

STUDY ON CHARACTERIZATION SOILS OF TARGU JIU DEPRESSION

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Abstract: *The paper presents characterization Targu Jiu depression in terms of location in the environment, topography, hydrography, climate, lithology, natural vegetation. Analyzing soils in Targu Jiu depression, observed that under the influence of different natural conditions of climate, relief, rock and groundwater depth, they fall into different classes - subclasses -types - subtypes. To highlight the physical and chemical indicators of soil quality of Depression Targu Jiu, were harvested four different soil samples from areas Bîrsești, Preajba and Telesti, on 5 levels of depth and were determined quality indicators clay, humus, pH, primary nutrients N, P, K and C / N ratio. After analysis it was shown that coating Depression Targu Jiu soils is very complex, reflecting the diversity of environmental factors that contributed to their formation.*

Key words: *characterization, soils, depression, Targu Jiu*

1. INTRODUCTION

Depression Targu-Jiu or Carpathian basin of Oltenia is an individualized unit, located in the north of Oltenia, between the Carpathian mountains and hills. It consists of two rows of depressions of tectonic origin, which arose with land cover changes from early Quaternary:

- first series of depressions - stretching from Horezu to Baia de Arama, in the vicinity of mountains that separates the Carpathian hills area (*Carpathian Depression itself* or *groove depression*)
- the second row of depressions - located south of the first, about 20 km away from the mountain range (*interhill depression* or *depression between hills*). Depression intrahill stretching from east, Gilortului Valley, to the west of the valley Tismana, thus having an east-west, with a length of

50 km and a width that varies between 2 and 15 km (Figure 1) .

Based on morphological appearance, depression intrahill be subdivided into two large areas:

- Ciuperceni-Cornești- Târgu-Jiu area
- Budieni-Scoarța-CâmpulMare, Cărbunești area

Area Ciuperceni-Cornești Targu-Jiu is bounded to the north by a range of hills with low altitude (300-450 m), strongly fragmented transverse valleys, which connects with the groove interhill depression. From west to east, hills which close northward lowland plains are: Negoiesti (387 m), Godinești (350 m), Sporesti (402 m), Brădiceni (375 m), Stroesti (306 m), Rasova (343 m) Dealul Targului (348 m), Bălănești (417 m) and Copacioasa (453 m). From Ciuperceni village, the northern boundary of the basin bypasses the villages north: Telesti, Cornești, Bălești, Bîrsești, Targu-Jiu, Drăgoieni, which are strung like a chain under

the lee of Carpathian hills. In the south, depression is closed by hilly massive Dealul lui Bran, showing low heights (below 345 m). Southern boundary down the Tismana valley, Jiu river passes south of the village Rogojelu, anticlinatului law Rovinari and cut terraces of Dealul lui Bran, south of the villages: Tîlvești, Urechești, Dănești and north of the village Cornetu, until Budieni village, where the second region begins east interhill depression.

Interhill depression relief include low and high forms. Largest area is occupied by the lower forms, which appears as a large plain with small bumps. This plain tectonic stretching over a length of over 25 km, from west of the village Călnic and to the northwest by the municipality Budieni. Its width varies from a few km, village Cilnic of up to 8-10 km west of Tg-Jiu, where it forms the widest section. Absolute elevation of the basin is 220 m from Budieni, 205 m from Tg-Jiu and 150 m from Rovinari, showing a slight inclination towards the Jiu Valley, west of Tg-Jiu. Highest forms of depression, are represented by erosion thresholds and slopes, linking tectonics and anticline neighboring plains.

Main basin consists of Jiu river, which crosses the basin from northeast to southwest and collect from west of Tg-Jiu, all water drains interhill depression. On the right, Jiu receives tributaries: Tismana united Jaleșul, Șușița, Cartiul and Sîmbotinul. On the left, Jiu has one main tributary, Amaradia, that collects rain water from hilly massifs Bălănești, Voitești and Copacioasa.

Lithology is represented by alluvial, colluvial deposits, colluvial and proluvial, sedimented over a bed of clay marl of Pliocene age. The highest forms of relief are terrace deposits consist of sand and gravel by the torrential waters dug valleys. Groundwater depth varies considerably across the basin. On forms is high at over 15 m, and the bass range from 1 to 10 m, mostly affecting the morphology of the soil profile.

The natural vegetation consists of oak forests (*Quercus robur*), sessile oak (*Quercus petraea* and *Q. polycarpa*) heaven (*Q. cerris*), flasks (*Q. frainetto*), beech (*Fagus sylvatica*).

The natural grasslands, the highest forms of relief associations meet *Agrostis tenuis* and *Cynosurus cristatus*, and the bass associations *Agrostis alba*, *Alopecurus pratensis* and *Agropyrum repens*.

The climate is characterized by relatively high temperatures, annual average of 10.2 0 C, with an annual amplitude of 24.10 C. Annual temperatures recorded favorable development of sophisticated crop. Rainfall is evenly distributed during the years, sometimes with torrential character.

Analyzing soils in Targu Jiu depression, observed that under the influence of different natural climatic conditions, relief, rock and groundwater depth, they fall into different classes - subclasses -types - subtypes (Table 1 and Figure 2).

2. MATERIALS AND METHODS

To highlight physical and chemical indicators of soil quality of Targu Jiu Depression, were collected 4 different solis sample from the ground, Bîrsești Preajba and Telesti areas, as follows:

- poor yellow podzolit forests soil from Bîrsești area
- the average yellow podzolit forests soil from Preajba area
- yellow podzolic loamy iluvial pseudogleizat soil from Preajba area
- gleyed podzolic soil from Telesti area

Soils were collected using a probe collection of soil samples, on 5 levels deep: 0-25cm, 25-40cm, 40-70cm, 70-100cm, over 100 cm. Soil samples collected were transported and prepared for analysis. Were determined following physical and chemical indicators of quality:

- *clay content* (%), the fraction <0.002 mm - particle size separation method
- *content of humus* (organic matter) (%) - by wet oxidation method and dosage titration Walkley Black, based on the oxidation of carbon with oxidizing mixture of K₂Cr₂O₇ and H₂SO₄
- *the content of primary nutrients*: N (%) by the Kjeldahl method, P (P₂O₅ mg/100 g soil), by the colorimetric

method with ethyl ammonium lactate, K (K₂O in mg/100 g soil), the method ethyl ammonium lactate

- *C/N*
- *the pH* of the aqueous suspension, with pH-meter potentiometer

3. RESULTS AND DISCUSSION

Physical and chemical quality indicators of soil samples collected from the five levels deep, Bîrşeşti, Preajba and Telesti area of Targu Jiu depression, are presented in Table 2 for yellowish brown forest poorly podzolit soil, Table 3, to yellowish brown forest podzolit soil, Table 4, for yellow podzolic loamy iluvial pseudogleizat soil and Table 5 for gleyed podzolic soil.

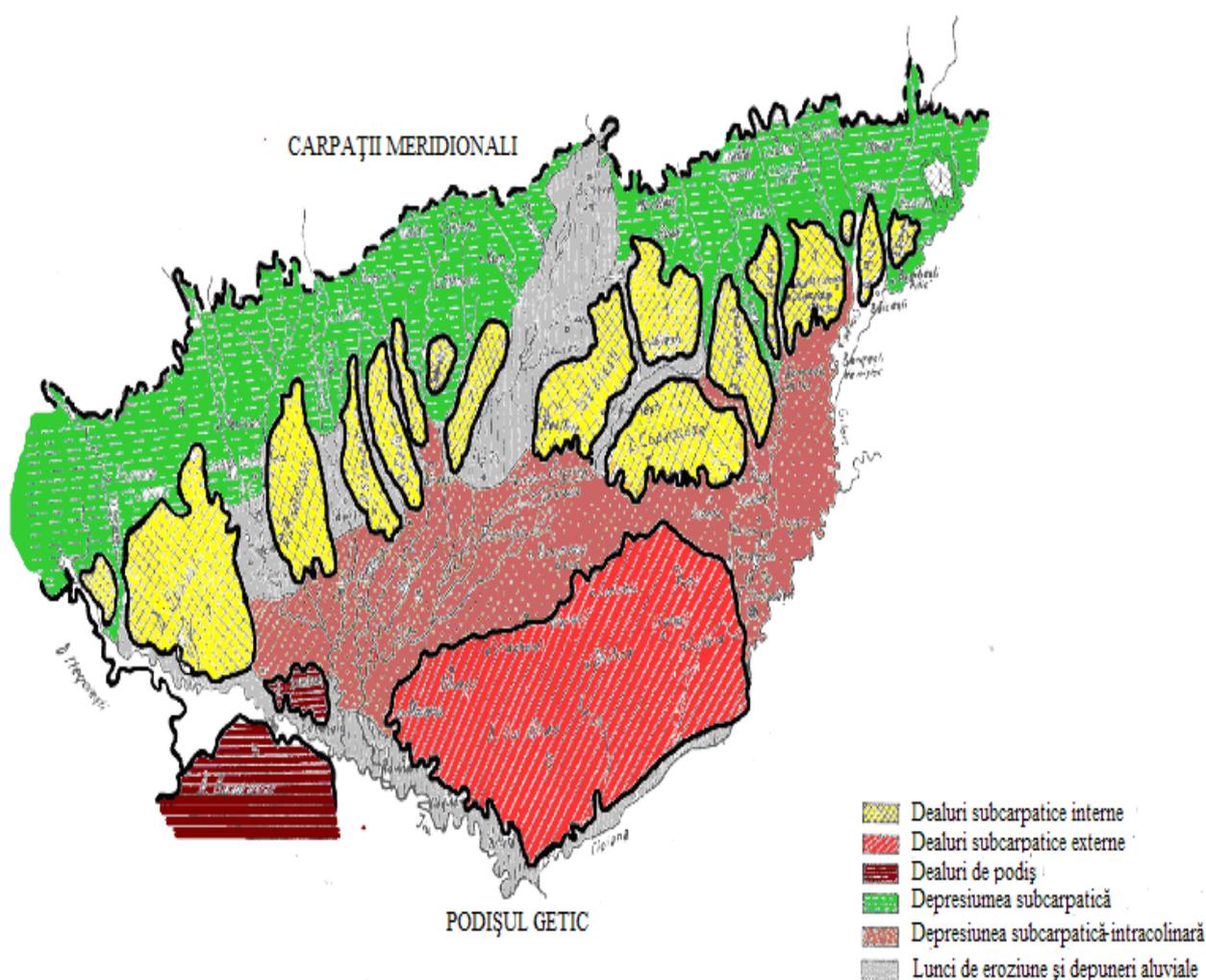


Figure 1. Geomorphological sketch of Carpathian basin of Oltenia

Table 1. Soils of Targu Jiu depression

Classe– subclasse –type-subtype			
Regional soils	Brown forests soils	Automorfe soils	podzolic brown forests soils
			podzolic yellowish brown forests soils
			dark brown forests soils
			brown forest soils reddish deposits
		Stagno hidroautomorfe soils	podzolic pseudogleizat brown forest soils
		podzolic pseudogleizat brown-yellow soils	
	Phreatic hidroautomorfe soils	gleyed podzolic brown forest soils	
	yellowish brown gleyed podzolic soils		
	Podzolic soils	Automorfe soils	podzolic loamy iluvial soils
		Stagno hidroautomorfe soils	podzolic pseudogleizat loamy iluvial soils
yellow podzolic loamy iluvial pseudogleizat soils			
yellow podzolic clay B1 horizon iluvial pseudogleizat closed soils			
gleyed podzolic soils			
Phreatic hidroautomorfe soils		yellow gleyed podzolic soils	
Intra-zone soils	Litomorfe soils	pseudorezine leachates	
	Hidromorfe soils	gleyic soils	
		semigleyic soils	
		amfigleyic soils	
		pseudogleyic soils	
Poorly evolved soils		regosols	
		river deposits	
		alluvial soils	

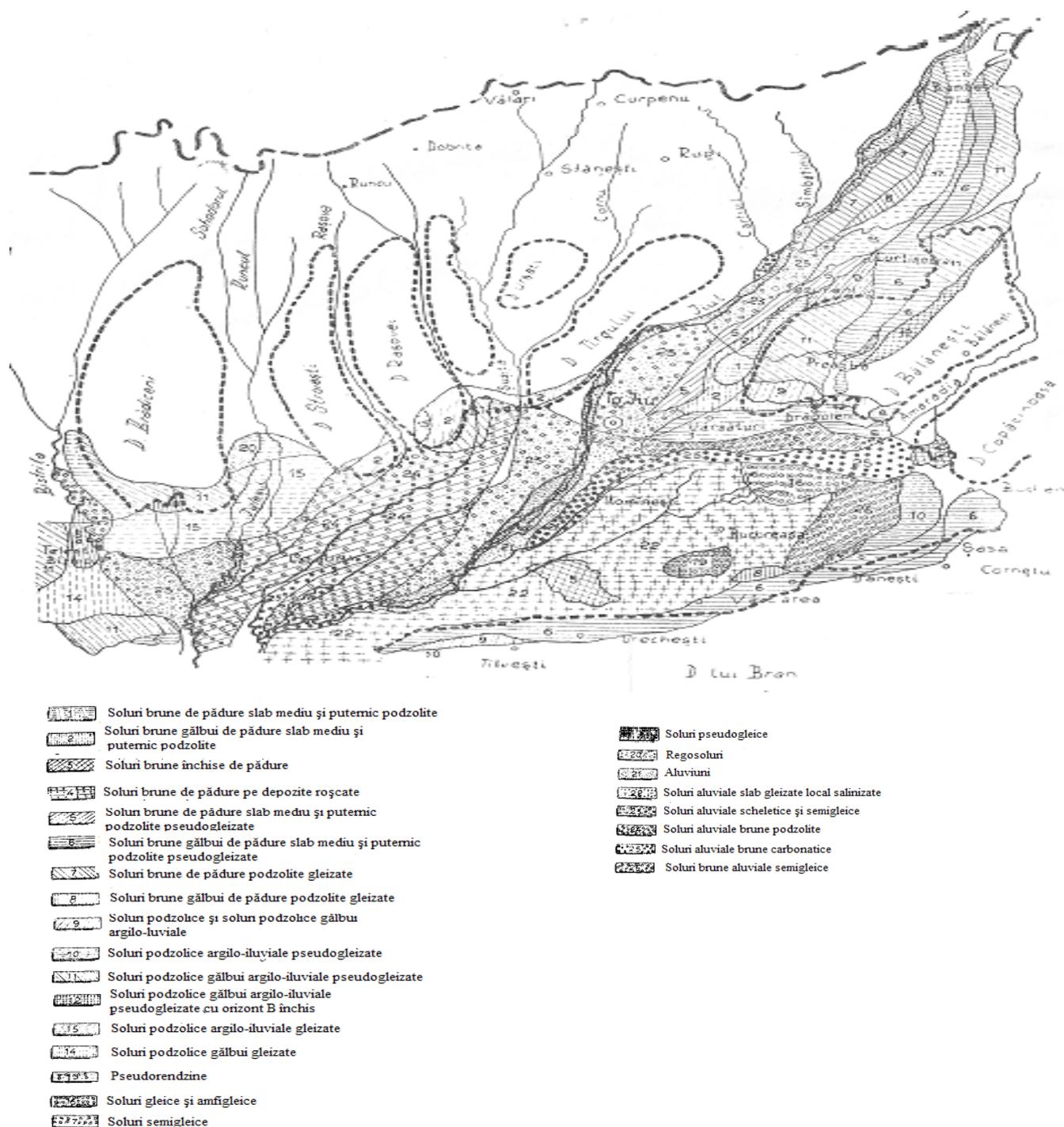


Figure 2. Soils of Targu Jiu Depression

Table 2. Physico-chemical indicators for yellowish brown forest podzolite soil (Bîrsești)

Depth (cm)	Clay (%)	Humus (%)	N total (%)	C/N	pH	mg/ 100 g soil	
						P	K
0-25	49,85	3,9	0,182	14,46	6,3	0,8	10,4
25-40	51,85	2,18	0,113	13,04	6,2	0,6	14,4
40-70	73,91	-	-	-	6,9	0,4	3,0
70-100	67,84	-	-	-	7,1	0,3	3,6
peste 100	57,08	-	-	-	7,3	1,8	16,9

Table 3. Physico-chemical indicators for yellowish brown forest podzolit soil from(Preajba)

Depth (cm)	Clay (%)	Humus (%)	N total (%)	C/N	pH	P ₂ O ₅	K ₂ O
						mg/ 100 g soil	
0-25	21,37	3,56	0,163	14,68	5,2	0,1	5,6
25-40	20,93	1,90	0,093	13,80	5,1	0,0	3,6
40-70	41,42	0,86	0,05	11,62	5,6	0,0	4,9
70-100	52,45	0,81	-	-	5,4	0,2	7,2
peste 100	50,01	0,43	-	-	5,6	1,3	6,1

Table 4. Physico-chemical indicators of clay-yellow podzolic iluvial pseudogleizat soil (Preajba)

Depth (cm)	Clay (%)	Humus (%)	N total (%)	C/N	pH	P ₂ O ₅	K ₂ O
						mg/ 100 g soil	
0-25	21,47	2,48	0,115	14,53	5,6	0,2	5,6
25-40	25,63	1,90	0,121	10,61	5,0	0,3	6,4
40-70	24,59	1,40	0,09	10,50	5,0	0,2	6,4
70-100	50,13	0,83	-	-	5,7	0,4	6,2
peste 100	58,57	0,85	-	-	6,6	0,4	2,0

Table 5. Physico-chemical indicators of the gleyed podzolic soil (Telesti area)

Depth (cm)	Clay (%)	Humus (%)	N total (%)	C/N	pH	P ₂ O ₅	K ₂ O
						mg/ 100 g soil	
0-25	26,94	3,80	0,171	14,14	5,5	1,2	3,6
25-40	42,32	1,19	0,08	10,22	5,7	0,4	3,2
40-70	21,39	0,68	0,06	7,63	5,9	0,6	3,7
70-100	51,32	-	-	-	6,1	1,8	9,6
peste 100	42,08	-	-	-	7,0	4,8	6,4

4. CONCLUSIONS

- Soils from Targu-Jiu Depression is very complex, reflecting the diversity of environmental factors that contributed to their formation.
- Surface highest occupied by yellowish brown podzolic soils and yellow podzolic pseudogleizat soils, that have evolved rocks poor basic elements, very diverse in terms of mineralogy. They are acidic soils (pH 5.3 to 6.3), low in humus and phosphorus assimilated and are indicated for use as pastures, meadows, orchards and cultivated rye, wheat, corn and potatoes, according to relief and slope.
- On low relief forms and well drained, brown alluvial soils have evolved, sometimes skeletal carbonate. They are slightly acidic or neutral (pH 6.5 to 7.2), well supplied with nutrients and is recommended for potato crops, rye and corn.
- On low relief forms with insufficient drainage or groundwater near the surface, and semigleye gley soils evolved compact, slightly acidic (pH 6.0-6.7), poor especially assimilable phosphorus and are indicated for gardening or grazing
- Soil brown, yellowish brown and pseudorendzinelor occupy small areas. They are neutral weak acid soils (pH 6.6 to 7.0), well supplied with humus

and nutrients, being suitable for vineyards and fruit.

- Fertilizers with nitrogen and phosphorus are necessary to ensure soil fertility of depression Targu Jiu.

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