

A relatively even plain thus formed, with many meander-like riverbeds temporarily reactivated during excessive rainfall periods, with relic swamps that are nowadays visible through willow oases located between the numerous drainage ways, works that have almost totally reclaimed the lands degraded by moisture excess.

All morphological phenomena led to a specific soil-cover more roughly textured and charged with a diversity of chemical elements carried and deposited by the streams crossing the area, and differentiated by an oscillating phreatic level with increased mineralization that favoured here and there soil alkalinisation.

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Most of the times, the high soil diversity complicates the design and execution of hydro-ameliorative works and diversifies quite a lot the quality state of agricultural lands.

On the other hand, the Timis Plain (the Ciacova area) combines, over small portions, almost all the features of the Timis Plain sectors.

Located on a maximum deepening of the fundament, the Plain as the typical subsidence aspect mainly divagations and abatements of the waters with well-shaped meanders ad frequent swamping (the Cebza – Macedonia – Petroman – Obdad area).

Periodical coverage of the low plain with fluvial material kept the area at least partially outside the fluvial and lake sedimentation area.

Isolated, on the route map of the old branches of the Pannonia swamps, intercalations of finely textured materials gave the soil the same trends of secondary salting.

Table 1

Analytic data on the cambic, moist phreatic phaeosiom (Ciacova)

Horizons	Ap	Atp1	Atp2	Am	AB	Bv	BC	CGo_3	Cca
Depth (cm)	0-19	19-26	26-38	38-60	60-76	76-94	-118	-155	-180
Coarse sand (2.0-0.2 mm) %	5.4	3.1	4.3	1.8	3.1	1.1	1.8	1.7	2.0
Fine sand (0.2-0.02 mm) %	43.0	43.1	43.3	40.8	42.7	45.8	45.4	46.8	50.4
Dust (0.02-0.002 mm) %	24.8	26.1	25.4	24.4	23.9	22.8	24.3	24.3	25.6
Loam (below 0.002 mm) %	26.8	27.7	27.0	33.0	32.1	30.3	28.5	27.2	22.0
Physical loam (below 0.01 mm) %	40.1	40.9	39.3	44.5	44.9	42.8	39.5	39.9	34.8
TEXTURE	LL	LL	LL	LA	LL	LL	LL	LL	LL
pH of the H_2O	6.57	6.69	6.70	6.83	7.13	7.32	7.39	7.52	8.26
Humus (%)	3.22	3.10	2.54	1.98					
Mobile phosphorus (ppm)	40.9	46.6	57.3	13.4					
Assimilable potassium (ppm)	147	132	127	123					
Exchange bases (SB me/100 g soil)	14.13	14.78	14.35	18.48					
Exchangeable hydrogen (me/100 g soil)	2.17	2.44	2.50	1.90					
Cationic exchange capacity (T me)	16.30	17.22	16.85	20.38					
Base saturation degree (V%)	86.68	85.83	85.16	90.67					

Description of phaeosiom profiles and analytic data

Cambic, moist phreatic phaeosiom (Ciacova)

Ap: 0-19 cm, 10Y 3/2, very dark brown, medium clay, dusty structure

Atp: 19-30 cm, 10YR 2/1, blackish-brown, medium clay, sub-angular polyedric structure

Am: 38-60 cm, 10 YR 2/1, medium loamy clay, sub-angular polyedric structure

AB: 60-76 cm, 10 YR 3/3, medium clay, moderately developed sub-angular polyedric structure

Bv: 76-96 cm, 10 YR 3/4, medium clay, moderately developed polyedric structure

BC: 96-118 cm, 10 YR 3/4, moist medium clay

C: 118-155 cm, 10 YR 4/4, medium clay with GO_3

Cca: 155-180 cm, 10 YR 4/4 medium clay, loessoid deposits, $CaCO_3$ concretions

Relief conditions: low plain (80-85 m absolute altitude)

Climate conditions: multi-annual mean temperature 10.6^0C, multi-annual mean precipitations 640 mm

Hydro-geologic conditions: phreatic water at about 3 m deep in the soil

Parental materials: alluvial deposits from the superior Holocene, with pebbles, sands and loams, and isolated loessoid deposits

Table 2

Analytic data on the loamy phaeosiom (Voiteg)

Horizons	Ap	Atp	Am	AB	Bt	C
Depth (cm)	0-21	21-29	29-40	40-55	55-90	90-100
Coarse sand (2.0-0.2 mm) %	3.0	3.5	3.5	2.6	3.2	3.2
Fine sand (0.2-0.02 mm) %	30.9	30.9	31.0	30.4	30.1	30.7
Dust (0.02-0.002 mm) %	27.2	26.7	26.1	26.2	26.4	24.9
Loam (below 0.002 mm) %	38.9	38.9	39.4	40.8	40.3	241.2
Physical loam (below 0.01 mm) %	50.6	51.0	52.3	54.3	54.2	53.9
TEXTURE	TT	TT	TT	TT	TT	TT
pH of the H_2O	6.09	6.19	6.47	6.46	6.70	6.95
Humus (%)	3.58	2.45	3.40			
Mobile phosphorus (ppm)	15.2	10.1	6.7			
Assimilable potassium (ppm)	132	127	132			
Exchange bases (SB me/100 g soil)	19.02	19.02	21.48	21.69	21.69	20.87
Exchangeable hydrogen (me/100 g soil)	5.67	4.79	3.34	2.55	1.63	1.40
Cationic exchange capacity (T me)	24.69	23.81	24.82	24.24	23.32	22.27
Base saturation degree (V%)	77.03	79.88	86.54	89.48	93.01	93.71

Loamy phaeosiom (Voiteg)

Ap: 0-21 cm, 10Y 3/2, dark brown, medium loamy clay, moderately developed small polyedric sub-angular structure

Atp: 21-29 cm, 10YR 3/1, medium loamy clay, medium-large sub-angular polyedric structure

Am: 29-40 cm, 10 YR 3/2, medium loamy clay, sub-angular polyedric structure

AB: 40-55 cm, 10 YR 3/3, medium prismatic medium loamy clay

Bt: 55-90 cm, 10 YR 3/2, medium prismatic medium loamy clay

C: sub 100 cm, medium prismatic medium loamy clay with low effervescence

Bati-stagnic loamy phaeosiom (Gãtaia)

Ap: 0-12 cm, 10YR 3/3, medium loamy clay, small sub-angular polyedric structure

Atp: 12-23 cm, 10YR 3/3, medium loamy clay, medium sub-angular polyedric structure

Am: 23-51 cm, 10 YR 3/3, medium loamy clay, firm sub-angular polyedric structure

AB: 51-64 cm, 10 ZR 3/3, medium loamy clay, large sub-angular polyedric structure

BtW_3: 64-100 cm, 10 YR 4/4, clayish loam, large sub-angular polyedric structure

BtW_2: 100-130 cm, 10 YR 4/5, medium loamy clay

BC: 130-170 cm, 10 YR 5/5, clayish loam

Table 3

Analytic data on the bati-stagnic loamy phaeosiom (Gãtaia)

Horizons	Ap	Atp	Am	AB	BtW_3	BtW_2	BC
Depth (cm)	0-12	12-23	23-51	51-64	64-100	-130	-170
Coarse sand (2.0-0.2 mm) %	2.5	30.	4.0	3.4	2.3	2.0	1.4
Fine sand (0.2-0.02 mm) %	31.5	30.5	30.6	27.1	28.1	29.2	28.0
Dust (0.02-0.002 mm) %	30.3	32.6	29.2	26.4	23.8	24.1	23.2
Loam (below 0.002 mm) %	36.0	35.9	36.2	43.1	45.8	44.7	47.4
Physical loam (below 0.01 mm) %	50.0	50.7	51.3	55.9	57.8	56.3	58.1
TEXTURE	TT	TT	TT	TT	AL	AL	AL
pH of the H_2O	6.11	6.19	6.27	6.47	6.44	6.52	6.67
Humus (%)	2.00	3.18	1.88				
Mobile phosphorus (ppm)	5.39	3.76	4.52				
Assimilable potassium (ppm)	130	127	120				
Exchange bases (SB me/100 g soil)	14.71	15.53	17.58	18.00	18.61	19.03	19.84
Exchangeable hydrogen (me/100 g soil)	4.88	4.18	3.07	3.16	3.58	2.84	2.00
Cationic exchange capacity (T me)	19.59	19.71	20.65	21.16	22.19	21.84	21.84
Base saturation degree (V%)	75.08	78.79	85.13	85.06	83.86	87.01	90.84

CONCLUSIONS

Phaeosioms have a deep, dark coloured mollic horizon in the soil matrix or with no calcium carbonate concentrations, but with a base saturation over 50% in the first 100 cm.

They are developing on basic unconsolidated materials such as loess, loessoid deposits, and glacier deposits.

Many phaeosioms have deep down accumulations of loam that increase water holding capacity but that makes it suffer from lack of moisture during the dry season.

Gradually, the wind and partially flooding waters have mixed old alluvia with new ones ad with loessoid materials from the two higher "isles" (the area between Parta and Ciacova on the left bank of the river Timis and the area between Peciu and Giulvaz, on the right bank of the same river).

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